



Annual Environmental Report 2010

MURPHY ENVIRONMENTAL GORMANSTON
(A DIVISION OF MURPHY CONCRETE MANUFACTURING LTD.)
EPA LICENCE W0151-01

AER Requirements: EPA Licence W0151-01

	Section
▪ Reporting Period	1.
▪ Waste activities carried out at the facility	2.
▪ Quantity and Composition of waste received, disposed of and recovered during the reporting period and each previous year	2.
▪ Types and Quantity of recovered materials sold to third parties (e.g. as aggregate material)	2.
▪ Calculated remaining capacity of the facility and year in which final capacity is expected to be reached	2.
▪ Methods of deposition of waste	2.
▪ Summary report on emissions	4.
▪ Summary of results and interpretation of environmental monitoring	4.
▪ Resource and energy consumption summary	4.
▪ Proposed development of the facility and timescale of such development	2.
▪ Volume of leachate produced and volume of leachate transported / discharged off-site	4.
▪ Report on development works undertaken during the reporting period, and a timescale for those proposed during the coming year	2.
▪ Report on restoration of completed cells / phases	2.
▪ Site survey showing existing levels of the facility at the end of the reporting period	4.
▪ Estimated annual and cumulative quantities of landfill gas emitted from the facility	4.
▪ Estimated annual and cumulative quantity of indirect emissions to groundwater	4.
▪ Annual water balance calculation and interpretation	4.
▪ Report on the progress towards achievement of the Environmental Objectives and Targets contained in previous year's report	3.
▪ Schedule of Environmental Objectives and Targets for the forthcoming year	3.
▪ Full title and a written summary of any procedures developed by the licensee in the year which relates to the facility operation	3.
▪ Tank, pipeline and bund testing and inspection report	4.
▪ Report on the performance and compatibility of the septic tank (and associated percolation area) with the Agency's Wastewater Treatment manual: "Treatment Systems for Single Houses"	N/A
▪ Reported incidents and Complaints summaries	5.
▪ Review of Nuisance Controls, including an assessment of dust and noise control measures	4.
▪ Reports on financial provision made under this licence, management and staffing structure of the facility, and a programme for public information	2.
▪ Report on training of staff	3.
▪ Any other items specified by the Agency	N/A

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A DIVISION OF MURPHY CONCRETE MANUFACTURING LTD.

1.

About the Gormanston Facility



EPA Licence

Murphy Environmental holds a Waste Licence (Number W0151-01) from the Environmental Protection Agency ('EPA', also referred to as 'the Agency') for restoration of the Gormanston site and recovery of inert Construction & Demolition (C&D) materials. The site is located just off the M1 motorway at Sarsfieldstown, Gormanston, Co. Meath.

Murphy Environmental

In 2003, Murphy Environmental was established as a trading division of Murphy Concrete Manufacturing (MCM) Ltd., to serve as the waste management division of the company, with responsibility for all aspects of the management and operation of the facility and compliance with the Waste Licence.

EPA Licence W0151-01

The Waste Licence for the Gormanston facility has the reference number W0151-01. W0151-01 (previously '151-1') was issued on the 5th June, 2003 for the operation of a facility for the recovery of inert C&D waste in an active sand and gravel pit so as to restore the site into the surrounding landscape.

A full copy of our EPA Waste Licence is available for inspection at our site office or can be downloaded from the EPA Website (www.epa.ie).

This Annual Environmental Report (AER) is for the calendar year 2010.

2. *Waste Acceptance 2010*

Background

Under the Waste Management Act (1996), waste activities can be classified as waste disposal or waste recovery, within which there are a number of classes of activity. The Waste Licence (Ref. W0151-01) lists the activities which Murphy Environmental is licensed to carry out at Gormanston:

Disposal

- Class 1: Deposit on, in or under land (including landfill)
- Class 13: Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced

Recovery

- Class 3: Recycling or reclamation of metals and metal compounds
- Class 4: Recycling or reclamation of other inorganic materials
- Class 13: Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced

Waste Types Accepted

Only inert waste is acceptable at Gormanston. Inert waste means waste that does not undergo any significant physical, chemical or biological transformations.

Inert waste will **not**:

- Dissolve, burn or physically or chemically react
- Biodegrade (decompose)
- Adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health.
- Generate a leachate (runoff) which could cause pollution or endanger the quality of surface water and/or groundwater.

The majority of the material accepted at Gormanston is comprised of soils and stones.

Waste Acceptance Procedures

We have agreed detailed Waste Acceptance Procedures with the EPA, to ensure only appropriate clean and inert wastes are accepted at the site.

Waste Collection Permits

All hauliers delivering waste to site must hold a valid Waste Collection Permit. Anyone collecting waste is required by law to hold a valid Waste Collection Permit. We maintain a detailed on-site register of Waste Collection Permits for all vehicles delivering waste to our facilities.

Weighbridge Software

Murphy Environmental operates specially-designed computer software to manage waste records.

Methods of Waste Deposition

Inert waste material is brought to the site in trucks from construction/ demolition or soil removal sites.

Material is deposited directly into the active restoration area, as directed by the weighbridge operator and banksman.

Waste Acceptance 2010

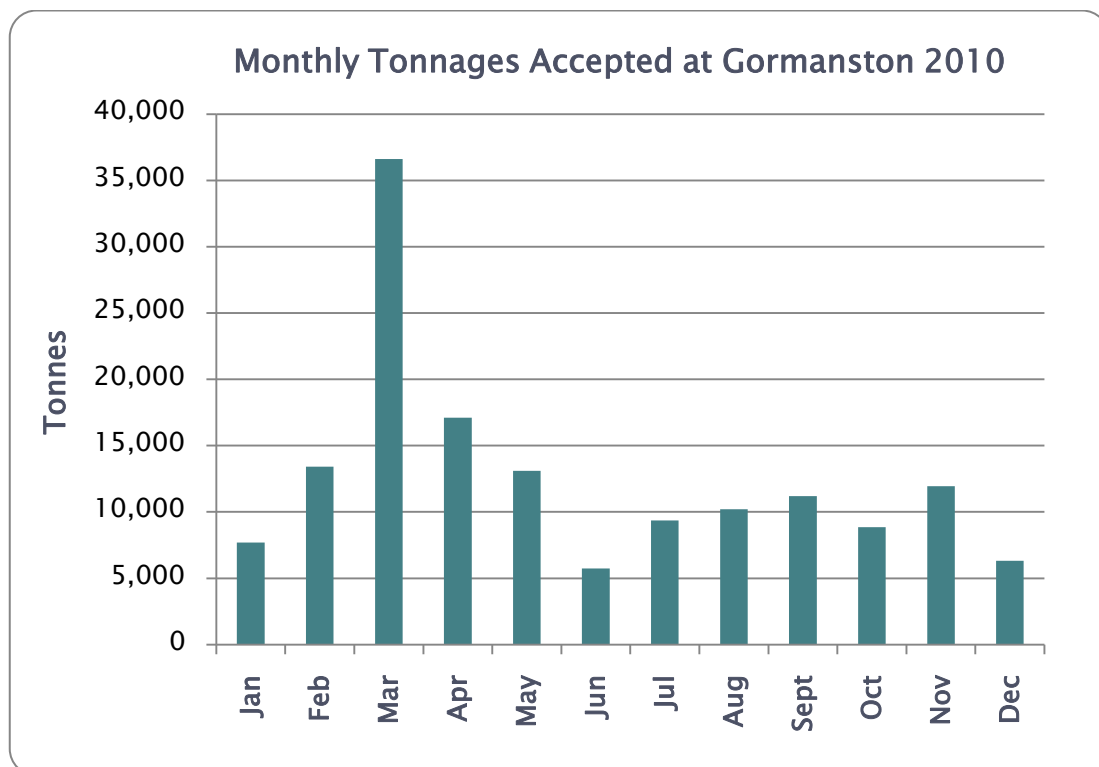
151,477 tonnes of inert waste was accepted at Gormanston in 2010. A summary of waste accepted, classified by EWC code, is presented in the table and chart below. It can be seen that *Soils & Stones* were the largest contributor to the waste accepted at the facility.

Materials accepted 2010

EWC Code	Description	Tonnage
17 01 01	Concrete	13,460
17 05 04	Soil & stones	138,016
TOTAL:		151,477

Waste Acceptance 2003–2010

Since the commencement of operations at the facility in 2003, a total of 3,356,975 tonnes of inert material has been accepted (as at year-end 2010).



Restoration of the Site

Restoration of Completed Phases

The Gormanston site is being restored on a phased basis system (Zones 1 to 8) as follows:

- **ZONE 1** has been used for the storage of pipes by Bord Gáis but this activity ceased at year-end 2007.
- **ZONES 2 to 4** are areas of historical waste deposition. These areas were capped and grassed during 2005. Zones 1 and 4 were subject to a gas pumping trial, which was reported on in 2006.
- **ZONE 5** is filled and is to be capped and grassed.
- **ZONE 6** is the current tipping area for incoming material.
- **ZONE 7** is the location of the Cemex batching plant (not in operation).
- **ZONE 8** has planning permission for the development of a C&D waste recovery area. There will also be capacity for filling.

