Environmental Risk Assessment

Fenix Battery Recycling Ltd

Report produced for **Fenix Battery Recycling Ltd**

Provided by Walker Resource Management Ltd (WRM)

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Version No.	Date	Description of change
0.1	08/02/2021	First Draft
0.2	09/02/2021	Internal Review
0.3	12/02/2021	Draft Incorporated with Client Comments
1.0	12/02/2021	First issue
1.1	20/05/2021	Reference to Point Source Emissions on Alkaline Process Line and the Acid Storage Tanks

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1.0 INTRODUCTION

Walker Resource Management Limited (WRM) are acting consultants for Fenix Battery Recycling Ltd (hereon referred to as Fenix), who have commissioned WRM to produce an Environmental Risk Assessment in line with operational activities associated with a waste battery recycling and treatment facility.

Fenix are proposing to accept hazardous and non-hazardous waste batteries for processing through the onsite waste treatment system as outlined in the Non-Technical Summary (Document Reference: FEN-A01). The table in section 2 presents the identified risks on site, the potential linkages from source, pathway and receptor, and provides an assessment of the residual risk following the proposed risk management strategy.

Operator	Fenix Battery Recycling Ltd
Operational Site	Fenix Battery Recycling Field Street Willenhall West Midlands WV13 2PN
Assessment Date	12th February 2021
Carried Out by	William Grant
	WRM
Approved by	Miles Freeman

1.1 Assessment Process

The guidance *Risk Assessments for your Environmental Permit* produced by the Environment Agency and DEFRA gives a five-step process for assessing the site activity and the risk to local amenity to successful produce an Environmental Risk Assessment:

1. Identify and consider risks for your site, and the sources of the risks.
2. Identify the receptors (people, animals, property and anything else that could be affected by the hazard) at risk from your site.
3. Identify the possible pathways from the sources of the risks to the receptors.
4. Assess risks relevant to your specific activity and check they're acceptable and can be screened out.
5. State what you'll do to control risks if they're too high.

This risk assessment will identify people or parts of the environment that could be harmed by the activity and carry out risk assessments for these potential sources. Assessment of potential accidents at the facility and the consequential effects on sensitive receptors have been accounted for in a separate Accident Management Plan (see FEN-C01).

2.0 ENVIRONMENTAL RISK ASSESSMENT

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptor**	**P**	**C**	**M**	**Justification of Magnitude**	**Risk Management**	**Residual Risk**
Aerial emissions of dust, fibres and particulates.	Deposition from air and inhalation.	Local Human Population.	Med	High	High	Permitted waste types do not include dusts, powders or loose fibres but the treatment activities will produce particulate matter so a high magnitude risk is estimated. There is potential for exposure if anyone is living or working close to the site (apart from the operator and employees).	• The site will be kept clean and dust suppression will be used as and when needed. • Material will be assessed by site prior to processing. • Material will be processed inside a structure. • Localised dust extraction and dampening systems on alkaline battery processing line. With reference to the alkaline process treatment line, a localised forced extraction system will remove dust emissions from this activity. The treatment line shall be enclosed to ensure dust is extracted at the set capture points. The extraction system is proposed to be a CFE-4 Modular dust collector. There will be 6 connection points in total. These are as follows: - First connection point above hopper which deposits batteries into the shredder. - Second connection is at the bottom of the enclosed conveyor.	Low

Pollutant Model			Judgement				Action	
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							- Third connection is at the top of the enclosed conveyor. - Fourth connection is on top of the dual screen vibratory sieve. - Fifth connection on the magnetic separator. - Sixth connection on the air separation equipment. Dust is captured within a collector via this system and air is discharged via an exhaust. The system is being specified to handle 12,000m^3 of air per hour. This will provide a slight negative pressure at each extraction point. The new fan outlet will be ducted to atmosphere via the nearest wall / roof, it will be turned upwards and will terminate with a high velocity cowl. Prior to discharge via the exhaust, the air shall be channelled through a carbon filter which will deal with any ammonia which comes off the line. • Lead dust extraction system on wet filled acid battery line. This line contains localised dust extraction on the process saws but these are not considered as	

Pollutant Model			Judgement				Action	
Source	Pathway	Receptor	P	C	M	Justification of Magnitude	Risk Management	Residual Risk
							point source emissions as air will be contained within the building. The dust extraction is fitted to each cutting station and the dust which is captured is deposited into a sealed drum. No further extraction is seen to be required on this processing line. • Dust collected will be stored in sealed containers. • Daily site inspections. • Fugitive Emissions Management Plan.	
Airborne lead dusts.	Air transport and inhalation.	Local Human Population.	Med	High	High	Toxic nature of dusts and close proximity of operational staff to source.	• Control of Lead at Work Protocols and monitoring. • Lead dust extraction system on wet filled acid battery line. This line contains localised dust extraction on the process saws but these are not considered as point source emissions as air will be contained within the building. The dust extraction is fitted to each cutting station and the dust which is captured is deposited into a sealed drum. No further extraction is seen to be required on this processing line. • Activities occur within enclosed building.	Low
Emissions of toxic gases.	Air transportation then	Local Human Population.	Med	High	High	Proximity of sensitive receptors.	• Material will be processed within enclosed buildings. • With reference to the alkaline process treatment line, a localised forced	Low

