Tyrecycle Erskine Park | Section 4.55(2) Modification

STATEMENT OF ENVIRONMENTAL EFFECTS

Prepared for Tyrecycle Pty Ltd | 7 December 2023

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Tyrecycle Erskine Park

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7 December 2023

PR230

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Date	7 December 2023	7 December 2023	7 December 2023

DOCUMENT CONTROL

Revision	Date	Description	Prepared by	Reviewed by
0	28 February 2023	For Tyrecycle review	Element Environment	Tyrecycle Pty Ltd
1	8 March 2023	For submission to Council	Element Environment	Tyrecycle Pty Ltd
2	7 December 2023	Revised to account for a revision to fire mitigation measures	Element Environment	Tyrecycle Pty Ltd

EXECUTIVE SUMMARY

Introduction

Tyrecycle Pty Ltd (Tyrecycle) is one of Australia's largest tyre recycling companies and operates a tyre processing facility at 1-21 Grady Crescent, Erskine Park (Lot 9 DP 1261030) (the site). Up to 29,000 tonnes per annum (tpa) of passenger, four-wheel drive and truck tyres are processed at the site, with the existing development approved as integrated development by the Sydney Western City Planning Panel (SWCPP) on 20 December 2020 under Part 4, Division 4.3 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) (DA20/0589).

Tyrecycle is seeking approval to increase production at the site from 29,000 tpa to 60,000 tpa (the modification).

This statement of environmental effects (SEE) has been prepared by Element Environment Pty Ltd (Element) on behalf of Tyrecycle to address the requirements of Section 4.55(2) of the EP&A Act. The objective of this SEE is to assess the potential environmental and social impacts of the modification and accompany the modification application to be lodged with Penrith City Council (Council).

Justification and need for the modification

Tyrecycle is one of Australia's largest tyre recycling companies and has seen an increase in demand that has taken it from processing less than 12 million tpa to over 20 million tpa, with a recycling rate of 99%.

Due to the limitations in the conditions of consent (DA20/0589) and environment protection licence (EPL) issue by the NSW Environment Protection Authority (EPA), Tyrecycle cannot accommodate the increased market demand for recycled tyre products. As such, Tyrecycle is seeking to increase tyre receival and processing from 29,000 tpa to 60,000 tpa.

Tyrecycle is an accredited tyre collector and recycler working under the National Tyre Product Stewardship Scheme and is a member of the Australian Tyre Recyclers Association. The modification will aid in the objectives of this organisation to increase the number of recycled end-of-life tyres in Australia.

The site will continue to contribute to the growth and development of Erskine Park and the Western Sydney Employment Area through the continued employment of more than 30 full time employees.

The site will continue to process tyre waste into tyre derived products (TDP) and tyre derived fuel (TDF), providing the community with an effective and sustainable alternative to landfill.

Site description

The existing development is in a leased warehouse and distribution complex in the Erskine Business Park. The site is approximately 10.8 kilometres (km) south-west of Blacktown and approximately 5.6 km south-east of St Marys. The site is owned by Fitzpatrick Investments, which is the landowner of the Fitzpatrick Industrial Estate in Erskine Business Park.

The site is in the ‘general industrial’ land use zone, adjacent to other industrial facilities such as warehousing and packaging businesses.

The Erskine Business Park forms part of the Western Sydney Employment Area, as identified by the Department of Planning and Environment (DPE), due to the area’s strategic importance in the Sydney metropolitan area.

The surrounding area is characterised by commercial and industrial land uses, with the closest residential dwellings approximately 330 metres (m) north on Shaula Crescent.

Description of the modification

The site will continue to operate 24 hours per day, seven days per week. The only proposed operational change is to increase the processing limit from 29,000 tpa to 60,000 tpa of waste tyres. The primary operational activities at the site remain the same, and include:

- Receival and temporary storage of tyres.
- Processing and shredding of tyres.
- Dispatch of processed TDF and other TDPs.

The increased production of TDP and TDF will not require any alterations to buildings and structures, plant, equipment, processing methodology, number of employees, hours of operation or utilities. However, the modification will include changes to shifts, and result in additional vehicles entering and exiting the site, which can be accommodated in the existing site layout.

All by-products of the shredding process are non-hazardous and recyclable, such as steel and fibre textile. All tyres received at the site are either processed into TDF or TDP, with steel and textile by-products sold on. There is no need for chemical processing or heating, with all tyres mechanically shredded.

Environmental impact assessment

The likely impacts on the natural and built environments and social and economic impacts on the locality were assessed. The SEE has been prepared in accordance with Section 4.15(1)(b) of the EP&A Act, as well as Council's pre-lodgement meeting and advice notes.

Environmental risks were assessed prior to preparation of the SEE to identify the key potential environmental issues or impacts associated with the modification. The key environmental aspects requiring detailed assessment were noise, air quality, traffic and access, and hazards and risks, and are summarised below. Other low risk environmental matters were not assessed in detail and are summarised in the SEE.

Air quality

Air quality impacts on nearby sensitive receivers were assessed. Following refinements on conservative assumptions in the original air quality impact assessment, the modification will generate less air emissions compared to approved operations and will comply with assessment criteria at the closest sensitive receivers.

Management measures will be implemented to further reduce impacts to air quality.

Noise

The modification will not result in exceedances of noise criteria at the nearest receivers, disturb sleep, or generate unacceptable road traffic and construction noise provided noise management measures are implemented.

Traffic

Potential traffic and safety impacts associated with the modification on local and main roads were assessed. The modification will not change existing peak hour vehicle movements and will not impact public transport. There will be minor changes to heavy vehicle movements outside of peak hours.

Hazards and Risks

The hazards and risks generated from the modification have been assessed in detail, including an updated fire risk assessment. The modification will not result in additional hazards and risks with the implementation of the recommended management measures.

Sustainability

The modification can be undertaken in an ecologically sustainable manner as it will not require alterations to the existing site, there will be no changes to site infrastructure and no requirement of landscaping or removal of vegetation.

Sustainability initiatives that were approved for the existing development have been implemented at the facility. They include a building management system to manage artificial light; rainwater harvesting reducing reliance on potable water; and translucent roof sheeting maximising natural light availability. Negotiations are also in their final stages to install a solar system with installation planned for March 2023.

The sustainability initiatives implemented at the site are aligned with Tyrecycle's commitment to carry out their operations in an environmentally responsible manner, with the promotion of sustainability in daily operations.

Other environmental matters

The following environmental matters were considered low risk and were not assessed in detail for the following reasons:

- Visual amenity – the modification will not change the external appearance of the facility.
- Contamination and hazards – the modification will not include excavation and will not disturb soils. There will be no change to the use of hazardous materials and the modification will not introduce any new hazardous materials to site.
- Surface water – the modification will not change any built or sealed areas and will not impact stormwater management and quality.
- Heritage – the modification will not change any buildings or require excavation and will not impact historic or cultural heritage.
- Biodiversity – the modification will not require habitat disturbance and will not impact biodiversity.
- Waste – the modification will increase quantities of waste receival, processing and dispatch but will not generate any new waste streams. The existing waste management plan has been revised in relation to the modification.

Conclusion

Potential impacts from the modification on air quality, noise, traffic and other environmental aspects were assessed. It was determined that with the implementation of environmental management and mitigation measures as outlined in this SEE, there would not be significant alteration to the supporting biophysical and social environments as a result of the modification.

Based upon the predicted environmental impacts of the modification and the ability to manage these impacts to minimise harm to the environment, the modification is unlikely to create any significant adverse environmental impacts on adjoining properties or prejudice the future use of land in the locality.

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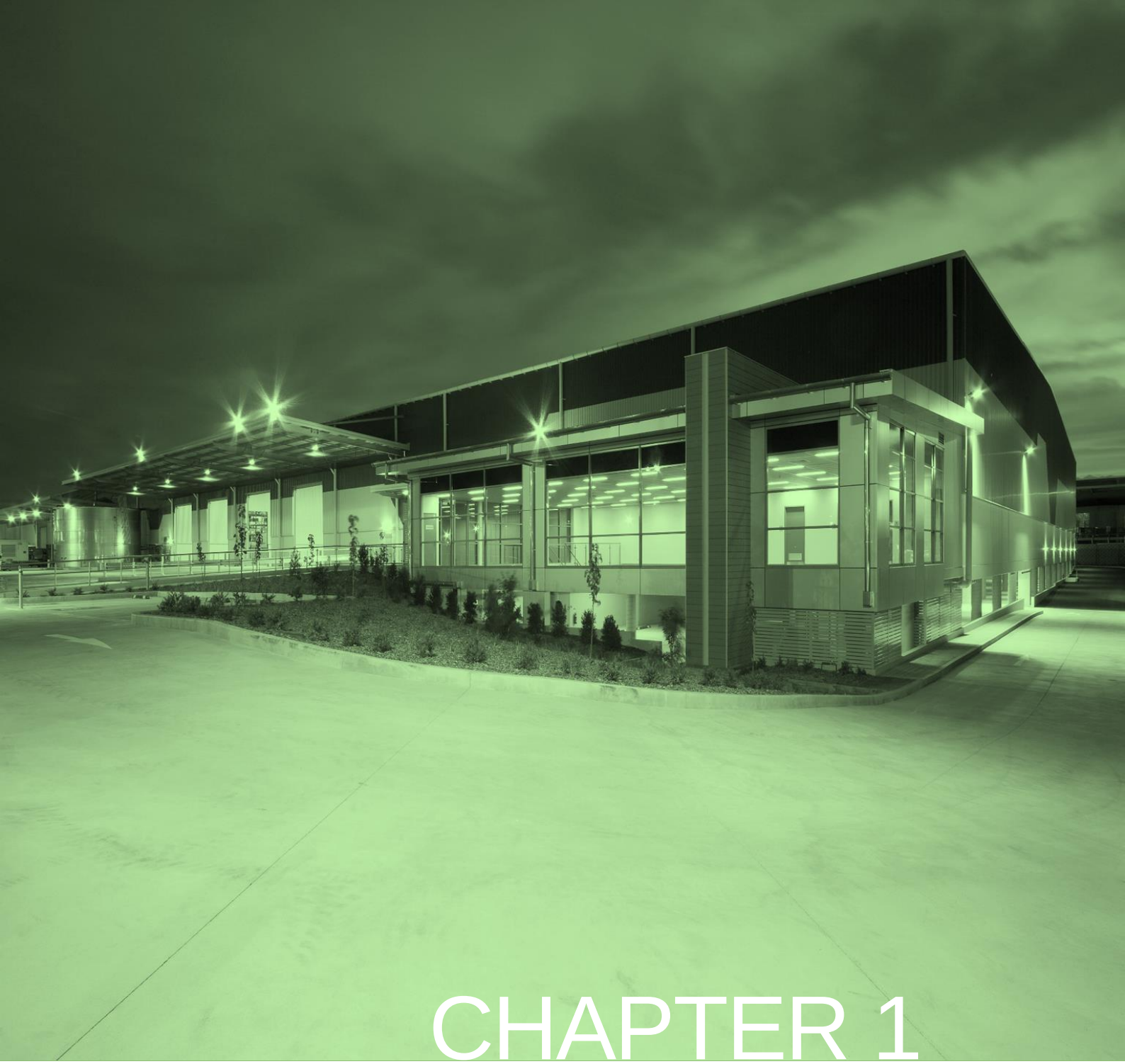
ABBREVIATIONS AND ACRONYMS

Abbreviation/Acronym	Definition
ADG	Australian dangerous good
AM	Ante meridiem: before noon
AS	Australian Standard
AQIA	Air quality impact assessment
BC Act	NSW *Biodiversity Conservation Act 2016*
CIV	Capital investment value
CO	Carbon monoxide
CO_2	Carbon dioxide
CLM Act	NSW *Contaminated Land Management Act 1997*
cm	Centimetre
DA	Development Application
dBA	A-weighted decibels
DCP	Development Control Plan
DPE	Department of Planning and Environment
Element	Element Environment Pty Ltd
EPA	NSW Environment Protection Authority
EP&A Act	The NSW *Environmental Planning and Assessment Act 1979*
EP&A Reg	The NSW Environmental Planning and Assessment Regulation 2021
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
EPI	Environmental planning instrument
EPL	Environment protection licence
ESD	Ecologically sustainable development
IESEPP	State Environmental Planning Policy (Industry and Employment) 2021
km	Kilometre
LEP	Local environmental plan
LGA	Local government area
LOTO	Lockout/tagout safety system
m	Metre
MNES	Matter of national environmental significance
NIA	Noise impact assessment
NO2	Nitrogen dioxide
NPI	Noise Policy for Industry
NPW Act	NSW *National Parks & Wildlife Act 1974*
NSW	New South Wales
NSW WARR	NSW Waste Avoidance and Resource Recovery Strategy 2014-21
O2	Oxygen
PHA	Preliminary hazard analysis
PIRMP	Pollution and incident response management plan
PM2.5	Particulate matter less than or equal to 2.5 micrometres in aerodynamic diameter
PM10	Particulate matter less than or equal to 10 micrometres in aerodynamic diameter
PM	Post meridiem: after noon
POEO Act	NSW *Protection of Environment Operations Act 1997*

Abbreviation/Acronym	Definition
PPE	Personal protective equipment
RFS	NSW Rural Fire Service
RHSEPP	State Environmental Planning Policy (Resilience and Hazards) 2021
RMS	NSW Roads and Maritime Services
SEPP	State environmental planning policy
SO2	Sulphur dioxide
t	Tonne
TEC	Threatened ecological community
TfNSW	Transport for NSW
TISEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021
tpa	Tonnes per annum
TSP	Total suspended particulate
WARR Act	NSW *Waste Avoidance and Resource Recovery Act 2001*
WMP	Waste management plan
µm	Micrometres



CHAPTER 1
INTRODUCTION

1 INTRODUCTION

1.1 Background

Tyrecycle Pty Ltd (Tyrecycle) is one of Australia's largest tyre recycling companies and operates a tyre processing facility at 1-21 Grady Crescent, Erskine Park, New South Wales (Lot 9 DP 1261030) (the site). Up to 29,000 tonnes per annum (tpa) of passenger, four-wheel drive and truck tyres are processed at the site (the existing development).

The existing development was approved by the Sydney Western City Planning Panel (SWCPP) on 20 December 2020 under Part 4, Division 4.3 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) as integrated development (DA20/0589 – the consent). The existing development was integrated development as it required an environment protection licence (EPL) under the NSW *Protection of the Environment Operations Act 1997* (POEO Act).

Tyrecycle proposes to modify the consent under Section 4.55(2) of the EP&A Act to increase the quantity of tyres received and processed at the site from 29,000 tpa to 60,000 tpa (the modification). Element Environment Pty Ltd (Element) has prepared this statement of environmental effects (SEE) on behalf of Tyrecycle to address:

- the pre-lodgement meeting notes provided by Penrith City Council (Council), following a pre-lodgement meeting on 25 August 2022; and
- the provisions of Section 4.15 of the EP&A Act.

1.2 The proponent

As summarised in Table 1.1, Tyrecycle is the proponent for the modification.

Tyrecycle was established in 1992 as a division of a major tyre manufacturer. Due to an unmet demand, it quickly expanded into a national tyre recycler for all types of tyres. It is now part of the highly regarded integrated resource recovery group ResourceCo Pty Ltd.

Table 1.1 Proponent details

Item	Detail
Project contact	Jim Fairweather – Chief Executive Officer
Postal address	30-56 Encore Avenue, Somerton VIC 3062
Company website	http://www.tyrecycle.com.au/
Corporate email address	jim.fairweather@tyrecycle.com.au
Contact no.	+61 3 8339 3518
ABN	84 085 545 053

1.3 Site location and existing environment

The site is in an existing leased warehouse and distribution complex in the Erskine Business Park. The site is approximately 10.8 kilometres (km) south-west of Blacktown and approximately 5.6 km south-east of St Marys.

The site is owned by Fitzpatrick Investments, which is the owner of the Fitzpatrick Industrial Estate in the Erskine Business Park.

The Erskine Business Park forms part of the Western Sydney Employment Area due to its strategic importance in the Sydney metropolitan area (FDS 2013). As shown on Figure 1.1, the Erskine Business Park provides a central location for employment generating activities in Western

Sydney, whilst providing strong links with major transport infrastructure (such as the M4 and M7 motorways) to facilitate the movement of goods regionally, nationally and internationally.

The site is in the 'general industrial' land use zone. General industrial land uses surround the site including PMA, DHL, IVE Group, Flower Power facilities, FedEx, Bellisimo Mobile Woodfired Pizza Catering and Coates Hire.

As shown on Figure 1.2, there are residential properties to the north of the site, with the closest approximately 330 metres (m) away on Shaula Crescent.

The site is highly modified and consists of asphalt driveways, concrete hardstand and the existing warehouse. Vegetation is limited to the eastern side of the warehouse and was previously landscaped to provide screening along Grady Crescent as part of the consent.

The local topography is gently undulating with elevation increasing to the south-east of the site.

The existing warehouse and administration office have a floor area of 9,620 m^2 and is between the PMA and FedEx building to the south and the Bellisimo Mobile Woodfired Pizza Catering and Coates Hire site to the north, with access via Grady Crescent.

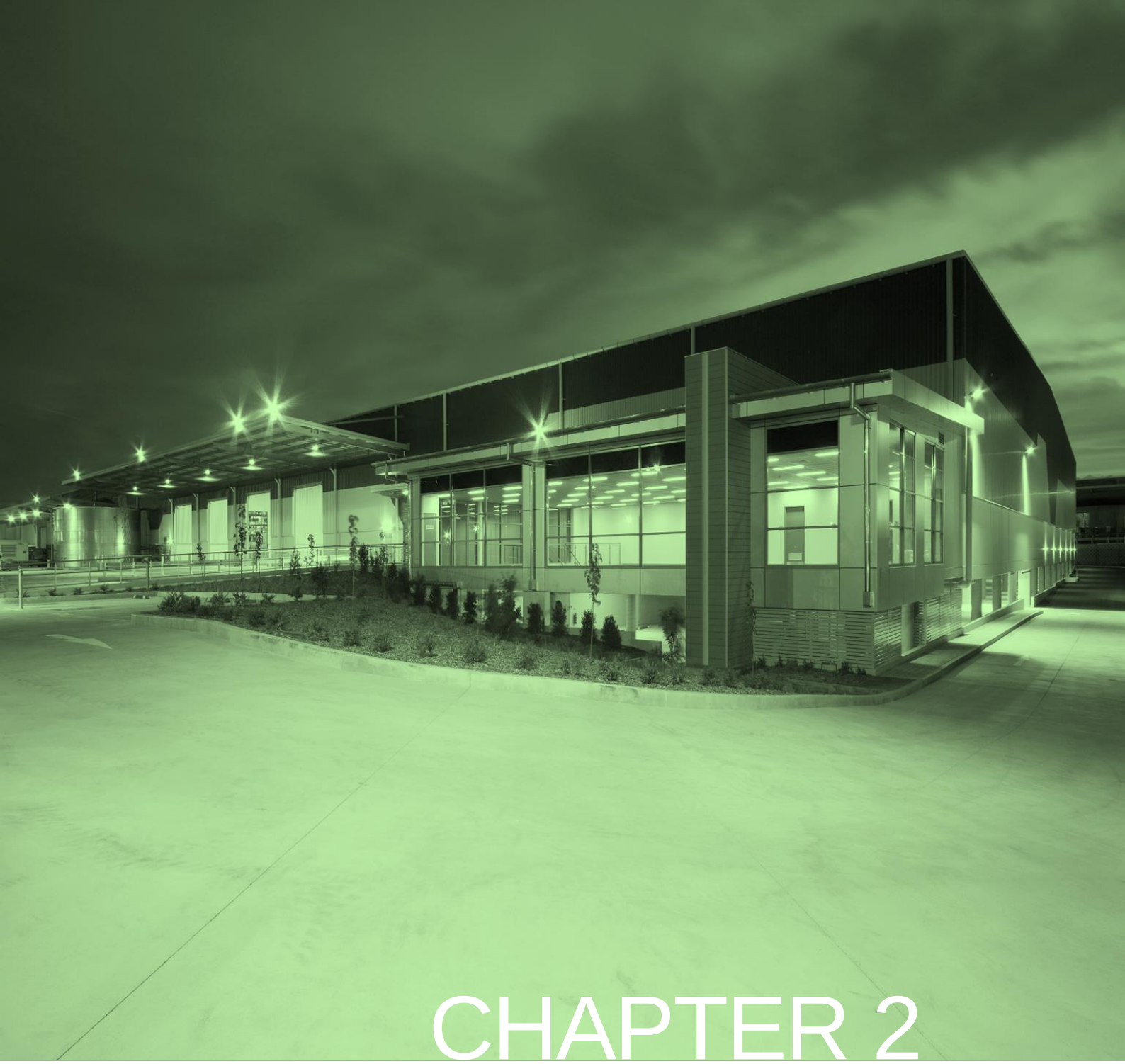
Refer to Chapter 5 for a description of the site in context of respective environmental aspects.