Remaining Capacity; Proposed Development of the Facility & Timescale

The restoration and aftercare of the facility will be carried out in accordance with EPA requirements and relevant planning permissions. The rate of filling is related to the level of activity in the construction sector.

Site Development Works 2010

No significant site development works took place during 2010, other than ongoing restoration activities.

Financial Provision

Murphy Environmental has established a Liabilities and Restoration Fund for the site, in consultation and agreement with the Agency.

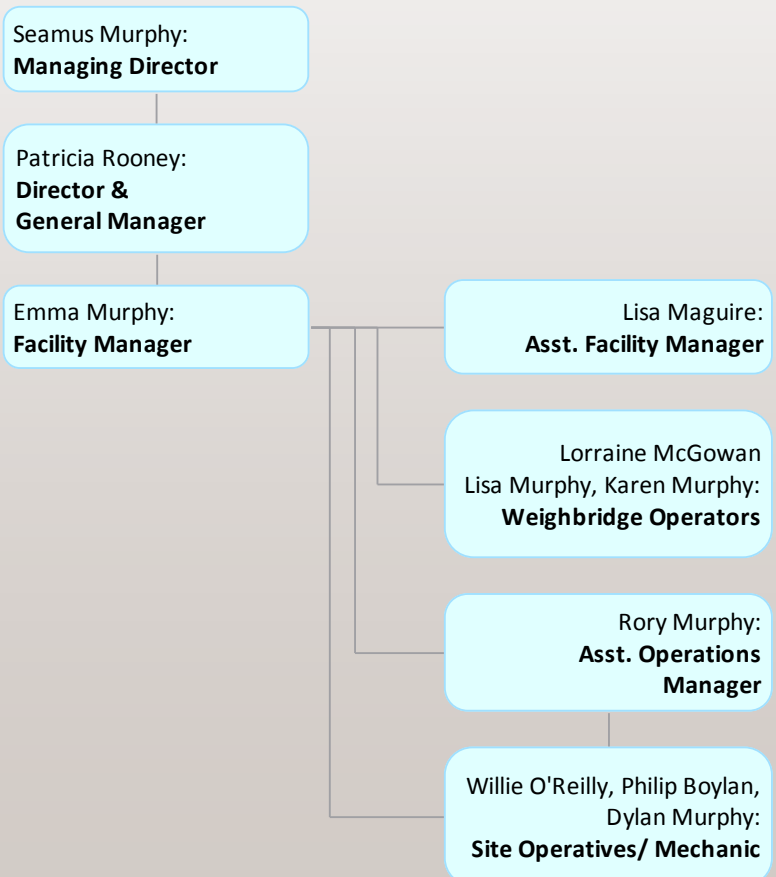
3. *Management Systems*

Management Team

Murphy Environmental has an appointed team for management of its operations. Patricia Rooney is the Director & General Manager of the company, and Seamus Murphy is the Managing Director.

In 2010, the Facility Manager at Gormanston was Emma Murphy and the Assistant Facility Manager was Lisa Maguire. They are supported by an office team, which has responsibility for operating the weighbridge and office and data management duties, and an operations team, who direct and control incoming vehicles in restoration areas.

The company is further supported by consultant teams.



Environmental Management System

The Gormanston site was the second privately-operated landfill in Ireland (Murphy Environmental Hollywood Ltd being the first) to achieve accreditation to ISO14001, the international standard for Environmental Management Systems, in 2005.

Procedures/EMS Documentation Developed, 2010

As the EMS is an advanced and well-established system at Murphy Environmental, no new procedures were developed during 2010. One new form was included within the scope of the EMS, 'F4.3.B Sponsorship', to record sponsorship initiatives (this form was used previously by Murphy Environmental but was not heretofore within the scope of the formal management system).

Environmental Objectives and Targets

A core requirement of ISO14001:2004 is the setting and reviewing of environmental Objectives and Targets (O&T), structured around the overall goal of continual environmental improvement. The Murphy Environmental O&T Register is used to strategically plan for issues for the forthcoming year, and it serves as a reminder of key target dates.

Objectives & Targets 2011

The targets for 2011 for the Gormanston facility are:

- Submit AER to the Agency
- Carry out monitoring of dust, noise, gas, water and leachate in line with Agency requirements
- Seed and grass Zone 5

Objectives & Targets 2010

The O&T schedule which was included in the 2009 AER is presented overleaf. An indication of progress against targets is given. All 2010 targets were achieved with the exception of capping and grassing of Zone 5.

Objectives & Targets 2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Submit AER to the Agency			⊙									👍
Carry out bi-annual noise monitoring and Noise at Work monitoring					⊙				⊙			👍
Carry out daily meteorological monitoring	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	👍
Carry out quarterly dust monitoring			⊙			⊙			⊙		⊙	👍
Carry out quarterly leachate & groundwater monitoring		⊙		⊙			⊙			⊙		👍
Carry out bi-annual surface water monitoring				⊙						⊙		👍
Emergency Response Procedure drills								⊙				👍
Seed and grass Zone 5						⊙						👎

Key: ⊙ = Target 👍 = Achieved 2010 👎 = Not Achieved 2010

Staff training 2010

All Facility Managers and Assistant Facility Managers in the company have completed the Fás/FETAC National Waste Management Training Programme. The following staff training was completed during 2010.

Training 2010

Training Carried Out	Employees Trained
Safepass	Ken Rooney
4Projects collaboration software	Ken Rooney, Kathryn Moonan, Lisa Maguire
Elected to Chartered Engineer (CEng MIEI) with Engineers Ireland	Ken Rooney
IWMA/CIWM Waste Policy Forum	Ken Rooney
Site visits to UK and European waste management facilities	Patricia Rooney, Ken Rooney

Health & Safety in the Workplace

First Aid Bags

First aid bags are installed at three strategic locations on site: one in the offices, one in the garage/mobile mechanic's unit, and one located with a machine driver. Their positioning means that, in the event of an accident at any point on the site, a First Aider and a first aid bag can reach the casualty within a very short period of time.



Defibrillator

A defibrillator machine is installed in both the Hollywood and Gormanston site offices. The defibrillator is normally used immediately following a cardiac arrest, to restart the heart rhythm. Designated staff have received accredited training in the use of the defibrillator.



Occupational Noise Monitoring

A Noise at Work survey was carried out at the Gormanston facility during June 2010. The purpose of the noise assessment was to quantify existing noise levels and assess noise levels with regard to legislative standards.

The results of the survey indicate that noise levels within the cabs of all the vehicles tested were below the First Action Levels; however, as a precaution, it was recommended that Murphy Environmental retain their policy of issuing ear defenders to all operators of heavy machinery.

The recommendation for the crusher units and the washer unit was to ensure the continued use of hearing defenders and warning signage at these locations.

4. *Monitoring and Measurement*

Monitoring Requirements

Murphy Environmental is required to conduct regular monitoring to ensure that no environmental impact is occurring as a result of site operations, and to submit all monitoring reports are submitted to the EPA.

Monitoring of noise, dust, gas, surface water, groundwater, leachate and meteorology is conducted throughout the year. Monitoring locations are shown on the drawing overleaf.

Bund Testing

No bund testing was completed in 2010.

Topographical Survey

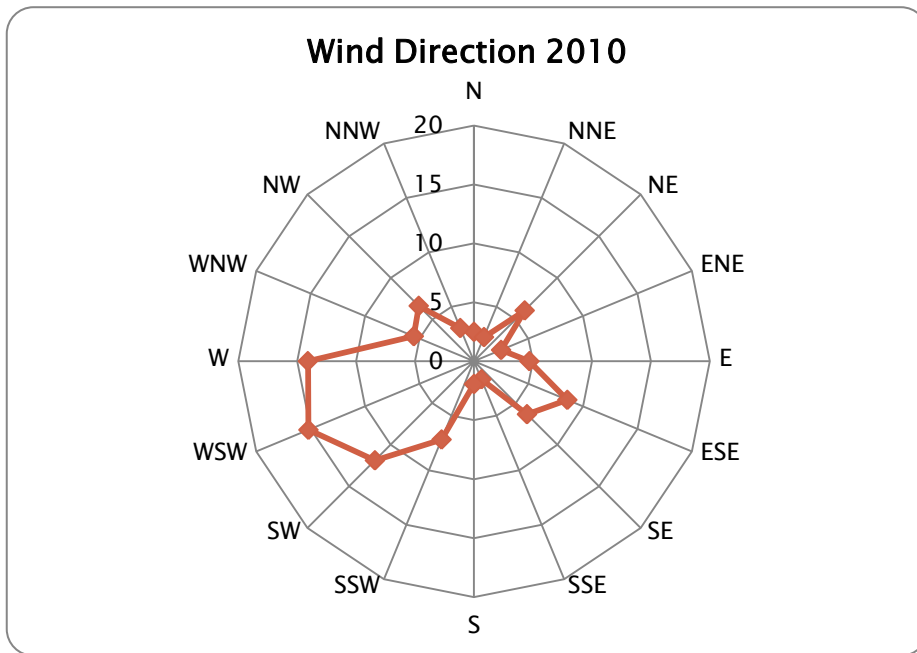
No topographical surveying was completed at the site in 2010.

