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O'Callaghan Moran & Associates
ENVIRONMENTAL MANAGEMENT FOR BUSINESS

ENVIRONMENTAL LIABILITY

RISK ASSESSMENT

STARRUS ECO HOLDINGS LTD

MATERIALS RECOVERY FACILITY

MILLENNIUM BUSINESS PARK

BALLYCOOLIN

COUNTY DUBLIN

INDUSTRIAL EMISSIONS LICENCE NO. W0183-01

Prepared For: -

Starrus Eco Holdings Ltd
Fassaroe
Bray,
County Wicklow.

Prepared By: -

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March 2017

Project	Environmental Liability Risk Assessment			
Client	Starrus Eco Holdings Ltd			
Report No	Date	Status	Prepared By	Reviewed By
17138070101	12/03/2017	Draft	Billy Hamilton BSc, MLitt	Jim O'Callaghan MSc, CEnv, MCIWM, IEMA
	24/03/2017	Final		
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1. INTRODUCTION

1.1 Activity Details

Starrus Eco Holdings Ltd (SEHL) operates a Materials Recovery & Transfer facility (MRF) at Millennium Business Park, Ballycoolin, Dublin 11 under Industrial Emissions Licence (IED) (W0183-01) issued by the Environmental Protection Agency (Agency) in April 2004.

The installation is currently licensed to accept and process 220,000 tonnes of waste per annum, comprising commercial/industrial non-hazardous waste, municipal waste and construction and demolition wastes. All waste processing takes place inside the waste transfer building, as specified in Condition 4.1 of the Licence. The Agency has granted approval for the outdoor storage of wrapped bales of Solid Recovered Fuel (SRF).

An Environmental Liability Risk Assessment (ELRA) was prepared in 2013. SEHL appointed O'Callaghan Moran & Associates (OCM) to revise and update this ELRA. The methodology followed the EPA Guidance on assessing and costing environmental liabilities (2014).

1.2 Methodology

The assessment was based on the Environmental Protection Agency's (Agency) '*Guidance on assessing and costing environmental liabilities' (March 2014).* The ELRA has been prepared to accurately reflect the risks of unplanned, but plausible incidents occurring.

The assessment included:

- An assessment of site operations, including materials and product handling and storage practices; production processes; process waste management; emission control and management (infrastructural and procedural); accident prevention policy and emergency response procedures
- Determining the environmental setting and the identification of any particular sensitive receptors that could be impacted in the short, medium and long term by the site operations;
- Establishment of the site history and regulatory compliance performance.

2. SCOPING

The ELRA addresses the liabilities from past and present activities. In this regard, all aspects of the historic and the licensable activities licence that pose a plausible risk to the environment are described and evaluated. The ELRA is based on Condition 11.2 of the Licence.

The ELRA is based on current conditions observed during environmental assessment activities and on past conditions as determined be a review of available records.

3. RISK IDENTIFICATION

3.1 Site Operation

3.1.1 Size and Nature of the Activity

The installation occupies 4.45 hectares (ha) in the east of the Millennium Business Park, Ballycoolin, Dublin 11 (Figure 3.1). It is intended to develop the facility in a number of Phases. Phases 1 and 2 opened in July 2006 and involved the construction of the Materials Recovery Facility (MRF) building and supporting ancillaries as shown on Figure 3.2. The licence allows for the construction of a biowaste treatment building but this has not yet been constructed. The Business Park (Park) is accessed via the Cappagh Road, the entrance to the installation is off an internal road within the Park.

The installation is licenced to accept 220,000 tonnes of non-hazardous municipal, commercial & industrial, and construction & demolition waste per year.

A range of fixed and mobile plant and equipment items are used at the installation and these are listed in Table 3.1.

