



APPLICATION

By

Donegal County Council

to

Environmental Protection Agency

for

Waste Licence Review

W0024-02

**Ballynacarrick Landfill Site,
Ballintra County Donegal**

ATTACHMENTS TO SECTION I

Existing Environment Impacts of the Facility

ATTACHMENTS TO SECTION I EXISTING ENVIRONMENT, IMPACTS AND MITIGATIONS

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Table I.2 (i) Surface Water Quality

Table I.4 (i) Groundwater Water Quality

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ATTACHMENTS TO SECTION I

The EIS undertaken in 2003 waste licence review has been included as a reference document for information purposes only. This review will not have affect on the general conditions of the existing waste licence.

Attachment I.1 Atmospheric Emissions

This review will have no affect on current atmospheric emissions from the site.

Attachment I.2 Surface Water

This review will have no affect on current emissions from site to surface water.

Attachment I.3 Sewer

Not Applicable

Attachment I.4 Geology & Hydrogeology

This review will have no affect on the current Geology & Hydrogeology of the area.

Attachment I.5 Groundwater and/or groundwater contamination

This review will have no affect on current emissions from site to groundwater.

Attachment I 6 Noise

This review will have no affect on current noise arising from site.

Attachment I 7 Ecology

This review will have no affect on the ecology of the surrounding area.

APPENDIX I

Table I.2 (i) Surface Water Quality

Table I.4 (i) Groundwater Water Quality

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Table I.2(i) SURFACE WATER QUALITY

(Sheet 1 of 2) Monitoring Point/ Grid Reference: SW1/(193476 367534)

Parameter	Results (mg/l)				Sampling method ² (grab, drift etc.)	Normal Analytical Range ²	Analysis method / technique
	15/02/07	Mar 07	April 07	May 07			
pH	7.57	7.46	nm	7.91			
Temperature	8.90	9.7	nm	13.6			
Electrical conductivity EC	265	220	nm	379			
Ammoniacal nitrogen NH ₄ -N	0.93	<0.01	nm	4.97			
Chemical oxygen demand		49	nm	nm			
Biochemical oxygen demand	4.76	6.12	nm	2.52			
Dissolved oxygen DO	10.88	11.37	nm	9.28			
Calcium Ca	nm	nm	nm	<0.4			
Cadmium Cd	nm	nm	nm	nm			
Chromium Cr	nm	nm	nm	<0.05			
Chloride Cl	nm	nm	nm	46			
Copper Cu	nm	nm	nm	< 1			
Iron Fe	nm	nm	nm	347			
Lead Pb	nm	nm	nm	< 1			
Magnesium Mg	nm	nm	nm	6516			
Manganese Mn	nm	nm	nm	4			
Mercury Hg	nm	nm	nm	<0.05			

Surface Water Quality (Sheet 2 of 2)

Parameter	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method / technique
	15/02/07	Mar 07	April 07	May 07			
Nickel Ni	nm	nm	nm	7			
Potassium K	nm	nm	nm	nm			
Sodium Na	nm	nm	nm	nm			
Sulphate SO ₄	nm	nm	nm	41			
Zinc Zn	nm	nm	nm	41			
Total alkalinity (as CaCO ₃)	nm	nm	nm	50			
Total organic carbon TOC	nm	nm	nm	nm			
Total oxidised nitrogen TON	0.08	<0.01	nm	0.11			
Nitrite NO ₂	<0.03	<0.03	nm	0.219			
Nitrate NO ₃	0.35	<0.04	nm	0.19			
Faecal coliforms (/100mls)	nm	nm	nm	nm			
Total coliforms (/100mls)	nm	nm	nm	nm			
Phosphate PO ₄	0.037	0.03	nm	0.03			

Table I.2(i) SURFACE WATER QUALITY

(Sheet 1 of 2) Monitoring Point/ Grid Reference: SW2/(193865 367564)

