BALLEALLY LANDFILL, BALLEALLY, LUSK, CO.DUBLIN

ANNUAL ENVIRONMENTAL REPORT 2015

IED LICENCE REF. NO. W0009-03

ORIGINAL

MARCH 2016

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BALLEALLY LANDFILL, BALLEALLY, LUSK, CO.DUBLIN

ANNUAL ENVIRONMENTAL REPORT 2015

INDUSTRIAL EMISSIONS LICENCE IED LICENCE REF. NO. W0009-03

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Abstract: This report represents the monitoring results for Balleally landfill, Balleally, Lusk, Co. Dublin. This report covers the annual reporting period of 2015 in accordance with Industrial Emissions Licence Reg. No. W0009-03.

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1 INTRODUCTION

1.1 Reporting Period

The reporting period for the AER is 1st January to 31st December 2015.

1.2 IED Licence

In 2000 Fingal County Council was granted a IED Licence (Reg. 9-1) to continue operating Balleally Landfill. In July 2001 Fingal County Council applied for a review of this licence. IED Licence W0009-02 was issued on the 8th January 2003. On the 21st December 2009 the Environmental Protection Agency (EPA) issued Fingal County Council a third revision of the IED Licence for Balleally Landfill: IED Licence W0009-03. The licence was subsequently brought into conformity with the provisions and requirements of the Council Directive 2010/75/EU on the 20th December 2013, becoming an Industrial Emissions (IE) Licence.

This licence permits the operation of a non-hazardous landfill. In accordance with the requirements of Condition 11.6 of the IED Licence, an Annual Environmental Report (AER) for the facility must be submitted to the EPA.

1.3 Facility Location

Fingal County Council has responsibility for the management and operation of the facility. The facility is located at:

Balleally Landfill
Balleally Lane
Lusk

National Grid reference E322500 N252200.

Drawing Monitoring Locations (Figure 1) in Appendix 1 is a map of the facility and the monitoring locations.

1.4 Licensed Industrial Emissions Activities at the Facility

Balleally Landfill is situated in Lusk, Co. Dublin. It has been in operation since 1971. Activities at the facility include landfill, special handling, a construction and demolition (C&D) recycling facility (which ceased in August 2005 due to capping commitments) and a civic amenity site (which ceased in December 2008 due to capping/operational commitments). Balleally Landfill closed to waste acceptance on 11th May 2012.

On January 8th 2003 Fingal County Council was licensed to carry out the following activities at Balleally Landfill, Lusk, Co. Dublin subject to twelve conditions.

The licensed activities under the IE amendment are:

11.5 Landfills, within the meaning of Section 5 (amended by Regulations 11(1) of the Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008 (S.I. No. 524 of 2008)) of the Act of 1996, receiving more than 10 tonnes of waste per day or with a total capacity exceeding 25,000 tonnes, other than landfills of inert waste.

11.1 The recovery or disposal of waste in a facility, within the meaning of the Act of 1996, which facility is connected or associated with another activity specified in this Schedule in respect of which a licence or revised licence under Part IV is in force or in respect of which a licence under the said Part is or will be required.

During 2015 Balleally Landfill continued to receive C&D for restoration purposes. Landfill gas is collected and converted to electricity.

E39 is the appropriate NACE code to describe activities undertaken in Balleally during 2015 – "Remediation activities and other waste management activities."

1.5 Local Environmental Conditions

The landfill site covers approximately 50 ha in total. The east face of the landfill is bordered by the Dublin-Belfast railway line and the southern boundary is the Rogerstown Estuary. See Figure 1, Drawing DE07-164-03-001, Appendix 1.

The former landfill facility was approx. 40ha. The extension to this facility to the north west of the site consists of 6 engineered / lined cells (approx. 10 Ha).

1.6 Environmental Monitoring

Environmental monitoring is carried out in accordance with licence conditions and is reported quarterly to the Agency. The quarterly reports include results, interpretation and a certificate of analysis. The original results certificates are not included again in this report. This report only presents summary data.

1.7 EPA Updated Reporting Requirements

Fingal County Council has prepared the annual environmental report in line with the new EPA 2013 draft reporting requirements "AER Draft Guidance Document: Annual Environmental Report: Standardised Reporting Guidance for all IPPC (Excluding Intensive Agriculture) and IED Licences". To this end a text document is being employed whereby the 2015 AER follows the same format as the summary template structure, where possible, and includes only information as required in the AER template. In some instances individual tabs from the AER Workbook are filled out and included as appendices to the text document. This allows Fingal County Council to streamline the AER process prior to the summary templates becoming mandatory in the coming years.

2 AIR EMISSIONS MONITORING

2.1 Landfill Gas Management – Stack Emissions

As per Schedule D.7.1 of IED Licence W0009-03 the licensee is required to carry out annual or periodic environmental monitoring of the Gas Combustion Plant/Enclosed Flare. Air Scientific Limited carried out the stack emissions monitoring on behalf of Fingal County Council and the results are presented in table 2.1. All results for 2015 were compliant with Emission Licence Values set out in the IED licence W0009-03.

Table 2-1: Stack Emission Results 2015

Emission reference no:	Parameter / Substance	Frequency of Monitoring	ELV in licence or any revision thereof	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence limit	Method of analysis	Annual mass load (kg)
Flare 1	CO	Annual	50	No 30min mean can exceed the ELV	8.72	mg/m3	Yes	EN15058:2006	N/A
Flare 1	NOX	Annual	150		67.83	mg/m3	Yes	EN14792:2006	N/A
Flare 1	Total volatile organic carbon	Annual	10		3.76	mgC/m3	N/A	EN12619:2013	N/A
Flare 1	HCL	Annual	50		0.67	mg/m3	Yes	EN1911:2010	N/A
Flare 1	HF	Annual	5		1.3	mg/m3	Yes	EN15713:2006	N/A
Flare 1	SO2	Annual	-		38.35	mg/m3	N/A	TGN21	N/A
BY01	Total particulate matter	Annual	130		<0.64	mg/m3	Yes	EN13284-1:2002	3.80
BY01	CO	Annual	1400		1311.79	mg/m3	Yes	EN15058:2006	7,423.64
BY01	NOX	Annual	500		245.82	mg/m3	Yes	EN14792:2006	1,401.88
BY01	Total VOCs	Annual	-		890.5	mg/m3	N/A	EN12619:2013	5095.44
BY01	HCL	Annual	50		0.32	mg/m3	Yes	EN1911:2010	1.8144
BY01	HF	Annual	5		0.47	mg/m3	Yes	EN15713:2006	3.024
BY01	TA Luft organics	Annual	20		<0.07	mg/m3	Yes	EN13649:2002	<0.4053

Emission reference no:	Parameter/ Substance	Frequency of Monitoring	ELV in licence or any revision thereof	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence limit	Method of analysis	Annual mass load (kg)
BY01	SO2	Annual	-	No 30min mean can exceed the ELV	675.17	mg/m3	N/A	TGN21	3,858.71
BY01	Volumetric flow	Annual	4500		1892	m3/hr	yes	EN16911:2013	N/A
BY02	Total particulate matter	Annual	130		<0.66	mg/m3	Yes	EN13284-1:2002	8.83
BY02	CO	Annual	1400		1224.75	mg/m3	Yes	EN15058:2006	15,844.48
BY02	NOX	Annual	500		251.23	mg/m3	Yes	EN14792:2006	3,283.21
BY02	Total VOCs	Annual	-		867.25	mgc/m3	N/A	EN12619:2013	11342.62
BY02	HCL	Annual	50		0.69	mg/m3	Yes	EN1911:2010	9.1416
BY02	HF	Annual	5		0.9	mg/m3	Yes	EN15713:2006	14.064
BY02	TA Luft organics	Annual	20		<0.07	mg/m3	Yes	EN13649:2002	<0.7276
BY02	SO2	Annual	-		661.66	mg/m3	N/A	TGN21	8,645.51
BY02	Volumetric flow	Annual	4500		1860	m3/hr	yes	EN16911:2013	N/A

Inlet	Total Sulphur	Annual	N/A		99.88	mg/m3	N/A	USPEA M16a	N/A
Inlet	Total Chlorine	Annual	N/A		0.12	mg/m3	N/A	US EPA Method 26	N/A
Inlet	Total Fluorine	Annual	-		0.12	mg/m3	N/A	BS ISO 15713	N/A

2.2 Dust Monitoring

Dust monitoring was carried out at 4 locations in accordance with Schedule D of the licence. The locations of these monitoring points are shown on Balleally Monitoring Locations Map, Appendix 1 .

Bergerhoff style gauges were used to determine total dust deposition levels at the site. Four gauges were set up so that the dust jars were at a height of at least 1.5 m above the ground and the jars were set in place during the monthly monitoring events. The samples were submitted to Alcontrol Laboratories Ltd for analysis of total dust contents.

2.2.1 Dust & PM_{10} Monitoring Results

The annual results for total dust deposition are presented in Table 2.1. PM10 monitoring results are shown in Table 2.2.

Table 2-2: Total Dust Deposition Results (mg/m²/day)

Monitoring Locations	May-June 2015	Aug-Sept 2015	Oct-Nov 2015
D1	10	13.8	4.3
D2	59.4	37.4	80.6
D3	85.8*	6.9	8.06
D4	9.44	28.2	93.5

*: D3 had error in sampling pot in Round 1 and was resampled in June-July 2015

Table 2-3: Total Dust PM_{10} Results (ug/m³)

Monitoring Locations	24 hour sampling start date	Average Concentration Value ug/m3 Q4 2015
PM1	24/11/2015	<30
PM2	25/11/2015	20
PM3	1/12/2015	38

2.2.2 Interpretation of Results

A full laboratory analysis of daily dust deposition was completed. The results indicate that during the monitoring period all results were under the licence limit of 350 mg/m³/day.

The PM10 limit (50 ug/M³) as set out in the IED Licence was not exceeded at any location during the monitoring period.

3 LANDFILL GAS MONITORING

The licence requires monthly monitoring of perimeter gas boreholes/vents/wells. The location of the 13 no. monitoring positions is shown on Balleally monitoring Locations Map, Appendix 1.

In addition to the perimeter landfill gas perimeter monitoring wells, two leachate monitoring wells (chosen at random) from each of the southern and eastern boundaries LMW1-LMW18 were also monitored. LMW1 – LMW18 boreholes are located on the landfill side of the vertical barrier wall.

It should be noted that boreholes LMW1-18 are leachate sampling wells in the waste body and not specifically designed for monitoring landfill gas.

In accordance with Table D.2.1 of the IED Licence, gas wells were monitored for Methane (CH_4), Carbon Dioxide (CO_2), Oxygen (O_2) and atmospheric pressure.

3.1 Monitoring Results

The gas (LFG) monitoring results were included in the 2015 quarterly reports submitted to the Agency.

3.2 Interpretation of Results

Methane results for the 2015 monitoring period were below the 1% v/v trigger level.

It was seen on a number of occasions across the monitoring locations that carbon dioxide level results were elevated above the 1.5% trigger level. C02 Exceedances were found at the following wells and notified to the EPA as incidents:

- January (GA3,GA5,GA8,GA12) (INCI006618), March (GA12)(INCI007213),
- April and June (GA12)(INCI007521), May (GA5, GA8, GA12, (INCI007640), June (GA3, INCI007823).
- July (GA3,GA7,GA12), August (GA3,GA4,GA7,GA12), September (GA3,GA4,GA7,GA12) under incidents INCI007823(GA3 and GA4), INCI007640 (GA7, GA12), INCI007521(GA12).
- October (GA3, GA7,GA12, GA13), November (GA3, GA7, GA12,GA13), December (GA7,GA12,GA13) under incidents INCI007823(GA3), INCI008183 (GA7), INCI007640(GA12 and subsequent updates, GA13).

Elevated concentrations of carbon dioxide can occur naturally at shallow depths of up to 2 m due to microbial activity associated with the roots of many types of vegetation.

No methane was recorded above the trigger levels at the gas well (GA10) adjacent to offsite receptors.

3.3 Conclusion

Methane levels were below the trigger level throughout the monitoring period. Carbon dioxide levels were measured in monitoring boreholes above trigger level of 1.5% v/v during monitoring events in 2015. This is believed to be due to natural sources and was monitored at levels very similar to previous year's data. As the landfill is so old, there is no baseline data to compare to.

Please refer to incidences tab of AER summary.

4 SURFACE WATER & LEACHATE MONITORING

This section of the Annual Environmental Report presents the:

- Surface water monitoring results
- Leachate monitoring results
- Sewer Gas monitoring results

As of April 2014, Fingal County Council commenced the discharge of leachate to sewer. Relevant information is included on water/wastewater tab of the AER summary sheet (Appendix 2).

4.1 Surface Water

Schedule D of the IED Licence specifies the monitoring to be carried out for licence compliance. The licence lists 7 no. surface water monitoring locations. Monitoring is currently carried out at S7, S3, SW20a at SWV1 as listed in the licence and at SWFD. The surface water monitoring locations are predominately upstream of the landfill footprint. The results of surface water monitoring is included in the Water_Wastewater tab of the AER summary template (Appendix 2).

There are 4 no. surface water monitoring locations, in addition to those listed in the licence, that are monitored by Fingal County Council as part of an ongoing investigation into surface water quality. These locations are located on site and are part of the surface water management system. Surface water outfalls from the southern boundary of the site are also monitored on a quarterly basis.

Results are discussed in body of text here and results are presented as annual mean in the water/waste water tabs are in the AER. The individual results were reported in the Quarterly Reports.

4.2 Surface Water Monitoring

The sample locations can be seen in Drawing Balleally Monitoring Locations Map, Appendix 1.There are 5 no. surface water monitoring locations.

SWFD
Discharges to an open drain immediately west of the entrance to the wastewater treatment plant.

SWV1
The surface water discharge at the Western Point Surface Water Outfall – The samples are collected in the open channel immediately upstream of the discharge pipe/cut-off flap.

S3
This sampling point is located on a stream to the north east edge of the landfill site prior to its discharge to the estuary.

S7
This sampling point is located upstream of the site on the stream to the north of the landfill site.

SW20a
This sampling point is located at a drainage ditch to the east of Rogerstown Lane, close to the north-eastern tip of the landfill. It is currently bunged and does not discharge to the estuary.

4.3 Surface Water Monitoring Results

The visual assessment results and the full surface water analysis datasets as issued by the Laboratory have been previously submitted in the individual quarterly reports during the reporting period.

Annualised data for each of the 5 no. surface water monitoring locations is included in the water/wastewater tab of the AER summary sheet.

4.4 Interpretation of Surface Water Results

The surface water results have been compared to maximum admissible concentrations (MAC) as outlined in the Surface Water Regulations, 1989. It can be seen from the results that over the course of the year, several parameters were elevated above the MAC.

The parameters examined were chosen because they are likely indicators of leachate impact, but they also may demonstrate impact by other sources, such as sewage or the nearby estuary.

Historic monitoring of the surface water at Balleally indicates evidence of contamination by leachate. Fingal County Council has been implementing mitigation measures, see following section for more detail.