Meteorological Data

Meteorological data was obtained from the meteorological station situated at Dublin Airport. The parameters obtained were: rainfall, temperature, sunshine, wind speed and direction, relative humidity, mean sea level pressure and evapo-transpiration.

Wind Direction

Daily wind data and all meteorological data required under the licence are retained on site. The wind rose for 2010 indicates that winds were mainly from a south-westerly/west-south-westerly direction.

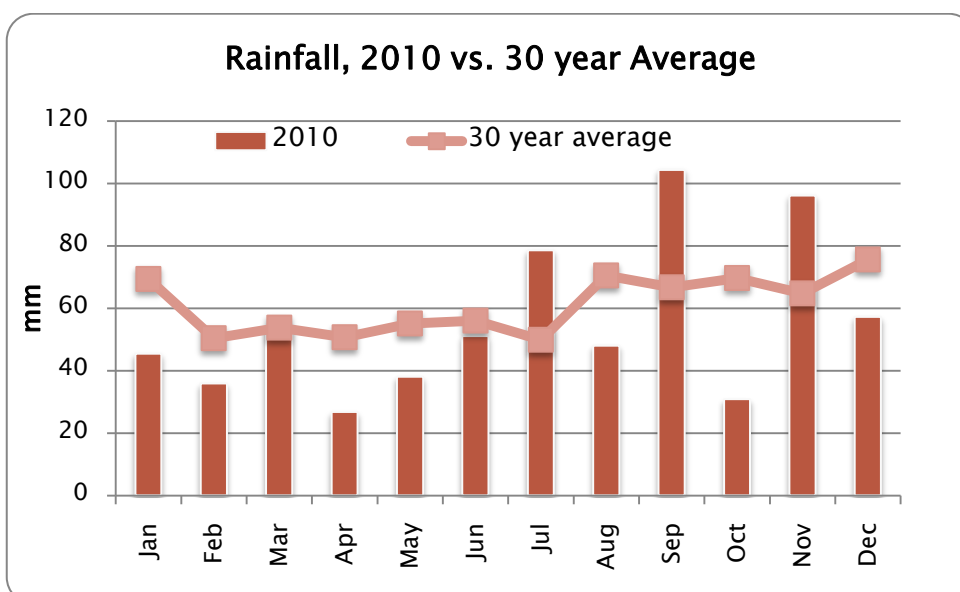


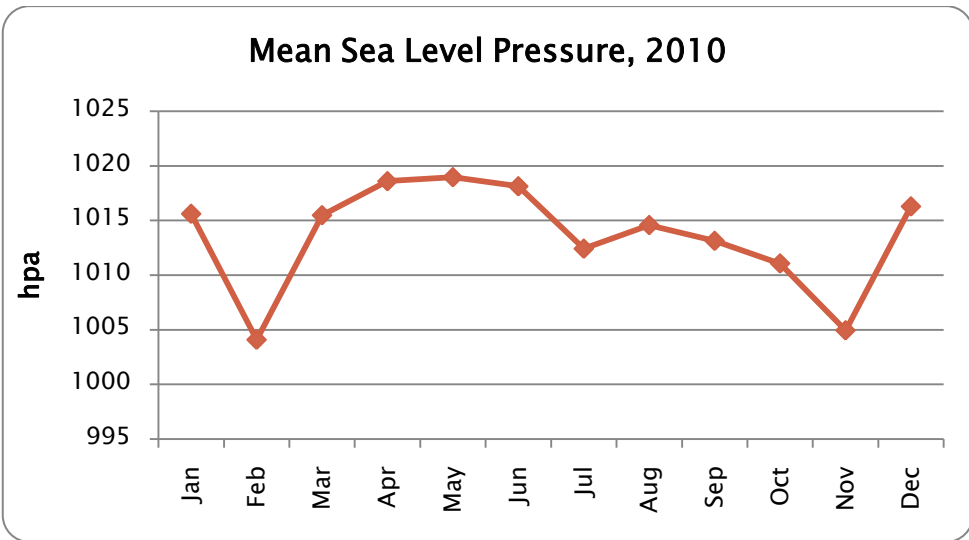
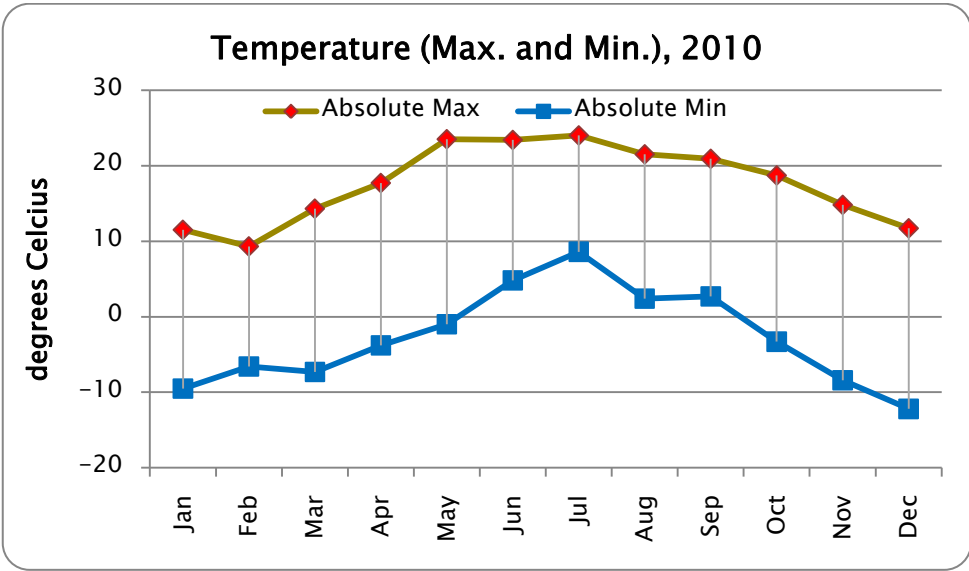
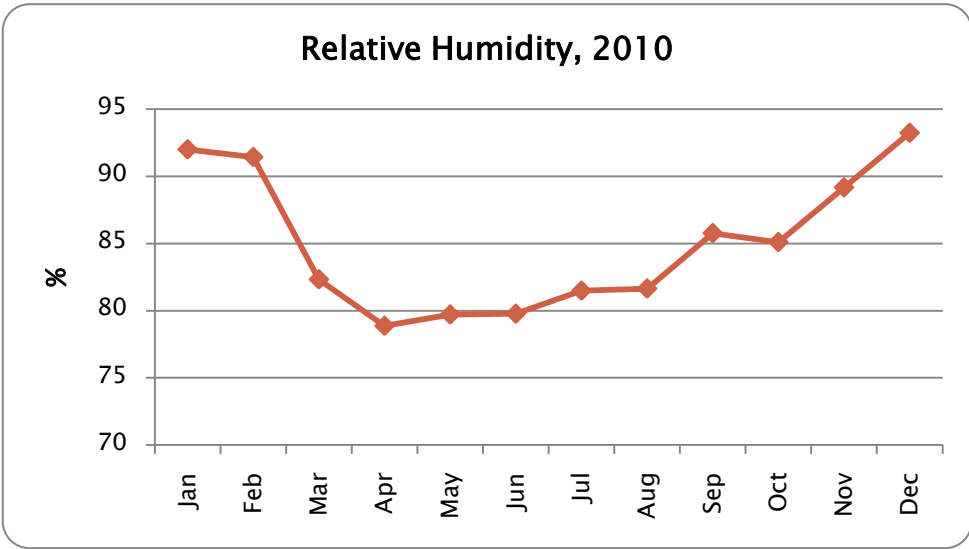
Rainfall

The total rainfall amount for 2010 was 667mm.

This is somewhat lower than the 30-year average (733mm) and significantly lower than the 2009 total of 918mm.

July, September and November 2010 were wet months (approximately 150% of the 30-year average), whilst April and October were markedly drier than the norm.







