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ENVIRONMENTAL LIABILITY RISK ASSESSMENT

FORGE HILL RECYCLING LTD

FORGE HILL

CORK

Prepared For: -

Forge Hill Recycling Limited,
Forge Hill,
Ballycureen,
County Cork.

Prepared By: -

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May 2018

Project	Environmental Liability Risk Assessment			
Client	Forge Hill Recycling Ltd			
Report No	Date	Status	Prepared By	Reviewed By
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	01/05/2018	Final		

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1. INTRODUCTION

Forge Hill Recycling Ltd operates its Materials Recovery Facility at Forge Hill, Cork under a Waste Licence (W0291-01) issued by the Environmental Protection Agency (the Agency).

Condition 12.3.2 of the licence requires the completion, by an independent and appropriately qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA), which addresses the liabilities from past and present activities. The condition also requires the ELRA to be reviewed as necessary to reflect any significant change on site. The ELRA was prepared in 2016 and subsequently revised a number of times, most recently December 2017. .

The current planning permission and waste licence limit the annual waste intake to 82,000 tonnes. FHR intends to apply for approval to increase the waste acceptance rate to 100,000 tonnes and this will require planning permission and a revision of the EPA licence. The ELRA has been revised to take into consideration the additional waste intake and storage areas and the increased annual throughput.

1.1 Methodology

The assessment was based on the Agency's *'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 was based on a review of the ELRA prepared by SLR Consulting in December 2017 and an evaluation of site operations, including materials and waste handling and storage practices; waste processes; emissions control and management (infrastructural and procedural); accident prevention policy and emergency response procedures;

1.2 Limitations

The ELRA is based on the current activities and the proposed increase in waste acceptance. The assessments of costs required to reduce or mitigate the environmental liabilities identified in this report are based on the information available at the time of the report preparation and may be subject to amendment based on future investigations.

The ELRA does not address the costs of dealing with the sudden, unexpected closure, as these are addressed in the separate Decommissioning Management Plan.

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 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 site layout is shown on Drawing No. 14/4347-PL-01 covers. It occupies 10,110m^2 and comprises a waste processing building, which following the completion of the proposed development will be made up of four adjoining buildings, with annexes that house a compressor and maintenance area; two storey office, an electrical substation, a power wash storage hut; two weighbridges, paved open yards and a small unpaved area in the east of the site. A security fence surrounds the operational area and there are two entrances off Forge Hill Road.

FHR is authorised to accept and sort mixed dry recyclables which are then exported to overseas recycling facilities. Non-recyclable residues are sent to other waste management facilities in Ireland for processing to produce solid recovered fuel (SRF).

3.2 Site Security

There is a palisade fence around the southern, eastern and western boundary of the operational area with fencing, a block wall and two security gates (north and south) on the western boundary. There is a CCTV surveillance and a monitored alarm system.

3.3 Services

The site has connections to the mains water supply, the municipal foul sewer and telecom services. There is an electricity substation at the western boundary and a ring main fitted with 4 No. fire hydrants.

3.3.1 Wastewater Drainage System

The wastewater drainage system is shown on Drawing No. 14/4347-PL-03. Sanitary wastewater from the toilets and waste water from the staff welfare facilities discharge directly to the Irish Water foul sewer. Rainwater run-off from areas of the site where, due to the operations and waste types that were carried out, were susceptible to contamination, is discharge to the municipal foul sewer via a Class 1 Oil Interceptor. There is a manual shut-off valve on the foul sewer line just outside the northern exit gate.

SCHEDULE OF AREAS:

BUILDING 1: 1314.2m²
BUILDING 2: 1428.6m²
BUILDING 3: 1053m²
EXTENSION 1: 1468m²
EXTENSION 2: 140m²
ADMIN BUILDING : 593.7m²
OPEN YARD AREA: 4424.54m²

BOUNDARY UNALTERED
NEW WALL ON BOUNDRY
INTERNAL DOWNPIPE
171.91
NEW DOCKING RAMP
DOCKING BAY RAMP
EXISTING WEIGH-OUT BRIDGE
BUILDING 1
BUILDING 2
BUILDING 3
EXISTING WASTE HANDLING BUILDING
VALLEY
RIDGE
FFL: 42.03
EXTENSION 1 (BUILDING 4)
PROPOSED WASTE RECEPTION AREA 1468 m²
NEW FENCE LINE
76.692
1250 Walkway
FERROUS METAL STORAGE
NON- FERROUS METAL STORAGE
3.5
5
5
42.26
Ø27m
42.17
F.F.L.: 42.06
EXTENSION 2
AREA:140m²
EXISTING STAIRS MOVED TO EXTERIOR
42.22
PROTECTIVE BOLLARDS
+42.12
+42.09
ENTERING TRAFFIC
OLD BOUNDARY FENCE LINE
STEEL-WALLED BUNDED TANK STORAGE
PROPOSED CAR PARKING
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
SITE NOTICE
9.415
EXIT ONLY
+41.98
+42.09
TARMACADAM
ESB SUBSTATION
NEW GATE
BOUNDARY UNALTERED
FORGE HILL- PUBLIC ROAD
77.161
+42.34
ENTRY ONLY
FOR MODIFICATION TO ENTRANCE TO ACCOMMODATE PEDESTRIANS, SEE MHL DRAWING FHR-ENT-P01
+42.49
+42.68
+42.90
1:20 RAMP
EXISTING TRAFFIC
25.778
EXISTING ADMIN. BUILDING
13.309
CYCLE PARKING
22
EXISTING WEIGH-IN BRIDGE
41.97
122.323
OLD ROAD
SITE NOTICE
N
YARD IN ADJACENT SITE

TRAFFIC MOVEMENT
INBOUND
OUTBOUND

SITE BOUNDARY IN RED
PROPOSED EXTENSION IN GREEN

SITE LAYOUT PLAN
SCALE 1:250

Notes:
ALL BOUNDARIES WHERE EXTENTION IS NOT BEING CONSTRUCTED RETAINED AS EXISTING

Notes:
1. This drawing is for planning purposes only. - If in doubt ask.
2. Do not scale, figured dimensions only to be taken.
3. Engineer to be informed of any discrepancies before work proceeds.
4. Contractor to check all dimensions and conditions on site before commencing works.
5. Drawing to be read in conjunction with current Building Regulations.
6. All components and materials to be installed fully in accordance with manufacturers instructions.

Revision	Comments	Date

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Project:
EXTENSIONS TO MATERIALS RECYCLING FACILITY AT FORGE HILL, CO. CORK

Client:
FORGE HILL RECYCLING LTD

Drawing Title:
SITE LAYOUT PLAN - PROPOSED NEW EXTENSIONS

Scale:	Date:	Revision
1:250 @A1	March 2018	R0
Drawn By: E.F.	Drawing Number: 14/4347-PL-01	

3.3.2 Surface Water Drainage System

The surface water drainage system is shown on Drawing No. 14/4347-PL-02. Rainwater run-off the paved open yard areas that are not connected to the foul water sewer is directed to a Class I Full Retention Oil interceptor, fitted with an oil alarm, from where it flows to an underground two chamber tank, located in the north west of the site. The water enters the tank's western chamber (82m^3).

Rainwater run-off from the building roofs is piped directly to the western chamber and does not pass through the interceptor. The water in the western chamber is kept at a high level for use for fire-fighting by means of a high level overflow pipe into the eastern chamber (90m^3). This chamber is used for flow attenuation and also serves as a firewater retention facility. A float activated submersible pump is used to control the water level in the chamber by pumping it out via a rising main to an inspection chamber (SW-1) at the western boundary.

There is a pipe from SW-1 to an unnamed stream to the west of the site. This stream joins the Tramore River, approximately 370m to the north of the site. There is a manual shut off valve on the system at SW-1.

Under normal conditions the roof-water flows directly to the balancing tank, while run-off from the paved areas, other than those connected to the foul sewer, passes through the oil interceptor and into the western chamber. During a heavy rainfall event the water level in the eastern chamber will increase if the inflow rate is higher that the pump capacity. If the tank fills the water will enter an overflow pipe near the top of the chamber. This pipe connects to SW-1.

In the event of an incident that has the potential to contaminate surface water the emergency response actions include switching off the pump in the balancing tank and closure of the valve at SW-1.

3.4 Waste Processes

The mixed wastes are mechanically separated by type (plastic, paper , cardboard, metals) and then baled and stored prior to transfer to other facilities for further processing, for example paper mills, steel mills, aluminium smelters and plastics factories. The processing plant, which has the capacity to process 23 tonnes/hour, comprises;

- Grab Machine – to load materials into the fed bunker.
- Below ground metering bunker and conveyor – to regulate the feed rate.
- OCC Screen – to remove large flat fractions from the mix (e.g. large sheets of cardboard).
- OCC Optical Sort – to capture cardboard.
- Ballistic Separator – to separate materials by size and shape (2D, 3D and fines).