Contamination of surface water was detected at SWVI during 2015: Ammoniacal Nitrogen BOD, COD, TSS, Chloride, Sulphate and Electrical Conductivity were all recorded at levels above the MAC. These elevated results are attributed to surface water contamination near the offices at the entrance to the facility where the capping programme and vertical barrier are yet to be completed.

For the monthly S3 sample analysis, BOD results were recorded above the MAC on 4 occasions in February, August, September and November. COD results were elevated above the MAC in September sampling. TSS were recorded as elevated in November. Ammoniacal Nitrogen was above the MAC for A1 waters at S3 throughout the year. Results overall are similar to 2014.

S7 is an upstream site. Ammoniacal N was elevated above MAC in Q1, Q2. Electrical conductivity levels varied throughout the monitoring period below the MAC for the year. Ammoniacal N was elevated above MAC in Q1, Q2. As it is upstream of the site, it is likely that agri pollution may contribute to these elevated readings. Others parameters have remained relatively stable and below MACs in 2015.

SW20A was dry during Q2 and Q3. Electrical conductivity was above the MAC in Q1, Q4. Ammoniacal nitrogen and COD were elevated during Q1 and Q4. Total Suspended Solids were elevated during Q4.

BOD was seen to be above the MAC at SWFD in Q2 and Q4 and below the MAC for the period Q1 and Q3. COD and TSS were above the MAC at SWFD in Q4. Other parameters remained below MACs throughout the monitoring period.

In summary, Ammoniacal nitrogen levels were elevated across all sites at most sampling times during the monitoring period, ranging between <0.2 mg/l to 59.2 mg/l, suggesting potential landfill impact. The other results on sites SWV1 and SW20a as discussed above also suggest potential leachate influence.

Trigger levels were agreed with the Agency for Ammoniacal nitrogen for four surface water outfalls to the estuary (OF1-OF4). Samples were compliant with this trigger level when sampled quarterly in 2015.

4.4.1 Additional Surface Water Monitoring

Additional surface water monitoring was carried out on-site in 2015 at 6" pump chamber, SWV1, SWMH7 and P2. Additional monitoring of the leachate sump are also included in the 'additional surface water monitoring'. These monitoring points are all locations on site, within the existing surface water management system. Surface water is currently pumped from the area outside the landfill gate into P2 chamber. This bottom of this chamber is located at original ground height. Water is pumped from it to SWV1 via SWMH7. The additional monitoring is part of an investigation into contamination at SWV1.

The construction of a vertical barrier wall along the northern boundary of the facility will commence in April 2016. The design of this VBW is to isolate leachate from surface water, leading to improvements in surface water quality at SWV1.

The results of additional monitoring conducted during 2015 were included in each of the quarterly reports submitted to the Agency.

Interpretation of additional surface water monitoring results

The surface water contamination incidents noted above were notified to The Agency through EDEN (Ref INCI 007429; and subsequent updates) and is being managed through CI 000992.

4.4.2 Surface Water Improvements

A review of surface water contamination at the site is ongoing since August 2011. Fingal County Council committed to continuing additional monitoring at P2, SWV1, SWMH7 and at surface water outfalls OF1-OF4 and submitted two reports to the Agency entitled *"WOO-09-03-SWV1-010.pdf, SWV1 Trigger Level Proposal and Loading Report"* and *"Report OF1-OF4-009.pdf, Trigger Level and Nutrient Loading From OF1 to OF4 off Southern Boundary"* respectively. The former proposal was rejected by the Agency pending further investigations and the latter was accepted.

The ongoing capping programme and final restoration of the landfill may help alleviate surface water contamination at SWV1 which is sourced near the entrance to the site. This is evident particularly at additional surface water monitoring locations P2, SWMH7 and SWV1. The proposed shallow vertical barrier surrounding the facility will be completed at the entrance as part of the closure plan which will contain any breakouts that may occur and may alleviate surface water contamination at SWV1. The programme of works relating to remedial measures to address contamination of surface water in this area is being managed through Compliance Investigation CI 000992.

Remedial works were first undertaken during Q2, 2009 and again in Q1, 2012 to protect the surface water drain/ditch in the vicinity of SW20A. A 50 m length of the drain/ditch was excavated and cleaned prior to lining with low-permeability clay and a HDPE liner pinned and stabilised to the underlying clay bank. These two layers of impermeable material serve to minimise inputs into the drainage ditch. The ditch adjacent to SW20a was re-graded with stone fill, which allows the movement of water through the gravel. A manhole access point was built to facilitate visual assessment and the required periodic environmental sampling. Consequently there is no flow into the estuary from SW20a as the outfall point is bunged.

The shallow vertical barrier proposed at the site entrance is in the process of is scheduled to begin construction in April 2016.

4.4.3 Conclusions

Surface water results indicate that water quality is impacted by both the landfill (which is both a dilute and disperse landfill and an engineered designed landfill) and the nearby estuary, in terms of salinity sources from the estuary.

Fingal County Council has and continues to undertake additional measures in relation to monitoring and on-site works to mitigate the impact in consultation with the EPA.

4.5 Leachate Monitoring

Prior to April 2014, leachate was tankered off-site to a wastewater treatment plant. As of April 2014, leachate can be discharged to sewer. In 2015, leachate was discharged to sewer and was tankered off site. Monitoring of discharge to sewer is as per Technical Amendment B, Schedule C. Relevant information is therefore included on water/wastewater tab of the AER summary sheet.

4.5.1 Leachate Treatment Plant

Operation of the leachate treatment plant was suspended during Q2, 2009. During 2009, FCC applied for a full licence review for the site. The licence review was seeking to remove Chemical Oxygen Demand (COD) as a leachate treatment plant parameter and to raise the ELV levels for some of the other leachate treatment plant parameters. This application was withdrawn and a technical amendment was sought to facilitate discharge to sewer. Technical Amendment B to Industrial Emissions Licence provides for the discharge of leachate to a sewer on Rogerstown Lane 14/03/2015 and this commenced early in April 2014.

4.5.2 Bund / Pipeline Testing

Condition 3.11 of W0009-03 governs Tank and Drum Storage Areas and the need for testing of same. All tanks are rendered impervious to the materials stored therein as per condition 3.11.1. Condition 3.11.2 stipulates that all tank and drum storage areas are to be bunded either locally or remotely, to a volume not less than the greater of the following:

(a) 110% of the capacity of the largest tank or drum within the bunded area; or
(b) 25% of the total volume of substance which could be stored within the bunded area.

There are two areas on site (Landfill Gas Utilisation Plant & Leachate Treatment Plant) that are remotely bunded in the sense that as per Condition 3.11.3 the drainage from these bunded areas can be diverted for collection and safe disposal – back through the leachate treatment plant and through the leachate storage and treatment tanks.

The Leachate storage and treatment tanks are inspected by Irish Industrial Tanks Limited. As per condition 3.11.5 The Leachate and Storage Tanks are inspected at least once every three years. They were last tested in November 2014 – Storage tanks T1a, T1b, SBR1, SBR2, T4, T5 and PFT were found to be satisfactory following inspection for structural and liquid integrity. The next integrity assessment is due February 2016. The inspection reports are available for inspection at the site offices.

Please see bund testing in AER Summary Sheet (Appendix 2).

4.5.3 Water Balance and Leachate Transfers

A water balance for the reporting period has been prepared and is included as Table 4.1. The water balance calculation is derived from EPA Landfill Manuals “Landfill Site Design” (EPA, 2000; p59) and indicates that there was 22,636 m^3 of leachate was produced at the landfill. Infiltration rate used was 5% for capped areas and 25% for temporary capped areas.

The combined total of leachate removed from site (Tankered and Pumped) was 27,742m^3. The volume of leachate tankered off-site was greater than that estimated as generated in the water balance, but some contaminated water pumped to plant may account for this.

Table 4.1: Water Balance Calculation for Balleally Landfill 2015

Month	Leachate Tankered Offsite	Water Balance Calculation	Rainfall	Rainfall	Old landfill	Capped	IR	Temp	IR	New landfill	Capped
	m^3	m^3	mm	m	m^2	m^2	%	m^2	%	m^2	m^2
January[1]	2927	1229	47.7	0.0477	345028	332,528	5	12,500	25	120,359	120,359
February[1]	2934	892	34.6	0.0346	345,028	332,528	5	12,500	25	120,359	120,359
March[1]	2296	1482	57.5	0.0575	345028	332,528	5	12,500	25	120,359	120,359
April[2]	1978	1131	43.9	0.0439	345,028	332,528	5	12,500	25	120,,359	120,,359
May[2]	2664	2332	90.5	0.0905	345,028	332,528	5	12,500	25	120,359	120,359
June[2]	2340	363	14.1	0.0141	345028	332,528	5	12,500	25	120,359	120,359
July[2]	1534	1783	69.2	0.0692	345,028	332,528	5	12,500	25	120,359	120,359
August[2]	1414	2580	100.1	0.1001	345028	332,528	5	12,500	25	120,359	120,359
September[2]	1344	1459	56.6	0.0566	345,028	332,528	5	12,500	25	120,359	120,359
October[2]	1462	1265	49.1	0.0491	345,028	332,528	5	12,500	25	120,359	120,359
November[2]	1252	3134	121.6	0.1216	345,028	332,528	5	12,500	25	120,359	120,359
December[2]	5597	4986	193.5	0.1935	345,028	332,528	5	12,500	25	120,359	120,359
	27742	22636	**878.4**	0.8784							

Old Landfill Capped + New Landfill Capped + Old Landfill Temp Cap.

Leachate Produced Landfill = {(.8784 * 345028 *.05) + (.8784 * 120359*.05) + (.8784 * 12500 * .25)

Leachate Produced Landfill m3		**22,636**	
Leachate Tankered [1] and Pumped[2] Off-Site		**27,742**	

4.5.4 Leachate levels

A trigger level of 5.5 meters above ordnance datum (m AOD) for wells between LMW1 to LMW18 and LMW30 to LMW34 has been established to indicate an elevated head of liquid in the landfill. Leachate was recorded above the trigger level at a number of locations, highlighted in Figure 4.1.

Leachate levels in LMW5, LMW6 LMW31, and LMW32 were above the trigger level for the year. Leachate levels in LMW33 was above the trigger level for the majority of months of the year. LMW9 was above the trigger level for three months of the year.

All of the wells (LMW31, LMW5, LMW6, LMW32, LMW33 and LMW9) which exceed the trigger are located beside one another on the southern boundary of the site.

There was one exceedance of the leachate trigger level in LMW18 in January 2015. There were no exceedances of the trigger level in leachate monitoring wells LMW10, LMW12, LMW13, LMW14, LMW34, LMW16, LMW30 and L24.

The level of the vertical barrier is 6m and this level was exceeded at a number of wells along the southern boundary(LMW5, LMW6 and LMW9), which are set back from the vertical barrier by approximately 20 m. LMW30, LMW31, LMW32 and LMW33, which are adjacent to the vertical barrier recorded leachate levels below 6m during the year. No leachate breakouts were evident along the southern boundary. These incidences were reported to the Agency through EDEN (INCI007410 and subsequent updates). Ammoniacal nitrogen levels at monitored surface water outfalls (OF1-OF4) were below trigger levels when monitored.

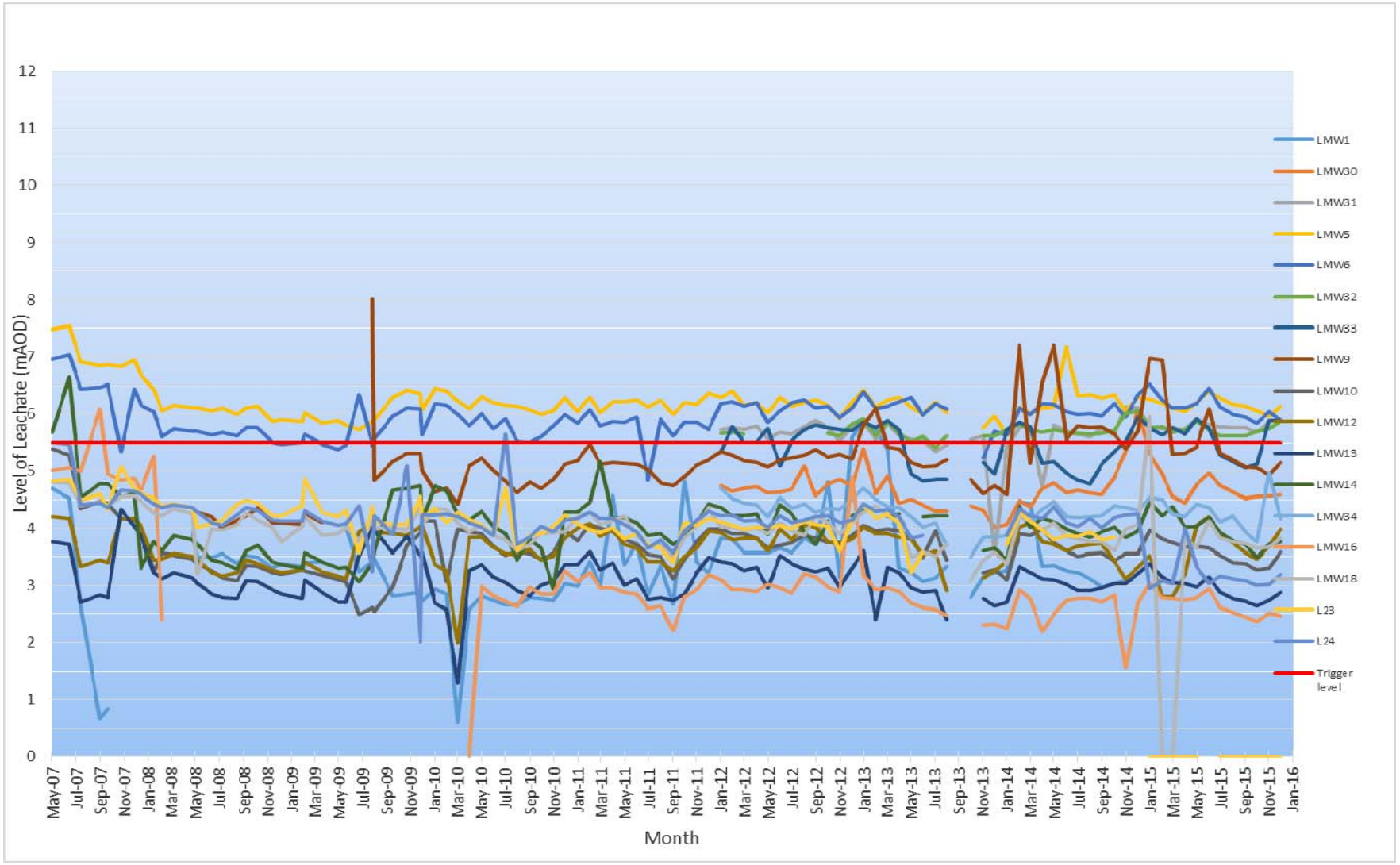


Figure 4.1: Monthly Level of Leachate Recorded in the landfill 2007-2015

4.5.5 Leachate Quality

This section presents a summary of the chemical results. The results for leachate monitoring were included in the quarter 4 report to the Agency. The pumping chamber receives leachate from a number of different locations on-site. As it collects leachate from a number of different areas over the site it is representative of general leachate quality over a greater time period than the individual grab samples from each of the leachate wells. The pumping chamber collects leachate from:

- Pipe 1A – New cells
- Pipe 1B – Old northern boundary
- Pipe 1C – Southern boundary

It is noted that the results for the southern boundary are slightly more concentrated, than the results along the eastern boundary. While variations are noted, the leachate quality is typical of leachate sampled from large landfills, as outlined in the Landfill Operational Practices Guidance Manual, EPA 1997 and EPA Manual on Landfill Site Design (2000).

