

Pollution Incident Response Management Procedure

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Pollution Incident Response Management Procedure

Battery Energy Power Solutions Pty Ltd
Pollution Incident Response Management Procedure



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Pollution Incident Response Management Procedure



1. Purpose

This Pollution Incident Response Management Procedure (PIRMP) has been written for Battery Energy for the lead-acid battery manufacturing and warehousing facility located at 96 Fairfield Street, Fairfield NSW 2165. The site is covered by the Environmental Protection Licence number 5803.

Work health, safety and environment concern the health, safety and welfare of all people in the workplace and the environment. Battery Energy's emphasis is on the prevention of work-related incidents, injury, illness and disease by using safe people, safe systems of work and a safe work environment including property and plant. Battery Energy is committed to the development and maintenance of a safe and healthy working environment with its fundamental obligations to employees, society and the environment.

2. Scope

This procedure applies to all Battery Energy employees, management, contractors and visitors.

This procedure describes Battery Energy's objectives and policies regarding pollution incident response management.

3. References

- 3.1. NSW Occupational Health and Safety Act 2000
- 3.2. NSW Occupational Health and Safety Regulations 2001
- 3.3. The Protection of the Environment Operations Act 1997
- 3.4. Australian Standard AS/NZ 4801 Occupational Health and Safety
- 3.5. Managing Risk of Hazardous Chemicals in the Workplace Code of Practice
- 3.6. Battery Energy Occupational Health and Safety Policy
- 3.7. Battery Energy Quality Manual
- 3.8. Battery Energy Risk Assessment
- 3.9. Battery Energy MSDS
- 3.10. Australian Standard AS4260-1997 High Efficiency Particulate Air (HEPA) Filters
- 3.11. Australian Standard ISO 14001:2204 Environmental Management Systems

4. Definitions

- 4.1. **Hazard:** (including ENVIRONMENTAL) something with the potential to cause harm to people, plant, property, or to the environment
- 4.2. **JSA:** Job Safety Analysis
- 4.3. **SDS:** Safety Data Sheet
- 4.4. **PPE:** Personal Protective Equipment

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- 4.5. **Risk:** (including ENVIRONMENTAL) is the likelihood of potential harm being realized. Risk/impact is expressed as a calculation of the severity of the potential harm multiplied by the likelihood that it would be realised.
- 4.6. **RTW:** Return to Work
- 4.7. **SWMS:** Safe Work Method Statement

5. Responsibilities

- 5.1. The following individuals are responsible for activating the Pollution Incident Response Management Procedure and managing the response.
 - 5.1.1. General Manager
 - 5.1.2. Production Manager
- 5.2. The following individuals are authorized to notify and co-ordinate the relevant authorities.
 - 5.2.1. Warehouse Supervisor
 - 5.2.2. Maintenance Supervisor
 - 5.2.3. Hygiene Officer

6. Pollution Incident Response Management Arrangements

Battery Energy's pollution incident management procedure is based on the following elements:

6.1. Assess

Identify the severity, risk and extent of the incident:

- 6.1.1. What is the substance?
- 6.1.2. What are the properties of the substance? (Check hazard ID checklist)
- 6.1.3. Is there a risk to health, safety or environment? (Do you have necessary PPE to manage the emission?)
- 6.1.4. Where is the incident?
- 6.1.5. What is the volume of the emission?
- 6.1.6. Risk assessment and controls shall be carried out, if the emission has the potential to cause material harm go to 6.2 and notify.

6.2. Notify

A pollution incident is required to be notified if there is a risk of "material harm" to the environment which is defined in Section 147 of The Protection of the Environment Operations Act.

- 6.2.1. Harm to the environment is material if:
 - 6.2.1.1. It involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or

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- 6.2.1.2. It results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations), and
- 6.2.1.3. Loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.
- 6.2.2. If a spill occurs on site that has resulted in or has the potential to cause material harm to the environment the authorities outlined in appendix B will be notified immediately.
 - 6.2.2.1. Only contact relevant authorities if incident has occurred outside the bunded factory/warehouse areas.
- 6.2.3. Individuals nominated for activating and managing plans.(see 5.1)
- 6.2.4. Individuals authorized to notify and co-ordinate relevant authorities (see 6.2).

If a spill presents a significant risk of causing material harm to persons, property, and/or the environment to an area that is not trivial, any community stakeholders within these areas will be notified at the earliest convenience.

