Slit Trench Number: ST-1

Project: 09-039-01

Completion Depth: 2.8m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
1	***Fill*** Sandy clay with bricks, glass, metal and plastic.			
2	***Fill*** Clay with rock and small boulders (20cm x 20cm).			
3	***Bedrock*** Limestone.			

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 22/03/2010

Sheet: 1 of 1

Slit Trench Number: ST-2

Project: 09-039-01

Completion Depth: 3.3m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with rocks, glass, plastics and some metals.			
1				
2				
3				
	Bedrock Limestone.			
4				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 22/03/2010

Sheet: 1 of 1

Slit Trench Number: ST-3

Project: 09-039-01

Completion Depth: 1.3m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with rocks.			
1	***Bedrock*** Limestone.			

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 22/03/2010

Sheet: 1 of 1

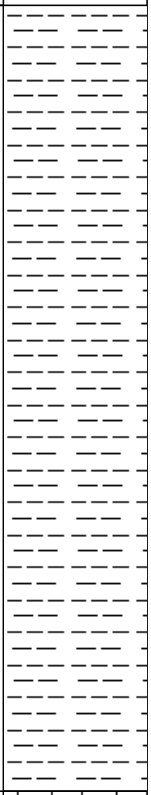
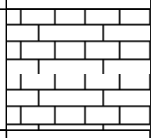
Slit Trench Number: ST-4

Project: 09-039-01

Completion Depth: 1.3m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
1	***Bedrock*** Limestone.			

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

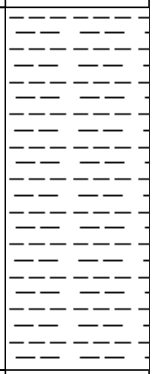
Slit Trench Number: ST-5

Project: 09-039-01

Completion Depth: 0.6m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
1				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

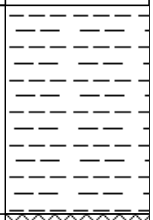
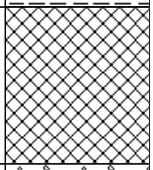
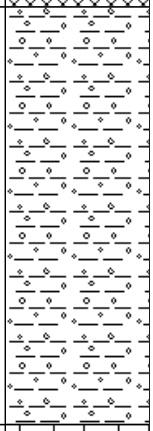
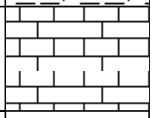
Slit Trench Number: ST-6

Project: 09-039-01

Completion Depth: 1.5m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with metal, plastics. Black in colour.			
1	***Clay*** Firm sandy gravelly clay.			
	Bedrock Limestone.			
2				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

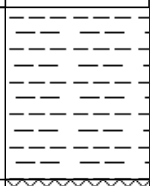
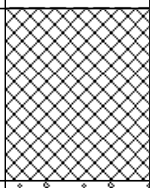
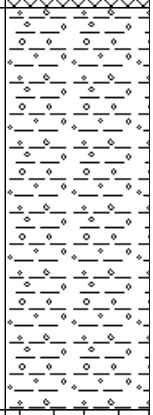
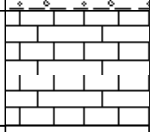
Slit Trench Number: ST-7

Project: 09-039-01

Completion Depth: 1.3m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with minor waste.			
	Clay Firm sandy gravelly clay.			
1	***Bedrock*** Limestone.			
2				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

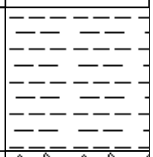
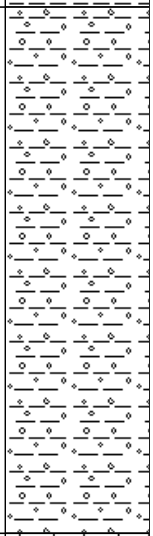
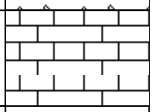
Slit Trench Number: ST-8

Project: 09-039-01

Completion Depth: 1.4m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Clay Firm sandy gravelly clay.			
1				
	Bedrock Limestone.			
2				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 24/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-1

Project: 09-039-01

Completion Depth: 4m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with minor amounts of glass, plastic and string.			0.8ppm
1				
2				
3	***Clay*** Firm sandy gravelly clay.			
4	***Bedrock*** Limestone.			
5				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 22/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-2

Project: 09-039-01

Completion Depth: 4m

Location: Velvetstown Landfill

Groundwater entry: - 4m

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with minor amounts of plastics, bottles, metal.			2ppm
1				
2				
3	***Clay*** Firm sandy gravelly clay. Water encountered at base of clay layer.			
4	***Bedrock*** Limestone.			
5				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 22/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-3

Project: 09-039-01

Completion Depth: 3.1m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with glass and rocks. Clay is black - evidence of burning.			0ppm
1				
2				
3	***Clay*** Firm sandy gravelly clay. Water encountered at base of clay layer.			
	Bedrock Limestone.			
4				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 22/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-4

Project: 09-039-01

Completion Depth: 3.1m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with bottles, timber and plastics.			0.5ppm
1				
2				
	Clay Firm sandy gravelly clay.			
3	***Bedrock*** Limestone.			
4				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 22/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-5

Project: 09-039-01

Completion Depth: 2.7m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with bottles, plastics, rocks and metals.			0ppm
1				
2				
	Clay Firm sandy gravelly clay.			
	Bedrock Limestone.			
3				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-6

Project: 09-039-01

Completion Depth: 3.5m

Location: Velvetstown Landfill

Groundwater entry: - 3.4m

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with metals, bottles and plastics.			0ppm
1				
2				
	Clay Firm sandy gravelly clay. Water encountered at base of clay layer.			
3				
	Bedrock Limestone.			
4				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-7

Project: 09-039-01

Completion Depth: 3.5m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with plastic, metal, car parts, metal rope and glass. Black in colour.			0ppm
1				
	Clay Firm sandy gravelly clay.			
2				
3				
	Bedrock Limestone.			
4				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-8

Project: 09-039-01

Completion Depth: 2.9m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with plastic bottles. Black in colour.			0ppm
1				
	Fill Sandy clay with metal. Black in colour.			
2				
	Clay Firm sandy gravelly clay.			
3	***Bedrock*** Limestone.			

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

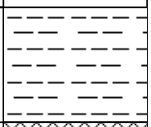
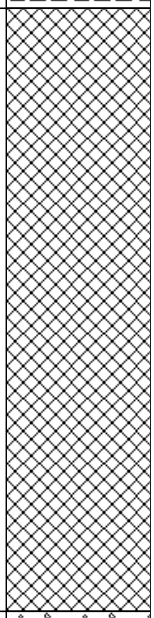
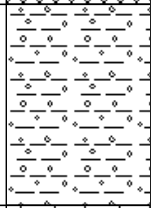
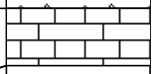
Trial Pit Number: TP-9

Project: 09-039-01

Completion Depth: 3.2m

Location: Velvetstown Landfill

Groundwater entry: - 3.0m

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with metal and glass. Black in colour.			0ppm
3	***Clay*** Firm sandy gravelly clay. Water encountered at base of Clay layer.			
	Bedrock Limestone.			
4				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-10

Project: 09-039-01

Completion Depth: 3.8m

Location: Velvetstown Landfill

Groundwater entry: - 3.6m

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam			
	Fill Sandy clay with plastic, metal and glass.			0ppm
1				
2				
	Clay Firm sandy gravelly clay. Water encountered at base of Clay layer.			
3				
	Bedrock Limestone.			
4				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-11

Project: 09-039-01

Completion Depth: 1.3m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam plus very minor amounts of watse.			
	Clay Firm sandy gravelly clay. Water encountered at base of Clay layer.			0ppm
1	***Bedrock*** Limestone.			
2				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 23/03/2010

Sheet: 1 of 1

Trial Pit Number: TP-12

Project: 09-039-01

Completion Depth: 3m

Location: Velvetstown Landfill

Groundwater entry: -

Depth (m)	Lithology Description	Lithology	Soil Sample Depth (m)	PID Readings (ppm)
0	Ground Surface			
	Clay Slightly Gravely SILT/CLAY Loam plus very minor amounts of watse.			
	Fill Sandy clay with metal, glass and plastic. Black in colour.			0ppm
1				
2				
	Clay Firm sandy gravelly clay.			
3	***Bedrock*** Limestone.			
4				

Excavation Method: 21.5tonne Track Mounted Excavator

Supervisor: K. Coffey

Excavation Date: 24/03/2010

Sheet: 1 of 1

Rotary Openhole Drilling Report Sheet

IGSL Limited

Contract: M20 Project - Velvetstown Landfill Site (Monitoring Well Installation Works)
Location:
Client: Cork County Council
Engineer
Project No. 14720
Date 12th April 2010

Drill Hole Number	Ground Level (mOD)	From Depth (m)	To (m) Depth (m)	Drilling Difficulty	Possible Interpretation (based on visual observations of fragments arising from hole - no sample recovery)	Standing Time / Comments
RC 1		0.00	1.10	Low	Overburden (clay / silt)	Standing 11am - 2pm waiting for digger to arrive to break down bund and access site
		1.10	2.60	Medium	Overburden (gravelly clay)	
		3.60	3.90	Medium to Hard	Weathered Rock / Very hard gravelly clay	Groundwater noted @ 3.60m
		3.90	10.00	Medium to Hard	Rock	

Please Note:- Rotary Openhole drilling does not return intact samples to surface from the borehole. The descriptions of the strata penetrated are compiled based on drilling rates and powdered returns which may or may not be returned to surface.

Standpipe Details
100mm slotted 10m - 5m with gravel pack
100mm plain 5m - GL with bentonite seal
Installed Headworks

Rotary Openhole Drilling Report Sheet					*IGSL Limited*	
Contract:	M20 Project - Velvetstown Landfill Site (Monitoring Well Installation Works)					
Location:						
Client:	Cork County Council					
Engineer						
Project No.	14720					
Date	12th April 2010					

Drill Hole Number	Ground Level (mOD)	From Depth (m)	To (m) Depth (m)	Drilling Difficulty	Possible Interpretation (based on visual observations of fragments arising from hole - no sample recovery)	Standing Time / Comments

Rotary Openhole Drilling Report Sheet					*IGSL Limited*	
Contract:	M20 Project - Velvetstown Landfill Site (Monitoring Well Installation Works)					
Location:						
Client:	Cork County Council					
Engineer						
Project No.	14720					
Date	12th April 2010					

Drill Hole Number	Ground Level (mOD)	From Depth (m)	To (m) Depth (m)	Drilling Difficulty	Possible Interpretation (based on visual observations of fragments arising from hole - no sample recovery)	Standing Time / Comments
RC 2		0.00	2.30	Low	Overburden (peaty clay / silt)	
		2.30	2.80	Low to Medium	Overburden (gravelly clay)	
		2.80	3.70	Medium to Hard	Weathered Rock / Very hard gravelly clay	
		3.70	5.30	Medium to Hard	Rock	Groundwater noted @ 5.30m
		5.30	9.00	Low to Medium	Weathered Rock	

Please Note:- Rotary Openhole drilling does not return intact samples to surface from the borehole. The descriptions of the strata penetrated are compiled based on drilling rates and powdered returns which may or may not be returned to surface.

Standpipe Details
50mm slotted 9m - 4.5m with gravel pack
50mm plain 4.5m - GL with bentonite seal
Installed Headworks

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 14474

CONTRACT M20 Additional Hydrogeological SI

DRILLHOLE NO **MW5**
SHEET Sheet 1 of 2

CO-ORDINATES
GROUND LEVEL (mOD)

RIG TYPE
FLUSH Air/mist
INCLINATION (deg) -90
CORE DIAMETER (mm)

DATE DRILLED 02/02/2010
DATE LOGGED 02/02/2010

CLIENT
ENGINEER WYG/Arup

DRILLED BY Millennium
LOGGED BY DO'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								OPEN HOLE DRILLING: Observed by driller as returns of clayey gravels				
1												
									2.00			
2								OPEN HOLE DRILLING: Observed by driller as returns of weathered rock				
3												
4												
5												
6												
									7.00			
7								OPEN HOLE DRILLING: Observed by driller as returns of fractured rock with clay				
8												
9												
									10.00			

REMARKS
Hole cased 0.0-4.00m.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.00	2.00				

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
02-02-10	20.00	6.00	20.00	50mm SP

IGSL RC FI 10M 14474.GPJ IGSL.GDT 10/2/10

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 14474

CONTRACT M20 Additional Hydrogeological SI

DRILLHOLE NO MW5
SHEET Sheet 2 of 2

CO-ORDINATES
GROUND LEVEL (mOD)

RIG TYPE
FLUSH Air/mist
INCLINATION (deg) -90
CORE DIAMETER (mm)

DATE DRILLED 02/02/2010
DATE LOGGED 02/02/2010

CLIENT
ENGINEER WYG/Arup

DRILLED BY Millennium
LOGGED BY DO'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10								OPEN HOLE DRILLING: Observed by driller as returns of rock				
11												
12												
13												
14												
15												
16												
17												
18												
19									20.00			

REMARKS
Hole cased 0.0-4.00m.