4.6 Sewer Gas Monitoring

Sewer gas monitoring commenced in 2014 when Fingal County Council was granted permission to pump leachate to sewer, as per Technical Amendment B of the Industrial Emissions Licence, approved by the Agency on 12/03/2014.

The monitoring location is at a manhole on Rogerstown Lane.

The annualised results for monthly monitoring of the wastewater discharge are included in the Water_Wastewater tab in the AER Summary Sheet (Appendix 2).

The sewer gas was compliant on all monitoring occasions, below the Methane daily mean concentration limit of 0.5%v/v.

5 GROUNDWATER MONITORING

This section of the Annual Environmental Report presents the findings of groundwater monitoring. Please also refer to the GW/Soil tab of the AER summary sheet. Balleally Landfill, unlike other landfills e.g. Dunsink Landfill (Reg. No; W0127-01) did not receive a Technical Amendment to its licence relating to the provisions of Article 12 of the European Communities Environmental Objectives (Groundwater) Regulation 2010. The landfill is located in an estuarine setting and not currently mapped as overlaying a groundwater body. The downgradient groundwater monitoring borehole is in an estuarine setting.

5.1 Monitoring Locations

Groundwater monitoring was carried out at the locations shown on Drawing Balleally Monitoring Locations Map, Appendix 1. As part of a previous extension to the landfill a number of the boreholes stipulated in W0009-03 are no longer accessible. During July 2004 a revised monitoring schedule was agreed with the Environmental Protection Agency (EPA) on which the present monitoring is based. Details of the groundwater locations now monitored are presented in Table 5.1.

Monitoring location MB18 is located up-gradient, approximately 535 m north of the landfill on private agricultural land. Access to the monitoring location was not granted during the monitoring period.

Table 5-1: Groundwater Monitoring Locations

Station	Classification	Easting	Northing
MB18	Eastern Up gradient	323 245	252 783
RC3	Western Up gradient	321 906	252 729
MB35	South western Down gradient	322 029	251 906
CD1	Control Drain N/W of Cell 1	322 008	252 356

Location Description

Borehole MB35
This borehole is situated approximately 190 m south of the landfill on the edge of the Inner Rogerstown Estuary, downgradient of the landfill.

Location CD1
The control drain sampling location CD1 is situated approximately 30 m south of Balleally Lane west of the landfill extension. This drain collects groundwater from underneath the newly constructed lined cells.

MB18
This is an upgradient private well of Rogerstown House which lies to the north east of the landfill site along the estuary. No access permitted.

RC3
This upgradient borehole is situated approximately 535 m north of the landfill on private agricultural land.

5.1.1 Monitoring Parameters

Groundwater levels were monitored and a visual assessment was performed on a monthly basis at all groundwater wells.

Groundwater monitoring location CD1 is sampled monthly and analysed for quarterly groundwater parameters, listed in Table D.5.1 of the IED Licence and the results are presented in the GW-Soil tab of the AER. MB35 and RC3 are sampled quarterly and analysed for quarterly groundwater parameters, listed in Table D.5.1 of the IED Licence.

The results of quarterly groundwater monitoring undertaken for CD1, MB35 and RC3 were included in each of the quarterly reports to the Agency. Annualised and maximum results are presented in the GW-Soil tab of the AER summary templates. (Appendix 2).

5.2 Interpretation of Results

The groundwater results have been compared to the relevant Interim Guideline Value (IGV) set out in the EPA report '*Towards Setting Guideline Values for the Protection of Groundwater in Ireland'.* It should be noted that the groundwater beneath the landfill is likely to be estuarine in nature and would not generally be considered to be potable water.

The groundwater quality at RC3 upgradient of the landfill. Ammoniacal nitrogen and Chloride was above the IGV in Q3. Whilst Ammoniacal nitrogen and total suspended solids have shown an upward trend in the last 5 years of data at RC3, ammoniacal N levels have fallen since 2014 and have remained below the MAC in Q1,Q2,Q4 in 2015. Chloride was above the IGV in Q3. This parameter has been on a downward trend overall in the past 5 years.

The groundwater quality in CD1, which monitors the quality of groundwater from underneath the lined cells shows that the groundwater is influenced both by saltwater and leachate from the unlined portion of the site. Ammoniacal N levels, conductivity and chloride levels are elevated above the MAC throughout 2015. The 5 year trend shows that the levels of all parameters are decreasing with the exception of conductivity, chloride and total suspended solids.

The groundwater quality at MB35 has shown very gradually rising trend in Chloride and electrical conductivity levels in the last 5 year trend. Ammoniacal Nitrogen was above MAC throughout 2015. Ammoniacal nitrogen show a rising 5 year trend. Groundwater at MB35 is impacted by the landfill, but given its location, the water at MB35 is highly influenced by saline water from the estuary and this has a large influence on sampling and results.

5.3 Conclusion

Groundwater results indicate that groundwater quality upgradient of the landfill is impacted by local activities and quality on and downgradient of the landfill is impacted by both the landfill (which is both dilute and disperse landfill and an engineered designed landfill) and the nearby estuary (saline intrusion from the estuary).

6 FINANCIAL PROVISIONS

Condition 12.2 of the licence requires the establishment of a fund to implement the Restoration and Aftercare Plan. Fingal County Council has provided in its accounts a reserve for the restoration of the site which amounted to €7,900,761 on 31/12/2015.

See ELRA tab from AER summary templates.doc in Appendix 2.

7 ENVIRONMENTAL MANAGEMENT PROGRAMME

7.1 Environmental Objectives and Targets for 2015

See EMP tab from AER summary templates.doc in Appendix 2.

7.2 Environmental Objectives and Targets for 2016

See EMP tab from AER summary templates.doc in Appendix 2.

7.3 Summary of written procedures

There were no new written procedures during the reporting period. The application process for applying for clay tickets was put up online at:

http://www.fingalcoco.ie/environment/rubbish-and-recycling/landfills/

7.4 Communications Programme for Public Information

The Communications Programme for Fingal County Council contains information on Balleally Landfill. The information can roughly be divided into two areas. Background information prior to granting of IED Licence, and information concerning the waste licence and IED Licence (W009-02 & 03). There is also a register of correspondence to and from the Agency, along with the various correspondences relevant to the Licence. This information was updated on a continuous basis. During Q1 2013, a change came about in that correspondence with The Agency was almost exclusively sent through a new online web based system called EDEN. Most correspondence between the Agency and the Licensee must now be accessed through this system.

Environmental Information can be viewed at the following locations:

- At the Council's Headquarters between 9.30 a.m. and 12.45 p.m. and 2.00 p.m. and 4.00 p.m. Monday to Friday (excluding public holidays), unless otherwise arranged by prior appointment.
- Permanent facilities for viewing information including a computer to be provided at Balleally Landfill.
- At Balleally Landfill by prior appointment with the Landfill Manager.
- Since March 2013, Licence Reports have been submitted through, stored on and available through the Environmental Protection Agency's Website; www.epa.ie or reporting portal, EDEN.

Site Visits

- Site visits to Balleally Landfill can be arranged by writing to the Landfill Manager requesting the date and time of the proposed visit and indicating the number of visitors and the purpose of such a visit and whether any presentation is required. The use of cameras and video equipment during the visit must be agreed in advance with Fingal County Council.
- Such requests will be accommodated where possible.

Balleally Landfill Liaison Committee

Information relating to the restoration and aftercare of Balleally Landfill is presented to the Liaison Committee for comment and adoption. Members of the committee during 2015 were comprised of:

- Six members of Balleally Residents and Farmers Association / Rush Community Council.
- Seven elected members of Fingal County Council.
- Six Fingal County Council officials.

The Committee met four times during 2015; 10/2/2015, 12/5/2015, 14/7/2015 and 10/11/2015. Agendas were set and minutes kept.

7.5 Management Structure

The facility is owned and operated by Fingal County Council. The Environmental Services Department of Fingal County Council manage the landfill facility. A description of the current management structure was sent to the agency through Eden in 2015 and is available for inspection at site offices and in County Hall.

7.6 Staff Training

Staff from Fingal County Council completed training in 2015 in various aspects of environmental management to improve their skills in operation and management of Balleally Landfill. Details are in table 7.1 below.

Table 7.1 Staff Training 2015

Staff Member	Position	Training completed
Mr. James Walls	Senior Executive Engineer	Postgraduate Diploma in Environmental Protection
Mr. David Devine	Landfill Manager, Executive Engineer	Module on Contaminated Land as part of an MSc in Civil Engineering
Mr. David Devine	Landfill Manager, Executive Engineer	Module on Project Management as part of an MSc in Civil Engineering
Mr. David Devine	Landfill Manager, Executive Engineer	Course in Project Management Professional by PMI
Mr. James Walls, Mr. Moritmer Loftus	Senior Executive Engineer, Executive Scientist	Closed Landfills Workshop organised by the EPA 28/04/15
Mr. Mortimer Loftus	Executive Scientist	1 day course on lone working and risk assessment
Mr. Mortimer Loftus	Executive Scientist	1 day course on Assessments in Environmental law

8 NOISE MONITORING

An Annual Noise Survey was undertaken on 16th March 2015 in order to assess the existing noise emissions from the site and to establish the existing noise environment at potentially sensitive receptors near the site in accordance with Schedule D of IED Licence W0009-03. Noise monitoring was carried out during daytime hours. The location of noise monitoring points can be seen in Figure Balleally Monitoring Locations map, Appendix 1.

Noise measurements were taken for 30 minutes at each location.

8.1 Monitoring Results

Fingal County Council sought and obtained Approval from the EPA to reduce noise monitoring from Quarterly to Annually. An Annual Noise monitoring report was submitted to the Agency in 2015. The result of this monitoring event is included on the Noise tab from AER summary templates.doc in Appendix 2.

Table 8-1: Noise Monitoring Results 2015

Location	Daytime 16/3/2015			
	Sample Time	LAeq, 30 Min (dB)	LA10, 30 min (dB)	LA90, 30 min (dB)
NM1	12:20	**64.83**	61.35	38.92
NM2	14:45	45.35	47.76	39.42
NM3	15:21	51.79	51.6	43.29
NM4	14:05	**55.59**	53.17	37.98
NM5	12:59	53.28	46.92	35
Noise Emission Limit Value	**55db**			

8.1.2 Interpretation of Results

There were two locations where the EPA limit of 55 dB (A) for daytime noise was breached. The LAeq values recorded at NM2, NM3 and NM5 were compliant with the limit value of 55 dB(A). It was observed that locations NM1, NM4 exceed the limit value of 55 dB(A). NM1, NM4 presented elevated noise levels between 55 and 65 dB(A) during this period. These noise levels were contributed to by primarily off-site noise sources.

Off-site noise sources included heavy road traffic (passing between ramps) along the Balleally local road, load bird-song, distant road traffic and overhead planes. On site noise sources were not clearly audible from NM1 and NM4.

At these two locations, the LAeq value and LA10 value are very similar showing that the LAeq value is being influenced by short, loud events occurring for less than 3 minutes of the 30 minute monitoring periods. Therefore, off-site noise sources such as road traffic rather than on-site sources are the contributory noise sources of the shorter time noise metrics. The site noise was described as faint at these two locations and is better described by the LA90 values which are less than 55 dB(A).

On analysis, No tonal characteristics were found and the LAeq values are not required to be penalised. Therefore rated levels are not required to be presented for these locations.

9 RESOURCE USAGE

See Resource-Energy tab from AER summary templates.doc in Appendix 2.

Resources consumed at Balleally Landfill include diesel fuel, electricity, hydraulic oil and lubricating oil. Table 9.1 presents a summary of the quantities of each used on site for the period of this report. Electricity consumed on site was used for the purpose of heating, lighting, the operation of office equipment and the leachate treatment plant. The largest consumer of electricity was the leachate treatment plant until it was mothballed during 2009. There was a sustained and significant drop in energy usage since 2008 peak, with an increase through 2013 - 2015 associated with new pumping arrangements from the Leachate Treatment Plant. Water consumption was higher in 2015 than in 2014, this may have been associated with a leaking main which has been detected and repaired.

Table 9-1: Summary of resources used on site 2015

Resource	FCC	BPS
Electricity	95,690 KWh	1,428
Diesel Fuel *	25,922	1,440
Lube Oil		27,830
Water	6,843 m3	

*Estimates based on average weekly usage

Table 9-2: Electricity consumption on site for the period January 2000 to December 2015

Year	Site	Site	Leachate Treatment Plant	KWHr Total
2015	Ceased	54,100	41,590	95,690
2014	Ceased	50,170	29,086	79,256
2013	Ceased	67,450	7.457	74,906
2012	Ceased	58,075	7 ,423	65,498*
2011	Ceased	59,100*	5,109*	64,209*
2010	Ceased	71,575*	6,460*	78,035*
2009	Ceased	82,950*	101,367*	184,317*
2008	1,832*	91,350*	202,739*	295,921*
2007	1,726*	84,900*	202,669*	289,295*
2006	2,109*	97,600*	73,420*	173,129*
2005	1,033*	115,050*	N/R	15,050*
2004	NR	66,250*	N/R	66,250*
2003	NR	NR	N/R	89,155 @
2002	NR	NR	N/R	76,529 @
2001	NR	NR	N/R	55,453 @
2000	NR	NR	N/R	49,016 @

* Data derived from Website for three accounts registered to Balleally.

- N/R: Accounts not set up at these times.
- @ Data sourced from AER 2006.

Note:

1) There was a significant increase in electricity consumption in the period 2006 – 2008, from previous years as can be observed from Table. This was attributable to the operation of site leachate treatment plant. The decrease in 2009 was attributable to the mothballing of the leachate treatment plant. The leachate treatment plant remained closed during 2011 and 2012.

2) The electricity consumption increased each year from 2000 (exception 2004) to 2008 and decreased through to 2011. 2011 decrease may in part be due to milder winter (less heating), direr conditions (less pumping) and the move from an automated to manual wheel wash. Electricity consumption was stable during 2012. There was an increase during 2013 to 2015, associated with pumping from the Leachate Treatment plant. Water consumption was higher in 2015 than in 2014, this may have been associated with a leaking main which has been detected and repaired.

See Waste tab from AER summary templates.doc in Appendix 2.