- 6.2.5. When it has been established that a community stakeholder is at risk from a spill that has the potential to cause material harm the following process will be implemented:
 - 6.2.5.1. Community stakeholders will be contacted immediately after the relevant authorities have been contacted by telephone (or face to face if this is not possible).
 - 6.2.5.2. Stakeholders will be advised of recommended actions that can be taken to prevent or minimize material harm, e.g. evacuate area, shut all doors and windows, cease drawing water for irrigation purposes.
 - 6.2.5.3. After the spill has been contained and managed by key personnel and authorities subsequent communication will be undertaken by the National Environmental Manager and relevant environmental advisors. These may include:
 - 6.2.5.3.1. Follow up telephone calls and/or face to face contact.
 - 6.2.5.3.2. Meetings with stakeholders
 - 6.2.5.3.3. Written correspondence containing updates in regard to safety and environmental concerns associated with the pollution incident.

6.3. Community Notification Strategy

- 6.3.1. Who will be notified?
- 6.3.2. All community stakeholders that may be affected by a spill will be notified. These include:
 - 6.3.2.1.1. Neighboring commercial properties.
 - 6.3.2.1.2. General public within the vicinity of the site including, pedestrians, motorists and users of nearby recreational facilities.

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- 6.3.2.1.3. Nearby water courses (rivers, streams, dams, etc.) used for recreational and/or commercial purposes.
- 6.3.2.1.4. Farmers located downstream from water courses affected by a spill.
- 6.3.2.1.5. Schools
- 6.3.2.1.6. Churches
- 6.3.2.1.7. Nursing Homes

See appendix A for a detailed list.

6.4. Stop

- 6.4.1. Stop the source of the emission/leak.
- 6.4.2. Ensure that necessary emergency materials are on hand to control larger emissions/leaks.

6.5. Contain

If there is a spill, leak or emission the succeeding actions should be followed to ensure the spill, leak or emission is contained:

- 6.5.1. Wear appropriate protective clothing, acid resistant boots, gloves, face shield and goggles.
- 6.5.2. If safe, stop the source of the leak.
- 6.5.3. Evacuate and limit access to the area.
- 6.5.4. Remove combustible material and all sources of ignition.
- 6.5.5. No smoking or naked flames near the spill, leak or emission.
- 6.5.6. Utilise barriers to prevent spreading.
 - 6.5.6.1. Absorbent booms, mats
 - 6.5.6.2. Rags
 - 6.5.6.3. Drain blanket
 - 6.5.6.4. Soda ash (Sulphuric acid only)
- 6.5.7. If the spill or leak is on a hard surface use appropriate absorbent barrier or sand/soda ash mix.
- 6.5.8. Ensure spilled material does not discharge off site.

6.6. Mitigate

If an acid spill is discharged outside the bunded factory/warehouse into storm water drains then mitigation controls are used to ensure this spill is not spread.

- 6.6.1. This may include:
 - 6.6.1.1. Blocking drains further down line.
 - 6.6.1.2. Implement environmental controls further downstream to minimize impact to the environment.
 - 6.6.1.3. Notify emergency services/Hazchem.

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6.7. Clean up

After the spill, leak or emission has been contained the succeeding actions should be followed:

- 6.7.1. Clean up the spill or leak using the appropriate controls/spill kit.
- 6.7.2. When the spill or leak has been neutralized, collect residue and place in a suitable container labelled as containing hazardous waste.
- 6.7.3. Treat refuse as hazardous waste when disposing.
- 6.7.4. Do not release hazardous waste into drains, sewers or the environment.
- 6.7.5. Dispose of refuse in accordance with relevant local waste management requirements.

6.8. Review

- 6.8.1. Conduct an investigation into the event.
- 6.8.2. Complete internal Incident Report Form.
- 6.8.3. Review the effectiveness of Pollution Incident Response Management Procedure annually and after the incident to ensure controls/spill kits are replenished.
- 6.8.4. Review the Hazardous Substance Register to ensure all hazardous chemicals are registered.
- 6.8.5. Review the Hazardous Risk Register to ensure the control measures are *adequate*.
- 6.8.6. Consult with employees about the review of the Hazardous Risk Register to ensure control measures and instructions are understood and complied with.
- 6.8.7. Assist the EPA and/or investigators with external enquiries if required.

7. Identification of Hazards and Risk

7.1. Description and Likelihood of Hazards

- 7.1.1. The main pollutant associated with Battery Energy's manufacturing facility is the emissions of lead dust. Minor pollutants are sulphuric acid fumes.
- 7.1.2. Sulphuric acid use on site is categorised as a closed process, adequately limiting potential emissions to air.
- 7.1.3. Potential point sources of lead emissions to air are:
 - 7.1.3.1. Lead oxide mill.
 - 7.1.3.2. Grid Casting (casting and stamping).
 - 7.1.3.3. Paste mixing (paste mixing, grid pasting, curing, and drying).
 - 7.1.3.4. Battery assembly area (group stacking and battery assembly).
- 7.1.4. Appendix F provides a hazardous risk register for the sites potential air impacts on the environment. A scale of I-III is applied with level I being the lowest risk and level III being the highest risk.