SURFACE DRAINAGE LEGEND
DRAINAGE FROM ROOF
DRAINAGE FROM GROUND
REDUNDANT DRAINAGE
(TO BE SEALED UP)

SURFACE WATER MONITORING LOCATIONS SW

FULL ACCESS TO BE RETAINED TO INTERNALIZED MANHOLES

EXTENSION 1 (BUILDING 4)

INTERNAL DRAIN TO BE FILLED WITH CONCRETE

PROPOSED WASTE RECEPTION AREA 1468 m²

NEW FENCE LINE

MH CL:42.38 IL:40.71

MH CL:42.29 IL:40.61

MH CL:42.21 IL:40.44

EXTERNAL CHANNEL DRAIN TO BE RETAINED

EXTERNAL CHANNEL TO BE CONNECTED TO YARD DRAINAGE SYSTEM

Ø27m

NEW DOCKING RAMP

DOCKING BAY RAMP

BUILDING 1

BUILDING 2

BUILDING 3

EXISTING WASTE HANDLING BUILDING

VALLEY

RIDGE

VALLEY

RIDGE

EXISTING WEIGH-OUT BRIDGE

1:20 RAMP

EXTENSION 2 AREA:140m²

PROTECTIVE BOLLARDS

ENTERING TRAFFIC

INTERNALIZED SURFACE DRAINAGE TO BE LEFT AVAILABLE FOR ACCESS

PROPOSED CAR PARKING

EXISTING CHANNEL DRAIN TO MANHOLES

EXISTING WEIGH-IN BRIDGE

MH CL:42.03 IL:41.48

MH CL:41.93 IL:40.63

MH CL:42.01 IL:40.06

MH CL:41.84 IL:39.82

MH CL:41.83 IL:40.66

MH CL:41.82 IL:39.91

MH CL:41.96 IL:39.37

MH (TANK) CL:41.82

EXITING TRAFFIC

OIL INTERCEPTOR

SHUT OFF VALVE

MH CL:42.16 IL:39.61

SW-1

High level overflow pipe

EXISTING ADMIN. BUILDING

PROPOSED PARKING SPACES

OLD ROAD

YARD IN ADJACENT SITE

Fire Extinguishing Water Storage Tank

MH (TANK) CL:41.76

LIT CL:41.75

CL:41.84

MH (TANK) CL:41.86

RISING MAIN

N

SITE BOUNDARY IN RED

NEW EXTENSIONS IN GREEN

SITE LAYOUT PLAN - AS-BUILT SURFACE DRAINAGE LAYOUT
SCALE 1:250

Notes:
1. This drawing is for planning purposes only. - If in doubt ask.
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3. Engineer to be informed of any discrepancies before work proceeds.
4. Contractor to check all dimensions and conditions on site before commencing works.
5. Drawing to be read in conjunction with current Building Regulations.
6. All components and materials to be installed fully in accordance with manufacturers instructions.

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Project:
EXTENSIONS TO EXISTING MATERIALS RECYCLING FACILITY AT FORGE HILL, CO. CORK

Client:
KWD RECYCLING

Drawing Title:
SITE LAYOUT PLAN
SURFACE DRAINAGE LAYOUT

Scale:	Date:	Revision
1:250 @A1	March 2018	R0
Drawn By: E.F.	Drawing Number: 14/4347-PL-03	

- Optical Separators (5 No.) – to separate plastic and paper fractions using the reflection and refraction properties of each material. Each optical separator is strategically placed and set up differently to capture different materials.
- Eddy Current Separator – to capture non-ferrous metals, particularly aluminium cans.
- Over-band Magnet – to capture ferrous metals, particularly steel cans.
- Balers (2 No.) – to produce bales of paper, cardboard, plastic film, plastic bottles, aluminium cans, steel cans, etc.
- Forklifts (2 No.) – to move bales to storage and to haulage vehicles.
- Teleporter – to move material to the balers.

The proposed development will involve the provision of a below ground feed hopper and a conveyor in the new intake area that will transfer the mixed recyclables to the existing process line.

Those items of plant critical to the efficient and adequate processing of waste at the facility (including inter alia waste loading vehicles and ejector trailers) have a 100% duty and 50% standby capacity.

3.5 Inventory of Raw Materials and Wastes

3.5.1 Materials

The diesel powered mobile plant are refuelled on-site as required by tanker fuel delivery trucks. To provide a contingency back-up to the tanker deliveries it is proposed to provide a 1000 litre plastic, diesel storage tank that will be located in a bund in the south-east corner of the site. This will only be used to re-fuel the plant outside of the normal fuel tanker delivery hours. The tank will comply with the design requirements specified in Condition 3.6 of the EPA licence.

Small quantities of oils such as hydraulic oil (1 No. 205 litre drum) lubricating oils and coolants (5 No. 205 litre drums) for plant maintenance purposes will be stored in a bunded pallet inside the processing building.

3.5.2 Wastes

A waste storage plan has been prepared in accordance with Condition 8.11 of the licence. It identifies discrete storage areas across the site and specifies the sizes of stockpiles, the recommended separation distances and the maximum amount of waste stored on site at any one time. The maximum amount of waste on-site at any one time will be 1,551 tonnes. A copy of the storage plan is in Appendix 1.

3.6 Plant Maintenance and Breakdown

The proposed development will involve the provision of a below ground feed hopper and a conveyor in the new intake area that will transfer the mixed recyclables to the existing process line.

As required by the EPA licence those items of plant critical to the efficient and adequate processing of waste at the facility (including inter alia waste loading vehicles and ejector trailers) have a 100% duty and 50% standby capacity and provision has been made for contingency arrangements and/or back up and spares in the case of breakdown.

The processing lines is subject to a preventative maintenance programme and critical spares are kept at the site.

3.7 Safety and Hazard Control

FHR has adopted a Corrective and Preventive Action Procedure (EP07) and prepared a Safety Statement that identifies and evaluates the major on-site potential hazards and describes the control measures in place to mitigate the hazards associated with current operations. A copy of the procedure is in Appendix 2.

An emergency is an accident/incident that has the potential to result in environmental pollution and harm to human health & safety. The EPA licence requires FHR to ensure that an Emergency Response Procedure (ERP) is in place that addresses any emergency situation that may originate on-site. FHR has prepared an ERP and a copy (EP09) is in Appendix 3.

FHR has completed a Fire Risk Assessment that specifies the fire prevention measures that are applied at the facility and informs the site specific Emergency Response (ERP) (EP09). Table 2.4 of the Risk Assessment identifies the current hazards and control measures, while Section 3 describes the fire risk action plan for the site. Copies of the extracts are in Appendix 4.

In addition to the measures outlined in the Fire Risk Assessment the new oil storage tank will be located 25 m from the processing building which will mean a fire in the building will not affect the integrity of the tank.

3.8 Emission Controls

All waste reception and processing and the majority of the storage are and will be carried out inside the processing building. The roller shutter doors are typically only opened to allow vehicles to enter and exit. The only materials stored externally are small amounts of non-recyclable residues in a fully enclosed trailer and bales of metal waste. These measures effectively mitigate noise and dust emissions and the control of odour emissions.

The processing does not generate any wastewater and the building floors, which are concrete paved are regularly inspected and cleaned as required.

Rainwater run-off from the yard areas where there is the potential for contamination to occur is collected separately and passed through a Class 1 Oil Interceptor before being discharged to the Irish Water foul sewer. Run-off from the remaining yards passes through another Class I Interceptor before entering the flow balancing tank.

During extended periods of dry weather the open yards are cleaned using the on-site road sweeper to control dust emissions.

There are shut-off valves on the foul and surface water drainage systems that can be closed in the event of an incident that has the potential to generate significant volumes of contaminated water. Ramps at the entrance doors in conjunction with the surface water balance tank provide firewater retention capacity.

3.9 Operator Performance

3.9.1 Site History

The site was initially developed in 1969 and has been used for waste management activities since 1987. In 2003 the EPA granted a Waste Licence to the company that then operated the site (IPODEC), which authorised the acceptance, processing and transfer of 82,000 tonnes/year of household, commercial, industrial and construction & demolition waste.

A redevelopment of the site in 2005 involved the demolition of the original waste handling building and the construction of a new waste processing building, weighbridge and offices and the installation of new foul and surface water drainage systems. In 2008 the waste transfer building was extended and a second weigh bridge was installed.

In 2009 the waste business was acquired by Greenstar Environmental Services Limited (Greenstar). Greenstar suspended waste operations in September 2011, following which all wastes were removed and the site closed.

In 2015 the site was acquired by the current landowner and leased to FHR. Cork County Council granted FHR a Waste Permit to operate the site as a recycling and transfer facility. The annual tonnage was limited to 49,999 tonnes. In 2016 the waste transfer building was extended to allow the internal storage of baled recyclables. In August 2017 the EPA granted FHR the current Waste Licence that authorised the acceptance of 82,000 tonnes of waste.

3.9.2 Facility Management & Staffing Structure

The Facility Manager has completed the FAS Training Programme and has 11 years' work experience in the waste industry. Facility staff include general operatives, plant drivers, and maintenance and office staff.

Condition 2 of the licence requires FHR to adopt an Environmental Management System (EMS). FHR has prepared documented EMS which comprises an Environmental Manual and a series of EMS Procedures (EP01 to EP18) and EMS Records (ER01 to ER15). The EMS requires the implementation of an Environmental Management Programme and the development of a

Schedule of Environmental Objectives and Targets that provides for a review of all operations and processes, including environmental training and awareness and emergency response actions.

3.9.3 Compliance History

Since the EPA licence was issued FHR has received only one notification of a non-compliance with the licence conditions, which related to the late submission of the ELRA and Decommissioning Management Plan.

The results of the environmental monitoring carried out in accordance with the licence requirements has established that emissions from the site are generally in compliance with the specified emission limit values.

3.9.4 Enforcement History

FHR has never been the subject of enforcement action by the regulatory authorities.

3.9.5 Incidents History

There is no record of any incident at the site that had the potential to result in significant soil and groundwater contamination.

3.9.6 Complaints History

FHR maintains a register of complaints received in accordance with Condition 11.5 of the licence. Since the EPA licence was granted, five complaints have been received from occupants of nearby commercial premises; three in in relation to odour, one in relation to noise and one in relation to dust. All complaints were investigated.

3.10 Environmental Sensitivity

3.10.1 Surrounding Land Use

The surrounding land use is primarily commercial, with the lands to the north and south comprising industrial estates/business parks and other commercial developments on the western side to the road. The closest residential properties are approximately 80m to the north-west and 120m to the east, with a residential estate approximately 270m to the west.

3.10.2 Hydrology

There are no surface water features either on or immediately adjacent to the site. The site is in the catchment of a small stream to the west of the site, which is a tributary of the Tramore River. The stream rises approximately 2 km south of the site, flows north and passes approximately 140 m to the west of the site and enters the Tramore River, approximately 370 m north of the facility. The Tramore River enters a tidal basin called the Douglas River that subsequently flows into Lough Mahon.