Table 3.1 Existing Plant

Type of Plant	Number
Front Loading Shovel	1
Forklifts	2
Grab Machine	1
Bag Opener	1
Trommel Screen	1
Overband Magnet	1
Picking Station	1
Round Baler and Wrapper Unit	1
Cardboard Baler	1
Conveyor	1

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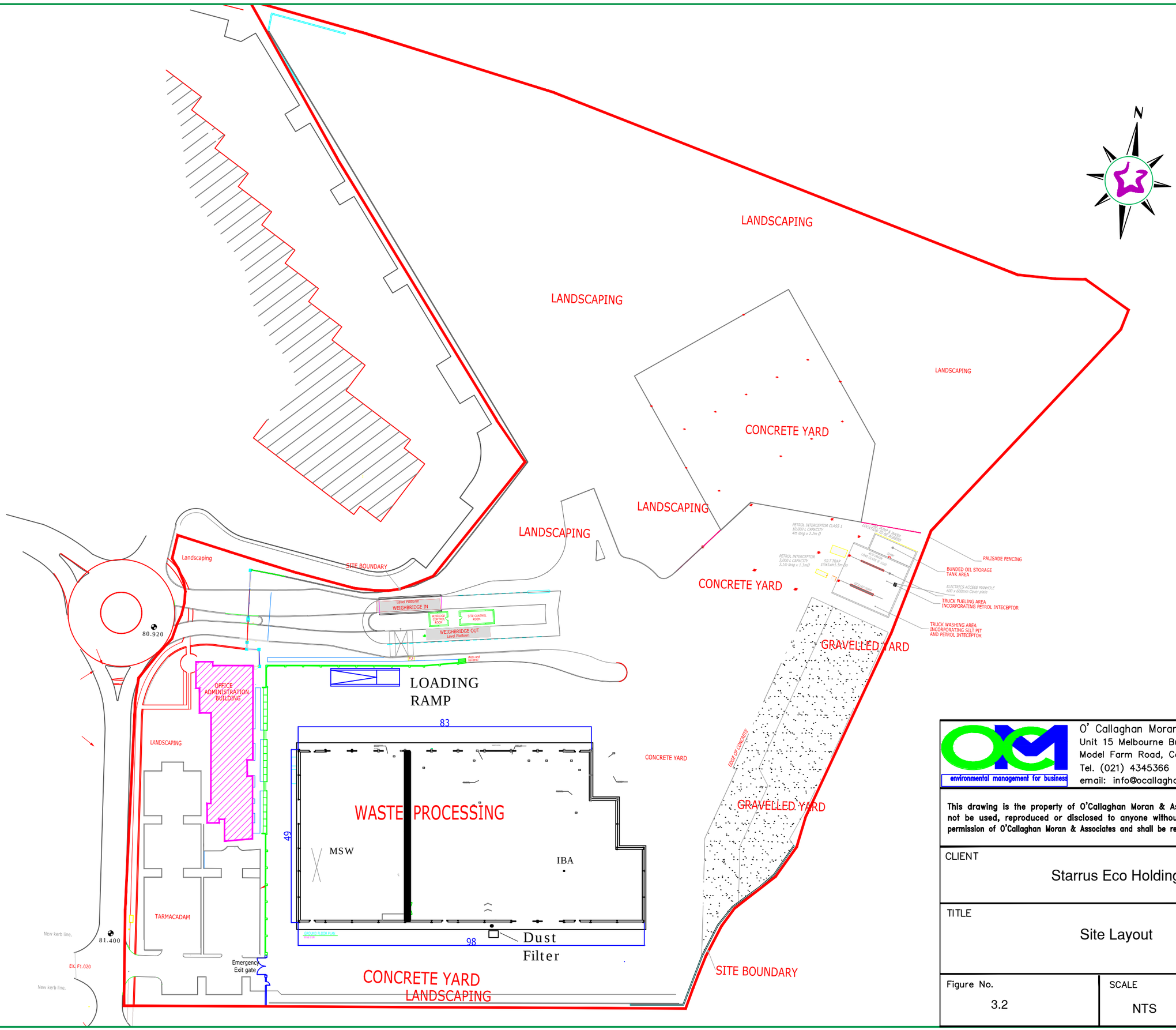
Environmental Management for Business

CLIENT
Starrus Eco Holdings Ltd.

