## Attachment J. Accident Prevention and Emergency Response

FHR will operate an EMS at the facility as detailed in Attachment C.2. This includes an Emergency Response Procedure that incorporates Accident Prevention procedures (EP09).

A fully costed Environmental Liabilities Risk Assessment prepared by SLR Consulting in April 2016 is attached.

global environmental solutions

**Materials Recovery Facility**
**Forge Hill**
**Cork**



# Environmental Liabilities Risk Assessment

**In Support of**
**A Waste Licence Application**
**by Forge Hill Recycling Ltd.**

**Report**

**3rd June 2016**
**SLR Ref: 160603_501.00271.00004**_Rev1

SLR Consulting Ireland, 7 Dundrum Business Park, Windy Arbour, Dublin 14, Ireland
T : +353 1 296 4667 F : +353 1 296 4676 www.slrconsulting.com

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# 1.0 INTRODUCTION AND BACKGROUND

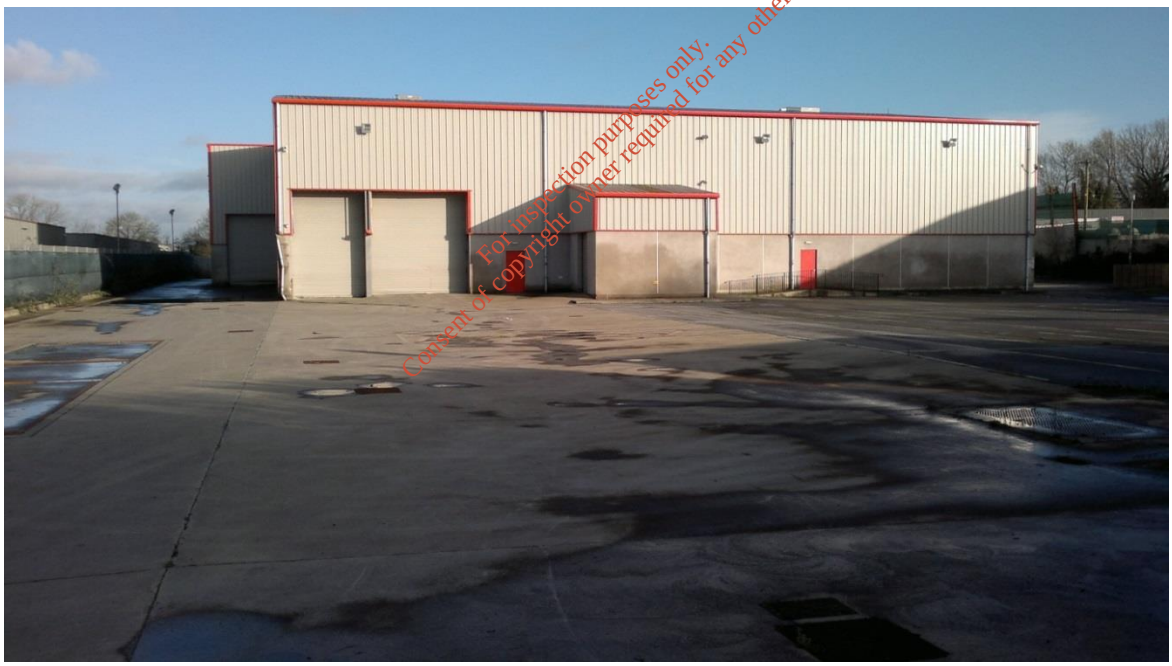
## 1.1 Our Brief

SLR Consulting Ireland (SLR) has prepared this independent Environmental Liabilities Risk Assessment (ELRA) in relation to the proposed operation of a Materials Recovery Facility (MRF) at Forge Hill, Cork. This report will accompany a Waste Licence Application by the proposed operator, Forge Hill Recycling Ltd. The site was previously operated by Ipodec/Onyx/Veolia/Greenstar as a MRF under Waste Licence No. W0173-01.

The site was closed in 2011 and the previous licence has now expired. It is notable that the previous site closure was orderly and carried out in a manner that was agreed with the Agency, leaving a valuable asset with no significant liabilities.

This Environmental Liabilities Risk Assessment is consistent with EPA guidance provided in the 2014 published document "*Guidance on Assessing and Costing Environmental Liabilities*". After the previous closure of the site, a residuals management plan was prepared by O'Callaghan Moran in consultation with the EPA. It was agreed at that time that there are no known environmental liabilities at the site and no reason to suspect underground contamination beneath the concrete and tarmacadam surfaces at the site.

**Photo 1 – Forge Hill Materials Recovery Facility**





## 1.2 About SLR Consulting

SLR Consulting is a major international multi-disciplinary environmental consultant, employing 1,000 staff in Ireland, the UK, North America, Australia and South Africa. In Ireland, the company trades as SLR Consulting Ireland, and employs around 30 environmental specialists, engineers and support staff at offices in Dublin and Hillsborough.

Recent Clients of SLR include the European Union, national governments, government departments, international lending agencies, UK and Irish regional and local authorities / agencies, waste treatment technology providers and private sector waste management companies.