End of Borehole at 20.00 m

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
02-02-10	20.00	6.00	20.00	50mm SP

IGSL RC FI 10M 14474.GPJ IGSL.GDT 10/2/10

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 14474

CONTRACT M20 Additional Hydrogeological SI

DRILLHOLE NO MW6
SHEET Sheet 1 of 2

CO-ORDINATES
GROUND LEVEL (mOD)
CLIENT
ENGINEER WYG/Arup

RIG TYPE
FLUSH Air/mist
INCLINATION (deg) -90
CORE DIAMETER (mm)

DATE DRILLED 29/01/2010
DATE LOGGED 29/01/2010
DRILLED BY Millennium
LOGGED BY DO'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								OPEN HOLE DRILLING: Observed by driller as returns of clayey gravels				
1												
2									2.70			
3								OPEN HOLE DRILLING: Observed by driller as returns of clay				
4												
5												
6												
7												
8									8.70			
9								OPEN HOLE DRILLING: Observed by driller as returns of clayey gravels				

REMARKS
Hole cased 0.0-11.50m.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
8.70	11.50		0.00		Rapid

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
29-01-10	20.00	13.00	20.00	50mm SP

IGSL RC FI 10M 14474.GPJ IGSL.GDT 10/2/10

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 14474

CONTRACT M20 Additional Hydrogeological SI

DRILLHOLE NO MW6
SHEET Sheet 2 of 2

CO-ORDINATES
GROUND LEVEL (mOD)

RIG TYPE
FLUSH Air/mist
INCLINATION (deg) -90
CORE DIAMETER (mm)

DATE DRILLED 29/01/2010
DATE LOGGED 29/01/2010

CLIENT
ENGINEER WYG/Arup

DRILLED BY Millennium
LOGGED BY DO'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10								OPEN HOLE DRILLING: Observed by driller as returns of clayey gravels *(continued)*	10.50			
11								OPEN HOLE DRILLING: Observed by driller as returns of weathered rock	11.50			
12								OPEN HOLE DRILLING: Observed by driller as returns of rock				
13												
14												
15												
16												
17												
18												
19									20.00			

REMARKS
Hole cased 0.0-11.50m.

End of Borehole at 20.00 m

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
29-01-10	20.00	13.00	20.00	50mm SP

IGSL RC FI 10M 14474.GPJ IGSL.GDT 10/2/10

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 14474

CONTRACT M20 Additional Hydrogeological SI

DRILLHOLE NO MW7
SHEET Sheet 1 of 2

CO-ORDINATES
GROUND LEVEL (mOD)

RIG TYPE
FLUSH Air/mist
INCLINATION (deg) -90
CORE DIAMETER (mm)

DATE DRILLED 01/02/2010
DATE LOGGED 01/02/2010

CLIENT
ENGINEER WYG/Arup

DRILLED BY Millennium
LOGGED BY DO'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								OPEN HOLE DRILLING: Observed by driller as returns of clayey gravels	1.20			
1								OPEN HOLE DRILLING: Observed by driller as returns of clayey sandy gravels	2.70			
2								OPEN HOLE DRILLING: Observed by driller as returns of clayey cobbly gravels				
3												
4												
5												
6												
7												
8												
9												

REMARKS
Hole cased 0.0-20.00m.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
7.10	7.10				Slow

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
01-02-10	20.00	8.00	20.00	50mm SP

IGSL RC FI 10M 14474.GPJ IGSL.GDT 10/2/10

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 14474

CONTRACT M20 Additional Hydrogeological SI

DRILLHOLE NO MW7
SHEET Sheet 2 of 2

CO-ORDINATES
GROUND LEVEL (mOD)
RIG TYPE
FLUSH Air/mist
INCLINATION (deg) -90
CORE DIAMETER (mm)

DATE DRILLED 01/02/2010
DATE LOGGED 01/02/2010

CLIENT
ENGINEER WYG/Arup

DRILLED BY Millennium
LOGGED BY DO'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10								OPEN HOLE DRILLING: Observed by driller as returns of clayey cobbly gravels *(continued)*				
11												
12												
13									13.20			
14								OPEN HOLE DRILLING: Observed by driller as returns of brown clayey gravels				
15												
16												
17												
18												
19									20.00			

REMARKS
Hole cased 0.0-20.00m.

End of Borehole at 20.00 m

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
10.20	10.20				Slow

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
01-02-10	20.00	8.00	20.00	50mm SP

IGSL RC FI 10M 14474.GPJ IGSL.GDT 10/2/10

Appendix 4

Full Laboratory Reports

ENVIRONMENTAL
LABORATORY SERVICES
Acorn Business Campus,
Mahon Industrial Park,
Blackrock,
CorkTel: 021-4536141
Fax: 021-4536149

Analysis Report

Attention:		**Report No:**	16298
Maurice Hourigan & Olivia Holmes (Arup)			
Cork County Council (M20 Cork)		**Date of receipt:**	11/02/2010
M20 Cork-Limerick Motorway Scheme		**Date Started:**	12/02/2010
Mallow Business Park			
Gooldshill			
Mallow			
Co. Cork.			
Ireland			
Fax No:		**Issue Date:**	09/03/2010
Tel No:	022 70 200 /087 2074858	**Page**	1 **of** 4
PO Number:	194573	**Delivery Mode**	Hand
Sample Type	Groundwater	**No of Samples**	1
Condition on receipt	Satisfactory	**Client Ref:**	See attached

QN1891A EPA Landfill Monitoring Per Tables C2

SIGNED **(09/03/2010)**

Technical Manager (or Deputy)
Brendan Murray

		Table C2 Parameters for Groundwater,Surfacewater and leachate																														Table D2 Trace Organic Substances (Groundwater and leachate)								
Method		AQ2							ICPMS																	Titralab	Titralab	Titralab	IC	Gravimetric	Coliert	Coliert	Analyser	GCMS			P&T GCMS	GCMS	Sub-Contract			
Method Number		EW003	EW015	EW035	EW034	EW051	EW007	EW015	EM130																	EW139	EW138	EW062	EW137	EW046	MIC133	MIC133	EW123	EO129			EO025	EO141				
Parameter		Ammonia	Chloride	Nitrite	Nitrate	TON	Ortho-Phosphate (MRP)	SO4	As	Cd	Total Cr	Fe	Hg	Mn	Ni	Pb	Sb	Zn	B	Ca	Cu	K	Mg	Na	Cond	pH	Total Alkalinity	Fluoride	TDS	Tot Coliforms	E.Coli	TOC	PAH	Triazines	Phenols	VOC's	TBT	Cyanide-Total (Non DW)	Organochlorine Pesticides	Organophosphorus Pesticides	Herbicides
Units		mg/l N	mg/l	mg/l N	mg/l N	mg/l N	mg/l P	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	us/cm	pH Units	mg/l CaCO3	mg/l	mg/l	MPN/ 100ml	MPN/ 100ml	mg/l	ug/l	ug/l	ug/l		ug/l	ug/l	ug/l	ug/l	ug/l
Limit of Detection		0.007	2.6	0.013	0.12	0.138	0.009	1.0	0.2	0.1	1.0	5.0	0.02	1.0	0.5	0.3	0.1	1.0	0.02	1.0	0.003	0.2	0.3	0.5	25-1999	0.3	25.0	0.1	1	0	0	0.25	Pg3	Pg3	Pg3	Pg5	0.02	10.0	Pg3	Pg3	Pg3
Date Testing Initiated		15/02	02/12						15/02																11/02			17/02	17/02	11/02		12/02	12/02			12/02	12/02	12/02	18/02			
ELS Ref	**Client Ref**																																								
16298-1	SP37	0.068	28.4	0.02	2.44	2.46	0.055	30.5	0.9	<0.1	3.9	8.3	<0.02	7.0	2.3	<0.3	0.4	34.3	0.11	143.6	0.005	11.5	13.6	17.0	641	8.0	320.0	<0.1	360	100	1	2.34	Pg3	Pg3	Pg3	Pg3-4	<0.02	<10	Pg3	Pg3	Pg3

NOTES

1 Sub-contract analysis denoted by *

2 ND = Concentration was below the limit of detection

TABLE D2 TRACE ORGANIC SUBSTANCES GROUNDWATER AND LEACHATE ONLY

Pesticides , PAH , Phenols & VOC

Chlorinated Pesticides, PCB-sub-contract	LOD (ug/l)	16298-1
Aldrin	0.003	<0.006
Lindane	0.001	<0.002
Dieldrin	0.003	<0.006
Beta Endosulfan	0.003	<0.006
Trifluralin	0.005	<0.010
Hexachlorobenzene	0.001	<0.002
Organophosphorus Pesticides-sub-contract		
Dichloryos	0.001	<0.002
Acid Herbicides-sub-contract		
Bromoxynil	0.05	<0.05
Mecoprop	0.05	<0.04
Dichloroprop	0.04	<0.05
Triazines		
Atrazine	0.01	<0.01
Simazine	0.01	<0.01
PAH Compounds	-	
Benzo (a) Pyrene	0.01	<0.01
Benzo(b)fluoranthene	0.01	<0.01
Benzo(g,h,i)perylene	0.01	<0.01
Benzo(k)fluoranthene	0.01	<0.01
Indeno(1,2,3-cd)pyrene	0.01	<0.01
Naphthalene	0.01	<0.01
Phenols	0.5	<0.5
2 Chlorophenol	0.5	<0.5
2 4 6 Trichlorophenol	0.5	<0.5
Pentachlorophenol	0.5	<0.5
VOC's		
Tetrachloroethylene	0.1	ND
Trichloroethylene	0.1	ND
12 Dichloroethane	0.1	ND
12 Dichlorobenzene	0.5	ND
Toluene	0.5	ND
m & p Xylene	0.5	ND
o Xylene	0.5	ND
Hexachlorobutadiene	0.5	ND
124 Trichlorobenzene	0.5	ND
123 Trichlorobenzene	0.5	ND
Chlorobenzene	0.5	ND
Benzene	0.1	ND
Methylene Chloride/DCM	5.0	ND

1. ND = Concentration was below the limit of detection
2.Some reporting limits have been raised by the sub-contract laboratory

Environmental Laboratory Services Ltd

Report Number 16298
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Appendix A

Volatile Organic Carbons (GROUNDWATER AND LEACHATE ONLY)

No.	Analyte	LOD	16298-1
		ug/l	SP37
2	Dichlorodifluoromethane	10.0	N.D
3	Chloromethane	0.5	N.D
4	Ethyl Chloride/Chloroethane	0.5	N.D
5	Vinyl Chloride/Chloroethene	0.5	N.D
6	Bromomethane	0.5	N.D
8	Trichloromonofluoromethane	0.5	N.D
9	Ethyl Ether/Diethyl Ether	0.5	N.D
10	11 Dichloroethene	0.5	N.D
11	Acetone	2.0	N.D
12	Iodomethane/Methyl Iodide	0.5	N.D
13	Carbon Disulphide	0.5	N.D
14	Allyl Chloride	0.5	N.D
15	Methylene Chloride/DCM	5.0	N.D
16	2-Propenenitrile/Acrylonitrile	2.0	N.D
17	Chlormethyl Cyanide/Chloroacetonitrile	0.5	N.D
18	Nitrobenzene	0.5	N.D
19	Propanenitrile	10.0	N.D
20	Hexachlorobutadiene	0.5	N.D
21	Trans-1,2 Dichloroethene	0.5	N.D
22	MtBE	0.5	N.D
23	11 Dichloroethane	0.5	N.D
24	22 Dichloropropane	0.5	N.D
25	cis-12 Dichloroethene	0.5	N.D
26	2-Butanone	5.0	N.D
27	Methyl Acrylate	5.0	N.D
28	Bromochloromethane	0.5	N.D
29	Methacrylonitrile	5.0	N.D
30	Tetrahydrofuran	5.0	N.D
31	Trichloromethane/ Chloroform*	1.0	N.D
32	111 Trichloroethane	0.5	N.D
33	1-Chlorobutane	0.5	N.D
34	Carbon Tetrachloride	0.5	N.D
35	11 Dichloropropene	0.5	N.D
36	Benzene	0.1	N.D
37	12 Dichloroethane	0.1	N.D
39	Trichloroethylene/ Trichloroethene	0.1	N.D
40	12 Dichloropropane	0.5	N.D
41	Dibromomethane	0.5	N.D
42	Methyl Methacrylate	0.5	N.D
43	Bromodichloromethane	2.0	N.D
44	13 Dichloropropene,cis	2.0	N.D
45	MIBK/4 Methyl 2 Pentanone	2.0	N.D
46	Toluene	0.5	N.D
47	13 Dichloropropene,trans	2.0	N.D
48	Ethyl Methacrylate	2.0	N.D
49	112 Trichloroethane	0.5	N.D
50	Tetrachloroethylene/ Tetrachloroethene	0.1	N.D
51	13 Dichloropropane	0.5	N.D
52	2-Hexanone	1.0	N.D
53	Dibromochloromethane	1.0	N.D
54	12 Dibromoethane	0.5	N.D
55	Chlorobenzene	0.5	N.D
56	1112 Tetrachloroethane	2.0	N.D
57	Ethyl Benzene	0.5	N.D
58	m & p Xylene	0.5	N.D
59	o Xylene	0.5	N.D
60	Styrene	2.0	N.D
61	Bromoform	1.0	N.D
62	Isopropyl Benzene	0.5	N.D
63	Bromobenzene	0.5	N.D
64	1122 Tetrachloroethane	0.5	N.D
65	123 Trichloropropane	2.0	N.D
66	Trans 14 Dichloro 2 Butene, tran	2.0	N.D
67	Propyl Benzene	0.5	N.D
68	2-Chlorotoluene	0.5	N.D
69	4 Chlorotoluene	0.5	N.D
70	135 Trimethylbenzene	0.5	N.D
71	Tert Butyl Benzene	0.5	N.D
72	124 Trimethylbenzene	0.5	N.D
73	Sec Butyl Benzene	0.5	N.D
74	13 Dichlorobenzene	0.5	N.D
75	P Isopropyltoluene	0.5	N.D
76	14 Dichlorobenzene	0.5	N.D
77	12 Dichlorobenzene	0.5	N.D
78	N Butyl Benzene	0.5	N.D
79	Hexachloroethane	5.0	N.D
80	12 Dibromo 3 Chloropropane	2.0	N.D
81	124 Trichlorobenzene	0.5	N.D
82	Napththalene	2.0	N.D
83	123 Trichlorobenzene	0.50	N.D

