# APPENDIX 2J

# OUTLINE CONTINGENCY PLAN

# ROADSTONE DUBLIN LIMITED

# REMEDIATION OF UNAUTHORISED LANDFILL SITES AND DEVELOPMENT OF ENGINEERED LANDFILL, BLESSINGTON, CO. WICKLOW



## OUTLINE CONTINGENCY PLAN

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# 1 ACCIDENTS AND THEIR CONSEQUENCES

## 1.1 Introduction

This document is the Contingency Plan for the proposed remediation scheme at Blessington. The remediation scheme will involve excavation, removal, transportation and deposition of waste.

The purpose of this document is to identify plans and arrangements that will be implemented during and after the proposed remediation scheme.

This document considers those aspects of the installation operations that may pose a risk of accidents that may have environmental consequences.

The resultant accident management plan describes the various techniques that will be implemented at the site to minimise the risks posed by the installation to the environment. It does not include those accidents, which may solely affect the health and safety of operatives, contractors or visitors to the site.

## 1.2 Accident / Hazard Identification

The following categories of potential hazard / accident have been identified and risk management measures are detailed in the following sections, which should be implemented at the site to ensure the environmental risks associated with the hazards are tolerable.

*Fire*

The fire management plan, which describes the procedures and precautions that will be implemented at the site, is presented in Section 2 of this plan.

*Spillage and Leakage*

Procedures that will be implemented at the site to minimise the risk from spillage and leakage is presented in Section 3 of this plan.

*Stability*

The measures to be taken during both the design process and during routine operations to ensure the stability of the site and prevent slippage are detailed in Section 4 of this plan.

*Security and Vandalism*

Measures that will be adopted to minimise the potential environmental impact associated with deliberate damage to control mechanisms such as oil storage facilities are detailed in Section 5 of this plan.

*Explosion*

Measures to be taken at the site to minimise the risk of explosion due to landfill gas and incompatible waste acceptance are outlined in Section 6 of this plan.

# 2. FIRE MANAGEMENT PLAN

## 2.1 Operational Techniques

Waste management sites can represent a potential fire risk for a number of reasons.

- Site buildings contain electrical appliances and other sources of ignition along with materials that would readily burn.
- Many waste materials may support combustion.
- Maintenance activities on plant and equipment can represent a potential fire risk if necessary precautions are not taken.
- Underground fires, whilst not always fully understood, have been known to occur at landfill sites.

Specific action that will be taken to prevent and minimise the risk of fires from these particular sources, together with general fire prevention precautions are detailed below.

*Site Buildings/Electrical Appliances*

All electrical appliances in use at the site will be tested in accordance with the Electrical Testing Regulations.

*Housekeeping*

Site buildings will be maintained in a tidy condition, and will be regularly cleaned to avoid the accumulation of paper and debris that may present an increased fire risk.

*Waste Compaction and Covering*

The compaction and covering of potentially combustible waste will minimise the risk of waste delivered to the site catching fire.

*Management Responsibility*

The Site Manager will have responsibility for ensuring that nuisances and hazards arising from the landfill due to fire are minimised.



*Training*

All employees will undergo training relevant to their role in fire prevention, use of fire extinguishers, and emergency procedures.

*Smoking Policy*

Smoking will only permitted at designated areas and specifically not at the operational areas on the site.

*Fire Protection Equipment*

Where appropriate, plant will be fitted with automated fire protection equipment.

*Hot Work Permitting System*

A formal permit to work system will be in place to ensure appropriate precautions are taken and approval obtained prior to any hot work being carried out on site plant and equipment.

*Transference of Hot Loads*

Although it is not anticipated that any hot loads will be encountered amongst the buried waste at the unauthorised landfill, contingency arrangements are outlined herein.

Possible waste types have the potential to be in a hot condition and can therefore present a potential fire risk within the site. Typical examples are foundry sand, slags from smelting works, and loads that have previously been on fire.

All potentially hot types will be identified at the point of excavation, and will be subject to quarantine procedures. Such waste will not be transported to the proposed non-hazardous landfill area without the specific approval of the Site Manager, who will be responsible for ensuring that the waste no longer presents a fire risk.

