



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

13696

CONTRACT Dublin Central Development - Draft		DRILLHOLE NO RC08
		SHEET Sheet 27 of 33
CO-ORDINATES(_)	GROUND LEVEL (m)	DATE STARTED 13/09/2008
	CORE DIAMETER (mm) 102	DATE COMPLETED 14/09/2008
CLIENT ENGINEER Dublin Central Developments Ltd. AGL Consulting Engineers	INCLINATION -90	DRILLED BY Millennium
	FLUSH Polymer Gel	LOGGED BY A. Mahony

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
26													
									26.11	Discontinuities are smooth and planar and clay smeared. Dips are sub-10°. (continued)			
								Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh to slightly and locally moderately weathered. Pyrite dispersed. Incipient fractures common.	26.32	Discontinuities are smooth to slightly rough and planar. Dips are sub-10°.			
26.30		100	30	0				Strong to moderately strong, thin to medium bedded, dark grey to black, fine grained ARGILLACEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. Local calcite veining.		Discontinuities are smooth and planar and slightly clay smeared. Dips are sub-10° with iron oxide stained sub-vertical fracture.			
26.60													

REMARKS				
Hand dug inspection pit to 1.2m.				
INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
14-09-08	13.00	6.00	13.00	50mm SP
14-09-08	32.50	26.50	32.50	50mm SP

INSTALLATION REMARKS				
Headworks.				
GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC NEWLOG 1M PER PG 13696.GPJ IGSL.GDT 11/11/08



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

13696

CONTRACT Dublin Central Development - Draft		DRILLHOLE NO RC08
		SHEET Sheet 28 of 33
CO-ORDINATES (_)		DATE STARTED 13/09/2008
		DATE COMPLETED 14/09/2008
CLIENT Dublin Central Developments Ltd.		DRILLED BY Millennium
ENGINEER AGL Consulting Engineers		LOGGED BY A. Mahony
		INCLINATION -90
		FLUSH Polymer Gel

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
27					0 250 500			Strong to moderately strong, thin to medium bedded, dark grey to black, fine grained ARGILLACEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. Local calcite veining. <i>(continued)</i>		Discontinuities are smooth and planar and slightly clay smeared. Dips are sub-10° with iron oxide stained sub-vertical fracture. <i>(continued)</i>			
	100	61	7						27.52	Discontinuities are smooth and planar and clay smeared. Dips are sub-10°.			
								Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh to slightly and locally moderately weathered. Pyrite dispersed. Incipient fractures common.					

REMARKS					INSTALLATION REMARKS				
Hand dug inspection pit to 1.2m.					Headworks.				
					GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments					
INSTALLATION DETAILS									
Date	Tip Depth	RZ Top	RZ Base	Type					
14-09-08	13.00	6.00	13.00	50mm SP					
14-09-08	32.50	26.50	32.50	50mm SP					

IGSL RC NEWLOG 1M PER PG 13696.GPJ IGSL_GDT 11/11/08



GEOTECHNICAL CORE LOG RECORD

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CONTRACT Dublin Central Development - Draft		DRILLHOLE NO RC08
		SHEET Sheet 29 of 33
CO-ORDINATES(_)	GROUND LEVEL (m)	DATE STARTED 13/09/2008
	CORE DIAMETER (mm) 102	DATE COMPLETED 14/09/2008
CLIENT ENGINEER Dublin Central Developments Ltd. AGL Consulting Engineers	INCLINATION -90	DRILLED BY Millennium
	FLUSH Polymer Gel	LOGGED BY A. Mahony

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
28	28.00				0 250 500			Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh to slightly and locally moderately weathered. Pyrite dispersed. Incipient fractures common. <i>(continued)</i>		Discontinuities are smooth and planar and clay smeared. Dips are sub-10°. <i>(continued)</i>			
		100	58	0									
	28.40							Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout.	28.42	Discontinuities are smooth and planar. Dips are sub-10°.			
		100	83	69									

REMARKS Hand dug inspection pit to 1.2m.					INSTALLATION REMARKS Headworks.				
					GROUNDWATER DETAILS				
		Date	Hole Depth	Casing Depth	Depth to Water	Comments			
INSTALLATION DETAILS									
Date	Tip Depth	RZ Top	RZ Base	Type					
14-09-08	13.00	6.00	13.00	50mm SP					
14-09-08	32.50	26.50	32.50	50mm SP					

IGSL RC NEWLOG 1M PER PG 13696.GPJ IGSL.GDT 11/11/08



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CONTRACT Dublin Central Development - Draft		DRILLHOLE NO RC08
		SHEET Sheet 30 of 33
CO-ORDINATES (_)		DATE STARTED 13/09/2008
		DATE COMPLETED 14/09/2008
CLIENT Dublin Central Developments Ltd.		DRILLED BY Millennium
ENGINEER AGL Consulting Engineers		LOGGED BY A. Mahony
		GROUND LEVEL (m)
		CORE DIAMETER (mm) 102
		INCLINATION -90
		FLUSH Polymer Gel

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
29					0 250 500					Discontinuities are smooth and planar. Dips are sub-10°. (continued)			
								Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh to slightly and locally moderately weathered. Pyrite dispersed. Incipient fractures common.	29.17	Discontinuities are smooth and planar and clay smeared. Dips are sub-10°.			
								Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout.	29.28	Discontinuities are smooth and planar and clay smeared. Dips are sub-10°.			
								Strong to very strong, thin to medium bedded, dark grey to black, fine grained ARGILLACEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout.	29.46	Discontinuities are smooth to slightly rough and clay smeared. Non-intact.			
29.50								Strong to moderately strong, thin to medium bedded, dark grey to black, fine grained ARGILLACEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout.	29.79	Discontinuities are smooth and slightly undulose. Dips are sub-10°.			
		100	27	27				Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout.		Discontinuities are smooth and planar. Dips are sub-10° with undulose sub-vertical fracture.			

REMARKS	INSTALLATION REMARKS
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Hand dug inspection pit to 1.2m.	Headworks.
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GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
14-09-08	13.00	6.00	13.00	50mm SP
14-09-08	32.50	26.50	32.50	50mm SP

IGSL RC NEWLOG 1M PER PG 13696 GPJ IGSL GDT 11/11/08



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CONTRACT Dublin Central Development - Draft		DRILLHOLE NO RC08
		SHEET Sheet 31 of 33
CO-ORDINATES(_)		DATE STARTED 13/09/2008
		DATE COMPLETED 14/09/2008
CLIENT Dublin Central Developments Ltd.		DRILLED BY Millennium
ENGINEER AGL Consulting Engineers		LOGGED BY A. Mahony
		GROUND LEVEL (m)
		CORE DIAMETER (mm) 102
		INCLINATION -90
		FLUSH Polymer Gel

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
30					0 250 500			Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. <i>(continued)</i>		Discontinuities are smooth and planar. Dips are sub-10° with undulose sub-vertical fracture. <i>(continued)</i>			
	30.10							Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh to slightly and locally moderately weathered. Pyrite dispersed. Incipient fractures common.	30.26	Discontinuities are smooth and planar with local clay gravel infill (30.32-30.34m, 30.47-30.48m). Dips are sub-10°.			
		100	76	58				Strong to moderately strong, thin to medium bedded, dark grey to black, fine grained ARGILLACEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. Local calcite veining.	30.51	Discontinuities are smooth and planar, slightly clay smeared. Dips are sub-10°.			
									30.95				

REMARKS					INSTALLATION REMARKS				
Hand dug inspection pit to 1.2m.					Headworks.				
					GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments					
14-09-08	13.00	6.00	13.00	50mm SP					
14-09-08	32.50	26.50	32.50	50mm SP					
INSTALLATION DETAILS									
Date	Tip Depth	RZ Top	RZ Base	Type					
14-09-08	13.00	6.00	13.00	50mm SP					
14-09-08	32.50	26.50	32.50	50mm SP					

IGSL RC NEW LOG 1M PER PG 13696 GPJ IGSL_GDT 11/11/08



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CONTRACT Dublin Central Development - Draft		DRILLHOLE NO RC08
		SHEET Sheet 32 of 33
CO-ORDINATES (_)		DATE STARTED 13/09/2008
		DATE COMPLETED 14/09/2008
CLIENT Dublin Central Developments Ltd.		DRILLED BY Millennium
ENGINEER AGL Consulting Engineers		LOGGED BY A. Mahony
		INCLINATION -90
		FLUSH Polymer Gel

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
31	31.00				0 250 500		Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. <i>(continued)</i>	31.02	Discontinuities are smooth to slightly rough and clay smeared. Non-intact.			
		100	17	0			Strong to moderately strong, thin to medium bedded, dark grey to black, fine grained ARGILLACEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout.	31.19	Discontinuities are smooth and planar. Dips are sub-10° with undulose sub-vertical calcite vein fracture.			
							Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout.	31.42	Discontinuities are smooth and planar. Dips are sub-10° with undulose sub-vertical calcite vein fracture.			
							Strong to moderately strong, thin to medium bedded, dark grey to black, fine grained ARGILLACEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. Local calcite veining.	31.72				
	31.70						Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. Local calcite veining.	31.99				

REMARKS					INSTALLATION REMARKS				
Hand dug inspection pit to 1.2m.					Headworks.				
					GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments					
INSTALLATION DETAILS									
Date	Tip Depth	RZ Top	RZ Base	Type					
14-09-08	13.00	6.00	13.00	50mm SP					
14-09-08	32.50	26.50	32.50	50mm SP					

IGSL RC NEWLOG 1M PER PG 13696.GPJ IGSL.GDT 11/11/08



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CONTRACT Dublin Central Development - Draft		DRILLHOLE NO RC08
CO-ORDINATES(_)		SHEET Sheet 33 of 33
CLIENT Dublin Central Developments Ltd.		DATE STARTED 13/09/2008
ENGINEER AGL Consulting Engineers		DATE COMPLETED 14/09/2008
GROUND LEVEL (m)		DRILLED BY Millennium
CORE DIAMETER (mm) 102		LOGGED BY A. Mahony
INCLINATION -90		
FLUSH Polymer Gel		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
32		100	50	50				Strong to moderately strong, thin to medium bedded, dark grey to black, fine grained ARGILLACEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. Local calcite veining. <i>(continued)</i>	32.11	Discontinuities are smooth and planar. Dips are sub-10°. <i>(continued)</i>			
								Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. Local calcite veining. <i>(continued)</i>	32.35	Discontinuities are smooth and planar. Dips are sub-10°.			
								Strong to moderately strong, thin to medium bedded, dark grey to black, fine grained ARGILLACEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. Local calcite veining. End of Corehole at 32.5 (m)	32.50				
32.50													

REMARKS					INSTALLATION REMARKS				
Hand dug inspection pit to 1.2m.					Headworks.				
					GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments					
INSTALLATION DETAILS									
Date	Tip Depth	RZ Top	RZ Base	Type					
14-09-08	13.00	6.00	13.00	50mm SP					
14-09-08	32.50	26.50	32.50	50mm SP					

IGSL RC NEWLOG TM PER PG 13696.GPJ IGSL_GDT 11/11/08



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

13696

CONTRACT Dublin Central Development - Draft

DRILLHOLE NO RC16
SHEET Sheet 1 of 15

CO-ORDINATES(_)

GROUND LEVEL (m)
CORE DIAMETER (mm) 102

DATE STARTED 18/11/2008
DATE COMPLETED

CLIENT Dublin Central Developments Ltd
ENGINEER AGL Consulting Ltd

INCLINATION -90
FLUSH Polymer Gel

DRILLED BY Millennium
LOGGED BY A. Mahony

Downhole Depth (m)	Core Run Depth (m)	T.C.R. %	S.C.R. %	R.Q.D. %	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
0					0 250 500			SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of fill (concrete, brick, black/brown clay)					
1								SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of clayey gravelly cobbles	1.20				

REMARKS
18/11/08- 6¼hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.