7.2. Pre-Emptive Actions to be Taken

- 7.2.1. As a first measure to manage air pollution point sources the facility ensures that equipment is well operated and regularly maintained, with a routine maintenance schedule in place.

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- 7.2.2. The Sovena Oxide Mill with steam ventilation Model 6T has an inbuilt bag dust collector, which operates at an extraction efficiency of >99.99%. The filter is a high-efficiency particulate arrestance (HEPA) made to AS4260 and certified to ISO 14001:2204.
- 7.2.3. The Mikropul (model 64S-8-30) dust collector with under housing suction can extract 8,500m³/h lead oxide dust at 20°C. The Mikropul is regularly serviced by Australian Filtration Service Pty Ltd. A Goyen BBD68B 'Broken Bag Detector' continuously monitors the dust extractor filter for leakage, and an alarm is activated when a leakage is detected.
- 7.2.4. A single workspace bay is connected to a smaller ozone dust extractor (model OB8-5-J), which is maintained by Battery Energy.
- 7.2.5. Regular air quality monitoring is conducted on site.
- 7.2.6. Air quality impact mitigation measures currently implemented on site are:
 - 7.2.6.1. Operation of equipment and activities within an enclosed building
 - 7.2.6.2. Use of regular wet sweeping to minimise the accumulation of lead dust on surfaces
 - 7.2.6.3. Closed processing of sulphuric acid in filing line using a piping network
 - 7.2.6.4. Battery formation using a 'wet process'
 - 7.2.6.5. Dust extractors (as described above)
 - 7.2.6.6. Continuous and alarmed monitoring system for Mikropul dust extractor.

7.3. Hazardous Chemicals

- 7.3.1. All hazardous chemicals or potential pollutants used and stored at Battery Energy 96 Fairfield Street Fairfield NSW 2165 must be registered in the Hazardous Substance Register Document number BE-GE-RO47. Details including:
 - 7.3.1.1. Type of substance
 - 7.3.1.2. Maximum quantity on site
 - 7.3.1.3. Location of the substance
 - 7.3.1.4. Current Safety Data Sheet SDS
 - 7.3.1.5. Date of Safety Data Sheet SDS
 - 7.3.1.6. Hazardous substance
 - 7.3.1.7. Dangerous goods
 - 7.3.1.8. Labelled
 - 7.3.1.9. Supplier
- 7.3.2. All hazardous substances stored must be:
 - 7.3.2.1. Correctly labelled
 - 7.3.2.2. Stored following the manufacturer's instructions on the SDS.
 - 7.3.2.3. Stored within controlled temperature range requirements.
 - 7.3.2.4. Keep in original packaging.
 - 7.3.2.5. Not be tampered with.
 - 7.3.2.6. Not be removed from original packaging.

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- 7.3.3. The Hazardous Substance Register must be updated annually, when a new hazardous substance is introduced into the work place or when the use of a particular hazardous chemical is discontinued.
- 7.3.4. If the contents of a container are not known, this should be clearly marked on the container e.g., 'Caution – do not use: unknown substance'.
 - 7.3.4.1. The unknown container should be stored in isolation until its contents can be identified.
 - 7.3.4.2. If identified as hazardous the container should be appropriately labelled.
 - 7.3.4.3. If the contents cannot be identified, they should be disposed of in accordance with relevant local waste management requirements.

7.4. Safety Data Sheets

- 7.4.1. SDS contain information on the identity of the products and any hazardous ingredients, potential health effects, physical hazards, safe use, toxicological properties, handling and storage, emergency procedures and disposal requirements specific to the chemical.
- 7.4.2. A current SDS for the hazardous chemical must be provided to any person, if the person:
 - 7.4.2.1. Is likely to be affected by the hazardous chemical.
 - 7.4.2.2. Ask for the SDS.
- 7.4.3. A folder containing current SDS for any hazardous chemical are kept at Battery Energy 96 Fairfield Street Fairfield NSW 2165 is located in the:
 - 7.4.3.1. Laboratory
 - 7.4.3.2. Production Manager Office (Master copy).
 - 7.4.3.3. Inside the main door of the warehouse.
 - 7.4.3.4. Inside the main door of the factory.
 - 7.4.3.5. Fitter's workshop
- 7.4.4. Employees are trained how to:
 - 7.4.4.1. Locate of the current SDS.
 - 7.4.4.2. Access the SDS.
 - 7.4.4.3. Interpret the SDS.