3.10.3 Geology & Hydrogeology

The site is underlain by a layer of made ground, which is on top of approximately 3m of sandstone derived till. The bedrock comprises sandstones, mudstones and siltstone. The subsoils at the site are not significantly water bearing. The bedrock aquifer is classified as a locally important aquifer, which is only moderately productive in local zones (Ll). The aquifer vulnerability rating is Extreme. Based on the topography, the local direction of groundwater flow is to be towards the stream to the west and north of the site.

3.10.4 Designated Sites

The nearest sites that are potentially susceptible to impacts associated with the proposed development are Cork Harbour SPA (Site Code 004030) and Great Island Channel SAC (Site Code 001058), which are 3.5km and 4.5km respectively to the east. Rainwater run-off from the facility discharges to a tributary of the Tramore River, which flows into Lough Mahon, part of Cork Harbour.

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 FHR 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;
- Implementation of a Fire Safety Management System based on the findings of a site specific Fire Risk Assessment and includes the restriction on the amount of combustible waste on site at any one time; provision of fire walls and sprinkler systems; alarmed fire detection system; provision and maintenance of fire extinguishers and hose reels and provision of firewater run-off retention capacity, and
- 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 installation, 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, 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 4.1. These take into account the installation 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 4.1 Risks

Risk ID	Process	Potential Hazards/Risks
1	Diesel Storage	Accidental release of diesel from storage tank contamination of surface water drains
2		Accidental release of diesel during deliveries and dispensing- contamination of surface water drains.
3		Accidental release of diesel- soil and groundwater contamination.
4	Engine/Hydraulic/Waste Oil Storage	Accidental spill from drums –contamination of surface water drains.
5		Accidental spill from drums-soil and groundwater contamination.
6	Fire in Waste Processing Building	Emissions to air.
7		Firewater run-off to surface water and foul water drains, surface water contamination and impact on municipal WWTP.
8		Firewater infiltration to ground-soil, groundwater and surface water contamination

4.4 Risk Analysis

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

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 4.3– 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) FHR 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 installation to such an extent that allowed all the control and containment measures to fail.

Table 4.4 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 Storage	Uncontrolled release from 1000 litre bulk storage tank that escapes the bund and enters the surface water drains.	Contamination of the surface water drains, with consequent impact on the Irish Water WWTP.	1	The bund design and construction will comply with licence requirements and will have more than 110% capacity of the tank. The bund will be subject to regular visual inspection and routine integrity testing and repaired as required. Drains around the tank connect to an oil interceptor and discharge to foul sewer. Shut off valve on the connection to foul sewer. ERP ensures rapid response to incident. The risk is **Very Low.**	2	Relatively small volumes (1000 litres) on site at any one time. All drainage from area around the tank passes through an oil interceptor. The severity of the impact would be M**inor**	2
2	Diesel/Oil Storage	Escape of diesel to surface water drainage system during filling/ dispensing	Contamination of the foul water drains, with consequent impact on tributary of the Tramore River and the Irish Water WWTP.	1	Documented procedure on refuelling/ dispensing will be prepared and staff will be fully trained in spill prevention and clean-up. Dispensing unit will be inside the bund Drains around the tank connect to an oil interceptor and discharge to the foul sewer. Shut off valve on the connection to foul sewer. The APP and ERP minimise the risk of accidents and ensure rapid response to incident. The risk is **Very Low**	2	Relatively small volumes on site at any one time. All drainage from area around the tank passes through an oil interceptor. The severity of the impact would be M**inor,**	2
3	Diesel/Oil Storage	Uncontrolled released from bund or spill during dispensing/refilling of tank that leaks through damaged paving or leaks in the surface water drains.	Soil / Groundwater contamination	2	Diesel stored in bunded tank, 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 minimise the risk of accidents and ensure rapid response to incident. The risk is **Low**.	1	Relatively small volumes on site at any one time. Approx 3m of 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	Engine/ Hydraulic/ Waste Oil Storage	Escape of oil to surface water drainage system during handling/ plant maintenance	Contamination of the surface water drains, with consequent impact on tributary of the Tramore River and the Irish Water WWTP.	1	Oil drums stored in bunded pallet inside the building. All maintenance carried out inside the building. No floor drains in the building. Staff fully trained in spill prevention and clean-up. All operational areas are paved with concretes. The APP and ERP minimise the risk of accidents and ensure rapid response to incident. The risk is **Very Low**.	2	Small amounts of oil on site at any one time. All surface water drains are connected to a Class I oil interceptor. The severity of the impact would be M**inor.**	2
5	Engine/ Hydraulic/ Waste Oil Storage	Escape of oil to ground during handling/ plant maintenance	Contamination of soil and groundwater	2	Oil drums stored in bunded pallet, 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 ERP minimises the risk of accidents and ensure rapid response to incident. The risk is **Low**.	1	Approx 3m of subsoils protect the bedrock aquifer. Potable water supply in the area is obtained from the mains supply. 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)
6	Fire in Waste Processing Building	Smoke emission to air.	Air pollution	5	APP minimises the risk of fire outbreak and on-site detection and suppression systems allow a rapid response and potential containment. However if a fire 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
7	Fire in Waste Processing Building	Escape of Firewater to surface water drainage system	Contamination of the surface water drains, with consequent impact on the tributary of the Tramore River and the Irish Water WWTP.	2	No internal floor drains. All external drains connect to oil interceptors, with run-off from areas where contamination is possible discharging to the foul sewer and run-off from other areas discharging to balance tank. Run-off from building roofs connects directly to the balance tank. Balance tank outfalls to a tributary of the Tramore River. Outflow from balance tank controlled by level activated submersible pump. Shut off-valves on the outfall from the balance tank and the connection to the foul sewer that can be shut in the event of an incident to contain run-off inside the site. The risk is **Low**	3	ERP will ensure a rapid response to incident, including closing the shut – off valves on the surface water and foul water drains and switching off the pump in the balance tank. The severity of the environmental impact would be **Moderate,**	6

Risk ID	Process*	Potential Risks	Environmental Effect	Likelihood	Basis of Likelihood	Consequence	Basis of Severity	Risk Score (Severity x Occurrence)
8	Fire in MRF Building	Firewater leak through damaged paving and damaged surface water drains	Soil / Groundwater contamination	1	Routine inspection and repair of damaged paved areas. Integrity testing of surface water drains and repairs as required. The risk is **Very Low**	1	Operational areas are entirely paved. Approx 3m of subsoils protect the bedrock aquifer. Potable water in the area is obtained from the main supply. The severity of the impact would be **Minor.**	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
7	Fire in Waste Processing Building	Firewater runoff contamination of the surface water drains.	3	2	6
6	Fire in Waste Processing Building	Air Pollution	1	5	5

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	**6**				
High	4					
Medium	3					
Low	2			**7**		
V. Low	1					
Consequence		Trivial	Minor	Moderate	Major	Massive
		1	2	3	4	5

Red – High-level risks requiring priority attention.

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
6	Smoke from fire causes localised air pollution	5	Firewalls limit fire spread before the arrival of the emergency services. Ring main and fire hydrants provided. 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
7	Firewater runoff contamination of the surface water drains, with subsequent impact on the tributary of the Tramore River and the Irish Water wastewater treatment plant	4	Sprinkler systems on waste intake areas. Firewalls limit fire spread before the arrival of the emergency services. Ring main and fire hydrants provide on-site suppression capacity. All drainage from yards passes through interceptors before discharging to surface water and foul sewer system. Run-off from the building roofs discharges directly to the balance tank. Flow from tank regulated by level activated pump. Shut off-valves on the foul water sewer and the outfall from the balance tank that will be closed before the emergency services arrived. Firewater retention assessment completed and the required capacity provided. ERP prepared and staff training provided.	No further physical mitigation measures are required	Staff refresher training on ERP to continue	Facility Manager

7. IDENTIFICATION OF PLAUSIBLE WORST CASE SCENARIO

The risk analysis identified one (Risk ID 7) 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 6), and if the fire occurred in the building where the maintenance oils are stored then these could be released (Risk ID 4 and 5).

7.1 Source-Pathway-Receptor

7.1.1 Sources

The source is a fire in one of the following, Building 1 & 2, Building 3 and Building 4. 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 and surface water drains.

7.1.3 Receptors

Potential receptors that could be affected by the fumes are installation staff and the occupants of the nearby commercial premises. The potential receptors for the contaminated run-off are the surface water drains, the tributary of the Tramore and the Irish Water municipal wastewater treatment plant.

7.2 Impacts and Remedial Measures

The potential impacts are on human health, surface water and the operation of the municipal wastewater treatment plant. The remedial measures include spill containment; removal and off-site treatment of the firewater; removal and off-site disposal of fire damaged wastes and demolition and removal of the damaged buildings.

8. QUANTIFICATION & COSTING

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

- The fire detection and alarm system ensure an outbreak is rapidly detected.
- The compartmentalisation provided by the firewalls will ensure that a fire outbreak will be restricted to the area it occurs (Buildings 1 &2, Building 3 and Building 4) until the Emergency Services arrive on-site
- The worst cases is a fire in Building 4 at a time when there is 500 tonnes of unprocessed materials stored.
- The fire will be extinguished in 8 hours.
- 25% of the waste will be consumed in the fire with the balance being fire damaged and not suitable for recycling.
- A maximum quantity of 1,126m^3 of contaminated firewater will be generated as detailed in the revised Firewater Retention Assessment. The available retention capacity is 1,296m^3 and all firewater generated will be retained inside the buildings
- Following the incident the fire-water can be discharged to the municipal wastewater treatment plant and that this will be managed by controlled discharge to the sewer in consultation with Irish Water and Cork County Council.
- A lump sum of €150,000 has been allowed to cover demolition works and associated clean-up and disposal costs,).
- A 20% contingency has been allowed.