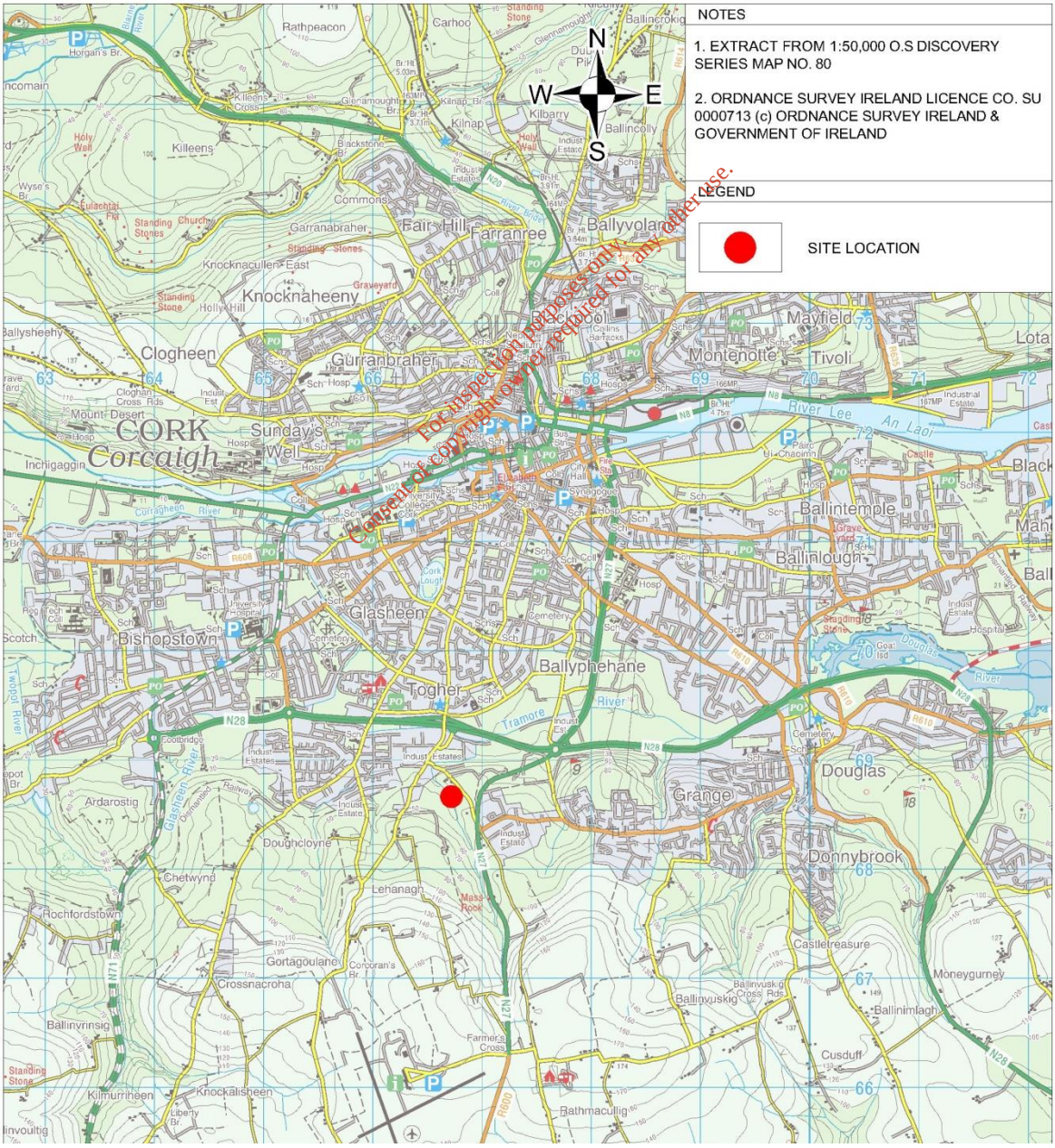
SLR employs the largest team of waste management experts in the UK and Europe. The equivalent of approximately 150 staff is employed on a full-time basis on waste management projects in Ireland and the UK. Specialist staff is employed across 30 separate technical disciplines.

## 1.3 Site Location

The existing MRF at Forge Hill, Cork is located on the southern fringe of Cork City, within the townland of Ballycurreen. The facility covers an area of approximately 1.03 hectares (2.48 acres) and is accessed from the Forge Hill Road via a junction on the N27 National Primary Road (Kinsale Road) leading from the N40 Southern Ring Road to Cork Airport. Waste operations at the facility ceased in September 2011.

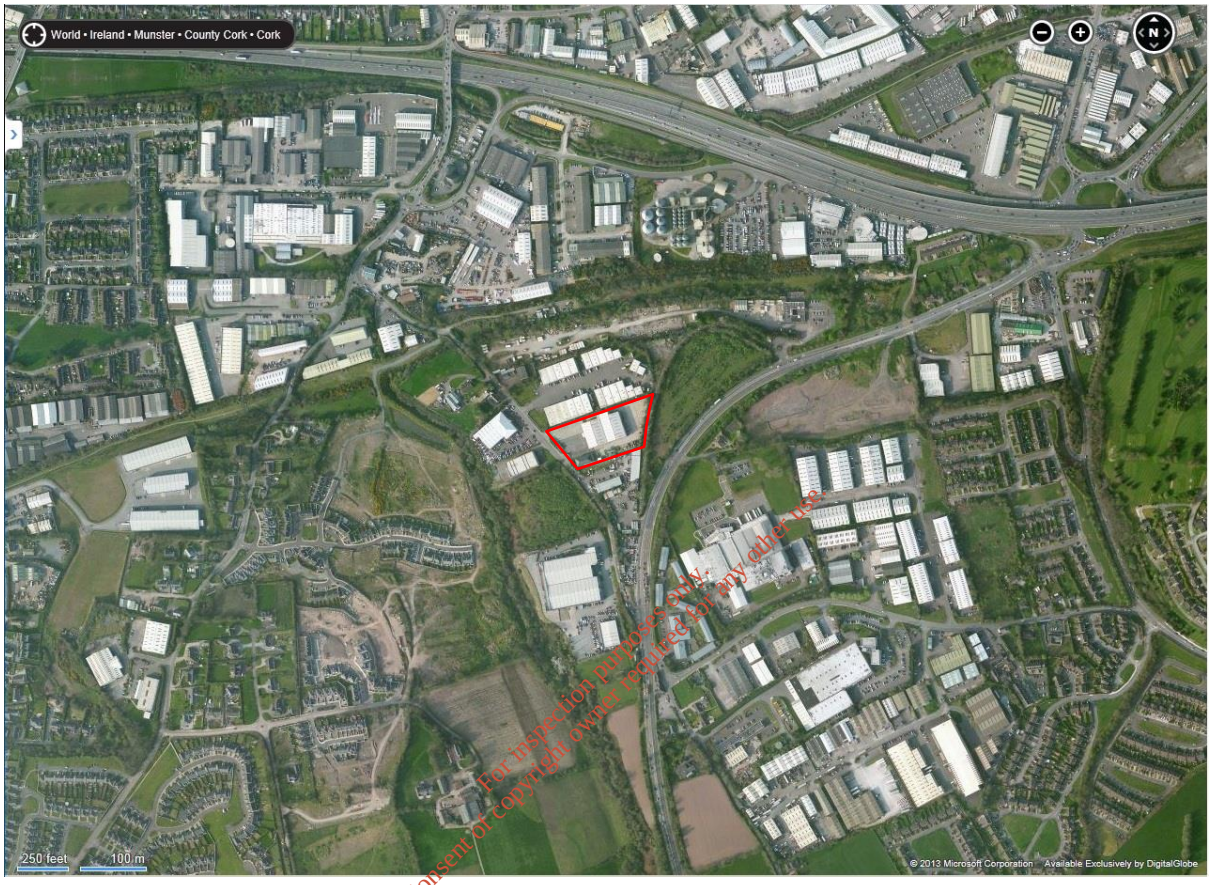
The location of the facility is shown in Figure 1 below.