7.5. First Aid Kits

- 7.5.1. First aid is the initial care provided to someone who has suddenly fallen ill, or someone who has been injured, until more advanced care is provided or the person recovers.
- 7.5.2. First Aider rendering assistance will:
 - 7.5.2.1. Undertake first aid training.
 - 7.5.2.2. Have a current first aid training certification.
 - 7.5.2.3. Not act beyond their capabilities or training.
 - 7.5.2.4. First Aide Officers.
 - 7.5.2.4.1. 2 x Main office building.
 - 7.5.2.4.2. 5 x Warehouse/Factory.
- 7.5.3. A fully stocked first aid kit is available to render assistance when required.

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- 7.5.3.1. The first aid kits are clearly identifiable by the label with a white cross on green background.
- 7.5.3.2. The first aid kits are located in:
 - 7.5.3.2.1. Main office building.
 - 7.5.3.2.2. Warehouse/Factory.
- 7.5.3.3. Medications are not supplied in the first aid kits.
- 7.5.3.4. First aid kits are maintained and restocked every six (6) months by an external provider.

7.6. Maps

7.6.1. The site is zoned as IN1 – General Industry within Fairfield City Council. The area is located within an industrial estate on the southern side of Fairfield Street and is surrounded by other industrial land uses to the east, west and south. Knight Park – a public recreational reserve – is located directly opposite the site to the north.

- 7.6.1.1. Appendix C site location map.
- 7.6.1.2. Appendix D site schematic map.
- 7.6.1.3. Appendix E location of potential air emission sources.

7.7. Staffing Training

Battery Energy has a workplace training program that allows employees the opportunity to expand their knowledge and skill sets. Ongoing training is important and allows Battery Energy to outline what training is required.

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Appendix A

Contact Details

CONTACTS	PHONE NUMBER
General Manager - Gaby Primer	0437 502 624
Production Manager – David Clark	0425 330 694
Warehouse Supervisor – Peter O’Regan	02 9681 8014
Maintenance Supervisor – Ziyad Yalda	02 9681 8019
Hygiene Officer – David Clark	02 9681 8006
Emergency services/Fire Hazchem	000
Fairfield Hospital	02 9616 8111
Department of Environment, Climate Change and Water Emergency 24 hour Service Number (formally NSW EPA) The Ministry of Health via the local Public Health Unit - <i>ask for public health officer</i>	131 555
WorkCover Authority	131 050
Local Council (if this is not DECCS)	Fairfield City Council 02 9725 0222
Fire and Rescue NSW	000
Sydney Water	132 090
Belmont Timber	02 9681 2100
King Wreck Australia	02 9721 0024
Yennora Public School	02 9632 8660
Rosary Nursing Home Yennora	02 9892 4665
Arabic Assembly of God	02 9755 7568
Yennora Oasis Hotel	02 9632 6328

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Appendix B

Name of Substance	Location	Max Quantity Stored
Ammonium Acetate	Lab	2kg
Sulphuric Acid 1400 Density	Lab	1L
Ethanol	Lab	2.5L
Nitrobenzene	Lab	500ml
Sodium Silicate	Lab	500ml
Fluoboric Acid	Lab	500ml
Diethyl Ether	Lab	250ml
Ammonia Solution	Lab	1L
Nitric Acid 70%	Lab	3L
Orthophosphoric Acid	Lab	2.5L
Acetic Acid 90 - 100%	Lab	3L
Potassium Bromate	Lab	550gram
Acetone	Lab	20 L
Phenolphthalein	Lab	250gram
Lead - Pure 0.9997	Lab	3kg
Methanol	Lab	10L
Citric Acid	Lab	564gram
Potassium Iodide Powder	Lab	565gram
Potassium Chloride Powder	Lab	500gram
Zinc Sulphate Hyptahydrate	Lab	455gram
Potassium Permanganate	Lab	570gram

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Name of Substance	Location	Max Quantity Stored
H1000 - Electronic Contact Cleaner	Lab	250g
Powerful Rust and Corrosion Protection	Lab	333g
Kerosene	Factory/Maintenance	100 L
Compressed Carbon Dioxide	Factory/Maintenance	8 cyl
Compressed Nitrogen	Factory	8 cyl
VRLA Ingot	Factory	19728.365kg
Tin Sticks	Factory	3.23kg
4% Tin Burning Lead Bar	Factory	358.0158kg
Red lead oxide	Factory	7,375kg
Sulphuric Acid 1400 Density	Factory	3000kg
De-Ionised Water	Factory	8832.0152L
Lanolin Grease Type A	Factory	36.8172kg
Silica-Wacker HDK Fumed N20 (10kg Bag)	Factory	245.3253kg
Epoxy Resin Container Sealing (4235A) 4:1 China Glue	Factory	13.9565L
Hardener to suit Epoxy Resin Container Sealing (4235B) 1:4 China Glue	Factory	2.1505L
Primer PC 120	Factory	2L
Resin Glue - Escon Gp Wxf Laminating Resin	Factory	23L
Butanox M-50	Factory	10L
Glue Stick Hot Melt For Bostik Gun Tg4 15Kg Box	Factory	7kg
Low Melt Glue 5kg Per Box 3792 LM-Q suit 3m LTQ Applicator	Factory	33.532kg
Loctite H4800 Speedbonder 490ml (8/pack). Also use CON-0290 mixers	Factory	19882ml