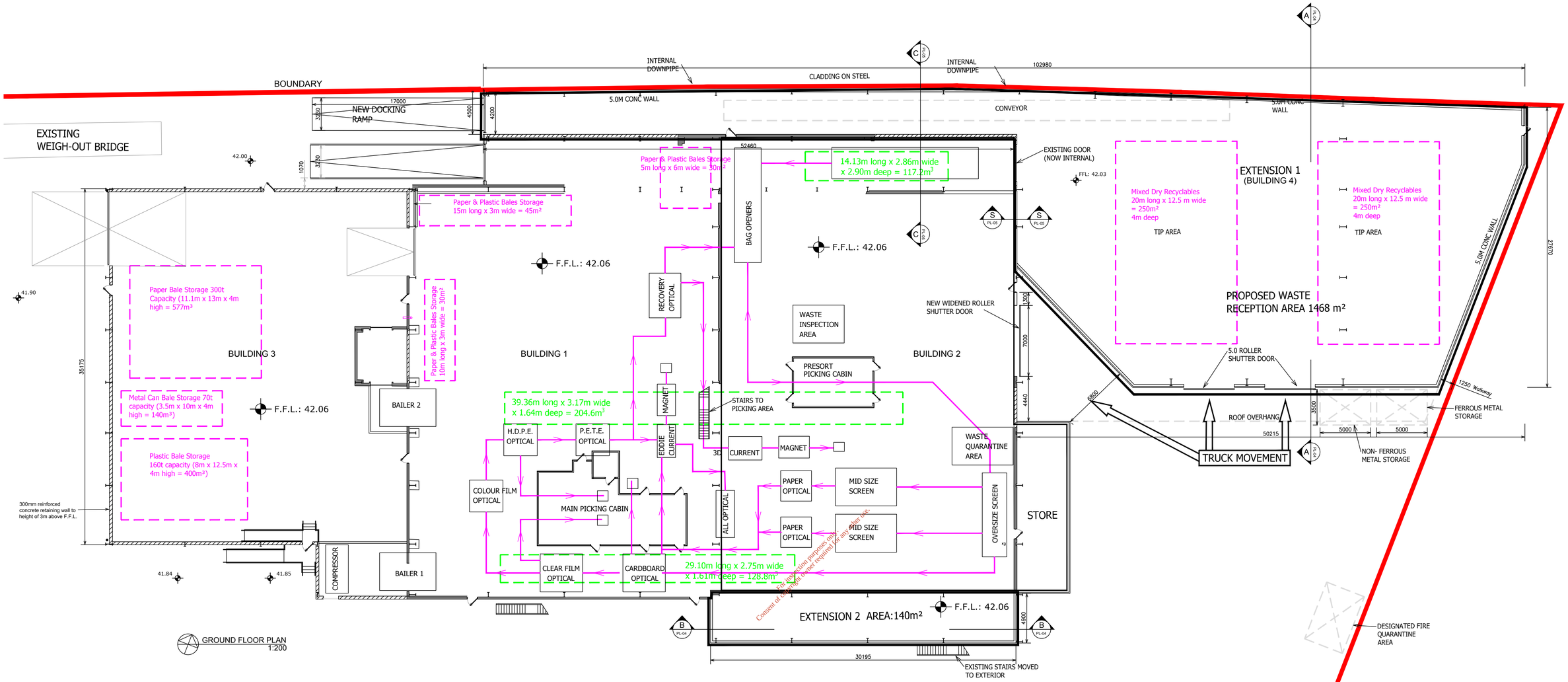
Table 8.1 Worst Case Costs

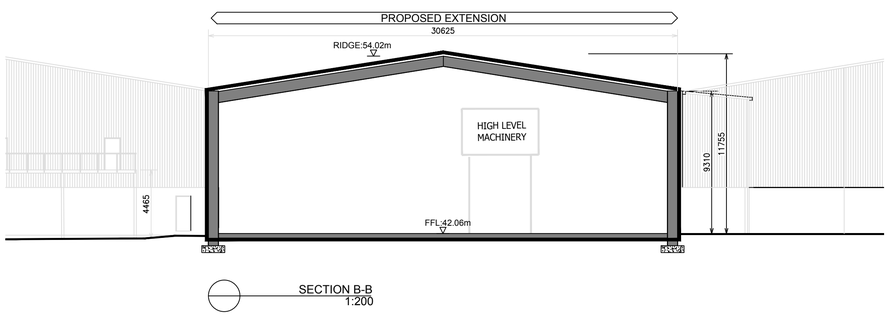
Task	Description	Quantity	Measurement Unit	Unit Rate (€)	Cost (€)	Source of Unit rates
Response to major fire incorporating hydrocarbon drums stored in the MRF and diesel in mobile plant.	Fire-fighting	100	Engine Hours	480	48,000	Rate based on SLR consultation with Cork Fire Service. Largest fee ever 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	1,216	m^3	2.13	2,590	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.
	Demolition and site clearance	1	Contract		150,000	SLR
	Site management, equipment, utilities & security during Fire and subsequent clean-up	1	Month	25,000	25,000	Based on 2 or 3 key staff and remote monitoring security outside of normal working hours.
	Environmental Consultants Report	1	Report	10,000	10,000	SLR
Total (€)					298,340	
Contingency (20%)					59,668	
Subtotal					358,008	
VAT (23%)					82,341	
Final Total					**440,349**	

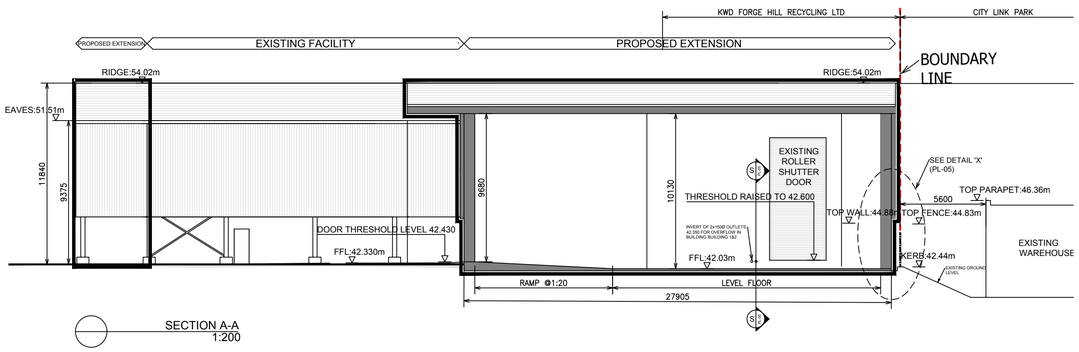
9. CONCLUSION

This ELRA was carried out in accordance with Agency's Guidance (March 2014). The cost associated with the 'worst case' scenario, is €440,349. The immediate cost of dealing with an incident will be covered by operational funds. These costs, along with the costs of the subsequent post incident remedial works, will be recouped from FHR's insurer.

APPENDIX 1







Notes:

ALL RIDGE AND EAVES HEIGHTS TO MATCH EXISTING

ALL FINISHES TO MATCH EXISTING

Notes:

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4. Contractor to check all dimensions and conditions on site before commencing works.
5. Drawing to be read in conjunction with current Building Regulations.
6. All components and materials to be installed fully in accordance with manufacturers instructions.

Revision	Comments	Date

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Project:
EXTENSIONS TO EXISTING MATERIALS RECYCLING FACILITY AT FORGE HILL, CO. CORK

Client:
FORGE HILL RECYCLING LTD

Drawing Title:
GROUND FLOOR & SECTIONS

Scale:	Date:	Revision
1:200 @A1	March 2018	R0
Drawn By: E.F.	Drawing Number: 14/4347-PL-04	

Waste Storage Plan Rev.1.0

1. Purpose

The purpose of this Plan is to achieve and maintain compliance with Condition 8.11 of W0291-01 in relation to the storage of waste. It is an addendum to the FHR Waste Storage Plan (November 2017) to reflect the proposal to increase the annual waste intake from 82,000 tonnes to 100,000 tonnes and the associated infrastructural works.

2. Scope

The Plan applies to all waste storage activities at the Forge Hill facility

3. Responsibilities

It is the responsibility of the Site Manager and/or Deputy to ensure this Plan is adhered to at all times.

It is the responsibility of the EHS Manager to ensure the Plan is communicated to the operatives and drivers and that the appropriate training is provided them.

It is the responsibility of the EHS Manager to revise and update the Plan in accordance with the EPA requirements. All revisions/updates shall be submitted to the EPA for approval before any changes to the agreed Plan are made.

4. Associated Documents

Conditions 9.5 and 8.11 of W0291-01

FHR Waste Storage Plan November 2017

FHR Firewater Risk Assessment December 2017

FHR Closure and Decommissioning Management Plan December 2017.

The EPA Guidance Note: Fire Safety at Non-Hazardous Waste Transfer Stations, 2013

The EPA Guidance on Fire Risk Assessment for Non-Hazardous Waste Facilities, 2016.

6. Site Layout

The site covers 10,110 m^2 and comprises a waste processing building made up of four adjoining buildings (1-4), two storey office, an electrical substation, two weighbridges and paved open yard. A security fence surrounds the operational area and there are two entrances off Forge Hill Road. There is a firewall between Building I and 3 and between Buildings 2 and 4. Rainwater run-off from paved areas where there is the potential for rainwater run-off to become contaminated is discharged to foul sewer. Run-off from the yard areas where there is a low risk of contamination discharges to a stream to the west of the site.

7. Waste Activities

The incoming mixed wastes are mechanically separated by type (e.g. plastic, paper, cardboard, metals) and the recyclables are baled and stored prior to transfer to other facilities for further processing. Non-recyclable residues are bulked up and sent to other waste management facilities for further treatment. All waste handling is carried out inside the buildings. All waste storage with the exception of baled ferrous and non-ferrous metals and non-recyclable MSW residues, is confined to inside the processing building.

8. Waste Storage Areas

8.1 The waste storage areas are shown on Drawing No. 14/4347-PL-04 with details of the maximum stockpile sizes specified in Table 1.

