

EPA Application Form

9.1 - Environmental Management Techniques - Attachment

Organisation Name: *

Donegal County Council

Application I.D.: *

LA007427

Authorisation Application Form

Amendments to this Application Form Attachment

Version No.	Date	Amendment since previous version	Reason
V.1.0	July 2017	N/A	Online application form attachment
As above	Mar 2018	Identification of required fields	Assist correct completion of attachment

9 Environmental Management Techniques ¹

9.1. Accident Prevention Measures

Measures to prevent accidental emissions and liabilities

Incidents and accidents are unplanned events. Emissions from incidents and (major) accidents usually occur within a relatively short time frame but with greater intensity than under normal operating conditions. Incidents such as fire or fuel spillages can result in liabilities such as contaminated soil and groundwater. Proactive risk management reduces the potential for an incident.

Abnormal operating conditions must be managed without endangering human health and harming the environment, and in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odours, and without adversely affecting the countryside or places of special interest.

The applicant must firstly undertake a risk assessment in accordance with EPA guidance on assessing and costing environmental liabilities. Having identified the key risks, the applicant should populate the following table with the measures to be taken to treat the key risks, e.g., bunding, integrity testing, fire prevention, etc.

The range of measures is dependent on the complexity of the site. Pollution prevention measures may, inter alia, include the following information:

- Conclusions on BAT set out in the EU Reference document on BAT on emissions from storage such as a safety management system; corrosion prevention measures on tanks, etc.
- Details of storage of all raw materials, products and wastes such as segregation, labelling, designation and impervious surface;
- Details of spill or emergency containment measures and structures such as bunds, high level alarms, absorbent materials;
- Details of fire detection and fire-water retention facilities in the event of emergencies or other measures to contain fire-water;
- Details of transport of material within the site, solid, liquid or sludge transported by pipe, vehicle or conveyor; etc.,
- The Agency has published a guidance document on Fire-Water Retention Facilities and on the Storage and transfer of materials.

¹ This part of the form collects information on environmental management at the installation/ facility. It seeks to understand the maturity of the management system in terms of knowledge of abnormal operating conditions, prevention and early detection measures and emergency response procedures. The level of detail required in this part of form relates to the environmental risk posed.



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Describe in the table below existing and/or proposed measures, including emergency procedures, to minimise the impact on the environment of an accidental emission or spillage. (This table should include the measures to be taken under abnormal operating conditions, including start-up, shutdown, leaks, malfunctions, breakdowns and momentary stoppages that will demonstrate that any emission arising will not cause significant environmental pollution)².

Measure *	Surveillance Measures		
	Description *	Frequency of Surveillance *	Method / Standard *
Leachate Management Landfill Gas Management Fire	See IBR0121 Accident Management Plan Final Chapter 5	See IBR0121 Accident Management Plan Final	See IBR0121 Accident Management Plan Final

*add rows to the table as necessary

² Information relating to the integrity, impermeability and recent testing of pipes, tanks and bund areas should be included.

* indicates required field



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Outline what provisions have been made to ensure an adequate response to emergency situations outside of normal working hours, i.e., during night-time, weekends and holiday periods (attach additional pages to this document if required): *

Donegal County Council has an EMS currently in place for Ballynacarrick Landfill Site. This includes the following procedure and document.

- OP02 Emergency Response Procedure
- IBR0121 Accident Management Plan Final

Soil Monitoring Points

Periodic monitoring of soil and groundwater is required having regard to the possibility of soil and groundwater contamination of the site³.

Complete the table below with details of soil monitoring locations and in particular where a baseline report has been/is required in accordance with Section 86B of the EPA Act 1992 as amended.

Is periodic soil monitoring proposed at the installation/facility? (Yes/No): *

No

Soil Monitoring Point Code	Monitoring Point Grid Ref.	
	Easting ⁴	Northing ⁵

*add rows to the table as necessary

Soil Parameters

- Inherent in the monitoring of soil and groundwater is accepting the possible necessity for remediation of the soil / groundwater. Regular monitoring of soil and groundwater provides an early detection of any contaminations.
- Six Digit GPS Irish National Grid Reference
- Six Digit GPS Irish National Grid Reference

* indicates required field



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Complete the table below with details of soil monitoring parameters (where a baseline report is required in accordance with Section 86B of the EPA Act 1992 as amended). (If different parameters are associated with different monitoring points this should also be identified in the table below.)

Parameter	Unit	Trigger Level	How was the trigger level determined?	Proposed Monitoring Frequency	Sample Method	Analysis Method / Technique

*add rows to the table as necessary



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Groundwater Monitoring Points

Based on the assessment(s) carried out previously or as part of this licence application, complete the table below with summary details of the groundwater monitoring points.

Is groundwater monitoring proposed at the installation/facility? (Yes/No): *

Yes

Monitoring Point Code	Monitoring Point Grid Ref.	
	Easting ⁶	Northing ⁷
GW1	193882	367722
GW2	193476	367536
GW4	193301	367581
GW5	193283	367720
GW6A	193487	367711
GW7	193653	367697
GW8A	193741	367693
GW9A	193660	367539
GW10	193545	367524
GW12	193331	367488
GW13	193271	367635
GW14	193113	367911
GW15	193290	367823
GW16	193389	367776
GW17	193349	367891

*add rows to the table as necessary

⁶ Six Digit GPS Irish National Grid Reference

⁷ Six Digit GPS Irish National Grid Reference

* indicates required field



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Groundwater Parameters

Complete the table below with summary details of the groundwater parameters. (If different parameters are associated with different monitoring points this should be identified in the table below.)

Parameter	Unit	Trigger Level	How was the trigger level determined?	Proposed Monitoring Frequency	Sample Method	Analysis Method / Technique
Parameters as per existing licence W0024-04 Table C.2.1 Water and Leachate - Parameters /Frequency		None		Quarterly as per existing licence W0024-04 Table C.2.1 Water and Leachate - Parameters /Frequency	As per current licence	As per current licence

*add rows to the table as necessary

* indicates required field



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Costed Environmental Liabilities Risk Assessment (ELRA)

Indicate if the activity, through pre-application meeting with the Agency or other means, is required to submit a costed ELRA⁸ as part of the licence, or licence review application.