LEGEND

EXISTING LOCATIONS

- ⊕ GROUNDWATER OVERBURDEN WELLS
MW-1, MW-2, MW-4, MW-5, MW-22, MW-24
- ⊕ GROUNDWATER BEDROCK WELLS
MW-3, MW-5, TW-2, MW-14, MW-16, MW-18, MW-25
- ⊕ GAS / GROUNDWATER OVERBURDEN WELLS
MW-17, 19, 20, 21
- ⊕ GAS / LEACHATE WELLS
L1, L2, L3, L4
- ⊕ PRIVATE WELL
PW 3, DW 1
- ⊕ SHALLOW GAS PROBES GG - G19
- ⊕ SURFACE WATER MONITORING LOCATIONS ST1 AND ST2
- NOISE LOCATIONS NMP5, NMP7, NMP8, NMP13
- DUST MONITORING LOCATIONS D1-D4
- OUTLINE OF ZONE BOUNDARIES

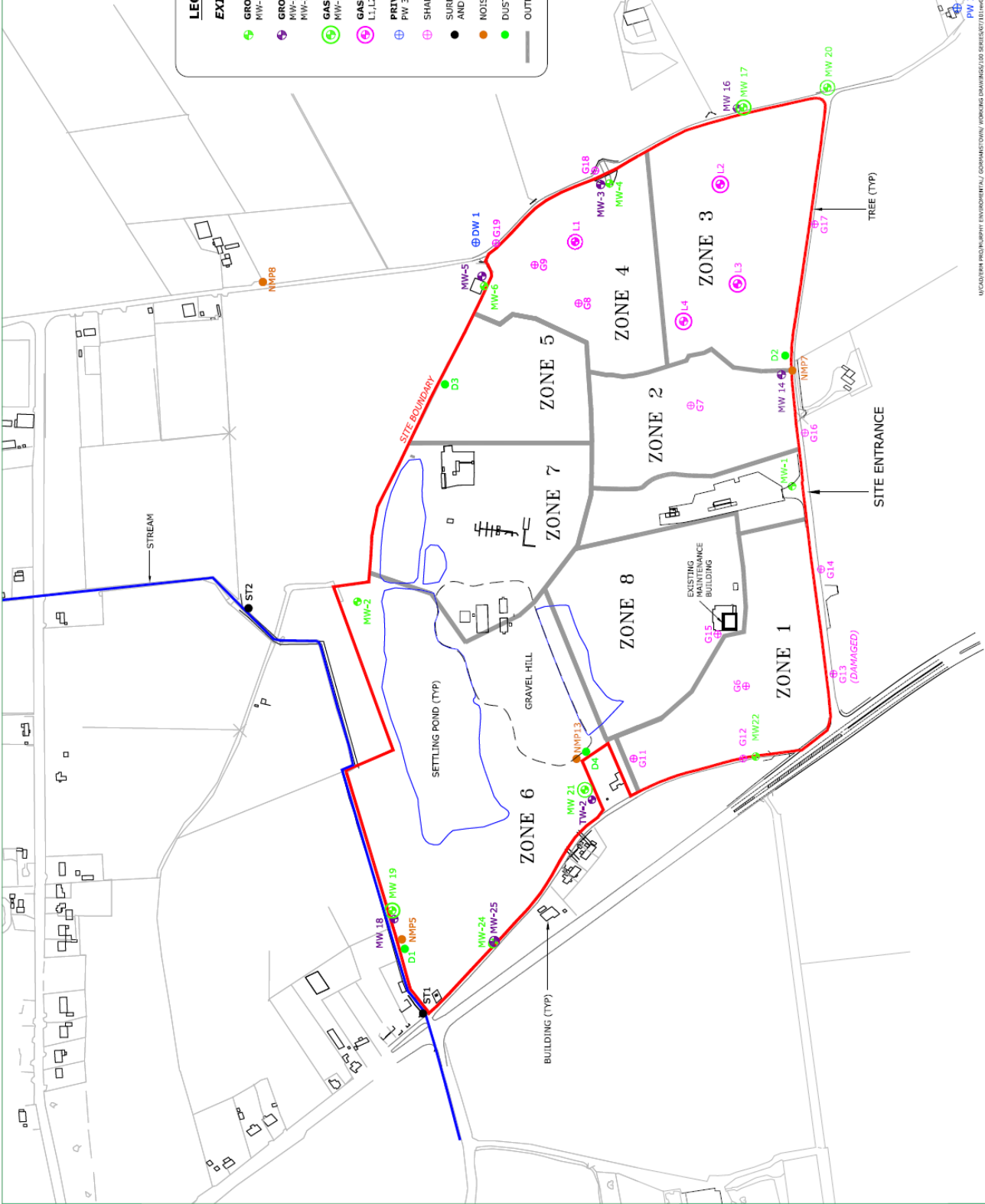
ORDNANCE SURVEY IRELAND
LICENCE NUMBER
AR0056006

Murphy Environmental
Waste Licence WO151-01
Sarsfieldstown Gormanstown, Co. Meath

EXISTING ENVIRONMENTAL MONITORING LOCATIONS

Project No.	06719278	Client	CC	Drawn By	CC	Scale	1:2,000	Date	14.09.04	Issue	SFPT 0F
Rev. No.	G7/108	Engineer	TM	Issue To	EPA	Issue Date	APR 08	Issue To	EPA	Issue Date	SEP 08
Rev. No.	G7/101	Engineer	TM	Issue To	EPA	Issue Date	APR 08	Issue To	EPA	Issue Date	SEP 08

Scale: 1:2,000



LOCATION AND MURPHY ENVIRONMENTAL ADMINISTRATION WORKING DRAWINGS FOR SITE G7/101

Dust Monitoring

Murphy Environmental is required to monitor dust levels at four locations (D1, D2, D3 and D4) quarterly under the terms of W0151-01. Dust emission limits are set in Schedule C.3 of the licence.

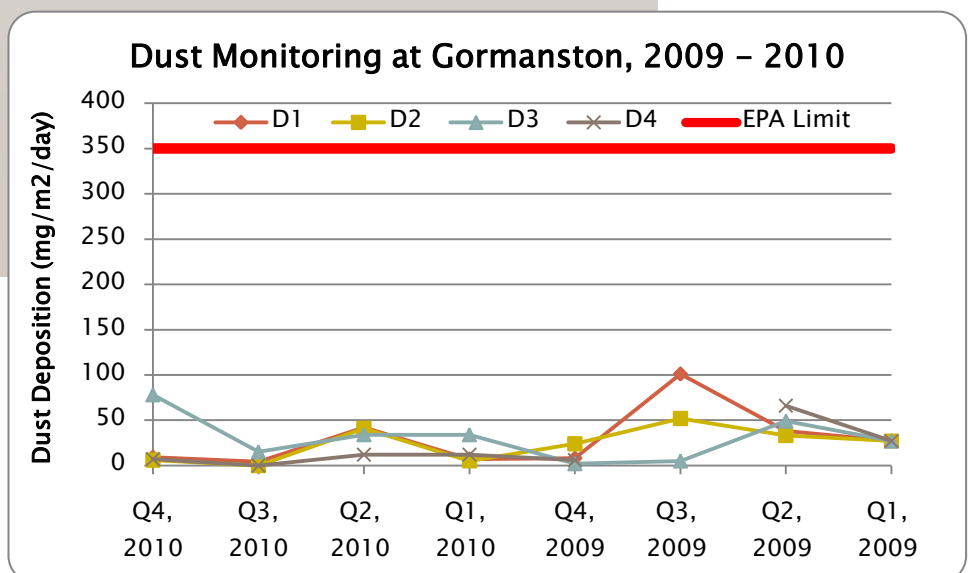
Dust is measured using a Bergerhoff dust gauge. This is exposed over a 30-day period to collect bulk dust deposition. The gauge consists of a gauge bottle supported on a stand of approximately 1.5 metres high. The samples collected are then transferred to a laboratory for gravimetric (weight) analysis to determine the concentration of deposit material in each gauge bottle.

Dust Monitoring Results, 2010

Four dust monitoring rounds were conducted at the Gormanston site during 2010. Dust management techniques such as dampening of roads and hardstand areas using the water bowser, sprinklers, wheelwash and roadsweeper are used by Murphy Environmental on an ongoing basis to manage and minimise dust levels.

Dust monitoring results were significantly below the licence limit for dust during all monitoring rounds in 2010, i.e. the

compliance rate for dust monitoring was 100% in 2010.



Noise Monitoring

Murphy Environmental must monitor noise levels at 4 locations (NMP5, NMP7, NMP8 and NMP13) twice per annum (Schedule D.4). Noise emission limits are set in the licence (Schedule C.1). Noise is monitored using a specialist noise meter.

Noise Monitoring Results 2010

The biannual noise surveys were conducted in May 2010 and September 2010. The results from the noise survey indicated that noise levels exceeded the EPA daytime limit of 55 dB(A) and the night-time limit of 45 dB(A) at certain noise monitoring points; however the dominant noise source at all locations was road traffic along the local road network.

The Murphy Environmental facility was not operating during the night-time survey period and did not contribute to the noise environment in the area during this period.

In light of the results of the noise surveys it was concluded that the Murphy Environmental Gormanston facility was **in compliance with the noise limits** contained within Schedule C of its Waste Licence for 2010 noise monitoring.

Noise Monitoring at Gormanston, 2010

Location	Daytime Noise LA _{EQ} dB(A)			Night-time Noise LA _{EQ} dB(A)		
	Q2, 2010	Q3, 2010	EPA Limit	Q2, 2010	Q3, 2010	EPA Limit
NMP5	66	69	55	59	65	45
NMP7	53	54	55	44	53	45
NMP8	50	50	55	39	46	45
NMP13	57	58	55	45	53	45

NMP5: located close to the R132 roadway beyond the north-western boundary of the facility

NMP7: located along a local roadway which leads east from the R132 roadway at a point close to the main entrance

NMP8: located along a local roadway to the northeast of the facility

NMP13: located close to a dwelling, which overlooks the site from beyond the south-western boundary of the facility

Surface Water Monitoring

Surface water monitoring was carried out during Quarters 2 and 4, 2010 at ST-1 and ST-2.