Figure 1.1
Regional context

Tyre Recycling Facility
Development Application - Statement of Environmental Effects

Figure 1.2
Local context

Tyre Recycling Facility
Development Application - Statement of Environmental Effects



CHAPTER 2
PROJECT DESCRIPTION

2 PROJECT DESCRIPTION

2.1 Existing operations

End-of-life tyres are received at the site and are processed into tyre derived fuel (TDF) or other tyre derived products (TDP), diverting tyres from landfill.

TDP is used as a construction material for roads and as a surface material for sports fields and playgrounds. It may also be used in conveyor belts or for civil engineering purposes such as embankments or as a lightweight fill. The TDF is used for either energy recovery (i.e. co-processing for use in cement kilns) or for energy generation in export markets.

Tyres still attached to the rim are separated and the wheels sorted into steel and aluminium streams prior to being removed off-site for recycling. Most truck tyres are processed on site into crumbed rubber.

By-products of the process, comprising steel and fibre textile, are sold as recyclable materials. There are no unwanted or hazardous by-products from the shredding process, and there is no need for chemical processing or heating, as tyres are processed via mechanical size reduction.

The existing development is summarised in Table 2.1 and existing plant and equipment comprises:

- Weighbridge.
- Tyre receival and storage bay.
- Tyre feeder.
- Primary shredder – super chopper.
- Two secondary process – rasper.
- Primary granulator.
- Primary classifier – textile/fabric separation.
- Secondary granulation.
- Secondary classifier – textile/fibre separation.
- Aspirator – classification of granular product.
- Cracker mill.
- Sieve.
- Bulk bag stations.
- Steel cleaning plant.
- Two dust extraction and air filtration systems.
- Waste storage and collection areas.
- Conveyor.
- Forklift.
- Skidsteer loader.
- Front-end-loader.

The existing operation comprises:

- **Receival and storage of tyres**: Tyres are collected by the Tyrecycle truck fleet, weighed at the weighbridge and then unloaded into dedicated storage areas in the warehouse, ready for processing. All feedstock is processed within 24 hours of receipt unless there is a mechanical breakdown.
- **Tyre feeder**: A front-end loader feeds tyres into the tyre feeder, which buffers the tyres to ensure automatic and continuous feeding to the super chopper.
- **Primary shredder – super chopper:** The super chopper is fed by the tyre feeder. A set of knives reduce tyres to a 15.2 cm rubber chip for sale as TDF or for further processing. A disc screen separates oversized material, which is returned to the super chopper for reprocessing.

- **Secondary shredding – raspers:** All 15.2 cm rubber chip allocated for further processing is fed into two raspers via a reversible conveyer from the super chopper. One of the raspers converts the 15.2 cm chips into a 3.8 cm TDF. The second rasper is connected to the granulation line and material fed into this rasper is further reduced in size during the granulation process. During the rasping process, the steel reinforcement of the tyre is removed as a by-product for sale as recyclable steel.
- **Granulation:** The granulation line consists of a primary and secondary granulator, each with a classifier, and a central aspirator. The granulators further reduce the size of the granules, and in the process liberates the fabric/textile and additional steel.
- **Fabric/textile separation:** The plant includes a fabric separator, allowing processing of a combination of passenger and truck tyres into rubber crumb in the one facility. After liberation by the granulators, the classifiers remove the fabric/textile and any remaining steel as a by-product for sale as an alternate energy source and recyclable steel. The rubber then passes through the aspirator where it is further classified and either bagged as granular product (third final product with some 'work in progress' (WIP) for later processing in the cracker mill) or processed directly through the cracker mill.
- **Cracker mill:** The cracker mill is fed with the granular product from the aspirator or WIP bulk bags. The energy efficient cracker mill uses two large rolls, rotating at different speeds. The granular rubber is forced through a small gap between the rolls, sheering the rubber, further reducing the size of the granules to 30 mesh or 40 mesh crumbed rubber. The rubber from the cracker mill is passed over a screen with oversized material returned to the cracker mill for reprocessing. Material that meets the specification is conveyed to the bulk bagging area and placed into bulk bags as 30 or 40 mesh (final product).
- **Fabric separator**: The fabric separator allows processing of passenger and truck tyres in the one facility. During the process, the steel and textile (fibre from passenger/four wheel drive tyres) are removed as by-products for sale as recyclable steel and textile.
- **Dispatch of processed tyres**: The TDF is loaded into shipping containers, ready for export. Bulk bags (on standard pallets) of granular material and crumbed rubber are stored in pallet racking for delivery to customers utilising B-doubles.
- **Storage and disposal of car batteries and oil filters**: In addition to the receival of waste tyres, Tyrecycle receives car batteries and oil filters on-site. Tyres and oil filters are not processed and are only stored prior to collection and disposal by a licensed contractor.

Note: The intent of the modification is for Tyrecycle to produce up an additional 31,000 tpa of TDF product for export to energy markets. Further processing of products will continue as per the existing approval.

Table 2.1 Summary of existing infrastructure and operations

Operational aspect	Detail
Site infrastructure	Existing site infrastructure comprises: ▪ The existing site area is 15,503 m^2. ▪ Warehouse building (9,300 m^2). ▪ Administrative office (320 m^2). ▪ Car parking (basement level for 78 parking spaces, including two disabled spaces). ▪ Landscaping. ▪ Security fencing (palisade style fencing along the Grady Crescent frontage in accordance with the development control plan (DCP). All other boundary fencing consists of black polyvinyl chloride coated chain wire mesh, consistent with all other developments on the Fitzpatrick Industrial Estate). ▪ Stormwater and drainage infrastructure. ▪ Awnings. ▪ Utility infrastructure. ▪ Fire protection system, including an early suppression fast response sprinkler system conforming with the requirements of the Building Code of Australia (BCA) and AS2188.1 (Automatic Fire Sprinkler Systems).

Operational aspect	Detail
Warehouse building	The existing warehouse building (including an administrative office) has a floor area of 9,620 m^2 and accommodates high bay storage racking in accordance with BCA requirements. The building is 12.2 m high and is supported by a steel structure and constructed with a concrete dado wall with metal cladding above. The roof of the building comprises zincalume metal cladding.
Vehicle access and parking	Vehicle access is provided by two driveways in the Grady Crescent frontage, enabling separated light and heavy vehicle access and movements in the site. The existing warehouse includes the provision of 78 car spaces via a basement car park. The maximum number of car spaces currently required at any one time is 28 (comprising employees for the day shift and management personnel). The parking requirements for the existing development is accommodated by existing parking available at the site. Heavy vehicles are parked in the loading dock of the site when not in use.
Services	The site is connected to the Sydney Water potable water and sewer system; NBN/Telstra's telecommunication network and Endeavour Energy's electricity network. The 500-kilovolt ampere (KVA) system on-site was upgraded to a 3,500 KVA system with an additional substation to facilitate the existing operations. Stormwater runoff is captured in the site's stormwater infrastructure, which flows to the Estate's approved stormwater system.
Volume of material processed per annum	The existing operation processes up to 29,000 tpa, recovering the following products: ▪ 30 Mesh – 9,397 tpa. ▪ 3.8 cm TDF – 12,620 tpa. ▪ Steel – 4,344 tpa. ▪ Fibre/Textile – 2,639 tpa.
Employment	The existing operation is split across three shifts as follows: ▪ Day shift (5 am to 1 pm) – 24 full time employees. ▪ Afternoon shift (1 pm – 9 pm) – three full time employees. ▪ Night shift (9 pm to 5 am) – three full time employees. The operations are supported by four full time management staff who typically work from 8 am to 5 pm weekdays.
Hours of operation	24 hours per day, seven days a week, including: ▪ Trucks (collection): - Monday – Friday: > Day: 4 am to 6 pm. > Night: 5 pm to 1 am. - Saturday: 4 am to 6 pm (as required). ▪ Plant operation (shredding): Monday 7 am to Saturday 7 am. ▪ Plant operation (crumbing): 24 hours, seven days per week. ▪ Deliveries (containers): Monday – Friday 8 am to 5 pm and Saturday 8 am to 6 pm (as required).
Development consent history	Development consent was granted by Council in 2013 for the construction of the warehouse and associated infrastructure (DA13/0193). A modification to DA13/0193 was subsequently granted for the site in 2013 and comprised: ▪ Deletion of dedicated driveway to basement parking. ▪ Relocation of two accessible parking spaces and additional three visitor spaces adjacent to the 'at grade' office entry. ▪ Relocation of approved outdoor area to main office level (adjacent to recessed loading dock). ▪ Deletion of lift, re-located amenities and modified office layout. ▪ Deletion of fire egress stairs to western warehouse elevation. ▪ Proposed electrical substation. Tyrecycle submitted a development application for the existing operations in 2020, and development consent (DA20/0589) was granted the SWCPP on 20 December 2020.
Land ownership	Fitzpatrick Investments Pty Ltd.
Zoning	IN1 – general industrial.

Operational aspect	Detail
Landscaping	The site is landscaped in accordance with the requirements of the development consent for the warehouse (DA13/0193). Landscaping exists at the main eastern frontage. It has been designed to help soften the impact of the warehouse to the Grady Crescent and is consistent with landscaping setbacks provided along the neighbouring PMA and DHL frontages to Grady Crescent. Landscaping also helps to screen the hardstand area from the road corridor (FDC 2013).
Traffic generation and internal movements	The existing development generates the following traffic during the morning and afternoon peak: ▪ Morning peak (4 am to 7 am) – seven outbound heavy vehicles trips and 31 light vehicle trips (28 inbound and 3 outbound). ▪ Afternoon peak (4 pm to 6 pm) – seven inbound heavy vehicles trips. The above traffic generation are considered worst case, however, in reality heavy vehicles which depart the site in the morning peak depart and return at staggered times of the day. Heavy vehicles associated with the existing development vary in size, with the most common vehicle type being rigid trucks, and largest a B-Double truck. As heavy vehicles return to site with tyres, they drive into the warehouse, offload the tyres into the designated area inside the warehouse, from which a front-end loader moves the material in the warehouse to the tyre feeder feeding the processing equipment. Tyre retailers also deliver tyres to the warehouse from 6 am to 5 pm. There are general deliveries to the site during standard business hours. There are an average of 125 containers of tyre waste materials delivered or collected by customers per month (average of six per day). Forklift and skid-steer loaders operate inside the warehouse during operational hours. Forklifts unload incoming tyres and load palletised crumbed and granule product into pallet racking for storage or onto outgoing B-Double trucks. Approximately 50 pallets are loaded and dispatched per day, equating to approximately two B-Double collections per day.
Lighting	There is existing lighting at the warehouse.
Security	Security infrastructure comprises: ▪ Security fencing. ▪ On-site security system: The warehouse building is alarmed to prevent unauthorised access. ▪ Security lighting. ▪ Closed circuit television (CCTV). ▪ Security gates (gate left open during the day and shut overnight and on weekends).
Signage	Signage comprises: ▪ Free standing site safety sign approximately 3015 millimetres (mm) x 1500 mm. ▪ Tyrecycle branding sign at the front of the building against the Terracotta wall at the office entry. ▪ Tyrecycle quality signage on the building near the loading docks.
Amenities	There are amenities in the administration office comprising toilet, basin, kitchen and break room. The internal floor space of the office was modified as part of the existing development to accommodate a meeting room and other operational requirements.
Waste management	All waste generated at the site is managed by Tyrecycle's lease conditions and in accordance with the waste management hierarchy. Waste streams generated are classified according to the *Waste Classification Guidelines* (EPA, 2014) and disposed of accordingly. Onsite waste management is summarised in Table 2.2.

Table 2.2 Waste management

Waste category	Approximate volume	Storage and final destination
General solid and food waste	6.25 kg/week	General solid waste is stored on-site in general waste bins. Bins are emptied into a central waste bin which is then collected by a licensed waste contractor. The waste is disposed of in landfill at a licensed waste facility.
Office waste	15 m^3/week	Recycling waste is kept in bins across the office before being emptied into a central, covered waste bin which is collected by a licensed waste contractor.
Wooden pallets	1m^3/ week	Collected into designated waste recycling area. Pallets are collected ad-hoc by a licensed contractor for recycling.
Ground sweepings	25 kg/week	Stored in site skip bin before collection by a licensed waste contractor on an ad-hoc basis.
Steel and textile	Steel: 79 tonnes/ week. Textile: 98 tonnes/ week.	Stored into designated shipping containers before collection by a licensed contractor for either recycling or sale. Spillage is fed back into the process thereby recovering the waste.
Used oil filters	1,250 filters/week	Received on-site and stored in bunded storage areas, installed in accordance with relevant Australian Standards. Spills are contained and managed in accordance with emergency response procedure. Filters are collected for recycling via a licensed waste contractor on an ad-hoc basis. Minimal stock maintained on-site.
Used automotive batteries	150 batteries per week equates to. 2,100 kg per week	Received on-site and stored in accordance with relevant standards and regulations, until collected for recycling by a licensed contractor. Car batteries are stored on pallets and wrapped ready for collection by the contractor. Collected on an ad-hoc basis to maintain minimal stock.

2.2 Proposed modification

Given recent demand, Tyrecycle is seeking to increase its production limit from 29,000 tpa to 60,000 tpa. To allow for the increased production Tyrecycle proposes to modify condition 8 of the consent:

"To ensure that the development does not exceed the threshold for designated development the proposed operation of a tyre processing facility (waste management facility) with ancillary storage and transfer of oil filters, oil drums and car batteries, is limited to a maximum handling capacity of no more than 30,000 tonnes per year of waste metal and rubber. Handling capacity includes the sorting, consolidating or temporary storage or material recycling of waste materials.

The approved activities at the site must not exceed the tonnages specified within the approved documentation, and as per the issued General Terms of Approval and related Environmental Protection License issued by the Environment Protection Authority (EPA). A log book or similar record containing evidence of total material tonnage received and stored per annum, is to be kept at the site and is to be made available for the EPA or Council inspection, upon request."

Tyrecycle is also seeking to vary conditions L2.1 and L2.3 of the EPL to increase the limit on the receival of waste tyres within a 12-month period from 29,000 t to 60,000 t.

The modification will not change the following approved aspects of the existing development:

- Operating method or site infrastructure.
- Plant and equipment.
- Building and infrastructure footprints.
- Vehicle parking requirements.
- Vehicle access and internal movement pathways.

- Hours of operation.
- Employment.
- Land ownership.
- Landscaping.
- Stormwater management.
- Utility services.
- Lighting, security and signage.

The existing development currently operates below its maximum capacity and given the state-of-the-art plant installed at the site, can meet the proposed increased capacity without requiring any alterations or additions to operations or the existing scale and layout of site infrastructure, plant and equipment.

The modification will continue to operate 24 hours a day, seven days a week. The quantity of tyres received and processed, and the quantity of TDF produced and dispatched will increase, contributing to additional truck movements to and from the site. Truck movements to and from the site will increase, with the additional movements occurring between 8 pm and 4 am outside of peak traffic hours.

The modification will generate up to 50 additional pallets of granulised and crumbed rubber product (palletised product) per day, requiring daily collection and dispatch via two additional B-double trucks.

Table 2.3 outlines the proposed operations as compared to the existing operations (as outlined in Table 2.1).

Table 2.3 Proposed modification of operations

Operational aspect	Existing operations	Proposed operations
Volume of material processed per annum	The existing operation processes up to 29,000 tpa, recovering the following products: ▪ 30 Mesh – 9,397 tpa; ▪ 3.8 cm TDF – 12,620 tpa; ▪ Steel – 4,344 tpa; and ▪ Fibre/Textile – 2,639 tpa.	The modification would increase the processing capacity of the site from 29,000 tpa to 60,000 tpa, comprising of the following products: ▪ 30 Mesh – 9,397 tpa; ▪ 3.8 cm TDF – 12,620 tpa; ▪ 15.2 cm TDF – 31,000 tpa ▪ Steel – 4,344 tpa; and ▪ Fibre/Textile – 2,639 tpa.
Employment	The existing operation is split across three shifts as follows: ▪ Day shift (5 am to 1 pm) – 24 full time employees. ▪ Afternoon shift (1 pm – 9 pm) – three full time employees. ▪ Night shift (9 pm to 5 am) – three full time employees. The operations are supported by four full time management staff who typically work from 8 am to 5 pm weekdays.	The modification will change shifts, specifically: ▪ Day shift (7 am to 3 pm) – 24 full time employees ▪ Afternoon shift (3 pm – 11 pm) – three full time employees. ▪ Night shift (11 pm to 7 am) – three full time employees. No change to management staff.
Hours of operation	24 hours per day, seven days a week.	No change.
Proposed operating hours per activity	Trucks (collection): ▪ Monday – Friday: - Day: 4 am to 6 pm. - Night: 5 pm to 1 am. ▪ Saturday: 4 am to 6 pm (as required). Plant operation (shredding): Monday 7 am to Saturday 7 am. Plant operation (crumbing): 24 hours, seven days per week. Deliveries (containers): Monday – Friday 8 am to 5 pm and Saturday 8 am to 6 pm (as required).	Trucks (collection): ▪ Monday – Friday: Night: 5 pm to 4 am. No change to plant operations.
Vehicle access and parking	Vehicle access is provided by two driveways in the Grady Crescent frontage, enabling separated light and heavy vehicle access and movements in the site. The existing warehouse includes the provision of 78 car spaces via a basement car park. The maximum number of car spaces required at any one time is 28 (comprising employees for the day shift, and management personnel). The parking requirements for the existing development is accommodated by existing parking available at the site.	No change.