Costed Environmental Liabilities Risk Assessment (ELRA) required to be submitted? (Yes/No): *

If 'Yes', upload a costed Environmental Liabilities Risk Assessment (ELRA), prepared in accordance with the *Environmental Protection Agency's Guidance on Assessing and Costing Environmental Liabilities* (2014) (select Document Type: 'ELRA' in the application form).

Costed **ELRA** document filename:

Indicate your preferred form of financial provision instrument to meet ELRA costings have regard to the Environmental Protection Agency's Guidance on Financial Provision (2015), e.g., Environmental Liability Insurance:

Upload a financial provision proposal have regard to the Environmental Protection Agency's Guidance on Financial Provision (2015) (where required at application /review application stage) (select Document Type: 'Financial Provision Proposal' in the application form)

Financial Provision Proposal filename:

⁸ There is an explicit requirement in EU and Irish law for financial provision for certain activities. The following categories of activities have an ELRA/CRAMP/FP requirement:

1. Landfills (excl. closed L.A. Landfills closed before 16th July 2009)
2. CAT A Extractive Waste Facilities
3. High Risk Contaminated Land Facilities
4. All Haz-Waste Transfer Stations
5. Non-Haz WTS (Accepting >50,000 tons/annum)
6. Incineration (incl. co-incineration of hazardous waste)
7. Upper & Lower Tier Seveso Sites
8. Exceptional circumstances associated with the site, e.g., significant ground/groundwater contamination.

Regard should be had by applicants to relevant Agency guidance on these matters.

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Closure, Restoration and Aftercare Management Plan (CRAMP)

A restoration/aftercare period will be required where there are on-going environmental liabilities following closure. Applicants are required to describe the existing or proposed measures to avoid any risk of environmental pollution and to return the site to a satisfactory state or the state established in the baseline report where applicable, after the activity or part of the activity ceases operation.

A key measure is the preparation of a Closure, Restoration and Aftercare Management Plan (CRAMP) by the operator, for certain activities⁹. Notwithstanding the requirements of the EC Environmental Objectives (Groundwater) Regulations 2010, S.I. No. 9 of 2010, the closure and restoration/ aftercare target is the site condition at the time of the original application or the baseline report. The applicant shall have regard to the Environmental Protection Agency's Guidance on Assessing and Costing Environmental Liabilities (2014) in the preparation of the CRAMP.

Upload a CRAMP, where applicable (select Document Type: '**Site Closure**' in the application form).

CRAMP filename:

Costed CRAMP

Indicate if the activity, through pre-application meeting with the Agency or other means, is required to have a CRAMP ⁹ submitted as part of the licence, or licence review application.

CRAMP required to be submitted at application/licence review application stage? (Yes/No): *

⁹ There is an explicit requirement in EU and Irish law for financial provision for certain activities. The applicant shall have regard to the Environmental Protection Agency's Guidance in determining CRAMP requirements and on Financial Provision (2015) in making financial provision to cover any liabilities.

The following categories of activities have an ELRA/CRAMP/FP requirement:

1. Landfills (excl. closed L.A. Landfills closed before 16th July 2009)
2. CAT A Extractive Waste Facilities
3. High Risk Contaminated Land Facilities
4. All Haz-Waste Transfer Stations
5. Non-Haz WTS (Accepting >50,000 tons/annum)
6. Incineration (incl. co-incineration of hazardous waste)
7. Upper & Lower Tier Seveso Sites
8. Exceptional circumstances associated with the site e.g. significant ground/groundwater contamination.



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Indicate your preferred form of financial provision instrument to meet CRAMP costings (where appropriate), e.g., Secured fund, On-demand performance Bond, Parent Company Guarantee, Charge on Property (have regard to the Environmental Protection Agency's Guidance on Financial Provision (2015) on the Agency's website):

State preferred form of financial provision instrument?	Form of assurance has been submitted on EDEN as per LR053988
---	--

Upload a financial provision proposal (where required) having regard to the Environmental Protection Agency's Guidance on Financial Provision (2015) in making financial provision to cover any liabilities (select Document Type: **Financial Provision Proposal** in the application form)

Financial Provision Proposal filename:

Cessation of Activity

Where a CRAMP is not required, describe the measures to be taken on and following the permanent cessation of the activity or part of the activity to avoid any risk of environmental pollution and to return the site of the activity to a satisfactory state. (Input your response in the text box below or attach the information in to this attachment).

Emergency Response Procedure

Do you have an emergency response procedure (ERP)? (Yes/No) *

Is the ERP compliant with the EPA guidance? (Yes/No) *

* indicates required field

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9.2. Nuisance

Complete the table below in relation to each potential nuisance. Identify if the activity may cause or contribute to the type of nuisance in the area of the installation/facility and, where applicable, identify the techniques used to prevent/minimise the nuisance.

Type of Nuisance	Applicable to the activity? * (Yes/No/ Not Applicable)	Techniques to prevent nuisances *	Where nuisances cannot be prevented, techniques to be used to minimise and reduce nuisances
Odour	Not Applicable		
Fire Control	Not Applicable		
Dust	Not Applicable		
Litter	Not Applicable		
Birds	Not Applicable		
Mud	Not Applicable		
Flies	Not Applicable		
Vermin	Not Applicable		
Other	Not Applicable		

If 'Other' is selected define the other nuisance(s):

Note: Odour must also be addressed in the fugitive emissions section of the '7.4 Emissions to Atmosphere – Main and Fugitive' template, where applicable.



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9.3. Environmental Management System (EMS)

Do you have an environmental management system? (Yes/No) *

If 'Yes', is the environmental management system accredited? (Yes/No) *

State the date accreditation was achieved or is expected to be achieved, where applicable:

State the standard of accreditation achieved:

Energy Efficiency

Outline the measures taken to ensure that energy is used efficiently having regard to the relevant decision on BAT conclusions and/or BAT guidance and where appropriate, an energy audit with reference to the EPA Guidance document on Energy Audit should be carried out. *

An Energy Audit Report was produced in 2007. It concluded that there was limited scope for energy reduction on site but recommended:

- Harnessing energy from the flare for energy generation and connection to national grid;
- Improving metering and control systems;
- Changing electricity supplier.