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Name of Substance	Location	Max Quantity Stored
RED Battery Sealant K-9118 RED Part A 20kg per can	Factory	19.9578kg
BLACK Battery Sealant K-9118BK Part A 20kg per can	Factory	19.9578kg
Activator Battery Sealant K-9118 Part B 20kg per can	Factory	7.487kg
Blanc Fixe N Barium Sulphate	Factory	105kg
Conductex SC Ultra Carbon	Factory	200.822kg
Vanisperse Ht-1	Factory	345kg
Floc-'Security' Armafloc Da3/60	Factory	50kg
Sodium Hydroxide Liquid 50 W/W	Factory	60L
Hydroxide-Sodium Tech Pellets Caustic Pearl 25Kg Sack	Factory	373.6003kg
Soda Ash - Sodium Carbonate	Factory	300kg
Polyester Resin Escon GP 35'	Factory	20kg
Liquefied Petroleum Gas (LPG)	Cage	10 cyl
Compressed Acetylene	Cage	4 cyl
Fiddly Bits	Maintenance	250g
TAC2 – Adhesive Lubricant	Maintenance	300g
Protech - Heavy Duty Degreaser	Maintenance	400g
Tread Rite - Slip Resistant Coating	Maintenance	1L
WD-40 Aerosol	Maintenance	425g
C.D.T – Cutting Oil	Maintenance	360ml
HD – Cutting Fluid	Maintenance	500ml
Goof Off - Remover	Maintenance	340g
Electrical Clean and Lube	Maintenance	175g

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Name of Substance	Location	Max Quantity Stored
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Ranex Rustbuster	Maintenance	250ml
SuperSheild Argon	Maintenance	3 cyl
Nickel Anti-Seize	Maintenance	300g
Anti-Spatter	Maintenance	400g
Multigrade 4-stroke Engine Oil	Maintenance	1L
Battery Cleaner	Maintenance	410g
Alpha sp 680 Gear box oil	Maintenance	20 L
Air Tool Lubricant	Maintenance	1L
Hand Cleaner	Maintenance	2L
Super Kleen	Maintenance	750ml
All Purpose Multfill – White	Maintenance	1Kg
Instant Water Leak Plug & Sealant	Maintenance	397g
Outdoor & Spider Surface Spray	Maintenance	385g
Control Bomb	Maintenance	125g
Wet Area – Silicone Sealant - White	Maintenance	300g
Liquid Nails – Heavy Duty	Maintenance	350g
Sika Boom - AP	Maintenance	850ml
Plasti-Bond	Maintenance	450g
Cream Cut & Polish	Maintenance	250g
Mr Buff – Cutting Compound	Maintenance	500g
Metal Bog	Maintenance	500ml

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Name of Substance	Location	Max Quantity Stored
Brake Fluid - Dot 4	Maintenance	500ml
Ant Kill	Maintenance	750ml
Paper Shredder Lubricating Oil	Maintenance	350ml
Citrus Hand Cleaner	Maintenance	500ml
Barrier Cream	Maintenance	500ml
SPF 50+	Maintenance	500ml
Aerosol – Lens Cleaner	Maintenance	150g
Car Wash	Maintenance	1L
No - Tox Silicone Valve Seal – Food Machinery Lubricant	Maintenance	0.453kg
Nu-Clear Thread – Cutting Oil	Maintenance	5L
Grease – LM Multi-Purpose	Maintenance	2.5kg
Coolant – 60 Plus	Maintenance	5L
Radiator Coolant – Type B	Maintenance	5L
Outdoor & Indoor Surface Spray	Maintenance	3L
Cool It Spray	Maintenance	125g
Icy Cool	Maintenance	250g
Copper Anti-Seize	Maintenance	500g
Ameron Special Thinner 24	Maintenance	4L
All Purpose Thinner – Premium Grade	Maintenance	4L
Touch up paint – Safety Yellow	Maintenance	200g
Super Chrome – Metal Tones	Maintenance	300g
Paint - Cold Galvanising	Maintenance	400g