INSTALLATION REMARKS

GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
19-11-08	8.00	4.50	8.00	50mm SP
19-11-08	25.00	20.00	25.00	50mm SP

IGSL RC NEW LOG 2M PER PG. 13696.GPJ IGSL.GDT. 28/11/08



GEOTECHNICAL CORE LOG RECORD

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13696

CONTRACT Dublin Central Development - Draft

DRILLHOLE NO RC16

SHEET Sheet 2 of 15

CO-ORDINATES(_)

GROUND LEVEL (m)
CORE DIAMETER (mm) 102

DATE STARTED 18/11/2008
DATE COMPLETED

CLIENT Dublin Central Developments Ltd
ENGINEER AGL Consulting Ltd

INCLINATION -90
FLUSH Polymer Gel

DRILLED BY Millennium
LOGGED BY A. Mahony

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)	
2					0 250 500	Legend	Non-intact zones (shaded)	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of clayey gravelly cobbles <i>(continued)</i>	2.50			Elevation	Standpipe Details	SPT (N Value)
								SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay					N = 4 (20, 5, 1, 1, 1, 1)	
3														

REMARKS
18/11/08- 6¼hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.

INSTALLATION REMARKS

GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
19-11-08	8.00	4.50	8.00	50mm SP
19-11-08	25.00	20.00	25.00	50mm SP

IGSL RC NEW LOG 2M PER PG. 13696.GPJ IGSL_GDT 28/11/08



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CONTRACT Dublin Central Development - Draft		DRILLHOLE NO RC16
		SHEET Sheet 4 of 15
CO-ORDINATES(_)		DATE STARTED 18/11/2008
		DATE COMPLETED
CLIENT Dublin Central Developments Ltd		DRILLED BY Millennium
ENGINEER AGL Consulting Ltd		LOGGED BY A. Mahony
GROUND LEVEL (m)		INCLINATION -90
CORE DIAMETER (mm) 102		FLUSH Polymer Gel

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
6					0 250 500			SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay <i>(continued)</i>				N = 41 (1, 2, 2, 4, 15, 20)	
7													

REMARKS
18/11/08- 6¼hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.

INSTALLATION REMARKS

GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
19-11-08	8.00	4.50	8.00	50mm SP
19-11-08	25.00	20.00	25.00	50mm SP

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CONTRACT Dublin Central Development - Draft		DRILLHOLE NO RC16
		SHEET Sheet 5 of 15
CO-ORDINATES (_)		GROUND LEVEL (m)
		CORE DIAMETER (mm) 102
		DATE STARTED 18/11/2008
		DATE COMPLETED
CLIENT Dublin Central Developments Ltd		DRILLED BY 19/11/2008 Millennium
ENGINEER AGL Consulting Ltd		LOGGED BY A. Mahony
		INCLINATION -90
		FLUSH Polymer Gel

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
8					0 250 500			SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay <i>(continued)</i>					N = 46 (2, 4, 8, 10, 12, 16)
									10.00				

REMARKS 18/11/08- 6¼hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.					INSTALLATION REMARKS				
					GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments					
19-11-08	8.00	4.50	8.00	50mm SP					
19-11-08	25.00	20.00	25.00	50mm SP					
INSTALLATION DETAILS									
Date	Tip Depth	RZ Top	RZ Base	Type					
19-11-08	8.00	4.50	8.00	50mm SP					
19-11-08	25.00	20.00	25.00	50mm SP					

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CONTRACT Dublin Central Development - Draft

DRILLHOLE NO RC16
SHEET Sheet 6 of 15

CO-ORDINATES(_)

GROUND LEVEL (m)
CORE DIAMETER (mm) 102

DATE STARTED 18/11/2008
DATE COMPLETED

CLIENT Dublin Central Developments Ltd
ENGINEER AGL Consulting Ltd

INCLINATION -90
FLUSH Polymer Gel

DRILLED BY Millennium
LOGGED BY A. Mahony

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
10	10.00				0 250 500			Clayey GRAVEL (rounded and coarse).	10.20				N = 50 (2, 3, 3, 11, 17, 19)
		87	0	0			Dark brown, firm, sandy gravelly CLAY. Gravel is rounded and medium grained.	10.85					
	10.40						Dark brown, slightly gravelly (fine) SAND (medium to fine)	11.10					
11		100	0	0			Dark brown, firm to stiff, slightly sandy, gravelly CLAY. Gravel is fine to medium, sub-angular to sub-rounded.	11.90					
	11.90												

DGC PLAN NO 5126/22
RECEIVED: 26/10/2022

REMARKS
18/11/08- 6¼hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.

INSTALLATION REMARKS

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
19-11-08	8.00	4.50	8.00	50mm SP
19-11-08	25.00	20.00	25.00	50mm SP

IGSL RC NEW LOG 2M PER PG. 13696.GPJ IGSL_GDT 28/11/08



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CONTRACT Dublin Central Development - Draft

DRILLHOLE NO RC16
SHEET Sheet 7 of 15

CO-ORDINATES (_)

GROUND LEVEL (m)
CORE DIAMETER (mm) 102

DATE STARTED 18/11/2008
DATE COMPLETED

CLIENT Dublin Central Developments Ltd
ENGINEER AGL Consulting Ltd

INCLINATION -90
FLUSH Polymer Gel

DRILLED BY Millennium
LOGGED BY A. Mahony

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
12	12.30	100	0	0				Dark brown, firm to stiff, slightly sandy, gravelly CLAY with occasional cobbles. Gravel is fine to coarse, sub-angular to sub-rounded. Loss of recovery 0.2m. (continued)	12.60				
								Very clayey (brown/black) gravelly cobbles of argillaceous LIMESTONE (probable moderate to highly weathered bedrock).	13.03				
13		100	41	9				Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh to slightly weathered with incipient fractures.	13.70	Discontinuities are smooth and planar. Clay smeared and slightly iron oxide stained (13.51m-13.7m) Dips are sub-10°.			
	13.90							Strong to locally moderately strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to slightly weathered.		Discontinuities are smooth to slightly rough and planar. Iron oxide stained 13.7m-13.9m. Heavily clay smeared 13.9m-14.02m. Dips are sub-10°.			

REMARKS
18/11/08- 6¼hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.

INSTALLATION REMARKS

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
19-11-08	8.00	4.50	8.00	50mm SP
19-11-08	25.00	20.00	25.00	50mm SP

IGSL RC NEWLOG 2M PIER PG. 13696.GPJ IGSL.GDT. 28/11/08



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CONTRACT Dublin Central Development - Draft		DRILLHOLE NO RC16
		SHEET Sheet 8 of 15
CO-ORDINATES(_)		DATE STARTED 18/11/2008
		DATE COMPLETED
CLIENT Dublin Central Developments Ltd		DRILLED BY Millennium
ENGINEER AGL Consulting Ltd		LOGGED BY A. Mahony
GROUND LEVEL (m)		
CORE DIAMETER (mm) 102		
INCLINATION -90		
FLUSH Polymer Gel		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
14					0 250 500		Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh to slightly weathered with incipient fractures.	14.02	Non-Intact. Discontinuities are smooth and planar and heavily clay smeared. Dips are sub-10° with variable fractures.			
							Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh.	14.28	Discontinuities are smooth and planar. Dips are sub-10°.			
		100	43	29			Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh	14.48	Discontinuities are smooth and planar. Clay smeared 14.48m-14.71m. Dips are sub-10°.			
							Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh to locally slightly weathered.	14.90	Discontinuities are smooth and planar. Clay smeared 15.01m. Dips are sub-10°.			
15							Strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to slightly weathered. Pyrite lense 15.25m.	15.01	Discontinuities are smooth to slightly rough and planar. Dips are sub-10°.			
							Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh. Pyrite lense 15.36m.	15.28	Discontinuities are smooth and planar. Dips are sub-10°.			
15.40								15.84	Discontinuities are smooth and planar. Dips are sub-10°.			

REMARKS
 18/11/08- 6¼hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.

INSTALLATION REMARKS

GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
19-11-08	8.00	4.50	8.00	50mm SP
19-11-08	25.00	20.00	25.00	50mm SP

IGSL RC NEWLOG 2M PER PG 13696.GPJ IGSL_GDT 28/11/08



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DRILLHOLE NO RC16
SHEET Sheet 9 of 15

CO-ORDINATES(_)

GROUND LEVEL (m)
CORE DIAMETER (mm) 102

DATE STARTED 18/11/2008
DATE COMPLETED

CLIENT ENGINEER Dublin Central Developments Ltd
AGL Consulting Ltd

INCLINATION -90
FLUSH Polymer Gel

DRILLED BY 19/11/2008
Millennium
LOGGED BY A. Mahony

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
16					0 250 500	Legend		Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh to locally slightly weathered. <i>(continued)</i>		Discontinuities are smooth and planar. Dips are sub-10°. <i>(continued)</i>			
	100	94	82										
17								Strong to locally moderately strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE with argillaceous zones. Slightly weathered with sub-vertical calcite vein throughout.	17.20	Discontinuities are smooth to slightly rough and planar. Dips are sub-10° with sub-vertical calcite fracture throughout.			
	17.10												
		100	100	100									

REMARKS
18/11/08- 6¼hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.

INSTALLATION REMARKS

GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
19-11-08	8.00	4.50	8.00	50mm SP
19-11-08	25.00	20.00	25.00	50mm SP

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ENGINEER AGL Consulting Ltd		LOGGED BY A. Mahony
GROUND LEVEL (m)		CORE DIAMETER (mm) 102
INCLINATION -90		FLUSH Polymer Gel

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
18	18.20				0 250 500			Strong to locally moderately strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE with argillaceous zones. Slightly weathered with sub-vertical calcite vein throughout. <i>(continued)</i>	18.92	Discontinuities are smooth to slightly rough and planar. Dips are sub-10° with sub-vertical calcite fracture throughout. <i>(continued)</i>			
19	19.00	100	100	91				Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE (slightly siliceous). Fresh to locally slightly weathered. Pyrite lense 19.39m.	19.68	Discontinuities are smooth and planar. Dips are sub-10° with sub-vertical fractures 19.14m-19.39m.			
	19.80	100	43	33				Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh to locally slightly weathered. Incipient fractures common.	19.80	Discontinuities are smooth and planar. Dips are sub-10°.			
										Discontinuities are smooth to slightly rough and planar. Dips are sub-10°.			