Operational aspect	Existing operations	Proposed operations
	Heavy vehicles would be parked in the loading dock of the site when not in use.	
Traffic generation and internal movements	The existing development generates the following traffic during the morning and afternoon peak: ▪ Morning peak (4 am to 7 am) – seven outbound heavy vehicles trips and 30 light vehicle trips (25 inbound and 5 outbound). ▪ Afternoon peak (4 pm to 6 pm) – seven inbound heavy vehicles trips and 30 light vehicle trips (5 inbound and 25 outbound). The above traffic generation is worst case, however, it is likely that heavy vehicles which depart the site in the morning peak would depart and return at staggered times of the day. Heavy vehicles associated with the existing development vary in size, with the most common vehicle type being rigid trucks, and largest a B-Double truck. As heavy vehicles return to site with tyres, they drive into the warehouse, offload the tyres into the designated area inside the warehouse, from which a front-end loader moves the material in the warehouse to the tyre feeder feeding the processing equipment. Tyre retailers also deliver tyres to the warehouse periodically throughout business hours (6 am to 5 pm). General deliveries to the site throughout business hours required. There are an average of 125 containers of tyres materials are delivered or collected by customers per month (average of 15 per day). Forklift and skid-steer loaders operate inside the warehouse during operational hours. Forklifts unload incoming tyres and load palletised crumbed and granule product into pallet racking for storage or onto outgoing B-Double trucks. Approximately 50 pallets are loaded and dispatched per day, equating to approximately two B-Double collections per day.	No change to inbound and outbound light and heavy vehicle movements during the morning and afternoon peak periods. Heavy vehicle movements will increase across the working day, with the majority of additional movements occurring between 8 pm and 4 am. This includes two additional B-double movements to and from the site that are required to collect the additional palletised product generated from the modification. The modification does not require adjustments to the site plan or swept path diagrams on site.
Waste management	All waste generated at the site is managed by Tyrecycle's lease conditions and in accordance with the waste management hierarchy. Waste streams generated are classified according to the *Waste Classification Guidelines* (EPA, 2014) and disposed of accordingly. Onsite waste management is summarised in Section 5.5.6.	No change. Refer to Section 5.5.6 and Appendix B.

2.3 Need and justification

Prior to the development and operation of the site, Tyrecycle was processing approximately 11.5 million of the 51 million passenger tyres that reach end-of-life in Australia each year (Equilibrium, 2017). However, following increased demand, Tyrecycle now receives over 20 million end-of-life tyres per annum, with a recycling rate of 99%.

Due to the increased demand at the site, and the existing limitations stipulated in the conditions of consent (DA20/0589) and EPL (21464), Tyrecycle is no longer able to accommodate the increased market demand for recycled tyre products. As such, Tyrecycle is seeking to increase the quantity of tyres that can be received and processed each year at the site.

The increased production of TDF and TDP can be met using the existing state of the art equipment at the site, as the existing plant and equipment are capable of processing 60,000 tpa of TDF and TDP.

2.3.1 End-of-life tyres

The modification will enable Tyrecycle to meet the growing demand for sustainable and effective alternatives to landfill by processing end-of-life tyres into TDF or TDP.

2.3.2 Product stewardship

Tyrecycle is an accredited tyre collector and recycler working under the National Tyre Product Stewardship Scheme (TPSS) and is a member of the Australian Tyre Recyclers Association (ATRA).

The TPSS objectives are (DAWE 2020):

- To increase resource recovery and recycling.
- Minimise the environmental, health, and safety impacts of all end-of-life tyres generated in Australia.
- Develop Australia's tyre recycling industry and markets for TDP.

ATRA's objectives are to assist its members to minimise damage to human health and the environment, both locally and globally through cost-effective and environmentally sound tyre recycling activities.

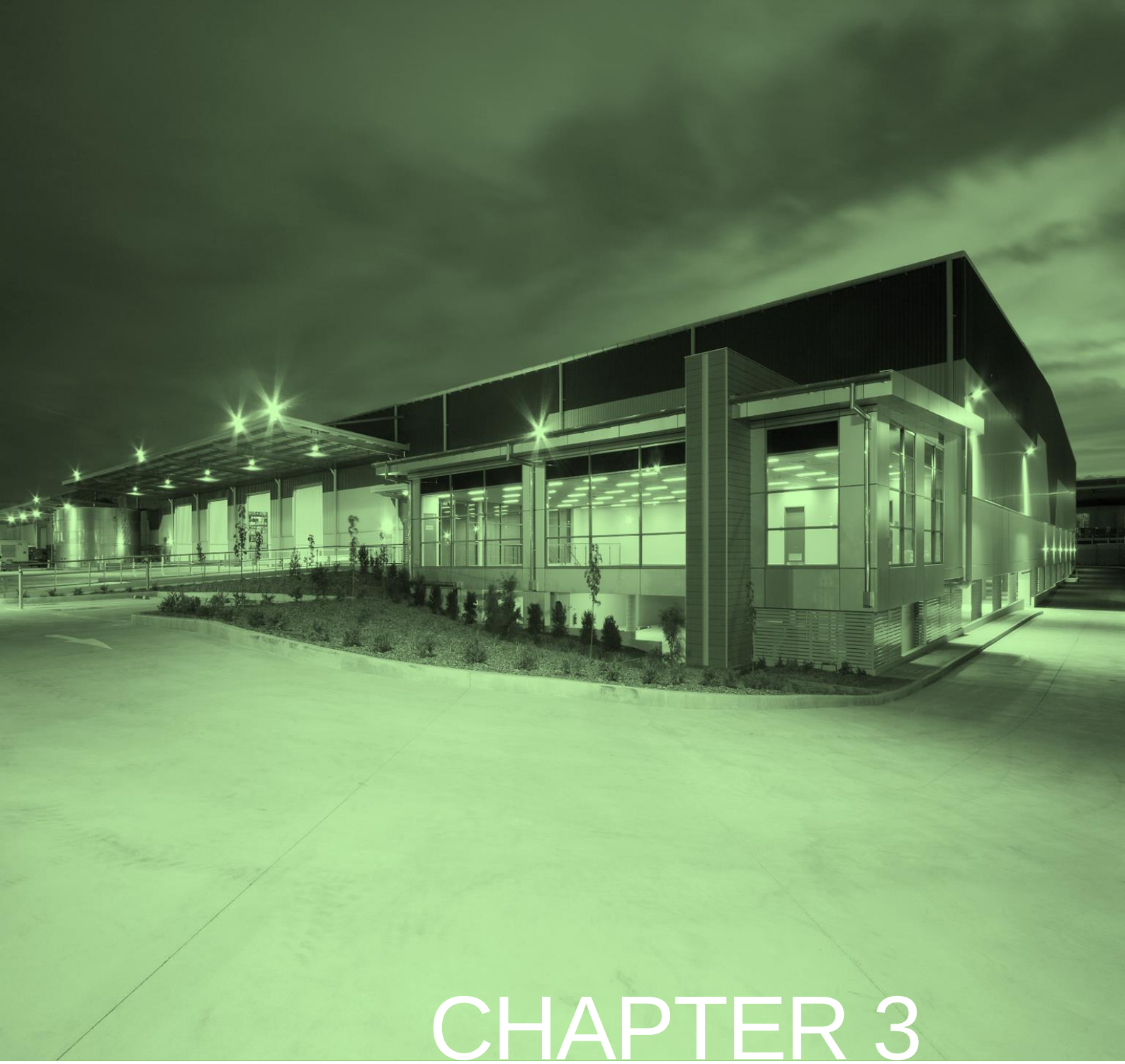
The modification will meet the objectives of the TPSS by processing end of life tyres into new products for potential use in:

- road construction (as a constituent in asphalt roads);
- surface materials (such as artificial turf, sporting field and playground surfaces, and conveyor belts);
- alternative fuel for industries (including producers of energy and cement, and as a substitute for diesel in explosives); and
- civil engineering (such as embankments and lightweight fill).

2.3.3 Social and economic

The site as modified will continue to employ 30 full time employees across three shifts, supported by four management staff. Therefore, the development will continue to contribute to the objectives of the Western Sydney Employment Hub.

As outlined in Section 3.3.1, the development continues to meet the objectives of the State Environmental Planning Policy (Industry and Employment) 2021 and will maintain viable employment opportunities that are suitable for the needs and skills of the workforce, allowing Penrith to fulfil its role as a regional city in the Sydney Metropolitan region.



CHAPTER 3
PLANNING FRAMEWORK

3 PLANNING FRAMEWORK

This section identifies the relevant Commonwealth and State environment and planning legislation, applicable environmental planning instruments, and discusses the relevant planning approval process applicable to the modification.

Of key importance is the evaluation of the environmental effects of the modification in accordance with Section 4.15(1) of the EP&A Act, which is outlined in Chapter 5 of this SEE.

3.1 Commonwealth legislation

A review of the Commonwealth legislation that is relevant to the modification is provided in Table 3.1.

Table 3.1 Commonwealth legislation

Planning provision	Comments
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Approval by the Commonwealth Minister for the Environment is required for any action that may have a significant impact on matters of national environmental significance (MNES) listed under the EPBC Act. If an activity is likely to have a significant impact on a MNES then it may be a controlled action and should be referred to the Commonwealth Minister for the Environment for consideration. The nine MNES are: ▪ World heritage properties; ▪ National heritage places; ▪ Wetlands of international importance (Ramsar wetlands); ▪ Nationally threatened species and ecological communities; ▪ Migratory species; ▪ Commonwealth marine areas; ▪ The Great Barrier Reef Marine Park; ▪ Nuclear actions (including uranium mining); and ▪ A water resource, in relation to coal seam gas development and large coal mining development. The Protected Matters Search Tool was reviewed in December 2022, which concluded that the modification will not significantly impact on any MNES and thus the requirements of the EPBC Act are not relevant to the modification. As such, referral of the modification to the Commonwealth Department of Agriculture, Water and the Environment is not required.
Native Title Act 1993 (NT Act)	The NT Act recognises that Aboriginal people have rights and interests to land and waters which derive from their traditional laws and customs. Native title may be recognised in places where Indigenous people continue to follow their traditional laws and customs and have maintained a link with their traditional country. It can be negotiated through a Native Title Claim, an Indigenous Land Use Agreement or future act agreements. The National Native Title Register, Register of Native Title Claims, and Register of Indigenous Land Use Agreements were searched in December 2022 for reported native title claimants in the LGA. There were no results for declared native title in the LGA. No Native Title has been prescribed for the land on which the modification is proposed and therefore no further approval is required under the NT Act.

3.2 NSW legislation

This section provides an overview of NSW legislation associated with the modification.

Table 3.2 provides a summary of the planning pathway for the modification, with additional detail in the subsequent sections.

Table 3.2 Planning pathway

Query	Comment	Section where query is addressed
Permissibility – Is the development permissible?	The site is in an IN1 – General Industrial land use zone specified by the State Environmental Planning Policy (Industry and Employment) 2021. The existing development is consistent with the definition of a waste management facility, which by virtue of State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP) and is permitted with consent in the IN1 land use zone. The proposed modification will not alter the permissibility of the development.	Section 3.3.1
Is the development integrated development?	The existing development required approval under the POEO Act as it requires an EPL to operate. Given that the requirement for an EPL is a trigger for integrated development under Section 4.46 of the EP&A Act, the existing development is integrated development. The development will continue to be categorised as integrated development following the proposed modification, as the development will continue to operate under an EPL.	Section 3.2.1
Is the development designated development?	The proposed modification will result in processing up to 60,000 tpa of tyre waste, which exceeds the designated development threshold of 30,000 tpa specified under section 45(2) of the NSW Environmental Planning and Assessment Regulation 2021 (EP&A Regulation). However, Tyrecycle has obtained legal advice (Appendix C) confirming the proposed increase to production is not designated development, but rather qualifies for modification under Section 4.55 of the EP&A Act. Therefore, Tyrecycle is seeking consent to modify the existing approval under this section of the EP&A Act and is not applying for designated development consent.	Section 3.3.1 and Section 3.2.2
Is the development state significant development?	State Environmental Planning Policy (Planning Systems) 2021 (Planning SEPP) defines development that is declared State significant development (SSD), provided it meets the relevant criteria set out in schedule 1. Section 23 of Schedule 1 to the Planning SEPP is relevant to waste and resource management facilities and states if resource recovery or recycling facilities process more than 100,000 tonnes of waste per annum, the development is declared SSD and approval would be required under Division 4.7 of the EP&A Act. The modification does not fall within the definition or thresholds of a SSD and therefore the provisions for SSD within the Planning SEPP are not applicable.	Section 3.3.1
Is the development regionally significant development?	Section 2.19 of the Planning SEPP identifies regionally significant development as development specified in Schedule 6. The existing development was declared to be regionally significant development under Section 5 of Schedule 6 to the SEPP (Planning Systems) as the CIV was above the $5 million threshold for 'waste or resource management facilities'. As such, and as per Council pre-lodgement advice for the proposed modification (Appendix D), the SWCPP will assess and determine the modification application.	Section 3.3.1
What level of assessment is required?	The modification will be assessed under section 4.55(2) of the EP&A Act.	Section 3.2.1
Who is the consent authority?	Tyrcycle is seeking to modify the consent of a regionally significant development, as such the SWCPP is the consent authority for the proposed modification as per section 4.5(b) of the EP&A Act.	Section 3.2.1

3.2.1 NSW Environmental Planning and Assessment Act 1979

Objectives

The EP&A Act is administered by DPE and local government authorities. It is the primary legislation governing environmental planning and assessment for NSW. The modification's consistency with relevant objectives of the EP&A Act are described in Table 3.3.

Table 3.3 Objectives of the EP&A Act

Objective	Comments
To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,	The modification will enable the existing operation to increase its processing capacity and accept more end-of-life tyres from the community, with the potential to divert an additional 31,000 tpa of tyre waste from landfill. The site will continue to contribute to the NSW and National economy and maintain ongoing employment opportunities for 30 personnel.
To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,	The proposed modification is consistent with the principles of ecologically sustainable development (ESD) as outlined in Section 3.2.2.
To promote the orderly and economic use and development of land,	The orderly and economic use of land is best served by development which is permissible under the relevant environmental planning instruments and generally in accordance with planning controls. The modification comprises a permissible development which is consistent with the statutory control and strategic planning directions. The site is also geographically separated from incompatible land uses such as residential and environmental conservation zoning, so as to avoid potential amenity impacts. The site would continue to operate within the already established industrial warehouse complex and utilise the operation's existing equipment, plant, infrastructure and warehouse layout. Potential environmental risks associated with the increased processing capacity of the operation have been subject to specialist assessment. As demonstrated in Chapter 5 of this SEE, all noise and air emissions generated by the modification will comply with relevant assessment criteria at all times of operation. Additional traffic generated by the modification will not result in detrimental impacts to the surrounding and arterial road network. Appropriate mitigation measures and management strategies have been proposed to reduce any adverse residual environmental and social impacts.
To promote the delivery and maintenance of affordable housing,	Not applicable to the modification.
To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,	The site is highly modified and consists of asphalt driveways, concrete hardstand and the existing warehouse. Vegetation is limited to a few isolated trees and shrubs on the eastern side of the warehouse, planted for landscaping and screening along Grady Crescent. As the modification will not require any changes to the current layout of the site, there is no significant impact to fauna or flora at the site.

Objective	Comments
To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),	The site is covered by impermeable concrete hardstand with an existing warehouse building. The modification will not disturb ground. As such, the modification will not impact upon items of Aboriginal or non-Aboriginal heritage significance.
To promote good design and amenity of the built environment,	Specialist consultants have assessed potential impacts to noise, air quality, traffic and access, and hazards and risks, as described in Chapter 5.
To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,	The modification will not require the construction of any new buildings, structures or infrastructure. All existing structures for the modification comply with relevant building standards and are maintained to improve the health, well-being and safety of site personnel.
To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,	Despite development consent to be granted by the SWCPP, Council, as local government authority, will assess and provide a recommendation for approval of the modification. By virtue of integrated development and referral to other government agencies, such as the EPA, it is considered that both State and local government agencies would share responsibility for assessment and approval of the modification.
To provide increased opportunity for community participation in environmental planning and assessment.	Following submission of the development application, Council will notify all government agencies, organisations, interest groups, stakeholders and community members with a potential interest in the modification to review the SEE, seek clarification with Tyrecycle on the content of the SEE and provide written submissions if required.

Tyrecycle is seeking a modification to the existing development consent under Section 4.55 (2) of the EP&A Act. The requirements of this section are outlined below in Table 3.4.

Table 3.4 Section 4.55(2) Requirements

Clause and requirements	Comments
4.55 Modifications of consents – generally (cf previous s 96) (2) Other modifications. A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if--	-
(a) it is satisfied that the proposed modification is of minimal environmental impact, and	Chapter 5 summarises the environmental impacts associated with the modification. The modification relative to the original approval is of minimal environmental impact.
(b) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally grated was modified (if at all), and	The proposed modification will remain substantially the same development as approved. This is supported by legal advice from Swaab (Appendix C) and the minor nature of changes resulting from the modification when compared to the existing development.
(c) it has notified the application in accordance with – (i) the regulations, if the regulations so require, or	The modification application will be submitted to Council which may require the notification or advertising of the application for modification of a development consent.

Clause and requirements	Comments
(ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and	
(d) it has considered any submissions made concerning the proposed modifications with any period prescribed by the regulations or provided by the development control plan, as the case may be.	Any submissions made will be considered.
Subsections (1) and (1A) do not apply to such a modification.	-
(3) In determining an application for modification of a consent under this section, the consent authority must take into consideration such of the matters referred to in section 4.15(1) as are of relevance to the development the subject of the application. The consent authority must also take into consideration the reasons given by the consent authority for the grant of consent that is sought to be modified.	Refer to Table 3.5.
(4) The modification of a development consent in accordance with this section is taken not to be the granting of development consent under this Part, but a reference in this or any other Act to a development consent includes a reference to a development consent as so modified.	-

As outlined above, in determining an application for a modification of an existing development consent, the determining authority is to take into account those matters listed under Section 4.15(1) of the EP&A Act, as they are relevant to the modification. A summary of the matters requiring consideration, and comments on how/where these matters have been addressed within this report are outlined in Table 3.5.

Table 3.5 Section 4.15(1) EP&A Act matters for consideration

Clause and requirement	Comment
4.15(1) Matters for consideration – general In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application: (a) the provisions of -	-
(i) any environmental planning instrument, and	All environmental planning instruments relevant to the modification have been considered in Section 3.3.
(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and	N/A
(iii) any development control plan, and	Refer to Section 3.3.3.

Clause and requirement	Comment
(iiia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and	N/A
(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph),	Refer to Section 3.2.2.
(v) (Repealed)	-
that apply to the land to which the development application relates,	-
(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,	Refer to Chapter 5.
(c) the suitability of the site for the development,	Refer to Section 1.3.
(d) any submissions made in accordance with this Act or the regulations,	Tyrecycle will respond to any government agency or public submissions received during the exhibition of the development application that Council requests a response to.
(e) the public interest.	Clauses (d) and (e) of section 4.15(1) require that any public submissions made in accordance with the Act or the public interest be considered in the development assessment process. Tyrecycle will respond to any public submissions received during the exhibition of the development application that Council requests a response to.

Integrated development

Part 4 (Development Assessment and consent), Division 4.8 (Integrated development), section 4.46 of the EP&A Act states that a proposal is integrated if an EPL is required under the POEO Act.

EPL 21464 (issued on 19 May 2021) licenses the development to carry out the scheduled activities of:

- Waste processing (non-thermal treatment).
- Resource recovery.
- Waste storage.

Condition L2 of the EPL limits the quantity of waste that may be received within a 12 month period and permitted on the premises at any one time (Table 3.6). The modification will exceed the EPL limit of 29,000 tpa and a variation to the EPL is required.

Table 3.6 EPL waste limits

Waste	Activity	Limit
Waste oil/hydrocarbons mixtures/emulsions in water	Waste storage	A maximum of 60 tonnes of waste lead acid batteries and/or waste oil permitted to be stored at the premises at any one time.
Waste tyres	Waste processing (non-thermal treatment) Waste storage	A maximum of 29,000 tonnes to be received at the premises in a 12-month period.
Lead acid batteries	Waste storage	A maximum of 60 tonnes of waste lead acid batteries and/or waste oil permitted to be stored at the premises at any one time.