Table 9-3: Equipment and Plant list at Balleally Landfill and quantities 2015

Type of Item	Item	Quantity
Transport	05 D 81788 Isuzu 4X4*	1
	02D76224 mazda	1
	06 D 80671 Caddy Van*	1
	04 D 62989 Canteen*	1
	Minidigger	1
Plant	04 D 64948 John Deere 4X4 Tractor*	1
	07 D 7332 Same Tractor*	1
Heavy Plant		1
	Cat excavator 330* / Dozer Package	1
	30 Ton Vibrating Roller*	1
	Diesel H/P power washer and Bowser*	1
Auxiliary Plant	CONSAW*	1
	6 inch pump*	1
	6.5 KVA diesel generator*	1
Survey	Sokkisna level and tripod*	1
	Sokkisna theodolite & Tripod*	1
	NIKON auto level*	1
	Garmen GPS*	1
	GMI gas monitor*	1
	GAS DATA LMSXi	1
Type of Item	**Item**	**Quantity**
	GMI FI 2000*	1
	30 Metre steel Tape*	1
	30m dip meter*	1
	Various P.C.s and printers*	1

9.1 Landfill gas utilisation

See Table 7 on the Waste tab from AER summary templates.doc in Appendix 2.

Landfill gas is collected by means of a series of wells and a collection pipe network in the waste body. The gas is pumped through two main lines to the site utilisation plant. The utilisation plant comprises three generators grouped into two operating units AER1 and AER3.

The total power output from the station for the period is shown in Table 9.4 & Table 9.5. Currently sufficient gas is being extracted to run 2 of the 3 engines on a continuous basis.

Table 9-4: Electricity output (MWhr) from the on-site power station at Balleally Landfill per year 2003-2015

YEAR	ELECTRICITY OUTPUT (MWhr)
2003	30,194
2004	21,636
2005	21,234*
2006	20,529*
2007	23,762
2008	27,117
2009	25,429
2010	21,909
2011	20,534
2012	20,928
2013	16,693
2014	13,679
2015	10,812

* Corrected data for 2005-2006 reported by Bioverda Power Systems.

Table 9-5: Electricity output (MW) from the on-site power station at Balleally Landfill 2015

Month	Combined BY01-BY03 (MWhrs)
January	1,045
February	905
March	1,044
April	952
May	993
June	884
July	803
August	783
September	812
October	852
November	851
December	888
Total	**10,812**

10 ENVIRONMENTAL INCIDENTS & COMPLAINTS

Please See Complaints and Incidents tab from AER summary templates.doc in Appendix 2.

11 WASTE SUMMARY

Please refer to the Waste tab of the AER summary sheet (Appendix 2).

The landfill closed to waste acceptance in 2012.

37,890 t of C&D was accepted at the site in 2015 for closure and restoration works.

27,742 m3 of leachate was transferred off-site in 2015.

12,034,536 m3 of landfill gas was captured on site for utilisation in the landfill gas engines.

11.1 Remaining Landfill Capacity

The landfill is closed to waste acceptance.

12 METEOROLOGICAL MONITORING

Condition 8 and Schedule D.6.1 of IED Licence W0009-03 require daily monitoring of precipitation volume, temperature (max. /min.), wind force and direction, and atmospheric pressure, Evaporation and Atmospheric humidity.

July and August were warmest with the highest maximum mean monthly temperatures. Monthly Rainfall was highest during November and December when highest volumes of rainfall were recorded. The site was predominantly affected by south westerly winds. Evaporation and potential evapo-transpiration were highest in June and July.

Meteorological data is obtained from Met Eireann for Dublin Airport's Met. Station. Please see table 12.1 below for monthly averages of this data. Other meteorological parameters and daily data are available to view in Fingal County Hall and on site.

Table 12-1: Mean Monthly Data for meteorological parameters: Dublin Airport (Source Met Eireann)

Year	Month	Mean Temperature (C)	Total Rainfall (mm)	Mean MSL Pressure (hpa)	Mean Wind Speed (Knots)	Mean Evaporation mm	PE mm	Mean Atmospheric Humidity %
2015	1	4.7	47.7	999	15.1	0.7	16.3	85.7
2015	2	4	34.6	1005	10.8	0.8	15.9	87.1
2015	3	5.8	57.5	1008	12.9	1.9	37.8	80.3
2015	4	7.4	43.9	1010	9.4	2.9	56.2	79.6
2015	5	9.6	90.5	1002	12.6	3.6	68.8	79.4
2015	6	12.9	14.1	1008	10.5	4.6	92.2	73.4
2015	7	13.8	69.2	1002	10.5	3.7	78.0	78.8
2015	8	14	100.1	1001	9.2	3.4	73.2	79.5
2015	9	11.8	56.6	1007	9	2.2	46.1	83.4
2015	10	10.2	49.1	1006	8.6	1.2	27.3	85.5
2015	11	8.7	121.6	1000	13.6	0.9	19.4	87.8
2015	12	8.6	193.5	998	14.9	0.8	20.1	85.1

13 SITE DEVELOPMENT WORKS

13.1 Work carried out in the reporting period 2015

Table 13-1: Work carried out during 2015

Objective / Target	Description	Timescale
Objective 1	**To minimise environmental impact on the immediate environment**	
Target 1	To determine mitigation measures to deal with surface water contamination at SW20a. Some work completed on ditch by SW20a to separate contaminated water from local drainage.	Ongoing
Target 2	To continue to monitor Ammoniacal Nitrogen levels at OF1-OF4 in line with agreed trigger levels.	Ongoing.
Target 3	To investigate sources of SW contamination in landfill and propose mitigation measures to The Agency. Continue monthly monitoring of catchment of SWV1.	Ongoing.
Target 4	To Commence Leachate Recirculation in Cells 5 & 6.	Completed.
Objective 2	**Restoration of the facility.**	
Target 1	Capping of North East Slopes	**Completed.**
Target 1	Grass seeding of capped areas ongoing;	**Ongoing**
Target 2	Vertical barrier wall design and tendering process.	**Complete**
Target 3	Install 2 KM Service Road on top of landfill	**Complete**

Works for next reporting period (2016)

Table 13-2: Works to be carried out during 2016

Objective / Target	Description	Timescale
Objective 1	**To minimise environmental impact on the immediate environment**	
Target 1	Award Construction contract and complete vertical barrier at the northern boundary.	2016
Target 2	Replacement / Rehabilitation of surface water and foul lines, manholes and pumps in area between Gas Utilisation Plant and Site Offices.	2016/2017
Target 3	To determine final mitigation measures to deal with surface water contamination at SW20a and propose Specified Engineering Works if required.	2016/2017
Target 4	Address remaining flooding issue at Entrance to Site.	2016/2017
Target 5	Final Capping of area around Site Offices / Gas Compound.	2016
Objective 2	**Restoration of the facility**	
Target 1	Revise Restoration and Aftercare Plan	2016
Target 2 Target 3	Grass seeding of capped areas Install Footpaths	2016 2016

13.2 Progress on Site Restoration

The Restoration and Aftercare Plan for the landfill was submitted in July 2003 as per condition 4.1. This plan sets out a framework to successfully restore Balleally Landfill to a condition suitable for use as an amenity for the general public. The plan has been prepared in accordance with the EPA Landfill manual 'Landfill Restoration and Aftercare' (1999), the Council Directive (1999/31/EC) on the Landfill of Waste and IED Licence W0009-02 & -03. Restoration is being undertaken at Balleally Landfill using a phased approach due to the size of the site and seasonal constraints. On completion of restoration in each phase, the aftercare plan to establish and maintain the after use of the site shall be implemented.

Capping of the site is as per Condition 4.3. The geotextile alternative was investigated and agreed in early 2004 with the EPA. This decreased the number of vehicle movements required for importing soil for the final cap.

Figure 2, Appendix 1, indicates the agreed phases for the capping and restoration of Balleally Landfill. The phasing provides for the restoration of the original landfill initially, and then the landfill extension area. Capping was concentrated in Phase 6 during 2015.

The total area for capping is 46.5 Hectares approx.

Between 2004 and December 2014, approx. 45.25 Hectares were capped. During 2015, an additional 1ha Hectare approx. (GCL) was capped, mainly in Phase 6. The majority of the "Old Landfill" is capped and the new landfill is now 100% capped. A total of 46.25 Hectares is now capped.

This equates to 97.8% of the entire landfill area to be capped. The remaining capping area is the old Landfill (1ha approx. – centred Landfill Gas Plant and Area outside site Offices).

13.2.2 Inert waste to be used for cover/restoration material at the facility

An estimate of soils required for the final capping of the landfill is as follows:

- Expected subsoil tonnages for restoration = 1,180,000 tonnes
- Expected topsoil tonnages for restoration = 580,000 tonnes

This estimate does not take into account any soil requirements for levelling off the contours prior to the placement of the final capping. However, it is expected that material on the landfill site (berms etc.) will be used which will limit the importation of soil/clay.

See below statistics of capping programme:

Start Date of Capping Programme: May 2004
Progress as of 31st December 2015: 46.25 ha approx.

The final capping profile is made up of:

1. Topsoil layer of 300 mm thickness.
2. Subsoil layer of 700 mm thickness.
3. Geocomposite Drainage Layer (GDL).
4. Geosynthetic Clay Liner (GCL) / LLDPE membrane liner on New Cells.
5. Geocomposite Gas Collection (GGCL).

A map showing the current extent of capping is included in Appendix 1.

13.3 Annual Topographical Survey

Condition 8.5.1 of WL W0009-03 requires an annual Topographical Survey to be undertaken in Balleally Landfill. The last full topographic survey was completed Q4 2015, issued on 4/1/2016 and is available to view on site or in Fingal County Hall.

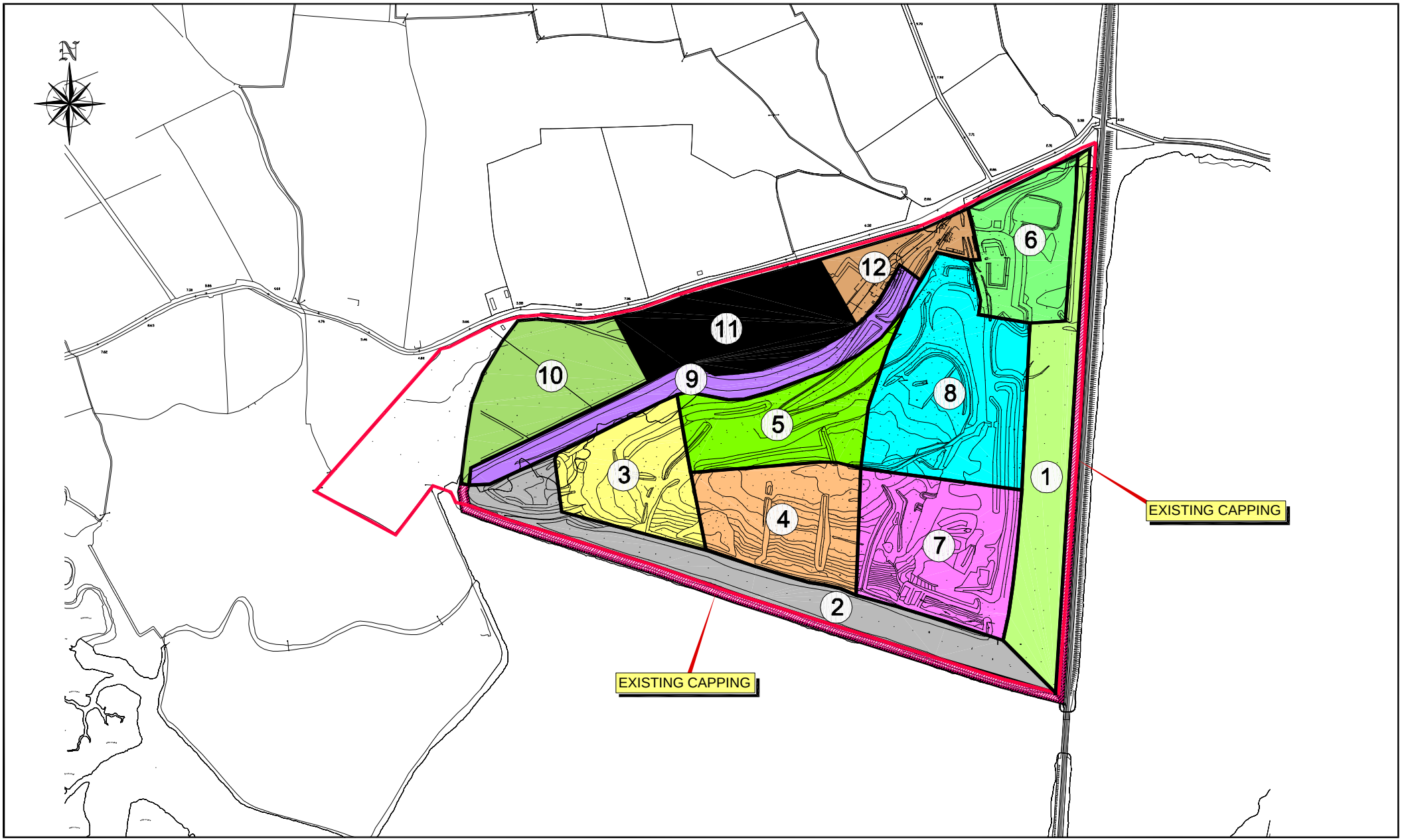
13.4 Slope Stability

As required under Licence Condition 8.8.1. a slope stability survey was undertaken in Balleally Landfill in December 2015. The report will be submitted to the Agency.

The conclusions and recommendations in the survey report are noted and will be implemented.