**Figure 1 – Site Location**



The MRF facility is located within the Forge Hill Business Park and is bounded to the north and south by other industrial and commercial premises. It is bounded to the west by a public road (Forge Hill) with other industrial premises on the opposite side of the road. To the east of the site is an area of undeveloped Greenfield land and beyond that is the N27 Kinsale Road. Figure 2 below shows an aerial view of the site and the surrounding area.

**Figure 2 – Aerial View of Site and Surrounding Area**






## 1.4 Site Description

The Forge Hill MRF commenced operation as a waste facility in the late 1970s. In September 2003, a waste licence (ref. no. W0173-01) was obtained for the facility by its operator at the time, IPODEC Ireland Limited.

The facility was licensed to accept and process up to 82,000 tonnes of mixed non-hazardous, municipal, commercial, industrial and commercial / demolition waste annually. Up to the time of its closure, this comprised:

- 25,000 tonnes of Municipal (Household) Waste
- 46,600 tonnes of Commercial Waste
- 6,400 tonnes of Industrial Waste
- 4,000 tonnes of Construction and Demolition (C&D) Waste.

No hazardous waste (in solid or liquid form) was accepted or processed at the facility.

IPODEC became Onyx and then Veolia Environmental Services through international mergers and/or acquisitions. Greenstar then purchased Veolia's waste management business in the Republic of Ireland and operated the site for a short period before the licence

was transferred in 2013 to Starrus Eco Holdings Ltd, which is a company controlled by Cerberus Capital Management. During the previous operation of the MRF, the site was leased, rather than owned by the operator. The site has now been purchased by Mr. Sean Murphy, the Managing Director of Forge Hill Recycling Ltd (FHRL) and also the Managing Director of Killarney Waste Disposal Ltd.

FHRL has recently acquired a waste permit[1] to operate a MRF at the site where the company intends to process up to 50,000 t/a of mixed dry recyclables. FHRL is now applying to the EPA for a Waste Licence to increase the throughput to 82,000 t/a, which is consistent with the planning permission for the site.

There are also plans to add a new building at the front of the existing buildings to accommodate extra storage and to allow flexibility for further refinement of the products, should the need arise in the future. Planning permission was granted by Cork County Council for this extension on 24th March 2016. At the time of writing, we await a final decision, i.e. with or without appeal.

When operational, all waste acceptance, handling and processing will be undertaken indoors, within the material recovery buildings.

The layout and details of the existing facility and proposed extension are shown on the Drawings prepared by Brian O'Kennedy & Associates Ltd and included with the Waste Licence Application.

Figure 3 below shows an aerial view of the site taken from Microsoft's Bing Maps website.

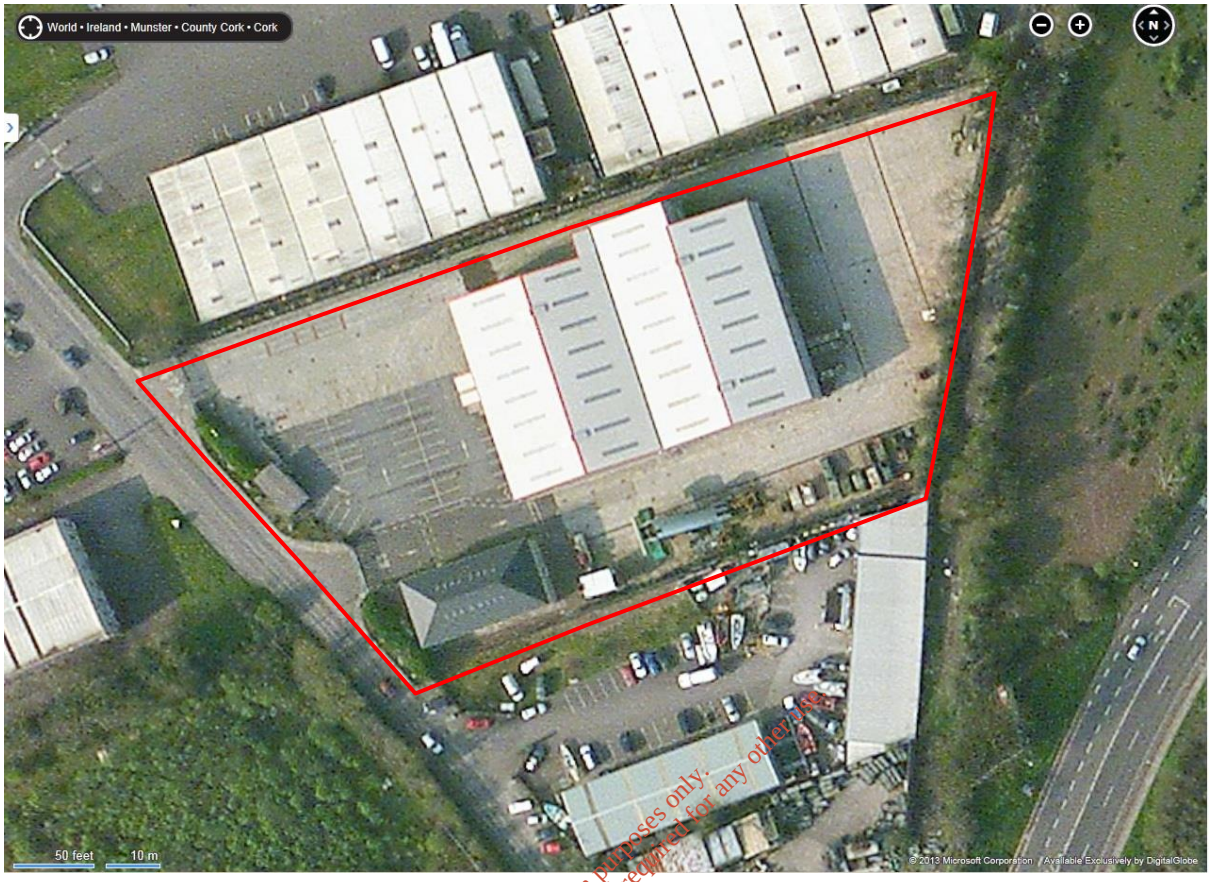
There are a number of buildings on site. The main waste transfer and handling buildings are adjoining steel portal frame structures with a shared concrete wall where waste activities are carried out. A small building which was used to store power cleaning equipment is located in the northeast corner of the site. On the western boundary of the site close to the exit is an ESB substation.

