



KWD Recycling
Waste Licence (Reg: W217-01)
Aughacurreen, Killarney, Co. Kerry.

Closure Plan & Environmental Liabilities Risk Assessment 2016



Closure Plan & Environmental Liabilities Risk Assessment (ELRA) 2016

Contents

1. INTRODUCTION.....	1
1.2 KEY ASSUMPTIONS.....	3
2.3 SOURCES OF INFORMATION.....	4
2. SITE EVALUATION.....	5
2.2 WASTE LICENCE DETAILS.....	5
2.3 WASTE LICENCE ACTIVITY CLASS.....	5
2.4 NATURE OF THE FACILITY.....	6
2.5 PROCESS DESCRIPTION.....	6
2.6 SITE HISTORY & INCLUDING FULL DETAILS OF SITE PROCESSES.....	7
2.7 SITE INVESTIGATIONS AND INFORMATION AVAILABLE REGARDING THE ENVIRONMENTAL PERFORMANCE OF THE SITE.....	8
2.8 ENVIRONMENTAL MANAGEMENT SYSTEM.....	8
3. CLOSURE PLAN.....	13
PROGRAMME TO ACHIEVE CLOSURE.....	18
PLANT RECOVERY OF DISPOSAL.....	19
Proposed Disposal Routes.....	20
Decontamination Works.....	20
Removal of Infrastructure & Services.....	20
Criteria for a Successful Closure.....	21
4. CLOSURE PLAN COSTING.....	23
Environmental monitoring during decommissioning.....	23
4.1 CLOSURE PLAN IMPLEMENTATION.....	24
4.2 CLOSURE PLAN VALIDATION.....	25
5. ENVIRONMENTAL LIABILITY RISK ASSESSMENT (ELRA) FOR UNKNOWN LIABILITIES.....	26
5.1. Emergency Response.....	26
5.2 Employee Training.....	26
5.3 RISK ASSESSMENT METHODOLOGY.....	26
6. QUANTIFICATION & COSTING.....	35

Attachment A Financial Provisions & Insurance

Glossary of Terms

AER	Annual Environmental Report
Biodegradable waste	Any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food, garden waste, sewage sludge, paper and paperboard.
Commercial Waste	As defined in Section 5(1) of the Waste Management Acts 1996 to 2005.
Construction and Demolition Waste	Wastes that arise from construction, renovation and demolition activities, as specified in Chapter 17 of the EWC or as otherwise may be agreed.
EMP	Environmental Management Programme.
Environmental Damage	Has the meaning given it in Directive 2004/35/EC.
European Waste Catalogue (EWC)	A harmonised, non-exhaustive list of wastes drawn up by the European Commission and published as Commission Decision 2000/532/EC and any subsequent amendment published in the Official Journal of the European Community.
Facility	Any site or premises used for the purposes of the recovery or disposal of waste.
Incident	The following shall constitute an incident for the purposes of this license: a) an emergency; b) any emission which does not comply with the requirements of this license; c) any exceedence of the daily duty capacity of the waste handling equipment; d) any trigger level specified in this license which is attained or exceeded; and, e) any indication that environmental pollution has, or may have, taken place.
Industrial Waste	As defined in Section 5(1) of the Waste Management Acts 1996 to 2005.
Recyclable Materials	Those waste types, such as cardboard, batteries, gas cylinders, etc, which may be recycled.
Sanitary Effluent	Waste water from facility toilet, washroom and canteen facilities.
Storm Water	Rain water run-off from roof and non-process areas.

1. Introduction

KWD Recycling (KWD) was established in 1987 and operates a Materials Recovery Facility at its site in Aughacurreen, Killarney, Co Kerry. The facility operates a waste collection service for domestic, commercial and industrial customers. Prior to the granting of the Waste Licence Register Number W0217-01 from the Environmental Protection Agency which allows for up to 40,000 tonnes of waste to be processed at the facility per annum. KWD are required to prepare a Closure Plan and an Environmental Liability Risk Assessment (ELRA) in accordance with the Environmental Liability Directive 2004/35/EC.

The aim of this report is to develop a closure which would be initiated in the event of an unforeseen closure. This report also evaluates and quantifies the environmental liabilities associated with operations at KWD, and provides details of Financial Provisions required to ensure no environmental contamination will remain on the site.

KWD are required to prepare an Environmental Liabilities Risk Assessment (ELRA) in accordance with Condition 12.2.1 of the Licence. In order to meet this requirement, KWD prepared an initial ELRA in 2009.

This report comprises a review of the ELRA in accordance with recent guidance from the EPA "*Guidance on assessing and costing environmental liabilities*" (EPA, 2014) and "*Guidance on Financial Provision for Environmental Liabilities*" (EPA, 2015).

1.1 Scope - Update to Closure Plan and ELRA

1.1.1 ELRA

This ELRA covers all environmental risks that may be associated with potential liability from past and present activities. Environmental risks include all risks associated with hazards that may cause direct or indirect harm to water, atmosphere and land.

The two types of liabilities at the site are:

- **Known Liabilities:** which include planned liabilities associated with site closure, and aftercare management and will be documented within the Closure Plan.
- **Unknown Liabilities**—These are liabilities that could occur through unexpected circumstances and are the main liabilities that are assessed through the ELRA process.

According to the EPA Guidance Note (2014), the stated objectives of the ELRA are:

- To identify and quantify environmental liabilities at the facility focusing on: unplanned, but possible and plausible events occurring during the operational phase; and
- To provide a mechanism to encourage continuous environmental improvement through the management of potential environmental risks.

As part of the review an assessment of site activities and operations has been undertaken to determine if circumstances have changed which may alter the potential for environmental liabilities to arise from unplanned operations. In particular, the operations on site were reviewed to determine if there were any additional potential scenarios, which may lead to a risk of significant pollution offsite, or if mitigation or control measures had changed in a manner which would lead to an increased risk from the scenarios previously examined.

This document also outlines the financial provision which has been put in place for each eventuality. The ELRA will review and evaluate all environmental risks at the site and provide financial provisions to ensure environmental protection. It will also document a risk management programme to allow for continuous environmental improvements on site.

The risks considered in this report are indicative of the risk category which KWD falls within in addition to the processes and procedures associated with operations at KWD and are based on a number of Loss of Containment scenario's at the facility.

Any future changes to processes, services and utilities at the installation, including changes to the range of materials used, will be assessed in subsequent revisions of the ELRA depending on the scale and significance of the changes.

1.1.2 Closure Plan Summary

The scope of this closure plan is to ensure that all the environmental aspects and impacts associated with KWD's operations with respect to the site's cessation are identified. The Closure Plan has been prepared in accordance with Condition 10 of Waste Licence (Reg. No. W0217-01) by outlining the procedures and mechanisms which will be adopted in the event of an unforeseen closure. The aspects of the site's operations, which have been considered as part of the Closure Plan preparation, are as follows:

- Decontamination of all process equipment within the Materials Recovery Facility
- Removal, re-distribution and/or disposal of all residual waste material.
- Distribution and removal of all finished product.

- Decommission of all plant equipment–shredder, trommel, ballistic separator, separators, conveyors etc.
- Decommissioning of machinery fluids i.e. removal of hydraulic oil/ grease/ anti-freeze etc.
- Decommissioning of the office boilers.
- Decommissioning of the surfacewater treatment lagoon.
- Disposal / removal of any contaminated soil/ sub soil.
- Provision of site security.
- Structural decommissioning.
- Cessation of contracts with contractors and suppliers.