*Quarantine Bay*

Hot waste identified will be placed in a quarantine area and monitored until such time as they no longer present a potential fire risk, after which they will be landfill at the proposed non-hazardous landfill (provided acceptable).

*Fire Fighting Equipment*

Fire extinguishers will be provided in the site buildings and will be used if it is appropriate and safe to do so, in the event that fire is discovered in the building.

*Landfill Gas Management System*

The landfill gas management system will be monitored regularly and adjusted where necessary to ensure that air is not entering the system.

*Leachate Extraction/Monitoring Wells*

Leachate extraction and monitoring wells will be sealed to prevent air ingress and thereby decrease the likelihood of underground fires.

*Smoke and Fire Alarms*

Smoke and fire alarms will be fitted in the site offices.



## 2.2 Monitoring Techniques

All operatives will remain vigilant regarding the breakout of fire at the site, and the emergency procedure and action plan outlined below will be followed if fire is observed.

Monitoring for underground fires will be routinely carried out during the regular monitoring of the landfill gas management system.

## 2.3 Fire Action Plan

In the event of fire, the Environmental Protection Agency will be advised as soon as practicable.

*Fire within Site Buildings*

- The person discovering the fire will raise the alarm.
- If the fire cannot be safely tackled using appropriate fire extinguishers the emergency services and the site manager will be informed
- If it is safe to do so, all electrical supplies will be isolated and made safe in the area of the fire.
- The site manager or his deputy will check for all visitors, contractors and staff to ensure everyone is accounted for.
- The site manager or his deputy will direct the emergency services to any casualties.
- All used fire extinguishers will be returned to the supplier for refilling or replacement.

*Fire at the Operational Area*

- The Site Manager and Environment Protection Agency will be informed immediately.
- If deemed necessary by the Site Manager, the Emergency Services will be called.

- All tipping operations will be suspended and all vehicles in the vicinity of the fire will be evacuated if it is safe to do so.
- Using available mobile plant with a bucket or blade the fire will be smothered with inert material working from the outside edge of the fire towards the centre.
- A second machine and operator will be available on standby.
- If the fire continues to burn below the surface, the burning material will be isolated by digging it out and spreading it on top of inert material, after which it will again be smothered.
- The area will continue to be monitored to ensure that all burning material has been fully and permanently extinguished.

*Plant and Equipment Fire*

- The person discovering the fire will raise the alarm.
- If the fire cannot be safely tackled using appropriate fire extinguishers the emergency services and the site manager will be informed
- If it is safe to do so, all electrical supplies will be isolated and made safe in the area of the fire.
- The site manager or his deputy will check for all visitors, contractors and staff to ensure everyone is accounted for.
- The site manager or his deputy will direct the emergency services to any casualties.
- All used fire extinguishers will be returned to the supplier for refilling or replacement.

*Underground Fire*

In the event that an underground fire is suspected, the following possible courses of action will be considered in consultation with the Environment Protection Agency: -

- excavation of the burning material;
- turning off gas extraction wells in the vicinity of the fire;
- ensuring all leachate extraction wells are sealed to prevent oxygen entering the site; and
- discharge of water or leachate via boreholes or wells constructed to the appropriate depth.



*Records*

A fire log will be maintained. It will include the following details: -

- records of the maintenance of fire extinguishers;
- a record of all incidents of fire including date, time, nature and cause of the fire; and
- details on the action taken to extinguish the fire, and any subsequent changes to operational and emergency procedures.

The Environment Protection Agency will be advised of all incidents of fire as soon as practicable.

# 3 SPILLAGE AND LEAKAGE MANAGEMENT PLAN

## 3.1 Operational Techniques

In order to prevent spillages and leaks of potentially polluting materials and minimise the impact of any spillages that do occur, the following measures will be implemented at the site.

*Unloading Procedure/Overfilling of Tanks*

All polluting materials delivered to site will be unloaded by suitably qualified employees from the delivery company, and overseen by a designated site operative. This will prevent the overfilling of tanks.