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Name of Substance	Location	Max Quantity Stored
Electrical Clean and Lube	Maintenance	175g
Spraypak – Wildfire Red	Maintenance	225g
Strokes – Gloss Black Enamel	Maintenance	250ml
Zinc Guard – Gold Galvanising Coating	Maintenance	500ml
Line Marking Paint - White	Maintenance	500gm
Paint Stripper - Polystrippa	Maintenance	500ml
Multi-Purpose Filler – Interior	Maintenance	500g
Shell Gadus S2 V220 2	Maintenance	10kg
Hyspin aws68 Hydraulic oil 101170	Maintenance	20 L
Hyspin aws 32 Fluid coupling oil	Maintenance	20 L
Compressed Supashield	Maintenance	5.3m3
Fire Extinguisher ABE	Maintenance	4.5kg
Ultra Concentrate Dishwashing Liquid	Kitchen	450L
Canola Cooking Spray	Kitchen	400g
Fire Extinguisher ABE	Kitchen	2.5kg
Tork Toilet Seat Cleaner	Bathroom	475ml
Gala Hand Soap	Bathroom	840ml
Print Catridge Yellow/Black/Cyan/Magenta	Office	331g
30 Second - Mould Off	Office	1L
Multi Purpose Cleaner	Office	750g

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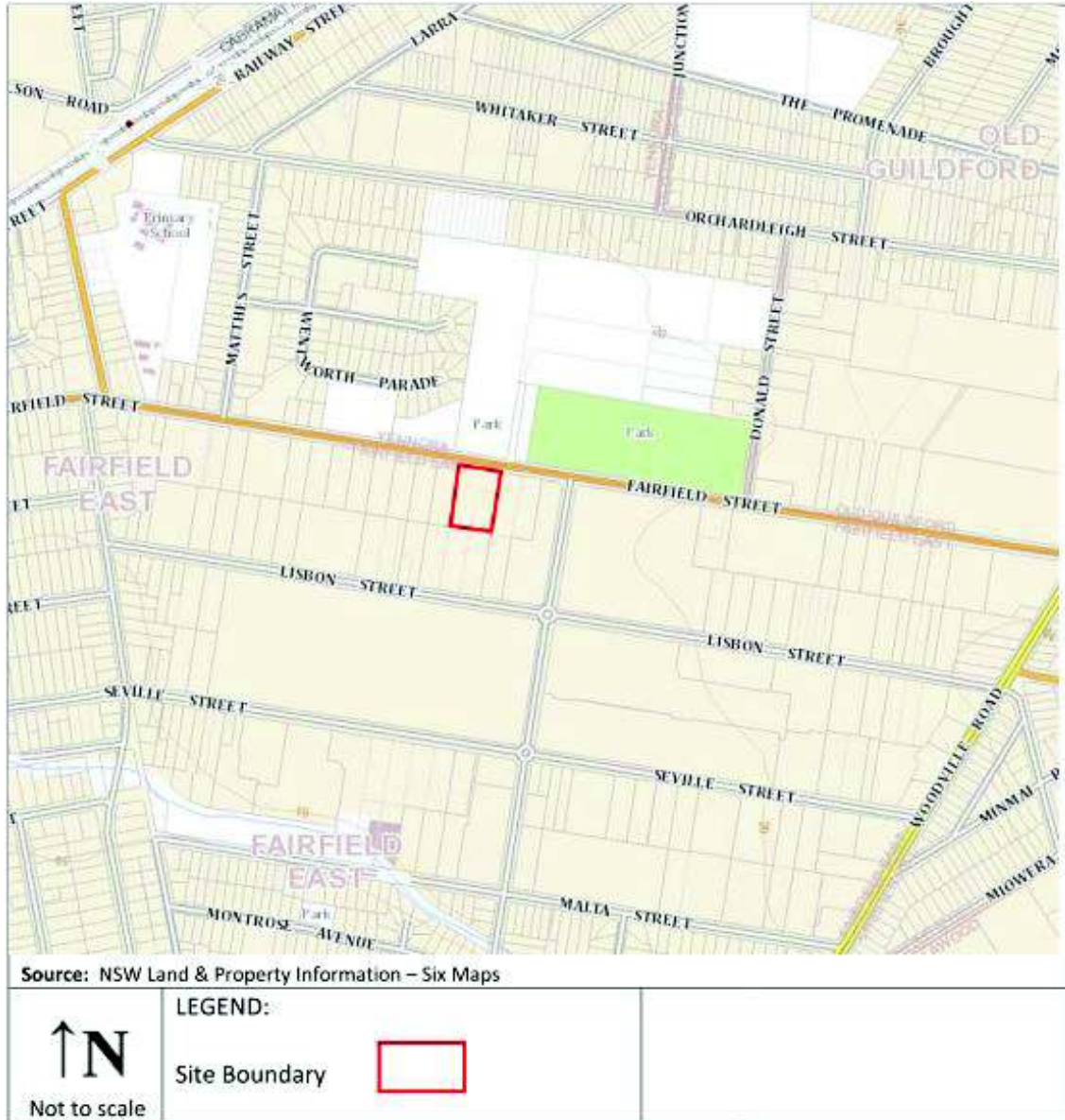
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Appendix C