REMARKS
 18/11/08- 6¼hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.

INSTALLATION REMARKS

GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
19-11-08	8.00	4.50	8.00	50mm SP
19-11-08	25.00	20.00	25.00	50mm SP

IGSL RC NEWLOG 2M PER PG. 13696.GPJ IGSL_GDT 28/11/08



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CO-ORDINATES(_)		DATE STARTED 18/11/2008
		DATE COMPLETED
CLIENT Dublin Central Developments Ltd		DRILLED BY 19/11/2008 Millennium
ENGINEER AGL Consulting Ltd		LOGGED BY A. Mahony
		GROUND LEVEL (m)
		CORE DIAMETER (mm) 102
		INCLINATION -90
		FLUSH Polymer Gel

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
20					0 250 500			Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE, locally argillaceous zones. Fresh. (continued)	20.41	Discontinuities are smooth to slightly rough and planar. Dips are sub-10°. (continued)			
		100	59	57				Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh to locally slightly weathered.	20.88	Discontinuities are smooth and planar. Dips are sub-10° with sub-vertical fractures 20.7m-20.88m.			
21								Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh. Pyrite lense 20.93 & 21.14m.	21.14	Discontinuities are smooth to slightly rough and planar. Dips are sub-10° with sub-vertical fracture 20.88m-20.97m.			
	21.20							Moderately strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh to locally slightly weathered with incipient fractures.	21.42	Discontinuities are smooth and planar. Black clay infilled 21.2m-21.24m. Dips are sub-10°.			
								Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh to locally slightly weathered.		Discontinuities are smooth and planar. Dips are sub-10° with sub-vertical fractures 21.51-21.68m, 21.76m-21.92m and 22.45m-22.69m-clay smeared.			

REMARKS 18/11/08- 6¾hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.					INSTALLATION REMARKS 																													
INSTALLATION DETAILS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Date</th> <th>Tip Depth</th> <th>RZ Top</th> <th>RZ Base</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>19-11-08</td> <td>8.00</td> <td>4.50</td> <td>8.00</td> <td>50mm SP</td> </tr> <tr> <td>19-11-08</td> <td>25.00</td> <td>20.00</td> <td>25.00</td> <td>50mm SP</td> </tr> </tbody> </table>					Date	Tip Depth	RZ Top	RZ Base	Type	19-11-08	8.00	4.50	8.00	50mm SP	19-11-08	25.00	20.00	25.00	50mm SP	GROUNDWATER DETAILS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Date</th> <th>Hole Depth</th> <th>Casing Depth</th> <th>Depth to Water</th> <th>Comments</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>					Date	Hole Depth	Casing Depth	Depth to Water	Comments					
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IGSL RC NEW LOG 2M PER PG 13696.GPJ IGSL.GDT 28/11/08



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		DATE COMPLETED
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ENGINEER AGL Consulting Ltd		LOGGED BY A. Mahony
GROUND LEVEL (m)		FLUSH Polymer Gel
CORE DIAMETER (mm) 102		
INCLINATION -90		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
22		100	55	47				Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh to locally slightly weathered. (continued)	22.70	Discontinuities are smooth and planar. Dips are sub-10° with sub-vertical fractures 21.51-21.68m, 21.76m-21.92m and 22.45m-22.69m-clay smeared. (continued)			
22.90								Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh to locally slightly weathered.	23.50	Discontinuities are smooth to slightly rough and planar. Dips are sub-10°.			
23		100	100	87				Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh to locally slightly weathered. Pyrite lense 23.95m.	23.99	Discontinuities are smooth and planar. Clay smeared 23.5m-23.58m. Dips are sub-10°.			

REMARKS 18/11/08- 6¾hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.					INSTALLATION REMARKS				
					GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments					
INSTALLATION DETAILS									
Date	Tip Depth	RZ Top	RZ Base	Type					
19-11-08	8.00	4.50	8.00	50mm SP					
19-11-08	25.00	20.00	25.00	50mm SP					

IGSL RC NEW LOG 2M PER PG. 13696.GPJ IGSL_GDT 28/11/08



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SHEET Sheet 13 of 15

CO-ORDINATES(_)

GROUND LEVEL (m)
CORE DIAMETER (mm) 102

DATE STARTED 18/11/2008
DATE COMPLETED

CLIENT Dublin Central Developments Ltd
ENGINEER AGL Consulting Ltd

INCLINATION -90
FLUSH Polymer Gel

DRILLED BY Millennium
LOGGED BY A. Mahony

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
24		100	91	73				Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh (continued)	24.21	Discontinuities are smooth and planar. Dips are sub-10°. (continued)			
								Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh to locally slightly weathered. Pyrite lense 24.35m & 24.8m.		Discontinuities are smooth and planar. Dips are sub-10°.			
	24.90								25.21				
25								Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh.		Discontinuities are smooth to slightly rough and planar. Dips are sub-10°.			
		100	100	95					26.00				

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REMARKS
18/11/08- 6¾hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.

INSTALLATION REMARKS

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
19-11-08	8.00	4.50	8.00	50mm SP
19-11-08	25.00	20.00	25.00	50mm SP



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CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm) 102

DATE STARTED 18/11/2008

DATE COMPLETED

CLIENT Dublin Central Developments Ltd
ENGINEER AGL Consulting Ltd

INCLINATION -90

FLUSH Polymer Gel

DRILLED BY Millennium

LOGGED BY A. Mahony

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
26					0 250 500			Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh.	26.22	Discontinuities are smooth and planar. Dips are sub-10°.			
								Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh.	26.50	Discontinuities are smooth to slightly rough and planar. Dips are sub-10°.			
	26.50							Moderately strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh	26.56	Discontinuities are smooth and planar. Dips are sub-10°.			
								Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE with interbedded siliceous limestone. Fresh. Pyrite lense 27.0m.	27.25	Discontinuities are smooth and planar. Dips are sub-10°.			
		100	97	87				Moderately strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh	27.44	Discontinuities are smooth and planar. Dips are sub-10°.			
								Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh.	27.78	Discontinuities are smooth and planar. Dips are sub-10°.			
								Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh.		Discontinuities are smooth to slightly rough and planar. Dips are sub-10°.			

IGSL RC NEWLOG 2M PER PG. 13696.GPJ IGSL_GDT 28/11/08

REMARKS
18/11/08- 6¼hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.

INSTALLATION REMARKS

GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
19-11-08	8.00	4.50	8.00	50mm SP
19-11-08	25.00	20.00	25.00	50mm SP



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CLIENT Dublin Central Developments Ltd		DRILLED BY 19/11/2008 Millennium
ENGINEER AGL Consulting Ltd		LOGGED BY A. Mahony
		GROUND LEVEL (m)
		CORE DIAMETER (mm) 102
		INCLINATION -90
		FLUSH Polymer Gel

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	Legend	Non-intact zones (shaded)	Description	Depth (m)	Discontinuities	Elevation	Standpipe Details	SPT (N Value)
28					0 250 500								
	28.10							Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh.	28.10	Discontinuities are smooth and planar. Dips are sub-10°.			
								Moderately strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh	28.48	Discontinuities are smooth and planar. Dips are sub-10°.			
								Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh.	28.70	Discontinuities are smooth to slightly rough and planar. Dips are sub-10°.			
		100	86	74				Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh to locally slightly weathered.	29.25	Discontinuities are smooth and planar. Dips are sub-10°.			
29													
									29.80				
	29.80							End of Corehole at 29.8 (m)					

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REMARKS					INSTALLATION REMARKS				
18/11/08- 6¾hrs Unload sludge tanks, load & erect fencing, dig inspection pit (widened due to pipe) and move equipment onto location.									
					GROUNDWATER DETAILS				
Date		Hole Depth	Casing Depth	Depth to Water	Comments				
19-11-08		8.00	4.50	8.00					
19-11-08		25.00	20.00	25.00					
INSTALLATION DETAILS									
Date	Tip Depth	RZ Top	RZ Base	Type					
19-11-08	8.00	4.50	8.00	50mm SP					
19-11-08	25.00	20.00	25.00	50mm SP					

APPENDIX 3

Soil Sampling Protocol

DCC PLAN NO 5126/22
RECEIVED: 26/10/2022



STANDARD OPERATING PROCEDURE

SOIL SAMPLING

The soil sampling technique described below will be followed to ensure that soil samples are representative of the environment which they are intended to characterise.

1.0 SAMPLING

- (A) Locate the soil sampling station in accordance with the workplan which will specify the number and type of samples to be taken. Place a wooden stake into the ground one metre from the sample location and record sample location on the stake.
- (B) Record the location in the field logbook and, if possible, photograph the location.
- (C) Collect soil samples from the depth specified in the workplan and record the depth in the field notebook. Describe the colour and texture of each sample and record in notebook.
- (D) Wear appropriate level of protection when taking samples (gloves, safety glasses, hard hat etc.) as specified in the workplan. Collect soil samples as specified in the workplan using decontaminated stainless steel trowel, soil corer, or similar device. Collect discrete soil samples from each station.
- (E) If required by the workplan, composite discreet soil samples by placing equal volumes of soil into the container and mixing thoroughly to a homogenous mixture. Samples may be hand picked, if necessary, to remove larger materials, such as leaves, sticks, gravel, rocks etc., if specified in the workplan. Record in notebook the nature of any materials removed from soil samples.
- (F) Deposit each soil sampled into a (clean, pre-washed) container. At the time of collection, the sample bottle will be filled to the top with soil sample.
- (G) Fill out labels with waterproof ink and attach to the sample container. The following information will be recorded on each sample label: -
 - Client/Site Name
 - Date Collected
 - Time Collected
 - Analysis
 - Preservative
 - Sample Identification Number

- (H) Decontaminate sampling equipment as described below unless otherwise specified in the site workplan. When using stainless steel sampling equipment: -
- wash with non-phosphate detergent in potable water,
 - rinse sequentially in potable water, methanol, acetone, methanol and D1 water and;
 - allow to air dry in a containment free area.
- (I) Wrap the decontaminated sampling equipment in aluminium foil which has been decontaminated in accordance with Section H.

2.0 FIELD DOCUMENTATION

Record sample information in the field notebook. Provide a complete description of the sample location, and a photograph, if necessary. Describe the soil appearance, especially if the presence of oil or an odour is noted. Document the sample bottle lot numbers in the field notebook. Record weather conditions at the time of sampling. The Field Team Leader will initial the logbook entries for correctness.

3.0 FIELD QA/QC SAMPLES

See the separate SOP on Field QA/QC samples for appropriateness and preparation of D1 Water Field Blanks, Cross-contamination Field Blanks, Trip Blanks and Field Duplicate Samples.

4.0 PACKAGING AND TRANSPORT

Check to be sure that all necessary information is on the sample container label. Complete the chain-of custody form. Package, label and transport the samples to the testing laboratory in accordance with requirements for packing, shipping and labelling environmental samples.

END.