*Storage Vessels/Containers*

Fuels used on site shall be stored within tanks constructed to the appropriate Irish, British or International Standard, meeting the requirements of the Local Government (Water Pollution) Acts 1977 and 1990 and associated regulations.

Other potentially polluting liquids such as odour control chemicals, lubricating oils, waste oils derived from vehicle maintenance, pesticides etc, will be stored within the site compound within a self-bunded purpose designed lockable storage facility.

All solid wastes arising on site and other solid potentially polluting materials will be segregated according to category and stored within containers constructed to ensure the contents do not spill or escape.

*Bunding*

All potentially polluting liquids will be stored in bunded tanks or tanks located within an area bunded to contain 110% of the volume of the largest vessel contained within the bund, or 25% of the aggregated total capacity, whichever is the greater.

Any minor spillages or rainwater that accumulates within bunded areas will be removed at regular intervals to ensure the capacity of the bund is maintained.

Inspection of storage bunds will be carried out in accordance with the 'work instruction for the inspection of storage bunds'.



*Inspection and Maintenance*

All bunds, containers and tanks will be inspected on a daily basis by the site manager or his designated deputy to ensure their continued integrity, and identify the requirement for any remedial action.

In the event that remedial action is required, arrangements will be made to transfer any potentially polluting materials to secure alternative storage pending completion of the remedial work. Remedial work will be undertaken as soon as possible. Containers and tanks found to be faulty will not be used for the storage of polluting materials until appropriate remedial action is completed.

*Absorbent Materials*

A supply of materials suitable for absorbing and containing any minor spillage will be maintained on site.

Sand bags or similar which are suitable for the blockage of the surface water discharge point will be maintained immediately adjacent to the discharge point for use in emergency situations.

## 3.2 Spill Containment Equipment

Materials suitable for containing spills including sealing devices and substances for damaged containers, drain seals and booms, and overdrums will be maintained at the site.

*Plant Maintenance*

All plant and equipment will be subject to maintenance in accordance with manufacturer's recommendations to avoid the failure of items of plant and equipment giving rise to potential emissions to the environment.

*Drains*

All drains will be subject to daily visual inspection by the Site Manager. Action will be taken to remove any obstructions to flow.

*Drain Connections*

All drain connections will be installed during the construction process, and this activity will be carried out under full CQA supervision. The construction of the installations will be fully documented. The risk of incorrect connections being made will therefore be avoided.

*Over Pressure of Vessels*

All vessels and pipework in use at the site will be designed to ensure that failure due to over pressure is prevented. This will be achieved by the use of materials, which are designed to accommodate the design pressures, and valves and vents at appropriate locations within the system, which will prevent the build up of unexpected pressure.

*Leachate Breakouts*

The potential for leachate breakouts that may give rise to surface water contamination will be minimised by the following operational procedures: -

- control of leachate heads within the site using leachate extraction sumps and pumps; and
- avoidance of perched leachate by the selection of appropriate daily cover and if necessary the removal of clayey material prior to surcharging with additional waste.



The site will be examined on a daily basis for evidence of leachate seepage or breakout from the surface, and appropriate remedial action taken to intercept the leachate and prevent it contaminating surface water. This may include the construction of interception or cut off trenches, construction of interception bunds, and the removal of leachate by pumping.

*Management of Fire Extinguishing Water (Fire Water)*

Options for the management of fire extinguishing water (i.e.fire water) depend upon the location and nature of the fire.

The main principle underlying any action in this regard will be to avoid wherever possible, fire water gaining access to the surface water drainage system.

In the event of fire at the active landfilling area, water will be allowed to soak into the underlying waste, and will ultimately be dealt with as leachate. Action will be taken if possible to prevent fire water entering the surface water drainage system. This will be achieved by using mobile plant and equipment to construct physical barriers such as earth bunds and interception ditches at strategic locations.

In the event of fire at the site control area, action will be taken if possible to divert water away from the surface water drainage system. It will be diverted if possible to soakaway into the underlying soils, thereby attenuating any pollutants prior to entering surface or groundwater.