Parameter	Results (mg/l)				Sampling method ² (grab, drift etc.)	Normal Analytical Range ²	Analysis method / technique
	15/02/07	Mar 07	April 07	May 07			
pH	7.57	6.63	7	6.80			
Temperature	8.90	9.2	19	13.3			
Electrical conductivity EC	265	158	172	146			
Ammoniacal nitrogen NH ₄ -N	0.01	<0.01	<0.01	<0.01			
Chemical oxygen demand	nm	30	nm	nm			
Biochemical oxygen demand	1.37	1.51	1.3	1.12			
Dissolved oxygen DO	9.26	7.95	6.79	6.87			
Calcium Ca	nm	nm	nm	nm			
Cadmium Cd	nm	nm	nm	<0.4			
Chromium Cr	nm	nm	nm	<0.05			
Chloride Cl	nm	nm	nm	42			
Copper Cu	nm	nm	nm	<1			
Iron Fe	nm	nm	nm	345			
Lead Pb	nm	nm	nm	<1			
Magnesium Mg	nm	nm	nm	252			
Manganese Mn	nm	nm	nm	<1			
Mercury Hg	nm	nm	nm	<0.05			

Surface Water Quality (Sheet 2 of 2)

Parameter	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method / technique
	15/02/07	Mar 07	April 07	May 07			
Nickel Ni	nm	nm	nm	nm			
Potassium K	nm	nm	nm	0.2			
Sodium Na	nm	nm	nm				
Sulphate SO ₄	nm	nm	nm	<3			
Zinc Zn	nm	nm	nm	18			
Total alkalinity (as CaCO ₃)	nm	nm	nm	54			
Total organic carbon TOC	nm	nm	nm	nm			
Total oxidised nitrogen TON	0.07	<0.01	<0.01	<0.01			
Nitrite NO ₂	0.04	<0.03	<0.03	<0.03			
Nitrate NO ₃	0.26	<0.04	<0.04	<0.04			
Faecal coliforms (/100mls)	nm	nm	nm	nm			
Total coliforms (/100mls)	nm	nm	nm	nm			
Phosphate PO ₄	0.022	0.03	0.15	0.05			

Table I.2(i) SURFACE WATER QUALITY

(Sheet 1 of 2) Monitoring Point/ Grid Reference: SW3/(193276 367728)

Parameter	Results (mg/l)				Sampling method ² (grab, drift etc.)	Normal Analytical Range ²	Analysis method / technique
	15/02/07	Mar 07	April 07	May 07			
pH	7.61	7.63	8	7.71			
Temperature	9.30	9.9	12	13.7			
Electrical conductivity EC	405	474	810	559			
Ammoniacal nitrogen NH ₄ -N	1.78	2.5	13	3.42			
Chemical oxygen demand	nm	35	nm	nm			
Biochemical oxygen demand	1.6	1.45	3.5	4.48			
Dissolved oxygen DO	10.44	9.71	7.82	8.45			
Calcium Ca	nm	nm	nm				
Cadmium Cd	nm	nm	nm	<0.4			
Chromium Cr	nm	nm	nm	<0.05			
Chloride Cl	nm	nm	nm	48			
Copper Cu	nm	nm	nm	<1			
Iron Fe	nm	nm	nm	305			
Lead Pb	nm	nm	nm	<1			
Magnesium Mg	nm	nm	nm	8127			
Manganese Mn	nm	nm	nm	1			
Mercury Hg	nm	nm	nm	<0.05			

Surface Water Quality (Sheet 2 of 2)

Parameter	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method / technique
	15/02/07	Mar 07	April 07	May 07			
Nickel Ni	nm	nm	nm	nm			
Potassium K	nm	nm	nm	6			
Sodium Na	nm	nm	nm	nm			
Sulphate SO ₄	nm	nm	nm	39			
Zinc Zn	nm	nm	nm	19			
Total alkalinity (as CaCO ₃)	nm	nm	nm	200			
Total organic carbon TOC	nm	nm	nm	nm			
Total oxidised nitrogen TON	0.38	0.19	0.45	0.39			
Nitrite NO ₂	<0.03	<0.03	<0.03	<0.03			
Nitrate NO ₃	1.67	0.84	1.995	1.74			
Faecal coliforms (/100mls)	nm	nm	nm	nm			
Total coliforms (/100mls)	nm	nm	nm	nm			
Phosphate PO ₄	0.045	0.16	0.15	0.03			

Table I.2(i) SURFACE WATER QUALITY

(Sheet 1 of 2) Monitoring Point/ Grid Reference: SW4/(193213 367797)