APPENDIX 1

DRAWINGS



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No.	Date	By	Amendments
A04	May'03	HF	RE-ISSUED FOR APPROVAL
A03	Apr'03	RH	RE-ISSUED FOR APPROVAL
A02	Nov'02	GDB	RE-ISSUED FOR APPROVAL
A01	Oct'02	SBG	ISSUED FOR APPROVAL

Job: BALLEALLY LANDFILL RESTORATION AND AFTERCARE PLAN

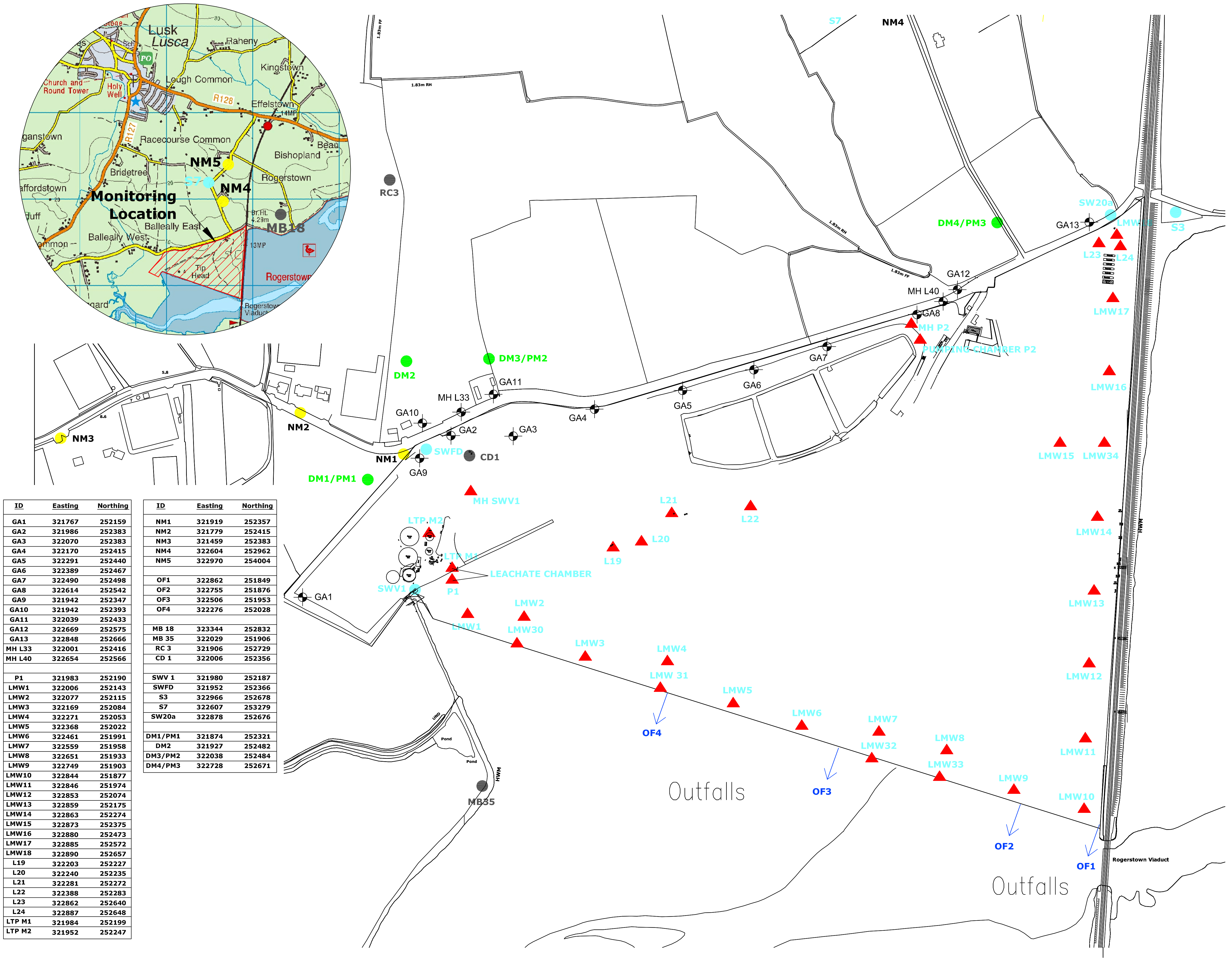
Title: RESTORATION PHASING

Drawn:	HF
Checked:	HD
Approved:	CB
Scale:	1:7500
Date:	Oct'02

File Ref.: 149507002FG0300

Drawing No.: FIG 3.0

Rev.: A04



ID	Easting	Northing
GA1	321767	252159
GA2	321986	252383
GA3	322070	252383
GA4	322170	252415
GA5	322291	252440
GA6	322389	252467
GA7	322490	252498
GA8	322614	252542
GA9	321942	252347
GA10	321942	252393
GA11	322039	252433
GA12	322669	252575
GA13	322848	252666
MH L33	322001	252416
MH L40	322654	252566
P1	321983	252190
LMW1	322006	252143
LMW2	322077	252115
LMW3	322169	252084
LMW4	322271	252053
LMW5	322368	252022
LMW6	322461	251991
LMW7	322559	251958
LMW8	322651	251933
LMW9	322749	251903
LMW10	322844	251877
LMW11	322846	251974
LMW12	322853	252074
LMW13	322859	252175
LMW14	322863	252274
LMW15	322873	252375
LMW16	322880	252473
LMW17	322885	252572
LMW18	322890	252657
L19	322203	252227
L20	322240	252235
L21	322281	252272
L22	322388	252283
L23	322862	252640
L24	322887	252648
LTP M1	321984	252199
LTP M2	321952	252247

ID	Easting	Northing
NM1	321919	252357
NM2	321779	252415
NM3	321459	252383
NM4	322604	252962
NM5	322970	254004
OF1	322862	251849
OF2	322755	251876
OF3	322506	251953
OF4	322276	252028
MB 18	323344	252832
MB 35	322029	251906
RC 3	321906	252729
CD 1	322006	252356
SWV 1	321980	252187
SWFD	321952	252366
S3	322966	252678
S7	322607	253279
SW20a	322878	252676
DM1/PM1	321874	252321
DM2	321927	252482
DM3/PM2	322038	252484
DM4/PM3	322728	252671

KEY

Symbol	Description
NSL1	Noise Monitoring Location
AD1	Dust Monitoring Location
OF1	Outfall Location
3d	Groundwater Monitoring Location
SW1	Surface Water Monitoring
MG1	Gas Well Monitoring Locations
LM1	Leachate Monitoring Locations

Rev.	Drawn	Chk'd	App'd	Date	Description
B	TM	DD	BG	10.01.08	ISSUE FOR INFORMATION
A	MMcC	DD	BG	05.07.07	ISSUE FOR INFORMATION

Name of Client: Fingal County Council

Name of Job: ENVIRONMENTAL MONITORING BALLEALLY

Title of Drawing: ENVIRONMENTAL MONITORING LOCATIONS

Scales Used: 1:2500 A1 / 1:5000 A3

Dwg. No.: DE07-164-03-001 Rev.: B

Dublin

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APPENDIX 2

AER SUMMARY TEMPLATES

Facility Information Summary	
AER Reporting Year	2015
Licence Register Number	W0009-03
Name of site	Balleally Landfill
Site Location	Balleally, Lusk, County Dublin.
NACE Code	E39
Class/Classes of Activity	11.1, 11.5
National Grid Reference (6E, 6 N)	E322500 N252200

A description of the activities/processes at the site for the reporting year. This should include information such as production increases or decreases on site, any infrastructural changes, environmental performance which was measured during the reporting year **and an overview of compliance with your licence** listing all exceedances of licence limits (where applicable) and what they relate to e.g. air, water, noise.

Activity during 2015 was mostly linked to landfill restoration. Capping with Geosynthetic Clay Liner and Imported clay and C&D materials (EWC 17 01 07 and 17 05 04). Leachate was mostly pumped to Portraine Waste Water Treatment Plant. Landfill Gas was collected and converted to electricity. There were 10 incidents notified during 2015, six relating to landfill gas exceedances of CO2 trigger level, two relating to leachate levels, one relating to surface water contamination and one relating to volumes of leachate discharged to sewer.

Declaration:

All the data and information presented in this report has been checked and certified as being accurate. The quality of the information is assured to meet licence requirements.

M. Jeffers	23/3/16
Signature Group/Facility manager (or nominated, suitably qualified and experienced deputy)	Date

AIR-summary template	Lic No:	W0009-03	Year	2015

Answer all questions and complete all tables where relevant

			Additional information
1	Does your site have licensed air emissions? If yes please complete table A1 and A2 below for the current reporting year and answer further questions. If **you do not have** licenced emissions and **do not complete a solvent management plan** (table A4 and A5) you do not need to complete the tables	Yes	Please refer to Chapter 2 of word report for Air Emission Results

Periodic/Non-Continuous Monitoring

2	Are there any results in breach of licence requirements? If yes please provide brief details in the comment section of TableA1 below		
3	Was all monitoring carried out in accordance with EPA guidance note AG2 and using the basic air monitoring checklist? Basic air monitoring checklist AGN2	Yes	

Table A1: Licensed Mass Emissions/Ambient data-periodic monitoring (non-continuous)

Emission reference no:	Parameter/ Substance	Frequency of Monitoring	ELV in licence or any revision therof	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence limit	Method of analysis	Annual mass load (kg)	Comments - reason for change in % mass load from previous year if applicable
BY01, BY03, Flare	volumetric flow	Annual		No 30min mean can exceed the ELV		SELECT		OTH	NA	
BY01	Carbon monoxide (CO)	Annual		No 30min mean can exceed the ELV		mg/Nm3		EN 15058:2004		
BY03	Carbon monoxide (CO)	Annual		No 30min mean can exceed the ELV		mg/Nm3		EN 15058:2004		
Flare 1	Carbon monoxide (CO)	Annual		No 30min mean can exceed the ELV		mg/Nm3		EN 15058:2004		
BY01	Nitrogen oxides (NOx/NO2)	Annual		No 30min mean can exceed the ELV		mg/Nm3		OTH		
BY03	Nitrogen oxides (NOx/NO2)	Annual		No 30min mean can exceed the ELV		mg/Nm3		OTH		
Flare 1	Nitrogen oxides (NOx/NO2)	Annual		No 30min mean can exceed the ELV		mg/Nm3		OTH		
BY01	TA Luft organic substances class 1	Annual		No 30min mean can exceed the ELV		mg/Nm3		EN 13649:2001	NA	
BY03	TA Luft organic substances class 1	Annual		No 30min mean can exceed the ELV		mg/Nm3		EN 13649:2001	NA	
BY01	Particulate matter (PM10)	Annual		No 30min mean can exceed the ELV		mg/Nm3		OTH		
BY03										
Flare 1										

Note 1: Volumetric flow shall be included as a reportable parameter

z

AIR-summary template	Lic No:	W0009-03	Year	2015

Continuous Monitoring

4	Does your site carry out continuous air emissions monitoring?	No	
	If yes please review your continuous monitoring data and report the required fields below in Table A2 and compare it to its relevant Emission Limit Value (ELV)		
5	Did continuous monitoring equipment experience downtime? If yes please record downtime in table A2 below		
6	Do you have a proactive service agreement for each piece of continuous monitoring equipment?	SELECT	
7	Did your site experience any abatement system bypasses? If yes please detail them in table A3 below	SELECT	

Table A2: Summary of average emissions -continuous monitoring

Emission reference no:	Parameter/ Substance	ELV in licence or any revision therof	Averaging Period	Compliance Criteria	Units of measurement	Annual Emission	Annual maximum	Monitoring Equipment downtime (hours)	Number of ELV exceedences in current reporting year	Comments
	SELECT			SELECT	SELECT					
	SELECT				SELECT					
	SELECT				SELECT					
	SELECT				SELECT					
	SELECT				SELECT					

note 1: Volumetric flow shall be included as a reportable parameter.

Table A3: Abatement system bypass reporting table

Bypass protocol

Date*	Duration** (hours)	Location	Reason for bypass	Impact magnitude	Corrective action

* this should include all dates that an abatement system bypass occurred

** an accurate record of time bypass beginning and end should be logged on site and maintained for future Agency inspections please refer to bypass protocol link

AIR-summary template	Lic No:	W0009-03	Year	2015

Solvent use and management on site

8	Do you have a total Emission Limit Value of direct and fugitive emissions on site? if yes please fill out tables A4 and A5	SELECT

Table A4: Solvent Management Plan Summary Total VOC Emission limit value

Solvent regulations — Please refer to linked solvent regulations to complete table 5 and 6

Reporting year	Total solvent input on site (kg)	Total VOC emissions to Air from entire site (direct and fugitive)	Total VOC emissions as %of solvent input	Total Emission Limit Value (ELV) in licence or any revision therof	Compliance
					SELECT
					SELECT

Table A5: Solvent Mass Balance summary

	(I) Inputs (kg)	(O) Outputs (kg)						
Solvent	(I) Inputs (kg)	Organic solvent emission in waste	Solvents lost in water (kg)	Collected waste solvent (kg)	Fugitive Organic Solvent (kg)	Solvent released in other ways e.g.	Solvents destroyed onsite	Total emission of Solvent to air (kg)
							Total	

AER Monitoring returns summary template-WATER/WASTEWATER(SEWER) Lic No: W0009-03 Year 2015

			Additional information
1	Does your site have licensed emissions direct to surface water or direct to sewer? If yes please complete table W2 and W3 below for the current reporting year and answer further questions. If **you do not have** licenced emissions you only need to complete table W1 and or W2 for storm water analysis and visual inspections	Yes	27,742m3 of leachate was removed from site during 2015. 330 m3 was tankered to Ringsend WWTP and the remainder went to Portrane WWTP.
2	Was it a requirement of your licence to carry out visual inspections on any surface water discharges or watercourses on or near your site? If yes please complete table W2 below summarising only any evidence of contamination noted during visual inspections	Yes	

Table W1 Storm water monitoring

Location reference	Location relative to site activities	PRTR Parameter	Licenced Parameter	Monitoring date	ELV or trigger level in licence or any revision thereof*	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence	Comments
SWV1	downstream		pH	2015	5.5-8.5	all deviate from the s	7.85	pH units	yes	
SWV1	downstream		Temperature		**No abnormal change**	N/A	12.52	degrees C	yes	
SWV1	downstream		Ammoniacal Nitrogen		0.23	N/A	16.99	mg/L	no (if no please enter details in comments box)	Contaminated surface water and potentially groundwater are impacting SWV1. Mitigation works underway
SWV1	downstream		Chloride		250	N/A	141.38	mg/L	yes	
SWV1	downstream		BOD		≤2.6	N/A	2.32	mg/L	yes	
SWV1	downstream		COD		40	N/A	48.12	mg/L	no (if no please enter details in comments box)	
SWV1	downstream		Suspended Solids		50	All values < ELV	66.75	mg/L	no (if no please enter details in comments box)	as above
SWV1	downstream		Dissolved Oxygen		**No abnormal change**	N/A	6.46	mg/L	yes	
SWV1	downstream		Conductivity		1	N/A	1.48	mS/cm @20°C	no (if no please enter details in comments box)	as above
SWFD	downstream		pH	2015	5.5-8.5	all deviate from the s	8.118	pH units	yes	
SWFD	downstream		Temperature		**No abnormal change**	N/A	12.775	degrees C	yes	
SWFD	downstream		Ammoniacal Nitrogen		0.23	N/A	0.200	mg/L	yes	
SWFD	downstream		Chloride		250	N/A	22.500	mg/L	yes	
SWFD	downstream		BOD		≤2.6	N/A	2.330	mg/L	yes	
SWFD	downstream		COD		40	N/A	27.200	mg/L	yes	
SWFD	downstream		Suspended Solids		50	N/A	39.500	mg/L	yes	
SWFD	downstream		Dissolved Oxygen		**No abnormal change**	N/A	8.273	mg/L	yes	
SWFD	downstream	SELECT	Conductivity		1	N/A	0.666	mS/cm @20°C	yes	
S3	downstream		pH		5.5-8.5	all deviate from the s	8.195	pH units	yes	
S3	downstream		Temperature		**No abnormal change**	N/A	12.400	degrees C	yes	
S3	downstream		Ammoniacal Nitrogen		0.23	N/A	1.358	mg/L	no (if no please enter details in comments box)	Presented within text of AER
S3	downstream		Chloride		250	N/A	56.225	mg/L	yes	
S3	downstream		BOD		≤2.6	N/A	1.448	mg/L	yes	
S3	downstream		COD		40	N/A	18.300	mg/L	yes	
S3	downstream		Suspended Solids		50	N/A	17.000	mg/L	yes	
S3	downstream		Dissolved Oxygen		**No abnormal change**	N/A	7.940	mg/L	yes	
S3	downstream		Conductivity		1	N/A	0.764	mS/cm @20°C	yes	
S7	upstream		pH	2015	5.5-8.5	all deviate from the s	8.203	pH units	yes	
S7	upstream		Temperature		**No abnormal change**	N/A	14.025	degrees C	yes	
S7	upstream		Ammoniacal Nitrogen		0.23	N/A	0.263	mg/L	no (if no please enter details in comments box)	Presented within text of AER
S7	upstream		Chloride		250	N/A	55.375	mg/L	yes	
S7	upstream		BOD		≤2.6	N/A	1.388	mg/L	yes	
S7	upstream		COD		40	N/A	27.825	mg/L	yes	
S7	upstream		Suspended Solids		50	N/A	16.125	mg/L	yes	
S7	upstream		Dissolved Oxygen		**No abnormal change**	N/A	6.130	mg/L	yes	
S7	upstream		Conductivity		1	N/A	0.718	mS/cm @20°C	yes	
SW20a	offsite		pH	2015	5.5-8.5	all deviate from the s	8.240	pH units	yes	
SW20a	offsite		Temperature		**No abnormal change**	N/A	11.150	degrees C	yes	
SW20a	offsite		Ammoniacal Nitrogen		0.23	N/A	12.245	mg/L	no (if no please enter details in comments box)	Presented within text of AER
SW20a	offsite		Chloride		250	N/A	90.700	mg/L	yes	
SW20a	offsite		BOD		≤2.6	N/A	2.270	mg/L	yes	
SW20a	offsite		COD		40	N/A	53.850	mg/L	no (if no please enter details in comments box)	Presented within text of AER
SW20a	offsite		Suspended Solids		50	N/A	34.000	mg/L	yes	
SW20a	offsite		Dissolved Oxygen		**No abnormal change**	N/A	5.870	mg/L	yes	
SW20a	offsite	SELECT	Conductivity		1	N/A	1.230	mS/cm @20°C	no (if no please enter details in comments box)	Presented within text of AER