## 3.3 Monitoring Techniques

All site personnel will be tasked with monitoring for evidence of spillage and leakage, during their day-to-day routine. The condition of bunds, tanks and containers will also be inspected on a daily basis.
A daily and weekly inspection checklist will be used to record inspections of infrastructure, operations, pollution control and amenity management and monitoring. The inspection checklist will be used by the site manager to identify requirements for remedial action.

Any evidence of spillage or leakage will be reported immediately to the Site Manager or his deputy for appropriate remedial action.

### 3.4 Leaks and Spillage Action Plan

In the event of spillage of polluting materials, immediate action will be taken to contain the spillage.

The spillage will be reported to the Site Manager, who will assess the situation and decide on the most appropriate course of action.

The action taken will depend upon the size of the spillage, the location of the spillage in relation to sensitive receptors and the chemical and physical nature of the spilled material.

Action taken may include some or all of the following: -

- if possible the leak will be stopped;
- if it safe to do so, the cause of the spill or leak will be isolated, and/or moved to a bunded area;
- if the spillage is small, spill granules will be used immediately if necessary to prevent the spill spreading. The area will be cleared and all contaminated material will be sent to an appropriately licensed site for disposal;
- if the spill is larger, inert materials such as clay or sand will be used to make a containment bund and specialist help will be sought to assist in clean up;
- in the event of a potentially serious spillage that may give rise to pollution of surface water, immediate action will be taken if possible to prevent the spread of the spill into surface water drains using suitable covers and barriers. The Environment Protection Agency will be informed immediately, and remedial action will be agreed.
- if the spillage cannot be contained using approved materials, the Environment Protection Agency and senior management will be contacted immediately and specialist help obtained;
- if a vehicle is found to be leaking, it will be moved to a position where the spillage can be contained i.e. quarantine area, or other hard surfaced area, if it is safe to do so; and
- all personnel will follow instructions provided by managers or other competent persons. Appropriate precautions will be taken depending upon the nature of the spilled material to prevent any harm to human health, and all personnel involved in clean up will wear protective clothing appropriate for the nature of the spilled material.

All spillage incidents, site inspections, and remedial actions will be recorded in the site diary.



### 3.5 Damage to Basal Liner

Damage could result from landfill or construction plant tracking on the engineered liner or penetrating the liner during waste placement and compaction. Whilst damage resulting from the construction process may be detected by the leak location survey and remediated, subsequent damage by the landfill traffic is not so easy to detect.

Measures that will be taken to minimise the potential for such include the use of selected waste, which excludes bulky or sharp objects in the first lift, application of minimal compaction for the first lift of waste and preventing compaction equipment coming into direct contact with the basal lining system.

In the event that damage to the basal liner is sustained, remedial work will be carried out under full CQA procedures and the works will be detailed in a completion report.

Any damage to the basal liner will be reported to the Environment Protection Agency as soon as practicable.

# 4 STABILITY MANAGEMENT PLAN

To ensure the continued integrity of the engineered containment system precautions will be incorporated both at the design stage and during landfilling operations as detailed below.

## 4.1 Design Considerations / Stability Assessment

Stability of the site during construction, prior to, during and following landfilling is a prime consideration during the design process.

The following factors have been taken into account during the design process: -

- *nature of substrata*, i.e. the presence of any historical mining and quarrying, presence of superficial deposits, variation in the water table, geotechnical and hydraulic properties of any materials to be utilised at the site;
- *stability of engineered lining systems*, i.e. inter-liner stresses and slip planes, effects of varying leachate head;
- *stability of waste body*, i.e. stability of temporary slopes during landfilling; and
- *stability of capping and restoration layers*, i.e. surface gradients and effects of waste settlement.

## 4.2 Operational Techniques

The following operational techniques to ensure stability of the waste mass, will be adopted at the site.