ST-1 was in full compliance with the Salmonid Water Regulations and the Surface Water Regulations in Quarter 2, 2010. ST-2 breached limit values for COD, manganese and total suspended solids in Quarter 2, 2010.

Both ST-1 and ST-2 were in full compliance with relevant guideline limit values during Quarter 4, 2010.

Groundwater Monitoring

Murphy Environmental must monitor groundwater quarterly at:

- 17 monitoring boreholes: MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-14, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, MW-22, MW-24, MW-25 and TW-2
- 1 private well: PW3 (this is only point locally from which water may be extracted for human consumption)
- 4 leachate wells: L1, L2, L3, and L4 (L1, L2 and L3 were dry during all sampling rounds in 2010)

Groundwater monitoring includes measuring the depth of groundwater, plus taking a sample of water from the borehole for analysis of prescribed parameters. The water level in each borehole is recorded using a 'dip meter'. A water sample is extracted by using an inertial pump, which feeds a column of water upwards through a length of sampling tubing, or by using a water bailer.

Groundwater Monitoring Results, 2010

Groundwater monitoring was conducted during Quarters 1, 2, 3 and 4 of 2010. Results were compared against EU Drinking Water Regulations.

A total of approximately 70 parameters were tested at each of the 18 groundwater monitoring locations during 2010.

During 2010, a total of over 1,250 individual analytical tests were conducted on groundwater samples.

The following table provides an indication of the overall level of compliance for parameters measured quarterly during 2010, at all monitoring locations in and around the site. The vast majority complied with relevant legislation and guideline limits. If there is a breach of guideline limits, Murphy Environmental must report this as an 'incident' to the EPA.

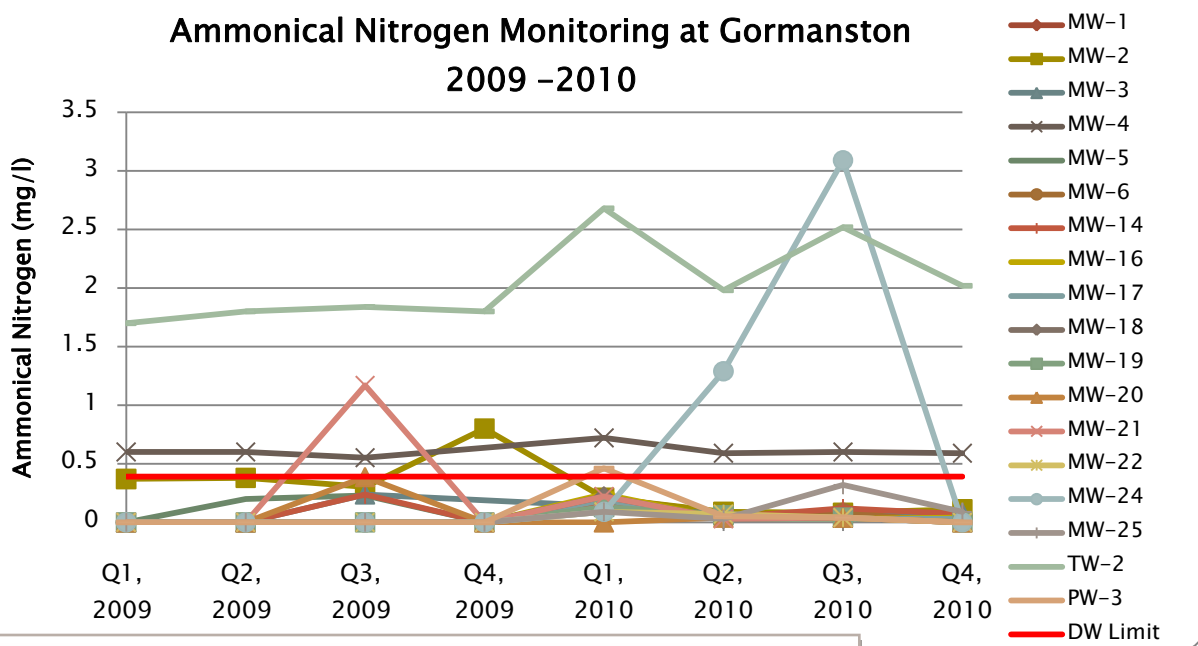
The overall 2010 compliance rate for quarterly monitoring parameters in groundwater boreholes was 98% (compared against limits prescribed in the Drinking Water Directive 98/83/EC).

Groundwater – Compliance with Quarterly Monitoring Requirements 2010

Quarterly Groundwater Parameter	Total No. of tests*	2010 Results vs. Drinking Water Limit Values		% Compliance
		Compliant	Breached	
Ammoniacal Nitrogen	72	61	11	85%
Chloride	72	72	0	100%
Phenols	72	72	0	100%
Total Organic Carbon	72	72	0	100%
Electrical Conductivity	72	72	0	100%
Dissolved Oxygen	72	72	0	100%
pH	72	72	0	100%

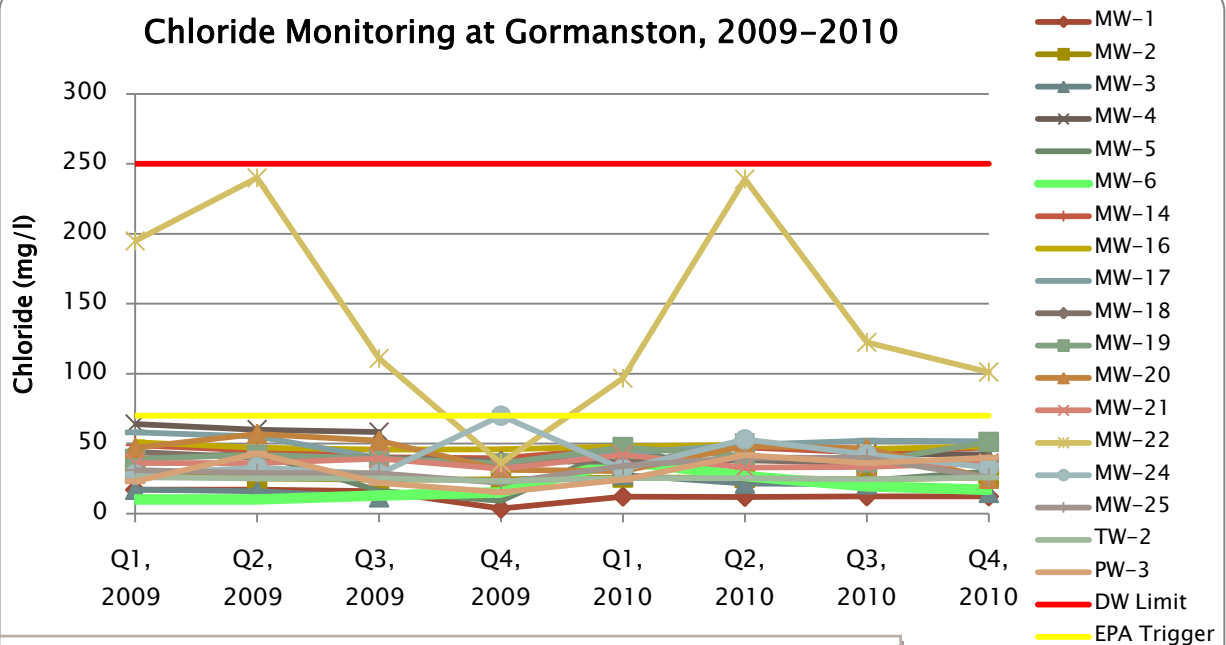
* 18 Boreholes x 4 Sampling Rounds

Ammonical Nitrogen Monitoring at Gormanston 2009 -2010



The 2010 compliance rate for Ammoniacal Nitrogen was **85%** (compared against Drinking Water Regulation limits)

Chloride Monitoring at Gormanston, 2009-2010



The 2010 compliance rate for Chloride was **100%** (compared against Drinking Water Regulation limits)

Ammoniacal Nitrogen

Ammoniacal Nitrogen exceeded guideline limits in MW-4, MW-24, TW-2 and PW-3 during 2010. This is thought to have been associated with agricultural or sewage sources in the vicinity of the site. Similar levels were detected in MW-4 and TW-2 during 2009; however there was a notable increase in Ammoniacal Nitrogen levels in MW-24 in Quarters 2-3, 2010; results for MW-24 in Quarter 4, 2010 were again below the limit of detection. There was one marginal breach of the Ammoniacal Nitrogen limit value in PW-3 during Quarter 1, 2010.

Chloride

The EPA Trigger level for chloride for the site is 70 mg/l. The levels recorded at MW-22 monitoring well were in exceedance of this value during some of the 2010 monitoring rounds but were within the limit set by the Drinking Water Directive of 250 mg/l – results were in keeping with 2009 chloride measurements also. All other monitoring wells were in compliance with both the Drinking Water Regulation limit and the EPA Trigger Level. Chloride exists in all natural waters and has no direct health or sanitary significance.