Before granting development consent, under Section 4.47 of the EP&A Act, Council must refer the development application to the integrated development authority (i.e. EPA) and incorporate the public authority's general terms of approval. It must not approve the development application if the integrated authority recommends refusal. If the advice is not received in 21 days after the integrated authority has received the application or requested additional information, the consent authority can determine the development application.

3.2.2 Environmental Planning and Assessment Regulation 2021

Designated development

As summarised in Table 3.2, the modification could be defined as designated development as it would process up to 60,000 tpa of tyre waste, which exceeds the designated development threshold of 30,000 tpa specified under Clause 45(2), Schedule 3 of the EP&A Regulation.

Despite the proposed increase in production, as demonstrated later in this SEE, the potential environmental impacts arising from the proposed development inclusive of the increased production will be minimal. To this effect, Tyrecycle engaged Swaab to undertake a legal review of the proposed development (refer to Appendix C).

The legal review concluded that:

- The SWCPP, in having regard to the relevant legal principles and recent case law, has the power to modify the original development consent via application of Section 4.55(1A) of the EP&A Act, given that the proposed development is 'substantially the same' as the development for which the original development consent was granted.
- The proposed development is an alteration to an approved development, being an alteration to the handling capacity limit of the original development consent.
- The proposed development will have only minimal environmental impacts and consequently there will not be a significant increase in the impacts of the development, the subject of the original development consent.

With the above considered, Tyrecycle is seeking consent to modify the existing approval under Section 4.55 of the EP&A Act and is not applying for designated development consent.

Whilst the legal advice supports an application under Section 4.55(1A), Tyrecycle understands that Council's preference is for the modification to be submitted under Section 4.55(2). Given that the requirements under Section 4.55(1A) are more conservative than those under Section 4.55(2), Tyrecycle consider that the legal advice has the same effect. Therefore, Tyrecycle is applying for consent to modify the existing approval under Section 4.55(2) of the EP&A Act.

Ecologically sustainable development

One of the objects in Section 1.3 of the EP&A Act is:

> *to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment".*

Clause 193 of the EP&A Regulation defines ESD.

This section outlines how the modification aligns with ESD principles.

The precautionary principle

The precautionary principle reinforces the need to take risk and uncertainty into account, particularly when potential threats of irreversible damage to the environment may be unknown or little understood.

In the application of the precautionary principle, the modification will be to a well-established operation. Tyrecycle has operated the existing development since December 2021 and has numerous similar operations around Australia.

The potential environmental impacts associated with the activity are well understood and have been effectively managed in a manner which results in little to negligible environmental impact.

This understanding gained from observing and monitoring current and similar operations has led to the identification of the key issues relating to the modification, which pose the greatest risk to the environment. Air, traffic and noise were assessed in detail to fully understand the key issues associated with the modification and to identify necessary environmental controls and management measures to avoid, minimise or at least mitigate these issues.

The approvals process meets the requirements of the precautionary principle and this SEE provides a process for identifying and assessing the potential impacts and environmental consequences of the modification.

Intergenerational equity

Intergenerational equity is the concept that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

One of the primary objectives of the modification is to facilitate operations that maintain continuity and beneficial reuse of waste material (i.e. tyres) in an environmentally and socially responsible manner.

This SEE has addressed the principles of intergenerational equity through:

- Engagement of suitably qualified, experienced and independent technical specialists to ensure the environmental assessment was independent and transparent.
- Management strategies and mitigation measures to minimise any potential adverse impact upon the local environment and nearby communities.

The modification will continue to divert waste from landfill and recycle wastes to reduce dependence on virgin materials, thus increase the availability of landfill space and raw materials for future generations.

Conservation of biological diversity and ecological integrity

This is the concept that conservation of biological diversity and ecological integrity should be a fundamental consideration.

As outlined in Chapter 5, the modification will not result in significant impacts to biodiversity.

Improved valuation and pricing of environmental resource

The principle of improved valuation, pricing and incentive mechanisms deems that environmental factors should be included in the valuation of assets and services, and that those who generate the pollution and waste should bear the cost of containment, avoidance or abatement.

Tyrecycle acknowledges and accepts the financial costs associated with all the measures required for the modification to avoid, minimise, mitigate and manage potential environmental and social impacts.

3.2.3 Other NSW legislation

Table 3.7 summarises the other NSW legislation potentially relevant to the modification.

Table 3.7 Summary of NSW legislation

Legislation	Overview
NSW *Protection of the Environment Operations Act 1997*	The POEO Act aims to protect, restore and enhance the quality of the environment in the context of ecologically sustainable development and to reduce risks to human health and prevent degradation of the environment. Section 48 of the POEO Act outlines that an EPL is required for any scheduled activities to be undertaken at a premise at which Schedule 1 of the Act indicates that a licence is required. EPL 21464 was issue by the EPA on 19 May 2021, which imposes limits on the quantity of tyres received at the site and the quantity of waste permitted on site at any one time. Tyrecycle met NSW EPA on 23 January 2023 to discuss the modification and matters relating to the upcoming licence variation.
Protection of the Environment Operations (Waste) Regulation 2014 (POEO Waste Reg)	The POEO Waste Reg aims to reduce the risks associated with waste activities in NSW to human health and the environment. The key area of application to the modification is the “proximity principle”, which aims to reduce unnecessary transportation of waste and ensure local communities take a greater responsibility for the waste they generate. The POEO Waste Reg makes it an offence to transport waste generated in NSW by motor vehicles for disposal more than 150 km from the place of generation (unless the nearest lawful disposal facilities are over 150 km from the place of generation). Section 76 requires companies that transport or receive waste tyres in excess of 200 kg or 20 tyres to use WasteLocate to report the movement of these tyres within NSW. Tyrecycle is subject to this requirement. Tyrecycle is transporting more than two tonnes of tyres or 200 kg of all other types of category 2 trackable waste in any load to another state or territory from NSW or into NSW from another state or territory. Tyrecycle therefore hold a waste transport licence and will continue to operate under this licence (EPL 11668). All waste transported is in full compliance with the POEO Waste Reg.
NSW *National Parks and Wildlife Act 1974* (NPW Act)	The NPW Act contains provisions for the protection and management of national parks, historic sites, nature reserves and Aboriginal heritage. The NPW Act provides statutory protection for Aboriginal objects by making it illegal to move, damage, deface or destroy a relic without written permission from the DPIE. The site is on existing disturbed land, within an existing warehouse building and will not have impacts to national park reserves, historic sites, nature reserves and Aboriginal heritage values afforded protection under the NPW Act.
NSW *Biodiversity Conservation Act 20*16 (BC Act)	The BC Act provides protection for threatened plants and animals native to NSW excluding fish and marine vegetation) and integrates the conservation of threatened species into development control processes under the EP&A Act. The site is on existing disturbed land, within an existing warehouse building and will not have impacts to threatened species, populations and communities listed under the BC Act.
NSW *Roads Act 1993*	Section 138 of the *Roads Act 1993* requires consent to be obtained prior to disturbing or undertaking work in, on or over a public road. No upgrades will be required to the local road network to accommodate the modification, and therefore a separate consent is not required under the Roads Act.
NSW *Contaminated Land Management Act 1997* (CLM Act)	The CLM Act establishes a process for investigating, and where required remediating contaminated lands, that pose a risk to human health and the environment. EPA’s Contaminated Land Record and List of Contaminated Sites notified to the EPA was searched in January 2023 for the Penrith LGA. No recorded contaminated sites near the site were identified.

Legislation	Overview
	Other than an unforeseen localised hydraulic oil leak from vehicles or machinery associated with the operation, contaminating activities are unlikely to occur. Operations associated with the modification will remain contained within the existing warehouse building on sealed concrete and no earthworks are required.
NSW *Waste Avoidance and Resource Recovery Act 2001* (WARR Act)	The purpose of the WARR Act is to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecological sustainable development. This Act provides for the making of policies and strategies to achieve these ends. The WARRA promotes a hierarchy of avoidance of unnecessary resource consumption; resource recovery (including reuse, reprocessing, recycling and energy recovery), and disposal (as a last resort). The modification promotes a hierarchy of avoidance of unnecessary resource consumption and facilitates resource recovery (including reuse, reprocessing, recycling and energy recovery of tyres). Resource recovery benefits the economy and environment by reducing the need for new materials and subsequent additional waste generation to landfill.

3.3 Environmental planning instruments

Environmental planning instruments (EPIs) such as State environmental planning policies (SEPPs) and local environmental plans (LEPs) are legal documents that regulate land use and establish requirements for development consent in NSW.

3.3.1 State environmental planning polices

The SEPPs considered in relation to the modification are summarised in Table 3.8.

Table 3.8 SEPPs relevant to the modification

SEPP	Overview
State Environmental Planning Policy (Planning Systems) 2021	As summarised in Table 3.2, the proposed increase to production is not SSD, however is a modification to a regionally significant development and as such will be determined by SWCPP.
State Environmental Planning Policy (Industry and Employment) 2021 (Employment SEPP)	The site is subject to the Employment SEPP and is in the Western Sydney Employment Area (WSEA) 'Precinct 7' (Erskine Park Employment Lands). The SEPP aims to protect and enhance the land to which the policy applies for employment purposes. The particular aims of this policy are as follows: (a) to promote economic development and the creation of employment of land in the WSEA; (b) to provide for the co-ordinated planning and development of land in the WSEA; (c) to rezone land for employment, environmental conservation or recreation purposes, (d) to improve certainty and regulatory efficiency by providing a consistent planning regime for future development and infrastructure provisions in the WSEA; (e) to ensure that development occurs in a logical, environmentally sensitive and cost-effective manner and only after a development control plan (including specific development controls) has been prepared for land concerned; and (f) to conserve and rehabilitate areas that have a high biodiversity or heritage or cultural value, in particular areas of remnant vegetation. The modification will continue to assist the approved development in upholding the aims of the Employment SEPP. Lenore Drive is mapped as a transport infrastructure route in the SWEA. As the site is in the vicinity of Lenore Drive and the modification will continue to utilise this roadway to access the site, the provisions of Section 2.25 apply

SEPP	Overview
	and Council must refer the modification application to DPE and take into account any comments received.
State Environmental Planning Policy (Resilience and Hazards) 2021 (Hazards SEPP)	Chapter 3 requires the consent authority to consider whether a proposal is a potentially hazardous industry or a potentially offensive industry. The existing development was assessed by applying the screening process specified in Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (NSW Department of Planning, 2011), and found the development was not classified as hazardous or offensive industry under the SEPP. Given the modification is substantially the same development, it is not classified as hazardous or offensive industry and the preparation of a preliminary hazard analysis (PHA) report is not required. Chapter 4 aims to provide a state-wide planning approach to the remediation of contaminated land and to reduce the risk of harm to human health and the environment by consideration of contaminated land as part of the planning process. Under Chapter 4 a consent authority must not consent to the carrying out of development on land unless it has considered potential contamination issues. The EPA's Contaminated Land Record and List of Contaminated Sites notified to the EPA was searched in January 2023 for the Penrith LGA. No recorded contaminated sites near the site were identified. Other than an unforeseen localised hydraulic oil leak from vehicles or machinery associated with the operation, contaminating activities are unlikely to occur. Operations associated with the modification will remain contained within the existing warehouse building on sealed concrete and no earthworks are required.
State Environmental Planning Policy (Transport & Infrastructure) 2021 (Infrastructure SEPP)	The Infrastructure SEPP provides a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process. This SEPP facilitates the development of State infrastructure, including telecommunication facilities, sewerage works and storm water management, and specified when development consent is (and is not required) for such development when carried out in certain zones. Section 2.122, in conjunction with Schedule 3 of the Infrastructure SEPP identifies that any alteration or addition to the size or capacity of a waste or resource management facility is traffic generating activity. Therefore, the provisions of the Infrastructure SEPP require the consent authority to give written notice of the development application to Transport for NSW (TfNSW), and consider any response or submission provided by TfNSW within 21 days of the notification. As highlighted in Section 5.3, traffic generated by the modification will not result in detrimental impact to the surrounding and arterial road network, and traffic routes utilised as a result of the modification will continue to avoid local roadways surrounded by residential land uses.

3.3.2 Penrith Local Environmental Plan 2010

Sections of the Penrith Local Environmental Plan 2010 (Penrith LEP) relevant to the modification are summarised in Table 3.9.

Table 3.9 Penrith LEP relevant sections to the modification

LEP section	Comment
Section 7.4 sustainable development	In deciding whether to modify the existing development consent, the consent authority must have regard to the principles of sustainable development. Refer to Section 3.2.2.
Section 7.6 salinity	The objective of this section is to protect natural hydrological systems by minimising soil disturbance and ensuring appropriate land use management; and to avoid the adverse effects of

LEP section	Comment
	rising salinity on land, including damage to infrastructure and buildings. Earthworks or land disturbance will not occur as part of the modification and therefore adverse effects of rising salinity will be is avoided.
Section 7.7 servicing	The objective of this section is to ensure that development of land reflects the availability of services. The modification is within an existing warehouse building, which is well serviced in regard to existing public utility infrastructure. All services are readily available and will continue to be used for the modification.

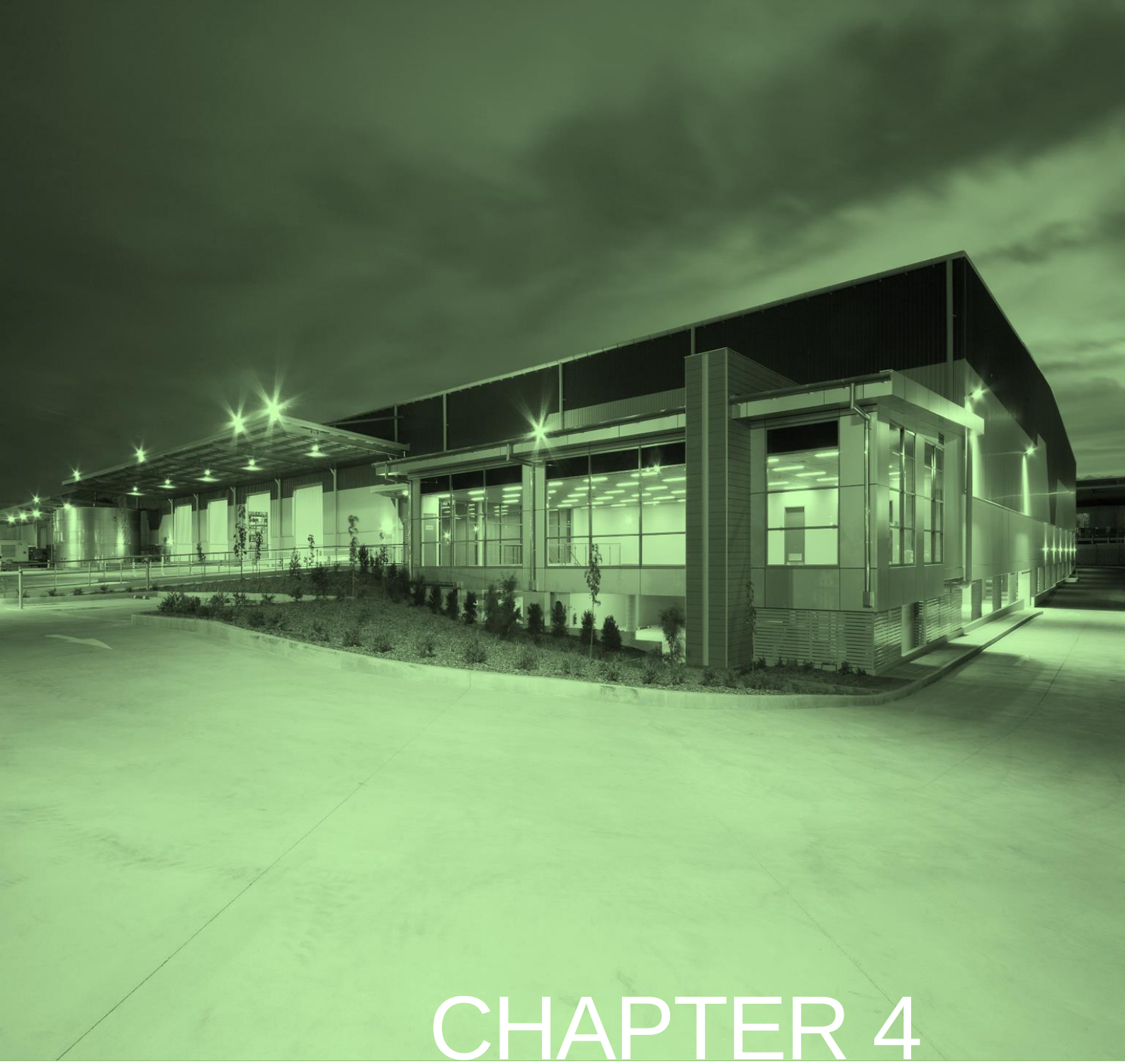
3.3.3 Other plans and policies

Penrith Development Control Plan 2014

The Penrith Development Control Plan 2014 (Penrith DCP) comprises core parts describing development controls applicable to the Erskine Business Park (E6), which are summarised in Table 3.10.

Table 3.10 Penrith DCP – E6 Erskine Business Park

DCP section	Comment
E6 Erskine Business Park	
6.4 Environmental quality 6.4.1: Noise pollution	Given the location of the site, very few impacts are anticipated with regard to the modification. Noise impacts are discussed further in Section 5.1.
6.4.2 Air pollution	Air impacts are discussed further in Section 5.2.
6.4.3 Storage, transportation and/or processing of chemical substances	This part ensures that the use, storage or transportation of any chemical substances do not have any detrimental impact on the environmental quality of the surrounding area. The DCP requires the consideration of the Hazards SEPP. Refer to Section 5.4 for consideration of the SEPP and other storage and handling of dangerous goods and hazardous substances.
6.5 Drainage	The provision of a drainage system is necessary to ensure that urban development is adequately serviced, occurs in an orderly manner and that best practice is applied to stormwater management solution. In consultation with the EPA, additional pro-active sediment control measures will be implemented at the site to ensure any excess debris during operation of the modification does not enter the stormwater system. Stormwater considerations are discussed further in Section 5.5.3.
6.6 Transport network	Part 6.6 considers the transport and car parking requirements for development within the Erskine Business Park. Traffic impacts are discussed further in Section 5.3. The maximum truck size associated with the modification has been previously assessed and is able to safely manoeuvre through the site.



CHAPTER 4
CONSULTATION

4 CONSULTATION

Tyrecycle and Element met with Council planning officers at a pre-lodgement meeting (via video conference) on 25 August 2022. Pre-lodgement meeting advice notes were provided by Council on 15 September 2022 (Appendix D), which are summarised in Table 4.1.

Table 4.1 Council pre-lodgement notes

Documentation	SEE reference
Updated operational plan of management	Appendix A.
Updated operational waste management plan (WMP)	Appendix B includes Council's WMP form and Section 5.5.6.
Acoustic Impact Assessment	Section 5.1 and Appendix E.
Air Quality Impact Assessment	Section 5.2 and Appendix F.
A Traffic Impact Assessment Report	Section 5.3 and Appendix G.
Turning swept paths in accordance with AS2890	Given there will be no change to truck types on-site, swept path diagrams will remain the same as provided in the original development application.

The potential planning pathways available to the modification were discussed in the pre-lodgement meeting.