NOTES
1. ND=Concentration was below the limit of detection

ELS LTD INAB ACCREDITATION SCHEDULE SUMMARY SHEET

Miscellaneous (P,G,W,S)
Ammonia/Ammonium 0.007-1mg/l N EW003
Chloride 2.6-250 mg/l EW015
Flouride 0.1 - 2 mg/l EW137
COD 8-1500 mg/l EW094
Nitrate 0.12-50 mg/l N EW034
Nitrite 0.013-1 mg/l N EW035
pH 4 – 10 pH Units EW138
Phosphate 0.009-1 mg/l P EW007
Alkaliniity 10-1000mg/l EW062
TOC 0.25-100mg/l EW123
BOD 1-1300mg/l EW001
Total Nitrogen 1-100mg/l N Ew140
Total Phosphorous 0.01-40 mg/l P EW143

Miscellaneous (P,G,S)
Bromate 1 to 50ug/l BRO3 (EW137)
Colour 2.5-50mg/l PtCCo (EW021)
Conductivity 25-6000 us/cm EW139
Dissolved Oxygen 1 to 10 mg/l (EW043)
Sulphate 1-250mg/l SO4(EW016)
Suspended Solids 5-1000mg/l (EW013)
Total Dissolved Solids 1-1000mg/l (EW046)
Total Hardness 3-330mg/l CaCO3 (EM099)
Total Oxidised Nitrogen 0.138-51mg/l N (EW051)

Metals EM130 (P,G,S)
Aluminium 5.0 – 500 µg/l
Antimony 0.1 – 10µg/l
Arsenic 0.2 - 20µg/l
Barium 1.0 - 100µg/l
Boron 0.02 – 2mg/l
Cadmium 0.1 – 10µg/l
Calcium 1.0 – 100mg/l
Chromium 1.0 - 100µg/l
Cobalt 1.0 - 100µg/l
Copper 3 - 4000µg/l
Iron 5.0 - 500µg/l
Lead 0.3 - 30µg/l
Magnesium 0.3 – 20mg/l
Manganese 1.0 - 100µg/l
Mercury 0.02 - 2µg/l
Molybdenum 1.0 - 100µg/l
Nickel 0.5 - 50µg/l
Potassium 0.2 – 20mg/l
Selenium 0.2 - 20µg/l
Sodium 0.5 – 50mg/l
Strontium 1.0 - 100µg/l
Tin 1.0 - 100µg/l
Vanadium 1.0 - 100µg/l
Zinc 1.0 - 100µg/l

SI439 Potable Water VOCs & THM
EO025 (P,G,S)
Benzene 0.1-35 µg/l
1.2-Dichloroethane 0.1-35 µg/l
Tetrachloroethene 0.1-35 µg/l
Trichloroethene 0.1-35 µg/l
Chloroform 1.0-150 µg/l
Bromoform 1.0-35 µg/l
Dibromochloromethane 1.0-35 µg/l
Bromodichloromethane 2.0-35 µg/l

Other VOC's EO025 (P,G,S)
Bromomethane 0.5 - 35 µg/l
Ethyl Ether/Diethyl Ether0.5 - 35 µg/l
11 Dichloroethene0.5 - 35 µg/l
Iodomethane/Mehyl Iodide 0.5 - 35 µg/l
Carbon Disulphide 0.5 - 35 µg/l
Allyl Chloride0.5 - 35 µg/l
Methylene Chloride/DCM 5.0 - 35 µg/l
2-Propenenitrile/Acrylonitrile 2.0 - 35 µg/l
Chlormethyl Cyanide 0.5 - 35 µg/l
Hexachlorobutadiene0.5 - 35 µg/l
Trans-1,2 Dichloroethene0.5 - 35 µg/l
MtBE0.5 - 35 µg/l
11 Dichloroethane0.5 - 35 µg/l
22 Dichloropropane0.5 - 35 µg/l
Cis-12 Dichloroethene0.5 - 35 µg/l
Methyl Acrylate5.0 - 35 µg/l
Bromochloromethane0.5 - 35 µg/l
Tetrahydrofuran5.0 - 35 µg/l
111 Trichloroethane0.5 - 35 µg/l
1-Chlorobutane0.5 - 35 µg/l
Carbon Tetrachloride0.5 - 35 µg/l
11 Dichloropropene0.5 - 35 µg/l
12 Dichloropropane0.5 - 35 µg/l
Dibromomethane0.5 - 35 µg/l
Methyl Methacrylate0.5 - 35 µg/l
13 Dichloropropene, cis2.0 - 35 µg/l
MIBK/4 Methyl 2 Pentanone 2.0 - 35 µg/l
Toluene0.5 - 35 µg/l
13 Dichloropropene,trans2.0 - 35 µg/l
Ethyl Methacrylate2.0 - 35 µg/l
112 Trichloroethane0.5 - 35 µg/l
13 Dichloropropane0.5 - 35 µg/l
2 Hexanone1.0 - 35 µg/l
12 Dibromoethane0.5 - 35 µg/l
Chlorobenzene0.5 - 35 µg/l
1112 Tetrachloroethane2.0 - 35 µg/l
Ethyl Benzene0.5 - 35 µg/l
m & p Xylene0.5 - 35 µg/l
O Xylene0.5 - 35 µg/l
Stryene2.0 - 35 µg/l
Isopropyl Benzene0.5 - 35 µg/l
Bromobenzene0.5 - 35 µg/l
1122 Tetrachloroethane0.5 - 35 µg/l
123 Trichloropropane2.0 - 35 µg/l
Propyl Benzene0.5 - 35 µg/l
2-Chlorotoluene0.5 - 35 µg/l
4 Chlorotoluene0.5 - 35 µg/l
135 Trimenthylbenzene0.5 - 35 µg/l
Tert Butyl Benzene0.5 - 35 µg/l
124 Trimethlbenzene0.5 - 35 µg/l
Sec Butyl Benzene0.5 - 35 µg/l
13 Dichlorobenzene0.5 - 35 µg/l
P Isopropyltoluene0.5 - 35 µg/l
14 Dichlorobenzene0.5 - 35 µg/l
12 Dichlorobenzene0.5 - 35 µg/l
N Butyl Benzene0.5 - 35 µg/l
Hexachloroethane5.0 - 35 µg/l
12 Dibromo 3Chloropropane 2.0 - 35 µg/l
124 Trichlorobenzene0.5 - 35 µg/l
123 Trichlorobenzene0.5 - 35 µg/l

PAH EO129 (P,G,S)
Range 0.01 - 0.2 µg/l
Acenaphthene
Benzo (a) Anthracene
Benzo (a) Pyrene
Benzo (b) Fluoranthene
Benzo (ghi) Perylene
Benzo (k) Fluoranthene
Chrysene
Dibenzo (ah) Anthracene
Fluoranthene
Fluorene
Indeno (123-cd) Pyrene
Phenanthrene
Pyrene

Acid Herbicides (P,G,S)
Range 0.01 - 0.2 µg/l
2,4,5-T H
2,4-D H
2,4-DB H
MCPA H
Picloram H

Organophosphorus Pesticides(P,G,S)
Range 0.01 - 0.2 µg/l
Famphur OP
Methyl Parathion OP
Parathion OP
Thionazin OP

Organochlorine Pesticides (P,G,S)
Range 0.01 - 0.2 µg/l
Aldrin
BHC Alpha isomer OC
BHC Beta isomer OC
BHC Delta isomer OC
Dieldrin OC
Endosulphan Alpha isomer OC
Endosulphan Beta isomer OC
Endosulphan Sulphate OC
Endrin OC
Heptachlor Epoxide OC
Heptachlor OC
Lindane OC
P,P' DDE OC
P,P'-DDD OC
P,P'-DDT OC

Notes

ENVIRONMENTAL
LABORATORY SERVICES
Acorn Business Campus,
Mahon Industrial Park,
Blackrock,
CorkTel: 021-4536141
Fax: 021-4536149

Analysis Report

Attention:
Maurice Hourigan & Olivia Holmes (Arup)
Cork County Council (M20 Cork)
M20 Cork-Limerick Motorway Scheme
Mallow Business Park
Gooldshill
Mallow
Co. Cork.
Ireland

Fax No:
Tel No: 022 70 200 /087 2074858
PO Number: 194573
Sample Type Ground Water

Condition on receipt Satisfactory

Report No: 16317
Date of receipt: 15/02/2010
Date Started: 15/02/2010

Issue Date: 09/03/2010
Page 1 **of** 4

Delivery Mode Hand
No. of Samples 3

Client Ref: Below

QN1891A EPA Landfill Monitoring Per Tables C2

SIGNED **(09/03/2010)**

Technical Manager (or Deputy)
Brendan Murray

Table C2 Parameters for Groundwater,Surfacewater and leachate

Method		AQ2							ICPMS															
Method Number		EW003	EW015	EW035	EW034	EW051	EW007	EW015	EM130															
Parameter		Ammonia	Chloride	Nitrite	Nitrate	TON	Ortho-Phosphate (MRP)	SO4	As	Cd	Total Cr	Fe	Hg	Mn	Ni	Pb	Sb	Zn	B	Ca	Cu	K	Mg	Na
Units		mg/l N	mg/l	mg/l N	mg/l N	mg/l N	mg/l P	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Limit of Detection		0.007	2.6	0.013	0.12	0.138	0.009	1.0	0.2	0.1	1.0	5.0	0.02	1.0	0.5	0.3	0.1	1.0	0.02	1.0	0.003	0.2	0.3	0.5
Date Testing Initiated		15/02	16/02						15/02															
ELS Ref	Client Ref																							
16317-1	M20-SP38	0.033	24.7	<0.013	1.23	1.23	0.009	28.6	0.2	<0.1	<1.0	15.4	<0.02	12.2	1.8	<0.3	0.2	14	<0.02	<1.0	<0.003	3.7	15.9	13.6
16317-2	M20-SP39	0.040	22.7	<0.013	2.31	2.31	0.015	35.8	0.6	0.2	<1.0	222	<0.02	26.6	2.9	2.2	0.2	21.5	0.04	3.8	0.004	8.0	14.1	13.7
16317-3	M20-SP40	0.063	9.29	<0.013	3.47	3.47	0.030	16.9	0.6	<0.1	1.1	33.8	<0.02	8.7	1.6	<0.2	0.3	23.6	<0.02	2	<0.003	4.9	7.5	7.1

Method		Titralab	Titralab	Titralab	IC	Gravimetric	Coliert	Coliert	Analyser
Method Number		EW139	EW138	EW062	EW137	EW046	MIC133	MIC133	EW123
Parameter		Cond	pH	Total Alkalinity	Fluoride	TDS	Tot Coliforms	E.Coli	TOC
Units		us/cm	pH Units	mg/l CaCO3	mg/l	mg/l	MPN/ 100ml	MPN/ 100ml	mg/l
Limit of Detection		25-1999	0.3	25.0	0.1	1	0	0	0.25
Date Testing Initiated		15/02			17/02	17/02	15/02		15/02
ELS Ref	Client Ref								
16317-1	M20-SP38	636	7.4	273.0	<0.1	395	63	0	2.95
16317-2	M20-SP39	728	7.2	428.0	<0.1	440	31	1	2.14
16317-3	M20-SP40	632	7.3	293.0	<0.1	355	173	0	1.9

Table D2 Trace Organic Substances (Groundwater and

Method		GCMS			P&T GCMS	GCMS	Sub-Contract			
Method Number		EO129			EO025	EO141				
Parameter		PAH	Triazines	Phenols	VOC's	TBT	Cyanide -Total (Non DW)	Organochlorine Pesticides	Organophosphorus Pesticides	Herbicides
Units		ug/l	ug/l	ug/l		ug/l	ug/l	ug/l	ug/l	ug/l
Limit of Detection		Pg3	Pg3	Pg3	Pg5	0.02	10.0	Pg3	Pg3	Pg3
Date Testing Initiated		15/02			03/03	15/02	22/02	22/02		
ELS Ref	Client Ref									
16317-1	M20-SP38	Pg3	Pg3	Pg3	Pg3-4	<0.02	<10	Pg3	Pg3	Pg3
16317-2	M20-SP39	Pg3	Pg3	Pg3	Pg3-4	<0.02	<10	Pg3	Pg3	Pg3
16317-3	M20-SP40	Pg3	Pg3	Pg3	Pg3-4	<0.02	<10	Pg3	Pg3	Pg3

NOTES
1 Sub-contract analysis denoted by *
2 ND = Concentration was below the limit of detection