Conductivity

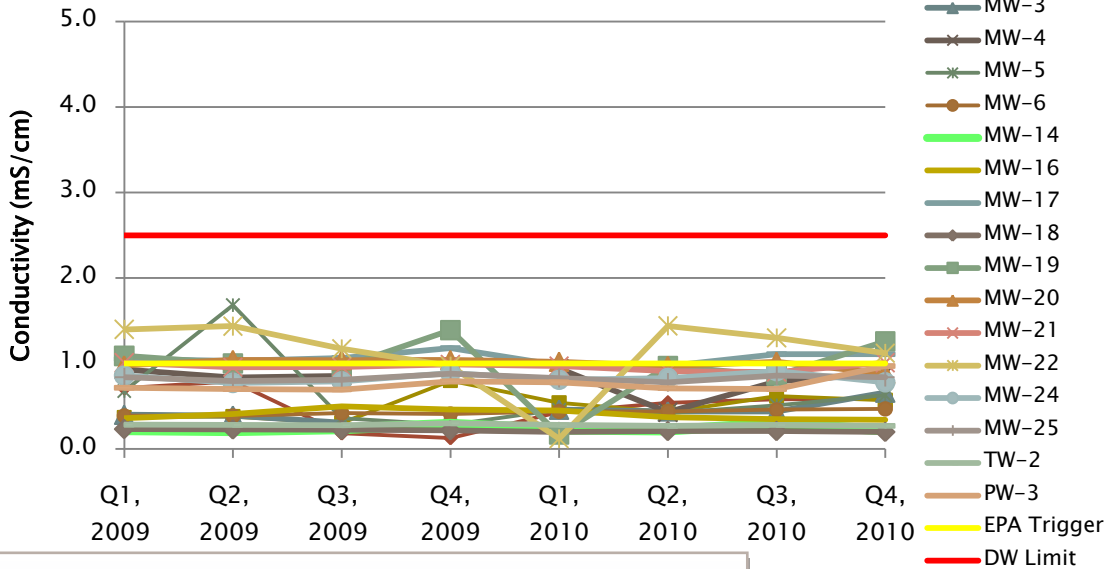
The EPA Trigger level for conductivity for the site is 1.0 mS/cm. The levels recorded at monitoring wells MW-17, MW-19 and MW-22 were in exceedance of this value during some of the 2010 monitoring rounds but were within the limit set by the Drinking Water Directive of 2.5 mS/cm – results are similar to those from 2009.

All other groundwater monitoring locations were in compliance with both the Drinking Water Regulation limit and the EPA Trigger Level. Conductivity is a measure of the mineral salt content of water and has no direct health or sanitary significance.

Total Organic Carbon

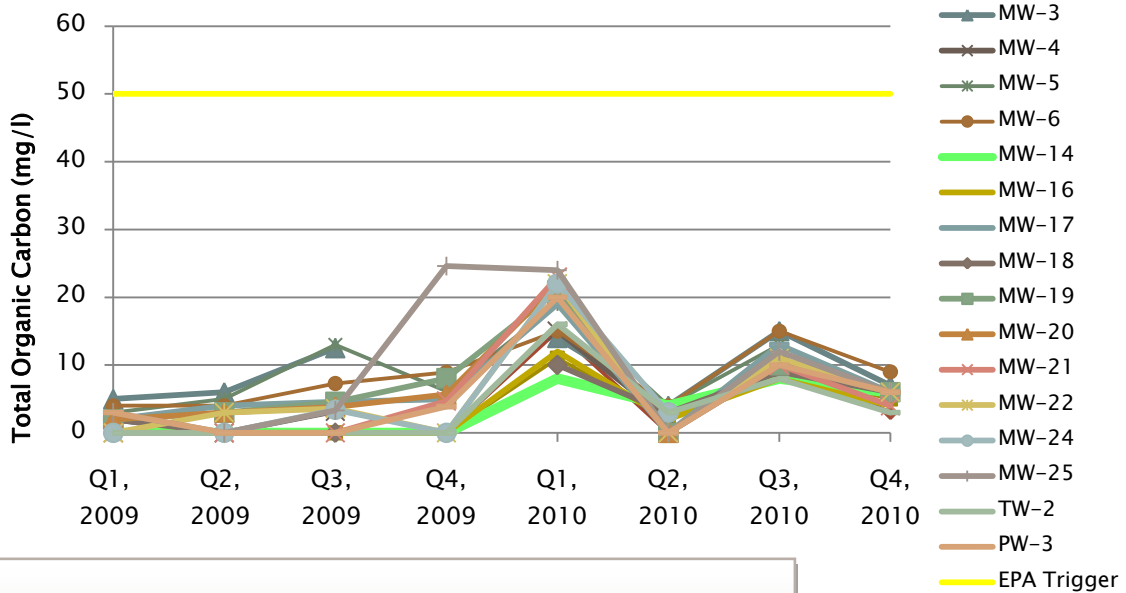
All Total Organic Carbon results were below EPA trigger levels for the site.

Conductivity Monitoring at Gormanston, 2009–2010



The 2010 compliance rate for conductivity was **100%** (compared against Drinking Water Regulation limits)

TOC Monitoring at Gormanston, 2009–2010



The 2010 compliance rate for Total Organic Carbon was **100%** (compared against Drinking Water Regulation limits)

Total & Faecal Coliforms

Microbiological monitoring of the groundwater is required annually; this was carried out at the site during Quarter 2, 2010. Faecal coliforms were found at levels above Drinking Water Regulation limits in MW-5, MW-6 and TW-2. High faecal coliform results are thought to be associated with agricultural or sewage sources. Coliforms are not generally an indicator of landfill runoff.

Coliform Analysis in Groundwater Boreholes, 2009-2010

Bore-hole Ref.	Faecal Coliforms (cfus/100ml)			Total Coliforms (cfus/100ml)		
	Q2, 2009	Q2, 2010	DW Limit	Q2, 2009	Q2, 2010	DW Limit
MW-1	1	0	0	1	<1	0
MW-2	8	0	0	12	<1	0
MW-3	<1	0	0	<1	1,986	0
MW-4	<1	0	0	900	9.6	0
MW-5	8	2	0	1,800	42	0
MW-6	<1	4	0	<1	38	0
MW-14	<1	0	0	<1	2	0
MW-16	<1	0	0	28	<1	0
MW-17	<1	0	0	100	<1	0
MW-18	<1	0	0	<1	<1	0
MW-19	1	0	0	100	<1	0
MW-20	<1	0	0	<1	<1	0
MW-21	<1	0	0	<1	<1	0
MW-22	<1	0	0	<1	1,274	0
MW-24	9	0	0	9	12,997	0
MW-25	<1	0	0	<1	5	0
PW-3	<1	0	0	<1	17	0
TW-2	<1	1	0	<1	2,420	0

Other Groundwater Monitoring Non-Compliances

In addition, there were non-compliances reported to the Agency for:

- Q1, 2010: Sulphate (Drinking Water Regulations); pH (EPA Trigger levels)
- Q2, 2010: Iron, Manganese, Cadmium, Nickel (Drinking Water Regulations); Sulphate, pH and Sodium (EPA Trigger levels)
- Q3, 2010: Sulphate and pH (EPA Trigger levels)
- Q4, 2010: Sulphate (Drinking Water Regulations); Sulphate and pH (EPA Trigger levels)

Leachate Monitoring

Leachate is formed when water passes through waste in a landfill cell. Leachate monitoring is required quarterly at the site. Samples could only be obtained from L-4 as there was no leachate present at the other leachate monitoring points. There were elevated levels of Ammoniacal Nitrogen and Iron in the L-4 leachate. The Surface Water Regulation limits are used for comparison purposes due to the fact that there are no trigger levels for leachate. No leachate was removed off-site during 2010.

Water Balance Equation

The water balance equation is estimated as follows:

- Annual Rainfall, 2010 = 667mm
- Annual Evapo-transpiration, 2010 = 410mm

It is assumed that water losses during operations will be numerically approximately 50% of evapo-transpiration from vegetated surfaces, i.e. 205 mm/year.

- Effective Rainfall = 667mm - 205mm = 462mm/year

The surface area of Zones 1 to 6 at the facility is 249,000m². Therefore the amount of recharge within Zones 1 to 6 is estimated as:

- 249,000 m² x 0.462m /year = 115,038 m³/year.

Estimated Indirect Emissions to Groundwater

Based on the area of Zones 1 to 4, effective rainfall and leachate monitoring data for 2010, the cumulative and indirect emissions to groundwater were estimated at 2.31 tonnes per annum.

Landfill Gas Monitoring

The inert material deposited at Gormanston will not generate landfill gas; however, landfill gas is monitored at Gormanston because of historic waste deposits on site.