8.2 Combustible materials shall be stored in separate stockpiles to reduce the risk of fires spreading.

8.3 All stockpiles shall be maintained such that they are higher than 4m and do not exceed the maximum volumes specified in Table 1.

8.4 A separation distance of 6m shall be maintained between the paper bale stockpile and the plastic bale stockpile in Building 3. Baled metal cans will be stockpiled in this gap as this material is non-combustible and will act as a fire barrier

8.5 A separation distance of 6m shall be maintained between the open stockpiles of mixed dry recyclables in Building 4.

9. Waste Quantities

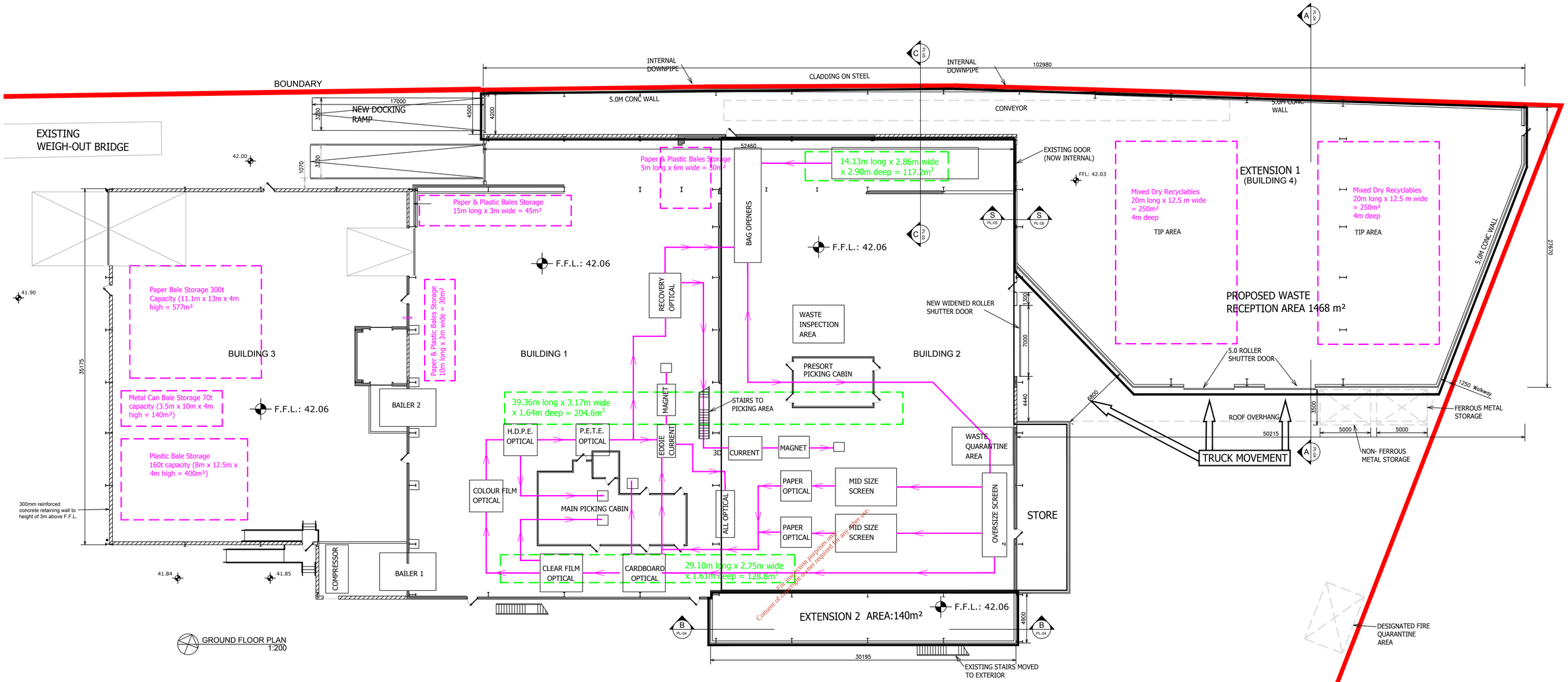
The maximum amount of waste on-site at any one time shall be 1,551 tonnes, comprising approximately 816 tonnes of baled dry recyclables 615 tonnes of loose mixed recyclables and 120 tonnes of baled metal cans,

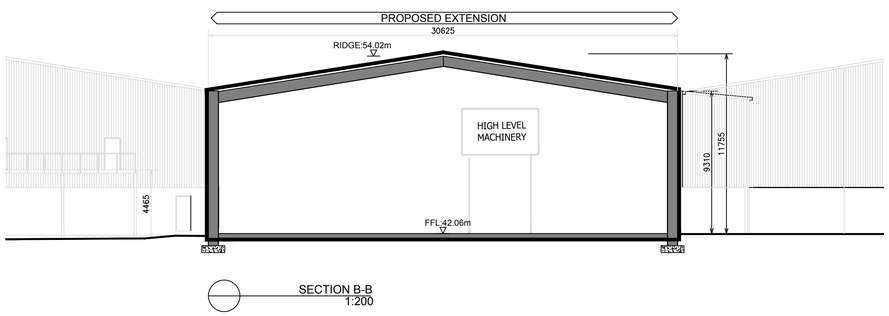
10. Fire Quarantine Area

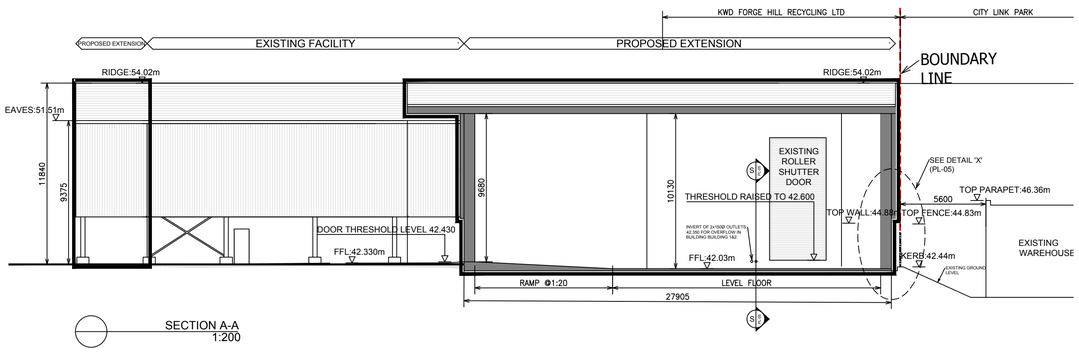
The fire quarantine area shall be not less than 6m from the building and shall not obstruct any exit routes. It area shall be kept available at all times for use if a hot load is imported or if a hotspot is identified in a stockpile and turning or digging out are considered to be suitable corrective measures.

Table 1 Maximum Planned Storage of Waste on Site

Location of Waste	Tonnes	Length (m)	Width (m)	Height (m)	Area (m^2)	Volume (m^3)	Material
Quarantine Area (Building 1)	1	2	2	1	4	4	Residual MSW
Inspection Area (Building 4)	5	3	3	2.3	9	21	Mixed Dry Recyclables
Input Storage Area (Building 4)							
Stockpile 1	250	20	12.5	4	250	1000	Mixed Dry Recyclables
Stockpile 2	250	20	12.5	4	250	1000	
Inspection Area (Building 1)	5	3	3	2.3	9	21	Mixed Dry Recyclables
Input Storage Area (Building 1)	100	20	10	2.1	200	417	Mixed Dry Recyclables
Waste on Process Line (Buildings 1 & 2)	10	n/a	n/a	n/a	n/a	42	Mixed Dry Recyclables
Paper & Card Storage (Building 2)	95	15.3	3	4	46	183	Baled Paper & Cardboard
Plastic Storage (Building 2)	95	20	3	4	60	238	Baled Plastic
Metal Can Storage (Building 3)	70	10	3.5	4	35	140	Baled Metal Cans
Paper & Card Storage (Building 3)	300	13	11.1	4	144	577	Baled Paper & Cardboard
Plastic Storage (Building 3)	160	12.5	8	4	100	400	Baled Plastic
Ferrous Metal (Outside Building 4)	25	5	3.5	4	17.5		Baled Metal Cans
Non-Ferrous Metal (Outside Building 4)	25	5	3.5	4	17.5		Baled Metal Cans
Non-Recyclable Residues (Enclosed Trailer outside Building 1)	20	n/a	n/a	n/a	n/a		Residual MSW
Total	**1,551**					**4,343**	







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Revision	Comments	Date

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EXTENSIONS TO EXISTING MATERIALS RECYCLING FACILITY AT FORGE HILL, CO. CORK

Client:
FORGE HILL RECYCLING LTD

Drawing Title:
GROUND FLOOR & SECTIONS

Scale:	Date:	Revision
1:200 @A1	March 2018	R0
Drawn By: E.F.	Drawing Number: 14/4347-PL-04	

APPENDIX 2

EP07 – Corrective & Preventative Action Procedure Rev. 1.0

EMS Procedure	Corrective & Preventative Action Procedure		
Date:	03/02/2016	Revision No.	1.0

Reasons for Revision	

EP07 – Corrective & Preventative Action Procedure Rev. 1.0

1. Purpose

The purpose of this Procedure is to define the approach that will be taken in implementing and evaluating corrective and preventive action.

2. Scope

This procedure applies to all corrective and preventive actions raised to resolve non-conformances arising from:

,

- receiving mixed dry recyclable materials,
- specified output product quality assessment
- external compliance auditing & inspections
- environmental incidents and accidents
- health and safety incidents and accidents
- internal forms completion

3. Responsibilities

3.1. Any member of staff can initiate a corrective and preventive action form (CAF).

3.2. The Site Manager is responsible for ensuring that all corrective and preventive actions are appropriately implemented and closed.

3.3. The recipient of corrective ensures that they are applied in a timely and effective manner.

4. Procedure

4.1. Corrective Action:

4.1.1. The Corrective Action Form (CAF) is raised by the initiator and contains details of the non-conformance. Initiator passes the CAF onto the recipient or to the Manager.