Map



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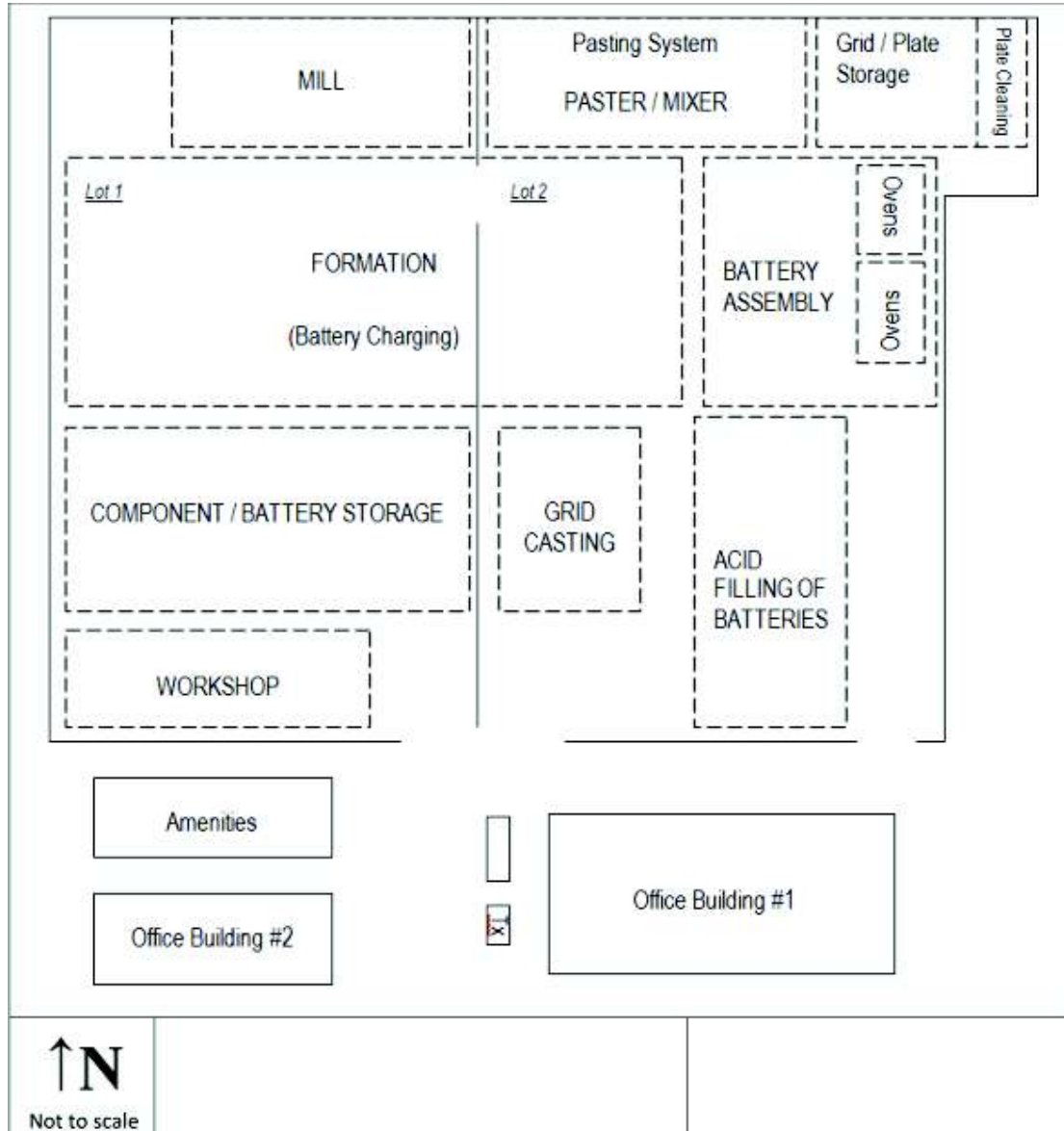
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Appendix D

