

# F & R Cawley Limited

## Part B4 – Section 3

### Technical Standards

This permit variation is to add the waste activity: shredding lithium batteries. There is no specific technical standard to describe this operating technique. The development of the battery treatment process has been developed over the past two years in accordance with the following technical guidance to ensure compliance with the required appropriate measures:

- Treating metal waste in shredders: appropriate measures for permitted facilities
- Non-hazardous and inert waste: appropriate measures for permitted facilities
- Waste electrical and electronic equipment (WEEE): appropriate measures for permitted facilities
- Chemical waste: appropriate measures for permitted facilities

The following appropriate measures are implemented on site:

Section	Appropriate Measures
General Management	<ul style="list-style-type: none"> <li>– Written Management System is in place. This has been submitted as part of the application.</li> <li>– Compliant with staff competence requirements</li> <li>– Emergency Spillage Procedures</li> <li>– Plant decommissioning – the shredding plant has been constructed so that it can be fully removed and transferred to another building or site as the company's operational needs change with the growth of the business. All equipment is above ground allowing the site building to be returned to an empty shell. No drainage is located within the building and the plant can be dismantled without causing a risk of pollution to the environment.</li> </ul>
Waste pre-acceptance, acceptance and tracking	<p>Procedures in place as per requirements for pre-acceptance, acceptance and tracking. Electronic tracking system is in operation to enable tracing of the entire process for every individual lithium ion battery. A QR coded system is due to be added. Additional measures are also in place to control the potential for thermal runaway during transport and initial acceptance process. Re-use of packaging is employed. If this is not possible they are cleaned to ensure they are free of any hazardous materials and recycled. If recycling is not possible, they will be sent for disposal.</p>
Waste storage, segregation and handling	<p>Storage procedures are as per appropriate measures in the guidance. Additional control measures are in place for battery storage, which include specially designed temperature-controlled ISO containers with fire break walls on three side. Linked up to water supply so can be flooded in the event of thermal runaway and thermal imaging cameras in use. Temperature monitoring undertaken twice daily. Damaged</p>