4.1.2. . The Manager files a copy and determines the person (recipient) best placed to undertake the corrective action and assigns the CAF.

4.1.3. The recipient (investigation team) needs to determine cause of non-conformance (collect data, get expert advice, consult with clients, review legal and regulatory requirements etc.)

4.1.4. The recipient has to follow the investigation:

4.1.4.1. evaluate information, determine level of response and make recommendations

4.1.4.2. decide on action to be taken

4.1.4.3. assign responsibility for corrective action and allocate resources

4.1.4.4. implements appropriate corrective and preventive actions within the agreed designated timescale.

4.1.5. The recipient records the action taken on the CAF and passes onto / returns it to GM.

4.1.6. The GM ensures that the assigned actions have been completed successfully and confirms this by completing the CAF form and register. Non-competition of assigned CAF should be raised by GM at MT meetings.

4.1.7. Initiator and / or GM will investigate the effectivity of the corrective actions taken

4.1.8. Where appropriate the GM will communicate proposed corrective actions implementation schedules & completion reports to appropriate external bodies.

4.1.9. The Initiator or GM may dispose of non-conforming issue without raising a CAF if such non-conformance is considered to be without appreciable cost or further implications to other staff or to customers, and the non-conformance is not recurring in nature.

4.2. Preventive Action:

4.2.1. If preventive action is taken to prevent potential non conformances follow point 5.1

4.2.2. If preventive action is taken to prevent re-occurrence of non-conformance.

4.2.2.1. The MT will review trends for corrective action, internal audit result and other forms of quality system feedback to determine need for preventive.

4.2.2.2. Recipient and / or Initiator will identify what long term preventive action is needed

4.2.2.3. GM will make sure that the preventive action is placed

4.3. Close out & Filing

Completed CAFs must be signed off and filed in the CAF File.

5. Associated documents

- Corrective Action Form (ER04)

APPENDIX 3

EP09 – Emergency Response Procedure Rev. 1.0

EMS Procedure	Emergency Response Procedure		
Date:	09/03/2016	Revision No.	1.0

Reasons for Revision	

EP09 – Emergency Response Procedure Rev. 1.0

1. Purpose

The purpose of this document is to set out the procedure to be followed in the event of an emergency at Forge Hill Recycling. Emergency Response procedures are designed to ensure the safety of people in buildings during emergencies by coordinating and controlling building evacuations until the appropriate emergency services arrive.

.

2. Scope

This procedure applies to all staff at Forge Hill Recycling.

3. Responsibilities

Emergency Coordinator

The Emergency Coordinator shall be responsible for overall coordination of actions in connection with Emergency Response Procedures. He/she is responsible for:

Before Fire or Emergency:

- Ensuring that personnel responsible for emergency evacuation are aware of their responsibilities.

In the case of Fire or Emergency:

- Checking that the alarm has been relayed to the Fire Service.
- Ensuring that designated duties are correctly and promptly carried out.
- Acting as liaison officer with Police, Fire Service and other emergency services.
- Ensuring that all emergency service personnel are directed to the building involved in the emergency.
- Liaison with the Building Warden for the building involved in the fire or emergency.
- Advising staff and contractors when it is safe to re-enter the building.

Fire Wardens

The Fire Warden, during emergency situations, will be in control of the occupants of the whole building until the arrival of the Fire Service Senior Officer. It is the Fire Warden's responsibility to:

Before Fire or Emergency:

Assist in training of emergency personnel under their command. Designate an assembly area (or areas) for the staff. Occupants of the area should be directed to assemble at a designated location out in accordance with the emergency

plan. This will facilitate checking that all occupants are safe and enable speedy return to the building when the "*all clear*" is given.

Ensure that in each area, a current list of the Area Wardens (and telephone numbers) is displayed, together with an emergency floor plan. The emergency floor plan should show all rooms, exits, assembly area to be used in case of fire or emergency, fire alarms, extinguishers, fire hose reels and special emergency equipment.

Ensure that all staff in the building are given instruction in relation to:

- evacuation procedures;
- means of escape from the building and location of assembly areas;
- the location and operation of fire alarms; and
- the location and operation of fire extinguishers or other emergency equipment required in the building.

In the case of Fire or Emergency (the assistance of a deputy may be required to undertake some of these tasks):

- Respond immediately to an alarm; determine the nature of the emergency.
- Initiate Emergency Response Procedures for the building.
- Direct the actions of Floor and Area Wardens within the building.
- Check that all occupants have proceeded to the designated assembly area.
- In consultation with the Fire Service and the Emergency Coordinator, advise occupants when it is safe to return to the building.

All personnel

Before FIRE or EMERGENCY: All personnel should make themselves familiar with the Emergency Response Procedures for their area, the location of fire exits and the operation of fire-fighting and emergency equipment.

4. Procedure

In the case of Fire or Emergency: Until the arrival of the Fire Service, the Emergency Coordinator and fire wardens will control all evacuation and fire fighting (use of fire extinguishers) on their floor or in their area. The Area Warden should:

- Check the source, type and severity of the emergency.
- Order the evacuation of the area if necessary.

- Advise the Emergency Coordinator of the incident and the proposed action to be taken.
- Ensure that all occupants of the area are aware of the evacuation procedure, and direct the occupants to the nearest accessible exit through which they should proceed to the designated assembly area.
- Ensure that evacuation from the area is orderly and by means of the stairs.
- Ensure that necessary assistance is given to disabled and other persons in need of special care.
- Check fire doors to ensure that they are closed and post a watch so that they are kept closed except during the escape of occupants.
- Provided it is safe to do so, make a thorough search of the whole floor or area to ensure that no persons remain.
- Advise the Building Wardens when evacuation is completed.
- Assist the Building Warden in checking that all building occupants have arrived at the assembly area.
- It should be emphasised that the primary role of wardens is not to combat fire and emergencies, but to ensure, as far as practicable, the safety of occupants and their orderly evacuation from emergencies.

In the case of FIRE or EMERGENCY:

- Any person who discovers a fire or emergency: Sound the fire alarm system (if there is a push button alarm).
- Notify the Area Warden who will contact the appropriate emergency service and provide:
  - Name & location of the caller.
  - Details of location, type and scale of the emergency
  - If it is safe to do so, use the appropriate fire extinguisher to put out any fire (*do not attempt to fight a fire if the fire is large or if you are not familiar with the use of the fire extinguisher).*
- Any person who hears the evacuate mode of the fire alarm or when instructed to evacuate by the Area Warden must:
  - Walk quietly but quickly to the nearest exit and proceed to the assembly point outside the building to await further instructions.
  - Listen and follow instructions from Area Wardens.
- In order to prevent injury and possible panic during evacuation:
  - Do not run, push, or overtake
  - Do not return to your desk, office or room
  - Do not return to your building until the "all clear" is given by the Building Warden or Fire Service.

- Outside of normal working hours (08.00 a.m. to 6.00 p.m. Monday to Friday, Sat 8 a.m.-2.p.m) on hearing the fire alarm, occupants should evacuate the building.

1. Emergency Evacuation Information

- Building wardens in co-operation with the emergency co-ordinator should arrange for a sign to be placed at a prominent position on each floor or in each area showing the following:

• The name of the Building and Floor number or area description.
• A brief statement of evacuation procedures, such as:
  - Alert Fire Service, and/or other emergency service, using the appropriate call-out number
  - Warn people in the vicinity
  - Evacuate the building, if necessary
  - If safe, confine the fire or other source of danger
• The location of the assembly area.
• A floor or area plan (Property and Facilities Division can assist in the provision of floor plans and preparation of emergency evacuation signage) showing the location of:
  - fire exits and escape routes
  - manual alarm points
  - fire extinguishers, and other emergency equipment
  - The names (and telephone numbers) of the:
  - Area Warden any additional wardens appointed.

2. Where emergency ambulance assistance is required the Emergency Coordinator will dial **999** and notify the operator that an ambulance is required and provide details of the location, the nature of the emergency, and provide a contact phone number for first aider.

Points to include in emergency procedures

- Consider what might happen and how the alarm will be raised. Don't forget night and shift working, weekends and times when the premises are closed, eg holidays

- Plan what to do, including how to call the emergency services. Help them by clearly marking your premises from the road. Consider drawing up a simple plan showing the location of hazardous items

- If you have 25 tonnes or more of dangerous substances, you must notify the fire and rescue service and put up warning signs
- Decide where to go to reach a place of safety or to get rescue equipment. You must provide suitable forms of emergency lighting
- You must make sure there are enough emergency exits for everyone to escape quickly, and keep emergency doors and escape routes unobstructed and clearly marked
- Nominate competent people to take control (a competent person is someone with the necessary skills, knowledge and experience to manage health and safety)
- Decide which other key people you need, such as a nominated incident controller, someone who is able to provide technical and other site-specific information if necessary, or first-aiders
- Plan essential actions such as emergency plant shutdown, isolation or making processes safe. Clearly identify important items like shut-off valves and electrical isolators etc.
- You must train everyone in emergency procedures. Don't forget the needs of people with disabilities and vulnerable workers
- Work should not resume after an emergency if a serious danger remains. If you have any doubts ask for assistance from the emergency services

Clean-up of fire damaged waste

- ❖ Fire damaged/wet waste recycling to be sent to landfill if safe to do so.
- ❖ Fire damaged equipment will be stripped down & recycled as much as possible with unrecyclable components sent for appropriate disposal.
- ❖ Fire damaged areas will be cleaned & efforts made to redesign/redecorate to original layout.
- ❖ Area will be inspected after redesign/redecoration/clean-up to ensure it is safe for staff to return to work.