TITLE
Site Location

Details:
Site Location

Figure 3.1



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CLIENT

Starrus Eco Holdings Ltd.

TITLE

Site Layout

Figure No.

3.2

SCALE

NTS

3.1.2 Site History

In 2004, An Bord Pleanala granted planning permission for the construction of the facility and construction began in January 2005 with the construction of Phase 1 and 2. Prior to this construction the installation was agricultural purposes. There is no record or evidence of any previous development on the site.

The Agency granted Greenstar a Waste Licence (Reg No. W0183-01) in April 2004. The Licence was transferred to SEHL on the 4th March 2014. The Licence was transitioned to an Industrial Emissions Licence (IED) on the 16th December 2015.

3.1.3 Site Processes

The installation is licensed to accept the following waste types and quantities, as specified in Schedule A of the Licence

- Municipal Waste (100,000 tonnes),
- Commercial & Industrial (90,000 tonnes),
- Construction & Demolition (30,000 tonnes).

No hazardous wastes or liquid waste are accepted at the facility.

The Materials Recovery building was designed to accommodate distinct waste handling areas for the Commercial and Industrial (C&I) waste, Municipal Solid Waste (MSW) and Construction and Demolition (C&D) waste. Each area has separate access for loading and unloading and waste sorting, processing and storage.

Over time the types of waste accepted and the method of processing changed. In 2014 the C&D and C&I processing line were removed and the processing of C&I and C&D waste ceased. The site continued to accept C&D waste, primarily household skip waste and residual household MSW and food waste. These wastes are bulked up and sent to other waste management facilities for treatment. Loose and baled SRF produced at other waste management facilities is accepted and stored at the site. The loose SRF is stored inside the building, while the bales are stored in a designated open area.

3.2 Site Security

There is 2 m high palisade fence around the perimeter and the site is accessed via security gates.

3.3 Services

The facility obtains water from the mains supply provided by Irish Water. Electricity is provided by the Electricity Supply Board.

3.4 Foul Water Drainage System

Process wastewater (dust/odour suppression mist) and yard run-off is discharged to the wastewater drainage system via a silt trap and oil interceptor. Sanitary waste water is discharged directly to the Park's wastewater drainage system.

3.5 Surface Water Drainage System

Rainwater run-off from the building roofs, car parks and areas of the yard where wastes are not stored, used to discharge to the municipal storm water sewer and the quality was monitored at two locations. In 2013, the surface water monitoring identified contamination. As part of the investigation SEHL contacted the Millennium Business Park Management Company who informed it that there was a problem with the flow in the sewer system serving the Business Park, which was causing back flow into the installation resulting in stagnant and nutrient rich water collecting at the monitoring locations.

Responsibility for addressing the drainage problems rests with the Management Company and, pending the resolution, the surface water run-off from the site has been diverted to the foul sewer. Therefore there are currently no emissions to surface water; however it is intended to recommence emissions to the surface water sewer serving the Business Park once the Management Company has resolved the drainage problems.

3.6 Inventory of Raw Materials and Wastes

The materials/products used on-site include diesel, hydraulic and engine oils, and odour control additive. The installation contains two 2,500 litre self-bunded plastic tanks containing diesel. Relatively small volumes of chemicals and hydrocarbons are stored on site, such as paints or white spirit for maintenance purposes, drums of hydraulic oils for maintenance of machinery, engine oils and anti-freeze etc. These materials are stored on pallets in the maintenance shed.

The maximum volume of hazardous materials on site at any one time are indicated in Table 3.2.