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	inhalation or deposition.					Potentially toxic nature of the emissions.	extraction system will remove dust emissions from this activity. Dust is captured within a collector via this system and air is discharged via an exhaust. Prior to discharge via the exhaust, the air shall be channelled through a carbon filter which will deal with any ammonia which comes off the line. • The two acid storage tanks will be vented via a scrubber to atmosphere. This will be a passive system attached to the exhaust of the acid storage tanks. The scrubber will be in place to deal with SO2 present in the tanks. The scrubber will remain on during opening hours at which time acid can be added to these tanks and any air displaced will be directed through the scrubber. • Fugitive Emissions Management Plan.	
Litter	Air transport, then deposition.	Local Human Population.	Med	Med	Med	Nuisance, loss of amenity.	• Wastes are inspected on arrival and turned away if the EWC code does not meet the allowable inputs as stated in the Waste Acceptance Procedure. • Daily inspection of site and removal of litter to closed receptacles. • Processes carried out within enclosed buildings. • Fugitive Emissions Management Plans	Low

Pollutant Model			Judgement				Action	
Source	Pathway	Receptor	P	C	M	Justification of Magnitude	Risk Management	Residual Risk
Waste, litter and mud on local roads.	Vehicles entering and leaving site.	Local Human Population.	Med	Med	Med	Road safety, local residents or workers at nearby commercial/industrial properties often sensitive to mud and debris on roads.	• Daily inspection of site and clean-up of mud and debris when required, as detailed within the site's Fugitive Emissions Management Plan. • Nature of facility on impermeable concrete surfacing reduces risk of mud being transported on to road.	Low

Pollutant Model			Judgement				Action	
Source	Pathway	Receptor	P	C	M	Justification of Magnitude	Risk Management	Residual Risk
Odour.	Air transport then inhalation.	Local Human Population.	Low	Med	Low	No organic wastes to be processed on site and all storage and processing takes place within enclosed buildings. Possibility for ammonia release from Alkaline process treatment line creating odourous emissions. SO2 release from displacement of air when filling the two acid storage tanks.	• Restricted by pre-acceptance criteria and inspection (FEN-OP02). • Processes occur within enclosed buildings. • With reference to the alkaline process treatment line, a localised forced extraction system will remove dust emissions from this activity. Dust is captured within a collector via this system and air is discharged via an exhaust. Prior to discharge via the exhaust, the air shall be channelled through a carbon filter which will deal with any ammonia which comes off the line. • The two acid storage tanks will be vented via a scrubber to atmosphere. This will be a passive system attached to the exhaust of the acid storage tanks. The scrubber will be in place to deal with SO2 present in the tanks. The scrubber will remain on during opening hours at which time acid can be added to these tanks and any air displaced will be directed through the scrubber. • Fugitive Emissions Management Plan.	Very Low

Pollutant Model			Judgement				Action	
Source	Pathway	Receptor	P	C	M	Justification of Magnitude	Risk Management	Residual Risk
Noise and vibration.	Noise through the air and vibration through the ground.	Local Human Population.	High	Med	High	Residents or workers at nearby residential / commercial / industrial properties often sensitive to noise and vibration. Conducting of "noisy" operations e.g., shredding and sawing.	• Noise and Vibration Management Plan. • Treatment processes to occur within an enclosed building. • Regular maintenance and servicing.	Low
Scavenging Animals and scavenging birds.	Air transport and over land.	Local Human Population. Local Environment.	Low	Med	Low	Permitted wastes are not likely to attract scavenging animals and birds. Building areas have the potential may become nesting/breeding sites.	• Waste stored in designated areas within enclosed buildings and/or stored in sealed containers. • Office and food waste from staff welfare stored in bins. • Pest control contract. • Fugitive Emissions Management Plan.	Very Low
Pests.	Air transport and over land.	Local Human Population. Local Environment.	Low	Med	Low	No organic wastes to be processed.	• Waste stored in designated areas within enclosed buildings and/or stored in sealed containers. • Office and food waste from staff welfare stored in bins. • Pest control contract. • Daily site walkover. • Fugitive Emissions Management Plan.	Very Low
Flooding of site.	Flood waters.	Human Population. Local environment.	Very Low	High	Med	Permitted waste types are hazardous so any waste washed off site will add to the hazard of polluted waters.	• The site is not located within a flood zone and therefore has a very low risk of flooding. • Site is fully bunded.	Very Low