The Council has changed its electric supply numerous times. The control systems on the site have been continuously upgraded following the Energy Audit Report. Additional meters were added to the leachate control infrastructure. A SCADA system for the leachate treatment and landfill gas extraction system was installed.

A tender process for the installation of landfill gas engine at the site was undertaken. However the installation of a landfill gas engine at the site is no longer being pursued due to changes in the Renewable Energy Feed-In Tariff.

Has an energy audit been carried out? (Yes/No) *

Do you have an energy efficiency management system? (Yes/No) *

If 'Yes', is the energy efficiency management system accredited? (Yes/No)

* indicates required field



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State the date accreditation was achieved or is expected to be achieved, where applicable:

State the standard of accreditation achieved:

9.4. Hours of Operation

Provide details of the hours of operation for the installation/facility * (hours and days per week, etc.), including:

(a) Proposed hours of operation.

Site is closed

(b) Proposed hours of construction and development works and timeframes.

As per existing licence. W0024-04

(c) For waste activities, the proposed hours of waste acceptance.

Site is closed

(d) Any other relevant hours of operation expected (e.g., waste handling, etc.).

Site is closed

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9.5. Review of a Licence

Where the Office of Environmental Enforcement (OEE) has agreed any variations or adjustments to the conditions or schedules of the existing licence, the licensee must provide details of these agreed variations and adjustments to the existing licence conditions in the table that follows.

An updated, scaled drawing of the site layout (no larger than A3) providing visual information on such adjustments or variations where appropriate should be uploaded in the **site tab** – 'site plan(s)' upload.

In the case of once-off assessments/reports required under conditions/schedules of the existing licence the licensee must provide details of those assessments/reports that have been completed and agreed with the OEE or as otherwise agreed, in the table below.

Condition/ Schedule No.	Existing Condition	OEE Agreement Reference	Description
Condition 10	Condition 10.8	LR054092	Closure, Restoration & Aftercare Management Plan (CRAMP)
Condition 12	Condition 12.2	LR053988	Environmental Liabilities Risk Assessment (ELRA)
Schedule C	C.1.2 Monitoring of Emissions to Air C.3 Dust Monitoring C.4 Noise Monitoring		Air , dust and noise monitoring no longer undertaken as agreed with OEE
Condition 6.12.6	6.12 Groundwater	EPA Letter dated 15/01/2013	This licence was amended on 15th January 2013 under Section 42B(1)(c) of the Waste Management Acts, 1996 to 2011. The details of Amendment A must be read in conjunction with this licence. The amendment document is entitled "Technical Amendment A"
Condition 3.14.2	3.14 Leachate Management Infrastructure	EPA Letter dated 22/02/2013	This licence was amended on 21st February 2013 under Section 42B(1)(c) of the Waste Management Acts, 1996 to 2011. The details of Amendment B must be read in conjunction with this licence. The amendment document is entitled "Technical Amendment B"



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*add rows to the table as necessary

9.6 Environmental Management Techniques – Upload Files

State the number of 'upload files' referred to and named in this attachment document? *



ACCIDENT PREVENTION PLAN

BALLYNACARRICK LANDFILL SITE

CO. DONEGAL

2010



DONEGAL COUNTY COUNCIL
BALLYNACARRICK LANDFILL SITE
ACCIDENT PREVENTION PLAN

DOCUMENT CONTROL SHEET

Client	Donegal County Council					
Project Title	Ballynacarrick Landfill Site					
Document Title	Accident Prevention Plan 2010					
Document No.	IBR0121/Reports					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	18	1	0	0

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
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1.0 INTRODUCTION

In order to meet the requirements of the Waste Licence W0024-04 for Ballynacarrick Landfill Site an Accident Prevention Plan is required. For accident management, there are three particular components:

- Identification of the hazards posed by the installation/activity.
- Assessment of the risks (hazard x probability) of accidents and their possible consequences.
- Implementation of measures to reduce the risks of accidents, and contingency plans for any accidents that do occur.

This Accident Prevention Plan has been undertaken in line with the following guidance documents; Environment Agency Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste, (Section 2.8 Accidents) and IPPC H1 Version 3.1 July 2002 Integrated Pollution Prevention and Control (IPPC):Environmental Assessment and Appraisal of BAT and EPA Landfill manuals, Landfill monitoring 2nd Edition.

2.0 IDENTIFICATION OF THE HAZARDS

Ballynacarrick landfill site is currently active and the following hazards have been identified during the operation of the site;

- Leakage from the leachate pumping main - leakage of leachate from the pumping main which may result in groundwater and surface water contamination.
- Over-topping of leachate tanks – which may result in groundwater and surface water contamination.
- Leachate tank leakage – which may result in groundwater and surface water contamination.
- Spillage of leachate during tankering off site – which may result in leachate entering surface water drains.
- Diesel Storage
 - Tank failure – which may result in groundwater and surface water contamination.
 - Spillage during filling – which may result in diesel entering surface water drains.
 - Fire – which may result in the escape of diesel and air emissions.
- Landfill Gas
 - Build up of landfill gas – potential for lateral migration.
 - Explosion of the gas extraction system – potential for gas extraction shut down and emissions to air.
- Landfill Fire – potential for loss of landfill containment and emission to air, groundwater and surface water.

3.0 ASSESSMENT OF RISKS

In undertaking a risk assessment and the likelihood of an accident, the following risk assessment table has been utilised;

Table 3.1 Likelihood Categories

	Category	Range
1	Extremely unlikely	Incident occurs less than once in a million years
2	Very unlikely	Incident occurs between once per million and once every 10,000 years
3	Unlikely	Incident occurs between once per 10,000 years and once every 100 years
4	Somewhat unlikely	Incident occurs between once per 100 years and once every 10 years
5	Fairly probable	Incident occurs between once per 10 years and once per year
6	Probable	Incident occurs at least once per year

As identified in Section 2.0 a number of potential risks have been identified. The potential of these accidents to occur and their impact on the environment has been assessed utilising the following risk tables.