*trigger values may be agreed by the Agency outside of licence conditions

Table W2 Visual inspections-Please only enter details where contamination was observed.

Location Reference	Date of inspection	Description of contamination	Source of contamination	Corrective action	Comments
S3	11/11/2005	Turbidity light brown after high rainfall, turbidity above regulatory limit of 50mg/l	offsite	N/A	Discussed in quarterly reports
SWV1	Ongoing	Issues with elevated Ammoniacal Nitrogen throughout the sampling year	site	Vertical Barrier wall is being constructed to address contamination issue at source near P2 manhole	Presented within text of AER

Licensed Emissions to water and /or wastewater(sewer)-periodic monitoring (non-continuous)

Was there any result in breach of licence requirements? If yes please provide brief details in the comment			No	
Was all monitoring carried out in accordance with EPA guidance and checklists for Quality of Aqueous Monitoring Data Reported to the EPA? If no please detail what areas require improvement in additional	External /Internal Lab Quality checklist	Assessment of results checklist	Yes	

AER Monitoring returns summary template-WATER/WASTEWATER(SEWER) Lic No: W0009-03 Year 2015

Table W3: Licensed Emissions to water and /or wastewater (sewer)-periodic monitoring (non-continuous)

Emission reference no:	Emission released to	Parameter/ SubstanceNote 1	Type of sample	Frequency of monitoring	Averaging period	ELV or trigger values in licence or any revision therof[Note 2]	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence	Method of analysis	Procedural reference source	Procedural reference standard number	Annual mass load (kg)	Comments
T4	Wastewater/Sewer	pH	discrete	Monthly	Monthly	6.0-10.0	All values < ELV	7.84	pH units	yes	pH Meter (Electrode)	Manufacturer method			
T4	Wastewater/Sewer	Temperature	discrete	Monthly	Monthly	42	All values < ELV	13.37	degrees C	yes	pH Meter (Electrode)	Manufacturer method			
T4	Wastewater/Sewer	Conductivity	discrete	Monthly	Monthly	N/A	All values < ELV	6.35	mS/Cm		Conductivity Meter (Electrode)	Manufacturer method			
T4	Wastewater/Sewer	BOD	discrete	Monthly	Monthly	150	All values < ELV	13.19	mg/L	yes	Filtered by Oxygen Meter on liquids	UK SCA "Blue Book" series		365,847,625	
T4	Wastewater/Sewer	COD	discrete	Monthly	Monthly	1100	All values < ELV	400.67	mg/L	yes	Dr Lange Kit	ISO		11,115,294,667	
T4	Wastewater/Sewer	Ammoniacal Nitrogen as NH3	discrete	Monthly	Monthly	800	All values < ELV	423.67	mg/L	yes	Kone Analyser	B.S. (British Standard)		11,753,360,667	
T4	Wastewater/Sewer	Suspended Solids	discrete	Monthly	Monthly	800	All values < ELV	17.43	mg/L	yes	TSS in waters	B.S. (British Standard)		483,404,350	
T4	Wastewater/Sewer	Ortho-phosphate (as PO4)	discrete	Monthly	Monthly	10	All values < ELV	3.00	mg/L	yes	Kone spectrophotometric Analysers	US EPA		83,103,473	
T4	Wastewater/Sewer	Sulphate	discrete	Monthly	Monthly	1000	All values < ELV	251.67	mg/L	yes	Kone spectrophotometric Analysers	US EPA		6,981,736,667	
T4	Wastewater/Sewer	Chromium (diss.filt)	discrete	Monthly	Monthly	0.3	All values < ELV	0.05	mg/L	yes	ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry)	APHA / AWWA "Standard Methods"		1,352,654	
T4	Wastewater/Sewer	Copper (diss. Filt.)	discrete	Monthly	Monthly	0.5	All values < ELV	0.00	mg/L	yes	ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry)	APHA / AWWA "Standard Methods"		56,770	
T4	Wastewater/Sewer	Nickel (diss.filt.)	discrete	Monthly	Monthly	0.5	All values < ELV	0.05	mg/L	yes	ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry)	APHA / AWWA "Standard Methods"		1,420,853	
T4	Wastewater/Sewer	Zinc (diss. Filt.)	discrete	Monthly	Monthly	1.5	All values < ELV	0.01	mg/L	yes	ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry)	APHA / AWWA "Standard Methods"		373,222	
T4	Wastewater/Sewer	mineral oil >C10 C40 (aq)	discrete	Monthly	Monthly	10	All values < ELV	<0.01	mg/L	yes	EPH in waters	Other (please specify)	Petroleum Hydrocarbons in	277,420	
T4	Wastewater/Sewer	TPH/Oils & Greases	discrete	Monthly	Monthly	100	All values < ELV	1.88	mg/L	yes	IR spectroscopy	Other (please specify)	HMSO London	52,224,315	
T4	Wastewater/Sewer	Chloride	discrete	Monthly	Monthly	10	All values < ELV	585.33	mg/L	yes	Kone Spectrophotometric Analysers	US EPA		16,238,317,333	
T4	Wastewater/Sewer	MTBE	discrete	Monthly	Monthly	5	All values < ELV	0.0023	mg/L	yes	GCMS (Gas Chromatography Mass Spectroscopy)	US EPA		62,604	
T4	Wastewater/Sewer	Benzene	discrete	Monthly	Monthly	5	All values < ELV	<0.001	mg/L	yes	GCMS (Gas Chromatography Mass Spectroscopy)	US EPA		27,742	
T4	Wastewater/Sewer	Toluene	discrete	Monthly	Monthly	5	All values < ELV	<0.001	mg/L	yes	GCMS (Gas Chromatography Mass Spectroscopy)	US EPA		27,742	
T4	Wastewater/Sewer	Ethylbenzene	discrete	Monthly	Monthly	5	All values < ELV	<0.001	mg/L	yes	GCMS (Gas Chromatography Mass Spectroscopy)	US EPA		27,742	
T4	Wastewater/Sewer	m,p-Xylene	discrete	Monthly	Monthly	5	All values < ELV	0.00	mg/L	yes	GCMS (Gas Chromatography Mass Spectroscopy)	US EPA		2,705	
T4	Wastewater/Sewer	o-Xylene	discrete	Monthly	Monthly	5	All values < ELV	<0.001	mg/L	yes	GCMS (Gas Chromatography Mass Spectroscopy)	US EPA		27,742	
T4	Wastewater/Sewer	Sum of Detected Xylenes	discrete	Monthly	Monthly	5	All values < ELV	0.00	mg/L	yes	GCMS (Gas Chromatography Mass Spectroscopy)	US EPA		0	
T4	Wastewater/Sewer	Methane is headspace	discrete	Monthly	Monthly	0.50%	All values < ELV	0.00	%	yes	Gas meter	Manufacturer method		0	

Note 1: Volumetric flow shall be included as a reportable parameter

Note 2: Where Emission Limit Values (ELV) do not apply to your licence please compare results against EQS for Surface water or relevant receptor quality standards

Continuous monitoring

		Additional Information
Does your site carry out continuous emissions to water/sewer monitoring?	Yes	Flow, pH temperature and dissolved methane
If yes please summarise your continuous monitoring data below in Table W4 and compare it to its relevant		
Did continuous monitoring equipment experience downtime? **If yes please record downtime in table W4 below**	No	
Do you have a proactive service contract for each piece of continuous monitoring equipment on site?	Yes	Instrumentation was fitted in 2014
Did abatement system bypass occur during the reporting year? **If yes please complete table W5 below**	SELECT	

Table W4: Summary of average emissions -continuous monitoring

Emission reference no:	Emission released to	Parameter/ Substance	ELV or trigger values in licence or any revision	Averaging Period	Compliance Criteria	Units of measurement	Annual Emission for current reporting year (kg)	% change +/- from previous reporting year	Monitoring Equipment downtime (hours)	Number of ELV exceedences in reporting year	Comments
	SELECT	SELECT		SELECT	SELECT	SELECT					
	SELECT	SELECT		SELECT	SELECT	SELECT					

note 1: Volumetric flow shall be included as a reportable parameter.

AER Monitoring returns summary template-WATER/WASTEWATER(SEWER) Lic No: W0009-03 Year 2015

Table W5: Abatement system bypass reporting table

Date	Duration (hours)	Location	Resultant emissions	Reason for bypass	Corrective action*	Was a report submitted to the EPA?	When was this report submitted?
						SELECT	

*Measures taken or proposed to reduce or limit bypass frequency

Bund/Pipeline testing template

Lic No: W0009-03 Year 2015

Bund testing

dropdown menu click to see options

		Additional information
1	Are you required by your licence to undertake integrity testing on bunds and containment structures ? if yes please fill out table B1 below listing all **new bunds and containment structures** on site, in addition to **all bunds which failed** the integrity test-**all bunding structures which failed including mobile bunds must be listed in the table below, please include all bunds outside the licenced testing period** (mobile bunds and chemstore included)	Yes	Please refer to section 4.5.2. in AER Text Document.
2	Please provide integrity testing frequency period	3 years	Completed Nov 2014, due again by Nov 2017.
3	Does the site maintain a register of bunds, underground pipelines (including stormwater and foul), Tanks, sumps and containers? (containers refers to "Chemstore" type units and mobile bunds)	Yes	
4	How many bunds are on site?	7	Please refer to section 4.5.2. in AER Text Document.
5	How many of these bunds have been tested within the required test schedule?	Yes	Please refer to section 4.5.2. in AER Text Document.
6	How many mobile bunds are on site?		
7	Are the mobile bunds included in the bund test schedule?	SELECT	
8	How many of these mobile bunds have been tested within the required test schedule?		
9	How many sumps on site are included in the integrity test schedule?		
10	How many of these sumps are integrity tested within the test schedule?		
	Please list any sump integrity failures in table B1		
11	Do all sumps and chambers have high level liquid alarms?	SELECT	
12	If yes to Q11 are these failsafe systems included in a maintenance and testing programme?	SELECT	
13	Is the Fire Water Retention Pond included in your integrity test programme?	SELECT	

Table B1: Summary details of bund /containment structure integrity test

Bund/Containment structure ID	Type	Specify Other type	Product containment	Actual capacity	Capacity required*	Type of integrity test	Other test type	Test date	Integrity reports maintained on site?	Results of test	Integrity test failure explanation <50 words	Corrective action taken	Scheduled date for retest	Results of retest(if in current reporting year)
T1a	prefabricated	Leachate Holding Tank	Leachate	1043		Structural assessment		19/11/2014	Yes	Pass		SELECT		
T1b	prefabricated	Leachate Holding Tank	Leachate	1043		Structural assessment		19/11/2014	Yes	Pass				
SBR1	prefabricated	Leachate Holding Tank	Leachate	2129		Structural assessment		19/11/2014	Yes	Pass				
SBR2	prefabricated	Leachate Holding Tank	Leachate	2129		Structural assessment		19/11/2014	Yes	Pass				
T4	prefabricated	Leachate Holding Tank	Leachate	1043		Structural assessment		19/11/2014	Yes	Pass				
T5	prefabricated	Leachate Holding Tank	Leachate	341		Structural assessment		19/11/2014	Yes	Pass				
PFT	prefabricated	Leachate Holding Tank	Leachate	115		Structural assessment		19/11/2014	Yes	Pass		SELECT		

* Capacity required should comply with 25% or 110% containment rule as detailed in your licence

		Commentary
	Has integrity testing been carried out in accordance with licence requirements and are all structures tested in line with BS8007/EPA Guidance? bunding and storage guidelines	SELECT	
16	Are channels/transfer systems to remote containment systems tested?	SELECT	
17	Are channels/transfer systems compliant in both integrity and available volume?	SELECT	

Pipeline/underground structure testing

1	Are you required by your licence to undertake integrity testing* on underground structures e.g. pipelines or sumps etc ? if yes please fill out table 2 below listing all underground structures and pipelines on site **which failed the integrity test and all which have not been tested withing the integrity test period as specified**	SELECT	
2	Please provide integrity testing frequency period	SELECT	

*please note integrity testing means water tightness testing for process and foul pipelines (as required under your licence)

Table B2: Summary details of pipeline/underground structures integrity test

Structure ID	Type system	Material of construction:	Does this structure have Secondary containment?	Type of secondary containment	Type integrity testing	Integrity reports maintained on site?	Results of test	Integrity test failure explanation <50 words	Corrective action taken	Scheduled date for retest	Results of retest(if in current reporting year)
	SELECT	SELECT	SELECT	SELECT	SELECT	SELECT	SELECT				SELECT

Please use commentary for additional details not answered by tables/ questions above