5. Fire Safety Register

Fire Prevention

- No smoking on-site (only in designated smoking area)

- Hot work permit (sub-contractors)
- Maintenance schedule on machines
- CCTV & security fencing in place around site
- All vehicles fitted with fire extinguishers
- Fire doors

Fire detection & warning systems

- Alarm system
- CCTV
- Emergency lighting

Fire control & Fire-fighting facilities

- Sprinkler system
- Fire extinguishers/blankets
- Fire hose reels
- Fire doors
- Fire hydrants
- 100,000 litres of water available at Lagoon

Fire escape, signage & lighting

- Exits free from obstruction
- Exit signage lighting & in good order with wayfinding signage
- Emergency lighting

Fire response planning & staff training

- Emergency response plan (displayed)
- Staff fire safety training & awareness
- Fire routine

Post fire actions

- Fire & accident investigation
- Safety issues
- Clean-up of fire damaged waste & fire water

APPENDIX 4

2 FIRE RISK ASSESMENT

To determine the potential risk posed by activities onsite, a risk assessment has been carried out. A risk assessment is a tool that may be used to measure the risk involved for any scenario. In this case, it has been specifically tailored towards the risk of a fire at the site.

The assessment of a risk comprises three sub-stages:

- Risk identification
- Risk analysis
- Risk evaluation

Following the completion of the above sub-stages and a full determination of the level of risk posed to the environment, a response to the risk is outlined. The recommendations of improvements to mitigate against the risk of a fire are outlined in Section 3.

2.1 Step 1 – Risk Identification

In identifying the risk posed from a fire, the following three aspects need to be considered:

- Fire Risk – the likelihood of ignition of flammable materials
- Fire Exposure – the quantity of combustible materials located in an area at risk of a fire
- Environmental Severity – the potential damage to the receiving environment

2.1.1 Fire Risk

Fire risk identifies the likelihood of flammable materials igniting at a site. In determining the fire risk at the proposed development site, the following three aspects are considered:

- Risk of ignition
- Risk of non-detection
- Risk of failure to respond to the fire promptly

Risk of ignition considers how close a source of ignition is to the flammable material. When no source of ignition is present, there will be no risk.

The risk of non-detection considers whether a fire will be detected and the speed at which it will be detected. It is dependent on the location of the fire, the presence of a fire detection system and human presence near the fire location.

The risk of failure to respond to the fire promptly considers the effectiveness of the fire response system and procedures which will be initiated following the commencement of a fire.

In determining the fire risk for this risk assessment, the level of risk will be classified as either low, medium or high. A factor rating will be assigned to the fire risk, depending on the level of risk classified. The classification of fire risk is presented in Table 2.1 over.

Table 2.1: Classification of Fire Risk

Risk	Description	Factor Rating
Low	Low: Unusually low likelihood of a fire as a result of negligible potential sources of ignition	1
Medium	Medium: Normal fire hazards (e.g. potential ignition sources) for this type of occupancy, with fire hazards generally subject to appropriate controls (other than minor shortcomings)	2
High	High: Lack of adequate controls applied to one or more significant fire hazards, such as to result in significant increase in likelihood of fire.	3

2.1.2 Fire Severity

Fire severity attempts to quantify or rate the potential severity of a fire on persons or the environment. The severity rating considers the nature of the building and the occupants as well as the fire protection and procedural arrangements observed at the time of the risk assessment.

The severity level will be classified as either slight, moderate or extreme harm.

Table 2.2: Fire Severity Factors

Severity	Description	Factor Rating
Slight Harm:	Outbreak of fire unlikely to result in serious injury or death of any occupant (other than an occupant sleeping in a bedroom in which a fire occurs).	1
Moderate Harm:	Outbreak of fire could result in injury of one or more occupants, but it is unlikely to involve multiple fatalities.	2
Extreme Harm:	Significant potential for serious injury or death of one or more occupants.	3

2.1.3 Risk Rating

The results of the fire risk and fire severity assessment will be combined (by multiplication) to calculate the risk rating.

Table 2.3: Fire Risk Factors

Fire Hazard (Probability)	Potential Consequences of Fire (Severity)		
	Slight Harm -1	Moderate Harm – 2	Extreme Harm - 3
Low -1	Negligible	Tolerable Risk	Moderate Risk
Medium – 2	Tolerable Risk	Moderate Risk	Substantial Risk
High - 3	Moderate Risk	Substantial Risk	Intolerable Risk

Score	Risk Rating
1	Negligible
2	Tolerable
3-4	Moderate
6	Substantial
9	Intolerable

The existing site hazards will them be ranked in accordance with their risk rating and a Fire Risk Action Plan developed for those risks with the highest risk rating.

Table 2.4: Fire Risk Assessment Matrix Forge Hill Recycling

Hazard	Existing Control Measures	Risk Rating		
		Probability	Severity	Risk
Fixed Installations	The following fixed installations are on site; • Balers • Compressors • Over-band magnets • Bag opener • Picking lines • OCC screen • Deck ballistic separators • Optical separators • Eddy current separators • Conveyors Machinery is relatively new and has not needed services or maintenance to date. No records available.	2	1	2
Portable Appliances	Limited portable appliances utilised onsite. All works subject to method statement and risk assessment. Electrician carries out an annual check.	1	1	1
Smoking	No smoking allowed onsite except in designated area. Smoking rules are part of the induction.	1	1	1
Arson	CCTV in place and site securely fenced across perimeter. Office building has burglar alarms installed.	1	1	1
Portable Heaters	No portable heaters on site	1	1	1
Cooking	Microwave & kettle present in canteen area. Appropriate firefighting equipment provided i.e. fire blankets and extinguishers	1	1	1
Lightning	Low risk area	1	1	1

Hazard	Existing Control Measures	Risk Rating		
		Probability	Severity	Risk
Other Ignition Sources	Mobile plant is maintained and serviced in accordance with manufacturer's instructions and subject to daily checks. All mobile plant carry fire extinguishers. Some service records are in the appendices.	1	1	1
Self-Combusting Materials	Low risk of self-combustion of stockpiled materials. The following materials are stockpiled onsite: • Mixed dry recyclables • Bailed paper • Bailed cardboard • Bailed plastic	1	1	1
Frictional Heat	Mobile plant is subject to regular checks and maintenance by the associated manufacturer. Fixed plant is maintained and repaired as is needed.	1	1	1
General Housekeeping	General housekeeping outside of the MRF was seen to be of a very good standard. Loose recyclable materials were scattered on the floor of the bale storage area. FHR workers sweep floor every 30 minutes.	1	1	1
Combustible Materials	The following combustible materials are stored onsite: • Mixed dry recyclables • Paper • Cardboard • Plastic Once bailed, these materials are stored in the bale storage area. Ignition sources are managed and kept to a minimum near the combustible materials. Firefighting equipment is available near the combustible materials	1	1	1
Stockpiles	The following materials are stockpiled onsite: • Mixed dry recyclables • Bailed paper • Bailed cardboard • Loose Cardboard • Bailed Plastic Quantities, heights and widths of materials stored onsite are within tolerance set by the EPA and FHR strive to abide by these limits.	1	1	1
Outside Contractors	All outside contractors who work regularly on site are inducted. All 'one-off' visitors are escorted while on site.	1	1	1

Hazard	Existing Control Measures	Risk Rating		
		Probability	Severity	Risk
Building Works e.g. hot works	Designated area (workshop) where all hot works take place. A 'Hot Works Permit' system is also in place when work is required outside this are. This area is a way from the main recycling facility.	1	1	1
Hazardous Materials	Oils for machinery stored on site in a separate building away from the main facility.	1	1	1
Works involving hazardous materials	n/a	1	1	1
Safe Systems of Works	Works subject to method statement and risk assessment. See Safety induction in appendices.	1	1	1
Explosive Atmosphere	Not applicable, dust control in place for site. Building are open and ventilated. Sweeper and water down when dusty.	1	1	1
Sources of oxygen	Oxy Acetylene for welding/cutting. Only 1 tank at a time as required. The tank is stored in accordance with its safety data sheet.	1	1	1
Oxidising Material	Not applicable	1	1	1
Means of escape	See 'PROPOSED ESCAPE ROUTES PRESORT PICKING CABIN', in appendix.	1	1	1
Fire Exits	See 'PROPOSED ESCAPE ROUTES PRESORT PICKING CABIN', in appendix. All fire exits have emergency lighting above doors and break glass units beside each exit.	1	1	1
Obstruction to Escape routes	It was noted that an exit was partially blocked by baled plastics at the time of the inspection. A clearance should be kept to the fire exits to prevent stockpiles collapsing and blocking exits in a fire event.	1	1	1
Fire Assembly Points	Designated fire assembly point sign posted on site by main gate, (see figure 1.4).	1	1	1
Fire Spread: Compartmentalisation	The following materials are stockpiled onsite: • Mixed dry recyclables • Cardboard • Bailed paper • Bailed cardboard • Bailed plastic Cardboard is stockpiled in the MRF building before being bailed.	2	2	4

Hazard	Existing Control Measures	Risk Rating		
		Probability	Severity	Risk
	The stockpile is contained on one sides by a concrete wall. A clear zone exists to the three faces of the stockpiles. Baled paper, baled cardboard and baled plastic are stored in the bale storage area. These bales are stored without separation.			
Fire Spread Build Fabric	The MRF buildings is constructed using: • Steel Portal Frame • Reinforced concrete walls • Profiled Steel Cladding and Sheeting • Blockwork construction. The office is of blockwork construction.	1	1	1
Fire Spread: Suppression Systems	Fire hose reels and fire extinguishers provided, (maximum of 10m between hose reels or extinguishers in the MRF building). A local sprinkler system is installed over the baler. Layout shown on 'PROPOSED ESCAPE ROUTES PRESORT PICKING CABIN' in the appendix	1	1	1
Fire Warning: Alarm & Detection System	The following fire alarm and detection systems are installed within the following licenced areas. **Office Building** • Smoke Detection • Heat Detection • Break Glass Units • Audible Alarms **MRF Building** • Smoke Detection • Break Glass Units • Flame detection • Audible alarms All alarm and detection systems are regularly serviced.	1	1	1
Fire Extinguishing: Portable Appliances	Fire extinguishers evident about site. Subject to regular maintenance, (inspected August 2017).	1	1	1
Fire Extinguishing: Training	2 no. staff have been trained as fire wardens. This training involves the use of fire extinguishers.	1	1	1