Table 3.2 Severity Categories

	Category	Definition
1	Minor	<ul style="list-style-type: none"> ▪ Nuisance on site only (no off site effects). ▪ No outside complaint.
2	Noticeable	<ul style="list-style-type: none"> ▪ Noticeable nuisance of site e.g. discernible odours ▪ Minor breach of permitted emissions limits, but no environmental harm. ▪ One or two complaints from the public.
3	Significant	<ul style="list-style-type: none"> ▪ Severe and sustained nuisance, e.g. strong offensive odours or noise disturbance. ▪ Major breach of Permitted emissions limits with possibility of prosecution. ▪ Numerous public complaints.
4	Severe	<ul style="list-style-type: none"> ▪ Hospital treatment required. ▪ Public warning and off-site emergency plan invoked. ▪ Hazardous substance releases into water course with ½ mile effect.
5	Major	<ul style="list-style-type: none"> ▪ Evacuation of local populace. ▪ Temporary disabling and hospitalisation. ▪ Serious toxic effect on beneficial or protected species. ▪ Widespread but not persistent damage to the land. ▪ Significant fish kill over 5 mile range.
6	Catastrophic	<ul style="list-style-type: none"> ▪ Major airborne release with serious off-site effects. ▪ Site shutdown. ▪ Serious contamination of groundwater or watercourse with extensive loss of aquatic life.

Following an assessment of each accident against likelihood and severity a Risk Matrix has been developed. This Risk Matrix is provided in Table 3.3. The Risk matrix will inform the potential magnitude of each environmental accident. The outcome of the risk evaluation will assist in the provision of mitigation measures required to limit the impact on the environment in the event of an environmental accident at the Ballynacarrick Landfill Site.

Table 3.3 Risk Matrix

Event	Likelihood	Severity	Risk Score (LxS)
Leakage from Leachate Pumping Main	5	2	10
Over-Topping of Leachate Tank.	4	3	12
Leachate Tank Leakage	4	3	12
Spillage of Leachate during Filling of Tankers for Tankering Off Site	5	1	5
Diesel Storage- Tank Failure	3	3	9
Diesel Storage- Spillage during Filling	5	1	5
Diesel Storage- Fire	3	2	6
Landfill Gas - Build Up of landfill gas	4	3	12
Landfill Gas - Explosion	4	4	16
Landfill Fire	3	4	12

Table 3.4 Risk Evaluation

Magnitude of risk	Score
Insignificant	6 or less
Acceptable	8 to 12
Unacceptable	15 or more

4.0 POSSIBLE CONSEQUENCES

Table 3.4 identifies the magnitude of an accident if it were to occur at Ballynacarrick Landfill Site. Following the risk assessment many accidents are classified as insignificant with other accidents classified as acceptable. Landfill gas explosion has been rated as an unacceptable risk.

Following the risk assessment the severity of the following events have been rated as insignificant;

- Spillage of Leachate during filling of tankers for tankering off site.
- Diesel Storage- Spillage during Filling

Following the risk assessment the severity of the following events have been rated as acceptable;

- Leakage from leachate pumping main.
- Over topping of Leachate Tank.
- Leachate tank leakage.
- Diesel storage tank failure.
- Diesel storage fire.
- Build up of landfill gas.
- Landfill fire.

Following the risk assessment the severity of the following events have been rated as unacceptable;

- Landfill gas explosion.

5.0 MITIGATION MEASURES

Following the risk assessment only the explosion of landfill gas was identified as an unacceptable risk. Even though potential accidents have been assessed as acceptable, this Accident Prevention Plan identifies mitigation measures to limit the impact from operational accidents at Ballynacarrick landfill site.

5.1 LEAKAGE LEACHATE PUMPING MAIN

The risk of leakage from the leachate pumping main will be mitigated by the undertaking of site inspection on a weekly basis. Any defects found will be recorded and corrective action taken. The site manager will then implement the required remedial action including diverting leachate from the point of leakage to ensure that contamination of the groundwater and surface water does not occur. The installation of the leachate pumping main has been undertaken ensuring the joints of pipes are robustly joined through electrofusion and butt fusion. This ensures that the joints are strong and less prone to failure.

5.2 OVER-TOPPING OF LEACHATE TANK

Visual monitoring of Leachate levels in the Tank will take place on a daily basis. The need to extract leachate from the landfill cells will be balanced with the remaining capacity in the tanks and the tankering of leachate off site. The level monitoring of the tank is recorded on the SCADA system.

The level in the storage tank is controlled by a float switch, which is linked to the main control panel. The leachate tanks will be maintained at a level to ensure that there is a minimum freeboard of 0.75m at all times and sufficient capacity remains for the required extraction from cells given the forecasted weather conditions. All valves will be checked during the weekly site inspection to ensure that they are operational. The valves on the leachate pumping system will be maintained as per the manufactures requirements to ensure operational defects do not lead to an overflow in the leachate tanks. If the flow of leachate into the tanks cannot be managed under the usual tankering schedule then the site manager will arrange for further tankers to be provided. In emergency situations leachate will be returned to cells that have sufficient capacity to contain the additional leachate.

5.3 LEACHATE TANK LEAKAGE

A three yearly inspection on the leachate tank will ensure that any defects in the tank are repaired. The tank will be visually inspected for deterioration or defects in the lining system.

If a leak is discovered from the tank then the leachate will be tankered off site and pumped back into the landfill site immediately to drain the tank. This will remove the amount of leachate that is liable to escape from the tank.

In the event that a defect is discovered in the tank then the defect will be repaired as soon as possible and the integrity of the tank checked.

5.4 SPILLAGE OF LEACHATE DURING TANKERING OFF SITE

During the tankering process the following procedure will be undertaken to ensure that no spillage of leachate occurs;

- The leachate is removed from the leachate tank via a flexible pipework attached to the tank and connected to the tankers as required.
- The flow from the leachate tank to the tankers is controlled via a manual valve situated on the outlet of the tank.
- The removal of the leachate is undertaken on a purpose built concrete slab only. All surface water and spillages in this area are collected into a gully which passes through a silt filter prior to being pumped back into the leachate treatment tank.
- Frequency of discharge shall be determined by site manager depending on the storage capacity in the holding tank.
- Any incidence of spillage during removal and transportation will be treated as an incident.
- Leachate or leachate contaminated water shall not be allowed to accumulate in any areas other than leachate management system or be discharged to any river, stream or surface water.