TABLE D2 TRACE ORGANIC SUBSTANCES GROUNDWATER AND LEACHATE ONLY

Pesticides , PAH , Phenols & VOC

Chlorinated Pesticides, PCB-sub-contract	LOD (ug/l)	**16317-1 M20-SP38**	**16317-2 M20-SP39**	**16317-3 M20-SP40**
Aldrin	0.003	<0.006	<0.006	<0.006
Lindane	0.001	<0.002	<0.002	<0.002
Dieldrin	0.003	<0.006	<0.006	<0.006
Beta Endosulfan	0.003	<0.006	<0.006	<0.006
Trifluralin	0.005	<0.010	<0.010	<0.010
Hexachlorobenzene	0.001	<0.002	<0.002	<0.002
Organophosphorus Pesticides-sub-contract				
Dichloryos	0.001	<0.002	<0.002	<0.002
Acid Herbicides-sub-contract				
Bromoxynil	0.05	<0.05	<0.05	<0.05
Mecoprop	0.05	<0.04	<0.04	<0.04
Dichloroprop	0.04	<0.05	<0.05	<0.05
Triazines				
Atrazine	0.01	<0.01	<0.01	<0.01
Simazine	0.01	<0.01	<0.01	<0.01
PAH Compounds	-			
Benzo (a) Pyrene	0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	0.01	<0.01	<0.01	<0.01
Naphthalene	0.01	<0.01	<0.01	<0.01
Phenols	0.5			
2 Chlorophenol	0.5	<0.5	<0.5	<0.5
2 4 6 Trichlorophenol	0.5	<0.5	<0.5	<0.5
Pentachlorophenol	0.5	<0.5	<0.5	<0.5
VOC's				
Tetrachloroethylene	0.1	ND	ND	ND
Trichloroethylene	0.1	ND	ND	ND
12 Dichloroethane	0.1	ND	ND	ND
12 Dichlorobenzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
m & p Xylene	0.5	ND	ND	ND
o Xylene	0.5	ND	ND	ND
Hexachlorobutadiene	0.5	ND	ND	ND
124 Trichlorobenzene	0.5	ND	ND	ND
123 Trichlorobenzene	0.5	ND	ND	ND
Chlorobenzene	0.5	ND	ND	ND
Benzene	0.5	ND	ND	ND
Methylene Chloride/DCM	0.5	ND	ND	ND

1. ND = Concentration was below the limit of detection
2.Reporting limit raised for some compounds by sub-contract lab

Appendix A

Volatile Organic Carbons (GROUNDWATER AND LEACHATE ONLY)

No.	Analyte	LOD	16317-1	16317-2	16317-3
		ug/l	M20-SP38	M20-SP39	M20-SP40
2	Dichlorodifluoromethane	10.0	N.D	N.D	N.D
3	Chloromethane	0.5	N.D	N.D	N.D
4	Ethyl Chloride/Chloroethane	0.5	N.D	N.D	N.D
5	Vinyl Chloride/Chloroethene	0.5	N.D	N.D	N.D
6	Bromomethane	0.5	N.D	N.D	N.D
8	Trichloromonofluoromethane	0.5	N.D	N.D	N.D
9	Ethyl Ether/Diethyl Ether	0.5	N.D	N.D	N.D
10	11 Dichloroethene	0.5	N.D	N.D	N.D
11	Acetone	2.0	N.D	N.D	N.D
12	Iodomethane/Methyl Iodide	0.5	N.D	N.D	N.D
13	Carbon Disulphide	0.5	N.D	N.D	N.D
14	Allyl Chloride	0.5	N.D	N.D	N.D
15	Methylene Chloride/DCM	5.0	N.D	N.D	N.D
16	2-Propenenitrile/Acrylonitrile	2.0	N.D	N.D	N.D
17	Chlormethyl Cyanide/Chloroacetonitrile	0.5	N.D	N.D	N.D
18	Nitrobenzene	0.5	N.D	N.D	N.D
19	Propanenitrile	10.0	N.D	N.D	N.D
20	Hexachlorobutadiene	0.5	N.D	N.D	N.D
21	Trans-1,2 Dichloroethene	0.5	N.D	N.D	N.D
22	MtBE	0.5	N.D	N.D	N.D
23	11 Dichloroethane	0.5	N.D	N.D	N.D
24	22 Dichloropropane	0.5	N.D	N.D	N.D
25	cis-12 Dichloroethene	0.5	N.D	N.D	N.D
26	2-Butanone	5.0	N.D	N.D	N.D
27	Methyl Acrylate	5.0	N.D	N.D	N.D
28	Bromochloromethane	0.5	N.D	N.D	N.D
29	Methacrylonitrile	5.0	N.D	N.D	N.D
30	Tetrahydrofuran	5.0	N.D	N.D	N.D
31	Trichloromethane/ Chloroform*	1.0	N.D	N.D	N.D
32	111 Trichloroethane	0.5	N.D	N.D	N.D
33	1-Chlorobutane	0.5	N.D	N.D	N.D
34	Carbon Tetrachloride	0.5	N.D	N.D	N.D
35	11 Dichloropropene	0.5	N.D	N.D	N.D
36	Benzene	0.1	N.D	N.D	N.D
37	12 Dichloroethane	0.1	N.D	N.D	N.D
39	Trichloroethylene/ Trichloroethene	0.1	N.D	N.D	N.D
40	12 Dichloropropane	0.5	N.D	N.D	N.D
41	Dibromomethane	0.5	N.D	N.D	N.D
42	Methyl Methacrylate	0.5	N.D	N.D	N.D
43	Bromodichloromethane	2.0	N.D	N.D	N.D
44	13 Dichloropropene,cis	2.0	N.D	N.D	N.D
45	MIBK/4 Methyl 2 Pentanone	2.0	N.D	N.D	N.D
46	Toluene	0.5	N.D	N.D	N.D
47	13 Dichloropropene,trans	2.0	N.D	N.D	N.D
48	Ethyl Methacrylate	2.0	N.D	N.D	N.D
49	112 Trichloroethane	0.5	N.D	N.D	N.D
50	Tetrachloroethylene/ Tetrachloroethene	0.1	N.D	N.D	N.D
51	13 Dichloropropane	0.5	N.D	N.D	N.D
52	2-Hexanone	1.0	N.D	N.D	N.D
53	Dibromochloromethane	1.0	N.D	N.D	N.D
54	12 Dibromoethane	0.5	N.D	N.D	N.D
55	Chlorobenzene	0.5	N.D	N.D	N.D
56	1112 Tetrachloroethane	2.0	N.D	N.D	N.D
57	Ethyl Benzene	0.5	N.D	N.D	N.D
58	m & p Xylene	0.5	N.D	N.D	N.D
59	o Xylene	0.5	N.D	N.D	N.D
60	Styrene	2.0	N.D	N.D	N.D
61	Bromoform	1.0	N.D	N.D	N.D
62	Isopropyl Benzene	0.5	N.D	N.D	N.D
63	Bromobenzene	0.5	N.D	N.D	N.D
64	1122 Tetrachloroethane	0.5	N.D	N.D	N.D
65	123 Trichloropropane	2.0	N.D	N.D	N.D
66	Trans 14 Dichloro 2 Butene, tran	2.0	N.D	N.D	N.D
67	Propyl Benzene	0.5	N.D	N.D	N.D
68	2-Chlorotoluene	0.5	N.D	N.D	N.D
69	4 Chlorotoluene	0.5	N.D	N.D	N.D
70	135 Trimethylbenzene	0.5	N.D	N.D	N.D
71	Tert Butyl Benzene	0.5	N.D	N.D	N.D
72	124 Trimethylbenzene	0.5	N.D	N.D	N.D
73	Sec Butyl Benzene	0.5	N.D	N.D	N.D
74	13 Dichlorobenzene	0.5	N.D	N.D	N.D
75	P Isopropyltoluene	0.5	N.D	N.D	N.D
76	14 Dichlorobenzene	0.5	N.D	N.D	N.D
77	12 Dichlorobenzene	0.5	N.D	N.D	N.D
78	N Butyl Benzene	0.5	N.D	N.D	N.D
79	Hexachloroethane	5.0	N.D	N.D	N.D
80	12 Dibromo 3 Chloropropane	2.0	N.D	N.D	N.D
81	124 Trichlorobenzene	0.5	N.D	N.D	N.D
82	Napththalene	2.0	N.D	N.D	N.D
83	123 Trichlorobenzene	0.50	N.D	N.D	N.D

NOTES

1. ND=Concentration was below the limit of detection

ELS LTD INAB ACCREDITATION SCHEDULE SUMMARY SHEET

Miscellaneous (P,G,W,S)
Ammonia/Ammonium 0.007-1mg/l N EW003
Chloride 2.6-250 mg/l EW015
Flouride 0.1 - 2 mg/l EW137
COD 8-1500 mg/l EW094
Nitrate 0.12-50 mg/l N EW034
Nitrite 0.013-1 mg/l N EW035
pH 4 – 10 pH Units EW138
Phosphate 0.009-1 mg/l P EW007
Alkaliniity 10-1000mg/l EW062
TOC 0.25-100mg/l EW123
BOD 1-1300mg/l EW001
Total Nitrogen 1-100mg/l N Ew140
Total Phosphorous 0.01-40 mg/l P EW143

Miscellaneous (P,G,S)
Bromate 1 to 50ug/l BRO3 (EW137)
Colour 2.5-50mg/l PtCCo (EW021)
Conductivity 25-6000 us/cm EW139
Dissolved Oxygen 1 to 10 mg/l (EW043)
Sulphate 1-250mg/l SO4(EW016)
Suspended Solids 5-1000mg/l (EW013)
Total Dissolved Solids 1-1000mg/l (EW046)
Total Hardness 3-330mg/l CaCO3 (EM099)
Total Oxidised Nitrogen 0.138-51mg/l N (EW051)

Metals EM130 (P,G,S)
Aluminium 5.0 – 500 µg/l
Antimony 0.1 – 10µg/l
Arsenic 0.2 - 20µg/l
Barium 1.0 - 100µg/l
Boron 0.02 – 2mg/l
Cadmium 0.1 – 10µg/l
Calcium 1.0 – 100mg/l
Chromium 1.0 - 100µg/l
Cobalt 1.0 - 100µg/l
Copper 3 - 4000µg/l
Iron 5.0 - 500µg/l
Lead 0.3 - 30µg/l
Magnesium 0.3 – 20mg/l
Manganese 1.0 - 100µg/l
Mercury 0.02 - 2µg/l
Molybdenum 1.0 - 100µg/l
Nickel 0.5 - 50µg/l
Potassium 0.2 – 20mg/l
Selenium 0.2 - 20µg/l
Sodium 0.5 – 50mg/l
Strontium 1.0 - 100µg/l
Tin 1.0 - 100µg/l
Vanadium 1.0 - 100µg/l
Zinc 1.0 - 100µg/l

SI439 Potable Water VOCs & THM
EO025 (P,G,S)
Benzene 0.1-35 µg/l
1.2-Dichloroethane 0.1-35 µg/l
Tetrachloroethene 0.1-35 µg/l
Trichloroethene 0.1-35 µg/l
Chloroform 1.0-150 µg/l
Bromoform 1.0-35 µg/l
Dibromochloromethane 1.0-35 µg/l
Bromodichloromethane 2.0-35 µg/l

Other VOC's EO025 (P,G,S)
Bromomethane 0.5 - 35 µg/l
Ethyl Ether/Diethyl Ether0.5 - 35 µg/l
11 Dichloroethene0.5 - 35 µg/l
Iodomethane/Mehyl Iodide 0.5 - 35 µg/l
Carbon Disulphide 0.5 - 35 µg/l
Allyl Chloride0.5 - 35 µg/l
Methylene Chloride/DCM 5.0 - 35 µg/l
2-Propenenitrile/Acrylonitrile 2.0 - 35 µg/l
Chlormethyl Cyanide 0.5 - 35 µg/l
Hexachlorobutadiene0.5 - 35 µg/l
Trans-1,2 Dichloroethene0.5 - 35 µg/l
MtBE0.5 - 35 µg/l
11 Dichloroethane0.5 - 35 µg/l
22 Dichloropropane0.5 - 35 µg/l
Cis-12 Dichloroethene0.5 - 35 µg/l
Methyl Acrylate5.0 - 35 µg/l
Bromochloromethane0.5 - 35 µg/l
Tetrahydrofuran5.0 - 35 µg/l
111 Trichloroethane0.5 - 35 µg/l
1-Chlorobutane0.5 - 35 µg/l
Carbon Tetrachloride0.5 - 35 µg/l
11 Dichloropropene0.5 - 35 µg/l
12 Dichloropropane0.5 - 35 µg/l
Dibromomethane0.5 - 35 µg/l
Methyl Methacrylate0.5 - 35 µg/l
13 Dichloropropene, cis2.0 - 35 µg/l
MIBK/4 Methyl 2 Pentanone 2.0 - 35 µg/l
Toluene0.5 - 35 µg/l
13 Dichloropropene,trans2.0 - 35 µg/l
Ethyl Methacrylate2.0 - 35 µg/l
112 Trichloroethane0.5 - 35 µg/l
13 Dichloropropane0.5 - 35 µg/l
2 Hexanone1.0 - 35 µg/l
12 Dibromoethane0.5 - 35 µg/l
Chlorobenzene0.5 - 35 µg/l
1112 Tetrachloroethane2.0 - 35 µg/l
Ethyl Benzene0.5 - 35 µg/l
m & p Xylene0.5 - 35 µg/l
O Xylene0.5 - 35 µg/l
Stryene2.0 - 35 µg/l
Isopropyl Benzene0.5 - 35 µg/l
Bromobenzene0.5 - 35 µg/l
1122 Tetrachloroethane0.5 - 35 µg/l
123 Trichloropropane2.0 - 35 µg/l
Propyl Benzene0.5 - 35 µg/l
2-Chlorotoluene0.5 - 35 µg/l
4 Chlorotoluene0.5 - 35 µg/l
135 Trimenthylbenzene0.5 - 35 µg/l
Tert Butyl Benzene0.5 - 35 µg/l
124 Trimethlbenzene0.5 - 35 µg/l
Sec Butyl Benzene0.5 - 35 µg/l
13 Dichlorobenzene0.5 - 35 µg/l
P Isopropyltoluene0.5 - 35 µg/l
14 Dichlorobenzene0.5 - 35 µg/l
12 Dichlorobenzene0.5 - 35 µg/l
N Butyl Benzene0.5 - 35 µg/l
Hexachloroethane5.0 - 35 µg/l
12 Dibromo 3Chloropropane 2.0 - 35 µg/l
124 Trichlorobenzene0.5 - 35 µg/l
123 Trichlorobenzene0.5 - 35 µg/l