APPENDIX 4

Groundwater Sampling Protocol



STANDARD OPERATING PROCEDURE

GROUNDWATER SAMPLING

The primary objective of groundwater sampling is to evaluate whether the potential contaminant sources at a site have impacted the quality of the groundwater in the underlying aquifer. The additional objective is to measure hydraulic gradient, or slope, of the water table in the shallow aquifer in an effort to evaluate the direction of groundwater flow.

The purpose of this procedure is to ensure that representative samples of groundwater are collected and documented using consistent methods to ensure sample integrity.

1.0 SAMPLING PROCEDURES

DCC PLAN NO 5126/22
RECEIVED: 26/10/2022

1.1 Well Operating and Purging Procedures

All groundwater sampling will be conducted after the installed and developed wells have been allowed to equilibrate for at least 2 to 3 days. A Field Data Sheet for Well Sampling will be completed for each well.

Groundwater sampling teams will use the following procedure for approaching, opening, purging and sampling all wells unless directed otherwise by the workplan.

- 1) Prior to placing any equipment into the well, decontaminate the sampling equipment according to standard decontamination protocol.
- 2) Approach the well with a working FID/PID, a well key, and a depth-to-water meter.
- 3) Unlock and open the well cap just enough to insert the probe of the PID/FID. Take and record a reading. A decision to upgrade PPE may be necessary based on the FID/PID readings in the breathing zone.
- 4) Where practical, the surface water column will be visually examined for the presence of hydrocarbons, if present or suspected, the thickness of the hydrocarbon layer will be measured using an oil/water interface probe prior to taking the depth-to-water measurement.
- 5) Insert the water level probe into the well and measure and record the static water level to the nearest 0.01 m with respect to the established survey point on top of the well casing.

- 6) Decontaminate the water level probe with DDI water (Do not rinse with any solvents unless product was encountered).
- 7) Calculate and record the minimum volume of water to be purged according to the following conversion factors: -

1 well volume	=	water column in metres x litres/linear metre
2 inch casing	=	2.0 LPM
4 inch casing	=	8.1 LPM
6 inch casing	=	18.2 LPM
8 inch casing	=	32.4 LPM

- 8) Purge the well of at least 3 casing volumes by pumping using a peristaltic pump with flow controller or bailing with a decontaminated submersible pump or PVC bailer equipped with a bottom filling check valve (if the purge volume is low, generally less than 100 litres, the sampling team might find it more efficient to purge with a bailer than a pump). Use a graduated bucket to track the amount of water removed from the well. The determination of purging and sampling will depend on parameters being analysed. Where VOCs or SVOCs are required it is recommended that slow purging using peristaltic pumping be undertaken. Periodically determine the pH, temperature and specific conductance of the purged water. Continue purging until the well has been completely evacuated or until the pH and specific conductance measurements have stabilised for at least one well volume. Wells that become dewatered prior to producing three casing volumes will be sampled as soon as practical once they recover sufficiently.
- 9) Dispose of purge water collected in the graduated bucket by dumping onto the ground at a distance of 50 to 60 metres from the vicinity of the well. If the water is known or suspected to be significantly contaminated, it may be necessary to store the purge water in a secure container, such as a drum, pending proper disposal.
- 10) Be aware and record any unusual occurrence during purging such as cascading (a shallow water entry zone that trickles into the borehole).

1.2 Field Parameter Measurement

Measurements of field parameters of pH, temperature and electrical conductivity are collected and organic vapour screening is conducted while the well is purged. To facilitate the collection of basic field parameters, the field team needs to: -

- Purge three well volumes of water from the well and measure field parameters for each well volume removed.
- Collection of water samples should take place after stabilisation of the following parameters: -
 - Temperature +/- 1°C
 - pH (meter or paper) +/- 0.2 units
 - Specific conductivity +/- 5%

- If the aforementioned parameters do not stabilise within three purge volumes, the well will be purged up to a maximum of six borehole volumes unless two consecutive sets of stabilised parameters are obtained.
- Note any observations in the field logbook.

1.3 Collection of Water Samples

All samples for chemical analysis will be placed in laboratory prepared bottles. The types of sample containers and preservative required for each type of analysis are described in the workplan. Where product layers are present a procedure and rationale for the collection of such layers should be outlined in the site specific work plan. If required, preservatives will be placed in the sample containers prior to collecting the samples.

The following procedure will be used to sample a well: -

- 1) After the well has been purged and allowed to recover, sample the well using a properly decontaminated or dedicated disposable bailer. Gently lower the bailer into the water column. Allow the bailer to sink and fill with a minimum of surface disturbance.
- 2) Slowly raise the bailer out of the well. Do not allow the bailer line to contact the ground, either by coiling it on a clean plastic sheet or by looping it from arm to arm as the line is extracted from the well.
- 3) Samples will be collected for VOCs analysis immediately after purging is complete and before other samples are collected. Pour the samples slowly into the laboratory prepared 40 ml glass vial. Overfill each vial slightly to eliminate air bubbles, a convex meniscus should be present at the top of the vial. Ensure that the Teflon liner of the septum cap is facing inward and that no bubbles are entrapped. After capping securely, turn bottle upside-down, tap it against your other hand, and observe sample water for bubbles. If bubbles are observed, remove the cap, overfill the vial and reseal. Repeat this step for each vial until the samples with no bubbles are obtained.
- 4) Place a label on the container and enter the following information: -

Client/Site Name
Date Collected
Time Collected
Analysis
Preservative
Sample Identification Number

- 5) Record pertinent information in the field logbook and on the Field Data Sheet for Well Sampling. Complete chain-of-custody form.
- 6) Place custody seals on the container caps. As soon as possible, place sample containers in a cooler with bagged ice and maintain at 4°C until extraction. Surround the bottles with vermiculite.

- 7) Obtain the semi-volatile compound/pesticides/PCBs sample(s) by transferring the water to a laboratory prepared 1000 ml amber glass bottle with Teflon-lined cap. Fill the bottle to the bottom of the neck and follow steps 4, 5 and 6 above.
- 8) Dissolved metals (if necessary) requires the team to filter the sample water through a .45 micron filter. The water is collected in a 1 litre, unpreserved, plastic or glass bottle with HNO₃ preservative. Filtering must be done within 15 minutes of sample collection.
- 9) Obtain the total metals sample by directly transferring the water from the bailer into a laboratory prepared 1000 ml plastic or glass bottle with HNO₃ preservative.
- 10) Be sure the pH of the metals sampled is less than 2 by pouring off an aliquot in a clean jar and testing for pH using litmus paper. Dispose of this water and rinse the jar.
- 11) Collect and prepare Field QA/QC samples in accordance with separate SOP.
- 12) Be sure to record all data required on the Field Data Sheet or Well Sampling and appropriate entries into the field logbook.
- 13) Secure the well cap and replace the locking cover.
- 14) Decontaminate all sampling equipment according to procedure.
- 15) Decontaminate submersible pumps as follows: -

Scrub pump and cord in a tub of Liquinox/or similar and potable water
Pump at least 80 litres of soapy water through pump
Rinse with potable water
Pump at least 80 litres of rinse water through the pump
Rinse with D1 water before lowering pump into the next well.

END.

APPENDIX 5

Laboratory Results

**Mr Crean
O Callaghan Moran & Assoc.
Granary House
Rutland Street
Cork**

14 August 2008

Test Report: MID/538002/2008

Dear Mr Crean

Analysis of your sample(s) submitted on 11 August 2008 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7658 4800 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using STL and we look forward to receiving your next samples.

Yours Sincerely,

Signed: *L. Ellis*

Name: L. Ellis

Title: Team Leader

STL Midlands

Rayner House, 80 Lockhurst Lane,
Coventry, CV6 5PZ

Severn Trent Laboratories Limited

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SEVERN
TRENT **STL**

Report Number: **MID/538002/2008**

Issue **1**

Laboratory Number: **10715372**

Sample **1** of **3**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH7 0.50m-1.00m**

Sample Date: Sample Received **11 August 2008** Analysis Complete: **14 August 2008**

Test Description	Result	Units	Accreditation	Method
Antimony as Sb, dry weight	1.6	mg/kg	Y Mid	30C
Arsenic as As, dry weight	16	mg/kg	Y Mid	30/30C
Barium as Ba, dry weight	150	mg/kg	Y Mid	30
Cadmium as Cd, dry weight	0.65	mg/kg	Y Mid	30
Chromium as Cr, dry weight	11	mg/kg	Y Mid	30
Copper as Cu, dry weight	19	mg/kg	Y Mid	30
Iron as Fe, dry weight	8900	mg/kg	Y Mid	30
Lead as Pb, dry weight	42	mg/kg	Y Mid	30
Manganese as Mn, dry weight	830	mg/kg	Y Mid	30
Mercury as Hg, dry weight	<0.25	mg/kg	Y Mid	30C
Nickel as Ni, dry weight	24	mg/kg	Y Mid	30
Tin as Sn, dry weight	<2.0	mg/kg	Y Mid	30
Zinc as Zn, dry weight	68	mg/kg	Y Mid	30
TPH >C6 - C10	<50	mg/kg	Y Mid	317
TPH >C10 - C20	<50	mg/kg	Y Mid	317
TPH >C20 - C40	180	mg/kg	Y Mid	317
TPH >C6 - C40, Total	180	mg/kg	Y Mid	317
1-methyl naphthalene	0.80	mg/kg	Y Mid	307
2-methyl naphthalene	<0.10	mg/kg	Y Mid	307
3-methyl naphthalene	0.48	mg/kg	Y Mid	307
fluorene	0.32	mg/kg	Y Mid	307
phenanthrene	4.0	mg/kg	Y Mid	307
anthracene	0.92	mg/kg	Y Mid	307
fluoranthene	4.0	mg/kg	Y Mid	307
pyrene	3.7	mg/kg	Y Mid	307
benzo(a)anthracene	1.7	mg/kg	Y Mid	307
chrysene	1.6	mg/kg	Y Mid	307
benzo(b)fluoranthene	1.4	mg/kg	Y Mid	307
benzo(k)fluoranthene	0.70	mg/kg	Y Mid	307
benzo(a)pyrene	1.6	mg/kg	Y Mid	307
Dibenz(a,h)anthracene	0.17	mg/kg	Y Mid	307
Benzo(g,h,i)perylene	1.1	mg/kg	Y Mid	307
Indeno(1,2,3-c,d)pyrene	0.83	mg/kg	Y Mid	307
PAH, Total of 16 EPA	23	mg/kg	Y Mid	307
benzene	<0.10	mg/kg	Y Mid	327

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Report Number: MID/538002/2008

Issue 1

Laboratory Number: 10715372

Sample 1 of 3

Sample Source: O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH7 0.50m-1.00m

Sample Date: Sample Received 11 August 2008 Analysis Complete: 14 August 2008

Test Description	Result	Units	Accreditation	Method
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327

Analyst Comments for 10715372: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn,
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered, I/S=Insufficient sample

Certificate of Analysis



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Report Number: **MID/538002/2008**

Issue **1**

Laboratory Number: **10715373**

Sample **2** of **3**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH9 0.50m-1.00m**

Sample Date:

Sample Received

11 August 2008

Analysis Complete:

14 August 2008

Test Description	Result	Units	Accreditation	Method
Antimony as Sb, dry weight	1.6	mg/kg	Y Mid	30C
Arsenic as As, dry weight	12	mg/kg	Y Mid	30/30C
Barium as Ba, dry weight	72	mg/kg	Y Mid	30
Cadmium as Cd, dry weight	1.2	mg/kg	Y Mid	30
Chromium as Cr, dry weight	14	mg/kg	Y Mid	30
Copper as Cu, dry weight	28	mg/kg	Y Mid	30
Iron as Fe, dry weight	20000	mg/kg	Y Mid	30
Lead as Pb, dry weight	79	mg/kg	Y Mid	30
Manganese as Mn, dry weight	1100	mg/kg	Y Mid	30
Mercury as Hg, dry weight	0.34	mg/kg	Y Mid	30C
Nickel as Ni, dry weight	31	mg/kg	Y Mid	30
Tin as Sn, dry weight	3.5	mg/kg	Y Mid	30
Zinc as Zn, dry weight	86	mg/kg	Y Mid	30
TPH >C6 - C10	<50	mg/kg	Y Mid	317
TPH >C10 - C20	<50	mg/kg	Y Mid	317
TPH >C20 - C40	150	mg/kg	Y Mid	317
TPH >C6 - C40, Total	150	mg/kg	Y Mid	317
1-methyl naphthalene	0.24	mg/kg	Y Mid	307
2-methyl naphthalene	<0.10	mg/kg	Y Mid	307
3-methyl naphthalene	<0.10	mg/kg	Y Mid	307
fluorene	<0.10	mg/kg	Y Mid	307
phenanthrene	0.62	mg/kg	Y Mid	307
anthracene	0.13	mg/kg	Y Mid	307
fluoranthene	0.63	mg/kg	Y Mid	307
pyrene	0.51	mg/kg	Y Mid	307
benzo(a)anthracene	0.27	mg/kg	Y Mid	307
chrysene	0.26	mg/kg	Y Mid	307
benzo(b)fluoranthene	0.25	mg/kg	Y Mid	307
benzo(k)fluoranthene	0.13	mg/kg	Y Mid	307
benzo(a)pyrene	0.25	mg/kg	Y Mid	307
Dibenz(a,h)anthracene	<0.10	mg/kg	Y Mid	307
Benzo(g,h,i)perylene	0.25	mg/kg	Y Mid	307
Indeno(1,2,3-c,d)pyrene	0.22	mg/kg	Y Mid	307
PAH, Total of 16 EPA	3.7	mg/kg	Y Mid	307
benzene	<0.10	mg/kg	Y Mid	327

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Report Number: **MID/538002/2008**

Issue **1**

Laboratory Number: **10715373**

Sample **2** of **3**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH9 0.50m-1.00m**

Sample Date: Sample Received **11 August 2008** Analysis Complete: **14 August 2008**

Test Description	Result	Units	Accreditation	Method
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327

Analyst Comments for 10715373: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. /S=Insufficient sample

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**SEVERN
TRENT** **STL**

Report Number: **MID/538002/2008**

Issue **1**

Laboratory Number: **10715374**

Sample **3** of **3**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH10 1.70m-2.50m**

Sample Date: Sample Received **11 August 2008** Analysis Complete: **14 August 2008**

Test Description	Result	Units	Accreditation	Method
Antimony as Sb, dry weight	1.7	mg/kg	Y Mid	30C
Arsenic as As, dry weight	13	mg/kg	Y Mid	30/30C
Barium as Ba, dry weight	79	mg/kg	Y Mid	30
Cadmium as Cd, dry weight	1.6	mg/kg	Y Mid	30
Chromium as Cr, dry weight	14	mg/kg	Y Mid	30
Copper as Cu, dry weight	30	mg/kg	Y Mid	30
Iron as Fe, dry weight	25000	mg/kg	Y Mid	30
Lead as Pb, dry weight	59	mg/kg	Y Mid	30
Manganese as Mn, dry weight	1500	mg/kg	Y Mid	30
Mercury as Hg, dry weight	<0.25	mg/kg	Y Mid	30C
Nickel as Ni, dry weight	37	mg/kg	Y Mid	30
Tin as Sn, dry weight	3.7	mg/kg	Y Mid	30
Zinc as Zn, dry weight	94	mg/kg	Y Mid	30
TPH >C6 - C10	<50	mg/kg	Y Mid	317
TPH >C10 - C20	<50	mg/kg	Y Mid	317
TPH >C20 - C40	<50	mg/kg	Y Mid	317
TPH >C6 - C40, Total	<50	mg/kg	Y Mid	317
1-methyl naphthalene	<0.10	mg/kg	Y Mid	307
2-methyl naphthalene	<0.10	mg/kg	Y Mid	307
3-methyl naphthalene	<0.10	mg/kg	Y Mid	307
fluorene	<0.10	mg/kg	Y Mid	307
phenanthrene	0.20	mg/kg	Y Mid	307
anthracene	<0.10	mg/kg	Y Mid	307
fluoranthene	0.13	mg/kg	Y Mid	307
pyrene	<0.10	mg/kg	Y Mid	307
benzo(a)anthracene	<0.10	mg/kg	Y Mid	307
chrysene	<0.10	mg/kg	Y Mid	307
benzo(b)fluoranthene	<0.10	mg/kg	Y Mid	307
benzo(k)fluoranthene	<0.10	mg/kg	Y Mid	307
benzo(a)pyrene	<0.10	mg/kg	Y Mid	307
Dibenz(a,h)anthracene	<0.10	mg/kg	Y Mid	307
Benzo(g,h,i)perylene	<0.10	mg/kg	Y Mid	307
Indeno(1,2,3-c,d)pyrene	<0.10	mg/kg	Y Mid	307
PAH, Total of 16 EPA	<1.0	mg/kg	Y Mid	307
benzene	<0.10	mg/kg	Y Mid	327

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Report Number: MID/538002/2008

Issue 1

Laboratory Number: 10715374

Sample 3 of 3

Sample Source: O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH10 1.70m-2.50m

Sample Date:

Sample Received

11 August 2008

Analysis Complete:

14 August 2008

Test Description	Result	Units	Accreditation	Method
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327

Analyst Comments for 10715374:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample

Signed: *L. Ellis*

Name: L. Ellis

Date: 14 August 2008

Title: Team Leader

**Mr Crean
O Callaghan Moran & Assoc.
Granary House
Rutland Street
Cork**

19 November 2008

Test Report: COV/558587/2008

Dear Mr Crean

Analysis of your sample(s) submitted on 31 October 2008 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out is included with this report.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using STL and we look forward to receiving your next samples.

Yours Sincerely,

Signed: *L. Ellis*

Name: L. Ellis

Title: Team Leader

STL Coventry

STL Business Centre, Torrington Avenue,
Coventry, CV4 9GU

Severn Trent Laboratories Limited

Registered in England & Wales Registration No. 2148934 Registered Office: 2297 Coventry Road, Birmingham B26

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Certificate No. FS67435



Report Summary



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**Mr Donal Crean
O Callaghan Moran & Assoc.
Granary House
Rutland Street
Cork**

Date of Issue: **19 November 2008**

Report Number: **COV/558587/2008**

Issue **1**

Job Description: Donal Crean

Job Location: 08-014-05

Number of Samples
included in this report **16**

Job Received: 31 October 2008

Number of Test Results
included in this report **400**

Analysis Commenced: 31 October 2008

Signed: *L. Ellis*

Name: **L. Ellis**

Date: **19 November 2008**

Title: **Team Leader**

STL was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis



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SEVERN
TRENT **STL**

Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888346**

Sample **1** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH7 13.0-14.00m**

Sample Date: Sample Received **31 October 2008** Analysis Complete: **13 November 2008**

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	1.19	% ratio	N Mid	33
Moisture at 105c	1.2	%	N Mid	33
Loss by Ignition in O2	0.52	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	<50	mg/kg	Y Mid	317
Naphthalene	<0.10	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	<0.10	mg/kg	N Mid	307
Fluorene	<0.10	mg/kg	N Mid	307
Phenanthrene	<0.10	mg/kg	N Mid	307
Anthracene	<0.10	mg/kg	N Mid	307
Fluoranthene	<0.10	mg/kg	N Mid	307
Pyrene	<0.10	mg/kg	N Mid	307
Benzo(a)anthracene	<0.10	mg/kg	N Mid	307
Chrysene	<0.10	mg/kg	N Mid	307
Benzo(b)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(k)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(a)pyrene	<0.10	mg/kg	N Mid	307
Benzo(a,h)anthracene	<0.10	mg/kg	N Mid	307
Benzo(g,h,i)perylene	<0.10	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	<0.10	mg/kg	N Mid	307
Coronene	<0.10	mg/kg	N Mid	307
PAH, Total of 17 WAC	<1.0	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	98.83	%	N Mid	Calculated

Analyst Comments for 10888346:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Raa = STL Reading, Run = STL Runcorn.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample

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SEVERN
TRENT **STL**

Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888347**

Sample **2** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH15 0.5-1.00m**

Sample Date:

Sample Received

31 October 2008

Analysis Complete:

13 November 2008

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	2.13	% ratio	N Mid	33
Moisture at 105c	2.1	%	N Mid	33
TOC by Ignition in O2	3.6	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	120	mg/kg	Y Mid	317
Naphthalene	0.20	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	<0.10	mg/kg	N Mid	307
Fluorene	<0.10	mg/kg	N Mid	307
Phenanthrene	0.44	mg/kg	N Mid	307
Anthracene	0.10	mg/kg	N Mid	307
Fluoranthene	0.50	mg/kg	N Mid	307
Pyrene	0.43	mg/kg	N Mid	307
Benzo(a)anthracene	0.34	mg/kg	N Mid	307
Chrysene	0.63	mg/kg	N Mid	307
Benzo(b)fluoranthene	0.41	mg/kg	N Mid	307
Benzo(k)fluoranthene	0.21	mg/kg	N Mid	307
Benzo(a)pyrene	0.39	mg/kg	N Mid	307
Dibenz(a,h)anthracene	<0.10	mg/kg	N Mid	307
Benzo(g,h,i)perylene	0.35	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	0.18	mg/kg	N Mid	307
Coronene	<0.10	mg/kg	N Mid	307
PAH, Total of 17 WAC	4.2	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	97.91	%	N Mid	Calculated

Analyst Comments for 10888347:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample

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**SEVERN
TRENT** **STL**

Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888348**

Sample **3** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH15 1.0-2.00m**

Sample Date: Sample Received **31 October 2008** Analysis Complete: **13 November 2008**