Table 3.2 – Volume of Hazardous Materials

Products	Quantity Stored
Diesel	5,000 litres
Engine and Lubricating Oil	200 litres
AdBlu	50 litres

At any one time the maximum amount of waste stored on site is approximately 4,600 tonnes, comprising mainly mixed municipal waste and dry recyclables (Table 3.3).

Table 3.3 – Materials Inventory

Wastes/Products	Quantity Stored
Mixed C & D	100
MMW	100
Organics	25
Batteries	1
Metal	20
Dry Waste	100
Timber	45
Non Ferrous Metals	6
Tyres	6
Cylinders	1
DMR	50
SRF	4000
Mattress	30

3.7 Environmental Emissions

Site operations are a source of noise and the licence specifies noise emission levels for the nearest noise sensitive locations. Operations are also a potential source of dust emissions and the licence specifies measures to control odour and dust emissions. Surface water and waste water emissions discharge to the Irish Water foul sewer.

3.8 Emergency Response

SEHL has adopted an Emergency Response Procedure (ERP) that identifies potential hazards at the site that may cause damage to the environment and also specifies the roles, responsibilities and actions required to deal quickly and efficiently with all foreseeable major incidents and to minimise environmental impacts.

3.9 Operator Performance

3.9.1 Environmental Management Systems

SEHL have implemented an Integrated Management System (IMS) in accordance with the requirements of Occupational Health and Safety Assessment Series (OHSAS) 18001:2007 and International Standard Organisation (ISO) 14001:2004 in order to manage the Health, Safety and Environmental performance of their business and to control health and safety risk and to minimise their environmental aspects and impacts.

The IMS has been developed for the achievement of continual improvement taking into account the requirements of the Waste Licence Conditions. SEHL has prepared and effectively implement documented procedures and instructions in accordance with the requirements of both the OHSAS 18001:2007 and ISO 14001:2004.

3.9.2 Facility Management & Staffing Structure

SEHL has prepared a documented Environmental Management Programme (EMP) which serves as a guidance document for installation staff and describes operational control and management practices. The EMP is a core element of the installation's Environmental Management System (EMS). All operatives are provided with the appropriate and necessary training to complete their assigned tasks.

3.9.3 Compliance History

In 2016, the installation received one (1 No.) non-compliance in relation to waste management. In 2017, the installation received one (1 No.) non-compliance in relation to bunding and materials handling.

3.9.4 Enforcement History

The installation has never been the subject of any enforcement action taken by the regulatory authorities.

3.9.4 Incidents History

There were no reportable incidents at the installation in 2016.

3.9.5 Complaints History

SEHL maintains a register of complaints received in accordance with Condition 9.4 of the licence. No complaints were received in 2016.

3.10 Environmental Sensitivity

3.10.1 Surrounding Land Use

The installation is located within an existing business park. The installation is bound to the north and east by a quarry operated by Roadstone Wood and to the west and south by other business premises within Millennium Business Park. The site is traversed from north-west to south-east by the Finglas to Woodlands high voltage (220kV) overhead power lines. The Finglas to Macetown high voltage (100kV) overhead power line runs from east to west along the southern site boundary.

The nearest occupied dwelling, 200 m to the south of the site, is screened by the hedgerow bordering Millennium Business Park as well as screening bordering the residence.

3.10.2 Hydrology

Rainwater run-off from the building roofs, car parks and areas of the yard where wastes are not stored, used to discharge to the municipal storm water sewer and the quality was monitored at two locations. In 2013, the surface water monitoring identified contamination. As part of the investigation SEHL contacted the Millennium Business Park Management Company who informed it that there was a problem with the flow in the sewer system serving the Business Park, which was causing back flow into the installation resulting in stagnant and nutrient rich water collecting at the monitoring locations.

Responsibility for addressing the drainage problems rests with the Management Company and, pending the resolution, the surface water run-off from the site has been diverted to the foul sewer. Therefore there are currently no emissions to surface water; however it is intended to recommence emissions to the surface water sewer serving the Business Park once the Management Company has resolved the drainage problems.