Hazard	Existing Control Measures	Risk Rating		
		Probability	Severity	Risk
Fire Extinguishing: Location and Suitability	Fire extinguishers and fire reels, strategically placed about site. Subject to regular maintenance, (inspected August 2017). See information in Appendices showing the location of all firefighting equipment on all levels.	1	1	1
Fire Extinguishing: Operational Maintenance	Inspected and certified: August 2017 Checked monthly.	1	1	1
Fire Extinguishing: Hose Reels Condition	Inspected and certified: August 2017 Checked monthly.	1	1	1
Fire Extinguishing: Hose Reels: Suitability of Supply	Hose reels located onsite are supplied from the underground storage tank and are powered by electric pumps, (these pumps have backup pumps).	1	1	1
Fire Extinguishing: Hydrants	Fire hydrant connections located at the four corners of the buildings. These hydrants are fed from an underground water storage tank. Location of all fire hydrants not immediately obvious, but FHR have organised to get signage erected by the fire hydrants and the covers re-painted yellow.	1	2	2
Fire Extinguishing: Automatic Fixed Systems	Sprinkler system in place over the baler only. A building wide sprinkler system is planned for the entire MRF building, (circa August 2018).	1	1	1
Appropriate Fire Procedures	See Safety Induction and emergency response procedures.	1	1	1
Staff Training Emergency Plan	Site Evacuation drills completed. See record in appendices.	1	1	1
Staff Training Dangerous Substances	n/a	1	1	1
Staff Training: Temporary Staff	Temporary staff subject to site induction training.	1	1	1
Training: Contractors	All contractors subject to site induction training.	1	1	1
Contractors: Training Records	Training record matrix set up for external contractors, (not used yet)	1	1	1
Training: Fire Wardens	2 no. staff are trained as fire wardens.	1	1	1
Training: Fire Response	See safety induction	1	1	1
Training: Information for Fire Response	See safety induction	1	1	1

Hazard	Existing Control Measures	Risk Rating		
		Probability	Severity	Risk
Training Fire Service: Pre-Inspection	Fire Service have not conducted a pre-inspection of the facility.	1	2	2
Training: Fire Service Information Package	A Fire Service information package has been completed and is located by the fire assembly point for easy access during a fire event, (attached in appendices)	1	1	1
Training: Fire Safety	See fire safety section of safety induction.	1	1	1
Training: Refresher Training	No refresher training system in place	1	2	2
Training: Fire Drills	Site Evacuation drill completed Record in appendices	1	1	1
Testing and Maintenance: Workplace	Daily, weekly and monthly checklists. See weekly checklist attached in the Appendices.	1	1	1
Testing and Maintenance: Fire Detection and Alarm	Inspected and certified: August 2017	1	1	1
Testing and Maintenance: Emergency Lighting	Checked monthly	1	1	1
Testing and Maintenance: Fire Extinguishers	Serviced records inspected August 2017 See attached in the appendices.	1	1	1
Testing and Maintenance: Sprinkler Installations	Sprinkler system by baler is tested annually. New system which is to be installed will be tested annually.	1	1	1
Testing and Maintenance: Dry Risers	n/a	1	1	1
Testing and Maintenance: Fire Fighting Lifts	n/a	1	1	1
Testing and Maintenance: Stair cases and Gangways	Stairs at the side of MRF building are currently not inspected.	1	2	2
Testing and Maintenance: Lightening protection Systems	n/a	1	1	1
Testing and Maintenance: Fire Hydrants	Monthly testing carried out on fire hydrants	1	1	1
Testing and Maintenance: Other	Flame detection system serviced by external consultant.	1	1	1
Records: Fire Training and Evacuation Drills	Records for fire drill are kept and an example is attached in appendices.	1	1	1
Records: Fire Alarm Tests	Fire Alarm test records attached in appendices	1	1	1
Records: Escape Lighting	Emergency lighting check sheet system in place	1	1	1
Records: Other Fire Protection Systems	n/a	1	1	1

Hazard	Existing Control Measures	Risk Rating		
		Probability	Severity	Risk
Records: Fire Plan	See safety induction	1	1	1
Records: Availability to relevant third parties	Records available on request	1	1	1

3 FIRE RISK ACTION PLAN

The following sections outlies the fire risk action plan for the site. The risks identified have been ranked in order of risk rating and collated in Table 3.1 below. The proceeding sections outlines the proposed action items for each risk.

Table 3.1: Fire Risk Items

Fire Risk Items			Recommendations
Fire Spread: Compartmentalisation	The following materials are stockpiled onsite: • Mixed dry recyclables • Cardboard • Bailed paper • Bailed cardboard • Bailed plastic Cardboard is stockpiled in the MRF building before being bailed. The stockpile is contained on one sides by a concrete wall. A clear zone exists to the three faces of the stockpiles. Baled paper, baled cardboard and baled plastic are stored in the bale storage area. These bales are stored without adequate separation from each other.	4	See Section 3.1.1
Fixed Installations	The following fixed installations are on site; • Balers • Compressors • Over-band magnets • Bag opener • Picking lines • OCC screen • Deck ballistic separators • Optical separators • Eddy current separators • Conveyor Machinery is relatively new and has not required servicing or maintenance No records available.	2	See Section 3.1.2
Fire Extinguishing: Hydrants	Fire hydrant connections located at the four corners of the buildings. These hydrants are fed from an underground water storage tank. Location of all fire hydrants not immediately obvious, but FHR have organised to get signage erected by the fire hydrants and the covers re-painted yellow.	2	See Section 3.1.3
Training Fire Service: Pre-Inspection	Fire Service have not conducted a pre-inspection of the facility.	2	See Section 3.1.7
Training: Refresher Training	No refresher training system in place	2	See Section 3.1.8
Testing and Maintenance: Stair cases and Gangways	Stairs at the side of MRF building are currently not inspected.	2	See Section 3.1.10

3.1.1 Fire Spread: Stockpile Management and Compartmentalisation

Table shows the EA recommended guidance on maximum stockpile sizes.

Table 3.2: Stockpile Management: Sizing

Maximum Waste Stockpile			
Waste type	**Loose and more than 150mm**	**30 to 150mm or baled**	**Less than 30mm**
Tires and rubber	450 m^3	300 m^3	300 m^3
Wood	750 m^3	450 m^3	300 m^3
Compost and green waste (excluding during the active composting process)	750 m^3	450 m^3	450 c m^3
RDF and SRF	450 m^3	450 m^3	450 m^3
Plastics	**750 m^3**	**450 m^3**	**300 m^3**
Paper and cardboard	**750 m^3**	**750 m^3**	**450 m^3**
Textiles	750 m^3	750 m^3	400 m^3
WEEE containing plastics, including fridges, computers and televisions	450 m^3	450 m^3	450 m^3
Metals other than WEEE	750 m^3	450 m^3	450 m^3
Fragmentiser fluff	450 m^3	450 m^3	450 m^3

materials closely associated with those currently onsite in **bold*

It is noted on all waste piles:

- the maximum height allowed is 4 metres.
- the maximum length or width allowed (whichever is the longest) is 20 metres.

EA guidance on the prevention of fire spread recommends:

- combustible wastes are stored with a separation distance of at least 6 metres between stockpiles
- a separation distance of at least 6 metres between waste piles and the site perimeter, any buildings, or other combustible or flammable materials

It is further advised that distances may be reduced by using fire walls and bays. Fire walls and bays must be designed to:

- resist fire (both radiative heat and flaming)
- have a fire resistance period of at least 120 minutes to allow waste to be isolated and to enable a fire to be extinguished within 4 hours

Wastes stored in fire bays must be subject to:

- full and frequent stock rotation i.e. a first in, first out policy
- temperatures check as required

The design of fire bays should ensure:

- an adequate thermal barrier to prevent transmission
- that all joints will be adequately sealed
- that construction has into accounted calculation of flame height and radiation in preventing the spread of fire between piles
- adequate 'freeboard' to top and sides of the walls clear at all times to prevent fire spreading over the walls
- bays are accessible for the quick removal of waste and availability of a quarantine area

It is recommended that a Waste Storage Plan for the site be developed in accordance with EA and EPA guidelines for the storage of waste. The design and construction of all fire wall and separation structures should meet the requirements as outlined above.

The recommendations of the waste management plan should be further integrated into the daily checklists for the site to ensure stockpiles are maintained appropriately, ensuring maximum stockpile sizes and adequate freeboard and/or separation distances are maintained.

It is recommended that the stockpile location plan is updated as the picking line has been removed and some stockpiles locations have changed.

3.1.2 Fixed Installations

It is recommended that all electrical installations associated with fixed installation infrastructure i.e. waste processing lines be subjected to annual (or other suitable periodic inspection) testing by an appropriately qualified electrician or specialist. Testing should include infrared heat monitoring on all electrical installation panels for fault detection. Records of these services should be kept onsite.

3.1.3 Fire Extinguishing: Hydrants

Hydrants which are located at the four corners of the building are currently not marked or signposted. FHR have organised for all fire hydrant locations to be appropriately marked and signposted in accordance with guidance. Once this is complete this item will reduce to a risk rating of 1.

3.1.4 Training Fire Service: Pre-inspection

It is recommended that the local Fire station carry out a pre-inspection of the site. This site walkover will allow the fire services to become familiar with the site and be better prepared to fight a fire should one take place.

3.1.5 Training: Refresher Training

It is recommended all staff be trained in the use of firefighting equipment and refresher courses given periodically.

3.1.6 Testing and Maintenance: Stair cases and Gangways

Stair cases and gangways should be subject to regular inspection and records kept.

3.1.7 Other

The break glass unit beside the fire exit door in the bale storage area on the northern wall was not yet installed. This should be installed as soon as possible and connected into the fire alarm system.
The proposed sprinkler system which was discussed for the MRF should be installed as soon as possible.