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	1.51	% ratio	N Mid	33
Moisture at 105c	1.5	%	N Mid	33
Loss by Ignition in O2	5.2	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	86	mg/kg	Y Mid	317
Naphthalene	0.16	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	<0.10	mg/kg	N Mid	307
Fluorene	<0.10	mg/kg	N Mid	307
Phenanthrene	0.42	mg/kg	N Mid	307
Anthracene	<0.10	mg/kg	N Mid	307
Fluoranthene	0.14	mg/kg	N Mid	307
Pyrene	0.12	mg/kg	N Mid	307
Benzo(a)anthracene	0.12	mg/kg	N Mid	307
Chrysene	0.32	mg/kg	N Mid	307
Benzo(b)fluoranthene	0.13	mg/kg	N Mid	307
Benzo(k)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(a)pyrene	<0.10	mg/kg	N Mid	307
Benzo(a,h)anthracene	<0.10	mg/kg	N Mid	307
Benzo(g,h,i)perylene	<0.10	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	<0.10	mg/kg	N Mid	307
Coronene	<0.10	mg/kg	N Mid	307
PAH, Total of 17 WAC	1.4	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	98.51	%	N Mid	Calculated

Analyst Comments for 10888348: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
 Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
 For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample

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Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888349**

Sample **4** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH15 12.0-13.00m**

Sample Date:

Sample Received

31 October 2008

Analysis Complete:

13 November 2008

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	0.79	% ratio	N Mid	33
Moisture at 105c	0.79	%	N Mid	33
TOC by Ignition in O2	0.34	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	<50	mg/kg	Y Mid	317
Naphthalene	<0.10	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	<0.10	mg/kg	N Mid	307
Fluorene	<0.10	mg/kg	N Mid	307
Phenanthrene	<0.10	mg/kg	N Mid	307
Anthracene	<0.10	mg/kg	N Mid	307
Fluoranthene	<0.10	mg/kg	N Mid	307
Pyrene	<0.10	mg/kg	N Mid	307
Benzo(a)anthracene	<0.10	mg/kg	N Mid	307
Chrysene	<0.10	mg/kg	N Mid	307
Benzo(b)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(k)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(a)pyrene	<0.10	mg/kg	N Mid	307
Dibenz(a,h)anthracene	<0.10	mg/kg	N Mid	307
Benzo(g,h,i)perylene	<0.10	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	<0.10	mg/kg	N Mid	307
Coronene	<0.10	mg/kg	N Mid	307
PAH, Total of 17 WAC	<1.0	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	99.21	%	N Mid	Calculated

Analyst Comments for 10888349:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn,
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered, I/S=Insufficient sample

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**SEVERN
TRENT** **STL**

Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888350**

Sample **5** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **W2 0.50-1.00m**

Sample Date:

Sample Received

31 October 2008

Analysis Complete:

13 November 2008

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	0.99	% ratio	N Mid	33
Moisture at 105c	0.98	%	N Mid	33
Loss by Ignition in O2	5.6	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	150	mg/kg	Y Mid	317
Naphthalene	5.5	mg/kg	N Mid	307
Acenaphthylene	0.11	mg/kg	N Mid	307
Acenaphthene	7.1	mg/kg	N Mid	307
Fluorene	4.4	mg/kg	N Mid	307
Phenanthrene	40	mg/kg	N Mid	307
Anthracene	13	mg/kg	N Mid	307
Fluoranthene	38	mg/kg	N Mid	307
Pyrene	34	mg/kg	N Mid	307
Benzo(a)anthracene	18	mg/kg	N Mid	307
Chrysene	17	mg/kg	N Mid	307
Benzo(b)fluoranthene	14	mg/kg	N Mid	307
Benzo(k)fluoranthene	7.7	mg/kg	N Mid	307
Benzo(a)pyrene	19	mg/kg	N Mid	307
Benzo(a,h)anthracene	1.1	mg/kg	N Mid	307
Benzo(g,h,i)perylene	6.9	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	6.9	mg/kg	N Mid	307
Coronene	1.5	mg/kg	N Mid	307
PAH, Total of 17 WAC	230	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	99.02	%	N Mid	Calculated

Analyst Comments for 10888350:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
 Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcom.
 For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected In volume of sample filtered. I/S=insufficient sample

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Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888351**

Sample **6** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **W2 1.00-2.00m**

Sample Date: Sample Received **31 October 2008** Analysis Complete: **13 November 2008**

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	2.00	% ratio	N Mid	33
Moisture at 105c	2.0	%	N Mid	33
TOC by Ignition in O2	5.4	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	5000	mg/kg	Y Mid	317
Naphthalene	16	mg/kg	N Mid	307
Acenaphthylene	0.29	mg/kg	N Mid	307
Acenaphthene	16	mg/kg	N Mid	307
Fluorene	8.1	mg/kg	N Mid	307
Phenanthrene	97	mg/kg	N Mid	307
Anthracene	25	mg/kg	N Mid	307
Fluoranthene	87	mg/kg	N Mid	307
Pyrene	88	mg/kg	N Mid	307
Benzo(a)anthracene	44	mg/kg	N Mid	307
Chrysene	42	mg/kg	N Mid	307
Benzo(b)fluoranthene	35	mg/kg	N Mid	307
Benzo(k)fluoranthene	19	mg/kg	N Mid	307
Benzo(a)pyrene	47	mg/kg	N Mid	307
Dibenz(a,h)anthracene	3.0	mg/kg	N Mid	307
Benzo(g,h,i)perylene	20	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	18	mg/kg	N Mid	307
Coronene	4.0	mg/kg	N Mid	307
PAH, Total of 17 WAC	570	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	98.04	%	N Mid	Calculated

Analyst Comments for 10888351:

{/*}TPH soils: detection limits raised due to original sample being over-range.{*/}

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
 Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
 For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=insufficient sample

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**SEVERN
TRENT** **STL**

Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888352**

Sample **7** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH8 0.50-1.00m**

Sample Date:

Sample Received

31 October 2008

Analysis Complete:

13 November 2008

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	2.38	% ratio	N Mid	33
Moisture at 105c	2.3	%	N Mid	33
Loss by Ignition in O2	3.1	%	N Mid	27
PCB, Total of 7 Congeners	0.028	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	510	mg/kg	Y Mid	317
Naphthalene	1.3	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	0.56	mg/kg	N Mid	307
Fluorene	1.3	mg/kg	N Mid	307
Phenanthrene	5.3	mg/kg	N Mid	307
Anthracene	1.7	mg/kg	N Mid	307
Fluoranthene	8.4	mg/kg	N Mid	307
Pyrene	6.4	mg/kg	N Mid	307
Benzo(a)anthracene	3.8	mg/kg	N Mid	307
Chrysene	3.4	mg/kg	N Mid	307
Benzo(b)fluoranthene	2.9	mg/kg	N Mid	307
Benzo(k)fluoranthene	1.6	mg/kg	N Mid	307
Benzo(a)pyrene	3.8	mg/kg	N Mid	307
Benzo(a,h)anthracene	0.23	mg/kg	N Mid	307
Benzo(g,h,i)perylene	1.4	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	1.3	mg/kg	N Mid	307
Coronene	0.52	mg/kg	N Mid	307
PAH, Total of 17 WAC	44	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	97.67	%	N Mid	Calculated

Analyst Comments for 10888352:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
 Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
 For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. /S=Insufficient sample

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SEVERN
TRENT **STL**

Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888353**

Sample **8** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH8 1.00-2.00m**

Sample Date: Sample Received **31 October 2008** Analysis Complete: **13 November 2008**

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	1.50	% ratio	N Mid	33
Moisture at 105c	1.5	%	N Mid	33
TOC by Ignition in O2	3.0	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	1800	mg/kg	Y Mid	317
Naphthalene	11	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	3.3	mg/kg	N Mid	307
Fluorene	4.6	mg/kg	N Mid	307
Phenanthrene	33	mg/kg	N Mid	307
Anthracene	13	mg/kg	N Mid	307
Fluoranthene	52	mg/kg	N Mid	307
Pyrene	43	mg/kg	N Mid	307
Benzo(a)anthracene	23	mg/kg	N Mid	307
Chrysene	21	mg/kg	N Mid	307
Benzo(b)fluoranthene	16	mg/kg	N Mid	307
Benzo(k)fluoranthene	9.5	mg/kg	N Mid	307
Benzo(a)pyrene	24	mg/kg	N Mid	307
Dibenz(a,h)anthracene	1.1	mg/kg	N Mid	307
Benzo(g,h,i)perylene	8.7	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	9.2	mg/kg	N Mid	307
Coronene	1.8	mg/kg	N Mid	307
PAH, Total of 17 WAC	280	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	98.53	%	N Mid	Calculated

Analyst Comments for 10888353: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. VS=Insufficient sample

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Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888354**

Sample **9** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH7 13.0-14.00m 10:1**

Sample Date: Sample Received **31 October 2008** Analysis Complete: **13 November 2008**

Test Description	Result	Units	Accreditation	Method
Leachate BSEN 10:1 extract	Y		N Mid	EN12457-3 10:1
Antimony, Soluble	<0.030	mg/l	N Mid	25C
Arsenic, Soluble	<50	ug/l	N Mid	25C
Bismuth, Soluble	0.014	mg/l	Y Mid	54F
Cadmium, Soluble	<0.10	ug/l	Y Mid	56
Calcium, Soluble	12	mg/l	Y Mid	53F
Chromium, Soluble	<10	ug/l	Y Mid	53F
Copper, Soluble	<10	ug/l	Y Mid	53F
Lead, Soluble	<10	ug/l	Y Mid	53F
Mercury, Soluble	0.38	ug/l	Y Mid	56
Molybdenum, Soluble	0.0085	mg/l	N Mid	68
Nickel, Soluble	<10	ug/l	Y Mid	53F
Selenium, Soluble	<6.0	ug/l	N Mid	25C
Zinc, Soluble	<10	ug/l	Y Mid	53F
Phenol Index	<0.050	mg/l	N Mid	32A
Sulphate as SO4	<11	mg/l	Y Mid	60
Chloride as Cl	7.1	mg/l	Y Mid	60
Dissolved Solids	<200	mg/l	N Mid	18
Fluoride as F-	0.42	mg/l	Y Mid	20
C (Filtered)	3.9	mg/l	Y Mid	41

Analyst Comments for 10888354: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample

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Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888355**

Sample **10** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH15 0.5-1.00m 10:1**

Sample Date:

Sample Received

31 October 2008

Analysis Complete:

13 November 2008

Test Description	Result	Units	Accreditation	Method
Leachate BSEN 10:1 extract	Y		N Mid	EN12457-3 10:1
Antimony, Soluble	<0.030	mg/l	N Mid	25C
Arsenic, Soluble	<50	ug/l	N Mid	25C
Barium, Soluble	0.0060	mg/l	Y Mid	54F
Cadmium, Soluble	<0.10	ug/l	Y Mid	56
Calcium, Soluble	54	mg/l	Y Mid	53F
Chromium, Soluble	18	ug/l	Y Mid	53F
Copper, Soluble	36	ug/l	Y Mid	53F
Lead, Soluble	42	ug/l	Y Mid	53F
Mercury, Soluble	0.35	ug/l	Y Mid	56
Molybdenum, Soluble	0.016	mg/l	N Mid	68
Nickel, Soluble	15	ug/l	Y Mid	53F
Selenium, Soluble	<6.0	ug/l	N Mid	25C
Zinc, Soluble	<10	ug/l	Y Mid	53F
Phenol Index	<0.050	mg/l	N Mid	32A
Sulphate as SO4	50	mg/l	Y Mid	60
Chloride as Cl	<2.5	mg/l	Y Mid	60
Dissolved Solids	420	mg/l	N Mid	18
Fluoride as F-	0.23	mg/l	Y Mid	20
TOC (Filtered)	6.2	mg/l	Y Mid	41