The ELRA and CP, were originally prepared in 2009. The EPA guidance document entitled "*Guidance on assessing and costing environmental liabilities*" (EPA, 2014) and "*Guidance on Financial Provision for Environmental Liabilities*" (EPA, 2015) has been used as the basis for the methodology in preparing this report, here in referred to as EPA 2014.

Since the report was last reviewed there has been no structural changes to the site. There is no known ground contamination at the facility and hence this plan is prepared and costed as a closure scenario with no requirement for restoration or aftercare management.

The closure aspect of the plan outlines the approach to the planned tasks and programs for the cessation of activity, the decontamination and decommissioning of the production facility and ancillary services, the removal of all residual materials/fuels/wastes.

In order to provide a robust worst case costing it estimated that the closure of the facility will be an unplanned event and assumes that all tasks will be carried out by third parties and not KWD personnel as a worst case assumption.

The calculated Financial Provision for the closure of the facility is **€117,942** (exclusive of VAT). This figure is based on a detailed analysis of the closure tasks and rates are based on existing suppliers and industry norms. Where there is uncertainty in the task or program a conservative estimate has been provided and a high level of contingency (10%) has been applied to the costing to ensure a robust financial provision.

1.2 Key Assumptions

The following assumptions have been made in order to facilitate the production of this report:

- The ELRA is based on the operations and alterations that have been carried out at the site to date.

- For the purpose of the ELRA, it is assumed KWD operates its site in accordance with the conditions of the current Waste Licence. No provisions have therefore been made for potential costs associated with any criminal proceedings that could arise.
- Any such costs are not covered by insurance and therefore cannot be underwritten by any third party or insurance organisation.

2.3 Sources Of Information

Information from the following sources was used in the preparation of this report:

- Site visit carried out on 11th January 2016 reviewed the activities undertaken at the site including all site processes and activities in the presence of environmental personnel;
- Annual Environmental Reports for 2009-2015,
- Drainage integrity test results for bunds and pipelines.
- Waste Licence Application and Inspectors Report;
- Waste Licence Reg. No. W217-01; and
- Non-compliance and environmental incident log records from the last five years.

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2. Site Evaluation

2.1 Site Location and General Context

Killarney Waste Disposal (KWD) was established in 1987 and operates a Materials Recovery Facility at its site in Aughacurreen, Killarney, Co Kerry. A site map is shown in Figure 2.1.



Figure 2.1 Site Layout and Location

2.2 Waste Licence Details

Waste Licence Register No.:	W0217-01
Licence Issue date:	01 st August 2006
Licensee:	Killarney Waste Disposal Limited.
Location of Activity:	Aughacurreen, Killarney, Co. Kerry

2.3 Waste Licence Activity Class

KWD operate licenced waste disposal and recovery activities under the current Waste Licence in accordance with the Third and Fourth Schedule of the Waste Management Acts 1996 to 2005.

The facility is licenced to undertake waste disposal activities set out under the Third Schedule are the Classes 11, 12 and 13; and waste recovery activities set out in the Fourth Schedule are the Classes 2, 3, 4, 11, 12 and 13. The principal activity is Class 4 under the Fourth Schedule.

2.4 Nature of the Facility

The Waste Licence Register Number W0217-01 allows for up to 40,000 tonnes of waste to be processed at the facility per annum, this can be broken down as follows:

Waste Type	Max. (Tonnes per Annum)
Mixed municipal waste	15,500
Organic waste (kitchen and canteen waste)	6,000
Dry recyclable wastes	6,500
Non-Hazardous Construction and Demolition (C&D)	12,000
Total	40,000

Waste is accepted from a number of domestic and commercial waste sources in the Munster Region. Processed materials are sold to customers for further processing and recycling.

2.5 Process Description

All incoming waste is weighed on the weighbridge which is located near the site entrance and the following information is recorded for site records:

Description of waste, waste types, composition form and relevant EWC code:

- Origin of waste including customer details
- Weight of the waste load
- Truck registration

The waste material is deposited in the MRF at the Waste Intake Area where it is inspected prior to processing. Any load failing inspection is transferred to the quarantine area where it undergoes further inspection and if found to be non compliant is returned to the customer.

Waste for recovery is segregated into the relevant waste streams and depending on the nature of the material is either bailed for further processing offsite or loaded for offsite disposal.

Materials undergoing further processing offsite are transferred to the holding area where they are stored until sufficient quantities are available for shipment by container.

KWD ensures that all information relating to the loading of containers on site is recorded for site records. All containers are sealed prior to shipment off site. The main waste Streams for processing are set out below:

Mixed Municipal Waste

Mixed Municipal Wastes, household and commercial wastes (originating from, factories, offices, hotels, and retail sources) are processed at the site. The waste is then baled into plastic film to ensure the bales remain intact while they are stored at the facility. There are two disposal options for this waste either sending to landfill or exporting, for the purpose of energy recovery. The separated organic fines either undergo further processing by drying, to reduce the moisture content before being exported for energy recovery, or they are directly composted at a specialist composting facility.

Dry Recyclables

Source segregated municipal dry recyclables also originate from the same sources as the MMW (the majority of customers both domestic and commercial, have a green bin along with the black bin, collections alternating every second week). The dry recyclables waste stream requires very little processing due to its nature. The process stream can be seen in Figure 2 below.

A ballistic separator is employed in the case of mixed dry recyclables, whereas segregated dry recyclables are simply inspected and baled.

Organics

Organic waste goes directly to a bulk trailer and is shipped to an Irish compost facility.

Construction and Demolition (C&D) Wastes

After inspection the C&D waste is sorted with loaders and large pieces of waste removed. Further separation into segregated fractions of metals, timber, soil and remaining C&D waste is achieved using the ballistic separator. Timber is shredded outdoors, and stored until sufficient volumes are built up to warrant transport to other waste facilities for further processing. Metal waste is accumulated in the same way.

No hazardous waste is at present accepted at the facility and process are in place to quarantine and remove these wastes to a licence facility.

2.6 Site History & Including Full Details Of Site Processes

KWD was granted a Waste Licence (Reg: W0217-01) from the Environmental Protection Agency and monitors all releases to all environmental media and reporting consent of limit infringements. Prior to the issuing of the Waste Licence the site operated a Waste Permit under Kerry County Council (WP23/03).

Since the facility was constructed there have been no significant changes to the site and no significant environmental pollution incidents have occurred.

2.7 Site Investigations And Information Available Regarding The Environmental Performance Of The Site

The processing of municipal waste gives rise to an effluent which is collected in an underground bund within the Materials Recovery Facility. The composition of this process effluent would be typical of a landfill leachate. A fully bunded precast concrete effluent collection tank (underground) has been installed to collect all liquid arising from the Materials Recovery Facility. The leachate is transported by tanker to Tralee Waste Water Treatment Plant (WWTP) for treatment.

KWD do not discharge process effluent to sewer and are required to monitor the process effluent as part of Waste Monitoring required as per Schedule C.4, requiring analysis of the effluent on an annual basis.

2.8 Environmental Management System

KWD have implemented an Environmental Management System (EMS) as part of the Waste Licence.

The EMS documents the overall management system that includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.

The company has identified environmental aspects register which identifies potential environmental emissions associated with the site and the actions KWD will implement to manage and prevent an environmental incident. The objectives and targets of the EMS ensure conformance with the Waste Licence, which set a defined time period for achievement. These include environmental training and awareness, and monitoring. Emergency procedures associated with the operation of the site are also prepared as part of the EMS.