There is a weighbridge located to the south of Unit 1 (the western most waste recovery building) and another situated in the north western corner of the site. In the north eastern corner of the site is an area which was used to wash out returned or damaged waste receptacles and to the north of Unit 1 is an engineered depression which was filled with water and used as a truck wheel wash. With the exception of a gravelled area around the offices, the open areas are paved with either tarmacadam or concrete.



[1] WFP-CK-15-0148-01 issued in December 2015 issued by Cork County Council.

**Figure 3 – Aerial View of Site**



# 2.0 SITE EVALUATION

## 2.1 Operator Performance

FHRL is a new company, but it is controlled and managed by Mr. Sean Murphy, the owner of Killarney Waste Disposal Ltd (KWD). KWD has operated a licensed waste facility (W0217-01) at Aughacurreen near Killarney for many years. That site was licensed in 2006 and the operator has a good compliance record.

The business has grown steadily in the last 10 years and KWD plans to alleviate capacity issues at the Killarney site, by relocating mixed dry recyclable processing to the Forge Hill site. Much of the dry recyclable material processed in Killarney is sourced in Cork and exported from Cork to international processing plants, so processing that material at Forge Hill will significantly reduce transport of these materials, with both cost and environmental benefits.

FHRL has developed an EMS for the facility and this will be submitted with the Waste Licence Application.

The Forge Hill site has been operated for many years with a good compliance record. It is purpose built to control emissions, particularly emissions to the water environment, with concrete surfaces and good management of both surface water and foul water at the site. The materials that will be handled at the site going forward are considered to pose a low risk of environmental pollution.

A review of the '*Environmental Incidents and Complaints'* sections of the 2008 to 2011 AERs indicated that no complaints were received by the Agency or the operator in relation to the operation of the Forge Hill facility during this four year period.



## 2.2 Environmental Pathways and Sensitivities

The nearest residential properties to the site are located approximately 80 metres to the north-west of the waste facility (property fronting onto Forge Hill) and ca. 115m to the east (just off the N27 Kinsale Road). The newly constructed Manor Village residential development is also located approximately 150m to the west of the facility.

The topography of the area immediately surrounding the facility is gently sloping. Ground levels slope down to a minor river valley to the west of the site and upward to low rising hills to the south.

Geological mapping published by the Geological Survey of Ireland (GSI) indicates that the bedrock underlying the site comprises sandstones, siltstones and mudstones of the Gyleen Formation which is classified as a moderately productive aquifer which is productive only in local zones (Ll). GSI mapping also indicates that the aquifer vulnerability rating for the site is extremely high, primarily on account of thin soil cover. The site is indicated by Teagasc / EPA soil mapping to be underlain by Made Ground and/or glacial till derived from sandstone.

Further details on geology/hydrogeology and an assessment of the likely impacts of the facility in this regard are provided in Section I.4 of the waste licence application.

The site is located within the catchment of the Tramore River which flows into Cork Harbour. While the quality and status of the Tramore River is not monitored, the transitional waters into which it flows in the harbour are currently indicated to be of good status. In the absence of any other available information, it is assumed that the Tramore River is of moderate to good quality status, equivalent to water quality Class B.

The Forge Hill MRF is located over 3km west of the Douglas River Estuary proposed Natural Heritage Area (pNHA) and Cork Harbour Special Protection Area (SPA) and approximately 1.75km east of Cork Lough pNHA. There is no fruit, vegetable or dairy farming within 150 m of the working areas of the facility.

Further details on the local surface water environment and an assessment of the likely impacts of the facility in this regard are provided in Section I.2 of the waste licence application.

The pathway to groundwater is restricted by the provision of concrete surfaces on site and the handling of waste materials only inside the building which has a concrete floor.

The pathway to surface water is controlled by the purpose built drainage system that:

- directs potentially contaminated yard water to the foul sewer line and ultimately the local authority sewer, via a hydrocarbon interceptor
- directs clean roof water to the balancing tank from where it is pumped to the discharge point and on to the local stream
- directs water from clean yard areas to a large interceptor / silt trap prior to the balancing tank from where it is pumped to the discharge point and on to the local stream
- shut off valves are installed in the foul and surface water lines, and
- prevents fire-water or other discharges from inside the buildings, by way of ramps on the doors.



The pathways for dust, odour or noise emissions are restricted by operating only in the buildings and by the separation distance described above.

An assessment of the potential impacts of atmospheric emissions from the facility is provided in Section I.1 of the waste licence application.

An assessment of the potential impacts of noise emissions from the facility is provided in Section I.6 of the waste licence application.