Parameter	Results (mg/l)				Sampling method ² (grab, drift etc.)	Normal Analytical Range ²	Analysis method / technique
	15/02/07	Mar 07	April 07	May 07			
pH	7.54	7.76	7.88	7.94			
Temperature	10.00	10.2	15.3	12.2			
Electrical conductivity EC	386	452	760	516			
Ammoniacal nitrogen NH ₄ -N	1.52	2.3	11.2	2.83			
Chemical oxygen demand	nm	31	nm	nm			
Biochemical oxygen demand	2.69	1.58	0.7	3.95			
Dissolved oxygen DO	10.63	10.28	8.80	9.61			
Calcium Ca	nm	nm	nm	nm			
Cadmium Cd	nm	nm	nm	<0.4			
Chromium Cr	nm	nm	nm	<0.05			
Chloride Cl	nm	nm	nm	43			
Copper Cu	nm	nm	nm	<1			
Iron Fe	nm	nm	nm	302			
Lead Pb	nm	nm	nm	<1			
Magnesium Mg	nm	nm	nm	7578			
Manganese Mn	nm	nm	nm	1			
Mercury Hg	nm	nm	nm	<0.05			

Surface Water Quality (Sheet 2 of 2)

Parameter	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method / technique
	15/02/07	Mar 07	April 07	May 07			
Nickel Ni	nm	nm	nm	nm			
Potassium K	nm	nm	nm	5			
Sodium Na	nm	nm	nm	nm			
Sulphate SO ₄	nm	nm	nm	35			
Zinc Zn	nm	nm	nm	15			
Total alkalinity (as CaCO ₃)	nm	nm	nm	161			
Total organic carbon TOC	nm	nm	nm	nm			
Total oxidised nitrogen TON	0.10	0.28	0.6	0.56			
Nitrite NO ₂	<0.03	0.23	0.23	<0.03			
Nitrate NO ₃	0.44	0.93	2.34	2.49			
Faecal coliforms (/100mls)	nm	nm	nm	nm			
Total coliforms (/100mls)	nm	nm	nm	nm			
Phosphate PO ₄	0.037	0.03	0.15	0.05			

Table I.4(i) GROUNDWATER QUALITY

(Sheet 1 of 2) Monitoring Point/ Grid Reference: GW1

Parameter	Results (mg/l)				Sampling method (composite etc.)	Normal Analytical Range	Analysis method / technique
	24/01/07	15/02/07	Mar 07	May 07			
pH	6.96	6.91	6.95	7.01			
Temperature	11.10	10.30	9.9	10.8			
Electrical conductivity EC	551	542	525	515			
Ammoniacal nitrogen NH ₄ -N	1.18	1.1	0.8	1.29			
Dissolved oxygen DO	4.71	nm	3.85	3.27			
Residue on evaporation (180°C)	nm	nm	nm	nm			
Calcium Ca	nm	nm	nm	nm			
Cadmium Cd	nm	nm	nm	0.4			
Chromium Cr	nm	nm	nm	<0.05			
Chloride Cl	20	nm	nm	23			
Copper Cu	nm	nm	nm	<1			
Cyanide Cn, total	nm	nm	nm	<0.05			
Iron Fe	51	nm	nm	245			
Lead Pb	nm	nm	nm	<1			
Magnesium Mg	nm	nm	nm	4581			
Manganese Mn	nm	nm	nm	<1			
Mercury Hg	nm	nm	nm	<0.05			
Nickel Ni	nm	nm	nm	<1			
Potassium K	nm	nm	nm	4			
Sodium Na	nm	nm	nm	nm			

GROUNDWATER QUALITY (SHEET 2 OF 2)

Parameter	Results (mg/l)				Sampling method (composite, dipper etc.)	Normal Analytical Range	Analysis method / technique
	24/01/07	15/02/07	Mar 07	May 07			
Phosphate PO ₄	0.035	0.037	0.16	0.15			
Sulphate SO ₄	nm	nm		53			
Zinc Zn	nm	nm		14			
Total alkalinity (as CaCO ₃)	nm	nm		222			
Total organic carbon TOC	nm	nm		nm			
Total oxidised nitrogen TON	0.15	0.08	0.03	<0.01			
Arsenic As	nm	nm		nm			
Barium Ba	nm	nm		nm			
Boron B	nm	nm		nm			
Fluoride F	nm	nm		nm			
Phenol	nm	nm		<0.01			
Phosphorus P	nm	nm		nm			
Selenium Se	nm	nm		nm			
Silver Ag	nm	nm		nm			
Nitrite NO ₂	<0.03	<0.03	<0.03	<0.03			
Nitrate NO ₃	0.64	0.34	0.13	<0.04			
Faecal coliforms (/100mls)	nm	nm		nm			
Total coliforms (/100mls)	nm	nm		nm			
Water level (m OD)	nm	nm		nm			