5.5 DIESEL STORAGE- TANK FAILURE

Fuel for the operation of site plant is currently stored in a 1,100 litre double skinned tank. The double skin provides bunding of the fuel tank to prevent leakage. This tank is mainly stored off site and is brought to site when required.

An inspection of the tank is undertaken on a weekly basis. Any defects in the tank will be noted and repaired as soon as possible.

5.6 DIESEL STORAGE- SPILLAGE DURING FILLING

A drip tray should be used while the diesel is being transferred to the fuel bowser or item of plant, this will ensure that any spillages are prevented. Any spillages that occur should be cleaned with appropriate absorbents as soon as possible.

5.7 DIESEL STORAGE- FIRE

The diesel is currently being stored in a bunded tank. It is considered that the only source of ignition could be a naked flame during filling operations if a spill has occurred. This will be mitigated by a no smoking policy on site. This will be combined with ensuring all spillages are contained and cleaned, removing the accelerant of a fire. Fire Training has been undertaken by staff.

5.8 LANDFILL GAS- BUILD UP OF LANDFILL GAS

The following procedures will be established to ensure a build up and lateral migration of landfill gas does not occur at the Ballynacarrick Landfill Site.

The monitoring of landfill gas will be in accordance with Waste Licence W0024-04. The requirements for landfill gas monitoring are identified in Table 5.1 and 5.2 below.

Table 5.1 Flare Monitoring

Parameter	Flare (enclosed) Monitoring Frequency
Inlet	
Methane (CH ₄) % v/v	Continuous
Carbon dioxide (CO ₂) % v/v	Continuous
Oxygen (O ₂) % v/v	Continuous
Process Parameters	
Combustion Temperature	Continuous
Residence Time	Quarterly
Outlet	
Volumetric Flow Rate	Continuous
Carbon monoxide (CO)	Continuous
Nitrogen Oxides (NO _x , as NO ₂)	Annually
Sulphur dioxide (SO ₂)	Annually
Total Organic Carbon (TOC)	Annually

Table 5.2 Monitoring Locations within the Landfill

Landfill Gas	Frequency
Stations	
LG1 to LG17 Incl	Monthly

Table 5.3 Landfill Gas Control and Trigger Levels

Monitoring Point	Parameter	Trigger Concentrations (%v/v)
Landfill Gas Piezometer	Methane	Greater than or equal to 1% v/v or
	Carbon Dioxide	Greater than or equal to 1.5% v/v

5.8.1 Pathways

There are a number of pathways whereby landfill gas has the potential to affect on-site and off-site receptors. These include:

- Fugitive emissions of landfill gas from the surface of the landfill (active landfill, partially restored and fully restored surfaces) into the atmosphere where they will be diluted and dispersed.
- Lateral migration of landfill gas through unlined areas and the landfill liner and subsurface.
- Emissions of landfill gas combustion products from landfill gas flares. Emissions will be from stacks associated with engines and flares and as with fugitive releases will be diluted and dispersed in the atmosphere depending on meteorological conditions.

Human exposure to landfill gas emissions in the atmosphere may arise, under certain particular circumstances via a number of pathways as follows:

- Direct inhalation of airborne contaminants and particles, including airborne contaminants that may arise from lateral migration of landfill gas.
- Deposition of contaminants present within landfill gas on to soils, vegetation and surfaces and subsequent ingestion of soils, vegetation and deposited dust.
- Dermal contact with contaminated soils and dust that have been contaminated with landfill gas.
- Vegetation that has been contaminated via deposition and uptake through leaves and roots.

5.8.2 Permanent Gas Collection Measures

Landfill gas is produced as a result of biodegradation of the organic fraction within the waste body. The landfill gas extraction system consists of the following

Landfill Gas Flare

A 500m³/hr enclosed landfill gas flare has been installed at the facility. This is located in an enclosed compound adjacent to the site office. The enclosed flare is designed to operate continuously with landfill gas as the primary fuel source. The landfill gas flare consists of;

- Flame Arrestor
- Slam Shut Valve
- Ignition System and Flame Detection.
- Flare Stack and Flare Lining System.
- Gas Filter
- Gas Blower
- Dewatering System
- Non Return Valves
- Flow meter
- SCADA System

Gas Extraction Wells

Vertical landfill gas extraction wells were installed at the facility. The gas wells were drilled to 75% of the waste depth and comprise of 400 mm diameter drilled boreholes fitted with a 160mm OD slotted High Density Polyethylene (HDPE) well casing backfilled with pea gravel. The well head are based around a 63mm diameter black HDPE 90° bend. The well head fits inside the well casings and remains both parallel and concentric with the well casing. A flex-seal coupling is fitted externally to provide a gas tight seal and prevent the ingress of debris. The well head connects to gas wells constructed from 160mm 10bar rated pipe. The well head contains a gas sampling point and leachate dipping point. Some of the well heads allow for the movement of the gas in relation to the waste in both horizontal and vertical direction with a flexible 63mm hose connection. Self dewatering well heads have been installed where the fall is back towards the gas extraction well.

Horizontal landfill gas extraction pipework consisting of a 90mm perforated HDPE pipe, surrounded by 16-32mm clean stone, has been installed at 15-20m centres and 3-4 metre vertical intervals within the waste infilled in Phase II only. This is connected to 90mm solid pipework which has been laid up at the side slope to the 250mm landfill gas main. Control of flow from the horizontal extraction pipework and gas monitoring is undertaken at the 250mm landfill gas main. This horizontal landfill gas extraction pipework will remain connected to the active landfill gas extraction system.

A horizontal gas extraction pipework system will be installed at the toe of the side slope to minimise gas emanating from the leachate collection layer in Phases 1 and 2. This system will be constructed 1m below the level of the existing waste. This extraction pipework will consist of a 90mm perforated HDPE pipe installed on 400mm deep crushed rock bedding in a trench

600mm wide and backfilled with crushed rock. The maximum length of the horizontal gas extraction pipework perpendicular to the edge of the cell will be 50m. This pipe will be connected to an adjacent manifold and ultimately to the existing gas extraction system.