The proposed monitoring points for the site are included on Drawings WL17 and WL18 that accompany Section F of the waste licence application. A summary with grid coordinates is provided in Section F.2 of the waste licence application form.

There are only 2 planned discharges from the site, SW1 (surface water) and FW1 (trade effluent / potentially contaminated yard run-off). These locations are shown on Drawing WL17 and their details are provided in Tables E.2 and E.3 in the waste licence application form.

## 2.3 Site Processes and Activities

The facility will accept mixed dry recyclables and will segregate and bale these materials prior to onward transport to processing facilities such as paper mills, steel mills, aluminium smelters and plastics factories. The segregation will be highly automated using hi-tech plant to separate by size, shape, optical refraction and other physical qualities. Manual picking will mostly be limited to quality control.

All wastes will be unloaded inside the buildings. All baled recyclables will be loaded to containers or vehicles either inside the buildings or at openings where there is adequate protection against the elements.

Residues and other non-conforming non-hazardous wastes will be loaded into a compactor inside the buildings and will be dispatched from there to appropriate treatment on a daily basis. Hazardous or other materials that are unsuitable to be treated as residues will be quarantined in a designated area and dispatched off site for appropriate treatment within 48 hours.

There will be no processing or handling of wastes in the outdoor areas of the site.

A wash area is provided in the north eastern corner of the site. This will be used infrequently as there are no plans for bin, skip or truck storage or maintenance at the site. The wash area drains to foul sewer.

## 2.4 Inventory of Buildings, Plant and Equipment

The site and building layouts are shown on the Drawings prepared by Brian O'Kennedy & Associates Ltd and submitted with the Waste Licence Application.

In addition, Attachment D.2.2 of the waste licence application contains a more detailed design drawing of the plant inside the buildings and Attachment D.1(m) contains further details on the dimensions and layout of the site buildings, with drawings that included floor plans and elevations.

The following plant and equipment will be used at the facility:



| Plant & Equipment | Function | Throughput Capability |
|---|---|---|
| Liebherr Grab | Transfer MDR from stockpile into processing plant bunker | 40 tonne per hour |
| Metering Bunker | Regulate feed rate of MDR into the sorting plant | 40 tonne per hour |
| OCC Screen | To remove large flat fractions from the MDR mix | 25 tonne per hour separation |
| OCC Optical Sort | To remove OCC from the large flat fraction separated | 10 tonne per hour (5 tonne per hour per meter belt width) |
| 2 deck Ballistic Separator | Separate incoming MDR into 2 dimensional, 3 dimensional and fines fractions | 40 tonne per hour. Efficiency reduced at throughputs above separation capacity. |
| 2 Dimension Oversize Optical Separator – Plastic Separation | Separate plastic film from mainly paper 2-D oversize fraction | 10 tonne per hour (5 tonne per hour per meter belt width) |
| 2 Dimension Midsize Optical Separator | Separate paper from mainly 2-D midsize fraction | 10 tonne per hour (5 tonne per hour per meter belt width) |
| 3 Dimension Line Optical Separator - Bottles | To separate PET and HDPE bottles from the 3-D stream | 10 tonne per hour (5 tonne per hour per meter belt width) |
| 3-Dimension Line Optical Separator – Paper Recovery | To recover paper from the 3-D stream | 10 tonne per hour (5 tonne per hour per meter belt width) |

| | | |
|---|---|---|
| Fine Fraction Line Optical Separator – Paper Recovery | To recover paper from the 3-D stream | 10 tonne per hour (5 tonne per hour per meter belt width) |
| Plastic Film Optical Separator | To remove clear plastic film from the plastics stream removed from the 2-D stream | 10 tonne per hour (5 tonne per hour per meter belt width) |
| Eddy Current Separator | Positive separation of non-ferrous metal material from 3-D stream | Not applicable. Efficiency reduced at target material throughputs above separation capacity |
| Over-band Magnet | Positive separation of ferrous metals from 3-D stream | Not applicable. Magnet does not restrict or limit line throughput. |
| 2 no. Twin Ram Automatic Balers | Baling of segregated fractions | 2 by 30 tonne per hour |
| 2 no. Forklift Units | Removal of baled product from baling stations | Not applicable |
| 1 Teleporter | Moving of material to baler | Not applicable |



## 2.5 Inventory of Raw Materials, Products and Wastes

The annual throughput of waste will be limited to 82,000 t/a and the plant is designed to run at that rate with adequate spare / standby capacity. That equates to roughly 300 tonnes of waste per day.

All incoming waste will be mixed dry recyclables. The majority will be from household kerbside collections, but some will be of commercial origin.

The main products will be as follows:

- Baled Paper
- Baled Cardboard
- Baled Aluminium Cans
- Baled Steel Cans
- Baled Plastic (some different grades depending on market conditions)

There is potential for other dry recyclables to be accepted for processing or temporary storage, but in normal circumstances, inputs will comprise mixed dry recyclables and outputs will comprise baled single stream recyclables.

There will be no fuel stored on site and no tanks provided for that purpose. Small quantities of oils such as lubricating oils and engine oils may be stored in drums on bunded pallets in a safe location inside the buildings.

## 2.6 Maximum Storage Capacity for Raw Materials, Products and Wastes

In the existing buildings, the maximum storage capacities for raw materials, products and wastes are detailed in Table 2-1 below.

**Table 2-1 – Maximum Planned Storage in Existing Buildings**

| Location of waste | Tonnes | Cubic metres[2] | Material | Notes, rationale, clarifications |
|---|---|---|---|---|
| Quarantine areas | 1 | 4 | Residual MSW | Dry recyclables only, so quarantine area is likely to have non-recyclable municipal waste |
| Inspection areas | 5 | 21 | Mixed Dry Recyclables | Pre-approved suppliers |
| Input Storage Area | 100 | 417 | Mixed Dry Recyclables | Pre-approved suppliers |
| Waste on Process Line | 10 | 42 | Mixed Dry Recyclables | Inspected in advance |
| Product 1 Storage area | 100 | 192 | Baled Paper & Cardboard | |
| Product 2 Storage area | 100 | 250 | Baled Plastic | |
| Product 3 Storage area | 100 | 167 | Baled Metal Cans | |
| Non-Recyclable Residues | 20 | 80 | Residual MSW | One compactor of non-recyclable municipal waste. Replaced several times per day. |
| **Total** | 936 | 2,224 | | |



When the extension is fully constructed, the maximum storage capacities for raw materials, products and wastes are detailed in Table 2-2 below.