2.9 Bedrock

Reference to the Geological Survey of Ireland (GSI) Sheet 21 "Geology of Kerry-Cork Scale 1:100,000 indicates that the bedrock underlying the site is black shale and sandstone of Upper Carboniferous (Namurian) age. The GSI has classified the shale and sandstone bedrock underlying the site as a locally important aquifer which is moderately productive only in local zones.

2.10 Soil

The General Soils Map of Ireland indicates that the soil type in the area is podzolic. These are poor, acidic soils, typical of cool, damp climates. GSI

Quaternary maps record Devonian Sandstone dominated Till (boulder clay) at the site location. The thickness of the subsoil deposits in the area can reach up to 30m in places while elsewhere the subsoil is absent (at outcrop) or less than a metre.

2.11 Hydrogeology

The GSI has classified the shale and sandstone bedrock underlying the site as a locally important aquifer which is moderately productive only in local zones. Such rocks generally have a low permeability with groundwater concentrated in fractures. They are capable of yielding enough water to a well to supply a house or small farm (0.2-0.5 l/s) and may yield more in good fracture zones.

2.12 Water Quality

The Killarney Waste Disposal facility is located in the catchment of the Glanooragh River which flows to the Gweestin River c.10km downstream of the facility. The Gweestin flows for a further c. 10km before joining the River Laune.

The site is located near a drain which flows to one of the headwater tributaries of the Glanooragh River c. 0.5km downstream of the facility. Monitoring undertaken in 2004 upstream (c.200m) of the facility shows the water is seriously polluted (Q1-Q2), and remains the same downstream of the confluence with the site. At the point where the drain meets the Glanooragh River it improves to Class Moderately polluted (Q3).

2.13 Conservation Designations

The area is not included in any nature conservation designations which include Natural Heritage Area, Special Area of Conservation or Special Protection Area. The nearest conservation area is the Killarney National Park (SPA), and Killarney National Park (site code 004038), Macgillycuddy'S Reeks and Caragh River. Catchment SAC (site code 000365) which are both located c.2.5 kilometres to the south of the site.

2.14 Site assets register: Inventory of tanks and bunds

KWD keep an inventory of all tanks and bunds on site. All bunds are tested in accordance with the conditions of the Waste licence and are certified by external contractors to the current EU standard. All the results of recent bund tests undertaken for the facility are outlined in Tables 2.14.1.

Table 2.14.1 Bund and Drain Register Integrity Tests

Bund ID	Type	Capacity (Litres)	Capacity required*	Test Type	Date	Results
Leachate Sump No.1	reinforced concrete	9,100	n/a	Hydraulic test	2016	Pass
Sump No.2 (Near Office Area)	reinforced concrete	9,100	n/a	Hydraulic test	2016	Pass
Sump No.3 (Near Timnber Shredder)	reinforced concrete	8,640	n/a	Hydraulic test	2016	Pass
Oil Bund No. 4	reinforced concrete	15,600	6000	Hydraulic test	2016	Pass
Oil Water Inteceptor No. 5	reinforced concrete	1,271	n/a	Hydraulic test	2016	Pass
Foul Drain (F1)	polypropyl ene	n/a	n/a	CCTV	2014	Pass
Foul Drain (F2)	polypropyl ene	n/a	n/a	CCTV	2014	Pass
Foul Drain (F3)	polypropyl ene	n/a	n/a	CCTV	2014	Pass
Foul Drain (F4)	polypropyl ene	n/a	n/a	CCTV	2014	Pass
Foul Drain (F5)	polypropyl ene	n/a	n/a	CCTV	2014	Pass

2.15 Residence

There are approximately 20 no. residences within 500m from the boundary of the facility. Most of residences are located on a ribbon development on the nearby road from Knockasarnet to Aghalee. The primary land use in the vicinity of the facility is agriculture.

2.16 Noise

All noise monitoring results to date have been compliant with licence limits.

2.17 Overall Sensitivity of Environmental Receptors

The overall sensitivity of the environmental receptors with respect to the operations of the site and development of environmental liabilities is regarded as being negligible for the following reasons:

- Environmental monitoring in accordance with the requirements of the licence is undertaken on a regular basis to ensure there is no environmental pollution.
- Monitor of all licenced emissions has been in compliance with the Emission Limit Values.
- The quality of the nearest watercourse indicates that it is a Class A/B which is "unpolluted-slightly polluted".
- The site was developed on a green field site. Any site monitoring which has been conducted to date has not identified any significant potential liabilities.

2.18 Facility Compliance Status

The compliance record of site has been evaluated as per the EPA Guidance Note as outlined in Table 2.6.

Table 2.6 EPA Compliance Status

Condition	Classification
<ul style="list-style-type: none"> • Newly licensed facilities and those operating without non-compliance of emission limits. 	Compliant New Facility
<ul style="list-style-type: none"> • Licensed facilities with administrative non-compliances only 	Administrative non-compliant
<ul style="list-style-type: none"> • Compliances (<5 non-compliances in a 12 month period) AND/OR • Facilities with minor soil and groundwater contamination i.e. those with concentrations above background but not posing a risk to the environment are also considered in this class 	Minor Non-Compliant
<ul style="list-style-type: none"> • Licensed facilities with major emission non-compliances (≥ 5 non-compliances in a 12 month period) AND/OR • Facilities with significant soil and groundwater contamination (i.e. 	Major Non-compliant/ Significant Ground Contamination

Condition	Classification
requiring remediation and/or long-term monitoring requirements)	
<ul style="list-style-type: none"> Facilities with repeated non-compliances (>10 in total) during a 12 month period 	Repeat Non-Compliance

There has been a number of minor non compliances (<5 non-compliances in a 12 month period) in relation to the Waste Licence within the past five years. Non-Compliances related to exceedances of waste tonnage, odour, storage of waste, waste acceptance hours, and bunding. KWD have responded to the EPA in relation to addressing any non-compliances relating to the site.

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3. Closure Plan

The Closure Plan has been prepared in accordance with the methodology set out in the EPA guidance document entitled '*Guidance on assessing and costing environmental liabilities (2014)*' and the '*Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006)*'.

The CRAMP is intended to illustrate how KWD intends to manage known liabilities associated with the decommissioning of its Aughacurreen site.

The EPA advocates the use of a systematic, step-wise approach for the assessment of known and unknown liabilities as follows:

- Step 1: Initial screening and operational risk assessment;
- Step 2: Preparation of a CRAMP for known liabilities;
- Step 3: Preparation of an ELRA for unknown liabilities; and
- Step 4: Identification of appropriate financial provision and instruments.

This document describes the decommissioning process and includes a description of the financial provisions (FP) and instruments that were identified to support the associated costs. Information from the following sources was used in the preparation of this report:

- Site visit carried out on 11th January 2016 reviewed the activities undertaken at the site including all site processes and activities in the presence of environmental and health and safety personnel;
- Annual Environmental Reports for 2010-2016,
- Drainage and pipeline integrity test results.
- IPPC Licence Application and Inspectors Report;
- IPPC Licence Reg. No. P0835-01; and,
- Non-compliance and environmental incident log records from the last five years.

3.1 Initial Screening

The EPA Guidance Note (2006) outlines a methodology to classify a site into an initial "Risk Category" in order to determine the specific CRAMP, ELRA and Financial Provision (FP) requirements which should be applied.

The methodology proposed in the guidance note is based on an initial assessment of the complexity of the activity being carried out at the site. The definition of complexity, in this context, is given in the EPA Guidance Note (2006) as:

The extent and magnitude of potential hazards present due to the operation of the facility (e.g. a function of the nature of the activity, the volumes of hazardous materials stored on site etc.).