Gas Collection Pipework

A black HDPE gas main has been constructed with a 250mm Nominal Bore (NB) and joined using electrofusion or fully automatic butt-welding techniques. The gas main has been installed from the flare compound on the landfill site. Black HDPE spurs with a 90mm NB from the landfill gas wells are connected to the gas main using manifolds. Pipes are laid to a fall in the direction of landfill gas flow, where possible.

Manifolds

There are currently nine manifold chambers installed to access and control the gas wells on the site. Gas wells are connected to central collection points or manifolds via 90mm OD HDPE pipework. The pipes belonging to each well are joined to the manifold by a butterfly or safi valve, which can be adjusted to control the pressure and flow. A Tefen gas sampling point is provided immediately upstream of each of the control valves to monitor the landfill gas composition from each well. While some manifolds are joined to the main gas main through the use of 90° bends and a T-junction, there are a number of 'in-line' manifolds. The manifolds are used to reduce the number of control points on a landfill site.

Manifolds consist of a HDPE chamber with a lockable lid. The lid overlaps the chamber to seal against water ingress. The lids are also spring loaded to allow for lifting and locking in an open position by one person, thus facilitate balancing of the field at the chamber. The manifold chambers are based around a galvanised steel support frame with outer walls either fabricated or constructed from HDPE.

Condensate Traps

The condensate traps consist of syphon tubes installed on the 250mm gas main. The syphon tubes consist of water seal leg and drip tube through which the condensate shall flow to a ground soakaway.

Pumped knockout Pot

One pumped condensate knockout is included in the gas main just before it enters the flare compound.

Gas Plant Condensate Pumping System

Condensate is removed from the sealed condensate pot using an electrical powered pump. The pump has a float switch connected directly to the motor, which stops and starts the pump automatically in response to changes in liquid levels.

Condensate Pipe work

A condensate discharge line in 32mm NB black HDPE is directed into the existing leachate collection system. Pipes were joined using electrofusion couplers or butt fusion welding techniques.

Landfill Gas Trench

A landfill gas trench consisting of slotted pipework and 100mm diameter vent pipes has been constructed along the boundary of the north eastern corner of the site. This is connected to the active landfill gas extraction system.

Monitoring Points

Monitoring points are at locations and frequencies are set out in Schedule C. Monitoring Point Location. Permanent access to all on-site and off-site monitoring points is maintained.

Monitoring infrastructure which is damaged or proves to be unsuitable for its purpose shall be replaced within three months of it being damaged or recognized as being unsuitable.

Table 5.4 Monitoring Locations within the Landfill

Landfill Gas	Dust	Noise	Surface water	Ground water	Leachate
Stations	Stations	Stations	Stations	Stations ¹	Stations
LG1 to LG17 Incl	DG1	N1	SW1	GW1	L1
	DG2	N2	SW2	GW2	L3
	DG3	N3	SW3	GW4	L6
	DG4		SW4	GW5	
	DG5			GW6	
				GW7	
				GW8	
				GW9	
				GW10	
				Under drainage interceptor discharge point ²	

Landfill Gas Monitoring and Field Balancing

Landfill gas piezometers have been installed along the site boundary. These are monitored on a weekly basis for the presence of landfill gas as per the Waste Licence requirements.

¹ And locations arising out of Conditions 6.12 and 6.13

² Location to be agreed in writing by the Agency.

Trigger levels for Methane and Carbon Dioxide are 1% v/v and 1.5%v/v respectively as per the Waste Licence requirements. Any exceedances in these trigger level will be treated as an incident.

Monitoring will be carried out using GA2000 analyser. This equipment will be maintained and calibrated in accordance with manufactures instructions. Operational manuals and maintenance records will be maintained on site. Landfill gas results will be reported on as per the Waste Licence requirement. If when monitored it indicates exceedances in accordance with the Waste Licence requirements then the environmental incident and corrective action procedure will be adopted.

Field balancing will be undertaken as required on landfill gas extraction wells in order to operate landfill gas flare on a continuous basis and to extract optimum landfill gas from the site.

5.9 LANDFILL GAS EXPLOSION

The persons responsible for managing emergency actions at the Ballynacarrick Landfill Site are the Landfill Manager and the Senior Executive Engineer and Scientific Officer.

If abnormal changes in the monitoring data are identified, the data will be checked and if an abnormality is confirmed then the appropriate person will be contacted to investigate the source of the issue.

5.9.1 Operational Procedures

The management of landfill gas on the Ballynacarrick Landfill Site is overseen by Senior Executive Engineer, Scientific Officer and the Landfill Site Manager.

The Scientific Officer and the Landfill Site Manager are responsible for the day to day running of the gas management systems on the site. Any problems with the gas control on the site identified by the Scientific Officer and the Landfill Site Manager will be reported to the Senior Executive Engineer, who will decide on the course of action to take.

Gas Flare

The gas plant will be checked daily (Landfill Site Manager) and weekly (Scientific Officer) in accordance with procedure OP05 Site Inspection and Recording. The results of the inspection shall be recorded on the daily (OP05 Daily Inspection Report Form) and weekly record (OP05 Weekly Inspection Report Form)

The gas flare will be serviced on a quarterly basis by AFS. The results of the inspection/service will be maintained on file (File 14, Calibration Certificates/Maintenance Records).

Gas Collection System

The system shall be balanced on a fortnightly basis and as required by the Scientific Officer. The results of the field balancing will be recorded on and stored on file (File 16, Landfill Gas monitoring).

The gas balancing will also indicate potential problems with the gas collection system. If any problem is identified during gas balancing (e.g. high oxygen on a well) an investigation into the problem will be carried out immediately. If the problem cannot be repaired immediately then it will be reported to the Senior Executive Engineer, who will decide on the course of action to take.

New additions to the gas collection system will have tests on commissioning as follows;

- □ Pressure test of gas main and condensate lines
- Dip gas wells

Non-Routine Incidents

Non-routine incidents include unplanned outage of the gas plant and failures of the gas collection system. Any incidents will be dealt with under the following procedures;

- OP05 Environmental Incident and Notification
- OP01 Corrective Action

These records will be maintained on file.