PAH EO129 (P,G,S)
Range 0.01 - 0.2 µg/l
Acenaphthene
Benzo (a) Anthracene
Benzo (a) Pyrene
Benzo (b) Fluoranthene
Benzo (ghi) Perylene
Benzo (k) Fluoranthene
Chrysene
Dibenzo (ah) Anthracene
Fluoranthene
Fluorene
Indeno (123-cd) Pyrene
Phenanthrene
Pyrene

Acid Herbicides (P,G,S)
Range 0.01 - 0.2 µg/l
2,4,5-T H
2,4-D H
2,4-DB H
MCPA H
Picloram H

Organophosphorus Pesticides(P,G,S)
Range 0.01 - 0.2 µg/l
Famphur OP
Methyl Parathion OP
Parathion OP
Thionazin OP

Organochlorine Pesticides (P,G,S)
Range 0.01 - 0.2 µg/l
Aldrin
BHC Alpha isomer OC
BHC Beta isomer OC
BHC Delta isomer OC
Dieldrin OC
Endosulphan Alpha isomer OC
Endosulphan Beta isomer OC
Endosulphan Sulphate OC
Endrin OC
Heptachlor Epoxide OC
Heptachlor OC
Lindane OC
P,P' DDE OC
P,P'-DDD OC
P,P'-DDT OC

Notes

ENVIRONMENTAL
LABORATORY SERVICES
Acorn Business Campus,
Mahon Industrial Park,
Blackrock,
CorkTel: 021-4536141
Fax: 021-4536149

Analysis Report

Attention:		**Report No:**	16918
Kieran Coffey			
Cork County Council (Iniscarra Environmental Directorate)		**Date of receipt:**	14/04/2010
Inniscarra		**Date Started:**	14/04/2010
Co Cork			
Fax No:		**Issue Date:**	06/05/2010
Tel No:	021-4532751 / 086 3827197	**Page**	1 **of** 4
PO Number:		**Delivery Mode**	Hand
Sample Type	Ground Water	**No. of Samples**	2
Condition on receipt	Satisfactory	**Client Ref:**	Below

QN1891A EPA Landfill Monitoring Per Tables C2

SIGNED **(06/05/2010)**

Technical Manager (or Deputy)
Brendan Murray

		Table C2 Parameters for Groundwater,Surfacewater and leachate																															Table D2 Trace Organic Substances (Groundwater and leachate)							
Method		AQ2							ICPMS																Titralab	Titralab	Titralab	IC	Gravimetric	Coliert	Coliert	Analyser	GCMS			P&T GCMS	GCMS	Sub-Contract			
Method Number		EW003	EW015	EW035	EW034	EW051	EW007	EW015	EM130																EW139	EW138	EW062	EW137	EW046	MIC133	MIC133	EW123	EO129			EO025	EO141				
Parameter		Ammonia	Chloride	Nitrite	Nitrate	TON	Ortho-Phosphate (MRP)	SO4	As	Cd	Total Cr	Fe	Hg	Mn	Ni	Pb	Sb	Zn	B	Ca	Cu	K	Mg	Na	Cond	pH	Total Alkalinity	Fluoride	TDS	Tot Coliforms	E.Coli	TOC	PAH	Triazines	Phenols	VOCs	TBT	Cyanide -Total (Non DW)	Organochlorine Pesticides	Organophosphorus Pesticides	Herbicides
Units		mg/l N	mg/l	mg/l N	mg/l N	mg/l N	mg/l P	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	us/cm	pH Units	mg/l CaCO3	mg/l	mg/l	MPN/ 100ml	MPN/ 100ml	mg/l	ug/l	ug/l	ug/l		ug/l	ug/l	ug/l	ug/l	ug/l
Limit of Detection		0.007	2.6	0.013	0.12	0.138	0.009	1.0	0.2	0.1	1.0	5.0	0.02	1.0	0.5	0.3	0.1	1.0	0.02	1.0	0.003	0.2	0.3	0.5	25-1999	0.3	25.0	0.1	1	0	0	0.25	Pg3	Pg3	Pg3	Pg4	0.02	10.0	Pg3	Pg3	Pg3
Date Testing Initiated		19/04	15/04						19/04																15/04			21/04	20/04	14/04		22/04	19/04			19/04	22/04	22/04	22/04	22/04	22/04
ELS Ref	**Client Ref**																																							
16918-1	**Velvetstown Landfill MW1**	0.038	27.8	<0.013	2.63	2.63	0.045	12.5	0.6	0.1	1.5	<5.0	<0.02	1.8	0.8	<0.3	<0.1	3.9	<0.02	126.3	<0.003	6.15	7.064	14.98	684	7.2	309	<0.1	480	317	1	1.6	Pg3	Pg3	Pg3	Pg4	<0.02	<10	Pg3	Pg3	Pg3
16918-2	**Velvetstown Landfill MW2**	0.036	33.7	0.016	1.85	1.87	0.061	90.0	1.2	0.3	8.5	<5.0	<0.02	105.1	4.1	<0.3	0.6	81	0.15	147.0	0.004	11.94	19.4	19.2	879	7.3	356	<0.1	565	2143	1	2.6	Pg3	Pg3	Pg3	Pg4	<0.02	<10	Pg3	Pg3	Pg3

NOTES

1 Sub-contract analysis denoted by *

2 ND = Concentration was below the limit of detection

TABLE D2 TRACE ORGANIC SUBSTANCES GROUNDWATER AND LEACHATE ONLY

Pesticides , PAH , Phenols & VOC

Chlorinated Pesticides, PCB-sub-contract	LOD (ug/l)	16918-1	16918-2
Aldrin	0.003	<0.006	<0.006
Lindane	0.001	<0.002	<0.002
Dieldrin	0.003	<0.006	<0.006
Beta Endosulfan	0.003	<0.006	<0.006
Trifluralin	0.005	<0.010	<0.010
Hexachlorobenzene	0.001	<0.002	<0.002
Organophosphorus Pesticides-sub-contract			
Dichloryos	0.001	<0.002	<0.002
Acid Herbicides-sub-contract			
Bromoxynil	0.05	<0.05	<0.05
Mecoprop	0.05	<0.04	<0.04
Dichloroprop	0.04	<0.05	<0.05
Triazines			
Atrazine	0.01	<0.01	<0.05
Simazine	0.01	<0.01	<0.05
PAH Compounds	-		
Benzo (a) Pyrene	0.01	<0.01	<0.05
Benzo(b)fluoranthene	0.01	<0.01	<0.05
Benzo(g,h,i)perylene	0.01	<0.01	<0.05
Benzo(k)fluoranthene	0.01	<0.01	<0.05
Indeno(1,2,3-cd)pyrene	0.01	<0.01	<0.05
Naphthalene	0.01	<0.01	<0.05
Phenols	0.5		
2 Chlorophenol	0.5	<0.5	<2.5
2 4 6 Trichlorophenol	0.5	<0.5	<2.5
Pentachlorophenol	0.5	<0.5	<2.5
VOC's			
Tetrachloroethylene	0.1	ND	ND
Trichloroethylene	0.1	ND	ND
12 Dichloroethane	0.1	ND	ND
12 Dichlorobenzene	0.5	ND	ND
Toluene	0.5	ND	ND
m & p Xylene	0.5	ND	ND
o Xylene	0.5	ND	ND
Hexachlorobutadiene	0.5	ND	ND
124 Trichlorobenzene	0.5	ND	ND
123 Trichlorobenzene	0.5	ND	ND
Chlorobenzene	0.5	ND	ND
Benzene	0.1	ND	ND
Methylene Chloride/DCM	5.0	ND	ND

1. ND = Concentration was below the limit of detectio
2. LOD raised due to receipt of only 500ml of -2

Appendix A

Volatile Organic Carbons (GROUNDWATER AND LEACHATE ONLY)

No.	Analyte	LOD	16918-1	16918-2
		ug/l		
2	Dichlorodifluoromethane	10.0	N.D	N.D
3	Chloromethane	0.5	N.D	N.D
4	Ethyl Chloride/Chloroethane	0.5	N.D	N.D
5	Vinyl Chloride/Chloroethene	0.5	N.D	N.D
6	Bromomethane	0.5	N.D	N.D
8	Trichloromonofluoromethane	0.5	N.D	N.D
9	Ethyl Ether/Diethyl Ether	0.5	N.D	N.D
10	11 Dichloroethene	0.5	N.D	N.D
11	Acetone	2.0	N.D	N.D
12	Iodomethane/Methyl Iodide	0.5	N.D	N.D
13	Carbon Disulphide	0.5	N.D	N.D
14	Allyl Chloride	0.5	N.D	N.D
15	Methylene Chloride/DCM	5.0	N.D	N.D
16	2-Propenenitrile/Acrylonitrile	2.0	N.D	N.D
17	Chlormethyl Cyanide/Chloroacetonitrile	0.5	N.D	N.D
18	Nitrobenzene	0.5	N.D	N.D
19	Propanenitrile	10.0	N.D	N.D
20	Hexachlorobutadiene	0.5	N.D	N.D
21	Trans-1,2 Dichloroethene	0.5	N.D	N.D
22	MtBE	0.5	N.D	N.D
23	11 Dichloroethane	0.5	N.D	N.D
24	22 Dichloropropane	0.5	N.D	N.D
25	cis-12 Dichloroethene	0.5	N.D	N.D
26	2-Butanone	5.0	N.D	N.D
27	Methyl Acrylate	5.0	N.D	N.D
28	Bromochloromethane	0.5	N.D	N.D
29	Methacrylonitrile	5.0	N.D	N.D
30	Tetrahydrofuran	5.0	N.D	N.D
31	Trichloromethane/ Chloroform*	1.0	N.D	N.D
32	111 Trichloroethane	0.5	N.D	N.D
33	1-Chlorobutane	0.5	N.D	N.D
34	Carbon Tetrachloride	0.5	N.D	N.D
35	11 Dichloropropene	0.5	N.D	N.D
36	Benzene	0.1	N.D	N.D
37	12 Dichloroethane	0.1	N.D	N.D
39	Trichloroethylene/ Trichloroethene	0.1	N.D	N.D
40	12 Dichloropropane	0.5	N.D	N.D
41	Dibromomethane	0.5	N.D	N.D
42	Methyl Methacrylate	0.5	N.D	N.D
43	Bromodichloromethane	2.0	N.D	N.D
44	13 Dichloropropene,cis	2.0	N.D	N.D
45	MIBK/4 Methyl 2 Pentanone	2.0	N.D	N.D
46	Toluene	0.5	N.D	N.D
47	13 Dichloropropene,trans	2.0	N.D	N.D
48	Ethyl Methacrylate	2.0	N.D	N.D
49	112 Trichloroethane	0.5	N.D	N.D
50	Tetrachloroethylene/ Tetrachloroethene	0.1	N.D	N.D
51	13 Dichloropropane	0.5	N.D	N.D
52	2-Hexanone	1.0	N.D	N.D
53	Dibromochloromethane	1.0	N.D	N.D
54	12 Dibromoethane	0.5	N.D	N.D
55	Chlorobenzene	0.5	N.D	N.D
56	1112 Tetrachloroethane	2.0	N.D	N.D
57	Ethyl Benzene	0.5	N.D	N.D
58	m & p Xylene	0.5	N.D	N.D
59	o Xylene	0.5	N.D	N.D
60	Styrene	2.0	N.D	N.D
61	Bromoform	1.0	N.D	N.D
62	Isopropyl Benzene	0.5	N.D	N.D
63	Bromobenzene	0.5	N.D	N.D
64	1122 Tetrachloroethane	0.5	N.D	N.D
65	123 Trichloropropane	2.0	N.D	N.D
66	Trans 14 Dichloro 2 Butene, tran	2.0	N.D	N.D
67	Propyl Benzene	0.5	N.D	N.D
68	2-Chlorotoluene	0.5	N.D	N.D
69	4 Chlorotoluene	0.5	N.D	N.D
70	135 Trimethylbenzene	0.5	N.D	N.D
71	Tert Butyl Benzene	0.5	N.D	N.D
72	124 Trimethylbenzene	0.5	N.D	N.D
73	Sec Butyl Benzene	0.5	N.D	N.D
74	13 Dichlorobenzene	0.5	N.D	N.D
75	P Isopropyltoluene	0.5	N.D	N.D
76	14 Dichlorobenzene	0.5	N.D	N.D
77	12 Dichlorobenzene	0.5	N.D	N.D
78	N Butyl Benzene	0.5	N.D	N.D
79	Hexachloroethane	5.0	N.D	N.D
80	12 Dibromo 3 Chloropropane	2.0	N.D	N.D
81	124 Trichlorobenzene	0.5	N.D	N.D
82	Napththalene	2.0	N.D	N.D
83	123 Trichlorobenzene	0.50	N.D	N.D