Table I.4(i) GROUNDWATER QUALITY
(Sheet 1 of 2) Monitoring Point/ Grid Reference: GW2

Parameter	Results (mg/l)				Sampling method (composite etc.)	Normal Analytical Range	Analysis method / technique
	24/01/07	15/02/07	Mar 07	May 07			
pH	6.89	6.89	6.95	6.99			
Temperature	11.440	9.50	9.8	10.9			
Electrical conductivity EC	938	1024	902	901			
Ammoniacal nitrogen NH ₄ -N	2.58	23.13	16.1	17.17			
Dissolved oxygen DO	3.98	2.95	3.27	2.10			
Residue on evaporation (180°C)	nm	8.8	nm	nm			
Calcium Ca	nm	nm	nm	nm			
Cadmium Cd	nm	nm	nm	<0.4			
Chromium Cr	nm	nm	nm	<0.05			
Chloride Cl	63	nm	nm	47			
Copper Cu	nm	nm	nm	<1			
Cyanide Cn, total	nm	nm	nm	<0.05			
Iron Fe	225	nm	nm	110			
Lead Pb	nm	nm	nm	<1			
Magnesium Mg	nm	nm	nm	18260			
Manganese Mn	nm	nm	nm	540			
Mercury Hg	nm	nm	nm	<0.05			
Nickel Ni	nm	nm	nm	4			
Potassium K	nm	nm	nm	19			
Sodium Na	nm	nm	nm	nm			

GROUNDWATER QUALITY (SHEET 2 OF 2)

Parameter	Results (mg/l)				Sampling method (composite, dipper etc.)	Normal Analytical Range	Analysis method / technique
	24/01/07	15/02/07	Mar 07	May 07			
Phosphate PO ₄	0.028	0.058	0.16	0.03			
Sulphate SO ₄	nm	nm	nm	39			
Zinc Zn	nm	nm	nm	17			
Total alkalinity (as CaCO ₃)	nm	nm	nm	290			
Total organic carbon TOC	nm	nm	nm	nm			
Total oxidised nitrogen TON	0.06	0.08	<0.01	0.09			
Arsenic As	nm	nm	nm	nm			
Barium Ba	nm	nm	nm	nm			
Boron B	nm	nm	nm	nm			
Fluoride F	nm	nm	nm	nm			
Phenol	nm	nm	nm	<0.01			
Phosphorus P	nm	nm	nm	nm			
Selenium Se	nm	nm	nm	nm			
Silver Ag	nm	nm	nm	nm			
Nitrite NO ₂	0.06	<0.03	0.23	<0.03			
Nitrate NO ₃	0.18	0.34	<0.04	0.38			
Faecal coliforms (/100mls)	nm	nm	nm	nm			
Total coliforms (/100mls)	nm	nm	nm	nm			
Water level (m OD)	nm	nm	nm	nm			

Table I.4(i) GROUNDWATER QUALITY
(Sheet 1 of 2) Monitoring Point/ Grid Reference: GW4

Parameter	Results (mg/l)				Sampling method (composite etc.)	Normal Analytical Range	Analysis method / technique
	24/01/07	15/02/07	Mar 07	May 07			
pH	7.36	7.43	7.52	6.98			
Temperature	11.2	9.90	9.6	12.5			
Electrical conductivity EC	805	783	1016	1106			
Ammoniacal nitrogen NH ₄ -N	<0.01	<0.01	<0.01	0.005			
Dissolved oxygen DO	5.34	4.72	4.23	3.30			
Residue on evaporation (180°C)	Nm	Nm	Nm	Nm			
Calcium Ca	Nm	Nm	Nm	Nm			
Cadmium Cd	Nm	Nm	Nm	<0.4			
Chromium Cr	Nm	Nm	Nm	<0.05			
Chloride Cl	32.00	Nm	Nm	31			
Copper Cu	Nm	Nm	Nm	<1			
Cyanide Cn, total	Nm	Nm	Nm	<0.05			
Iron Fe	52	Nm	Nm	137			
Lead Pb	Nm	Nm	Nm	<1			
Magnesium Mg	Nm	Nm	Nm	21190			
Manganese Mn	Nm	Nm	Nm	<1			
Mercury Hg	Nm	Nm	Nm	<0.05			
Nickel Ni	Nm	Nm	Nm	7			
Potassium K	Nm	Nm	Nm	2.70			
Sodium Na	Nm	Nm	Nm	nm			