Analyst Comments for 10888355:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered, I/S=Insufficient sample

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Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888356**

Sample **11** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH15 1.0-2.00m 10:1**

Sample Date: Sample Received **31 October 2008** Analysis Complete: **13 November 2008**

Test Description	Result	Units	Accreditation	Method
Leachate BSEN 10:1 extract	Y		N Mid	EN12457-3 10:1
Antimony, Soluble	<0.030	mg/l	N Mid	25C
Asenic, Soluble	<50	ug/l	N Mid	25C
Barium, Soluble	0.0055	mg/l	Y Mid	54F
Cadmium, Soluble	<0.10	ug/l	Y Mid	56
Calcium, Soluble	26	mg/l	Y Mid	53F
Chromium, Soluble	<10	ug/l	Y Mid	53F
Copper, Soluble	28	ug/l	Y Mid	53F
Lead, Soluble	43	ug/l	Y Mid	53F
Mercury, Soluble	0.49	ug/l	Y Mid	56
Molybdenum, Soluble	0.013	mg/l	N Mid	68
Nickel, Soluble	14	ug/l	Y Mid	53F
Selenium, Soluble	<6.0	ug/l	N Mid	25C
Zinc, Soluble	13	ug/l	Y Mid	53F
Phenol Index	<0.050	mg/l	N Mid	32A
Sulphate as SO4	19	mg/l	Y Mid	60
Chloride as Cl	<2.5	mg/l	Y Mid	60
Dissolved Solids	<200	mg/l	N Mid	18
Fluoride as F-	<0.20	mg/l	Y Mid	20
; (Filtered)	3.6	mg/l	Y Mid	41

Analyst Comments for 10888356: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
 Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
 For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample

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Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888357**

Sample **12** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH15 12.0-13.00m 10:1**

Sample Date:

Sample Received

31 October 2008

Analysis Complete:

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Test Description	Result	Units	Accreditation	Method
Leachate BSEN 10:1 extract	Y		N Mid	EN12457-3 10:1
Antimony, Soluble	<0.030	mg/l	N Mid	25C
Arsenic, Soluble	<50	ug/l	N Mid	25C
Barium, Soluble	0.017	mg/l	Y Mid	54F
Cadmium, Soluble	<0.10	ug/l	Y Mid	56
Calcium, Soluble	17	mg/l	Y Mid	53F
Chromium, Soluble	<10	ug/l	Y Mid	53F
Copper, Soluble	15	ug/l	Y Mid	53F
Lead, Soluble	41	ug/l	Y Mid	53F
Mercury, Soluble	<0.30	ug/l	Y Mid	56
Molybdenum, Soluble	0.0046	mg/l	N Mid	68
Nickel, Soluble	14	ug/l	Y Mid	53F
Selenium, Soluble	<6.0	ug/l	N Mid	25C
Zinc, Soluble	<10	ug/l	Y Mid	53F
Phenol Index	<0.050	mg/l	N Mid	32A
Sulphate as SO ₄	13	mg/l	Y Mid	60
Chloride as Cl	10	mg/l	Y Mid	60
Dissolved Solids	<200	mg/l	N Mid	18
Fluoride as F ⁻	0.47	mg/l	Y Mid	20
TOC (Filtered)	3.7	mg/l	Y Mid	41

Analyst Comments for 10888357:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Res = STL Reading, Run = STL Runcorn.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=insufficient sample

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SEVERN
TRENT **STL**

Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888358**

Sample **13** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **W2 0.50-1.00m 10:1**

Sample Date:

Sample Received

31 October 2008

Analysis Complete:

13 November 2008

Test Description	Result	Units	Accreditation	Method
Leachate BSEN 10:1 extract	Y		N Mid	EN12457-3 10:1
Antimony, Soluble	0.036	mg/l	N Mid	25C
Asenic, Soluble	<50	ug/l	N Mid	25C
Barium, Soluble	0.024	mg/l	Y Mid	54F
Cadmium, Soluble	<0.10	ug/l	Y Mid	56
Calcium, Soluble	43	mg/l	Y Mid	53F
Chromium, Soluble	21	ug/l	Y Mid	53F
Copper, Soluble	34	ug/l	Y Mid	53F
Lead, Soluble	43	ug/l	Y Mid	53F
Mercury, Soluble	<0.30	ug/l	Y Mid	56
Molybdenum, Soluble	0.0066	mg/l	N Mid	68
Nickel, Soluble	13	ug/l	Y Mid	53F
Selenium, Soluble	<6.0	ug/l	N Mid	25C
Zinc, Soluble	11	ug/l	Y Mid	53F
Phenol Index	<0.050	mg/l	N Mid	32A
Sulphate as SO4	44	mg/l	Y Mid	60
Chloride as Cl	2.7	mg/l	Y Mid	60
Dissolved Solids	210	mg/l	N Mid	18
Fluoride as F-	0.41	mg/l	Y Mid	20
Fluoride as F- (Filtered)	4.5	mg/l	Y Mid	41

Analyst Comments for 10888358:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=insufficient sample

Certificate of Analysis



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Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888359**

Sample **14** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **W2 1.00-2.00m 10:1**

Sample Date:

Sample Received

31 October 2008

Analysis Complete:

13 November 2008

Test Description	Result	Units	Accreditation	Method
Leachate BSEN 10:1 extract	Y		N Mid	EN12457-3 10:1
Antimony, Soluble	<0.030	mg/l	N Mid	25C
Arsenic, Soluble	<50	ug/l	N Mid	25C
Barium, Soluble	0.018	mg/l	Y Mid	54F
Cadmium, Soluble	<0.10	ug/l	Y Mid	56
Calcium, Soluble	110	mg/l	Y Mid	53F
Chromium, Soluble	<100	ug/l	Y Mid	53F
Copper, Soluble	<100	ug/l	Y Mid	53F
Lead, Soluble	<100	ug/l	Y Mid	53F
Mercury, Soluble	<0.30	ug/l	Y Mid	56
Molybdenum, Soluble	0.0081	mg/l	N Mid	68
Nickel, Soluble	<100	ug/l	Y Mid	53F
Selenium, Soluble	<6.0	ug/l	N Mid	25C
Zinc, Soluble	<100	ug/l	Y Mid	53F
Phenol Index	<0.050	mg/l	N Mid	32A
Sulphate as SO ₄	160	mg/l	Y Mid	60
Chloride as Cl	14	mg/l	Y Mid	60
Dissolved Solids	420	mg/l	N Mid	18
Fluoride as F-	<0.20	mg/l	Y Mid	20
TOC (Filtered)	6.0	mg/l	Y Mid	41

Analyst Comments for 10888359:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered, I/S=insufficient sample

Certificate of Analysis



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Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888360**

Sample **15** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH8 0.50-1.00m 10:1**

Sample Date:

Sample Received

31 October 2008

Analysis Complete:

13 November 2008

Test Description	Result	Units	Accreditation	Method
Leachate BSEN 10:1 extract	Y		N Mid	EN12457-3 10:1
Antimony, Soluble	<0.030	mg/l	N Mid	25C
Asenic, Soluble	<50	ug/l	N Mid	25C
Barium, Soluble	0.021	mg/l	Y Mid	54F
Cadmium, Soluble	<0.10	ug/l	Y Mid	56
Calcium, Soluble	690	mg/l	Y Mid	53F
Chromium, Soluble	<100	ug/l	Y Mid	53F
Copper, Soluble	<100	ug/l	Y Mid	53F
Lead, Soluble	<100	ug/l	Y Mid	53F
Mercury, Soluble	<0.30	ug/l	Y Mid	56
Molybdenum, Soluble	0.010	mg/l	N Mid	68
Nickel, Soluble	<100	ug/l	Y Mid	53F
Selenium, Soluble	<6.0	ug/l	N Mid	25C
Zinc, Soluble	<100	ug/l	Y Mid	53F
Phenol Index	<0.050	mg/l	N Mid	32A
Sulphate as SO ₄	1500	mg/l	Y Mid	60
Chloride as Cl	4.3	mg/l	Y Mid	60
Dissolved Solids	2400	mg/l	N Mid	18
Fluoride as F-	<0.20	mg/l	Y Mid	20
Residual Chlorine (Filtered)	5.2	mg/l	Y Mid	41

Analyst Comments for 10888360:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample

Certificate of Analysis



Report Number: **COV/558587/2008**

Issue **1**

Laboratory Number: **10888361**

Sample **16** of **16**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH8 1.00-2.00m 10:1**

Sample Date:

Sample Received

31 October 2008

Analysis Complete:

13 November 2008

Test Description	Result	Units	Accreditation	Method
Leachate BSEN 10:1 extract	Y		N Mid	EN12457-3 10:1
Antimony, Soluble	<0.030	mg/l	N Mid	25C
Arsenic, Soluble	<50	ug/l	N Mid	25C
Barium, Soluble	0.025	mg/l	Y Mid	54F
Cadmium, Soluble	<0.10	ug/l	Y Mid	56
Calcium, Soluble	650	mg/l	Y Mid	53F
Chromium, Soluble	<100	ug/l	Y Mid	53F
Copper, Soluble	<100	ug/l	Y Mid	53F
Lead, Soluble	<100	ug/l	Y Mid	53F
Mercury, Soluble	<0.30	ug/l	Y Mid	56
Molybdenum, Soluble	0.0095	mg/l	N Mid	68
Nickel, Soluble	<100	ug/l	Y Mid	53F
Selenium, Soluble	<6.0	ug/l	N Mid	25C
Zinc, Soluble	<100	ug/l	Y Mid	53F
Phenol Index	<0.050	mg/l	N Mid	32A
Sulphate as SO4	1400	mg/l	Y Mid	60
Chloride as Cl	5.8	mg/l	Y Mid	60
Dissolved Solids	2400	mg/l	N Mid	18
Fluoride as F-	<0.20	mg/l	Y Mid	20
TOC (Filtered)	7.3	mg/l	Y Mid	41

Analyst Comments for 10888361:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample

Signed: *L. Ellis*

Name: **L. Ellis**

Date: **19 November 2008**

Title: **Team Leader**

Severn Trent Laboratories Ltd.

**Mr Crean
O Callaghan Moran & Assoc.
Granary House
Rutland Street
Cork**

24 December 2008

Test Report: COV/569308/2008

Dear Mr Crean

Analysis of your sample(s) submitted on 12 December 2008 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using STL and we look forward to receiving your next samples.