[2] Density assumptions are explained in Attachment D.1(o) of the waste licence application.

**Table 2-2 – Maximum Planned Storage including Extension**

| Location of waste | Tonnes | Cubic metres | Material | Notes, rationale, clarifications |
|---|---|---|---|---|
| Quarantine areas | 1 | 4 | Residual MSW | Dry recyclables only, so quarantine area is likely to have non-recyclable municipal waste |
| Inspection areas | 5 | 21 | Mixed Dry Recyclables | Pre-approved suppliers |
| Input Storage Area | 100 | 417 | Mixed Dry Recyclables | Pre-approved suppliers |
| Waste on Process Line | 10 | 42 | Mixed Dry Recyclables | Inspected in advance |
| Product 1 Storage area | 600 | 1,154 | Baled Paper & Cardboard | |
| Product 2 Storage area | 500 | 1,250 | Baled Plastic | |
| Product 3 Storage area | 200 | 334 | Baled Metal Cans | |
| Non-Recyclable Residues | 20 | 80 | Residual MSW | One compactor of non-recyclable municipal waste. Replaced several times per day. |
| **Total** | 1,436 | 3,302 | | |

# 3.0 RISK ASSESSMENT

## 3.1 Risk Identification

The environmental risks associated with incidents or accidents at the Forge Hill MRF have been identified through site visits, interviews with the operator, review of public documents and various assessments carried out for the Waste Licence Application.

As all potentially polluting materials will be handled within a building with a concrete floor surrounded by concrete and tarmacadam yards with controlled run-off, there is no plausible risk to groundwater. It is notable that there will be no fuel tanks on site and these are generally pose the highest risk of water pollution at waste transfer stations and MRFs.

The identified risks are listed in Table 3-1 below:

**Table 3-1**
**Plausible Risks Identified for the Activity**

| Risk Ref. No. | Process | Potential Risk |
|---|---|---|
| 1 | Fuel Delivery | Fuel spillage during tanker delivery to Mobile Plant |
| 2 | Storage of Hydrocarbons for Maintenance | Spillage of Engine Oil, Transmission oil and/ or Hydraulic Oil drums, discharge to surface water |
| 3 | Weather | Flooding on site causing uncontrolled discharge |
| 4 | Waste Management Practices | Leaching from waste storage contaminating surface water |
| 5 | Drainage Network | Excessive loss of suspended solids to surface water network |
| 6 | Fire | Fire water discharge |
| 7 | Fire | Emissions to air |
| 8 | Traffic | Loss to environment due to incidents involving vehicles |



## 3.2 Risk Analysis

The risks above were assessed against likelihood and consequence as defined in the EPA guidance document[3] and reproduced in Tables 3-2 and 3-3 below:

**Table 3-2**
**Risk Classification Table - Likelihood**

| Rating | Likelihood | |
|---|---|---|
| | 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 |

[3] Guidance on Assessing and Costing Environmental Liabilities, EPA, 2014

**Table 3-3**
**Risk Classification Table - Consequence**

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

Table 3-4 below contains the Risk Analysis of the likelihood and consequences of the plausible risks identified above. The effectiveness of mitigation measures are also considered in the analysis.

**Table 3-4**
**Risk Analysis**

| Risk ID. | Process | Potential Risks | Environmental Effect | Consequence Rating | Basis of Consequence | Likelihood Rating | Basis of Likelihood | Risk Score (Consequence x Likelihood) |
|---|---|---|---|---|---|---|---|---|
| 1 | Fuel Delivery | Fuel spillage during tanker delivery to Mobile Plant | Contamination of surface water. | 3 | Volume being delivered is limited. Hazardous and persistent material | 1 | Fuel will be delivered in a building that has concrete floor and ramp designed for containment of very large volume of liquids | 3 |
| 2 | Storage of Hydrocarbons for Maintenance | Spillage of Engine Oil, Transmission oil and/ or Hydraulic Oil drums, discharge to surface water | Contamination of surface water. | 3 | Small volumes Hazardous and persistent material. | 1 | Drums will be stored and used in a building that has concrete floor and ramp designed for containment of very large volume of liquids | 3 |
| 3 | Weather | Flooding on site causing uncontrolled discharge | Contamination of surface water | 2 | Very low quantities of potentially polluting materials to be stored on site – massive dilution in flood event. | 2 | Site is on a hill well removed from flood plains. No history of flooding on site. | 4 |
| 4 | Waste Management Practices | Leaching from waste storage contaminating surface water | Contamination of surface water | 2 | Mixed dry recyclables have little potential to pollute. Small quantity of potentially polluting materials could be found | 1 | All waste will be handled in a building that has concrete floor and ramp designed for containment of very large volume of liquids | 2 |
| 5 | Drainage Network | Excessive loss of suspended solids to surface water network | Contamination of surface water. | 2 | Potential for temporary impairment of local stream | 1 | No C&D waste handled. Interceptor on SW line acts as silt trap. Balancing tank also acts as silt trap. | 2 |

| Risk ID. | Process | Potential Risks | Environmental Effect | Consequence Rating | Basis of Consequence | Likelihood Rating | Basis of Likelihood | Risk Score (Consequence x Likelihood) |
|---|---|---|---|---|---|---|---|---|
| 6 | Fire | Fire water discharge | Contamination of surface water. | 3 | Fire water from waste facilities is generally poor quality and comprises a large volume | 3 | Fires commonly occur at waste facilities and this facility will store significant volumes of combustible waste | 9 |
| 7 | Fire | Emissions to air | Air pollution | 2 | Local nuisance is likely, but significant air pollution is unlikely based on experience at large fires at waste facilities in Ireland (e.g. Oxigen, Ballymount) | 3 | Fires commonly occur at waste facilities and this facility will store significant volumes of combustible waste | 6 |
| 8 | Traffic | Loss to environment due to incidents involving vehicles | Contamination of surface water. | 2 | Small volumes<br>Hazardous and persistent material. | 2 | One way traffic system in yard. Mobile plant only operated in building where there is full containment. | 4 |

### 3.3 Risk Evaluation

The risks presented in the risk analysis are ranked in Table 3-5 below to assist in identifying the risks for prioritisation in the risk treatment process.