The complexity scale ranges from G1 to G5, where G1 indicates an activity of low complexity and G5 indicates high complexity. The EPA has allocated a rating of between G1 and G5 to each of the different activities specified in the IPPC Directive. If a site is involved in an activity that is deemed to be of low or medium complexity (i.e. G1, G2 or G3), then further evaluation in terms of environmental sensitivity and compliance record is required in order to determine the risk category of the site. However, if the site is deemed to be of high complexity (i.e. G4 or G5), then it is automatically allocated the highest risk category.

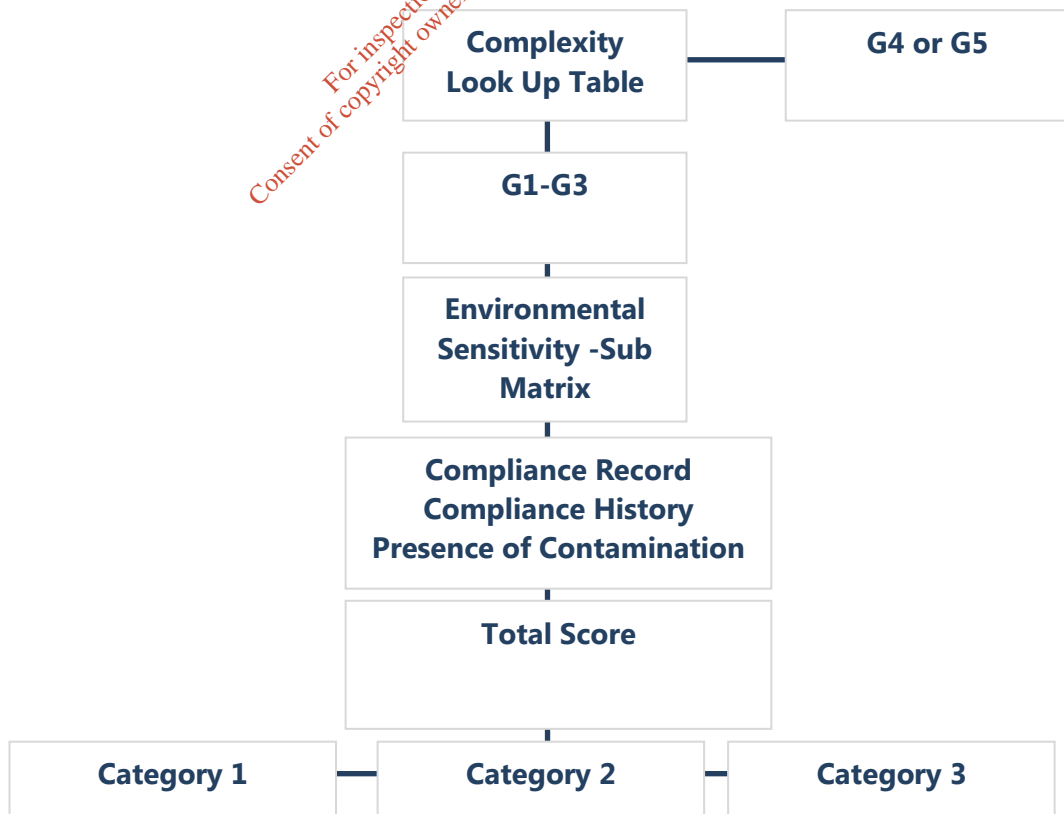


Figure 1 Initial Screening and Operational Control Risk. Source EPA, 2006

The risk category for KWD is determined by evaluating the presence of potential hazards, the environmental sensitivity of the site, and the compliance record in accordance with EPA Guidelines. There are three areas which are required to be addressed as part of this process. These include:

- **Complexity** –A Complexity Band is assigned based on the extent and magnitude of each potential hazard (G1 least complex to G5 most complex) for each class of activity has been assigned.
 - **Environmental Sensitivity** – the sensitivity of the receiving environment in the vicinity of the facility, with more sensitive locations given a higher score. The Environmental Sensitivity is calculated on a site-specific basis using a sub-matrix.
 - **Compliance Record** – the compliance history of the facility and whether soil and/or activities carried on are in compliance with license requirements and emission limits.
- Each aspect is multiplied to give the Total Score for the facility, and this can be used to place the facility into an appropriate Risk Category (1-3) as outlined in Table 3.1.

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Table 3.1 KWD Risk Score

Complexity	Sub Matrix Score	Score
Licence Activity Class: Licenced Waste Disposal and Recovery Activities, in accordance with the Third and Fourth Schedules of the Waste Management Acts 1996 to 2005: Third Schedule of the Waste Management Acts 1996 to 2005. Class 11, Class 12, and Class 13. Fourth Schedule of the Waste Management Acts 1996 to 2005. Class 2, Class 3, and Class 4, Class 11, Class 12, Class 13.	Maximum Band Category G3	3
Environmental Sensitivity	Sub Matrix Score	
Human Occupation– Located 500m from site	1	
Groundwater Protection - Overlying Locally Important Aquifer (GSI)	1	
- Groundwater Vulnerability High-Low- Assume High (GSI)	2	
Sensitivity of Receiving Waters Q1-Q2: Class D	0	
Protected Ecological Sites- Located 2.5Km from Killarney National Park SAC, pNHA (Site Code 0365), SPA (Site Code 4038),	0	
Air Quality & Topography - Simple Terrain	0	
Sensitive Agricultural receptors - Dairy Farming 100m from site	1	
Total Environmental Sensitivity	5	1
Compliance Record		
Minor Non-Compliant (Minor Non-Compliances)	3	3
OVERALL RISK SCORE (Complexity x Environmental Sensitivity) x Compliance Record)	3 x 1x 3 =	9
RISK CATEGORY		Category 2

KWD have been classified as a Category 2 facility hence in accordance with *Environmental Protection Agency guidance on environmental liability risk Assessment, Residuals Management Plans and Financial Provision (2006)*.

KWD will apply the *generic approach* in accordance with EPA Guidance. There are no long-term issues and monitoring demonstrates that there are no outstanding environmental issues hence as a result it is envisaged that the closure plan will result in clean site closure of the site. The following details the measures and costs associated with returning the site to a clean closure state in the event of unforeseen closure.

3.2 Closure Plan

Given the compliance history of the site, development from a Greenfield site, KWD adopts the Clean Closure approach. The closure plan has therefore been devised on the assumption that clean closure will occur.

In order to develop a fully costed Closure Plan for the site, a number of assumptions have been made:

- It has been assumed that the closure of the facility will be an unforeseen event with no planning incorporated into the day to day operation of the site. This is a worst case scenario as typically for such a facility, the closure would be a well-planned event and production schedules and raw materials purchasing and storage will be planned to reflect this. However, for this closure scenario, a conservative approach has been employed which assumes that the facility as to process waste at the site therefore all labor associated with this process would be included in the closure costs.
- The entire site will be fully decontaminated (i.e. cleaned) and decommissioned (i.e. rendered safe and removed from the site where stated). All wastes, materials, etc. on the site will be removed and treated as waste.
- It has been assumed that the costs of decontamination and decommissioning will be based on contractors carrying out such works, i.e. these are not standard KWD operational costs.
- It is not proposed to demolish any of the buildings or infrastructure on the site. It has been assumed that the site and buildings may be sold by KWD to any interested party but the costs generated as a result of the acquisition will not be used to offset the debit of the closure costs.
- The Closure Plan will be subject to regular reviews, particularly focusing on the cost and suitable financial provisions and take into account any changes in the activities carried out at the facility.
- Based on the information contained in the previous sections, which has taken into account the processes, environmental risks posed by the facility and its compliance history, there is no requirement for restoration or aftercare management at the KWD site.