Following the meeting, Tyrecycle undertook a preliminary review of the potential environmental impacts of the modification, including a review of the revised operations on potential air and noise emissions, and traffic impacts on the road network. Council advised that Tyrecycle could provide additional supporting information in which Council could further clarify whether modification of the existing development consent is a viable submission pathway.

Letter correspondence was provided to Council on 14 November 2022 including the legal opinion (Appendix C) and preliminary environmental impact assessments for air, noise and traffic impacts associated with the modification. Council subsequently confirmed on 2 December 2022 that Tyrecycle proceed with an application to modify the consent under Section 4.55(2) of the EP&A Act.

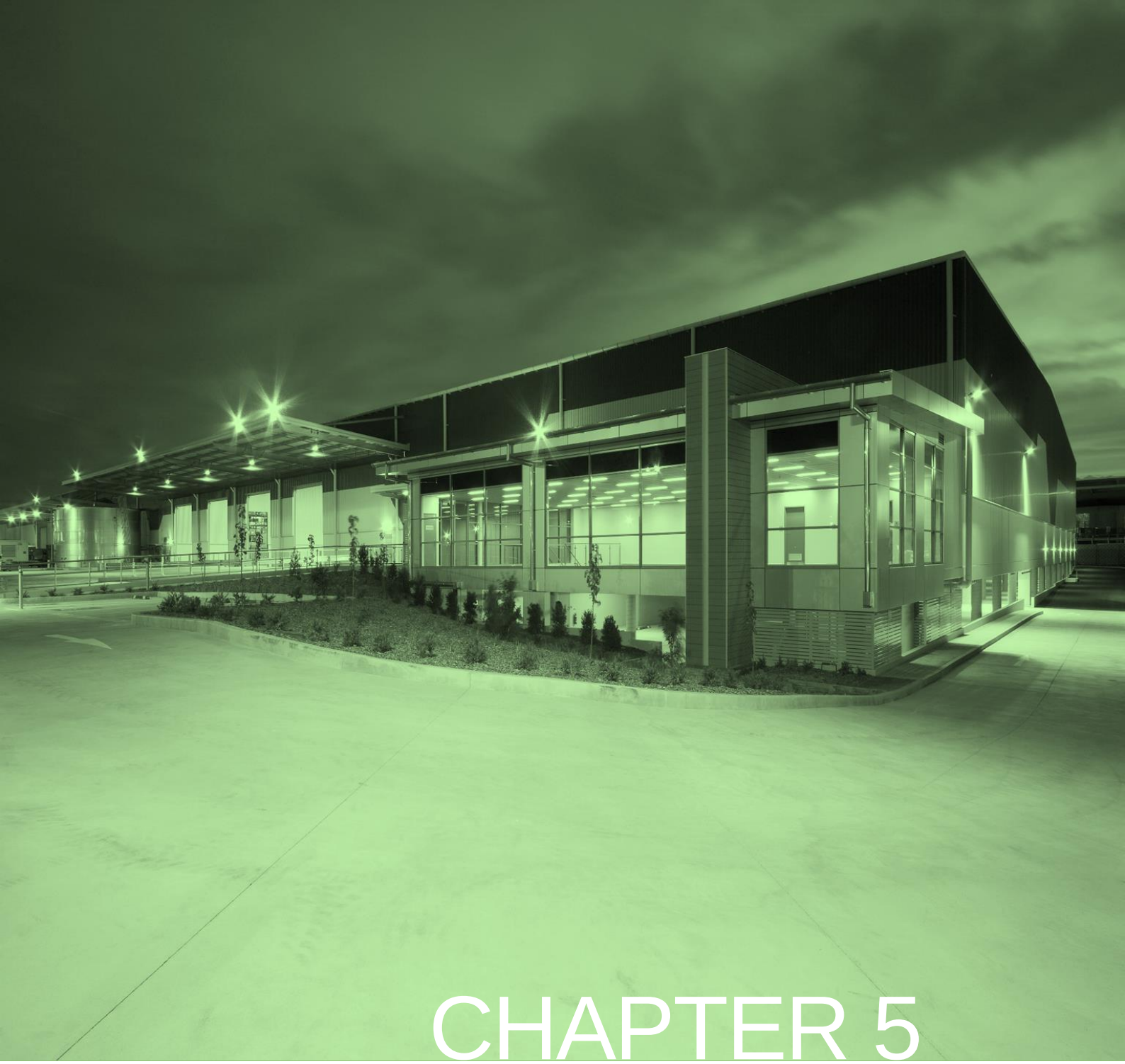
A meeting was held with the EPA on 23 January 2023 to discuss the modification. Key items discussed included:

- The EPA advised key risks include any increased impact to noise and air emissions.
- The EPA Identified previous circumstances of rubber crumb tracked across hardstand areas at the frontage of the site. The EPA suggested Tyrecycle provide detail on how they propose to prevent rubber crumb entering on-site stormwater drains. The EPA requested Tyrecycle investigate proactive engineering solution in addition to regular sweeping of hardstand surfaces. Following the meeting, Tyrecycle discussed the existing stormwater management system with the landowner and will continue to implement measures as further outlined in Section 5.5.3.
- The EPA noted various fire risks (further addressed in Section 5.4).

Fitzpatrick (owner of all adjacent lots) was consulted on 7 March 2023 and did not raise any objections, concerns or comments.

Following submission of the modification application, Council will notify all government agencies, organisations, interest groups, stakeholders and community members with a potential interest in the modification. They will be invited to review this SEE, seek clarification from Tyrecycle on matters affecting stakeholders and provide written submissions if required.

Tyrecycle will prepare a response to submissions report, if required, to address any written submissions, prior to determination of the modification application.



CHAPTER 5

STATEMENT OF ENVIRONMENTAL EFFECTS

5 STATEMENT OF ENVIRONMENTAL EFFECTS

Section 4.15 (1)(b) of the EP&A Act requires the consent authority to consider:

The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.

This chapter considers the likely impacts of the modification, including impacts on the natural and built environment and social and economic impacts in accordance with Section 4.15(1)(b) of the EP&A Act, as well as Council pre-lodgement notes (Table 4.1).

Given the nature of the modification, noise, air quality, traffic and access, and hazards and risks are key environmental aspects. These factors were assessed in detail and are summarised in Sections 5.1, 5.2, 5.3 and 5.4 respectively. Risks to these matters were identified by:

- Considering the existing environmental context of the site and the surrounding locality.
- Consultation with stakeholders, including Council and the EPA.
- Preliminary environmental risk analysis outcomes.
- Technical specialist assessments.
- Meeting notes from Council.
- The legislative framework that underpins the modification.

Low risk environmental aspects were not assessed in detail and are summarised in Section 5.5.

5.1 Noise

5.1.1 Introduction and methods

This section summarises the noise impact assessment (NIA) report (Appendix E). It describes the noise assessment criteria which applies to the modification, potential noise emission sources, modelling method and results, potential impacts and mitigation measures where impacts are unavoidable.

Vibration impacts were not assessed given the distance between proposed activities and sensitive receivers.

5.1.2 Existing environment

Attended noise monitoring was conducted in May 2022 near the three closest residential receivers on Shaula Crescent (Figure 3, Appendix E).

The attended noise monitoring found that when wind is from a northerly direction (away from the receivers) the measured levels are above the site-specific noise criteria. This indicates that foreign noise sources are influencing the measurements. Conversely, when wind is blowing from the southerly direction (from the site toward the receivers) noise levels are below the site-specific noise criteria, suggesting that noise from the site is largely inaudible.

Operational noise and vibration sources

Sound power levels used in the original NIA are in Table 5.1. An occupational noise assessment (JTA Health, Safety & Noise Specialists, 2021) after commencement of operations confirmed the assumptions used for the original NIA. No new noise sources are proposed other than additional truck movements associated with increased haulage of feed materials and products.

Table 5.1 Equipment sound power levels

Equipment	Sound power levels (dBA)
Granulator	107
Shredder	103
Conveyor	96
Forklift	80
Skidsteer loader	94
Front-end-loader	103
Cyclone fan	101
Trucks unloading inside	104
Truck movement inside	98
Loading truck outside	90
Truck movement outside	104

The most significant noise sources will be in the warehouse, with some truck and forklift movements generating noise on the hardstand in front of the building. The acoustic model assumed that the warehouse doors will remain open during operations. This is a conservative model as doors will only open to enable truck movements in and out of the warehouse.

5.1.3 Potential impacts

Noise impacts associated with the modification were assessed qualitatively and considered the increased noise relative to the approved operations. The increase in the annual production will be met by operating existing plant and equipment for longer periods within the approved operational hours. There will be no change to plant, equipment, hours of operation or approved processing activities.

The original NIA for the approved operations assumed a potential worst-case scenario, with all equipment within the warehouse operating at a maximum capacity at the same time. A noise level of 93 dBA was estimated within the warehouse with all equipment operating and was applied in the modelling predictions. This noise level is higher than subsequent attended measurements conducted at the site and is therefore an overestimate of the actual operational noise generated by the development, resulting in a conservative noise assessment.

The NIA also considered vehicle movements and loading/unloading as noise generating activities outside the warehouse in the driveway. Whilst there would be some additional truck movements for the proposed development, these will be minimal and occur intermittently over the day, and there are no proposed changes to the approved morning and afternoon peak heavy movements. The original NIA assessed the potential noise emissions from trucks based on the peak heavy movements, which represent the maximum impact and thus given there is no change to maximum truck movements in the peak hours, the worst-case noise impacts from truck movements will not alter.

As a conservative measure, the scenario in the original NIA assumed daytime levels of plant activity, along with noise enhancing meteorological conditions towards receivers. In reality, the modelled weather conditions correspond with night-time periods, when there will likely be minimal

site activity external to the warehouse building. Thus, the predicted noise levels in the original NIA are conservative and will adequately account for the increased production.

Predicted noise levels in the original NIA did not exceed the project noise trigger levels at the nearest residential receivers. The modification will not add new sources of noise beyond approved operations and as such the original NIA is still considered conservative compared to the modification.

To date, the project has not received a complaint related to noise from the general operations or associated traffic. Increasing the capacity of the facility and shift times will not add noise sources beyond those already approved for the site.

Sleep disturbance

Increased truck movements do not represent a risk to sleep disturbance along haulage routes as Lenore drive and Grady Crescent are not in residential areas.

Maximum noise events may occur for example if equipment is dropped, items slammed such as a truck tailgate or air is released from pneumatic brake systems. The maximum sound power for such events are typically around 120-125 dB(A) or approximately 4-9 dB(A) higher than the total modelled sound power. Thus, the L_{AFmax} at any residential receiver would be approximately 4-9 dB(A) higher than the predicted worst-case noise levels which are up to 42 dB(A) at the most impacted residential receiver. The estimated L_{AFmax} at the most impact residential receiver is 51 dB(A), which is below maximum noise trigger level of 56 dB(A). As such, the modification will not result in sleep disturbance for residential receivers to the north.

5.1.4 Conclusion

There is sufficient capacity in existing operational parameters and equipment to accommodate the proposed production increases without requiring additional equipment or changes to operating hours. There are no any additional noise impacts from the modification above that already predicted for the approved operations.

Therefore, noise from the modification will not impact sensitive receivers and no new management measures are required.

5.2 Air quality

This section summarises the air quality impact assessment (AQIA) report (Appendix F). It describes the air quality assessment criteria which applies to the modification, potential air emission sources, modelling method and results in comparison to the approved operations and potential impacts and mitigation measures where impacts are unavoidable.

5.2.1 Overview of assessment methods

Potential air quality impacts on sensitive receivers associated with the modification were assessed in accordance with EPA's (2017) *Approved methods for the modelling and assessment of air pollutants in New South Wales* (the 'approved methods').

The following atmospheric pollutants are generated by the existing development and may potentially increase as a result of the modification:

- Deposited dust.
- Total suspended particulate (TSP) matter, which is nominally taken to be less than 30 micrometres (µm) in diameter and refers to all suspended particles in the air.

- PM_{10}, which is a subset of TSP and have a diameter of 10 µm or less.
- $PM_{2.5}$, which is a subset of TSP and have a diameter of 2.5 µm or less.
- Pollutants generated through the combustion of fuel in vehicle engines (oxides of nitrogen and sulfur (NO_2 and SO_2), PM_{10} and $PM_{2.5}$).

Emissions from diesel powered equipment generally include carbon monoxide (CO), nitrogen dioxide (NO_2) and other pollutants, such as sulphur dioxide (SO_2). The emissions of CO, NO_2 and SO_2 generated from diesel powered equipment is too low to generate any significant off-site pollutant concentrations and were not assessed further.

Dispersion of air pollutants was modelled with estimated emission rates, neighbouring emission sources, proposed mitigation measures and local meteorology to predict incremental and cumulative air quality impacts. These results were overlaid with the predictions for the approved operations allowing for direct comparison of the potential change associated with the modification.

Assessment criteria

The site-specific air quality criteria in Table 5.2 were established in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA, 2022).

Table 5.2 NSW EPA air quality impact assessment criteria

Particulate matter	Averaging time	Criterion
TSP	Annual	90 micrograms per cubic metre (µg/m³)
PM_{10}	24-hour	50 µg/m³
	Annual	25 µg/m³
$PM_{2.5}$	24-hour	25 µg/m³
	Annual	8 µg/m³
Deposited dust	Annual	Maximum incremental (site only) increase of 2 g/m²/month Maximum total (site and other sources) of 4 g/m²/month

5.2.2 Existing environment

The main sources of air pollutants in the area are industrial operations, the Cleanaway Erskine Park Landfill and other anthropogenic activities such as wood heaters and motor vehicle exhaust.

Annual average PM_{10} and $PM_{2.5}$ values from the St Marys and Prospect monitoring stations between 2015 and 2022 were used to represent the background levels for the modification.

In the absence of available data, estimates of the annual average background TSP and deposited dust concentrations were determined from a relationship between PM_{10}, TSP and deposited dust concentrations and the measured PM_{10} levels. The annual average TSP concentration and dust deposition levels at the site were conservatively estimated using the relationship and assumed that a PM_{10} concentration of 30 µg/m³ will have an equivalent TSP concentration of 90 µg/m³ and dust deposition level of 4 g/m²/month.

It is noted there is no readily available data for $PM_{2.5}$ background levels at the St Marys monitor during 2015. However, there is data available for 2016 to 2022. To estimate background $PM_{2.5}$ concentrations for the modification, it was assumed that the average of the $PM_{2.5}$ / PM_{10} ratio of the annual average values recorded for 2016 to 2022 are equivalent to the ratio experienced in 2015.

The estimated background air quality levels used in the modelling were:

- Annual average TSP concentrations – 53.4 µg/m^3.
- Annual average deposited dust levels – 2.73 g/m^2/month.
- Daily average $PM_{2.5}$ concentrations – 7.6 µg/m^3.
- 24-hour average PM_{10} concentrations – variable.
- Annual average $PM_{2.5}$ concentrations – 7.6 µg/m^3.
- Annual average PM_{10} concentrations – 17.8 µg/m^3.

5.2.3 Potential impacts

Estimated dust emissions

Activities associated with the modification such as handling and processing of tyres and derived products generate dust emissions. Additionally, vehicle movements associated with the modification will generate air emissions from the exhaust and wheel generated dust when travelling on internal roads.

The estimated dust emissions for the modification reflect the current conditions at the site. This includes only one stack ventilation point servicing the cyclone filters emitting from the roof, with the other ventilation point emitting into the warehouse building (the original AQIA had assumed two stack ventilation points). The assumed and modelled concentration of particulates in the cyclone filters in the original AQIA was 10 milligrams per cubic metre (mg/m^3). This has been revised to a level of 5 mg/m^3 following a review of recent manufacture specifications. The stack has also been moved to the north-west corner, where previously it was modelled in the south-west corner.

Other changes compared to the original AQIA include a control efficiency of 80% being applied to the material handling activities as these processes are largely contained within the warehouse, which significantly reduces the potential for fugitive dust emissions. This control was not considered in the original modelling in the AQIA assessment and was a conservative (i.e., overestimate) for the operations at the time.

The estimated annual dust emissions for the existing development and the proposed modification for all sources (fugitive and stack) are compared in Table 5.3.

Table 5.3 Comparison of estimated dust emission rate for the modification

Emission type	Scenario	TSP emissions	PM_{10} emission	$PM_{2.5}$ emission
Fugitive	Existing	1,232	483	137
	Modification	1,109	516	221
	Variance (%)	-10	7	61
Stack	Existing	7,884	7,884	3,942
	Modification	3,066	3,066	1,533
	Variance (%)	-61	-61	-61

Fugitive emissions are particles that are not contained in the warehouse or filtered through the warehouse stack. It is calculated that the net annual fugitive total suspended particulate (TSP) emissions associated with the proposed development will decrease by approximately 10% relative to the approved operations, however, will see an increase in the estimated fugitive PM_{10} and $PM_{2.5}$ emissions.

The estimated change in total annual dust emissions due to the proposed modification arises from:

- An increase in the amount of material processed from 29,000 tpa to 60,000 tpa.

- Consideration of the control efficiency associated with the activities occurring within the warehouse.
- The ventilation point emitting into the warehouse building.

For the stack sources, dust emissions associated with the modification are lower (by approximately 61%), as is to be expected with the removal of one stack ventilation point and a reduction in particulate concentration.

Dispersion modelling

The existing air quality model from the original AQIA was revised to include the changes associated with the modification and stack location, and more accurately reflected processing activities.

The near identical dispersion modelling between the modification and existing development enables direct comparison between results (Appendix F, Figure B-1). The modelling indicates that the estimated increase in dust emissions due to the modification is minor in comparison to the existing development with the greatest change occurring close to the site. The closest residential receivers will be unlikely to discern a change in dust levels compared to the existing approved development.

5.2.4 Conclusion

The comparison of the results for all assessed dust emissions show that the modification has a negligible effect at the assessment locations and are not predicted to exceed the applicable air quality impact criteria.

A similar negligible change to cumulative impacts will also be anticipated and will not result in any significant additional impacts at the surrounding receiver locations.

Based on the comparison of modelling predictions, it is concluded the modification will not result in any discernible additional impact above that presented in the original AQIA at any receiver locations.

Notwithstanding, existing air quality management measures will continue to be implemented to further reduce air quality impacts.

5.3 Traffic and access

Potential traffic impacts associated with the modification on local and main roads were assessed (Appendix G).

5.3.1 Existing environment

Traffic and road network

Vehicles access the site via the following:

- M4 Motorway: six lane divided carriageway which has an east-west alignment along the northern side of the Erskine Park and St Clair areas and connects between the Great Western Highway at Strathfield and the Blue Mountains at Emu Plains.
- M7 Motorway: four lane divided carriageway, which has a north-south alignment along the eastern side of the Erskine Park area and connects between the M2 at Baulkham Hills and the M5 at Prestons.
- Great Western Highway: is a State road, which connects between the Sydney central business district to west of the Blue Mountains. Near Erskine Park, the Highway is aligned parallel to

the M4 Motorway and is an alternative route to the motorway. For much of its length, the Highway carries three lanes in each direction, and provides connectivity to the local road network.

- Mamre Road: State road connecting between the Great Western Highway at St Marys and Elizabeth Park at Cecil Hill.
- Erskine Park Road: State road which provides a secondary connection between Mamre Road and the M4 Motorway.
- Lenore Drive: State road and forms the primary access to Erskine Business Park. Lenore Drive connects with Old Wallgrove Road at Eastern Creek, which connects with Wallgrove Road and the M7 Motorway. The carriageway carries two lanes in each direction and is divided by a central median accommodating auxiliary right turn lane at a number of intersections.
- Grady Crescent: local access road which connects with the Lenore Drive. The carriageway has a width of 13 m and carries a single lane in each direction.