3.10.3 Geology & Hydrogeology.

Geotechnical site investigations undertaken at the Business Park indicate that the overburden ranges in thickness from less than 1.3 m to 8.45 m thick. At the installation, the thickness is thin in the north-western portion of the site and thickens to the east and south. Information from the GSI suggests a similar range in overburden thickness locally in the surrounding area. The overburden comprises sandy gravelly boulder clays.

The bedrock locally comprises calcareous, shale, limestone, conglomerate of the Tober Coleen Formation. Based on data obtained from the GSI the bedrock aquifer is a locally important **(Lm)** aquifer that is productive in local zones. The aquifer vulnerability rating is Extreme (**E**).

3.10.4 Designated Sites

There are no proposed Natural Heritage Area (pNHA) or Special Area of Conservation (SAC), within 10km of the site.

4. RISK ANALYSIS

4.1 Installation Design and Operation

The licence conditions require the provision of mitigation measures, both infrastructural and procedural, that effectively minimise the risk of environmental liabilities associated with unplanned events. Such measures, which are subject to regular review by SEHL include:

- Provision of an appropriately experienced Facility Management Team and implementation of appropriate staff training programmes;
- Implementation of a site specific Environmental Management System (EMS), including an Environmental Management Programme (EMP);
- Adoption of site specific Accident Prevention Policy and Emergency Response Procedures (ERPs), which will be reviewed annually;
- Provision of impermeable concrete surfaces in areas where wastes are stored and handled;
- Provision and maintenance of appropriate spill response and clean-up equipment in areas where there is a risk of spills occurring;
- Regular site inspections.
- Regular site inspections.

4.2 Risk Identification

Environmental liabilities arise from contamination or damage to environmental media (air, surface water, soils and groundwater), which can act as pathways to sensitive receptors. The Agency, in reaching a decision to grant the current Licence concluded that the facility, if designed and operated in accordance with the licence conditions, will not give rise to environmental liabilities.

Therefore, for the purposes of this ELRA, future environmental liabilities are confined to incidents such as fires, explosions, spills and leaks. The receptors that are potentially susceptible to adverse impacts associated with such incidents include, air, soils, groundwater, surface water and nearby commercial activities and residences.

4.3 Plausible Risks

The plausible risks identified at the site are presented in Table 4.4. These take into account the facility history, the controls and mitigating measures that are already in place, with due regard for those controls to contain incidents and for the potential failure of the controls.

Table 4.4 Risks

Risk ID	Process	Potential Hazards/Risks
1	Diesel/Oil Storage	Accidental release of diesel from bulk storage tanks-surface water contamination
2		Accidental release of diesel during deliveries and dispensing-surface water contamination.
3		Accidental release of diesel and oils- soil and groundwater and surface water contamination.
4	Fire in Recycling Buildings/ External Waste Storage Areas	Emissions to air.
5		Firewater run-off to surface water drains-surface water contamination.
6		Firewater infiltration to ground-soil, groundwater and surface water contamination

4.4 Risk Analysis

An assessment of the risks presented by the facility operations was completed taking consideration of site specific characteristics and the Classification Tables for Likelihood and Consequence in the Agency Guidance Document (Ref Table 4.2a and 4.2b).

Table 4.2a – Risk Classification Table (Likelihood)

Risk	Category	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 4.2b– Risk Classification Table (Consequence)

Risk	Category	Description
1	Trivial	No damage or negligible change to the environment
2	Minor	Minor/localised impact or nuisance
3	Moderate	Moderate damage to the environment
4	Major	Severe damage to the environment
5	Massive	Massive damage to a large area, irreversible in the medium term

The Risk Analysis Form is presented in Table 4.3. The assignation of the severity rating scores takes into consideration the mitigation measures that are already in place. OCM does not

consider it plausible that all of the containment and control measures already in place would fail at the time of an incident, as this would require:

a) SEHL to wilfully disregard the licence conditions regarding bund integrity testing; accident prevention and emergency response provisions; inspection and repair of paved areas; maintenance of plant and equipment; staff levels and training, and

b) a failure by the Agency to properly regulate the facility to such an extent that allowed all the control and containment measures to fail.