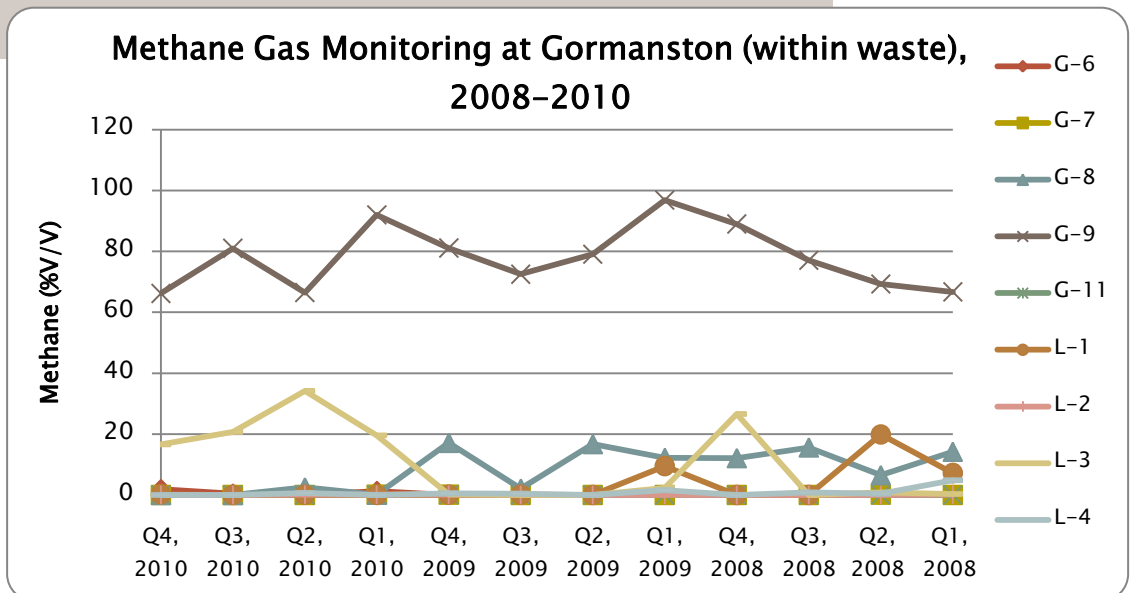
Landfill gas is measured at 20 monitoring wells on the Gormanston site (within the waste: G-6, G-7, G-8, G-9, G-11, L-1, L-2, L-3 and L-4; outside waste: G-12, G-14, G-15, G-16, G-17, G-18, G-19, MW-17, MW-19, MW-20 and MW-21).

Gas monitoring results, 2010

The level of landfill gas is monitored on a quarterly basis and levels are compared against limits set down in Schedule C of the Waste Licence. Methane (CH₄) and Carbon Dioxide (CO₂) results are summarised in the tables opposite.

In monitoring locations outside waste, methane was recorded consistently at, or close to, 0% v/v. The licence specifies a CH₄ emission limit of 1% v/v in any building on or adjacent to the facility. Carbon dioxide levels recorded above 1.5% v/v at monitoring locations outside waste or at perimeter locations were reported to the EPA as incidents. Such incidents were recorded at G-12, G-14, G-19, MW-17, MW-19 and MW-20 during 2010.

Methane results at monitoring locations within the waste were variable during 2010 (see chart below). G-9 showed consistently high methane levels during the year.



Methane Monitoring at Perimeter Gas Wells, 2010

Monitoring Location	2010 Methane Levels (%v/v)				Limit Value (%v/v) ¹
	Q1	Q2	Q3	Q4	
G-12	0.1	0	0	0	1.0
G-14	0.1	0	0	0	1.0
G-15	0	0	0	0	1.0
G-16	0	0	0.1	0	1.0
G-17	0	0	0	0	1.0
G-18	0	0	0	0	1.0
G-19	0.1	0	0	0	1.0
MW-17	0	0	0	0	1.0
MW-19	0	0	0	0	1.0
MW-20	0.1	0	0	0	1.0
MW-21	0.1	0	0	0	1.0

Carbon Dioxide Monitoring at Perimeter Gas Wells, 2010

Monitoring Location	2009 Carbon Dioxide (% v/v)				Limit Value (%v/v) ²
	Q1	Q2	Q3	Q4	
G-12	9.1	2.8	4.6	7.3	1.5
G-14	4.0	0.7	5.6	2.9	1.5
G-15	0.1	0	0.0	0.0	1.5
G-16	1.3	0	0.1	0.0	1.5
G-17	1.3	1.4	0.3	0.0	1.5
G-18	0	0	1.6	0.0	1.5
G-19	2.1	1.8	2.8	0.0	1.5
MW-17	0	2.4	0.0	0.3	1.5
MW-19	0.8	1.9	4.4	0.0	1.5
MW-20	1.9	2.2	0.3	2.2	1.5
MW-21	0.8	0.1	0.1	1.0	1.5

¹ Schedule C.2 of W0151-01 (measured in any building on or adjacent to the facility)

Energy & Resource Use

Murphy Environmental's energy provider is Airtricity, one of Ireland's green renewable energy providers – their power is sourced from wind-farms and from certified hydro-power stations.

Electricity Use 2010

Based on electricity bills, the energy consumption at Murphy Environmental Gormanston for 2010 was 60,425 kWh (electricity use at on-site offices only and excludes electricity usage for MCM quarry-related plant and equipment).

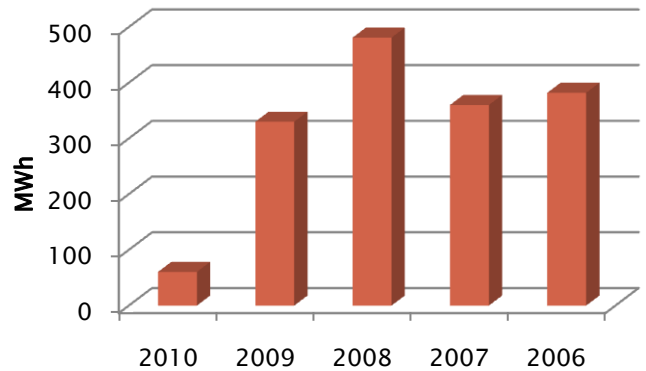
Electricity-related Carbon Emissions, 2010

Airtricity data from 2010 states that 69% of its energy is sourced from renewable sources, as opposed to 11% for other providers, on an all island basis. Electricity generated by Airtricity produces 142 kg CO₂ per MWh, as opposed to an average for Ireland of 533 kg (Source: Airtricity).

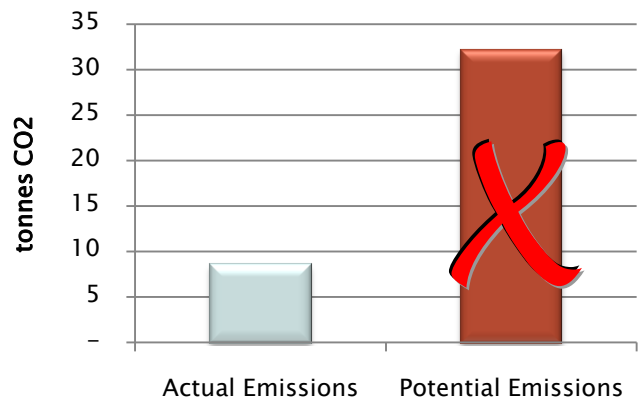
The chart shows the actual CO₂ emissions based on electricity use at Gormanston in 2010, and potential emissions, based on average CO₂ emissions from electricity generation in Ireland.

Based on 2010 consumption rates, CO₂ emissions associated with Murphy Environmental Gormanston electricity usage was 9 tonnes.

Electricity Use Gormanston, 2006–2010



Electricity CO₂ Emissions – Actual and Potential, 2010





In 2010, Murphy Environmental Gormanston avoided the release of over 23 tonnes of CO₂ emissions to the atmosphere by using a renewable energy provider – this is the equivalent of taking approximately 9 cars off the road for a year².

Diesel

During 2010, a total of 60,983 litres of diesel were used by plant associated with operations at Murphy Environmental Gormanston.



Water

Water usage at Murphy Environmental Gormanston during 2010 was 281 m³ (consumption records run from 30th September 2009 to 30th September 2010).



Composition of Wastes Removed off-site

General municipal waste (e.g. from the site canteen) and waste paper are collected and removed off-site by permitted waste collectors for recycling or disposal. The quantity of waste removed during 2010 is detailed in the table below.



Off-site Waste Removal, 2010

Waste Removed Off Site	Quantity
Municipal waste	4 x 1,100-litre wheelie bin lifts
Mixed dry recyclables	11 x 1,100-litre wheelie bin lifts
Waste oil	3 drums
Waste oily rags	1 x 240-litre bin lift
Waste oil filters	2 x collections

² Based on the average Irish car releasing 164g CO₂/km (SEI, July 2008) and an average mileage of 16,894 km/annum (SEI, August 2005), i.e. total annual CO₂ emissions of approximately 2.8 tonnes

5. *Murphy Environmental & The Community*

Corporate Policies

Murphy Environmental has documented and published policies relating to Environment and Health & Safety; the policies have also been translated into Russian and Polish.

Public Commitments

Murphy Environmental has developed a communications procedure to allow public access to facility information. The main methods are:

- Annual Environmental Reports
- Site notice board
- Complaints are recorded and tracked
- An information pack is available to customers and interested parties
- Site documentation is available for inspection at the site office
- Our Facility Managers are available to answer any queries

We are also in routine and regular communication with the Agency with reference to compliance requirements and requests for information, all of which is on the public record.