Monitoring Gas Control Measures

The landfill gas extraction wells are located within the waste mass and connected into the extraction system. Table 5.5 details locations and the current frequency for monitoring of landfill gas in the collection system during the operational phase of the landfill.

Table 5.5 Monitoring Determinants and Frequencies for Collection System

Location	Determinants	Frequency
Manifold overall mix	CH ₄ , CO ₂ , O ₂ , (balance), suction	Fortnightly
Gas wells (at well head or at manifold inlet)	CH ₄ , CO ₂ , O ₂ , (balance), suction	Fortnightly

The gas plant will consist of an enclosed flare with a 500m³/hr capacity. The monitoring frequencies and determinands for the flare are shown in Table 5.1.

5.9.2 Action Plan

In the event of a problem with landfill gas on the site (either identified by routine monitoring, servicing, due to a complaint or identified by accident) the Landfill Site Manager, Scientific Officer and Senior Executive Engineer must be informed. They will then assess the situation and ensure that the relevant action is implemented.

Unless otherwise determined from baseline monitoring results, the trigger levels for emissions of methane and carbon dioxide in boreholes outside the waste body are shown in Table 5.6. These trigger levels for landfill gas emissions also apply to measurements in any service duct or manhole on, at or immediately adjacent to the landfill.

Table 5.6 Emergency Procedures for Methane and Carbon Dioxide

Parameter Level 345	Location	Action to be Taken by Person Undertaking Monitoring	Action to be Taken by Landfill Manager
Methane 10,000 ppm (20% LEL) 1% by volume (% v/v). Carbon Dioxide 1.5% by volume (% v/v).	Landfill Piezometer and Buildings	Immediately inform landfill manager and Senior Executive Engineer.	If either of these trigger levels are attained within buildings then the affected areas should be evacuated and the emergency services notified. Monitoring should be undertaken to identify the point of gas ingress and control measures should be implemented to prevent further ingress

In the case of an accident affecting the gas management system or a deep seated fire the enhanced monitoring of the gas boreholes will commence within 24 hours of the event. In the event of increased lateral migration of landfill gas away from site due to an accident on the site, an assessment of the risk will be carried out and collection wells will be installed as soon as practicable in order to minimise the gas escaping from the site.

³ Parts per million, method of expressing concentration. 10,000 ppm v/v equates to 1 per cent gas at standard temperature and pressure (STP) by volume. v/v By volume (as in % v/v or ppm v/v); usually applied to gases.

⁴ The lowest percentage concentration by volume of a mixture of flammable gas with air which will propagate a flame at 25°C and atmospheric pressure. The Lower Explosive Limit (LEL) and the Upper Explosive Limit (UEL) of methane are approximately 5% v/v and 15% v/v respectively.

⁵ Trigger Levels as per EPA Landfill manuals, Landfill monitoring 2nd Edition.

Training in the fire evacuation procedures will be provided to all existing and new employees at the Ballynacarrick Landfill Site.

In the event of an emergency procedure that requires the evacuation of the site the following procedure will be followed;

- All staff to assemble in the car park – at fire point.
- If any vehicles are tipping waste at the active area of the landfill site, site staff will escort the personnel and vehicles involved with the waste tipping to the fire point area identified above.
- If any contractors are working on the site they should be made aware of the fire point area. Any contractors working on the site should be escorted to the fire point area by the site manager or other members of staff if possible.
- The site manager should collect the site diary, rota of staff and visitors book from the site office.

The site manager or supervisor should ensure that all staff, contractors and visitors are accounted for.

5.15 LANDFILL FIRE

A landfill fire is a potentially serious situation that may impact receptors on and off site and also result in a hazard to personnel on site. Indications of a fire include smoke and acrid smells from leachate and gas wells, elevated CO and temperature readings from the gas system and smoking fissures forming on the landfill surface. In the event of a fire being identified the Action Plan as set out in 5.9.2 and Table 5.6 shall be followed with regards to gas management.

It is the responsibility of the Landfill Manager to identify potential emergency situations.

A landfill fire typically occurs where excessive levels of air have been drawn into the site from open unsealed areas. The oxygen in the air is consumed by aerobic bacteria. If too much air is drawn into the site the anaerobic bacteria can become poisoned and the site takes on the characteristics of a compost heap. The aerobic bacteria produce higher temperatures than the anaerobes resulting in auto ignition of trace components of the landfill gas. The fire is then fed by the burnable fraction of the waste, methane from surrounding areas and most importantly oxygen drawn into the site.

In the case of an accident affecting the gas management system or a deep seated fire the enhanced monitoring of the gas boreholes will commence within 24 hours of the event. In the

event of increased lateral migration of landfill gas away from the site due to an accident on the site, an assessment of the risk will be carried out and collection wells will be installed as soon as practicable in order to minimise the gas escaping from the site.

6.0 CONCLUSION

The potential environmental accidents that may occur at the Ballynacarrick Landfill Site have been assessed and scored according to the risk matrix provided in the Environment Agency Guidance, IPPC H1 Integrated Pollution Prevention and Control (IPPC); Environmental Assessment and Appraisal of BAT.

Following the risk assessment the only unacceptable risk is the explosion of landfill gas. Mitigation measures have been provided for all potential accidents with further information being provided to ensure, as far as is reasonably practicable, the explosion of landfill gas does not occur. It is considered that the management of the site in accordance with the Waste Licence requirements and procedures and this Accident Prevention Plan will ensure the effective control of environmental accidents at the Ballynacarrick Landfill Site.



Issue: 1

Date: April 2010

Authorised By: Donegal County Council

Procedure No: OP02

Procedure: Emergency Response Procedures

Responsibility: All site personnel

Purpose: To identify any emergency situations, which may arise at the facility and provide provisions for minimising the effect on the environment as per Condition 9.2 of Waste Licence W0024-04.