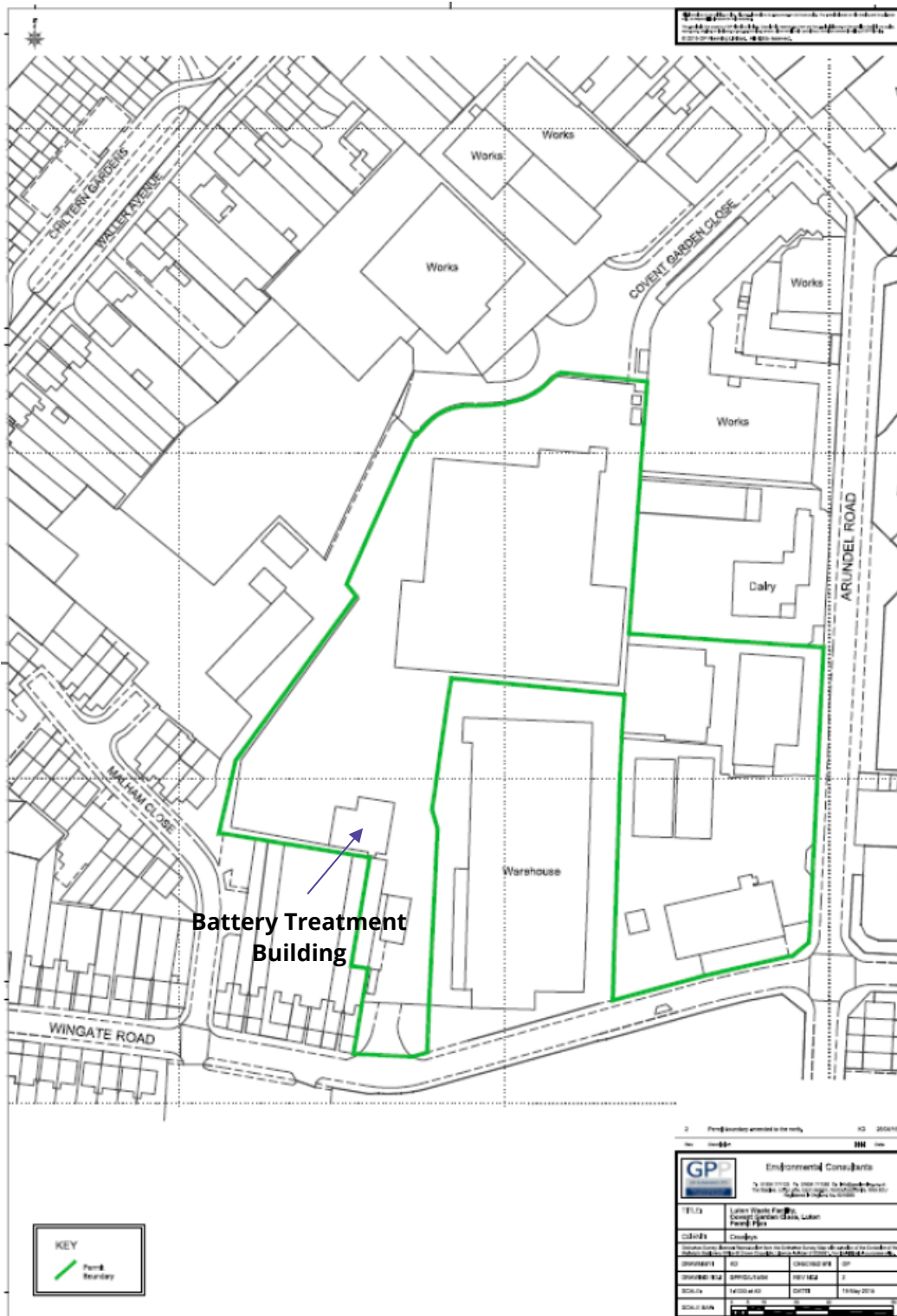
	<p>/ burnt batteries are removed and stored separately to allow additional monitoring and batteries segregated for re-use where possible. Lithium flake stored on sealed drainage (concrete hardstandings).</p>
Pre Treatment	<p>Prior to shredding the battery units are partially dismantled by hand to remove the outer casing and fully discharged. The battery unit is manually placed on a conveyor belt to take it into the closed system. No pre shredding is undertaken.</p>
Waste Treatment	<p>Metal shredding has been designed to be compliant with the waste treatment appropriate measures i.e. within a building with sealed drainage, dust extraction and emissions abatement. In addition, the building has fire rated glass and doors between the workshop and shredding plant. All conveyors are covered. Additional measures also include a Helios fire suppression system on the shredder. Detailed emergency procedures are in place and a DSEAR risk assessment in place for controlling risk of explosion.</p> <p>The treatment facility comprises a closed shredder capable of shredding up to 8T per day. Site aspirations are to have an operational capacity of 5T per day once fully permitted. The shredding process is a 'dry' process unless fire extinguishers were to be deployed. No further separation of lithium flake is undertaken. The lithium flake has been tested and classified using WM3.</p>
Emissions Control	<p>Diffuse emissions are minimised by the activity conducted within the treatment building within separate enclosures using fire rated glass and blocks. Dust extraction system is in place to remove risk to air and workers and minimise build up of explosive dust.</p> <p>Dust extraction system from workshop goes to local exhaust vent (Stack 1) with abatement provided by carbon filters as per Best Available Techniques (BAT) Reference Document for Waste Treatment.</p> <p>LEV system from shredding plant is as ATEXON® VR18Z Spark Detection and Extinguishing System, which has been installed and designed to reduce the risk of ignition sources such as embers from reaching protected equipment.</p> <p>An odour from the batteries is released during the shredding process, which is considered to be a fugitive emission. The odour is controlled by the additional of a chemical to mask it and testing has been completed to confirm this is not harmful and does not change the composition of the final material produced.</p> <p>Automatic fire suppression on shredder. If deployed fire water collected in metal bund beneath equipment. Bund provides a minimum of 110% of water used to dose fire and is located on concrete floor in a building with no drainage to reduce/prevent risk of emissions to sewers or runoff over hardstandings.</p> <p>Quench tank located is block work bund with 110% volume of tank.</p> <p>Fugitive emissions from the storage of lithium flake is prevented by full closure of FIBC.</p>
Emissions Monitoring and Limits	<p>Annual monitoring of parameters associated with lithium ion batteries in accordance with relevant BAT Associated Emission Levels (AELs), where they exist for relevant parameters and OEL for others. Monitoring undertaken in accordance with M1 guidance.</p>

Site plans and the layout of the internal and external battery treatment area are provided in Appendix I. Site photographs of the battery treatment area are provided in Appendix II. A process flow diagram in provided in Appendix III.