Table 4.6 Risk Analysis Form

Risk ID	Process*	Potential Risks	Environmental Effect	Likelihood	Basis of Likelihood	Consequence	Basis of Severity	Risk Score (Severity x Occurrence)
1	Diesel/Oil Storage	Uncontrolled release from bulk storage tanks that escapes the bunds and enters the surface water drains.	Contamination of the foul water drains	1	The bund design and construction complies with licence requirements and has more than 110% capacity of the tank. The bund is subject to regular visual inspection and routine integrity testing and repaired as required. Drains connect to an oil interceptor and Irish Water Sewer. ERP ensures rapid response to incident. The risk is **Very Low.**	2	All drainage from yards passes through oil interceptor before entering the sewer. The severity of the impact would be M**inor**	2
2	Diesel/Oil Storage	Escape of diesel or oil to surface water drainage system during filling/ dispensing	Contamination of the foul water drains	1	Oil stored in fully bunded area. Documented procedure on refuelling/dispensing and staff fully trained in spill prevention and clean-up. Drains connect to an oil interceptor tank into a holding tank. The APP and ERP minimises the risk of accidents and ensure rapid response to incident. The risk is **Very Low**	2	All drainage from yards passes through oil interceptor to the sewer. The severity of the impact would be M**inor**	2
3	Diesel/Oil Storage	Uncontrolled released from bund or spill during dispensing/refilling storage tanks that leaks through damaged paving or leaks in the surface water drains.	Soil / Groundwater contamination	2	Oil stored in bunded tanks, staff fully trained in spill prevention and clean-up All operational areas are paved with concrete, Routine inspection and repair of damaged paved areas. Routine integrity testing of the drains. The APP and ERP minimises the risk of accidents and ensure rapid response to incident. The risk is **Low**.	1	Subsoils protect the bedrock aquifer. Potable water is obtained from an external source. The severity of the impact would be **Trivia**l	2

Risk ID	Process*	Potential Risks	Environmental Effect	Likelihood	Basis of Likelihood	Consequence	Basis of Severity	Risk Score (Severity x Occurrence)
4	Fire in MRF Building	Smoke emission to air.	Air pollution	5	APP minimises the risk of fire outbreak. However if it occurs the risk of smoke emissions is **Very High**.	1	Smoke presents a potential health risk. Surrounding land use primarily commercial. ERP ensures rapid response to incident Emergency Service Co-ordinator will make decision on the need to evacuate nearby commercial premises. Could be significant disruption during incident, but no long term effect. The severity of the impact would be **Trivial.**	5
5	Fire in MRF Building	Escape of Firewater to surface water drainage system	Surface water contamination	2	Drains connect to an oil interceptor tank and discharges to the sewer. There is a shut off-valve on the outlet pipe to the drain, which in the event of an incident (spill, fire) can be shut to contain run-off inside the site. The risk is **Low**	3	ERP minimises the risk of fire and fire impacts and ensure rapid response to incident. The severity of the environmental impact would be **Moderate.**	6
6	Fire in MRF Building	Firewater leak through damaged paving and damaged surface water drains	Soil / Groundwater contamination	2	Routine inspection and repair of damaged paved areas. Integrity testing of surface water drains and repairs as required. The risk is **Low**	1	Water is supplied locally by Irish Water. The severity of the impact would be **Trivial.**	2

5. RISK EVALUATION

The risks associated with the operation of the installation fall into two categories:

1 Risk of surface water and/ or soil and groundwater contamination associated with diesel storage and handling.

2 Risk of surface water and/or soil and groundwater contamination associated with a fire.

Each of the risks have been ranked to assist in the prioritisation of treatment and these are presented in Table 5.1. Only those risks with a risk score greater than 2 have been included.