The closure plan will take account of the decontamination and decommissioning of all plant buildings and equipment (i.e. to render safe the site). Upon closure, it is recommended to conduct a validation of clean closure by way of outline soil/ground water assessment in key potential source areas to verify that significant soil/groundwater contaminants do not present additional long-term liability that requires restoration and aftercare management.

As the closure of the site is an unprecedented activity at KWD unexpected problems may arise during the process that may not be identified during the planning phase. However KWD will utilize good project planning, risk assessment, and proactive management to reduce any environmental incident which may arise. If environmental contamination sources become evident as work progresses, they will be carefully addressed and appropriate action will be taken.

3.3 Programme to Achieve Closure

In the event that the entire site is closed, all areas of the facility will be decommissioned and decontaminated. Table 3.3.1 details the likely methodology employed in fully decommissioning and decontaminating the entire facility.

It is estimated that the closure of the facility and associated infrastructure would take a 12 month timeframe to achieve all steps in Table 3.3.1

Table 3.3.1 Closure Criteria

Ref No.1	Criterion
1	All plant will be safely decontaminated using standard procedures and trained personnel.
2	All waste will be handled, temporarily stored, recovered and/or disposed of in a manner which complies with regulatory requirements and best practice.
3	All relevant records relating to movement, transfer or disposal of waste will be managed and retained throughout the closure process and will be available for review by the EPA.
4	Surface water monitoring records will show no evidence of contamination to a level that poses a risk to human health or neighboring properties.
5	No soil within the site boundary will be contaminated to a level that poses a risk to human health or neighbouring properties. Contamination levels will be checked against the Dutch guidelines for commercial/industrial enduse, the UK CLEA Guidelines or similar appropriate guidelines that are available.
6	Access to monitoring locations will be maintained at all times during the closure process.

Ref No.1	Criterion
7	Site security will be maintained at all times while the site is in the ownership of KWD.
8	The Environmental Management System will remain in place and will be actively implemented during the closure period.
9	Consultation with the EPA and any other interested parties will be maintained throughout the closure process.

3.4 Plant Recovery of Disposal

KWD has defined a strategy for any plant that may need to be recovered or disposed of in the case of closure. This strategy is underpinned by a hierarchy of management, which is shown in Figure 3.4.1 and explained in Table 3.4.1.

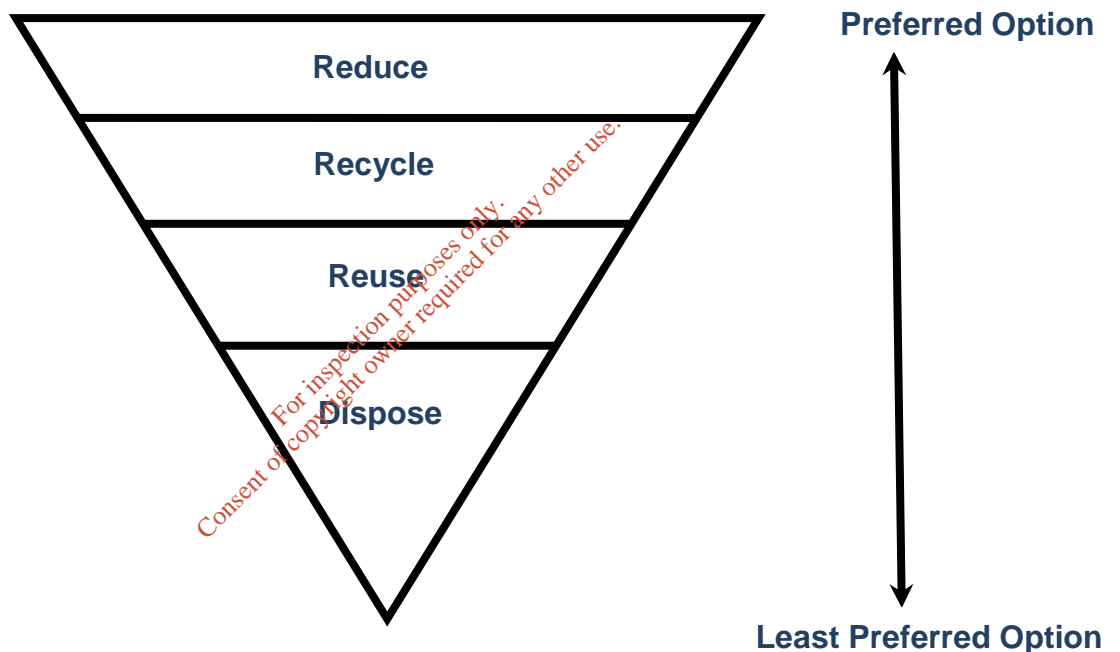


Figure 3.4.1 Hierarchy Of Management For Plant/Equipment

Table 3.4.1 Management Hierarchy

Strategy	Detail
Reduce & Re-use	<p>KWD takes all reasonable measures to ensure that all plant and equipment is maintained in good condition. These measures include substantial maintenance, inspection and monitoring procedures.</p> <p>These procedures are organised and delivered under the site’s Environmental Management System. Most of the equipment used could potentially be used in other waste processing sites. A significant amount of equipment could therefore be moved to other sites or sold to sites involved in similar processes.</p>

Strategy	Detail
Recycle	<p>If it is not possible to re-use the equipment, this plant can be recycled and the metal recovered for alternatives uses.</p> <p>The costs associated with recycling of plant should not therefore be significant.</p>
Transport	<p>A number of the scenarios described in this table would require the transport of equipment. For the purpose of this report, the site has assumed that the buyer of the equipment will pay for the transport costs.</p>
Disposal	<p>KWD does not envisage that any of its plant or equipment will need to be disposed of, as it should be possible to re-use or recycle all of it.</p>
TOTAL COST OF PLANT/EQUIPMENT TRANSPORT/DISPOSAL/RECOVERY = €0	

Soil Or Spoil Removal

As determined during the site tour via a interviews with personnel it was noted that no areas of existing known contaminated soil are within the site boundary.

Proposed Disposal Routes

- All mobile plant will be resold or recycled.
- All abandoned fixed plant to be drained of oils and decontaminated.
- All containers of fuels, oils and greases will be disposed of by a licenced contractor.

Decontamination Works

- An assessment of the potential of contamination with the following residues or materials will be made: gas oil, greases, paint, thinners, solvents, and associated process reagents/chemicals,
- All residues containing fuels, oils and other contaminants will be removed off site for recovery or disposal.

Removal of Infrastructure & Services

- All drainage and associated services including sumps to be carefully cleaned and removed. Associated wash water will be sent for disposal/recovery at an authorised facility.
- A detailed sequential programme of infrastructure removal will be provided with the validation report.

Criteria for a Successful Closure

The overall objective is to achieve clean closure of the site with no residual liabilities or constraints. The EPA defines successful clean closure ... *"when it can be demonstrated that there are no remaining environmental liabilities at the site. In practice this will require demonstration that the following criteria have been met"*.