**Table 3-5**
**Risk Evaluation Table**

| Risk ID. | Process | Potential Risks | Consequence Rating | Likelihood Rating | Risk Score |
|---|---|---|---|---|---|
| 6 | Fire | Fire water discharge | 3 | 3 | 9 |
| 7 | Fire | Emissions to air | 2 | 3 | 6 |
| 3 | Weather | Flooding on site causing uncontrolled discharge | 2 | 2 | 4 |
| 8 | Traffic | Loss to environment due to incidents involving vehicles | 2 | 2 | 4 |
| 1 | Fuel Delivery | Fuel spillage during tanker delivery to Mobile Plant | 3 | 1 | 3 |
| 2 | Storage of Hydrocarbons for Maintenance | Spillage of Engine Oil, Transmission oil and/ or Hydraulic Oil drums, discharge to surface water | 3 | 1 | 3 |
| 4 | Waste Management Practices | Leaching from waste storage contaminating surface water | 2 | 1 | 2 |
| 5 | Drainage Network | Excessive loss of suspended solids to surface water network | 2 | 1 | 2 |



The Risk Matrix is displayed in Table 3-6 below.

In line with the EPA Guidance, the risks have been colour coded in the matrix to provide a broad indication of the critical nature of each risk. The colour code is as follows:

Red – These are considered to be high-level risks requiring priority attention. These risks have the potential to be catastrophic and as such should be addressed quickly.

Amber – These are medium-level risks requiring action, but are not as critical as a red coded risk.

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 and if cost effective mitigation can be carried out to reduce the risk even further this should be pursued.

**Table 3-6**
**Risk Matrix**

| Likelihood | | | | | | |
|---|---|---|---|---|---|---|
| Very High | 5 | | | | | |
| High | 4 | | | | | |
| Medium | 3 | | 7 | 6 | | |
| Low | 2 | | 3, 8 | | | |
| Very Low | 1 | | 4, 5 | 1, 2 | | |
| | | Trivial | Minor | Moderate | Major | Massive |
| | | 1 | 2 | 3 | 4 | 5 |

Consequence



All identified risks fall within the green zone in the risk matrix.

## 3.4 Risk Treatment

Table 3-7 below presents a Statement of Measures where a set of appropriate and achievable mitigation measures are assigned to each risk, with a risk owner responsible for the ongoing management of the risk and a timeframe for implementation of the risk mitigation measure.

## Table 3-7
## Statement of Measures

| Risk ID. | Potential Risks | Risk Score | Mitigation Measures to be Taken | Outcome | Action | Date For Completion | Owner/ Contact person |
|---|---|---|---|---|---|---|---|
| 6 | Fire water discharge | 9 | a) Provide full containment of fire-water within the MRF Buildings.<br><br>b) Limit the extent and intensity of a fire by limiting storage volumes and by providing compartmentalisation between the existing MRF and the extension. | a) Firewater will be contained on site and can be tested prior to appropriate discharge.<br><br>b) Fire will be less extensive and less intensive. | a) Add 250mm height to ramps at all doors to provide 1,156m3 of fire-water containment in the existing buildings, including containment in 3 trenches.<br>b) Block drain from MRF building to foul sewer line.<br>c) Construct extension with 380mm ramps at doors to provide 434m3 of additional containment.<br>d) Link extension to existing MRF building via underground drain to combine containment in both buildings.<br>e) Construct a fire-break wall between the existing and new buildings to limit the extent of a fire.<br>f) Limit the storage of combustible wastes to 300 tonnes in existing buildings prior to extension.<br>g) Limit the storage combustible wastes to 450 tonnes in existing buildings and 750 tonnes in the extension after the extension is completed.<br>(see Attachment D.1(o) for more details). | a), b) and f) to be completed prior to commencement of operations.<br><br>c), d) and e) to be completed as part of the MRF extension works and prior to storage of waste in the extension. | Facility Manager and Engineering Consultant (Brian O'Kennedy & Co.) |
| 7 | Emissions to air due to Fire | 6 | Limit the extent and intensity of a fire by limiting storage volumes and by providing compartmentalisation between the existing MRF and the extension. | Fire will be less extensive and less intensive. | a) Construct a fire-break wall between the existing and new buildings to limit the extent of a fire.<br>b) Limit the storage of combustible wastes to 300 tonnes in existing buildings prior to extension.<br>c) Limit the storage combustible wastes to 450 tonnes in existing buildings and 750 tonnes in the extension after the extension is completed.<br>(see Attachment D.1(o) for more details). | Prior to storage of waste in relevant buildings. | Facility Manager |