GROUNDWATER QUALITY (SHEET 2 OF 2)

Parameter	Results (mg/l)				Sampling method (composite, dipper etc.)	Normal Analytical Range	Analysis method / technique
	24/01/07	15/02/07	Mar 07	May 07			
Phosphate PO ₄	0.058	0.058	0.05	0.05			
Sulphate SO ₄	Nm	Nm	Nm	565			
Zinc Zn	Nm	Nm	Nm	17			
Total alkalinity (as CaCO ₃)	Nm	Nm	Nm	140			
Total organic carbon TOC	Nm	Nm	Nm	Nm			
Total oxidised nitrogen TON	0.08	0.09	<0.01	Nm			
Arsenic As	Nm	Nm	Nm	Nm			
Barium Ba	Nm	Nm	Nm	Nm			
Boron B	Nm	Nm	Nm	Nm			
Fluoride F	Nm	Nm	Nm	Nm			
Phenol	Nm	Nm	Nm	0.01			
Phosphorus P	Nm	Nm	Nm	Nm			
Selenium Se	Nm	Nm	Nm	Nm			
Silver Ag	Nm	Nm	Nm	Nm			
Nitrite NO ₂	<0.03	<0.03	<0.03	<0.03			
Nitrate NO ₃	0.35	0.41	<0.04	0.87			
Faecal coliforms (/100mls)	Nm	Nm	Nm	Nm			
Total coliforms (/100mls)	Nm	Nm	Nm	Nm			
Water level (m OD)	Nm	Nm	Nm	Nm			

Table I.4(i) GROUNDWATER QUALITY
(Sheet 1 of 2) Monitoring Point/ Grid Reference: GW5

Parameter	Results (mg/l)				Sampling method (composite etc.)	Normal Analytical Range	Analysis method / technique
	24/01/07	15/02/07	Mar 07	May 07			
pH	7.18	7.14	7.19	7.21			
Temperature	10.70	9.50	9.9	12.8			
Electrical conductivity EC	746	783	785	660			
Ammoniacal nitrogen NH ₄ -N	0.19	0.24	0.2	0.22			
Dissolved oxygen DO	3.22	3.52	3.13	3.33			
Residue on evaporation (180°C)	nm	nm	nm	nm			
Calcium Ca	nm	nm	nm	nm			
Cadmium Cd	nm	nm	nm	<0.4			
Chromium Cr	nm	nm	nm	<0.05			
Chloride Cl	63	nm	nm	43			
Copper Cu	nm	nm	nm	2			
Cyanide Cn, total	nm	nm	nm	<0.05			
Iron Fe	58	nm	nm	184			
Lead Pb	nm	nm	nm	<1			
Magnesium Mg	nm	nm	nm	38740			
Manganese Mn	nm	nm	nm	2			
Mercury Hg	nm	nm	nm	<0.05			
Nickel Ni	nm	nm	nm	2			
Potassium K	nm	nm	nm	3			
Sodium Na	nm	nm	nm	nm			

GROUNDWATER QUALITY (SHEET 2 OF 2)

Parameter	Results (mg/l)				Sampling method (composite, dipper etc.)	Normal Analytical Range	Analysis method / technique
	24/01/07	15/02/07	Mar 07	May 07			
Phosphate PO ₄	0.045	0.058	0.05	0.05			
Sulphate SO ₄	nm	nm	nm	14			
Zinc Zn	nm	nm	nm	15			
Total alkalinity (as CaCO ₃)	nm	nm	nm	300			
Total organic carbon TOC	nm	nm	nm				
Total oxidised nitrogen TON	0.08	0.06	<0.01	<0.01			
Arsenic As	nm	nm	nm	nm			
Barium Ba	nm	nm	nm	nm			
Boron B	nm	nm	nm	nm			
Fluoride F	nm	nm	nm	nm			
Phenol	nm	nm	nm	<0.01			
Phosphorus P	nm	nm	nm	nm			
Selenium Se	nm	nm	nm	nm			
Silver Ag	nm	nm	nm	nm			
Nitrite NO ₂	<0.03	<0.03	<0.03	<0.03			
Nitrate NO ₃	0.33	0.28	<0.04	<0.04			
Faecal coliforms (/100mls)	nm	nm	nm	nm			
Total coliforms (/100mls)	nm	nm	nm	nm			
Water level (m OD)	nm	nm	nm	nm			