Scope: This procedure applies to all emergency situations, which may affect the environment

Related Documents: Corrective Action, Training and awareness, Environmental Incidents and Notification

Date of Procedure Review: Annually or following an incident

Person Responsible for procedure update: Senior Executive Engineer

Authorised By: Donegal County Council

Procedure:

Emergency situations are identified as follows

- Fire
- Landfill Gas
- Plant breakdown
- Significant spillages
- Accident or injury

Emergency situations shall be handled initially by the staff on site.

Fire

1. Raise alarm immediately
2. Evacuate the site and proceed to the assembly point at the facility entrance ensuring all persons have left including visitors to site.

3. Site operative to notify Site Manager.
4. Nominated competent person to assess potential risk. Tackle fire if you feel confident but only if small. For fire in office building use fire extinguishers provided.
5. For fire on landfill site:

Above ground - surface fires at the working face.

If minor incident implement procedure to minimise oxygen available for combustion by smothering, or remove combustible materials, or ignition sources (heat). Monitor area after to ensure fire has been completely extinguished.

Subsurface landfill fires –

Minimise oxygen available for combustion by smothering. Ensure passive air intrusion sources such as cracks/fissures in the cap and areas of inadequate cover material are sufficiently covered. Temporarily shut down the gas extraction system in the area of the suspect fire.

Water – can be used – however very large quantities may be needed if any success is likely and it is very hard to get the water to the seat of the fire before it drains away through the rest of the surrounding waste. Monitor area after to ensure fire has been completely extinguished.

Monitor;

- Local ground temperatures.
 - Inspect the surface of the landfill in the vicinity of the suspected fire for areas where air (oxygen) may be readily entering the landfill.
 - Monitor the gas temperature of the extraction wells in the fire area to determine if elevated gas temperatures are present.
 - Monitor the carbon monoxide levels in the gas extraction wells in the suspected area to determine if elevated levels of carbon monoxide are present. (Carbon monoxide gas is a by-product of combustion.)
 - Inspect the gas wellheads internal components in the impacted area for the presence of soot, combustion odours and signs of damage due to heat or combustion
 - Inspect the ground around the impacted area for signs of subsidence due to the fire. The impacted area should be fenced off and safety precautions taken. No personnel or heavy equipment should enter area until it has been deemed safe.
6. Site Management will report all other incidents to Fire Brigade.
 7. Site Management will dial 999 and request emergency services to attend:

Fire at: Ballynacarrick Landfill Site, Ballintra, Co Donegal

8. Site management will nominate member of staff to direct Fire Brigade to site from the main Donegal to Ballyshannon Road
9. Do not re-enter site until the all clear has been issued by fire officer.
10. Investigate cause of the fire.
11. Consider implication of fire in relation to operational procedures at the landfill and take appropriate action.

12. Replace any fire extinguishing equipment that may have been used immediately.

Landfill Gas

1. When landfill gas concentrations are found within peripheral boreholes to be above 1.0% v/v of methane (20%) or 1.5% v/v carbon dioxide then all adjacent buildings will be monitored.
2. If levels within building exceed the above trigger levels then warn occupants of the danger and possible risk to life and property; advise necessity of evacuation. Leave all doors open
3. Report results to Site Manager.
4. Isolate all ignition sources
5. Site Manager will initiate corrective action procedure.
6. Put in place appropriate measures to prevent further off-site migration.
7. Continue assessment of monitoring regime until gas levels are below trigger levels.
8. Consider implication of gas migration in relation to operational procedures at the landfill and take appropriate action.

Significant Spillages

1. Establish nature of the spill and clean up immediately.
2. Use suitable equipment from emergency spillage kit stored next to site office to contain and absorb spillage as per manufacturer's instructions.
3. Dispose the used absorbent materials at the appropriate waste disposal facility.
4. Prevent spill from entering drains.
5. Consider implication of spill in relation to operational procedures at the landfill and take appropriate action.

Accident Or Injury (Trained First Aider on site: *Nigel Breslin*)

1. If an accident injury happens on site call for assistance immediately and initiate appropriate first aid as per training provided and manual.
2. If injury is considered to be serious Site Manager or nominated person to dial 999/ 991 and request emergency services to attend.

Accident at Ballynacarrick Landfill Site, Ballintra, Co Donegal

3. Site management will nominate member of staff to direct Ambulance, Fire Brigade to site from the main Donegal to Ballyshannon Road.

Plant Breakdown

Breakdown situation will be resolved by the staff on site.

1. Site Manager will maintain list of approved plant suppliers and specialist mechanics in office.
2. From list arrange for onsite repair of existing plant or alternatively hire plant to come to site promptly.
3. Consider implication plant breakdown in relation to operational procedures at the landfill and take appropriate action.

Emergency Contact Numbers

Donegal County Council	(074) 9172222 (Day)
Senior Executive Engineer (Environment Section)	087 6623137
Environmental Monitoring Officer	(087) 686 0295
Fisheries Board	(071) 9851 435
Fire Brigade	112/999
Local Health Department	
<i>Letterkenny Hospital</i>	<i>(074) 9125888</i>
<i>Sligo Hospital</i>	<i>(071) 9171111</i>
Environmental Protection Agency	
<i>Wexford</i>	<i>053 9160600</i>
<i>Castlebar</i>	<i>094 9048400</i>
Local Garda (Ballyshannon)	(071) 9851102
Water Quality Lab.	(074) 9122787
Electricity Supply Board	1850 372 999

Recording Of Incident

Please refer to EMP04 Environmental incident and notification and associated report form for recording of incident and action to be taken.

Notification To The Environmental Protection Agency

Notify the Agency by both telephone and facsimile, if available, to the Agency's headquarters in Wexford and Castlebar as soon as practicable after the occurrence of any of the following:

- i) any release of environmental significance to atmosphere from any potential emission point including bypasses;
- ii) any emission, which does not comply with the requirements of this licence;
- iii) any malfunction or breakdown of key control equipment or monitoring equipment set out in Schedule C: Control & Monitoring of this licence which is likely to lead to loss of control of the abatement system;
- iv) any incident with the potential for environmental contamination of surface water or groundwater, or posing an environmental threat to air or land, or requiring an emergency response by the Local Authority.

The licensee shall include as part of the notification, date and time of the incident, summary details.