Facility Layout Schematic



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Appendix E

Aerial View



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Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
Acid Filling Area														
	Release of fume.	Contact with sulphuric acid fumes.	Failure of acid storage tank.	Inspect for damage and leaks. Protect against physical damage.	Release sulphuric acid fumes through open doorways.	Spill contained by site personnel. Acid is neutralised, clean up undertaken.	Minor	Possible	II	es	Check bunding has capacity of 110% of the tank volume. Preventative maintenance	Minor	Possible	II
			Spill from acid filling line.	Bunding	Release sulphuric acid fumes through open doorways.	Spill contained by site personnel. Acid is neutralised, clean up undertaken.	Minor	Possible	II	es	, inspection of pipelines Provision of emergency isolation valves.	Minor	Possible	II

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Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	As the risk ALARP	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
Formation														
	Release of fume.	Contact with hydrogen and sulphuric acid mist.	Charging of batteries.	Building ventilation.	Hydrogen and sulphuric acid mist released through open doorways.	Spill contained by site personnel. Acid is neutralised, clean up undertaken.	Minor	Possible	III	Yes		Minor	Possible	III
	Electrical fire /Explosion.	Electrical fire /Explosion.	Sulphuric acid is heated and decomposes.	Building ventilation.	Fire damage, explosion, release of sulphur dioxide.	Fire services.	Major	Unlikely	II	No	Measure explosive gas concentrations and if LEL reaches 10% then add additional ventilation.	Major	Unlikely	I

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Battery Storage														
	Release of fume.	Release of sulphuric acid fumes.	Physical damage to batteries.	Inspect for damage and leaks. Protect against physical damage.	Release sulphuric acid fumes.	Spill contained by site personnel. Acid is neutralised, clean up undertaken.	Minor	Possible	III	Yes		Minor	Possible	III
Grid Casting														
	Release of dust.	Release of lead dusts.	Failure of exhaust system.	Regular maintenance checks.	Liberation of lead dust in air, release of lead dust through open doorways.	Avoid dust formation on surfaces – sweep.	Minor	Possible	III	Yes		Minor	Possible	III

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Paster/Mixer														
	Release of dust.	Release of lead dusts.	Failure of exhaust system.	Regular maintenance checks.	Liberation of lead dust in air, release of lead dust through open doorways.	Avoid dust formation on surfaces – sweep.	Minor	Possible	III	Yes		Minor	Possible	III
Oxide Mill														
	Release of dust.	Release of lead dusts.	Failure of dust extractor.	Regular maintenance checks.	Lead dust not captured, released into environment.	Avoid dust formation on surfaces – sweep.	Minor	Possible	III	Yes		Minor	Possible	III
			Failure of oxide mill.	Regular maintenance checks.	Liberation of lead dust in air, release of lead dust through open doorways.	Avoid dust formation on surfaces – sweep.	Minor	Possible	III	Yes		Minor	Possible	III

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Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
Grid/Plate Storage & Cleaning														
	Release of dust.	Release of lead dusts.	Failure of dust extractor split of bag.	Regular maintenance checks.	Lead dust not captured, released into environment.	Avoid dust formation on surfaces – sweep.	Minor	Possible	III	Yes	Preventative maintenance by routine replacement of bags.	Minor	Possible	III
	Release of dust.	Release of lead dusts.	Mishandling of lead materials/products.	Site personnel training.	Liberation of lead dust in air, release of lead dust through open doorways.	Avoid dust formation on surfaces – sweep.	Minor	Possible	III	Yes		Minor	Possible	III

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Battery Assembly Area														
	Release of dust.	Release of lead dusts.	Failure of dust extractor.	Regular maintenance checks.	Lead dust not captured, released into environment.	Avoid dust formation on surfaces – sweep.	Minor	Possible	III	Yes		Minor	Possible	III
	Release of dust.	Release of lead dusts.	Mishandling of lead materials/products.	Site personnel training.	Liberation of lead dust in air, release of lead dust through open doorways.	Avoid dust formation on surfaces – sweep.	Minor	Possible	III	Yes		Minor	Possible	III
General														
	Release of dust.	Release of lead dusts.	Mishandling of lead materials/products.	Site personnel training.	Liberation of lead dust in air, release of lead dust through open doorways.	Avoid dust formation on surfaces – sweep.	Minor	Possible	III	Yes		Minor	Possible	III

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Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
	Harmful exposure.	Release of flammable gases.	Leak from/explosion of flammable gas cylinder.	Inspect for damage and leaks. Protect against physical damage. Correct storage of flammable gases.	Fire with release of smoke.	Fire services.	Major	Unlikely	II	Yes		Major	Unlikely	

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