KWD have a structured and organised management approach to all aspects of the business. This approach extends to all aspects of environmental protection, and the site operated an Environmental Management System. The principal criteria against which successful closure will be gauged are as follows;

- The areas occupied by all the surface facilities will be decommissioned and rehabilitated to a condition as close as possible to a Greenfield site.
- There should be no constraints on future land use as it is envisaged that there is no contamination
- Materials will be treated in such a manner that equipment or uncontaminated materials will be resold or sold for scrap
- Any contaminated materials will be disposed of by authorised hazardous waste contractors

The Agency Criteria for Successful Clean Closure are:

- *All plant safely decontaminated using standard procedures and authorized contractors.*

Compliance: *KWD have extensive experience in the short term decommissioning of process plant and are familiar with the requirements for decontamination and cleaning of equipment. KWD has access to specialist external contractors and other resources to assist.*

- *All wastes handled, packaged, temporarily stored and disposed or recovered in a manner which complies with regulatory requirements.*

Compliance: *all residual wastes handled through a combination of existing approved contractors and specialist contractors. All regulatory documentation to be compiled in accordance with existing EMS procedures.*

- *All relevant records relating to waste and materials movement and transfer or disposal will be managed and retained throughout the closure process.*

Compliance: *full details of all waste types removed from the facility including European Waste Catalogue (EWC) codes, quantities, WTF forms, disposal/recovery certificates and any other related documentation will be prepared for review and submission to the agency.*

- *There will be no soil or groundwater contamination at the site. This was verified using monitoring data and a soil /groundwater assessment at the time of closure (if required).*

Compliance: *there is no history of significant contamination at the site.*

- *The Environmental Management System remained in place and was actively implemented during the closure period.*

Compliance: *the EMS will form one of the central components in the development of the Project Plan for execution of the Closure Plan, and will be used to manage, measure and record performance during closure.*

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4. Closure Plan Costing

The estimated costs associated with site closure and decommissioning are tabulated below and include an estimate of KWD staff costs and external contractor costs associated with plant run down, cleaning and decommissioning.

4.1 Environmental Monitoring During Decommissioning

All waste licence monitoring with respect to surface water, air, and noise will remain in effect over the course of the decommissioning phase.

Item	Area/Element	Cost (€)
1.	Waste Intake and residual processing of material.	15,000
2.	Boiler House & Diesel Storage Tank <ul style="list-style-type: none"> • Drain down hot & cold water lines. • Remove Burner from boiler. • Empty and decommission oil storage tank. • Specialist Contractor x 3 days 	1,800 1,440
3.	Disposal of Leachate from Sump 4.55m ³	1,000
4.	Treatment of residual storm water in the lagoon, decommissioning of lagoon, and monitoring and analysis to confirm no contamination is present.	2,000
5.	Workshop <ul style="list-style-type: none"> • Removal of any hazardous wastes associated with workshop activities. • Waste Contractor 0.5 x day 	500 320
6.	Offices <ul style="list-style-type: none"> • Unplug all electrical equipment from the mains. • Computer waste not fit for reuse will be sent for recycling. • Electrical Contractor x 2 days 	1,600 960
7.	Pneumatic System <ul style="list-style-type: none"> • All oils associated with compressors are to be drained down and collected by a certified contractor. 	800

Item	Area/Element	Cost (€)
8.	Site Security <ul style="list-style-type: none"> Security at the site for 12 months 	40,000
9.	Closure Management <ul style="list-style-type: none"> Presence of a suitably qualified consultant to oversee all aspects of the closure plan. 	6,800
10.	Environmental Monitoring Groundwater Surface Water	10,000
11.	Other Costs <ul style="list-style-type: none"> Surrender of IPPC Licence Exit Auditing, Supplementary Monitoring Validation & Decommissioning reports. 	25,000
	Total	107,220
	Contingency (10%)	10,722
	Total Closure Plan Costs	€117,942

KWD propose to review the Closure Plan on an annual basis as part of the preparation of the Annual Environmental Report (AER).

KWD will undertake a comprehensive review of the Closure Plan every 3 years. This reassessment will examine the continuing suitability of the closure scenario, with respect to the costing of works involved and addition of any new elements as appropriate.

4.2 Closure Plan Implementation

The implementation of the Closure Plan will proceed along the following approximate lines:

The EPA will be notified of the Closure. The Closure Plan will be reviewed and an implementation plan prepared for the Closure.

The level of investigation and documentation required by the EPA will be scoped out and agreed. The applicability and or requirement for an Exit Audit will be determined.

All residual inputs and in-process materials will be processed. The timeframe involved is approximately one week.

Once processing has ceased, the shutdown of the auxiliary services can commence. The Closure Plan documentation will be compiled and issued to the Agency for approval.

4.3 Closure Plan Validation

An Environmental Exit Audit of the site will be carried out following the announcement of closure and prior to actual decommissioning and closure operations taking place. The audit will devise an accurate inventory of all plant, equipment and wastes on the site. This inventory will be used as a benchmark against which successful decommissioning will be assessed.

The audit will serve to validate the closure and decommissioning and will involve:

- An examination of records of the monitoring and removal from site of relevant materials, wastes, equipment and structures.
- An evaluation of any variation in the agreed actions will be evaluated for material compliance with the Closure Plan.

The output of the Exit Audit will be a report detailing performance against agreed decommissioning and closure actions and will identify the decommissioning and treatment or removal from the site of all materials, wastes, plant, equipment, structures and buildings, together with information on the quantities, collection routes, recovery and or disposal locations for those materials. This report will include full details of all waste types removed from the facility including European Waste Catalogue (EWC) codes, quantities, WTF forms, disposal/recovery certificates and any other related documentation will be prepared for review and submission to the agency.

5. Environmental Liability Risk Assessment (ELRA) For Unknown Liabilities

The scope of this document extends to identifying and assessing the potential liability through an unforeseen event or series of events at the KWD installation.

The assessment of risk is based on our understanding of the current range of activities carried out at the site, and the current range of materials used.

Future changes to processes, services and utilities at the installation, including changes to the range of materials and chemicals used, may require that the Risk Assessment is revised, depending on the significance of the changes.

The assessment was undertaken having regard to the Guidance issued by the Agency in 2014 on "*Guidance on assessing and costing environmental liabilities*" (EPA, 2014) and "*Guidance on Financial Provision for Environmental Liabilities*" (EPA, 2015).

Details relating to the site description, nature of operations and environmental performance are outlined in Section 2 of the report.

5.1. Employee Training

Training in environmental issues assists in increasing employee/contractor awareness of the requirements of the Waste licence and environmental issues specific to their job function. This assists to reiterate to all employees the importance of environmental aspects of the sites operations.

5.2 Emergency Response

There is an experienced Emergency Response Team in place at KWD. The primary aim of the team is to protect human life at risk from any emergency and to prevent injury, prevent environmental pollution. Preventative measures are also in place to avoid potential emergency situations escalating by good practices and control measures (fire, hazardous materials, chemicals, bulk deliveries of oil).

5.3 Risk Assessment Methodology

The risk assessment has been undertaken in accordance with the Environmental Protection Agency's Guidance note on assessing and costing environmental liabilities (2014). The risk identification process involved:

- The identification of potential environmental receptors at the site;
- The identification of production processes that posed potential hazards to the environment ;and,
- The identification and quantification of the risks posed by individual processes on site.

It should be noted that abatement measures already in place (as described in Table 5.4.4) are predicted to limit the potential for certain emissions and site risks and are considered when assessing the potential risk.

5.4 Environmental Receptors

Environmental receptors comprise the surrounding environment which is likely to be affected by the processes that are on-going at the KWD. The significant environmental receptors include groundwater, surface water, human beings air quality, and natural habitats and protected species. The receptors are used as a starting point to ensure that all significant hazards are identified and all major aspects of the environment are taken into account.