Table 5.1 Risk Ranking

Risk ID	Process	Potential Risk	Consequence	Likelihood	Risk Score
4	Fire in MRF	Air Pollution	1	5	5
5	Fire in MRF	Firewater runoff contamination of the surface water drains.	3	2	6

A colour coded risk matrix (Table 5.2) has been prepared to provide a broad indication of the critical nature of each risk and is a visual tool for regular risk reviews since the success of mitigation can be easily identified.

Table 5.2 Risk Matrix

Likelihood

V. High	5	**4**				
High	4					
Medium	3					
Low	2			**5**		
V. Low	1					
Consequence		Trivial	Minor	Moderate	Major	Massive
		1	2	3	4	5

Red – High-level risks requiring priority attention.

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Amber – Medium-level risks requiring treatment, but not as critical as a High risk .

Green – Lowest-level risks that do not need immediate attention but there is a need for continuing awareness and monitoring on a regular basis.

There are no risks in the red and amber zones that require either priority attention or treatment. The remaining risks are in the green zone indicating a need for continuing awareness and monitoring on a regular basis. A risk treatment programme has been prepared and is presented in Section 6.

6. RISK TREATMENT

The risk management programme for the installation is set out in Table 6.1

Table 6.1 –Risk Management Plan

Risk ID	Potential Risk	Risk Score	Mitigation Measures	Outcome	Action	Person Responsible
4	Smoke from fire causes localised air pollution	5	APP and ERP prepared and staff trained.	While the risk of occurrence is very high, the long term environmental impact would be trivial. No further physical mitigation measures are required.	Staff refresher training on ERP to continue	Facility Manager
5	Firewater runoff contamination of the surface water drains.	6	All drainage passes through interceptor to surface water holding tank. The discharge point is fitted with a shut-off valve. ERP prepared and staff training provided.	Firewater retention assessment not completed. Limited storage within site boundary. Vacuum tankers could empty the tank	Complete firewater retention assessment Implement recommendations of the assessment within 6 months of receipt of Agency approval	Facility Manager

7. IDENTIFICATION OF PLAUSIBLE WORST CASE SCENARIO

The risk analysis identified one (Risk ID 5) with a Moderate consequence and this is considered to be the 'worst case' scenario for the installation. It would have 'knock on' effects in that there would be there would be smoke emissions to air (Risk ID 4).

7.1 Source-Pathway-Receptor

7.1.1 Sources

The source is a fire in the MRF building. The incident generates fumes and contaminated firewater.

7.1.2 Pathways

Potential pathways for the fumes is the atmosphere. The pathway for the contaminated firewater is the paved yard, surface water drains and infiltration through damaged paving.

7.1.3 Receptors

Potential receptors that could be affected by the fumes are installation staff and the occupants of the nearby commercial premises. Given the distance to the nearest private residence it is possible it would have to be evacuated, depending on the wind direction. The potential receptors for the contaminated run-off are the surface water sewer and groundwater.

7.2 Impacts and Remedial Measures

The potential impacts are on human health, surface water, groundwater or soils. The potential remedial measures include spill containment; demolition and removal of damage buildings or tanks, surface water quality monitoring, excavation and removal of contaminated soils and reinstatement, monitoring and possible installation and monitoring of groundwater quality and/or possibly groundwater remediation.

8. QUANTIFICATION & COSTING

The costs, which are presented in Table 8.1, are based on the following assumptions:

- The fire service will be on site within 20 minutes of the alarm being raised. The fire will be fought over one day by two fire crews, with one crew remaining on site for 24 hours after the fire has been extinguished.

- The rates applied for the removal and off-site disposal of wastes and the contaminated firewater run-off are those currently charged by hazardous waste contractors and include transport and treatment costs.

- Following the incident a soils and groundwater assessment will be carried out. It is assumed that groundwater monitoring wells will be required to determine the nature and extent of the impacts.