All roads are approved 25-26 m long B-double routes.

Most of the heavy vehicles associated with the modification will approach the site via the M4 Motorway, then turn into Mamre Road or Erskine Park Road, turn into Lenore Drive and then turn left into Grady Crescent. When leaving the site, heavy vehicles will exit the site via Grady Crescent, turn left onto Lenore Drive and then turn onto the M7 Motorway.

There are no heavy vehicles movements along local roads, which have the potential to impact residential receivers. Therefore, the increased operations at the site will not result in significant impacts to the amenity of residential land uses or impact upon traffic network conditions.

Traffic at the western Lenore Drive/Grady Crescent intersection was surveyed on 6 September 2022, which indicated that the morning (AM) and afternoon (PM) peak hours are 6.15 am to 7.15 am and 4 pm to 5 pm. There is significant spare capacity at the intersection.

Public transport

There are two bus routes that operate along Lenore Drive with the nearest bus stop within 300 m from the site.

The 779 route operates between Kemps Creek and St Marys with services generally once per hour, while the 835 route only operates in the weekday AM and PM peak periods between Penrith and Prairiewood.

Parking

The warehouse has 78 car parking spaces at basement level (including two disabled spaces). Unrestricted on-street parking is available on both sides of Grady Crescent, with no on-street parking permitted along Lenore Drive.

5.3.2 Assessment

Trip generation

The proposed modification will result in additional trips, as summarised in Table 5.4. Shift changes are shown in Table 2.3.

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Table 5.4 Traffic generation for the modification

Existing operations	Proposed operations
▪ Morning peak (4 am to 7 am) – seven outbound heavy vehicles trips and 31 light vehicle trips (28 inbound and 3 outbound). ▪ Afternoon peak (4 pm to 6 pm) – seven inbound heavy vehicles trips and 31 light vehicle trips (3 inbound and 28 outbound).	Current peak hour traffic movements will remain the same.
On average, six trucks collect and drop-off tyres and products per day.	Collection and drop-off trucks will increase to 10 trucks per day and will enter and leave site between 8 pm and 4 am.
On average, 50 pallets are loaded and dispatched per day, equating to two B-double collections per day.	A maximum of 100 pallets will be loaded and dispatched per day, equating to four B-double collections per day.

There will be no change to employment and associated light vehicle movement. Changes in staff shift times mean that light vehicle movements associated with employee shift changes will be outside the morning and afternoon traffic peaks on the surrounding road network, thereby reducing traffic impacts.

There is no proposed change to heavy vehicle volumes in the morning and afternoon traffic peak periods. Therefore, there will be no additional impact on traffic on the surrounding road network in these peak periods.

The two additional B-double movements will be dispersed throughout the day and occur outside of peak traffic periods.

There will be no additional staff and therefore no increased demand for public transport.

Parking

There will be no additional staff and therefore no requirement for additional parking spaces at the site.

Vehicle access and servicing provisions

The site has two driveways to Grady Crescent. One driveway is 15.4 m wide and is used as a truck access, while the other driveway is 6.35 m wide and is used for car access.

No changes are proposed to the existing access, internal manoeuvrability and servicing arrangements and therefore no further assessment is required.

5.3.3 Conclusion

The additional truck movements associated with the modification will not occur during peak hours and will not impact road capacity and intersection performance. Employment will not increase and there will be no additional light vehicle movements or demand on public transport/site parking.

5.4 Hazards and risks

5.4.1 Introduction

This section provides details on the potential hazards and risks associated with the modification, including potential risks to public safety and potential risks associated with emergency events,

along with strategies and management measures which, when implemented, would reduce these hazards and risks to acceptable levels.

Additionally, the section provides an assessment of the handling, transport, storage and use of dangerous goods at the site, and the implications of these dangerous goods with respect to the Hazards SEPP.

The application of the Hazards SEPP to the site has been determined in accordance with Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (NSW Department of Planning, 2011).

5.4.2 Existing environment

The site is not in an area prone to natural hazards/disasters e.g. flooding or bushfires.

Public safety management

Public safety risks may arise from un-authorised access of members of the public.

All visitors to the site are required to report to the site administration office and register prior to gaining entry to the active areas of the site.

Additional site security requirements are outlined in Table 2.3.

Fire management

The existing fire system at the warehouse is compliant with AS 2118:1. The increased operational capacity at the site does not include material changes to the warehouse structure, location of fire extinguishers or number of staff required within the facility at any time.

Fire safety was assessed by ARUP Pty Ltd in September 2022 (Appendix H), which identified fire hazards and risks to the tyre recycling facility, with respect to:

- Potential ignition and fuel sources.
- Assessment of tyre storage configurations.
- Behaviour of a tyre fire.
- Review of tyre cycle fire incidents.
- Existing fire prevention methods.
- Review of global tyre fire incidents.
- Impact of a tyre fire.

A subsequent technical note was issued on 7 December 2023 to revise the fie risk assessment (ARUP, 2022). The technical note is also provided in Appendix H. At the time of writing the fire risk assessment had assessed an initial concept to increase internal storage quantities at the site. Mitigation and management recommendations were subsequently recommended; however the scope of the proposed modification has since been altered and will no longer seek storage of additional quantities of tyre products beyond the existing development consent.

The management and mitigation measures identified in Section 5.4.5 will be implemented to mitigate fire risks identified in Appendix H.

Equilibrium also assessed fire safety at a similar facility at St Mary's tyre recycling facility for Tyrecycle. This study focused on identifying the possible hazards associated with a tyre recycling facility that may result in a fire emergency. The range of hazards considered covered all operational aspects of a tyre recycling facility that presented a risk in regard to ignition of flammable and combustible materials, and potential consequences particularly in regard to the human health, local environment and site operations.

Table 5.5 identifies the possible hazards that may result in a fire emergency, which were identified by Equilibrium for the St Marys tyre recycling facility and are applicable to the existing operations and hence modification.

Hazardous substance and dangerous goods management

The hazardous substances and dangerous goods required for the existing development include hydrocarbons, such as fuels (diesel), oils and greases. No additional hazardous substances are required on-site for the modification.

Diesel

Diesel is classified as a combustible liquid by AS 1940:2004 *The Storage and Handling of Flammable and Combustible Liquids* (AS 1940:2004) (Class C1) for the purpose of storage and handling, but is not classified as a dangerous good by the criteria of the Australian Dangerous Goods (ADG) Code (National Transport Commission, 2014, Edition 7.3).

The modification will require the continued use of diesel, with a self-bunded diesel storage tank with a capacity of between 500 and 1,000 litres, located in a bunded area of the warehouse building.

All heavy vehicles will continue to be fuelled off-site, with select plant (such as forklifts and bobcats) to be re-fuelled on-site as required. The plant will be parked in the bunded area while re-fuelling, and any spills which occur in the collection areas will be adequately contained, managed in accordance with emergency response procedures, and classified and disposed of in accordance with relevant waste legislation.

Given the diesel storage tank is bunded and stored away from other flammable materials, the storage and use of diesel is not considered potentially hazardous in terms of the Hazards SEPP.

Oils and greases

Oil is classified as a combustible liquid (Class C2) by AS 1940:2004.

Tyrecycle will continue to store small quantities of hydrocarbons, typically oils and greases for maintaining plant and equipment. These are stored in bunded storage areas, installed in accordance with relevant Australian Standards.

Additionally, oil filters and empty oil drums will also continue to be collected and stored at the site prior to transfer to a licenced recycling facility.

In accordance with the above, the storage and use of these materials is not considered potentially hazardous in terms of the Hazards SEPP.

Car batteries

Car batteries are classified as Class 8 dangerous goods by the ADG Code.

Tyrecycle will continue to store car batteries at the site prior to collection by a licenced recycling contractor. Batteries will continue to be stored on pallets and wrapped ready for collection by the contractor.

As car batteries do not have an assigned packaging group, there is no threshold associated with the storage of car batteries, and as such this activity is not considered potentially hazardous in terms of the Hazards SEPP.

Liquified Petroluem Gas

Liquified petroluem gas (LPG) are classified as Class 2, division 2.1 dangerous goods by the ADG Code.

Tyrecycle will continue to store up to four 19 kg LPG cylinders on site for use on forklifts, basic maintenance and welding. The LPG cylinders stored on site include one argon, one carbon dioxide (CO_2), one oxygen (O_2) and one dissolved acetylene.

As there is less than a total of 10 tonnes of LPG stored above ground, this activity is not considered potentially hazardous in terms of the Hazards SEPP.

5.4.3 Potential impacts

The key hazards identified for the modification are detailed below.

Soil and water contamination

In the event of a spill of the fuels used on-site, via human error, or failure or rupture of the storage vessel, potential impacts may include localised contamination of water, as well as impacts on health and safety.

If released to the environment uncontrolled, hydrocarbons may be damaging to soils and aquatic ecosystems, and fires can occur if these materials are ignited.

Potentially hazardous products such as fuels, oils, lubricants and grease required during operation of the modification will continue to be contained within appropriately bunded areas in accordance with relevant Australian Standards, codes and regulations.

Refuelling and maintenance activities will be restricted to hardstand bunded areas within the site, on flat slope and away from stormwater drains. As such, the risk of soil, surface water and groundwater contamination during operation of the modification is limited to spills and anticipated to be low. Plant and equipment will also be maintained to minimise the potential for leakages, while appropriately sized and stocked spill response kits will be provided within strategic areas of the site, and within mobile vehicles.

Fire and explosion

If there was to be a fire because of the ignition of flammable material, it could result in injury or destruction of property.

Fire is unlikely to spread to fragmented vegetation within the high voltage powerline easement to the north of the site (categorised as vegetation buffer and vegetation category 2 bushfire prone land) as it is shielded by neighbouring property (Coates Hire). In very strong wind conditions there may be potential for fire to spread through ember attack to the vegetation buffer, which could result in a potentially uncontained grass fire event.

The existing fire system at the warehouse was reviewed by a qualified fire engineer and considered site parameters (including materials to be stored and height of stacking), with the existing fire system to remain compliant with AS 2118:1 during operation of the modification. No upgrade to the existing fire systems are required for the modification.

Table 5.5 identifies potential fire hazards associated with the modification.

Table 5.5 Fire hazard identification and analysis

Identified fire hazard (facility or event)	Potential cause	Potential results/consequences	Prevention/detection protection measures
Whole tyres	▪ Electrical/wiring. ▪ Electrical boards faults. ▪ Lighting faults. ▪ Unsafe storage. ▪ Hot works conducted nearby	▪ Fire spreading to tyres and TDF/TDP. ▪ Toxic combustion products released to air and fire water. ▪ Spread of fire to other parts of the	▪ Storage compliance with Guidelines for Bulk Storage of Rubber Tyres (RFS, 2014) and EPL.

Identified fire hazard (facility or event)	Potential cause	Potential results/consequences	Prevention/detection protection measures
	flammable materials. ▪ Arson. ▪ Smoking.	facilities (buildings and tyres). ▪ Building structures on fire potentially collapsing. ▪ Human health affected from smoke inhalation.	▪ On-site fire suppression and warning systems. ▪ Fire emergency management planning. ▪ Site security systems. ▪ Equipment maintenance programs. ▪ Maintenance of electrical equipment. ▪ Enclosed warehouse operation reduces risk of arson. ▪ Provision for fire-water containment system. ▪ Hot-works procedure. ▪ Stock management plan. ▪ Smoking bans enforced with designated safe smoking areas.
Rubber crumb	▪ Electrical/wiring. ▪ Electrical boards faults. ▪ Lighting faults. ▪ Unsafe storage. ▪ Hot works conducted nearby flammable materials. ▪ Arson. ▪ Smoking.	▪ Fire spreading to tyres and tyre by-products. ▪ Toxic combustion products released to air and fire water. ▪ Spread of fire to other parts of the facilities (buildings and tyres). ▪ Building structures on fire potentially collapsing. ▪ Human health affected from smoke inhalation.	
TDF	▪ Faulty equipment used nearby or inside containers (e.g. forklifts). ▪ Hot works conducted nearby material. ▪ Arson. ▪ Smoking.	▪ Fire involving TDF. ▪ Fire spreading to tyres and tyre by-products. ▪ Toxic combustion products released to air and fire water. ▪ Spread of fire to other parts of the facilities (buildings and tyres). ▪ Building structures on fire potentially collapsing. ▪ Human health affected from smoke inhalation.	
Heat generated from the shredding plant	▪ Failure of the water-spray system in the shredders igniting due to excessive heat.	▪ Fire spreading to tyres and tyre by-products. ▪ Toxic combustion products released to air and fire water. ▪ Spread of fire to other parts of the facilities (buildings and tyres). ▪ Building structures on fire potentially collapsing. ▪ Human heal affected from smoke inhalation.	▪ The water spray system is temperature controlled and failure of the system would alarm and stop the shredder. In addition, there is spark detection system and water sprays fitted in the Rasper and ducting. Upon detection of a spark, water is sprayed in localised area to extinguish.
Grass fire or bushfire threatening facilities	▪ Lightning. ▪ Arson. ▪ Uncontrolled or accidental fire.	▪ Potential to threatened buildings and combustible material stored on site. ▪ Toxic combustion products released to air and fire water.	▪ Property and boundary maintenance. ▪ Clearance zone along the boundary. ▪ NSW RFS Hazards Near Me App. ▪ Extreme weather alerts are included in toolbox talks.

Identified fire hazard (facility or event)	Potential cause	Potential results/consequences	Prevention/detection protection measures
		▪ Human health affected from smoke inhalation.	▪ Education of workforce. ▪ Text alerts. ▪ Evacuation drills and procedures practices. ▪ On-site security to prevent unauthorised access.
Gas cylinders	▪ Unconstrained and uncontrolled use of gas cylinders. ▪ Inappropriate use and storage of cylinders. ▪ Cylinder leaks. ▪ Gas cylinder usage with faulty equipment (e.g. forklift). ▪ Smoking.	▪ Gas leak combined with an ignition source creating a fire with potential to spread to buildings and combustible tyre materials. ▪ Human heal affected from gas inhalation.	▪ Operators trained in the handling and storage management of gas cylinders. ▪ Gas cylinders are contained at all times. ▪ Minimise volume of gas cylinders kept on site and order as needed. ▪ Smoking bans enforced with designated safe smoking areas.
Timber pallets/general storage of combustibles	▪ Faulty equipment used nearby or inside containers (e.g. Forklifts). ▪ Hot works conducted nearby material. ▪ Arson. ▪ Smoking.	▪ Isolated fire at most, unlikely to be able to spread to other parts of the facility.	▪ Limit excess pallets on site (ordered every two months). ▪ Minimise accumulation of unnecessary combustibles. ▪ Regular safety audits.
Car batteries	▪ Batteries are stored inside the warehouse on pallets, in demarcated areas along the south wall of the warehouse. ▪ Batteries pose a risk of explosion if exposed to excessive heat and ignition source.	▪ Acid used in car batteries is very corrosive and can cause severe harm if in contact with workers. ▪ Potential consequence from explosion would create substantial risks to human health (nearby workers). ▪ A battery explosion could potentially initiate fire with any nearby combustible material.	▪ Car batteries stored in a cool, well ventilated area indoors away from incompatible chemicals. ▪ Storage area protected from potential physical damage to batteries from equipment and works conducted at site. ▪ Bunded pallets used for storage to capture any acid leakage. ▪ Areas are signed and demarcated. ▪ Spill kit is made available.
Used oil filters	▪ Faulty equipment used nearby or inside containers (e.g. forklifts). ▪ Hot works conducted nearby material. ▪ Arson. ▪ Smoking.	▪ Potential to act as a fire accelerant in the event of a fire, serving to increase fire intensity and heat generation and spread to tyres stored nearby. ▪ Toxic emissions. ▪ Human health affected from smoke and emissions.	▪ Contained in leak proof containers. ▪ Storage is inside, within signed and demarcated areas. ▪ Storage is away from incompatible materials. ▪ Spill kit available. ▪ Assess options to remove oil filters away from tyre storage.
Flammable goods	▪ Electrical/wiring. ▪ Electrical boards faults.	▪ Incorrect storage or use of hazardous goods leading to	▪ Personnel trained in the handling and use of chemicals.

Identified fire hazard (facility or event)	Potential cause	Potential results/consequences	Prevention/detection protection measures
	▪ Lighting faults. ▪ Unsafe storage. ▪ Hot works conducted nearby flammable materials. ▪ Arson. ▪ Smoking.	dangerous mix of chemicals. ▪ Toxic emissions. ▪ Human health affected from smoke and emissions. ▪ Flammable goods storage is sufficiently contained and not likely to spread further.	▪ Flammable liquid cabinet. ▪ Storage away from tyres. ▪ Chemical bunding. ▪ Clear and correct chemical labelling, handling and PPE. ▪ Current safety data sheets and chemical register. ▪ Hazardous substance and dangerous goods risk assessments. ▪ Chemical spill kits are in place. ▪ On-site security to prevent unauthorised access.
Office fire	▪ Electrical/wiring. ▪ Electrical boards faults. ▪ Lighting faults. ▪ Overheating of computer equipment. ▪ Arson. ▪ Smoking.	▪ Faulty equipment causing a fire in the office space. ▪ Fire spreading to other parts of the administration block. ▪ Building damage as a result of fire and fire suppression systems. ▪ Human health affected by smoke inhalation.	▪ Routine test tagging of electrical equipment. ▪ Qualified electrical contractors. ▪ Routine office inspections and audits. ▪ Daily pre-start checks. ▪ On-site security to prevent unauthorised access.

Using the risk assessment matrix outlined in Equilibrium's report, the likelihood and consequence of each identified fire hazard, relevant to the modification, has been evaluated in Table 5.6.

Table 5.6 Fire hazard likelihood and consequence analysis

Identified fire hazard (facility or event)	Initial hazard and likelihood and consequence analysis			Residual likelihood and consequence		
	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating
Whole tyres	Unlikely	Severe	High	Very Unlikely	Severe	Medium
Rubber crumb	Unlikely	Severe	High	Very Unlikely	Severe	Medium
TDF	Unlikely	Severe	High	Very Unlikely	Severe	Medium
Heat generated from the shredding plant	Possible	Minor	Low	Very Unlikely	Minor	Low
Grass fire or bushfire threatening facilities	Very Unlikely	Major	Low	Very Unlikely	Major	Low
Gas cylinders	Possible	Moderate	Medium	Very Unlikely	Moderate	Low

Identified fire hazard (facility or event)	Initial hazard and likelihood and consequence analysis			Residual likelihood and consequence		
	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating
Timber pallets/general storage of combustibles	Possible	Minor	Low	Very Unlikely	Minor	Low
Car battery storage	Unlikely	Severe	High	Very Unlikely	Severe	Medium
Used oil filters	Unlikely	Severe	High	Very Unlikely	Severe	Medium
Flammable goods	Possible	Moderate	Medium	Very Unlikely	Moderate	Low
Office and computer room fire	Possible	Moderate	High	Very Unlikely	Moderate	Low

Risk to workers

As with any industrial facility, daily operations have inherent risk to workers and contractors. Such activities have the potential to result in injury or fatality if workers are ill informed of the hazards involved, or risks associated with equipment and plant are not managed. Examples of activities which could result in injury or fatality include crush injuries by moving plant and equipment, motor accidents or crush by heavy vehicles, or exposure to hazardous materials.