Potential hazards identified have been assessed against the Risk Classification Tables (Tables 5.4.1 and 5.4.2) to reflect the levels of risk appropriate to the KWD.

A risk score was calculated for each risk using the ratings. The likelihood and consequence of each hazard occurring is assessed based on professional opinion, and historical experience at the facility. This system allowed the risks to be ranked and compared in line with EPA criteria for the assessment of environmental impacts. These risks include existing controls present within the site as outlined in Table 5.4.3.

Table 5.4.1 Risk Classification Table (Likelihood)

Rating	Category	Likelihood Description
1	Very Low	Very low chance of hazard occurring
2	Low	Low chance of hazard occurring
3	Medium	Medium chance of hazard occurring
4	High	High chance of hazard occurring
5	Very High	Very High chance of hazard occurring

Table 5.4.2 Risk Classification Table (Consequence)

Rating	Category	Consequence
		Description
1	Trivial	No damage or negligible change to the environment
2	Minor	Minor impact/localised or nuisance and low clean-up costs.
3	Moderate	Moderate damage to environment and significant clean-up costs.
4	Major	Severe damage to local environment and remediation cost required.
5	Massive	Massive damage to a large area, irreversible in medium term and significant remediation costs.

A Risk Matrix has been compiled in accordance with EPA guidelines. The Risk Matrix has been updated for 2015 as part of the review to allow risks to be easily displayed and prioritised. The likelihood and consequence of ratings are used in the matrix with the level of severity forming the x-axis and the likelihood of occurrence forming the y-axis. The colour code is applied as follows:

- **Red-(deep red and light red)** - These are hazards with high-level of risks and requiring priority attention. These hazards have the potential to be catastrophic and should be addressed as a priority.
- **Amber/Yellow** - These are hazards with medium to high-level risk requiring action, but are not as critical as a red coded risk..
- **Green (light and dark green)** - These are lowest-level risks and indicate a need for continuing awareness and monitoring on a regular basis. Whilst they are currently low or minor risks, some have the potential to increase to medium or even high-level risks and must therefore be regularly monitored. If cost effective mitigation can be carried out to reduce/mitigate the risk even further this should be pursued.

Table 5.4.3 Risk Matrix Before Mitigation

Likelihood	Very High	5					
	High	4					Scenario's 2 &5
	Medium	3			Scenarios 4	Scenario 3	
	Low	2				Scenario	

						1		
	Very Low	1						
			Trivial	Minor	Moderate	Major	Massive	
			1	2	3	4	5	
			Consequence					

The project Risk Register outlines the potential scenarios which may occur at the site as shown in Table 5.4.4.

Loss of Containment Scenarios

This section assesses the potential for environmental incidents which may result in the release of process materials to an environmental media (e.g. surface water, air, land or groundwater). The assessment does not consider the probability of occurrence, and therefore the scenario's and associated financial costs represent a "worst-case-scenario".

A review of the process was undertaken on raw materials in order to identify a number of potential risks which may give rise to an environmental liability. The following, as recommended in the Environmental Protection Guidance,¹ were considered:

- Spillages from bund
- Leaks from process and effluent drains
- Fire and failure/overspill from fire water storage at the facility
- Tank overflows
- Mobile tanker spills on site

The scenarios developed for the site are tabulated below:

No.	Activity/Material	Description of Contamination Scenario and Consequence
1	Oil Spill from tanker during offloading operations	20,000 litres of fuel oil released to ground. It is assumed that free-floating hydrocarbons are floating on the surface of the groundwater aquifer, and that the oil has been motile reaching the ground water and shall contamination has occurred.
2	Fire Water Retention	Combustion of diesel resulting in Potential contamination to ground, and surface water.

No.	Activity/Material	Description of Contamination Scenario and Consequence
		<p>The facility also combustibles materials such as paper, cardboard and plastic, so there is a plausible risk of fire at the facility.</p> <p>Residual firewater possibly contaminated with combustion products, fuel oils, utility chemicals, organic milk products).</p>
3	Contaminated Yard Runoff	Potential contamination of local watercourse and/or groundwater.
4	Spillage of Hazardous Material (paint, white spirits, hydraulic oil, engine oil, anti-freeze, etc.)	Potential contamination of local watercourse and/or groundwater.
5	Contamination of soils from gradual release- Tank overflows, spillages or leaks outside bunds, or rupture of hose/failure of coupling on tanker.	Localised contamination of hydrocarbons from diesel fuel storage tank, a volume assumed to be 5,000 litres equivalent to approx. 10 tonnes of contaminated material.

The potential costs associated with each of the above (environmental liabilities) are tabulated in Table 5.4.4.

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Table 5.4.4 Project Risk Register Review 2016

	Environmental Liability	Potential Scenario	Risk Level Before Controls		Controls	Risk Level After Controls	
			Likelihood	Consequence		Likelihood	Consequence
1	Spill from oil tanker during offloading operations	20,000 litres of fuel oil released to ground. It is assumed that free-floating hydrocarbons are floating on the surface and within the groundwater aquifer, and that the oil has been motile reaching the ground water and shall contamination has occurred.	2	4	<ul style="list-style-type: none"> All HGV's that deliver oil have bunded compartments to contain any potential spillages. Dedicated KWD personnel are present to supervise the loading of hazardous material. Spill kits are available within the oil tank area. The oil bund is regularly tested to ensure its integrity. 	2	3
			8			6	
2	Fire At the Facility	Combustion of diesel resulting in potential contamination to ground, and surface water. Residual firewater possibly contaminated with combustion products, fuel oils, utility chemicals, organic milk products).	4	5	<ul style="list-style-type: none"> Employees are fully trained in fire-safety and evacuation procedures, fire drills, etc. Plant and machinery is designed for fire safety. Risk assessments are carried out in advance of dangerous activities such as welding, angle grinding, etc at the facility. Diesel is located within bunded which is hydraulically tested to ensure its integrity. A fire water suppression system is installed within the MRF and fire 	3	4
			20			12	

	Environmental Liability	Potential Scenario	Risk Level Before Controls		Controls	Risk Level After Controls	
					hydrants are positions at various locations around the building.		
3	Contaminated Yard Runoff		Likelihood	Consequence	<ul style="list-style-type: none"> All putrescible material is processed within MRF which has a dedicated leachate tank. Any residual waste stored in the yard area is roofed or non-biodegradable. Drainage from the site is directed to the foul drains & wastewater treatment system. The site yard is composed of concrete slabs, thereby protecting groundwater. The yard is regularly swept with a road sweeper. Monitoring is undertaken of the effluent and trigger values are set for water to prevent any potential contamination of nearby watercourses. 	Likelihood	Consequence
			3	4		2	4
			12 <i>For inspection purposes only. Consent of copyright owner required for any other use.</i>		8		
4	Spillage of Hazardous Material (paint, white spirits, hydraulic oil, engine oil, anti-	200l of hydraulic oil leaks to ground and a portion leaks to ground.	Likelihood	Consequence	<ul style="list-style-type: none"> The hydraulic oils, engine oils, anti-freeze, amongst other items are stored within a bunded metal container. Spill kits are also available in this building for the 	Likelihood	Consequence
			3	3		1	3
			9		3		