| Risk ID. | Potential Risks | Risk Score | Mitigation Measures to be Taken | Outcome | Action | Date For Completion | Owner/ Contact person |
|---|---|---|---|---|---|---|---|
| 3 | Flooding on site causing uncontrolled discharge | 4 | a) Keep all potentially polluting materials inside the MRF buildings.<br>b) Regular Maintenance of hydrocarbon interceptors. | a) Flooding of yard areas will be kept free of contaminants.<br>b) Volume of hydrocarbons in interceptors will be kept low. | a) Instruct site personnel to keep potentially polluting materials in the MRF building.<br>b) Regularly service the interceptors.<br>c) Make sure that this is covered in the EMS and that staff are aware of the requirements of the EMS. | a) In advance of operation<br>b) As required – regular checks of oil level.<br>c) In advance of operation | Facility Manager |
| 8 | Loss to environment due to incidents involving vehicles | 4 | a) Ensure drivers adhere to speed limits and drive cautiously.<br>b) Implement traffic management plan.<br>c) Provide spill kits in vehicles or at strategic locations. | a) Better road safety and less likelihood of spill.<br>b) As with a).<br>c) Spill clean-up to avoid environmental incident. | Talk to all drivers and observe behaviour.<br>Ensure that spill kits are in place. | In advance of operation. | Facility Manager |
| 1 | Fuel spillage during tanker delivery to Mobile Plant | 3 | a) Mobile Plant to be fuelled inside MRF where there is full containment.<br>b) Spill kits to be available in Mobile Plant or at strategic locations in the MRF. | Any spills will be contained and cleaned without discharging fuel to the water environment. | a) Instruct mobile plant operators that re-fuelling must take place inside MRF Building.<br>b) Ensure that spill kits are strategically placed in MRF or in mobile plant. | Prior to commencement of operations | Facility Manager |
| 2 | Spillage of Engine Oil, Transmission oil and/ or Hydraulic Oil drums, discharge to surface water | 3 | a) Keep all potentially polluting materials inside the MRF buildings.<br>b) Ensure that pumps to surface water are switched off and shut-off valves engaged as part of Emergency Response Procedure in the event of a major spill. | Full containment of spill | a) Instruct site personnel to keep potentially polluting materials in the MRF building.<br>b) Develop ERPs<br>c) Make sure that all relevant staff are familiar with the site ERPs. | In advance of operation. | Facility Manager |

| Risk ID. | Potential Risks | Risk Score | Mitigation Measures to be Taken | Outcome | Action | Date For Completion | Owner/ Contact person |
|---|---|---|---|---|---|---|---|
| | | | c) Develop Emergency Response Procedures (ERPs) and make staff aware of these. | | | | |
| 4 | Leaching from waste storage contaminating surface water | 2 | a) Waste inspection measures, waste acceptance procedures and customer profiling.<br><br>b) Provision of waste inspection and quarantine areas. | a) Better control on incoming wastes and less likelihood of acceptance of non-compliant loads.<br>b) Better control and safe storage of non-compliant materials. | a) Implement relevant waste acceptance, waste inspection and customer profiling procedures.<br><br>b) Construct / designate waste inspection and quarantine areas. | In advance of operation. | Facility Manager |
| 5 | Excessive loss of suspended solids to surface water network | 2 | Regular Maintenance of silt traps (interceptor and balancing tank) | Low levels of suspended solids in discharge to surface water. | Monitor and service silt traps. | Regular checks during site operation. | Facility Manager |

## 3.5 Identification of Worst Case Scenario

The ELRA identifies that the risks with the highest consequences relate to a fire at the site (Risk I.D. 7) and spillages of hydrocarbons (Risk I.D. 1 and 2).

In a worst case scenario, a large fire would generate large volumes of fire-water and would emit pollutants to the atmosphere. The fire-water will be contained so no contamination of the local surface water network is expected. However, the operator will need to remove the fire-water for safe disposal to completely remove the risk of environmental pollution.

In the worst case scenario, it is assumed that hydrocarbons from drums and mobile plant are included in the fire-water (incorporating Risks 1 and 2).

## 3.6 Quantification and Costing

The cost of fire-fighting and removal of fire-water from the site is estimated in Table 3-8 below based on the following assumptions:

- With the limit on storage of combustible materials and the compartmentalisation between the existing MRF and the extension, it is assumed that a fire can be extinguished in 19 to 20 hours (worst case), as detailed in Attachment D.1(o) of the waste licence application.
- A maximum quantity of 1,411m$^3$ of contaminated firewater is assumed, as detailed in the fire-water calculations contained in Attachment D.1(o) of the waste licence application.
- The degree of contamination of the fire-water is expected to be consistent with fire-water from other waste facilities such as Oxigen, Ballymount and Thorntons, Killeen Road. In both these cases, the fire-water was suitable for sewer discharge in a controlled manner.
- It is assumed that the fire-water can be discharged to a waste water treatment plant. It is also assumed that this will be managed by controlled discharge to the sewer in consultation with Irish Water and Cork County Council.
- We allow a 20% contingency.

**Table 3-8**
**Quantification and Costing of Worst Case Scenario**

| Task | Description | Quantity (No.) | Measurement Unit | Unit Rate (€) | Cost (€) | Source of Unit Rates |
|---|---|---|---|---|---|---|
| Response to: **Risk I.D. 1, 2 and 7** Major Fire incorporating hydrocarbon drums stored in the MRF and diesel in mobile plant. | Fire-fighting | 100 (assume 5 engines for 20 hours each) | Engine Hours | 480 | 48,000 | Rate based on consultation with Cork Fire Service. Largest fee ever charged was €35,000 |
| | Testing of Fire-water | 5 | samples | 150 | 750 | SLR |
| | Pumping of fire-water to sewer | 2 | days | 1,000 | 2,000 | Conservative rate for a man, diesel and pump-hire |
| | Discharge of fire-water to sewer | 822 | $m^3$ | 2.13 | 1,750 | http://www.water.ie/business/pricing/cork-county-council/ including water supply and wastewater disposal |
| | Removal of residual solid wastes / ash | 400 | tonnes | 150 | 60,000 | Transport and landfill gate fee including levy. |
| | Environmental Consultants Report | 1 | report | 5,000 | 3,000 | SLR |
| | **Total (€)** | | | | **115,500** | |
| | **Plus Contingency @ 20% (€)** | | | | **138,600** | |
| | **Plus VAT @ 23% (€)** | | | | **170,478** | |

## 4.0 CONCLUSION

This ELRA concludes that the facility operator should provide financial provision of **€170,478** to cover the worst case environmental pollution incident considered plausible at the Forge Hill MRF.

As the costs all relate to a fire incident, the operator may be able to cover these costs under Fire Insurance, without the need for a separate environmental liabilities insurance policy.

SLR also recommends that the waste facility operator adheres to the mitigation measures detailed in Table 3-7 above as these measures will minimise the likelihood and consequence of environmental pollution incidents at the facility.

## 5.0 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and publicly available data and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of our client, Forge Hill Recycling Ltd. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.