Pollutant Model			Judgement				Action	
Source	Pathway	Receptor	P	C	M	Justification of Magnitude	Risk Management	Residual Risk
All on-site hazards: wastes; machinery and vehicles.	Direct physical contact.	Human population. Local environment	Med	High	High	Some permitted waste types are hazardous, presenting potential risk in the event of direct contact. Delivery vehicles and mobile plant actively moving around the site.	• No public access to the site. • Site access gated and locked during out of hours. • Signs outlining onsite risks. • Hazardous wastes should only be received under the supervision of the technically competent manager. • Hazardous material shall be clearly labelled. • Wastes stored within enclosed buildings and/or sealed containers. • Traffic management flows. • Reversing beepers on vehicles and mobile plant.	Low
Liquid waste and process water generated from tank/bund failure or direct runoff.	Permeate/ flow through soil.	Ground Water.	Med	High	High	The facility is not located inside a Source Protection Zones 1 or 2. Hazardous wastes can have long-term or irreversible impacts on receptors.	• Impermeable concrete surface with external site bund. • The operational area inside each unit is fully enclosed and bunded. • Each tank is also bunded. • Routine inspection and maintenance of storage tanks, bunding and site surface. • The accident management plan outlines emergency procedures.	Low

Pollutant Model			Judgement				Action	
Source	Pathway	Receptor	P	C	M	Justification of Magnitude	Risk Management	Residual Risk
Spillage of liquids.	Direct run-off from site across ground surface, via surface water drains, ditches etc.	All surface waters close to and downstream of site. Acute effects: oxygen depletion, fish kill and algal blooms	Med	High	High	Liquid waste in the form of sulphuric acid is hazardous and can therefore have long-term or irreversible impacts on receptors.	• Impermeable concrete surface with external site bund. • The operational area inside each unit is fully enclosed and bunded. • Each tank is also bunded. • Staff training. • Accident Management Plan. • Fugitive Emissions Management Plan.	Low
Spillage of liquids.	All surface waters close to and downstream of site.	All surface waters close to and downstream of site. Chronic effects: deterioration of water quality	Low	High	Med	Waste types are hazardous so harm could be long-term and irreversible.	• Impermeable concrete surface with external site bund. • The operational area inside each unit is fully enclosed and bunded. • Each tank is also bunded. • Waste storage and processing within enclosed buildings. • Staff training. • Over 300m to nearest surface waters. • Accident Management Plan. • Fugitive Emissions Management Plan.	Low
Spillage of liquids.	Direct run-off from site across ground surface, via surface water drains, ditches etc. then abstraction.	Acute effects, closure of abstraction intakes.	Low	High	Med	Waste types are hazardous so harm could be long-term and irreversible. Watercourse must have medium / high flow for abstraction to be permitted, which will dilute contaminated run-off.	• Impermeable concrete surface with external site bund. • The operational area inside each unit is fully enclosed and bunded. • Each tank is also bunded. • Waste storage and processing within enclosed buildings. • Staff training. • Accident Management Plan.	Low

Pollutant Model			Judgement				Action	
Source	Pathway	Receptor	P	C	M	Justification of Magnitude	Risk Management	Residual Risk
Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land.	Air transport of smoke. Spillages and contaminated firewater by run off or via drainage system.	Human population and environment.	Med	High	High	Risk of accidental combustion of waste is moderate. Proximity of sensitive receptors. Waste types are hazardous so harm could be long-term or irreversible. Waste fires are not common but approximately 300 fires per year are linked to waste activities. Impact on health and amenity can be significant for many days or weeks.	• Licensed activities do not permit burning of waste. • Accident Management Plan. • Housekeeping controls. • Complaints procedure and investigation. • Waste storage and processing within enclosed buildings fitted with automatic fire-extinguishing system. • Monitoring of any stockpiles. • Fully bunded site boundary.	Low
Arson and / or vandalism causing the release of polluting materials to air (smoke or fumes), water or land.	Air transport of smoke. Spillages and contaminated firewater by run-off t or via drainage system.	Human population and local environment	Med	High	High	Waste types are hazardous so harm could be long-term and irreversible. Proximity of sensitive receptors.	• Accident Management Plan. • No public access to the site. • Site access gated and locked during out of hours. • CCTV in operation. • Enclosed buildings fitted with automatic fire-extinguishing system. • Fully bunded site boundary.	Low

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptor**	**P**	**C**	**M**	**Justification of Magnitude**	**Risk Management**	**Residual Risk**
Serious fire.	Direct run-off of fire water across site to surface waters.	All surface waters close to and downstream of site.	Low	High	Med	Waste fires are not common but approximately 300 fires per year are linked to waste activities. In event of fire, fire water can be produced for days/ weeks. Contaminated firewater run-off can kill fish and aquatic life.	• Fully bunded site boundary. • Licensed activities do not permit burning of waste. • Ability to block off drains to drainage system. • Wastes treatment processes occur within enclosed building fitted with automatic fire-extinguishing system. • Accident Management Plan details consequences and control of fires. • Monitoring of any stockpiles. • Housekeeping controls. • Complaints procedure and investigation.	Low
Any	Any	Protected sites - European sites and SSSIs	Low	High	Med	Waste operations may cause harm to and deterioration of nature conservation sites.	• There are no SSSIs within 500m of the site.	Very Low
P = Possibility C = Consequence M = Magnitude								

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