	Environmental Liabilities template	Lic No:	W0009-03
	Click here to access EPA guidance on Environmental Liabilities and Financial provision		
1	ELRA initial agreement status	Required but not submitted	See Sec 53A Response for Year Ending 31/12/2012
2	ELRA review status	Review required and not completed;	See Sec 53A Response for Year Ending 31/12/2012
3	Amount of Financial Provision cover required as determined	Specify	See Sec 53A Response for Year Ending 31/12/2012
4	Financial Provision for ELRA status	SELECT	See Sec 53A Response for Year Ending 31/12/2012
5	Financial Provision for ELRA - amount of cover	Specify	
6	Financial Provision for ELRA - type	Other please specify	Fingal County Council has provided in its accounts a reserve for the restoration of the which amounted to €7,900,761 on 31/12/2015
7	Financial provision for ELRA expiry date	Enter expiry date	
8	Closure plan initial agreement status	Required but not submitted	
9	Closure plan review status	Review required and not completed	
10	Financial Provision for Closure status	Required but not submitted	
11	Financial Provision for Closure - amount of cover	Specify	
12	Financial Provision for Closure - type	Other please specify	Fingal County Council has provided in its accounts a reserve for the restoration of the which amounted to €7,900,761 on 31/12/2015
13	Financial provision for Closure expiry date	Enter expiry date	Reserve set annually

	Environmental Management Programme/Continuous Improvement Programme template				Lic No:	W0009-03	Year	2015
	Highlighted cells contain dropdown menu click to view				Additional Information			
1	Do you maintain an Environmental Mangement System (EMS) for the site. If yes, please detail in additional information			Yes	Schedule of the Environmental Objectives & Targets			
2	Does the EMS reference the most significant environmental aspects and associated impacts on-site			Yes	2015 saw a focus on capping in the North Eastern portion of the landfill (Phase 6)			
3	Does the EMS maintain an Environmental Management Programme (EMP) as required in accordance with the licence requirements				See below			
4	Do you maintain an environmental documentation/communication system to inform the public on environmental performance of the facility, as required by the licence							
	Environmental Management Programme (EMP) report							
	Objective Category	Target	Status (% completed)	How target was progressed	Responsibility	Intermediate outcomes		
	Reduction of emissions to Water	Complete Vertical Barrier	80	Procurement Process almost completed this year.	Section Head	Installation of infrastructure		
	Reduction of emissions to Water	Replace / Rehabilitate Surface Water pipes / Manholes	80	Procurement Process almost completed this year.	Section Head	Installation of infrastructure		
	Reduction of emissions to Wastewater	Replace / Rehabilitate Foul Water pipes / Manholes	80	Procurement Process almost completed this year.	Section Head	Installation of infrastructure		
	Reduction of emissions to Water	Complete Capping	80	Procurement Process almost completed this year.	Section Head	Installation of infrastructure		

Groundwater/Soil monitoring template	Lic No:	W0009-03	Year	2015

			Comments	
1	Are you required to carry out groundwater monitoring as part of your licence requirements?	yes		Please provide an interpretation of groundwater monitoring data in the interpretation box below or if you require additional space please include a groundwater/contaminated land monitoring results interpretaion as an additional section in this AER
2	Are you required to carry out soil monitoring as part of your licence requirements?	no		
3	Do you extract groundwater for use on site? If yes please specify use in comment section	no		
4	Do monitoring results show that groundwater generic assessment criteria such as GTVs or IGVs are exceeded or is there an upward trend in results for a substance? If yes, please complete the Groundwater Monitoring Guideline Template Report (link in cell G8) and submit separately through ALDER as a licensee return AND answer questions 5-12 below. Groundwater monitoring template	Yes		This landfill has unlined cells built to a dilute and disperse sepcification. There is evidence of an upward trend in ammonical nitrogen in CD1 a groundwater well on site and in MB35 a downgradient well in the estuary. Conductivity and chloride levels in these wells are impacted by saline water as well as potentially by leachate. There is an upward trend in ammonical N levels at the upgradient monitoring point.
5	Is the contamination related to operations at the facility (either current and/or historic)	yes	Groundwater quality is influenced by leachate from the unlined portion of the landfill and also by saline intrusion.	
6	Have actions been taken to address contamination issues?If yes please summarise remediation strategies proposed/undertaken for the site	yes	See text of AER	
7	Please specify the proposed time frame for the remediation strategy	SELECT	See text of AER	
8	Is there a licence condition to carry out/update ELRA for the site?	SELECT	See text of AER	
9	Has any type of risk assesment been carried out for the site?	N/A	See text of AER	
10	Has a Conceptual Site Model been developed for the site?	N/A	See text of AER	
11	Have potential receptors been identified on and off site?	N/A	See text of AER	
12	Is there evidence that contamination is migrating offsite?	N/A	See text of AER	

Table 1: Upgradient Groundwater monitoring results

Date of sampling	Sample location reference	Parameter/ Substance	Methodology	Monitoring frequency	Maximum Concentration++	Average Concentration+	unit	GTV's*	IGV	Upward trend in pollutant concentration over last 5 years of monitoring data
2015	RC3	pH (field)	Alcontrol Laboratories Methodology	Quarterly	7.82	7.6	pH units		6.5 - 9.5	no
	RC3	Temperature	Alcontrol Laboratories Methodology	Quarterly	16.9	12.9	°C		25	no
	RC3	Ammoniacal Nitrogen	Alcontrol Laboratories Methodology	Quarterly	2.44	0.6	mg/l		0.12	yes
	RC3	Dissolved Oxygen	Alcontrol Laboratories Methodology	Quarterly	8.69	7.9	mg/l		No abnormal change	no
	RC3	Conductivity (Laboratory)	Alcontrol Laboratories Methodology	Quarterly	0.822	0.7	mS/cm		1	yes
	RC3	Chloride	Alcontrol Laboratories Methodology	Quarterly	58.2	31.8	mg/l		30	no
	RC3	TOC	Alcontrol Laboratories Methodology	Quarterly	<3	<3	mg/l		No abnormal change	no

.+ where average indicates arithmetic mean

.++ maximum concentration indicates the maximum measured concentration from all monitoring results produced during the reporting year

Groundwater/Soil monitoring template Lic No: W0009-03 Year 2015

Table 2: Downgradient Groundwater monitoring results

Date of sampling	Sample location reference	Parameter/ Substance	Methodology	Monitoring frequency	Maximum Concentration	Average Concentration	unit	GTV's*	IGV	Upward trend in yearly average pollutant concentration over last 5 years of monitoring data
2015	MB 35	pH (field)	Probe	Quarterly	7.2	7.3	pH units		6.5 - 9.5	no
2015	MB 35	Temperature	Probe	Quarterly	8.5	10.8	°C		25	no
2015	MB 35	Ammoniacal Nitrogen	Kone Spectrophotometric Analyser	Quarterly	6.3	6.6	mg/l		0.12	yes
2015	MB 35	Dissolved Oxygen	Probe	Quarterly	3.5	5.2	mg/l		No abnormal change	no
2015	MB 35	Conductivity (Laboratory)	Determination of EC using a Conductivity meter	Quarterly	42.1	42.5	mS/cm		1	yes
2015	MB 35	Chloride	Kone Spectrophotometric Analyser	Quarterly	15,025.0	16,100.0	mg/l		30	no
2015	MB35	TOC	Colorimetry	Quarterly	5.9	7.1	mg/l		No abnormal change	no
2015	CD1	pH (field)	Probe	Monthly	7.8	7.1	pH units		6.5 - 9.5	no
2015	CD1	Temperature	Probe	Monthly	17.7	13.5	°C		25	no
2015	CD1	Ammoniacal Nitrogen	Kone Spectrophotometric Analyser	Monthly	2.9	1.8	mg/l		0.12	no
2015	CD1	Dissolved Oxygen	Probe	Monthly	6.7	4.6	mg/l		No abnormal change	no
2015	CD1	Conductivity (Laboratory)	Determination of EC using a Conductivity meter	Monthly	1.4	1.3	mS/cm		1	no
2015	CD1	Chloride	Kone Spectrophotometric Analyser	Monthly	179.0	138.1	mg/l		30	yes
2015	CD1	TOC	Colorimetry	Monthly	6.0	5.0	mg/l		No abnormal change	no
							SELECT			

*please note exceedance of generic assessment criteria (GAC) such as a Groundwater Threshold Value (GTV) or an Interim Guideline Value (IGV) or an upward trend in results for a substance indicates that further interpretation of monitoring results is required. In addition to completing the above table, please complete the Groundwater Monitoring Guideline Template Report at the link provided and submit separately through ALDER as a licensee return or as otherwise instructed by the EPA.

Groundwater monitoring template

More information on the use of soil and groundwater standards/ generic assessment criteria (GAC) and risk assessment tools is available in the EPA published guidance (see the link in G31)

Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA 2013).

Interim Guideline Values (IGV)

**Depending on location of the site and proximity to other sensitive receptors alternative Receptor based Water Quality standards should be used in addition to the GTV e.g. if the site is close to surface water compare to Surface Water Environmental Quality Standards (SWEQS), If the site is close to a drinking water supply compare results to the Drinking Water Standards (DWS)

Surface water EQS | Groundwater regulations GTV's | Drinking water (private supply) standards | Drinking water (public supply) standards

Groundwater/Soil monitoring template Lic No: W0009-03 Year 2015

Table 3: Soil results

Date of sampling	Sample location reference	Parameter/ Substance	Methodology	Monitoring frequency	Maximum Concentration	Average Concentration	unit
							SELECT
							SELECT

Where additional detail is required please enter it here in 200 words or less

Resource Usage/Energy efficiency summary

Lic No: W0009-03 Year 2015

			Additional information
1	When did the site carry out the most recent energy efficiency audit? Please list the recommendations in table 3 below	Enter date of audit	2006
2	Is the site a member of any accredited programmes for reducing energy usage/water conservation such as the SEAI programme linked to the right? If yes please list them in additional information	No	SEAI - Large Industry Energy Network (LIEN)
3	Where Fuel Oil is used in boilers on site is the sulphur content compliant with licence conditions? Please state percentage in additional information	SELECT	Not Appropriate

Table R1 Energy usage on site

Energy Use	Previous year	Current year	Production +/- % compared to previous reporting year**	Energy Consumption +/- % vs overall site production*
Total Energy Used (MWHrs)		95960		
Total Energy Generated (MWHrs)				
Total Renewable Energy Generated (MWHrs)		10812		
Electricity Consumption (MWHrs)	79.256	95.69	20.73533865	
Fossil Fuels Consumption:				
Heavy Fuel Oil (m3)	99.34	55.19	-44.44332595	
Light Fuel Oil (m3)				
Natural gas (m3)				
Coal/Solid fuel (metric tonnes)				
Peat (metric tonnes)				
Renewable Biomass				
Renewable energy generated on site				

* where consumption of energy can be compared to overall site production please enter this information as percentage increase or decrease compared to the previous reporting year.
** where site production information is available please enter percentage increase or decrease compared to previous year

Table R2 Water usage on site

Water use	Water extracted Previous year m3/yr.	Water extracted Current year m3/yr.	Production +/- % compared to previous reporting year**	Energy Consumption +/- % vs overall site production*	Water Emissions: Volume Discharged back to environment(m^3yr):	Water Consumption: Volume used i.e not discharged to environment e.g. released as steam m3/yr	Unaccounted for Water:
Groundwater							
Surface water							
Public supply	5960	6843	14.80%				
Recycled water							
Total							

* where consumption of water can be compared to overall site production please enter this information as percentage increase or decrease compared to the previous reporting year.
** where site production information is available please enter percentage increase or decrease compared to previous year

Table R3 Waste Stream Summary

	Total	Landfill	Incineration	Recycled	Other
Hazardous (Tonnes)					
Non-Hazardous (Tonnes)					

Resource Usage/Energy efficiency summary

Lic No: W0009-03 Year 2015

Table R4: Energy Audit finding recommendations

Date of audit	Recommendations	Description of Measures proposed	Origin of measures	Predicted energy savings %	Implementation date	Responsibility	Completion date	Status and comments
2006	Set Up Sleep Mode on PCs		energy audit	560 kwhrs of 3,500,0	2008	Fingal County Council	2010	
	Monitoring Vehicle Use		energy audit	175,090 Kwhrs of 3,5	2006	Fingal County Council	2010	
	Driver Training		energy audit	203,595Kwhrs of 3,5	2006	Fingal County Council	ONGOING	
	Install inverter on Wheel wash		energy audit	17,290Kwhrs of 3,50	2010	Fingal County Council	2010	
	Replace old monitors with LCds		energy audit	N/A	2012	Fingal County Council	2012	
	Implement motor management policy		energy audit	N/A	2006	Fingal County Council	ONGONIG	
			SELECT					

Table R5: Power Generation: Where power is generated onsite (e.g. power generation facilities/food and drink industry)please complete the following information

	BY01	BY02	BY03	BY04	Station Total
Technology	Gas Combustion	Gas Combustion	Gas Combustion	Gas Combustion	
Primary Fuel	Landfill Gas	Landfill Gas	Landfill Gas	Landfill Gas	
Thermal Efficiency					
Unit Date of Commission	Aug-06	Aug-06	Aug-06	Aug-06	
Total Starts for year					
Total Running Time	3024	7032	5616	480	
Total Electricity Generated (GWH)					
House Load (GWH)					
KWH per Litre of Process Water					
KWH per Litre of Total Water used on Site					

Complaints and Incidents summary template

Lic No: W0009-03 Year 2015

Complaints

Have you received any environmental complaints in the current reporting year? If yes please complete summary details of complaints received on site in table 1 below	No	Additional information

Table 1 Complaints summary

Date	Category	Other type (please specify)	Brief description of complaint (Free txt <20 words)	Corrective action< 20 words	Resolution status	Resolution date	Further information
	SELECT				SELECT		
	SELECT				SELECT		
	SELECT				SELECT		
	SELECT				SELECT		
	SELECT				SELECT		

Total complaints open at start of reporting year	0
Total new complaints received during reporting year	0
Total complaints closed during reporting year	0
Balance of complaints end of reporting year	0

Incidents

Have any incidents occurred on site in the current reporting year? Please list all incidents for current reporting year in Table 2 below	Yes	Additional information

*For information on how to report and what constitutes an incident	What is an incident