Avoiding Nuisance

Murphy Environmental has invested in a number of pieces of equipment in order to better manage potential environmental issues associated with our facility. Roads in the vicinity of the site are serviced by a facility roadsweeper and water bowser. All trucks exiting our site must use the wheelwash, further reducing the potential for the generation of mud on roads. Daily, weekly and monthly site inspections are carried out to ensure that the site is kept clean and free of anything that might be perceived as causing a nuisance to site neighbours.

Complaints

Murphy Environmental logs all complaints or comments relating to the site which may be received directly by them, by the EPA or other parties. No complaints were received during 2010.

Environmental Incidents

Any incident that occurs on site must be reported to the EPA in accordance with the licence conditions. An incident is defined as:

- An emergency
- Any emission which does not comply with the requirements of the licence; Any trigger level specified in the licence which is attained or exceeded
- Any indication that environmental pollution has, or may have, taken place
- The non-acceptance or rejection of any waste load at the facility

Nine incident reports were submitted to the EPA for 2010: eight related to routine quarterly water monitoring (further discussed in the Monitoring & Measurement section) and one related to rejected loads.

Local Schools Sponsorship Programme

Murphy Environmental launched an environmental sponsorship programme of local primary schools in December 2005. We made a commitment to maintain the initiative for a minimum of five years, with the objective of fostering long-term projects. Projects which promote and encourage the preservation and protection of the environment are rewarded, with the specifics of the selected projects entirely at the schools' discretion.

The following primary schools have been sponsored by MEHL/Murphy Environmental in relation to the promotion of environmental issues:

1. Balbriggan Educate Together N.S., Hamlet Lane, Balbriggan, Co. Dublin
2. Balcadden N.S., Balcadden, Co. Dublin
3. Hedgestown N.S., Hedgestown, Lusk, Co. Dublin
4. Laytown N.S., Laytown, Co. Meath
5. Naul N.S., Naul, Co. Dublin
6. Realt na Mara N.S., Donacarney, Mornington, Co. Meath
7. Saints Peter & Paul N.S., Chapel Street, Balbriggan, Co. Dublin
8. St. George's N.S., Hampton Street, Balbriggan, Co. Dublin
9. St. Mologa's N.S., Bremore, Balbriggan, Co. Dublin
10. St. Oliver Plunkett N.S., Balrothery, Balbriggan, Co. Dublin
11. St. Patrick's N.S., Stamullen, Co. Meath
12. St. Theresa's N.S., Pinewood, Balbriggan, Co. Dublin
13. White Cross N.S., Julianstown, Co. Meath

Many of our sponsor schools are new 'Green Flag' holders, a demonstration of their hard work and commitment to sustainability projects.



6. PRTR

What is EU PRTR?

The European Pollutant Release and Transfer Register (E-PRTR) is an inventory of pollutant emissions from industry and other sources across Europe. The aim of the inventory is to make information more available to the public on pollutant emissions and waste transfers from a range of industrial sectors, including the waste management sector.

EPA Requirements

Murphy Environmental has completed the EPA PRTR 2010 template, which is attached to this AER. The PRTR is also transferred electronically via the EPA website.

Features of E-PRTR

The main features of the E-PRTR are as follows:

- 91 specified pollutants are required to be reported upon if they are released to air, water or land, either as permitted emissions or as accidental releases, or transferred to off-site Waste Water Treatment Plants (WWTPs).
- Types of emissions to be reported include deliberate, accidental, routine and non-routine releases.
- The transfer of hazardous and non-hazardous wastes must also be reported under the new Regulation.
- E-PRTR returns must be made by EPA to the EU; returns from operators must be made to EPA on an annual basis.
- Facilities are required to ensure an appropriate quality of the data they report to their Competent Authority.
- The data they provide must be complete, consistent and credible; this requires that they use, to the extent possible, internationally approved data recording and collection methodologies, or other methods shown to be equivalent.

(Source: EPA)



Environmental Protection Agency

[Guidance to completing the PRTR workbook](#)

AER Returns Workbook

Version 1.1.12

REFERENCE YEAR	2010
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1. FACILITY IDENTIFICATION

Parent Company Name	Murphy Environmental Hollywood Ltd.
Facility Name	Murphy Concrete Manufacturing Ltd
PRTR Identification Number	W0151
Licence Number	W0151-01

Waste or IPPC Classes of Activity

No.	class_name
4.4	Recycling or reclamation of other inorganic materials.
3.1	Deposit on, in or under land (including landfill). Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
3.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.13	Recycling or reclamation of metals and metal compounds.
4.3	
Address 1	Sarsfieldtown
Address 2	Gormanstown
Address 3	Co. Meath
Address 4	
Country	Ireland
Coordinates of Location	-6.25153 53.654
River Basin District	IEEA
NACE Code	3832
Main Economic Activity	Recovery of sorted materials
AER Returns Contact Name	Louise O'Donnell
AER Returns Contact Email Address	louise.odonnell@pateltonra.com
AER Returns Contact Position	Environmental Consultant
AER Returns Contact Telephone Number	01 8020520
AER Returns Contact Mobile Phone Number	086 8333724
AER Returns Contact Fax Number	01 8020525
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
50.1	General
5(d)	Landfills
50.1	General

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	No
Have you been granted an exemption ?	No
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

4.1 RELEASES TO AIR

[Link to previous years emissions data](#)

| PRTR#: W0151 | Facility Name : Murphy Concrete Manufacturing Ltd | Filename : W0151_PRTR_2010.xls | Return Year : 2010 |

19/04/2011 10:08

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

POLLUTANT		RELEASES TO AIR			Please enter all quantities in this section in KGs				
No. Annex II	Name	M/C/E	METHOD		Emission Point 1	QUANTITY			
			Method Code	Designation or Description		T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
						0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

POLLUTANT		RELEASES TO AIR			Please enter all quantities in this section in KGs				
No. Annex II	Name	M/C/E	METHOD		Emission Point 1	QUANTITY			
			Method Code	Designation or Description		T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
						0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

POLLUTANT		RELEASES TO AIR			Please enter all quantities in this section in KGs				
Pollutant No.	Name	M/C/E	METHOD		Emission Point 1	QUANTITY			
			Method Code	Designation or Description		T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
						0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill:

Murphy Concrete Manufacturing Ltd

Please enter summary data on the quantities of methane flared and / or utilised

T (Total) kg/Year	M/C/E	Method Used		Facility Total Capacity m3 per hour
		Method Code	Designation or Description	
Total estimated methane generation (as per site model)	0.0			N/A
Methane flared	0.0			0.0 (Total Flaring Capacity)
Methane utilised in engine/s	0.0			0.0 (Total Utilising Capacity)
Net methane emission (as reported in Section A above)	0.0			N/A

4.2 RELEASES TO WATERS

[Link to previous years emissions data](#)

| PRTR# : W0151 | Facility Name : Murphy Concrete Manufacturing Ltd | Filename : W0151_PRTR_2010.xls | Return Year : 2010 |

19/04/2011 10:08

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR Reporting as this onl

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT		M/C/E	Method Used		QUANTITY			
No. Annex II	Name		Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT		M/C/E	Method Used		QUANTITY			
No. Annex II	Name		Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT		M/C/E	Method Used		QUANTITY			
Pollutant No.	Name		Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.3 RELEASES TO WASTEWATER OR SEWER

[Link to previous years emissions data](#)

| PRTR# : W0151 | Facility Name : Murphy Concrete Manufacturing Ltd | Filename : W0151_PRTR_

19/04/2011 10:08

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.4 RELEASES TO LAND

[Link to previous years emissions data](#)

| PRTR# : W0151 | Facility Name : Murphy Concrete Manufacturing Ltd | Filename : W0151_PRTR_2010.xls | Return Year : 2010 |

19/04/2011 10:08

SECTION A : PRTR POLLUTANTS

POLLUTANT		RELEASURES TO LAND			Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

POLLUTANT		RELEASURES TO LAND			Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			QUANTITY		
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

| PRTR# : W0151 | Facility Name : Murphy Concrete Manufacturing Ltd | Filename : W0151_PRTR_2010.xls | Return Year : 2010 |

19/04/2011 10:08

Please enter all quantities on this sheet in Tonnes

3

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility	Non	Haz Waste : Address of Next Destination Facility	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						Haz Waste: Name and Licence/Permit No of Recover/Disposer			Non Haz Waste: Address of Recover/Disposer				
Within the Country	17 01 01	No	13460.0	concrete	R5	M	Weighed	Onsite in Ireland	Murphy Concrete Manufacturing Ltd.,W0151-01		Sarsfieldstown,Gormanston, Co. Meath,,Ireland		
Within the Country	17 05 04	No	138016.0	soil and stones other than those mentioned in 17 05 03	R5	M	Weighed	Onsite in Ireland	Murphy Concrete Manufacturing Ltd.,W0151-01		Sarsfieldstown,Gormanston, Co. Meath,,Ireland		

* Select a row by double-clicking the Description of Waste then click the delete button

[Link to previous years waste data](#)

[Link to previous years waste summary data & percentage change](#)

Produced with the assistance of:



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FURTHER INFORMATION

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