- Provision is made for surface water quality monitoring.

- It is not possible to quantify the losses to the atmosphere, but an air quality impact assessment will be carried out following the incident to determine the likely extent, if any, of the impacts associated with emissions to air.

Table 8.1 Worst Case Costs

Task	Description	Quantity	Measurement Unit	Unit Rate (€)	Cost (€)	Source of Unit rates
Response to Fire in Shed	Facility Management and Security.	6	Week	6,000	36,000	SEHL
	Fire Services Attendance on Site[1].	2	Day	50,000	100,000	SEHL
	Spill containment consumables (extinguishers, booms).	1	Incident	5,000	5,000	
	Testing of contaminated firewater[2]	4	Sample	250	1,000	OCM
	Transport of contaminated firewater[3]	1530	Tonne	12	18,360	SEHL
	Off-site treatment of fire water.[4]	1530	Tonnes	23	35,190	SEHL
	Demolition of Building	45,000	m^3	16	720,000	EPA Guidance
	Removal and off-site disposal of fire damaged materials[5]	4,484	Tonnes	105	470,820	SEHL
	Plant and Equipment Hire (Crane, Powerhouse)	3	Day Rate	5,000	15,000	OCM
	Removal and disposal non-hazardous building debris[6]	1500	Tonne	102.76	154,140	SEHL
	Cleaning yards	2	Day Rate	500	1,000	SEHL
	Cleaning drains.[7]	Item	Jet Vac	9,750	9,750	SEHL
	Drain integrity survey.	Item		3,500	3,500	OCM
	Air quality assessment.	1	Fees	3,000	3,000	OCM
	Surface water quality monitoring in storm sewer	12	Sample	250	3,000	OCM
	Remedial works on storm sewer serving the Business Park	Item			20,000	OCM
Response to Soil and Groundwater Contamination	Soil borings.	10	Boring	100	1,000	OCM
	Soil monitoring.	20	Sample	200	4,000	OCM
	Soil excavation, transport and disposal[8].	120	Tonnes	250	30,000	EPA Guidance
	Reinstatement of excavated area, including repaving.	120	Tonnes	20	2,400	OCM
	Groundwater wells.	3	Borehole	2,500	7,500	OCM
	Groundwater samples[9].	36	Sample	250	9,000	OCM
	Consultancy Services[10].	40	Day	500	20,000	OCM
Total (€)					1,669,660	
Contingency (20%)[11]					333,932	
Final Total					**2,003,592**	

NOTES

[1] The day rate is significantly higher than that set in the EPA's ELRA guidance on fires at landfills, which is approximately €18,000. Fire will be extinguished within 24 hours, but emergency services will remain on site for another 24 hours.

[2] Includes for laboratory analysis, consultants fees itemised separately

[3] Derived From Firewater Retention Assessment for Sarsfieldcourt (W0136-02), where main processing building is similar size and tonnage on site at any one time is also similar (4300 tonnes).

[4] Includes transport and treatment cost

[5] Based on tonnage on site at any one time and assumes all is fire damaged and it is disposed to indaver

[6] Based on the non-hazardous nature of the waste in the Shed, the debris will be classified as non-hazardous

[7] Includes use of Jet Vac tankers and transport and off-site treatment costs.

[8] Site is paved and subject to regular inspection and repair. Only pathway to soil is damaged paving and leaking drains. Quantity based on and estimated impacted area of 800m2 to a depth of 0.1m

[9] Includes for five years post incident monitoring at quarterly intervals

[10] Includes for Structural Engineer and Environmental Consultant

[11] Based on environmental sensitivity of the site

9. CONCLUSION

This ELRA was carried out in accordance with Agency's Guidance (March 2014). The cost associated with the 'worst case' scenario, is €2,003,592. The immediate cost of responding to an incident and costs of the subsequent post incident remedial works will be recouped from SEHL's insurer.