NOTES
1. ND=Concentration was below the limit of detection

ELS LTD INAB ACCREDITATION SCHEDULE SUMMARY SHEET

Miscellaneous (P,G,W,S)
Ammonia/Ammonium 0.007-1mg/l N EW003
Chloride 2.6-250 mg/l EW015
Flouride 0.1 - 2 mg/l EW137
COD 8-1500 mg/l EW094
Nitrate 0.12-50 mg/l N EW034
Nitrite 0.013-1 mg/l N EW035
pH 4 – 10 pH Units EW138
Phosphate 0.009-1 mg/l P EW007
Alkalinity 10-1000mg/l EW062
TOC 0.25-100mg/l EW123
BOD 1-1300mg/l EW001
Total Nitrogen 1-100mg/l N EW140
Total Phosphorous 0.01-40 mg/l P EW143

Miscellaneous (P,G,S)
Bromate 1 to 50ug/l BRO3 (EW137)
Colour 2.5-50mg/l PtCCo (EW021)
Conductivity 25-6000 us/cm EW139
Dissolved Oxygen 1 to 10 mg/l (EW043)
Sulphate 1-250mg/l SO4(EW016)
Suspended Solids 5-1000mg/l (EW013)
Total Dissolved Solids 1-1000mg/l (EW046)
Total Hardness 3-330mg/l CaCO3 (EM099)
Total Oxidised Nitrogen 0.138-51mg/l N (EW051)

Metals EM130 (P,G,S)
Aluminium 5.0 – 500 µg/l
Antimony 0.1 – 10µg/l
Arsenic 0.2 - 20µg/l
Barium 1.0 - 100µg/l
Boron 0.02 – 2mg/l
Cadmium 0.1 – 10µg/l
Calcium 1.0 – 100mg/l
Chromium 1.0 - 100µg/l
Cobalt 1.0 - 100µg/l
Copper 3 - 4000µg/l
Iron 5.0 - 500µg/l
Lead 0.3 - 30µg/l
Magnesium 0.3 – 20mg/l
Manganese 1.0 - 100µg/l
Mercury 0.02 - 2µg/l
Molybdenum 1.0 - 100µg/l
Nickel 0.5 - 50µg/l
Potassium 0.2 – 20mg/l
Selenium 0.2 - 20µg/l
Sodium 0.5 – 50mg/l
Strontium 1.0 - 100µg/l
Tin 1.0 - 100µg/l
Vanadium 1.0 - 100µg/l
Zinc 1.0 - 100µg/l

SI439 Potable Water VOCs & THM
EO025 (P,G,S)
Benzene 0.1-35 µg/l
1.2-Dichloroethane 0.1-35 µg/l
Tetrachloroethene 0.1-35 µg/l
Trichloroethene 0.1-35 µg/l
Chloroform 1.0-150 µg/l
Bromoform 1.0-35 µg/l
Dibromochloromethane 1.0-35 µg/l
Bromodichloromethane 2.0-35 µg/l

Other VOC's EO025 (P,G,S)
Bromomethane 0.5 - 35 µg/l
Ethyl Ether/Diethyl Ether0.5 - 35 µg/l
11 Dichloroethene0.5 - 35 µg/l
Iodomethane/Mehyl Iodide 0.5 - 35 µg/l
Carbon Disulphide 0.5 - 35 µg/l
Allyl Chloride0.5 - 35 µg/l
Methylene Chloride/DCM 5.0 - 35 µg/l
2-Propenenitrile/Acrylonitrile 2.0 - 35 µg/l
Chlormethyl Cyanide 0.5 - 35 µg/l
Hexachlorobutadiene0.5 - 35 µg/l
Trans-1,2 Dichloroethene0.5 - 35 µg/l
MtBE0.5 - 35 µg/l
11 Dichloroethane0.5 - 35 µg/l
22 Dichloropropane0.5 - 35 µg/l
Cis-12 Dichloroethene0.5 - 35 µg/l
Methyl Acrylate5.0 - 35 µg/l
Bromochloromethane0.5 - 35 µg/l
Tetrahydrofuran5.0 - 35 µg/l
111 Trichloroethane0.5 - 35 µg/l
1-Chlorobutane0.5 - 35 µg/l
Carbon Tetrachloride0.5 - 35 µg/l
11 Dichloropropene0.5 - 35 µg/l
12 Dichloropropane0.5 - 35 µg/l
Dibromomethane0.5 - 35 µg/l
Methyl Methacrylate0.5 - 35 µg/l
13 Dichloropropene, cis2.0 - 35 µg/l
MIBK/4 Methyl 2 Pentanone 2.0 - 35 µg/l
Toluene0.5 - 35 µg/l
13 Dichloropropene,trans2.0 - 35 µg/l
Ethyl Methacrylate2.0 - 35 µg/l
112 Trichloroethane0.5 - 35 µg/l
13 Dichloropropane0.5 - 35 µg/l
2 Hexanone1.0 - 35 µg/l
12 Dibromoethane0.5 - 35 µg/l
Chlorobenzene0.5 - 35 µg/l
1112 Tetrachloroethane2.0 - 35 µg/l
Ethyl Benzene0.5 - 35 µg/l
m & p Xylene0.5 - 35 µg/l
O Xylene0.5 - 35 µg/l
Stryene2.0 - 35 µg/l
Isopropyl Benzene0.5 - 35 µg/l
Bromobenzene0.5 - 35 µg/l
1122 Tetrachloroethane0.5 - 35 µg/l
123 Trichloropropane2.0 - 35 µg/l
Propyl Benzene0.5 - 35 µg/l
2-Chlorotoluene0.5 - 35 µg/l
4 Chlorotoluene0.5 - 35 µg/l
135 Trimenthylbenzene0.5 - 35 µg/l
Tert Butyl Benzene0.5 - 35 µg/l
124 Trimethlbenzene0.5 - 35 µg/l
Sec Butyl Benzene0.5 - 35 µg/l
13 Dichlorobenzene0.5 - 35 µg/l
P Isopropyltoluene0.5 - 35 µg/l
14 Dichlorobenzene0.5 - 35 µg/l
12 Dichlorobenzene0.5 - 35 µg/l
N Butyl Benzene0.5 - 35 µg/l
Hexachloroethane5.0 - 35 µg/l
12 Dibromo 3Chloropropane 2.0 - 35 µg/l
124 Trichlorobenzene0.5 - 35 µg/l
123 Trichlorobenzene0.5 - 35 µg/l

PAH EO129 (P,G,S)
Range 0.01 - 0.2 µg/l
Acenaphthene
Benzo (a) Anthracene
Benzo (a) Pyrene
Benzo (b) Fluoranthene
Benzo (ghi) Perylene
Benzo (k) Fluoranthene
Chrysene
Dibenzo (ah) Anthracene
Fluoranthene
Fluorene
Indeno (123-cd) Pyrene
Phenanthrene
Pyrene

Acid Herbicides (P,G,S)
Range 0.01 - 0.2 µg/l
2,4,5-T H
2,4-D H
2,4-DB H
MCPA H
Picloram H

Organophosphorus Pesticides(P,G,S)
Range 0.01 - 0.2 µg/l
Famphur OP
Methyl Parathion OP
Parathion OP
Thionazin OP

Organochlorine Pesticides (P,G,S)
Range 0.01 - 0.2 µg/l
Aldrin
BHC Alpha isomer OC
BHC Beta isomer OC
BHC Delta isomer OC
Dieldrin OC
Endosulphan Alpha isomer OC
Endosulphan Beta isomer OC
Endosulphan Sulphate OC
Endrin OC
Heptachlor Epoxide OC
Heptachlor OC
Lindane OC
P,P' DDE OC
P,P'-DDD OC
P,P'-DDT OC

Notes

ENVIRONMENTAL LABORATORY SERVICES
Acorn Business Campus,
Mahon Industrial Park,
Blackrock,
CorkTel: 021-4536141
Fax: 021-4536149

Analysis Report

Attention:		**Report No:**	16622
Kieran Coffey			
Cork County Council (Iniscarra Environmental Directorate)		**Date of receipt:**	29/03/2010
Inniscarra		**Date Started:**	29/03/2010
Co Cork			
Fax No:		**Issue Date:**	23/04/2010
Tel No:	021-4532751 / 086 3827197	**Page**	1 **of** 3
PO Number:		**Delivery Mode**	Hand
Sample Type	Sludge	**No. of Samples**	3
Condition on receipt	Satisfactory	**Client Ref:**	Below

QN2046 CorkCC -Sludge Full Suite

SIGNED **(23/04/2010)**

Technical Manager (or Deputy)
Brendan Murray

Limit Values for Waste Acceptable at Landfills for Inert Waste (L/S=10 L/Kg)

		LEACHATE TESTS																	SLUDGE TESTS						
Method		AQ2		ICPMS											IC	Spec	Gravimetric	Analyser	Gravimetric	Sub-Contract		GC-FID	GCMS	GCMS	SubCon
Method Number		EW015	EW015	EM130											EW137	EW007	EW046	EW123	EM113	Sub-Contract		EO062	EO025	EO129	SubCon
Parameter		Chloride	SO4	As	Ba	Cd	Total Cr	Hg	Mo	Ni	Pb	Sb	Se	Zn	Cu	Fluoride	Total Phenols	TDS	DOC (Dissolved Organic Carbon)	Solids Content	Loss on ignition	Total Organic Carbon (LOI/1.8	Mineral Oil	BTEX	PAH	PCB
Units		mg/kg	mg/kg	mg/kg											mg/kg	mg/kg	mg/kg	mg/kg	Pg9	Pg9	Pg9	Pg9	Pg9	Pg9	Pg9
Limit of Detection		26	10.0	0.02	0.1	0.01	0.1	0.002	0.1	0.05	0.03	0.01	0.02	0.1	0.3	1	0.05	10	2.5							
Allowable Limit (mg/kg dry substance)		800	1000	0.5	20.0	0.04	0.5	0.01	0.5	0.4	0.5	0.06	0.1	4.0	2.0	10	1	4000	500	Pg9	Pg9	Pg9	Pg9	Pg9	Pg9	Pg9
Date Testing Initiated				06/04												31/03	15/04	08/04	02/04	02/04						
ELS Ref	**Client Ref**																									
16622-1	TPX	<26	204	<0.02	4.2	<0.01	<0.1	<0.002	0.1	<0.05	0.05	0.05	<0.02	1.6	<0.3	5.80	<0.05	772	24.72	Pg3	Pg3	Pg3	Pg3	Pg3	Pg3	Pg3
16622-2	TPV	620	935	<0.02	3.4	<0.01	<0.1	<0.002	0.4	<0.05	<0.03	0.04	<0.02	1.9	<0.3	<1	<0.05	3862	50.47	Pg3	Pg3	Pg3	Pg3	Pg3	Pg3	Pg3
16622-3	TP 2	298	657	<0.02	3.0	<0.01	<0.1	<0.002	0.3	<0.05	<0.03	0.06	<0.02	1.3	<0.3	1.28	<0.05	2472	37.08	Pg3	Pg3	Pg3	Pg3	Pg3	Pg3	Pg3

NOTES

1 Sub-contract analysis denoted by *

2 ND = Concentration was below the limit of detection

3 All results presented as dry weight

Limit Values for Waste Acceptable at Landfills for Inert Waste (L/S=10 L/Kg)

			ELS Reference		16622-1	16622-2	16622-3
			Customer Reference	Allowable Limit	TPX	TPV	TP2
Method	**Parameter**	**Units**	**LOD**		**Results**	**Results**	**Results**
Sub-Contract	Organic Matter (LOI)	%	0	-	3.4	8.4	10
Calculated	Total Organic Carbon (LOI / 1.8)	mg/kg	0	30,000	18889	46667	55556
Gravimetric	Moisture Content	%	0	-	75	67	73
GCMS (BTEX)	Benzene	mg/kg	0.1	-	<0.1	<0.1	Note 2
	Toluene	mg/kg	0.1	-	<0.1	<0.1	Note 2
	Ethyl Benzene	mg/kg	0.1	-	<0.1	<0.1	Note 2
	Xylenes	mg/kg	0.1	-	<0.1	<0.1	Note 2
	Total BTEX	mg/kg	0.1	6	<0.1	<0.1	Note 2
GC-FID	Mineral Oil C10-C40	mg/kg	0.1	500	<10	<10	Note 2
GCMS (PAH)	Acenaphthene	mg/kg	0.1	-	<0.1	<0.1	Note 2
	Acenaphthylene	mg/kg	0.1		<0.1	<0.1	Note 2
	Anthracene	mg/kg	0.1		<0.1	<0.1	Note 2
	Benzo (a) Pyrene	mg/kg	0.1		<0.1	<0.1	Note 2
	Benzo(a)anthracene	mg/kg	0.1		<0.1	<0.1	Note 2
	Benzo(b)fluoranthene	mg/kg	0.1		<0.1	<0.1	Note 2
	Benzo(g,h,i)perylene	mg/kg	0.1		<0.1	<0.1	Note 2
	Benzo(k)fluoranthene	mg/kg	0.1		<0.1	<0.1	Note 2
	Chrysene	mg/kg	0.1		<0.1	<0.1	Note 2
	Dibenzo(a,h)anthracene	mg/kg	0.1		<0.1	<0.1	Note 2
	Fluoranthene	mg/kg	0.1		<0.1	<0.1	Note 2
	Fluorene	mg/kg	0.1		<0.1	<0.1	Note 2
	Indeno(1,2,3-cd)pyrene	mg/kg	0.1		<0.1	<0.1	Note 2
	Naphthalene	mg/kg	0.1		<0.1	<0.1	Note 2
	Phenanthrene	mg/kg	0.1		<0.1	<0.1	Note 2
	Pyrene	mg/kg	0.1		<0.1	<0.1	Note 2
	TOTAL PAH	mg/kg	0.1		<0.1	<0.1	Note 2
GCMS (PCB)	PCB-28	mg/kg	0.001		<0.001	0.0024	0.0076
	PCB-52	mg/kg	0.001		<0.001	0.0016	0.0049
	PCB-101	mg/kg	0.001		<0.001	<0.001	0.0020
	PCB-118	mg/kg	0.001		<0.001	<0.001	0.0012
	PCB-138	mg/kg	0.001		0.0013	<0.001	<0.001
	PCB-153	mg/kg	0.001		0.0013	<0.001	0.0024
	PCB-180	mg/kg	0.001		0.0014	<0.001	<0.001
	Total PCB's	mg/kg	0.001	1	0.004	0.004	0.0181