	Environmental Liability	Potential Scenario	Risk Level Before Controls		Controls	Risk Level After Controls	
	freeze, etc.)				purpose of containing minor hydrocarbon spills. <ul style="list-style-type: none"> ▪ Emergency Response Training is carried out as part of Environmental Awareness. ▪ Safety Data Sheets are filed for all hazardous liquids contained on site. ▪ The site yard is comprised of concrete slabs, thus protecting groundwater beneath the site. ▪ Environmental audits are undertaken to assess and rectify any potential environmental issues. 		
5	Contamination of soils from gradual release- Tank overflows, spillages or leaks outside bunds, or rupture of hose/failure of coupling on tanker.	Localised contamination of hydrocarbons from diesel fuel storage tank, a volume assumed to be 5, 000 litres equivalent to approx. 10 tonnes of contaminated material.	Likelihood 4	Consequence 5	<ul style="list-style-type: none"> ▪ The diesel tank is located within a concrete bund which is banded to contain 110% of the full volume of the tank. ▪ Spill kits comprising containment booms and absorbent materials are strategically placed on site. ▪ Drainage from the yard passes through a large hydrocarbon interceptor that will contain hydrocarbon spills or leaks at the site. ▪ The concrete surfaces in the yard provide mitigation against the potential impact of a diesel spill on 	Likelihood 3	Consequence 4
			20			12	

	Environmental Liability	Potential Scenario	Risk Level Before Controls	Controls	Risk Level After Controls
				<ul style="list-style-type: none"> ▪ groundwater beneath the site. ▪ Emergency Response Training is carried out as part of Environmental Awareness Training for all staff. ▪ Integrity testing is undertaken of bunds onsite to ensure they are fit for purpose. 	

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6. QUANTIFICATION & COSTING

6.1 Identification Of The Worst Case Scenario

Table 5.1 of this report presents the risk analysis for the KWD and ranks all potential site risks. The highest risk scores pre-mitigation measures relate to fire at the facility, and contamination of soils from gradual release (Risk ID 2, and 5).

The potential worst case scenario whereby a fire within the material recovery shed (Risk I.D.2) which could also trigger (Risk I.D.4) the spillage of hazardous material resulting in groundwater and/or soil contamination was developed to allow for a meaningful quantification of the potential costs that would be incurred following such an extreme event. Potential domino effects from the occurrence of both risks occurring at the same were considered a possibility and both risks are therefore considered as a single event. Significant mitigation measures are currently in place to minimise this occurrence; however, by applying this potential scenario the costing will be based on a highly conservative approach to quantification the worst-case scenario.

If a significant fire occurs around the site it is likely flow into the surface water drainage system before being discharged to the drainage ditch which flows to the Glanooragh River. Any spillages of hazardous material will be treated by an oil/water interceptor prior to discharge, however, if the event of a significant spillage during movement or delivery, this interceptor tank may become overloaded and may surcharge causing direct disposal of fuel to the surface water system and to ground. As a result any hydrocarbon spillages will not be treated before entering the drainage ditch. The impact could potentially cause contamination to the water within the Glanooragh River and to the surrounding open ground along the River.

The costings assume a detailed site investigation will be carried out following the incident to confirm if any ground and water contamination occurred during the event. It also includes for remediation works of the Glanooragh River and the surrounding area.

The plausible worst case scenario is predicted to involve:

- Generation of 400 tonnes of fire water which would be contained.
- Loss of 50 tonnes of fire water to ground resulting in contamination of 300 tonnes of soil (non-hazardous).
- Loss of 25 m³ of oil from storage tank (assume 50% loss due to bund overtopping) and 10 m³ from IBC storage to ground resulting in contamination of 600 tonnes of soil (hazardous) and 2,400 tonnes of soil (non-hazardous).
- Generation of 200 tonnes of waste from decontamination of buildings.

In addition to containment, excavation, transport and disposal of those losses, additional control and remediation measures include:

- Fire fighting
- Site investigation
- Groundwater pump and treat
- Monitoring
- Consultancy

Table 6.1.1 presents an estimation of the costs associated with controlling, cleaning and investigating the pollution caused by this scenario. A contingency of 20% has been added to the costing to ensure that any uncertainty in the assessment is adequately covered.

Table 6.1.1 Quantification And Costing Of Plausible Worst Case Scenario

Task	Description	Qty (No.)	Unit	Unit Rate (€)	Cost (€)
Fire Within the Facility (Risk I.D. 2)	Fire Fighting	2	Day	€20,000	€40,000
	Glanoraugh River diversion works (Contractor Costs)	8	Days	€2,000	€16,000
	Decontamination of the building	20	Days	€1,750	€35,000
	Disposal of Firewater	400	Tonnes	€50	€20,000
	Air Monitoring	20	Samples (1 month)	€200	4,000
	Surface and Groundwater monitoring	200	Samples (6 months)	€150	€30,000
	Ecological Monitoring	12	Samples (6 months)	€1,000	€1,200
	Excavation & Removal Of Contaminated Soil	300	Tonnes	€100	€30,000
	Consultancy Costs	20	Days	500	€10,000
Risk I.D.4 Spillage of Hazardous Material	Site Investigation (Consultant Costs)	20	Days	€750	€15,000
	Trial pits / Window Sampling	4	Days	€1,000	€4,000
	Installation of lined holding area	1	unit	€20,000	€20,000
	Soil testing (3 rounds)	30	Samples	€200	€6,000

Task	Description	Qty (No.)	Unit	Unit Rate (€)	Cost (€)
	Water Testing (2 rounds)	12	Samples	€200	€2,400
	Excavation of contaminated soil (non-hazardous)	300	Tonne	€100	€30,000
	Excavation of contaminated soil (hazardous)	400	Tonne	€150	€60,000
	Disposal of Hazardous Soil	400	Tonne	€200	€80,000
	Importation of topsoil	400	Tonne	€11	€4,400
	Landscaping	4	Days	€500	€2,000
	Validation Monitoring – Soil and Water Testing	15	Samples	€200	€3,000
	Validation Reporting	3	Days	€750	€2,250
Total					€426,050
Contingency (20%)					€85,210
Total Including Contingency					€511,260

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7. Financial Provision

7.1 Closure Plan

Killarney Waste Disposal will fund the costs associated with the decommissioning, rendering safe, and removal for disposal/recovery of buildings, plant or equipment, or any waste, materials or substances that may result in environmental pollution which amount to **€117,942**. A letter detailing how financial provisions will be utilised against any potential environmental costs associated with the site closure and decommissioning is appended as **Attachment A** of the report.

Environmental Liabilities Risk Assessment

Based on the identification and assessment of potential environmental risks, the total (sum) cost of dealing with all eventualities evaluated is **€511,260**.

KWD have comprehensively assessed all aspects of their activities to identify any current environmental liabilities.

KWD operates under an FBD Insurance Policy (No: AAL12242) which contains the public liability, for sudden and unforeseen events of **€6,500,000** for public liability.

The Environmental Management System assists to identify and manage any potential future risks. No environmental liabilities have been identified which would exceed their existing insurance cover or where potential remedial costs would compromise the financial solvency of KWD.

KWD are committed to reducing the potential for environmental liabilities to arise onsite by implementing the following measures:

An on-going emission monitoring programme, which monitors emissions to atmosphere, surface waters, noise and also monitors the quality of groundwater in accordance with the Waste Licence conditions.

- Dedicated bunded storage areas for diesel.
- Programme of bund Inspections, and integrity testing are programmed as part of preventative maintenance programme.
- Financial investment in the installation of the latest pollution control equipment
- Fire water Risk Assessment programme

In Conclusion KWD have insurance policies in place to deal with the eventualities evaluated in this assessment, and at levels far in excess of the financial implications of any single or combined liability.

Attachment A

Financial Provisions & Insurance

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