Table 2 Incidents summary

Date of occurrence	Incident nature	Location of occurrence	Incident category*please refer to guidance	Receptor	Cause of incident	Other cause(please specify)	Activity in progress at time of incident	Communication	Occurrence	Corrective action<20 words	Preventative action <20 words	Resolution status	Resolution date	Likelihood of reoccurence
28/01/2015	Trigger Level Reached	Other location (GA12, GA8 and GA3)	Category 1	Air	Adverse weather	Weather - Abstraction Rate - Soil	Normal activities	EPA	Recurring	Continued Monthly Monitor	Continued Monthly Monitoring	Ongoing		Medium
19/03/2015	Trigger Level Reached	Other location (GA12)	Category 1	Air	Other (add details	Weather - Abstraction Rate - Soil	Normal activities	EPA	Recurring	Continued Monthly Monitor	Continued Monthly Monitoring	Ongoing		Medium
05/01/2015	Trigger Level Reached	Other location (LMW31, 5, 6, 32, 33 & 9)	Category 1	No Uncontrolled release	Adverse weather		Normal activities	EPA	Recurring	Continued Monthly Monitor	Continued Monthly Monitoring	Ongoing		Medium
28/01/2015	Breach of ELV	Other location (SWV1, SWMH7, P1, S3 and	Category 1	Water	Other (add details	Leachate Management	Normal activities	Other (EPA / Inlan	Recurring	Specified Engineering Works	Specified Engineering Works	Ongoing		High
21/04/2015	Trigger Level Reached	Other location (GA12)	Category 1	Air	Adverse weather	Weather - Abstraction Rate - Soil	Normal activities	EPA	Recurring	Continued Monthly Monitor	Continued Monthly Monitoring	Ongoing		Medium
07/05/2015	Trigger Level Reached	Other location (GA12, GA8 and GA5)	Category 1	Air	Adverse weather	Weather - Abstraction Rate - Soil	Normal activities	EPA	Recurring	Continued Monthly Monitor	Continued Monthly Monitoring	Ongoing		Medium
02/06/2015	Trigger Level Reached	Other location (GA3)	Category 1	Air	Adverse weather	Weather - Abstraction Rate - Soil	Normal activities	EPA	Recurring	Continued Monthly Monitor	Continued Monthly Monitoring	Ongoing		Medium
21/07/2015	Trigger Level Reached	Other location (GA7)	Category 1	Air	Adverse weather	Weather - Abstraction Rate - Soil	Normal activities	EPA	Recurring	Continued Monthly Monitor	Continued Monthly Monitoring	Ongoing		Medium
19/10/2015	Trigger Level Reached	Other location (Cell 2)	Category 1	No Uncontrolled release	Plant or equipment	issues	Normal activities	EPA	New	New Pump and Sensor Place	New Pump and Sensor placed in Cell 2	Ongoing		Low
14/12/2015	Breach of ELV	Other location (SE-2)	Category 1	Sewer	Plant or equipmen	High Rainfall Generating High Volumes of Leachate	Normal activities	EPA	New	Leachate Recirculation and T	Leachate Recirculation and Temporary Agreement to increase discharge	Ongoing		Low

Total number of incidents current year	10
Total number of incidents previous year	15
% reduction/ increase	50%

Noise monitoring summary report

Lic No: W0009-03 Year 2015

1	Was noise monitoring a licence requirement for the AER period? If yes please fill in table N1 noise summary below	Yes
2	Was noise monitoring carried out using the EPA Guidance note, including completion of the "Checklist for noise measurement report" included in the guidance note as table 6? (Noise Guidance note NG4)	No
3	Does your site have a noise reduction plan	No
4	When was the noise reduction plan last updated?	Enter date
5	Have there been changes relevant to site noise emissions (e.g. plant or operational changes) since the last noise survey?	No

Table N1: Noise monitoring summary

Date of monitoring	Time period	Noise location (on site)	Noise sensitive location -NSL (if applicable)	LA_{eq}	LA_{90}	LA_{10}	LA_{max}	Tonal or Impulsive noise* (Y/N)	If tonal /impulsive noise was identified was 5dB penalty applied?	Comments (ex. main noise sources on site, & extraneous noise ex. road traffic)	Is site compliant with noise limits (day/evening/night)?
16/03/2015	12:20:00	NM1		64.38	38.92	61.35	N/A	No		Presented within text of AER and Quarterly Reports	Yes
16/03/2015	14:45:00	NM2		45.35	39.42	47.76	N/A	No		Presented within text of AER and Quarterly Reports	Yes
16/03/2015	15:21:00	NM3		51.79	43.29	51.6	N/A	No		Presented within text of AER and Quarterly Reports	Yes
16/03/2015	14:05:00	NM4		55.59	37.98	53.17	N/A	No		Presented within text of AER and Quarterly Reports	Yes
16/03/2015	12:59:00	NM5		53.28	35	46.92	N/A	No		Presented within text of AER and Quarterly Reports	Yes

*Please ensure that a tonal analysis has been carried out as per guidance note NG4. These records must be maintained onsite for future inspection

If noise limits exceeded as a result of noise attributed to site activities, please choose the corrective action from the following options: nothing**

** please explain the reason for not taking action/resolution of noise issues?

z

Incidents were notified to the Agency. Exceedences were attributed to off site sources in all cases.

WASTE SUMMARY Lic No: W0009-03 Year 2015

SECTION A-PRTR ON SITE WASTE TREATMENT AND WASTE TRANSFERS TAB- TO BE COMPLETED BY ALL IPPC AND WASTE FACILITIES

PRTR facility logon — dropdown list click to see options

SECTION B- WASTE ACCEPTED ONTO SITE-TO BE COMPLETED BY ALL IPPC AND WASTE FACILITIES

			Additional Information
1	Were any wastes accepted onto your site for recovery or disposal or treatment prior to recovery or disposal within the boundaries of your facility ?; (waste generated within your boundaries is to be captured through PRTR reporting) If yes please enter details in table 1 below	Yes	C&D 170107 & 170504
2	Did your site have any rejected consignments of waste in the current reporting year? If yes please give a brief explanation in the additional information	Yes	Some C&D material brought to site for closure and restoration works
3	Was waste accepted onto your site that was generated outside the Republic of Ireland? If yes please state the quantity in tonnes in additional information	No	

Table 1 Details of waste accepted onto your site for recovery, disposal or treatment (do not include wastes generated at your site, as these will have been reported in your PRTR workbook)

Licenced annual tonnage limit for your site (total tonnes/annum)	EWC code (European Waste Catalogue EWC codes)	Source of waste accepted	Description of waste accepted **Please enter an accurate and detailed description - which applies to relevant EWC code** (European Waste Catalogue EWC codes)	Quantity of waste accepted in current reporting year (tonnes)	Quantity of waste accepted in previous reporting year (tonnes)	Reduction/ Increase over previous year +/ - %	Reason for reduction/ increase from previous reporting year	Packaging Content (%)- only applies if the waste has a packaging component	Disposal/Recovery or treatment operation carried out at your site and the description of this operation	Quantity of waste remaining on site at the end of reporting year (tonnes)	Comments -
63,000	*17 05 04*	*17- CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)*	*Soil and Stone*	*32206*	*88370.25*	64%	*Capping works almost complete*		*R5-Recycling/reclamation or oth*	*0*	*Material used in Recovery and Capping layer*
63,000	*17 01 07*	*17- CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)*	*Concrete, bricks, tiles, ceramics and soil admixtures*	*5683.5*	*15594.75*	64%	*Capping works almost complete*		*R5-Recycling/reclamation or oth*	*0*	*Material used in Recovery and Capping layer*

SECTION C-TO BE COMPLETED BY ALL WASTE FACILITIES (waste transfer stations, Composters, Material recovery facilities etc) EXCEPT LANDFILL SITES

4	Is all waste processing infrastructure as required by your licence and approved by the Agency in place? If no please list waste processing infrastructure required onsite	SELECT	
5	Is all waste storage infrastructure as required by your licence and approved by the Agency in place? If no please list waste storage infrastructure required on site	SELECT	
6	Does your facility have relevant nuisance controls in place?	SELECT	
7	Do you have an odour management system in place for your facility? If no why?	SELECT	
8	Do you maintain a sludge register on site?	SELECT	

SECTION D-TO BE COMPLETED BY LANDFILL SITES ONLY

Table 2 Waste type and tonnage-landfill only

Waste types permitted for disposal	Authorised/licenced annual intake for disposal (tpa)	Actual intake for disposal in reporting year (tpa)	Remaining licensed capacity at end of reporting year (m3)	Comments
Household	152,500	0		Landfill Closed May 2012 for this waste
Commercial	200,000	0	N/A	Landfill Closed May 2012 for this waste
Sewage Sludge	30,000	0		Landfill Closed May 2012 for this waste
Construction and Demolition	63,000	37,890	N/A	Material used in Recovery and capping only

Table 3 General information-Landfill only

Area ID	Date landfilling commenced	Date landfilling ceased	Currently landfilling	Private or Public Operated	Inert or non-hazardous	Predicted date to cease landfilling	Licence permits asbestos	Is there a separate cell for asbestos?	Accepted asbestos in reporting year	Total disposal area occupied by waste (ha)	Lined disposal area occupied by waste (ha)	Unlined area (ha)	Comments on liner type
N/A	Apr-04	May-12	No	Public	Non Hazardous	May-12	No	No	No	46.25	10.11	36.14	Original Landfill Cells 1-6 and Piggybacking -HDPE

WASTE SUMMARY Lic No: W0009-03 Year 2015

Table 4 Environmental monitoring-landfill only

Landfill Manual-Monitoring Standards

Was meterological monitoring in compliance with Landfill Directive (LD) standard in reporting year +	Was leachate monitored in compliance with LD standard in reporting year	Was Landfill Gas monitored in compliance with LD standard in reporting year	Was SW monitored in compliance with LD standard in reporting year	Have GW trigger levels been established	Were emission limit values agreed with the Agency (ELVs)	Was topography of the site surveyed in reporting year	Has the statement under S53(A)(5) of WMA been submitted in reporting year	Comments
Met Data From Dublin A	Yes	Yes	Yes	No	Yes	Yes	No	Landfill Gas Surface Water and Groundwater Results presented within text of AER

.+ please refer to Landfill Manual linked above for relevant Landfill Directive monitoring standards

Table 5 Capping-Landfill only

Area uncapped* ha	Area with temporary cap ha	Area with final cap to LD Standard m2 ha, a	Area capped other	Area with waste that should be permanently capped to date under licence	What materials are used in the cap	Comments
1 ha approx	-	46.25		46.25	Geosynthetic clay liner / HDPE	

*please note this includes daily cover area

Table 6 Leachate-Landfill only

9	Is leachate from your site treated in a Waste Water Treatment Plant?	Yes
10	Is leachate released to surface water? If yes please complete leachate mass load information below	No

Volume of leachate in reporting year(m3)	Leachate (BOD) mass load (kg/annum)	Leachate (COD) mass load (kg/annum)	Leachate (NH4) mass load (kg/annum)	Leachate (Chloride) mass load kg/annum	Leachate treatment on-site	Specify type of leachate treatment	Comments

Please ensure that all information reported in the landfill gas section is consistent with the Landfill Gas Survey submitted in conjunction with PRTR returns

Table 7 Landfill Gas-Landfill only

Gas Captured&Treated by LFG System m3	Power generated (MW / KWh)	Used on-site or to national grid	Was surface emissions monitoring performed during the reporting year?	Comments
12034536	10,812 MWhrs	National Grid	Yes	Recommendations implemented

APPENDIX 3

PRTR

Environmental Protection Agency

Guidance to completing the PRTR workbook

PRTR Returns Workbook

Version 1.1.19

REFERENCE YEAR	2015

1. FACILITY IDENTIFICATION

Parent Company Name	Fingal County Council
Facility Name	Balleally Landfill
PRTR Identification Number	W0009
Licence Number	W0009-03

Classes of Activity

No.	class_name
-	Refer to PRTR class activities below

Address 1	Balleally
Address 2	Lusk
Address 3	
Address 4	
	Dublin
Country	Ireland
Coordinates of Location	-7.26329 55.2542
River Basin District	IEEA
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Mortimer Loftus
AER Returns Contact Email Address	Mortimer.Loftus@fingal.ie
AER Returns Contact Position	Acting executive scientist
AER Returns Contact Telephone Number	018905000
AER Returns Contact Mobile Phone Number	0876872025
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	3
User Feedback/Comments	2014 PRTR revised. file submitted to the AER returns department on 22-03-16. 1. Air Tab. stack emissons are measured on one to two days per annum and so results vary annually. The stacks have different runtimes each year and the mass emissions are calculated based on those runtimes. Differences in emissons year on year are a combination of differet stack emission results (mg/m3) and different runtimes. All stack emission monitoring results are compliant with ELVs. NMVOC and TPM not monitored in flare, but cell showing a value of 0. total fl and engine capacity are entered as m3/a of LFG.
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
5(d)	Landfills
5(c)	Installations for the disposal of non-hazardous waste
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 ?	
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

4. WASTE IMPORTED/ACCEPTED ONTO SITE

Guidance on waste imported/accepted onto site

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?	

This question is only applicable if you are an IPPC or Quarry site

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs					
POLLUTANT		METHOD						QUANTITY		
			Method Used		Flare 1	Engine 1	Engine 2			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	Emission Point 3	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	C	OTH	total generated minus total captured	0.0	0.0	0.0	1936548.0	0.0	1936548.0
03	Carbon dioxide (CO2)	M	OTH	Testo 350/454 mxl flue gas analyser	20300.25	461799.0	1055704.0	1537803.25	0.0	0.0
02	Carbon monoxide (CO)	M	OTH	Testo 350/454 mxl flue gas analyser	2.7	7424.0	15844.0	23270.7	0.0	0.0
08	Nitrogen oxides (NOx/NO2)	M	OTH	Testo 350/454 mxl flue gas analyser	21.17	1402.0	3283.0	4706.17	0.0	0.0
07	Non-methane volatile organic compounds (NMVOC)	M	OTH	Portable signal 3030 OM FID calibrated with Propane in accordance with EN1526:2002 non methane hydrocarbon cutter	0.0	5095.0	11343.0	16438.0	0.0	0.0
11	Sulphur oxides (SOx/SO2)	M	OTH	Testo 350/454 mxl flue gas analyser	11.97	3862.0	8646.0	12519.97	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 AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
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 C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

RELEASES TO AIR					Please enter all quantities in this section in KGs					
POLLUTANT		METHOD						QUANTITY		
			Method Used		flare	engine 1	engine 2			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	Emission Point 3	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
244	**Total Particulates**	M	OTH	TCR Tecora isokinetic particulate sample with QMA high termperature filter in accordance with ISO9096:2003	0.0	4.0	9.0	13.0	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: Balleally Landfill

Please enter summary data on the quantities of methane flared and / or utilised			Method Used			
	T (Total) kg/Year	**M/C/E**	**Method Code**	**Designation or Description**	**Facility Total Capacity m3 per hour**	
Total estimated methane generation (as per site model)	4910646.0	E	OTH	Gas sim model	N/A	
Methane flared	98497.0	M	OTH	flare data	2500.0	(Total Flaring Capacity)
Methane utilised in engine/s	2875601.0	M	OTH	engine data	3750.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	1936548.0	C	OTH	calculated	N/A	

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

Please enter all quantities on this sheet in Tonnes

0

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: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	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)
						M/C/E	Method Used					
Within the Country	19 07 03	No	330.0	landfill leachate other than those mentioned in 19 07 02	D8	M	Weighed	Offsite in Ireland	Ringsend Wastewater Treatment Plant,-,Dublin,-,Ireland	Portrane Sewerage Works,St. Ita's Hospital,Portrane,Co. Dublin,ireland		
Within the Country	19 07 03	No	27412.0	landfill leachate other than those mentioned in 19 07 02	D8	M	Weighed	Offsite in Ireland	Irish Water Portrane Sewerage Works,D0114-01			

* 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
Link to Waste Guidance