- *Waste compaction :* Waste will be levelled and compacted as soon as possible after discharge at the working area. This will minimises short-term settlement and enhance stability of the waste mass;
- *Large objects :* All large objects will be crushed to ensure that voids do not develop in the landfill;
- *Height of tipping face :* The maximum height of the tipping face after compaction will be 2.5 metres. The deposit of uncompacted waste over high unstable faces will therefore be avoided.
- *Gradient of temporary slopes :* During construction of the landfill, the slope adopted for temporary unrestored faces sloping to the landfill base will depend upon the nature of the waste, its moisture content, height of the slope, nature of the foundations and the consequences of failure.



## 4.3 Monitoring Techniques

The following action will be taken to monitor the stability and settlement of the landfill: -

*Visual Inspections*

Visual inspections will be carried out at weekly intervals to identify the following: -

- evidence of cracks in temporary waste slopes caused by movement of the waste mass;
- evidence of instability or movement in the lining system; and
- evidence of differential settlement causing depressions in the restored landform, cracks in the capping system, or damage to the drainage system.

## 4.4 Action Plan

In the event that stability or settlement problems are discovered, appropriate remedial action will be taken as detailed below: -

*Liner Instability*

- the liner will be inspected by an independent engineer to assess the need for any remedial action, which will be agreed with the Environment Protection Agency;

- revisions to liner design to provide additional resistance to slippage or damage will be considered and agreed with the Environment Protection Agency;

*Instability of Waste Mass*

If there is visual evidence of movement within the waste mass, or evidence from the regular topographical surveys, the situation will be reviewed by an independent engineer, and appropriate remedial action will be taken in agreement with the Environment Protection Agency.

The action taken will depend upon the severity of the movement, the timescales over which the unstable mass will remain unsupported, and the consequences of failure.

Action taken may include one or more of the following: -

- the situation will continue to be monitored through regular visual inspections and topographical surveys;
- prohibit operations at the base of the slope, which may place operatives at potential risk;
- adjustment to phasing of landfill operations to provide additional support to the waste mass as soon as possible;
- engineering work to reduce the gradient of the slope and reduce the risk of failure; and
- revised design for future phases to reduce slope gradients and/or height of slopes and reduce time period over which temporary slopes remain unprotected.

*Records*

Records will be maintained as follows: -

- the results of visual inspections and topographical surveys;
- stability problems including date, nature and suspected cause of the problem; and
- details on the corrective action taken, and any subsequent changes to site design or operational procedures.

# 5 SECURITY MANAGEMENT PLAN

Many potential problems can arise from inadequate control over access to landfill sites. These problems include: -

- non-permitted waste being deposited in contravention of the Waste Licence;
- fly tipping of wastes at the site entrance; and
- damage to lining systems, plant and equipment.

Such problems not only disrupt safe landfilling operations but can also have significant financial implications for the operator who will be required to replaced or repair stolen or damaged equipment. Environmental damage can also result if the integrity of gas and leachate control systems is compromised. There is also the potential for landfill fires, odour and litter from abandoned or disturbed waste.

## 5.1 Operational Techniques

In order to minimise the risk of problems arising as a result of inadequate security, the following measures will be implemented at the site.

*Building Security*

The site control office will have the benefit of a security alarm to discourage intruders. Windows will also be fitted with bars and /or shutters to prevent damage by vandals.

*Lighting*

The main site control area, environmental management compound and plant storage area will have security lighting to discourage unauthorised visitors during the hours of darkness.

*Fencing*

The site will have the benefit of security fencing which will extend around the perimeter of the site. There will also be a separate fence and gates around the environmental compound.

*Security Gates*

Security gates, which span the full width of the access road will be provided at the entrance to the site. The gates will be locked outside operational hours to deter unauthorised vehicular and pedestrian access.

*Inspection*

Gates and fencing will be inspected weekly by the site manager or his nominated deputy, to identify deterioration and damage, and the need for any repairs.

*Maintenance and Repair*

The fencing and gates will be maintained and repaired when required to ensure their continued integrity. In the event that damage is sustained a temporary repair will be made within 24 hours until permanent repairs can be effected.

*Warning Notices*

Notices warning against unauthorised access (and alerting potential trespassers to on site hazards) will be erected at the site entrance and adjacent to the footpath, and will be repeated as necessary at locations around the perimeter of the site.