NOTES
1. All results presented as dry weight
2. Not enough sample to perform test

ENVIRONMENTAL
LABORATORY SERVICES
Acorn Business Campus,
Mahon Industrial Park,
Blackrock,
CorkTel: 021-4536141
Fax: 021-4536149

Analysis Report

Attention:		**Report No:**	16619
Kieran Coffey			
Cork County Council (Iniscarra Environmental Directorate)		**Date of receipt:**	24/03/2010
Inniscarra		**Date Started:**	24/03/2010
Co Cork			
Fax No:		**Issue Date:**	21/04/2010
Tel No:	021-4532751 / 086 3827197	**Page**	1 **of** 4
PO Number:		**Delivery Mode**	Hand
Sample Type	Waste Water	**No. of Samples**	1
Condition on receipt	Satisfactory	**Client Ref:**	Below

QN2046 CorkCC -GW Leachate Full Suite

SIGNED **(21/04/2010)**

Technical Manager (or Deputy)
Brendan Murray

Table D2 Trace Organic Substances (Groundwater and leachate)

Method		AQ2							ICPMS																Titralab		IC	HACH	TOC	5-Day	GCMS			P&T GCMS	GCMS	Sub-Contract			
Method Number		EW00	EW0	EW03	EW034	EW051	EW007	EW01	EM130																EW139	EW13	EW137	EW094	EW123	EW00	EO129			EO025	EO141				
Parameter		Ammonia	Chloride	Nitrite	Nitrate	TON	Ortho-Phosphate (MRP)	SO4	As	Cd	Total Cr	Fe	Hg	Mn	Ni	Pb	Sb	Zn	B	Ca	Cu	K	Mg	Na	Cond	pH	Fluoride	COD	TOC	BOD	PAH	Triazines	Phenols	VOC's	TBT	Cyanide -Total (Non DW)	Organochlorine Pesticides	Organophosphorus Pesticides	Herbicides
Units		mg/l N	mg/l	mg/l N	mg/l N	mg/l N	mg/l P	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	us/cm	pH Units	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l		ug/l	ug/l	ug/l	ug/l	ug/l
Limit of Detection		0.007	2.6	0.013	0.12	0.138	0.009	1.0	0.2	0.1	1.0	5.0	0.02	1.0	0.5	0.3	0.1	1.0	0.02	1.0	0.003	0.2	0.3	0.5	25-1999	0.3	0.1	8	0.25	1	Pg3	Pg3	Pg3	Pg4	0.02	10.0	Pg3	Pg3	Pg3
Date Testing Initiated		30/03	26/03						29/03																24/03		31/03	25/03	25/03	25/03	25/03	25/03	25/03	25/03	25/03	26/03	25/03	25/03	25/03
ELS Ref	Client Ref																																						
16619-1	TP6	0.928	27.7	0.013	2.24	2.25	0.024	18.1	14.1	7.6	105.6	40100	0.11	3172.0	45.9	552.6	6.1	1048.0	0.21	200.9	183.7	16.0	24.8	16.0	807	7.3	<0.1	81	3.2	8	Pg3	Pg3	Pg3	Pg4	<0.02	<10	Pg3	Pg3	Pg3

NOTES
1 Sub-contract analysis denoted by *
2 ND = Concentration was below the limit of detection

TABLE D2 TRACE ORGANIC SUBSTANCES GROUNDWATER AND LEACHATE ONLY

Pesticides , PAH , Phenols & VOC

Chlorinated Pesticides, PCB	LOD (ug/l)	16619-1
Aldrin	0.003	<0.006
Lindane	0.001	<0.002
Dieldrin	0.003	<0.006
Beta Endosulfan	0.003	<0.006
Trifluralin	0.005	<0.010
Hexachlorobenzene	0.001	<0.002
Organophosphorus Pesticides		
Dichloryos	0.001	<0.002
Acid Herbicides		
Bromoxynil	0.05	<0.05
Mecoprop	0.05	<0.04
Dichloroprop	0.04	<0.05
Triazines		
Atrazine	0.01	<0.01
Simazine	0.01	<0.01
PAH Compounds	-	
Benzo (a) Pyrene	0.01	<0.01
Benzo(b)fluoranthene	0.01	<0.01
Benzo(g,h,i)perylene	0.01	<0.01
Benzo(k)fluoranthene	0.01	<0.01
Indeno(1,2,3-cd)pyrene	0.01	<0.01
Naphthalene	0.01	<0.01
Phenols	0.5	
2 Chlorophenol	0.5	<0.5
2 4 6 Trichlorophenol	0.5	<0.5
Pentachlorophenol	0.5	<0.5
VOC's		
Tetrachloroethylene	0.1	ND
Trichloroethylene	0.1	ND
12 Dichloroethane	0.1	ND
12 Dichlorobenzene	0.5	ND
Toluene	0.5	ND
m & p Xylene	0.5	ND
o Xylene	0.5	ND
Hexachlorobutadiene	0.5	ND
124 Trichlorobenzene	0.5	ND
123 Trichlorobenzene	0.5	ND
Chlorobenzene	0.5	ND
Benzene	0.1	ND
Methylene Chloride/DCM	5.0	ND

1. ND = Concentration was below the limit of detection

Appendix A

Volatile Organic Carbons (GROUNDWATER AND LEACHATE ONLY)

No.	Analyte	LOD	16619-1
		ug/l	TP6
2	Dichlorodifluoromethane	10.0	N.D
3	Chloromethane	0.5	N.D
4	Ethyl Chloride/Chloroethane	0.5	N.D
5	Vinyl Chloride/Chloroethen	0.5	N.D
6	Bromomethane	0.5	N.D
8	Trichloromonofluoromethane	0.5	N.D
9	Ethyl Ether/Diethyl Ether	0.5	N.D
10	11 Dichloroethene	0.5	N.D
11	Acetone	2.0	N.D
12	Iodomethane/Methyl Iodide	0.5	N.D
13	Carbon Disulphide	0.5	N.D
14	Allyl Chloride	0.5	N.D
15	Methylene Chloride/DCM	5.0	N.D
16	2-Propenenitrile/Acrylonitrile	2.0	N.D
17	Chlormethyl Cyanide/Chloroacetonitril	0.5	N.D
18	Nitrobenzene	0.5	N.D
19	Propanenitrile	10.0	N.D
20	Hexachlorobutadiene	0.5	N.D
21	Trans-1,2 Dichloroethene	0.5	N.D
22	MtBE	0.5	N.D
23	11 Dichloroethane	0.5	N.D
24	22 Dichloropropane	0.5	N.D
25	cis-12 Dichloroethene	0.5	N.D
26	2-Butanone	5.0	N.D
27	Methyl Acrylate	5.0	N.D
28	Bromochloromethane	0.5	N.D
29	Methacrylonitrile	5.0	N.D
30	Tetrahydrofuran	5.0	N.D
31	Trichloromethane/ Chloroform'	1.0	N.D
32	111 Trichloroethane	0.5	N.D
33	1-Chlorobutane	0.5	N.D
34	Carbon Tetrachloride	0.5	N.D
35	11 Dichloropropene	0.5	N.D
36	Benzene	0.1	N.D
37	12 Dichloroethane	0.1	N.D
39	Trichloroethylene/ Trichloroethen	0.1	N.D
40	12 Dichloropropane	0.5	N.D
41	Dibromomethane	0.5	N.D
42	Methyl Methacrylate	0.5	N.D
43	Bromodichloromethane	2.0	N.D
44	13 Dichloropropene,cis	2.0	N.D
45	MIBK/4 Methyl 2 Pentanon	2.0	N.D
46	Toluene	0.5	N.D
47	13 Dichloropropene,trans	2.0	N.D
48	Ethyl Methacrylate	2.0	N.D
49	112 Trichloroethane	0.5	N.D
50	Tetrachloroethylene/ Tetrachloroethen	0.1	N.D
51	13 Dichloropropane	0.5	N.D
52	2-Hexanone	1.0	N.D
53	Dibromochloromethane	1.0	N.D
54	12 Dibromoethane	0.5	N.D
55	Chlorobenzene	0.5	N.D
56	1112 Tetrachloroethane	2.0	N.D
57	Ethyl Benzene	0.5	N.D
58	m & p Xylene	0.5	N.D
59	o Xylene	0.5	N.D
60	Styrene	2.0	N.D
61	Bromoform	1.0	N.D
62	Isopropyl Benzene	0.5	N.D
63	Bromobenzene	0.5	N.D
64	1122 Tetrachloroethane	0.5	N.D
65	123 Trichloropropane	2.0	N.D
66	Trans 14 Dichloro 2 Butene, trar	2.0	N.D
67	Propyl Benzene	0.5	N.D
68	2-Chlorotoluene	0.5	N.D
69	4 Chlorotoluene	0.5	N.D
70	135 Trimethylbenzene	0.5	N.D
71	Tert Butyl Benzene	0.5	N.D
72	124 Trimethylbenzene	0.5	N.D
73	Sec Butyl Benzene	0.5	N.D
74	13 Dichlorobenzene	0.5	N.D
75	P Isopropyltoluene	0.5	N.D
76	14 Dichlorobenzene	0.5	N.D
77	12 Dichlorobenzene	0.5	N.D
78	N Butyl Benzene	0.5	N.D
79	Hexachloroethane	5.0	N.D
80	12 Dibromo 3 Chloropropane	2.0	N.D
81	124 Trichlorobenzene	0.5	N.D
82	Napththalene	2.0	N.D
83	123 Trichlorobenzene	0.50	N.D

NOTES

1. ND=Concentration was below the limit of detection

ELS LTD INAB ACCREDITATION SCHEDULE SUMMARY SHEET

Miscellaneous (P,G,W,S)
Ammonia/Ammonium 0.007-1mg/l N EW003
Chloride 2.6-250 mg/l EW015
Flouride 0.1 - 2 mg/l EW137
COD 8-1500 mg/l EW094
Nitrate 0.12-50 mg/l N EW034
Nitrite 0.013-1 mg/l N EW035
pH 4 – 10 pH Units EW138
Phosphate 0.009-1 mg/l P EW007
Alkalinity 10-1000mg/l EW062
TOC 0.25-100mg/l EW123
BOD 1-1300mg/l EW001
Total Nitrogen 1-100mg/l N EW140
Total Phosphorous 0.01-40 mg/l P EW143

Miscellaneous (P,G,S)
Bromate 1 to 50ug/l BRO3 (EW137)
Colour 2.5-50mg/l PtCCo (EW021)
Conductivity 25-6000 us/cm EW139
Dissolved Oxygen 1 to 10 mg/l (EW043)
Sulphate 1-250mg/l SO4(EW016)
Suspended Solids 5-1000mg/l (EW013)
Total Dissolved Solids 1-1000mg/l (EW046)
Total Hardness 3-330mg/l CaCO3 (EM099)
Total Oxidised Nitrogen 0.138-51mg/l N (EW051)

Metals EM130 (P,G,S)
Aluminium 5.0 – 500 µg/l
Antimony 0.1 – 10µg/l
Arsenic 0.2 - 20µg/l
Barium 1.0 - 100µg/l
Boron 0.02 – 2mg/l
Cadmium 0.1 – 10µg/l
Calcium 1.0 – 100mg/l
Chromium 1.0 - 100µg/l
Cobalt 1.0 - 100µg/l
Copper 3 - 4000µg/l
Iron 5.0 - 500µg/l
Lead 0.3 - 30µg/l
Magnesium 0.3 – 20mg/l
Manganese 1.0 - 100µg/l
Mercury 0.02 - 2µg/l
Molybdenum 1.0 - 100µg/l
Nickel 0.5 - 50µg/l
Potassium 0.2 – 20mg/l
Selenium 0.2 - 20µg/l
Sodium 0.5 – 50mg/l
Strontium 1.0 - 100µg/l
Tin 1.0 - 100µg/l
Vanadium 1.0 - 100µg/l
Zinc 1.0 - 100µg/l

SI439 Potable Water VOCs & THM
EO025 (P,G,S)
Benzene 0.1-35 µg/l
1.2-Dichloroethane 0.1-35 µg/l
Tetrachloroethene 0.1-35 µg/l
Trichloroethene 0.1-35 µg/l
Chloroform 1.0-150 µg/l
Bromoform 1.0-35 µg/l
Dibromochloromethane 1.0-35 µg/l
Bromodichloromethane 2.0-35 µg/l