# Appendices

## Appendix I – Site Plans

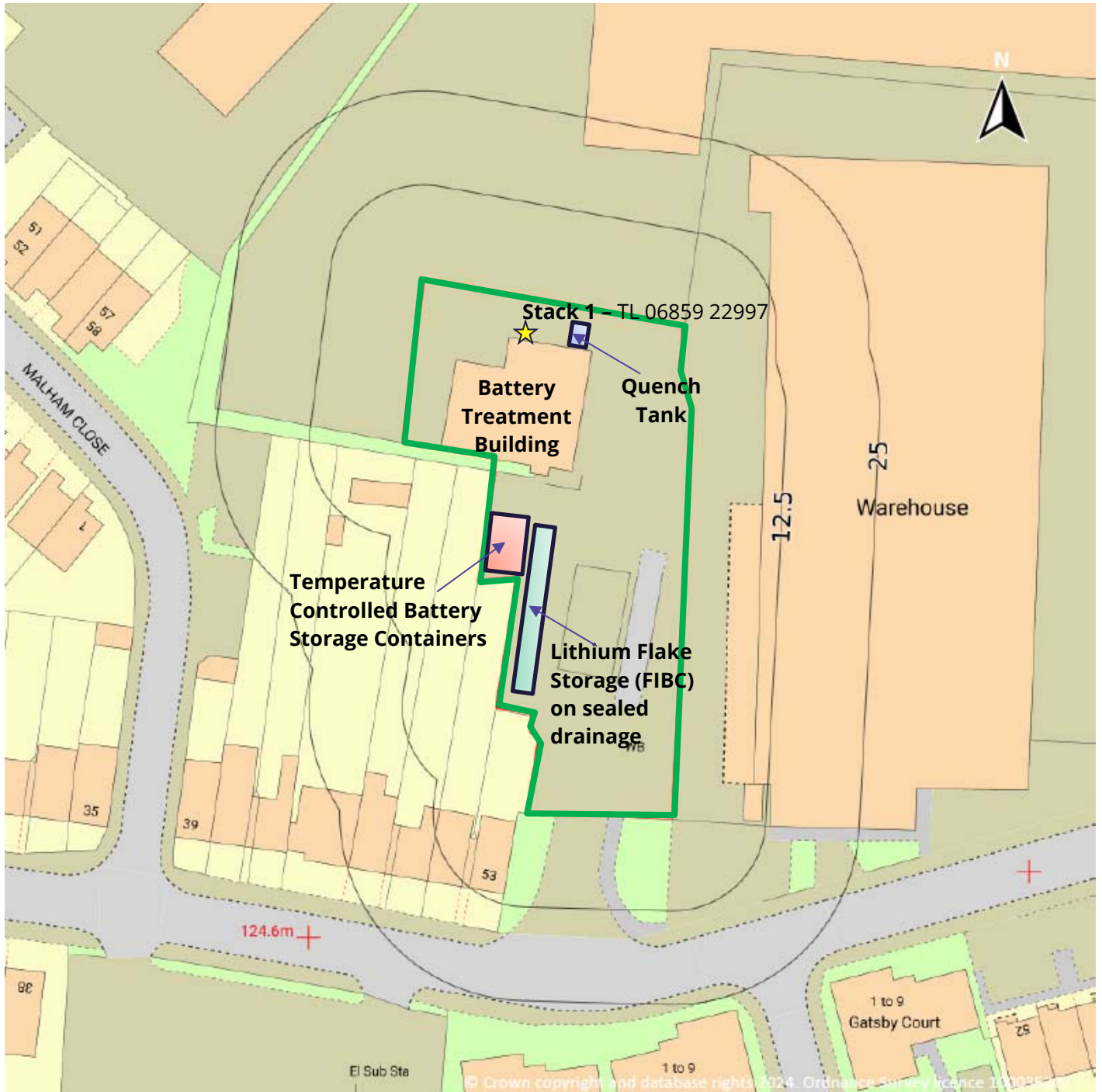
### Permitted Site Area



**Internal Battery Treatment Area**



**External Battery Treatment Area**



## Appendix II – Site Photographs



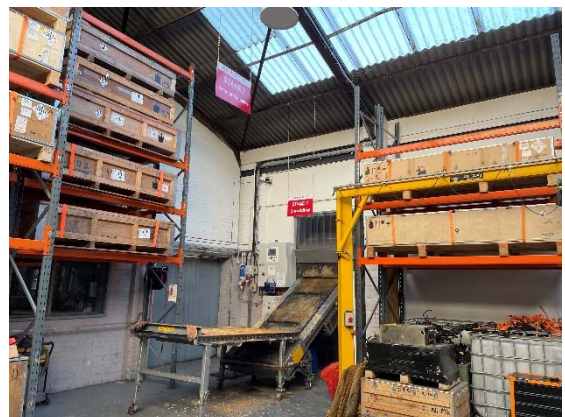
**Photo 1:** Temperature controlled shipping containers for battery storage and FIBC lithium flake storage



**Photo 2:** Fire break walls around temperature-controlled shipping containers and hose connections to flood containers with water in event of thermal runaway



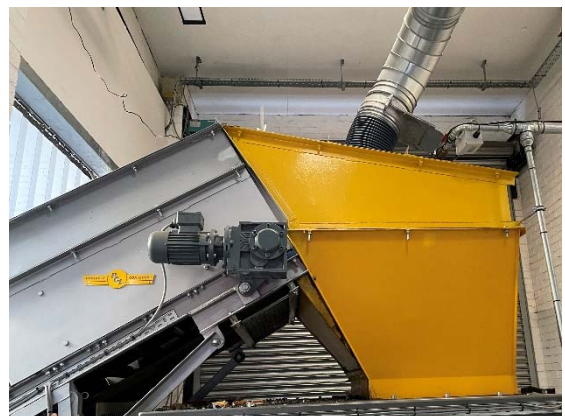
**Photo 3:** Battery discharge area



**Photo 4:** Conveyor from workshop to shredder plant



**Photo 5:** Process monitored remotely via cameras



**Photo 6:** Conveyor takes batteries to shredder



**Photo 7:** Shredded material passes along covered conveyor



**Photo 8:** Fire sensors to allow 2 sec bursts of water to be deployed until fire extinguished



**Photo 9:** Metal bund to collect any fire water deployed during shredding



**Photo 10:** Battery packaging storage



**Photo 11:** Safety control measures signage



**Photo 12:** Treatment building, quench tank and emissions stack and abatement

## Appendix III - Process Diagram