*Security Systems*

The site will have the benefit of a security system comprising either electronic alarms or security guards which will be activated / in place outside operational hours.

*Authorised Access System*

All visitors to the site will be required to register their presence by signing in the visitors book on entry to the site, and again on exit. This will minimise the risk of unauthorised visitors being present on site.

*Reporting Systems*

In the event of fly-tipped material being found at the entrance to the site, the fly tipped material will be examined for evidence of ownership. In the event of evidence being found, the Environment Protection Agency and Local authority will be advised so that legal action may be considered.

## 5.2 Monitoring Techniques

The operational procedures outlined above, including the regular inspections, security and reporting systems will ensure continual monitoring of security provision at the site.

## 5.3 Action Plan

In the event of a breach of security at the site, the following course of action will be followed;

*Unauthorised Access*

The route of access will be determined, and consideration given to the following measures as appropriate: -

- repair of gates or fencing;
- replacement of gates or fencing with more secure design;
- erection of warning signs; and
- installation or implementation of additional security measures for example security cameras, more frequent patrols.



*Unauthorised Tipping*

- the material will be examined for evidence of ownership;
- the Environment Protection Agency and Local Authority will be informed;
- with the agreement of the Environment Protection Agency and/or Local Authority, the material will be removed and disposed of correctly;
- if appropriate, additional warning signs will be erected; and
- additional security measures will be considered.

*Records*

A record relating to the management and monitoring of security will be maintained. It will include the following details: -

- records of the inspections and maintenance of security fencing and gates;
- a record of all breaches of security and incidents of fly tipping, and investigations of these breaches of security; and
- details of the action taken to replace or repair security equipment, and investigate fly tipping, including any subsequent changes to operational procedures.

# 6 EXPLOSION

The main risk of explosion at the installation is associated with landfill gas. In the event of an explosion, the action taken by installation personnel would be the same as that taken in the event of fire.

## 6.1 Landfill Gas System

It is anticipated that the landfill at Blessington will not produce sufficient volumes of gas to allow a flare to operate. The gas management system therefore relies upon passive venting.

Gas levels shall be monitored at the site on a regular basis to measure both the quality and quantity of gas produced. In the event that the waste mass produces significantly higher volumes of gas than originally expected, the venting system shall be connected to a flare.

## 6.2 Gas Migration

In view of the potentially hazardous nature of landfill gas, an Emergency Plan has been developed to outline the action that will be taken in the event of landfill gas migration giving rise to potentially dangerous situations.

If landfill gas migration is detected in the boreholes surrounding the landfill then one or more of the following actions shall be taken:

- Actively extract gas from the waste mass;
- Install further monitoring wells outside of the landfill; or
- Install an active gas collection system outside of the landfill.

In the event that landfill gas is detected in buildings at concentrations in excess of 20% of the lower explosive limit (LEL) above background levels, the alarm will be raised by fixed gas alarms or by monitoring personnel. The following measures will be taken:

- All buildings, cabins or other potentially confined spaces will be evacuated;
- Electrical switches and buttons will not be operated;
- If it is safe to do so, any possible sources of ignition will be isolated and locked off. For example, fuses from electrical systems will be removed;
- All windows and doors in buildings within the installation will be opened to ventilate the area and landfill gas levels should be determined immediately;
- The Site Manager / Site Supervisor will be informed immediately;
- The weighbridge will be alerted and movement of vehicles around the site will be stopped;
- Environmental monitoring staff and the health and safety manager will be advised of the situation;
- Buildings will not be entered until it is safe to do so;
- If the area of migration is adjacent to nearby buildings, the gas extraction field will be adjusted to increase suction in that area;
- Perimeter monitoring boreholes will be monitored at an increased frequency;
- If migration continues, the local emergency services and the Environmental Health Department will be called, and a joint monitoring exercise will be carried out on properties at risk;
- If local residents need to be evacuated, the Gardaí will be contacted; and
- The Site Manager will note down any actions taken and inform the Environment Protection Agency at the earliest opportunity.