Tyrecycle has a workplace health and safety policy, as required by the NSW *Work Health and Safety Act 2011* (WHS Act), whereby workers must conform to. All workers, contractors and visitors are inducted on safety protocols and procedures before entering active parts of the site. All personnel working on the site are trained in safety procedures (such as LOTO[1]) and required to wear personal protective equipment (PPE) such as high visibility clothing, safety glasses, steel toe cap enclosed footwear and other task specific PPE such as gloves, hearing protection etc. Regular communication of safety requirements and initiatives is also undertaken on a regular basis.

Provided the continued implementation of workplace health and safety protocols during operation of the modification, as required by the WHS Act and other relevant regulations or standards, the potential for injuries or fatalities to workers, contractors or visitors to the site would be minimised.

Designated first aid and emergency rescue facilities and equipment will continue to be made available at the site. Appropriately trained personnel is on site throughout the life of the modification and operation of the plant to provide first aid and respond to site emergencies.

Any injuries incurred at the site will be reported and investigated in consultation with SafeWork NSW and other relevant authorities as required and as outlined in Tyrecycle's incident management procedure. Any recommendations or findings of investigation reports will be implemented by Tyrecycle where feasible and practical.

[1] LOTO Lockout/Tagout, or Control of Hazardous Energy (29 CFR 1910.147), is an safety procedure implemented to protect maintenance and service workers in the performance of their duties. It specifically addresses hazards that could inure employees from the unexpected energization or start up o machines or equipment, or when stored energy could be released, while servicing or maintain equipment. Employees are protected by LOTO to shut down the machine and ensure that it cannot activate while they are working on it.

5.4.4 Application of Hazards SEPP

The Hazards SEPP requires the consent authority to consider whether a development proposal is a potentially hazardous industry or a potentially offensive industry.

The modification will not require any change to the storage and use of hazardous materials.

In context of the Hazards SEPP, DPE have published a guideline on the application of the Hazards SEPP to developments. The guideline is entitled 'Hazardous and Offensive Development Application Guidelines: Applying SEPP 33' (NSW Department of Planning, January 2011).

The guideline states that this SEE needs to determine if the modification will constitute a 'potentially hazardous industry'. If the modification is a potentially hazardous industry, then the Hazards SEPP applies and the guideline states that a preliminary hazard analysis (PHA) should be undertaken as part of the SEE.

A 'hazardous industry' under the Hazards SEPP is one which when all locational, technical, operational and organisational safeguards are employed, continues to pose a significant risk. A proposal cannot be considered a hazardous industry unless it is first identified as potentially hazardous industry and subjected to the assessment requirements of the Hazards SEPP.

Potentially hazardous industry

A PHA is required if the screening process described in Applying SEPP 33 indicates the proposal is potentially hazardous.

The screening process involves comparing the type and quantity of hazardous materials or dangerous goods to be used and stored on-site to the distance to public area thresholds in Applying SEPP 33.

As outlined above, the continued use and storage of minimal quantities of hazardous materials or dangerous goods will be required for the modification. All hazardous materials or dangerous goods will be transported, handled, stored and managed in accordance with relevant regulations and industry standards and would not exceed the thresholds of Applying SEPP 33. As such, the modification does not constitute a potentially hazardous industry, and the assessment requirements of the Hazards SEPP, including the requirement for a PHA, do not need to be included in this SEE.

Potentially offensive industry

Potentially offensive industry is where in the absence of safeguards and controls, the modification could 'emit a polluting discharge that could cause a significant level of offence'. Examples of this may include depositional dust, or operational noise impacts on adjacent residents or land uses.

Applying SEPP 33 states that a proposal is potentially offensive if it requires pollution licensing from the EPA. The granting of the licence by the EPA for the existing operations is sufficient to demonstrate that emissions can be effectively managed and, therefore, the proposal is unlikely to be offensive. The modification constitutes a 'scheduled activity' under the POEO Act and an EPL is required.

The modification will emit pollutants which in the absence of safeguards could cause offense. However, management measures have been incorporated into relevant models, which have demonstrated that emissions will not exceed relevant criteria. Therefore, the modification does not qualify as offensive development under the Hazards SEPP.

5.4.5 Management and mitigation measures

Hazardous substances and dangerous goods management

A pollution and incident response management plan (PIRMP) has been prepared by Tyrecycle and will be updated as required to incorporate the modification.

Fire safety management

ARUP's fire risk assessment and subsequent technical note (Appendix H) recommend controls which include the current mitigation measures in place at the facility. The following management measures are recommended to minimise the potential for fire risks associated with the modification:

- Site security measures to ensure that the facility remains enclosed and doors are locked during afterhours operations.
- Install additional thermal cameras alongside the three that are currently in place.
- Maintain stockpile configuration to ensure that the total tyre storage area of each pen is no greater than 30m^2 and stockpile height is no greater than 3.7 m.
- Tyre stocks are monitored to ensure that no organic material builds anywhere in the facility.
- Thermal scans of all electrical wiring and major electrical systems to ensure thermal hot spots are detected.
- Ensure maintenance checklists are followed as per MEX system for all new and current equipment on-site.
- In addition to the existing emergency response plans on-site, Tyrecycle is to consider other approach to full extinguishment of burning tyres, how to separate potential sources of fuel in the case of ignition and staff training around early fire suppression tools.
- An additional fire extinguisher appropriate to addressing lead battery fires are to be provided adjacent to the battery storage cupboard.
- Each row of tyre crumb racks is to have a minimum of 6 m unobstructed access on each accessible side.
- Granule product will be stored in the product storage racking.
- Egress provisions are at minimum one metre width.

5.5 Other environmental considerations

5.5.1 Visual amenity

Existing environment

General industrial and commercial businesses surround the site in all directions and operate primarily from large warehouses.

Views of the site from the interior of these neighbouring industrial premises, motorists and or pedestrians is restricted by perimeter fencing, limited windows and landscape vegetation planted along the property boundary. To the east of the site, the adjacent commercial premises have direct view of the site, particularly at the site access on Grady Crescent.

To the north-east, west, and south of the site businesses have a degree of visibility of the site through existing road verge landscaping along the north-eastern and western perimeter of the site, but this view is restricted.

The site is partially visible from the nearest residential premises located on Shaula Crescent (330 m north of the site). However, the views from these residential receivers are confined to the top of the warehouse building.

Trucks accessing the site at the entrance and trucks unloading tyres into the warehouse, are visible from Grady Crescent. All other activities occur within the enclosed warehouse and not visible to the public. The unloading of tyres into the warehouse results in temporary and minor visual impacts, however, these activities are in fitting with the zoned land use.

Potential impacts

The site is in an area zoned 'general industrial' and the continued use of the site as a waste management and resource recovery facility is not in conflict with the objectives of the zone or with the form and scale of the existing warehouse and local setting.

There is no proposed change to the existing building warehouse. The modification will not change the visual amenity of the location, or the views of surrounding neighbours.

The modification will not require any change to the approved 24 hour operating hours.

Despite partial views of the top of the warehouse from select residential receivers on Shaula Crescent, all operations will continue to be confined within the building and will not be visible by residential land users.

5.5.2 Site contamination

Exposure to unexpected, contaminated soil and/or materials could pose a health risk to site personnel and impact the wider area if the contaminant migrates. Contamination entering waterways can pose a threat to aquatic ecology, water quality and the wider community. It is an offence under the POEO Act to cause contamination or spread contaminated material.

As outlined in Table 3.8, EPA's Contaminated Land Record and List of Contaminated Sites notified to the EPA was searched in January 2023 for the Penrith LGA. No recorded contaminated sites near the site were identified.

Other than an unforeseen localised hydraulic oil leak from vehicles or machinery associated with the modification, or storage of oil filters and car batteries, the modification will not result in contamination. The modification will be in the warehouse and no earthworks are required. Furthermore, the impermeable concrete floor of the warehouse will ensure that no soil or groundwater contamination will occur from oil leaks or fuel spills.

All transportation vehicles will continue to be refuelled off-site, with forklifts and other mobile equipment periodically re-fuelled in a bunded area of the warehouse. Vehicles are operated on fully maintained leases and as such mechanical repairs will continue off-site. Personnel, however, regularly check and maintain machinery to minimise the risk of oil leaks. The re-fuelling of mobile equipment at the site and storage of oil filters in bunded areas also minimises the potential for leaks and spills to enter the Council stormwater system along Grady Crescent.

If contaminated material (such as absorbent material for leaks and spills) is generated during operation of the modification, relevant statutory requirements, including waste classification will be complied with, and the material managed and disposed of appropriately.

5.5.3 Stormwater management and water quality

The site is not near any natural drainage lines, creeks or rivers. The site is not in a 'flood planning area' (identified by the NSW planning special viewer flood planning map).

The modification will not require bulk earthworks and therefore there is no potential interaction with soils and groundwater.

As detailed in the existing warehouse's stormwater design, surface water runoff from the site is discharged into the Estate's stormwater system.

Following consultation with the EPA, Tyrecyle sought confirmation on the existing stormwater management system with the landowner. The site is currently equipped with an 'Ocean Protect' engineering solution which is a hydrodynamic separator which removes total suspended solids, oil and other gross pollutants from stormwater which drains from the site to the Estate's stormwater system. The Ocean Protect device captures gross pollutants such as rubber crumb which may be inadvertently tracked over hardstand surfaces. The device is regularly inspected, emptied and serviced in accordance with manufacturer specifications to maintain performance.

Tyrecycle will continue to implement existing water management measures to comply with Council's water sensitive urban design policy, for example rainwater harvesting.

The modification does not require any changes to the warehouse building or the existing stormwater management system.

With the above considered, there are no aspects to the modification which warrant further consideration of the Penrith DCP, Council's stormwater drainage specification for building developments policy, and Council's water sensitive urban design policy and technical guide.

5.5.4 Heritage

Existing environment

Previous research indicated that archaeological evidence is likely to be found in certain landforms, largely as a result of the resources that were associated with these landforms, or their suitability for long-term and/or repeated occupation, comprising:

- Within 200 m of waters.
- In a sand dune system.
- On a ridge top, ridge line or headland.
- Within 200 m below or above a cliff face.
- Within 20 m of or in a cave, rock shelter, or a cave mouth.

The site is not in a landform which may indicate historical Aboriginal occupation and potential for unidentified Aboriginal objects.

A search of the Aboriginal Heritage Information Management System identified the presence of 28 registered Aboriginal objects within 200 m of the site. These sites were identified as part of the Erskine Park Employment Area Archaeological Subsurface Testing Program (Navin Officer 2007).

The study stated the site is in an area with very low to low archaeological potential. All registered Aboriginal objects in the industrial precinct were subsequently salvaged and/or destroyed via an aboriginal heritage impact permit, and the previous construction of the industrial precinct, inclusive of levelling and other bulk earthworks, has removed all archaeological potential of the locality.

Potential impacts

The site is covered by impermeable concrete hardstand area where operations have been active for more than 12 months.

The modification will not involve any ground disturbance or impact upon items of Aboriginal or non-Aboriginal heritage significance and as such no additional assessment is required.

5.5.5 Biodiversity

Existing environment

According to an EPBC protected matters search on 7 February 2023 there are seven threatened ecological communities (TECs) which have been recorded within 10 km of the site. A total of 50 EPBC Act threatened species and 15 migratory species are known to or have the potential to also occur in the area.

A vegetation community of Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion has been identified approximately 1 km east of the site along the riparian corridor of Ropes Creek. This vegetation community belongs to Cumberland Plain Woodland (critically endangered under the BC Act) and Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (critically endangered under the EPBC Act).

A review of the NSW BioNet Atlas indicated several previous sightings of the threatened flora species Juniper-leaved Grevillea (*Grevillea juniperina*) were recorded prior to development of the industrial precinct. The species is listed as vulnerable under the BC Act. No additional recorded threatened flora or fauna species were identified near the site.

Potential impact

The site is highly modified and consists of asphalt driveways, concrete hardstand and warehouse. Vegetation is limited to a few isolated trees and shrubs on the eastern side of the warehouse, planted for landscaping and screening along Grady Crescent.

The proposed modification does not require the removal of any vegetation or potential habitat for threatened species.

5.5.6 Waste management

Waste streams generated by the modification require responsible management in accordance with the objectives of the WARR Act, POEO Act and the NSW WARR Strategy.

Failure to collect, separate and store waste, or transport and dispose of waste appropriately, can result in adverse impacts on the receiving environment.

This section outlines the impacts and management measures of new waste as a result of the modification. The Council WMP form (Appendix B), including section 3 – waste from ongoing use of premises and section 4 – on-going management of premises, has been addressed in this section.

Existing environment

The main waste streams generated by Tyrecycle's current operations are general solid wastes and minimal hazardous wastes as defined in the NSW Waste Classification Guidelines (EPA, 2014).

Wastes are separated, collected in designated waste disposal bins, reused where possible, or disposed of at an appropriately licensed waste facility.

Employees working at the site generate the equivalent of domestic waste such as food scraps, wastepaper and other incidental waste associated with running a small office. This waste is collected in separated recycling bins pending recycling or disposal.

Used oil filters (drained motor oil filters that do not contain free liquids) are classified as general solid (non-putrescible) waste and are collected for recycling by a licenced waste contractor.

Tyre shred that has fallen from the shredder (approximately 50 kg/week) is recycled in the production process.

There are limited volumes of hazardous wastes generated from automotive/car batteries. Used car batteries are stored on site to be collected by a licensed waste contractor for recycling off-site.

A contractor collects approximately 5 t of waste per month and disposes of it to landfill.

The nature and volume of waste generated during the operation of the modification will be relatively minor. However, there is potential for adverse impacts on the local environment if waste is not managed appropriately.

If managed inappropriately waste could impact:

- Visual amenity and aesthetic quality of the surrounding area.
- Health and safety of local residents, workers and visitors.
- Landfill space, through potentially reusable and/or recyclable materials contributing to landfill waste.
- Native fauna through ingestion of fugitive waste materials e.g. plastic bags; and hazardous waste, in particular fuels or oils, leaching into local drainage lines and watercourses, leading to subsequent water quality degradation.

Waste management

Tyrecycle conducts its business in accordance with the NSW waste hierarchy, which underpins the objectives of the WARR Act, and follows the principles of waste management through the process of: avoidance; resource recovery; and environmentally sound disposal throughout its core operations, including the handling and processing of tyres.

These principles are used and will continue to be used following the modification:

- purchasing recycled products where appropriate;
- developing and implementing waste management procedures to minimise the generation of waste and where unavoidable, re-use waste on-site;
- recycling as many wastes as practically possible through appropriate handling, separation, storage and collection; and
- where waste cannot be re-used or recycled, transportation and disposal of waste off-site at an appropriately licensed facility.

The NSW WARR has the following goals:

- avoiding and reducing the generation of waste;
- increasing recycling;
- diverting more waste from landfill;
- better management of problem wastes; and
- reducing litter and illegal dumping.

The NSW WARR recognises the importance of the waste hierarchy to guide effective resource management. As detailed above, Tyrecycle will continue to operate under the principles of the waste management hierarchy during operation of the Appendix B.

The following management measures will continue to be implemented for the modification:

- Waste management practices would be managed as set out in the WARR Act by adopting the principles of the waste management hierarchy during operation of the modification.

- Regular programmed maintenance of the shredder system to ensure efficient operation, which keeps losses to a minimum and involves reviewing capture systems around the shredder to maximise recovery of material.
- All waste generated as a result of the modification would be managed in accordance with the Waste Classification Guidelines (EPA, 2014) and relevant regulatory requirements. This will include (i) its classification prior to leaving the site and (ii) recording (via an appropriate waste tracking system) its legal off-site transportation for re-use, recycling or disposal.
- Any waste generated would be stored in a suitable container, with a lid (where appropriate), and transported from the site to an appropriately licensed facility. A sufficient number of suitable receptacles for general waste, hazardous waste and recyclable materials would be provided for waste disposal at the site, including sufficient bins to allow separation of wastes for recycling.
- All wastes is securely stored to ensure that any pollutants are prevented from escaping.
- Any fuel, lubricant or hydraulic fluid spillages would be collected using absorbent material and the contaminated material disposed of immediately at a licensed waste facility.
- All hazardous or contaminated wastes on site (if identified) is removed and disposed in accordance with the state and national regulations and guidelines and best practice for the removal of these materials. Hazardous materials will only be removed by suitably qualified, licensed and experienced contractors.
- Documents and records of the transport and fates of all materials removed from the site would be kept as proof of correct disposal and for environmental auditing purposes.
- Waste streams are sorted to maximise the reuse/recycling potential and minimise disposal costs.
- Materials would be re-used or recycled wherever possible. Details relating to the recycling of materials at appropriately licensed recycling facilities would be provided.
- Waste would be covered stored and removed in a timely manner so as not to attract native animals or vermin.

All waste handling, transport and disposal is in accordance with the requirements of the POEO Act (1997), WARR Act and relevant UP, EPA or WorkCover Guidelines.

Waste management plan

Waste management of the existing operations are addressed under Section 2.1. Section 5.5.6 details the current waste management practices in line with Council's WMP form (section 4) requirements in Appendix B.

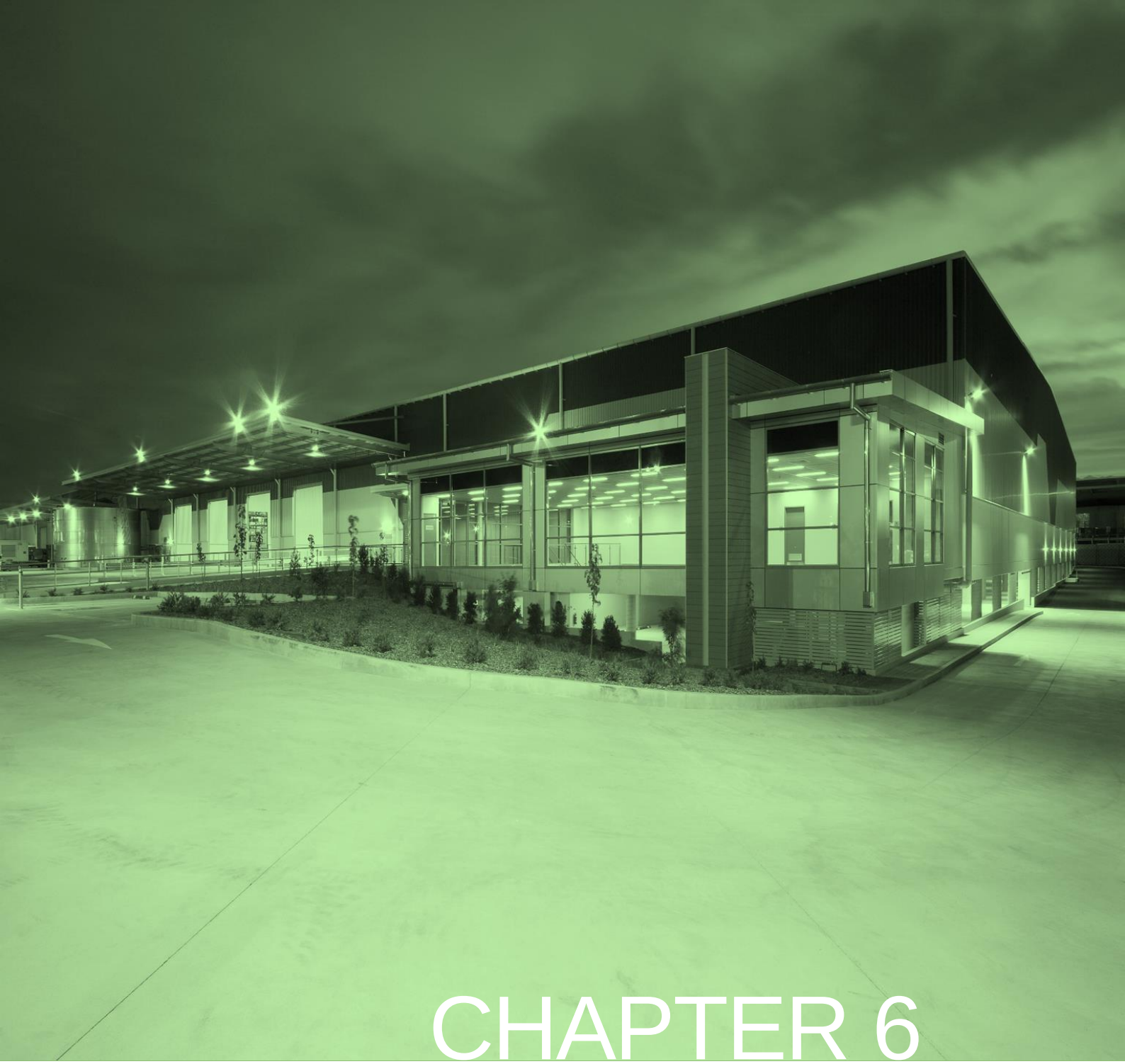
New waste and waste streams

The modification will not require the addition of new waste streams or any significant changes to the current waste generated on site.