Other VOC's EO025 (P,G,S)
Bromomethane 0.5 - 35 µg/l
Ethyl Ether/Diethyl Ether0.5 - 35 µg/l
11 Dichloroethene0.5 - 35 µg/l
Iodomethane/Mehyl Iodide 0.5 - 35 µg/l
Carbon Disulphide 0.5 - 35 µg/l
Allyl Chloride0.5 - 35 µg/l
Methylene Chloride/DCM 5.0 - 35 µg/l
2-Propenenitrile/Acrylonitrile 2.0 - 35 µg/l
Chlormethyl Cyanide 0.5 - 35 µg/l
Hexachlorobutadiene0.5 - 35 µg/l
Trans-1,2 Dichloroethene0.5 - 35 µg/l
MtBE0.5 - 35 µg/l
11 Dichloroethane0.5 - 35 µg/l
22 Dichloropropane0.5 - 35 µg/l
Cis-12 Dichloroethene0.5 - 35 µg/l
Methyl Acrylate5.0 - 35 µg/l
Bromochloromethane0.5 - 35 µg/l
Tetrahydrofuran5.0 - 35 µg/l
111 Trichloroethane0.5 - 35 µg/l
1-Chlorobutane0.5 - 35 µg/l
Carbon Tetrachloride0.5 - 35 µg/l
11 Dichloropropene0.5 - 35 µg/l
12 Dichloropropane0.5 - 35 µg/l
Dibromomethane0.5 - 35 µg/l
Methyl Methacrylate0.5 - 35 µg/l
13 Dichloropropene, cis2.0 - 35 µg/l
MIBK/4 Methyl 2 Pentanone 2.0 - 35 µg/l
Toluene0.5 - 35 µg/l
13 Dichloropropene,trans2.0 - 35 µg/l
Ethyl Methacrylate2.0 - 35 µg/l
112 Trichloroethane0.5 - 35 µg/l
13 Dichloropropane0.5 - 35 µg/l
2 Hexanone1.0 - 35 µg/l
12 Dibromoethane0.5 - 35 µg/l
Chlorobenzene0.5 - 35 µg/l
1112 Tetrachloroethane2.0 - 35 µg/l
Ethyl Benzene0.5 - 35 µg/l
m & p Xylene0.5 - 35 µg/l
O Xylene0.5 - 35 µg/l
Stryene2.0 - 35 µg/l
Isopropyl Benzene0.5 - 35 µg/l
Bromobenzene0.5 - 35 µg/l
1122 Tetrachloroethane0.5 - 35 µg/l
123 Trichloropropane2.0 - 35 µg/l
Propyl Benzene0.5 - 35 µg/l
2-Chlorotoluene0.5 - 35 µg/l
4 Chlorotoluene0.5 - 35 µg/l
135 Trimenthylbenzene0.5 - 35 µg/l
Tert Butyl Benzene0.5 - 35 µg/l
124 Trimethlbenzene0.5 - 35 µg/l
Sec Butyl Benzene0.5 - 35 µg/l
13 Dichlorobenzene0.5 - 35 µg/l
P Isopropyltoluene0.5 - 35 µg/l
14 Dichlorobenzene0.5 - 35 µg/l
12 Dichlorobenzene0.5 - 35 µg/l
N Butyl Benzene0.5 - 35 µg/l
Hexachloroethane5.0 - 35 µg/l
12 Dibromo 3Chloropropane 2.0 - 35 µg/l
124 Trichlorobenzene0.5 - 35 µg/l
123 Trichlorobenzene0.5 - 35 µg/l

PAH EO129 (P,G,S)
Range 0.01 - 0.2 µg/l
Acenaphthene
Benzo (a) Anthracene
Benzo (a) Pyrene
Benzo (b) Fluoranthene
Benzo (ghi) Perylene
Benzo (k) Fluoranthene
Chrysene
Dibenzo (ah) Anthracene
Fluoranthene
Fluorene
Indeno (123-cd) Pyrene
Phenanthrene
Pyrene

Acid Herbicides (P,G,S)
Range 0.01 - 0.2 µg/l
2,4,5-T H
2,4-D H
2,4-DB H
MCPA H
Picloram H

Organophosphorus Pesticides(P,G,S)
Range 0.01 - 0.2 µg/l
Famphur OP
Methyl Parathion OP
Parathion OP
Thionazin OP

Organochlorine Pesticides (P,G,S)
Range 0.01 - 0.2 µg/l
Aldrin
BHC Alpha isomer OC
BHC Beta isomer OC
BHC Delta isomer OC
Dieldrin OC
Endosulphan Alpha isomer OC
Endosulphan Beta isomer OC
Endosulphan Sulphate OC
Endrin OC
Heptachlor Epoxide OC
Heptachlor OC
Lindane OC
P,P' DDE OC
P,P'-DDD OC
P,P'-DDT OC

Notes

ENVIRONMENTAL
LABORATORY SERVICES
Acorn Business Campus,
Mahon Industrial Park,
Blackrock,
CorkTel: 021-4536141
Fax: 021-4536149

Analysis Report

Attention:		**Report No:**	16621
Kieran Coffey			
Cork County Council (Iniscarra Environmental Directorate)		**Date of receipt:**	24/03/2010
Inniscarra		**Date Started:**	24/03/2010
Co Cork			
Fax No:		**Issue Date:**	01/04/2010
Tel No:	021-4532751 / 086 3827197	**Page**	1 **of** 2
PO Number:		**Delivery Mode**	Hand
Sample Type	Groundwater	**No. of Samples**	2
Condition on receipt	Satisfactory	**Client Ref:**	Below

QN2046 CorkCC - Minor Suite

SIGNED **(01/04/2010)**

Technical Manager (or Deputy)
Brendan Murray

MINOR SUITE INDICATOR PARAMETERS

Method		AQ2	AQ2	AQ2	ICPMS	ICPMS	Titralab		5-Day
Method Number		EW003	EW015	EW015	EM130	EM130	EW139	EW138	EW001
Parameter		Ammonia	Cl	SO4	K	Na	Cond	pH	BOD
Units		mg/l N	mg/l	mg/l	mg/l	mg/l	us/cm	pH Units	mg/l
Limit of Detection		0.007	2.6	1.0	0.2	0.5	25-1999	0.3	1
Date Testing Initiated		29/03	31/03		26/03		24/03		25/03
ELS Ref	Client Ref								
16621-1	TP 9	8.50	33.6	24.7	83.7	45.3	954	7.3	164
16621-2	TP 10	0.010	33.5	<10.0 Note 3	6.6	14.6	735	7.2	<2

NOTES

1 Sub-contract analysis denoted by *

2 ND = Concentration was below the limit of detection

3 LOD raised,due to potential sample interference(sample contained a high level of solids)

ELS LTD INAB ACCREDITATION SCHEDULE SUMMARY SHEET

Miscellaneous (P,G,W,S)
Ammonia/Ammonium 0.007-1mg/l N EW003
Chloride 2.6-250 mg/l EW015
Flouride 0.1 - 2 mg/l EW137
COD 8-1500 mg/l EW094
Nitrate 0.12-50 mg/l N EW034
Nitrite 0.013-1 mg/l N EW035
pH 4 – 10 pH Units EW138
Phosphate 0.009-1 mg/l P EW007
Alkalinity 10-1000mg/l EW062
TOC 0.25-100mg/l EW123
BOD 1-1300mg/l EW001
Total Nitrogen 1-100mg/l N EW140
Total Phosphorous 0.01-40 mg/l P EW143

Miscellaneous (P,G,S)
Bromate 1 to 50ug/l BRO3 (EW137)
Colour 2.5-50mg/l PtCCo (EW021)
Conductivity 25-6000 us/cm EW139
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Sulphate 1-250mg/l SO4(EW016)
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Total Hardness 3-330mg/l CaCO3 (EM099)
Total Oxidised Nitrogen 0.138-51mg/l N (EW051)

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Barium 1.0 - 100µg/l
Boron 0.02 – 2mg/l
Cadmium 0.1 – 10µg/l
Calcium 1.0 – 100mg/l
Chromium 1.0 - 100µg/l
Cobalt 1.0 - 100µg/l
Copper 3 - 4000µg/l
Iron 5.0 - 500µg/l
Lead 0.3 - 30µg/l
Magnesium 0.3 – 20mg/l
Manganese 1.0 - 100µg/l
Mercury 0.02 - 2µg/l
Molybdenum 1.0 - 100µg/l
Nickel 0.5 - 50µg/l
Potassium 0.2 – 20mg/l
Selenium 0.2 - 20µg/l
Sodium 0.5 – 50mg/l
Strontium 1.0 - 100µg/l
Tin 1.0 - 100µg/l
Vanadium 1.0 - 100µg/l
Zinc 1.0 - 100µg/l

SI439 Potable Water VOCs & THM
EO025 (P,G,S)
Benzene 0.1-35 µg/l
1.2-Dichloroethane 0.1-35 µg/l
Tetrachloroethene 0.1-35 µg/l
Trichloroethene 0.1-35 µg/l
Chloroform 1.0-150 µg/l
Bromoform 1.0-35 µg/l
Dibromochloromethane 1.0-35 µg/l
Bromodichloromethane 2.0-35 µg/l

Other VOC's EO025 (P,G,S)
Bromomethane 0.5 - 35 µg/l
Ethyl Ether/Diethyl Ether0.5 - 35 µg/l
11 Dichloroethene0.5 - 35 µg/l
Iodomethane/Mehyl Iodide 0.5 - 35 µg/l
Carbon Disulphide 0.5 - 35 µg/l
Allyl Chloride0.5 - 35 µg/l
Methylene Chloride/DCM 5.0 - 35 µg/l
2-Propenenitrile/Acrylonitrile 2.0 - 35 µg/l
Chlormethyl Cyanide 0.5 - 35 µg/l
Hexachlorobutadiene0.5 - 35 µg/l
Trans-1,2 Dichloroethene0.5 - 35 µg/l
MtBE0.5 - 35 µg/l
11 Dichloroethane0.5 - 35 µg/l
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Tetrahydrofuran5.0 - 35 µg/l
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12 Dichloropropane0.5 - 35 µg/l
Dibromomethane0.5 - 35 µg/l
Methyl Methacrylate0.5 - 35 µg/l
13 Dichloropropene, cis2.0 - 35 µg/l
MIBK/4 Methyl 2 Pentanone 2.0 - 35 µg/l
Toluene0.5 - 35 µg/l
13 Dichloropropene,trans2.0 - 35 µg/l
Ethyl Methacrylate2.0 - 35 µg/l
112 Trichloroethane0.5 - 35 µg/l
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2 Hexanone1.0 - 35 µg/l
12 Dibromoethane0.5 - 35 µg/l
Chlorobenzene0.5 - 35 µg/l
1112 Tetrachloroethane2.0 - 35 µg/l
Ethyl Benzene0.5 - 35 µg/l
m & p Xylene0.5 - 35 µg/l
O Xylene0.5 - 35 µg/l
Stryene2.0 - 35 µg/l
Isopropyl Benzene0.5 - 35 µg/l
Bromobenzene0.5 - 35 µg/l
1122 Tetrachloroethane0.5 - 35 µg/l
123 Trichloropropane2.0 - 35 µg/l
Propyl Benzene0.5 - 35 µg/l
2-Chlorotoluene0.5 - 35 µg/l
4 Chlorotoluene0.5 - 35 µg/l
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Tert Butyl Benzene0.5 - 35 µg/l
124 Trimethlbenzene0.5 - 35 µg/l
Sec Butyl Benzene0.5 - 35 µg/l
13 Dichlorobenzene0.5 - 35 µg/l
P Isopropyltoluene0.5 - 35 µg/l
14 Dichlorobenzene0.5 - 35 µg/l
12 Dichlorobenzene0.5 - 35 µg/l
N Butyl Benzene0.5 - 35 µg/l
Hexachloroethane5.0 - 35 µg/l
12 Dibromo 3Chloropropane 2.0 - 35 µg/l
124 Trichlorobenzene0.5 - 35 µg/l
123 Trichlorobenzene0.5 - 35 µg/l

PAH EO129 (P,G,S)
Range 0.01 - 0.2 µg/l
Acenaphthene
Benzo (a) Anthracene
Benzo (a) Pyrene
Benzo (b) Fluoranthene
Benzo (ghi) Perylene
Benzo (k) Fluoranthene
Chrysene
Dibenzo (ah) Anthracene
Fluoranthene
Fluorene
Indeno (123-cd) Pyrene
Phenanthrene
Pyrene

Acid Herbicides (P,G,S)
Range 0.01 - 0.2 µg/l
2,4,5-T H
2,4-D H
2,4-DB H
MCPA H
Picloram H

Organophosphorus Pesticides(P,G,S)
Range 0.01 - 0.2 µg/l
Famphur OP
Methyl Parathion OP
Parathion OP
Thionazin OP

Organochlorine Pesticides (P,G,S)
Range 0.01 - 0.2 µg/l
Aldrin
BHC Alpha isomer OC
BHC Beta isomer OC
BHC Delta isomer OC
Dieldrin OC
Endosulphan Alpha isomer OC
Endosulphan Beta isomer OC
Endosulphan Sulphate OC
Endrin OC
Heptachlor Epoxide OC
Heptachlor OC
Lindane OC
P,P' DDE OC
P,P'-DDD OC
P,P'-DDT OC

Notes

ENVIRONMENTAL
LABORATORY SERVICES
Acorn Business Campus,
Mahon Industrial Park,
Blackrock,
CorkTel: 021-4536141
Fax: 021-4536149

Analysis Report

Attention:		**Report No:**	16621
Kieran Coffey			
Cork County Council (Iniscarra Environmental Directorate)		**Date of receipt:**	24/03/2010
Inniscarra		**Date Started:**	24/03/2010
Co Cork			
Fax No:		**Issue Date:**	01/04/2010
Tel No:	021-4532751 / 086 3827197	**Page**	1 **of** 2
PO Number:		**Delivery Mode**	Hand
Sample Type	Groundwater	**No. of Samples**	2
Condition on receipt	Satisfactory	**Client Ref:**	Below

QN2046 CorkCC - Minor Suite

SIGNED **(01/04/2010)**

Technical Manager (or Deputy)
Brendan Murray