Yours Sincerely,

Signed: 

Name: G. Smith

Title: Inorg and License Chem Manager

STL Coventry

STL Business Centre, Torrington Avenue,
Coventry, CV4 9GU

Severn Trent Laboratories Limited

Registered in England & Wales Registration No. 2148934 Registered Office: 2297 Coventry Road, Birmingham B26

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Cert. No. 10289
Environmental Management Systems



Certificate No. FS67435



Report Summary



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**Mr Donal Crean
O Callaghan Moran & Assoc.
Granary House
Rutland Street
Cork**

Date of Issue: **24 December 2008**

Report Number: **COV/569308/2008**

Issue **1**

Job Description: Donal Crean

Job Location: O Callaghan Moran & Associates

Number of Samples
included in this report **22**

Job Received: **12 December 2008**

Number of Test Results
included in this report **550**

Analysis Commenced: **12 December 2008**

Signed:

Name: **G. Smith**

Date: **24 December 2008**

Title: **Inorg and License Chem Manager**

STL was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

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Certificate of Analysis



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Report Number: **COV/569308/2008**

Issue **1**

Laboratory Number: **10956741**

Sample **1** of **22**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH7 4.00m-5.00m**

Sample Date:

Sample Received **12 December 2008** Analysis Complete: **24 December 2008**

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	0.10	% ratio	N Mid	33
Moisture at 105c	0.10	%	N Mid	33
Loss on Ignition in O2	3.1	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	<50	mg/kg	Y Mid	317
Naphthalene	<0.10	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	<0.10	mg/kg	N Mid	307
Fluorene	<0.10	mg/kg	N Mid	307
Phenanthrene	<0.10	mg/kg	N Mid	307
Anthracene	<0.10	mg/kg	N Mid	307
Fluoranthene	<0.10	mg/kg	N Mid	307
Pyrene	<0.10	mg/kg	N Mid	307
Benzo(a)anthracene	<0.10	mg/kg	N Mid	307
Chrysene	<0.10	mg/kg	N Mid	307
Benzo(b)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(k)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(a)pyrene	<0.10	mg/kg	N Mid	307
Benzo(a,h)anthracene	<0.10	mg/kg	N Mid	307
Benzo(g,h,i)perylene	<0.10	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	<0.10	mg/kg	N Mid	307
Coronene	<0.10	mg/kg	N Mid	307
PAH, Total of 17 WAC	<1.0	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	99.90	%	N Mid	Calculated

Analyst Comments for 10956741:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml.

I/S=insufficient sample

Severn Trent Laboratories Ltd.

Certificate of Analysis



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Report Number: COV/569308/2008

Issue 1

Laboratory Number: 10956742

Sample 2 of 22

Sample Source: O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH12 0.50m-1.00m

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	0.39	% ratio	N Mid	33
Moisture at 105c	0.39	%	N Mid	33
TOC by Ignition in O2	5.3	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	640	mg/kg	Y Mid	317
Naphthalene	0.47	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	0.18	mg/kg	N Mid	307
Fluorene	0.11	mg/kg	N Mid	307
Phenanthrene	1.3	mg/kg	N Mid	307
Anthracene	0.19	mg/kg	N Mid	307
Fluoranthene	0.87	mg/kg	N Mid	307
Pyrene	1.1	mg/kg	N Mid	307
Benzo(a)anthracene	0.43	mg/kg	N Mid	307
Chrysene	0.36	mg/kg	N Mid	307
Benzo(b)fluoranthene	0.26	mg/kg	N Mid	307
Benzo(k)fluoranthene	0.15	mg/kg	N Mid	307
Benzo(a)pyrene	0.34	mg/kg	N Mid	307
Dibenz(a,h)anthracene	<0.10	mg/kg	N Mid	307
Benzo(g,h,i)perylene	0.45	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	0.37	mg/kg	N Mid	307
Coronene	<0.10	mg/kg	N Mid	307
PAH, Total of 17 WAC	6.6	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	99.61	%	N Mid	Calculated

Analyst Comments for 10956742:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample

Severn Trent Laboratories Ltd.

Certificate of Analysis



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SEVERN
TRENT **STL**

Report Number: **COV/569308/2008**

Issue **1**

Laboratory Number: **10956743**

Sample **3** of **22**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH12 3.00m-4.00m**

Sample Date: Sample Received **12 December 2008** Analysis Complete: **24 December 2008**

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	0.29	% ratio	N Mid	33
Moisture at 105c	0.29	%	N Mid	33
Loss by Ignition in O2	3.0	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	170	mg/kg	Y Mid	317
Naphthalene	<0.10	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	<0.10	mg/kg	N Mid	307
Fluorene	<0.10	mg/kg	N Mid	307
Phenanthrene	0.11	mg/kg	N Mid	307
Anthracene	<0.10	mg/kg	N Mid	307
Fluoranthene	<0.10	mg/kg	N Mid	307
Pyrene	<0.10	mg/kg	N Mid	307
Benzo(a)anthracene	<0.10	mg/kg	N Mid	307
Chrysene	<0.10	mg/kg	N Mid	307
Benzo(b)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(k)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(a)pyrene	<0.10	mg/kg	N Mid	307
Benzo(a,h)anthracene	<0.10	mg/kg	N Mid	307
Benzo(g,h,i)perylene	<0.10	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	<0.10	mg/kg	N Mid	307
Coronene	<0.10	mg/kg	N Mid	307
PAH, Total of 17 WAC	<1.0	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	99.71	%	N Mid	Calculated

Analyst Comments for 10956743: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
 Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
 For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml.
 I/S=Insufficient sample

Severn Trent Laboratories Ltd.

Certificate of Analysis



Report Number: **COV/569308/2008**

Issue **1**

Laboratory Number: **10956744**

Sample **4** of **22**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH12 4.00m-5.00m**

Sample Date: Sample Received **12 December 2008** Analysis Complete: **24 December 2008**

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	0.28	% ratio	N Mid	33
Moisture at 105c	0.28	%	N Mid	33
TOC by Ignition in O2	2.4	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	57	mg/kg	Y Mid	317
Naphthalene	0.15	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	<0.10	mg/kg	N Mid	307
Fluorene	<0.10	mg/kg	N Mid	307
Phenanthrene	<0.10	mg/kg	N Mid	307
Anthracene	<0.10	mg/kg	N Mid	307
Fluoranthene	<0.10	mg/kg	N Mid	307
Pyrene	<0.10	mg/kg	N Mid	307
Benzo(a)anthracene	<0.10	mg/kg	N Mid	307
Chrysene	<0.10	mg/kg	N Mid	307
Benzo(b)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(k)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(a)pyrene	<0.10	mg/kg	N Mid	307
Dibenz(a,h)anthracene	<0.10	mg/kg	N Mid	307
Benzo(g,h,i)perylene	<0.10	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	<0.10	mg/kg	N Mid	307
Coronene	<0.10	mg/kg	N Mid	307
PAH, Total of 17 WAC	<1.0	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	99.72	%	N Mid	Calculated

Analyst Comments for 10956744: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.
 Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
 For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml.
 I/S=Insufficient sample

Severn Trent Laboratories Ltd.

Certificate of Analysis



**SEVERN
TRENT** **STL**

Report Number: **COV/569308/2008**

Issue **1**

Laboratory Number: **10956745**

Sample **5** of **22**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH12 8.00m-10.00m**

Sample Date: Sample Received **12 December 2008** Analysis Complete: **24 December 2008**

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	0.37	% ratio	N Mid	33
Moisture at 105c	0.37	%	N Mid	33
Loss by Ignition in O2	1.4	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	<50	mg/kg	Y Mid	317
Naphthalene	0.18	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	<0.10	mg/kg	N Mid	307
Fluorene	<0.10	mg/kg	N Mid	307
Phenanthrene	<0.10	mg/kg	N Mid	307
Anthracene	<0.10	mg/kg	N Mid	307
Fluoranthene	<0.10	mg/kg	N Mid	307
Pyrene	<0.10	mg/kg	N Mid	307
Benzo(a)anthracene	<0.10	mg/kg	N Mid	307
Chrysene	<0.10	mg/kg	N Mid	307
Benzo(b)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(k)fluoranthene	<0.10	mg/kg	N Mid	307
Benzo(a)pyrene	<0.10	mg/kg	N Mid	307
Benzo(a,h)anthracene	<0.10	mg/kg	N Mid	307
Benzo(g,h,i)perylene	<0.10	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	<0.10	mg/kg	N Mid	307
Coronene	<0.10	mg/kg	N Mid	307
PAH, Total of 17 WAC	<1.0	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	99.63	%	N Mid	Calculated

Analyst Comments for 10956745:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml.

I/S=Insufficient sample

Severn Trent Laboratories Ltd.

Certificate of Analysis



1314
0897
1229
1510



Report Number: **COV/569308/2008**

Issue **1**

Laboratory Number: **10956746**

Sample **6** of **22**

Sample Source: **O Callaghan Moran & Assoc.**

Sample Point Description: **O Callaghan Moran & Assoc.**

Sample Description: **BH14 0.50m-1.00m**

Sample Date: Sample Received **12 December 2008** Analysis Complete: **24 December 2008**

Test Description	Result	Units	Accreditation	Method
EN 12457-3 Leachate	Y		N Mid	EN12457-3
Moisture Content Ratio at 105C	1.60	% ratio	N Mid	33
Moisture at 105c	1.6	%	N Mid	33
TOC by Ignition in O2	4.4	%	N Mid	27
PCB, Total of 7 Congeners	<0.010	mg/kg	N Mid	312
Mineral Oils, >C10 - C40	99	mg/kg	Y Mid	317
Naphthalene	0.59	mg/kg	N Mid	307
Acenaphthylene	<0.10	mg/kg	N Mid	307
Acenaphthene	0.25	mg/kg	N Mid	307
Fluorene	0.11	mg/kg	N Mid	307
Phenanthrene	1.6	mg/kg	N Mid	307
Anthracene	0.26	mg/kg	N Mid	307
Fluoranthene	1.1	mg/kg	N Mid	307
Pyrene	1.2	mg/kg	N Mid	307
Benzo(a)anthracene	0.60	mg/kg	N Mid	307
Chrysene	0.57	mg/kg	N Mid	307
Benzo(b)fluoranthene	0.45	mg/kg	N Mid	307
Benzo(k)fluoranthene	0.18	mg/kg	N Mid	307
Benzo(a)pyrene	0.56	mg/kg	N Mid	307
Dibenz(a,h)anthracene	<0.10	mg/kg	N Mid	307
Benzo(g,h,i)perylene	0.37	mg/kg	N Mid	307
Indeno(1,2,3-c,d)pyrene	0.26	mg/kg	N Mid	307
Coronene	<0.10	mg/kg	N Mid	307
PAH, Total of 17 WAC	8.1	mg/kg	N Mid	307
benzene	<0.10	mg/kg	Y Mid	327
toluene	<0.10	mg/kg	Y Mid	327
ethylbenzene	<0.10	mg/kg	Y Mid	327
m&p-Xylene	<0.20	mg/kg	Y Mid	327
o-xylene	<0.10	mg/kg	Y Mid	327
Dry Ratio (BSEN 12457)	98.43	%	N Mid	Calculated

Analyst Comments for 10956746:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

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Severn Trent Laboratories Ltd.