The modification will result in the operation generating an additional 31,000 tpa of TDF, which requires minimal processing. The generation of TDF will not result in additional volumes of the steel and textile waste streams, as these waste streams are only generated during further processing as per Section 2.1.

There will be no new staff required on site and therefore no change to general solid, food or office waste. The modification will not require changes to the volume of used oil filters or automotive batteries.

Increases in the amount of spillage as a result of the modification will not increase waste as spillage is fed back into the equipment, therefore recovering the waste. Spill in the form of rubber crumb may be collected by the Ocean Protect device on site. The rubber crumb collected will not amount to a significant increase in waste collected and will be disposed of on an ad hoc basis.



CHAPTER 6

CONCLUSION

6 CONCLUSION

Tyrecycle is seeking approval to increase production at its facility at 1-21 Grady Crescent, Erskine Park from 29,000 tpa to 60,000 tpa. The primary operational activities will continue to be:

- receival and temporary storage of tyres;
- processing and shredding of tyres (from 29,000 tpa to 60,000 tpa); and
- dispatch of processed TDF and TDP.

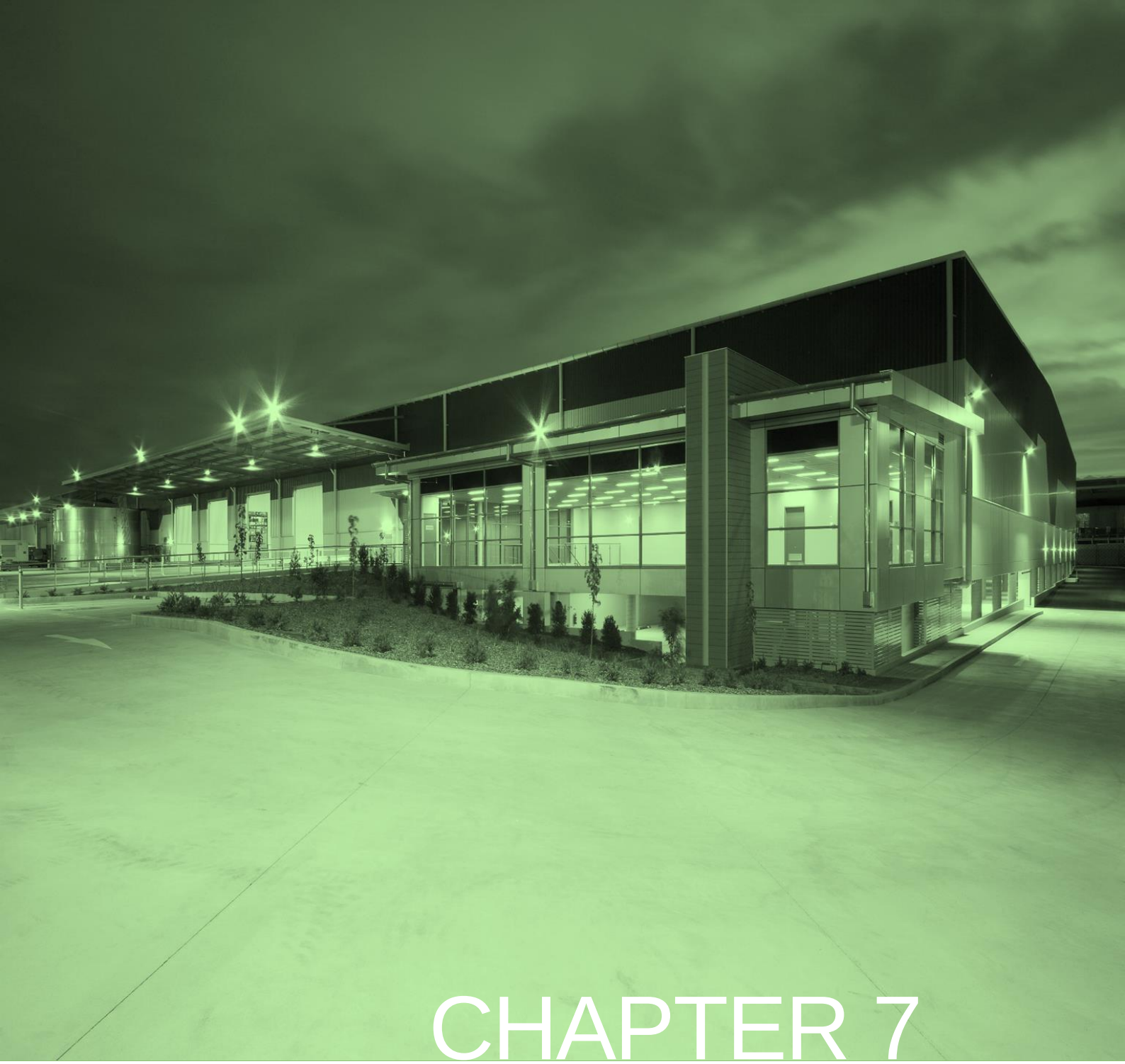
The 31,000 tpa increase in production will be achieved with the existing processing equipment operating for longer periods within the approved operational hours.

Element has prepared this SEE to accompany the modification application in accordance with the EP&A Act and in consultation with Council.

Potential impacts from the modification on air quality, noise, traffic and other environmental aspects were assessed. It was determined that with the implementation of environmental management and mitigation measures as outlined in this SEE, there will not be significant alteration to the supporting biophysical and social environments as a result of the modification. The modification will result in positive economic benefits for the Penrith LGA.

The modification is justified on economic, social and environmental grounds, as demonstrated with its consistency with the objects of the EP&A Act, the Employment SEPP and ESD.

Based upon the predicted environmental impacts of the modification and the ability to manage these impacts to minimise harm to the environment, the modification will not create any significant adverse environmental impacts on adjoining properties or prejudice the future use of land in the locality.



CHAPTER 7
REFERENCES

7 REFERENCES

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APPENDIX A

UPDATED OPERATIONAL PLAN OF MANAGEMENT

Tyrecycle Erskine Park | Tyre recycling facility

OPERATIONAL PLAN OF MANAGEMENT

Prepared for Tyrecycle Pty Ltd | 7 December 2023

element.

Tyrecycle Erskine Park

TYRE RECYCLING FACILITY | OPERATIONAL PLAN OF MANAGEMENT

Prepared for Tyrecycle Pty Ltd
7 December 2023

PR230

	Prepared by	Reviewed by
Name	Alistair Campbell	Luke Farrell
Company	Element Environment	Element Environment
Position	Environmental Consultant	Principal Environmental Consultant
Project Role	Lead Author	Project Manager
Date	6 December 2023	6 December 2023

DOCUMENT CONTROL

Revision	Date	Description	Prepared by	Reviewed by
0	7 March 2023	For Tyrecycle review	Element Environment	Tyrecycle Pty Ltd
1	8 March 2023	For submission to Council	Element Environment	Tyrecycle Pty Ltd
2	7 December 2023	Revised plan to account for revised fire mitigation measures	Element Environment	Tyrecycle Pty Ltd

Contents

Tables

1 INTRODUCTION

This operational plan of management (OPM) has been prepared on behalf of Tyrecycle Pty Ltd (Tyrecycle) to support the modification application for upscaled operations at their tyre recycling facility at 1-21 Grady Crescent, Erskine Park.

This OPM should be read in conjunction with the original OPM for the tyre recycling facility (September, 2020). The original OPM remains in effect, with this OPM providing additional management measures associated with the expansion to tyre processing at the site.

1.1 Purpose of operational plan of management

This OPM is a dynamic document which can be updated to respond to changing procedures and practices.

This OPM will be complied with by all operators on the site and should be read in conjunction with the Statement of Environmental Effects (SEE) and subsequent modification issued for the site.

The objectives of the OMP are to:

- Assist Council to understand all activities at the site to the fullest extent possible.
- Demonstrate the project commitment to the ongoing amenity of staff, and adjoining and nearby properties.
- Set out the specific operational process for the facility and activities on site.
- Detail times each activity is undertaken (in terms of 24 hour operations), including staff movements, deliveries, plant and machinery, vehicle movements and other specific project operations.
- Outline key mitigation measures and safeguards outlined within the SEE.
- Set out specific actions and procedures including how to remedy community complaints.

1.2 The site

The site is within an existing leased warehouse and distribution complex in the Erskine Business Park at 1-21 Grady Crescent, Erskine Park (Lot 4, DP 1253870). The site is approximately 10.8 kilometres (km) southwest of Blacktown and approximately 5.6 km southeast of St Marys. The project and site is further described within the SEE.

2 OPERATION

2.1 Proposed project

Tyrecycle is seeking approval to increase the quantity of tyres processed at their Erskine Park tyre recycling facility from 29,000 tonnes per annum (tpa) to 60,000 tpa (the project).

The primary operational activities of the project will remain the same in nature:

- receival and temporary storage of tyres;
- processing and shredding of tyres (up to 60,000 tonnes per annum); and
- dispatch of processed tyre derived fuel (TDF) and other tyre derived products (TDP).

2.2 Activities and operational process

The project will continue to be contained within the northern section of the existing warehouse building (covering a total floor space of 9,620 m^2), using the existing site infrastructure, plant and equipment.

The project will not result in changes to any of the following aspects:

- Operating methodology or site infrastructure.
- Building and infrastructure footprints.
- Vehicle parking requirements.
- Vehicle access and internal movement pathways.
- Hours of operation.
- Employment.
- Land ownership.
- Landscaping.
- Stormwater management.
- Utility services.
- Lighting, security and signage.

Existing mechanical processing plant and equipment within the warehouse building will remain the same, including a combination of the following:

- Weighbridge.
- Tyre receival and storage bay.
- Tyre feeder.
- Primary shredder – super chopper.
- Two secondary process – rasper.
- Primary granulator.
- Primary classifier – textile/fabric separation.
- Secondary granulation.
- Secondary classifier – textile/fibre separation.
- Aspirator – classification of granular product.
- Cracker mill.
- Sieve.
- Bulk bag stations.
- Steel cleaning plant.
- Two dust extraction and air filtration systems.
- Waste storage and collection areas.
- Conveyor.
- Forklift.
- Skidsteer loader.
- Front-end-loader.

Appendix D of the SEE for the original development consent, dated 16 September 2020 (Element, 2020) includes the existing architectural plan of the warehouse overlayed with a schematic (approximate location only not drawn to scale) of the existing operational plant, which will be located within the existing warehouse building. **Appendix D** of the SEE (Element, 2020) also shows the approximate location of waste bins for collection.

The project will continue to use the existing operational process, as outlined in Table 2.1.

Table 2.1: Operational process

Operational process	Operational detail
Receival and storage of tyres	Tyres are collected by the Tyrecycle truck fleet, weighed in over the weighbridge and then unloaded into dedicated storage areas in the warehouse, ready for processing. In the absence of a mechanical breakdown within the plant, it is anticipated that all feedstock collected will be processed within 24 hours of receipt.
Tyre feeding	Tyres are fed into the tyre feeder utilising mobile plant. The main purpose of the tyre feeder is to buffer the tyres to ensure automatic and continuous feeding to the super chopper.
Primary shredder – super chopper	The super chopper is fed by the tyre feeder. In the super chopper, the tyres are processed through a set of knives and reduced to a rubber chip of approximately 15.2 cm in size. The material from the super chopper is discharged through a disc screen that separates oversized material from material that is uniformly 15.2 cm in size. The oversized material is returned to the super chopper for further processing and the material that passes through the screen is the first product stream (15.2 cm TDF).
Secondary shredding – raspers	A reversible conveyer allows the 15.2 cm product from the super chopper to feed into two raspers. One of the raspers converts the 15.2 cm chips into 3.8 cm TDF, which is one of the final products. The second rasper is connected to the granulation line and material from the rasper is further reduced in size during the granulation process. During the rasping process, the steel reinforcement of the tyre is removed as a by-product for sale as recyclable steel.
Granulation	The granulation line consists of a primary and secondary granulator, each with a classifier, and a central aspirator. The granulators further reduce the size of the granules, and in the process liberates the fabric/textile and additional steel.
Fabric/textile separation	The new state of the art operational plant, includes a fabric separator, allowing processing of a combination of passenger and truck tyres into rubber crumb in the one facility. After liberation by the granulators, the classifiers remove the fabric/textile and any remaining steel as a by-product for sale as an alternate energy source and recyclable steel. The rubber product then passes through the aspirator where it is further classified and either bagged as granular product (third final product with some ‘work in progress’ for later processing in the cracker mill) or processed directly through the cracker mill.
Cracker mill	The cracker mill is fed with the granular product from the aspirator or WIP bulk bags. The energy efficient cracker mill utilises two large rolls,

Operational process	Operational detail
	rotating at different speeds. The granular rubber is forced through a small gap between the rolls, sheering the rubber, further reducing the size of the granules to 30 mesh[1] or 40 mesh crumbed rubber. The product from the cracker mill is passed over a screen with oversized material returned to the cracker mill for another pass through the mill. Material that meets the specification is conveyed to the bulk bagging area and placed into bulk bags as 30 or 40 mesh (final product).
Fabric separator	The fabric separator, allows processing of passenger and truck tyres in the one facility. During the process, the steel and textile (fibre from passenger/4WD tyres) are removed as by-products for sale as recyclable steel and textile.
Dispatch of processed tyres	The TDF is loaded into shipping containers, ready for export. Bulk bags (on standard pallets) of granular material and crumbed rubber is stored in pallet racking and delivered to customers utilising B-doubles.

2.3 Further detail on project operations

Table 2.2 provides further operational details of the project.

Table 2.2 Project operations

Operational aspect	Comment
Volume of material processed per annum	The project would process up to 60,000 tpa, recovering the following products: ▪ 30 Mesh – 9,397 tpa; ▪ 3.8 cm TDF – 12,620 tpa; ▪ 15.2 cm TDF – 29,000 tpa ▪ Steel – 4,344 tpa; and ▪ Fibre/Textile – 2,639 tpa.
Size and area of warehouse required.	9,620m^2 (9,300 m^2 warehouse and 320m^2 ancillary office).
Employment	The project will generally operate across three shifts as follows: ▪ Day shift (5 am to 1 pm) – 24 full time employees ▪ Afternoon shift (1 pm – 9 pm) – three full time employees. ▪ Night shift (9 pm to 5 am) – three full time employees. The operations would be supported by four full time management staff who will typically work from 8 am to 5 pm weekdays.
Hours of operation	24 hours per day, seven days a week.
Proposed operating hours per activity	▪ Trucks (collection): - Monday – Friday: > Day: 4 am to 6 pm. > Night: 5 pm to 1 am. - Saturday: 4 am to 6 pm (as required). ▪ Plant operation (shredding): Monday – Friday, 7 am start and Saturday, 7 am finish ▪ Plant operation (crumbing): 24 hours, seven days per week. ▪ Deliveries (containers): Monday – Friday 8 am to 5 pm and Saturday 8 am to 6 pm (as required)
Vehicle access and parking	Vehicle access is as per the existing arrangements specified in Error! Reference source not found..

[1] Mesh is the unit uses for sizing of the rubber crumb. 30 mesh is equivalent to 0.595 mm.

Operational aspect	Comment
	The maximum number of car spaces required at any one time is 28 (comprising employees for the day shift, and management personnel). The parking requirements for the project can be accommodated by existing parking available at the site. Heavy vehicles would be parked in the loading dock of the site when not in use.
Utilities and servicing	The project would not require the construction or upgrade of utility infrastructure and would continue to be serviced by existing utilities.
Traffic generation and internal movements	The project will not result in an increase to the number of light vehicles onsite. The shifts will change and the facility will operate 24 hours a day. Current peak hour light vehicle traffic movements will remain the same. Collection and drop-off trucks would increase from six to ten trucks per day and would enter and leave the site between 8pm and 4am. This is not within peak hour and will not have a significant impact on local roads. Heavy vehicles associated with the project would vary in size, with the most common vehicle type being rigid trucks, and largest a B-Double truck. A maximum of 100 pallets would be loaded and dispatched per day, equating to four B-double collections per day. These pallets would be loaded by Forklift and Bobcat (skid-steer loader) movements which will occur inside the warehouse during operational hours. Forklifts used as part of the operation would unload incoming tyres and load palletised crumbed and granule product into pallet racking for storage or onto outgoing B-Double trucks.
Lighting requirements	The project would utilise existing lighting at the warehouse during night operations. There is no requirement to upgrade existing lighting at the site.
Security requirements	▪ Security fencing: The existing security fencing for the site does not require upgrading for the project. ▪ On-site security system: The warehouse building is alarmed to prevent unauthorised access. ▪ Security lighting. ▪ CCTV. ▪ Security gates (gate to be left open during the day and shut overnight and on weekends).
Signage requirements	The project would utilise existing signage at the site, there is no requirement to upgrade signage.
Amenities	The project would be serviced by existing amenities within the administration office. Such amenities would include toilet and hand washing facilities, kitchen and break room. There will be no changes to the existing internal floor space of the office facility.
Capital investment value (CIV)	The project would utilise the existing warehouse, site infrastructure, equipment and plant. As such there is no capital investment required for the operation of the project.
Commencement of operations	The project is anticipated to commence following approval. All required plant and equipment is already established to service the existing operational needs of the site.
Landscaping	The project would retain existing landscaping around the warehouse facility. The existing landscaping includes a select range of Australian native ground covers, shrubs and non-deciduous trees to the local areas.
Waste management	Refer to section **Error! Reference source not found.** and **Appendix B** of the SEE.
Public safety management	Public safety risks may arise from un-authorised access of members of the public. All visitors to the site are required to report to the site administration office and register prior to gaining entry to the active areas of the site.
Work health and safety	Tyrecycle has a workplace health and safety policy, as required by the NSW *Work Health and Safety Act 2011* (WHS Act), whereby workers must conform to. All workers, contractors and visitors are inducted on safety protocols and procedures before entering active parts of the site. All personnel working on the site are trained in safety procedures (such as

Operational aspect	Comment
	LOTO[2]) and required to wear personal protective equipment (PPE) such as high visibility clothing, safety glasses, steel toe cap enclosed footwear and other task specific PPE such as gloves, hearing protection etc. Regular communication of safety requirements and initiatives is also undertaken on a regular basis. Provided the implementation of workplace health and safety protocols during operation of the project, as required by the WHS Act and other relevant regulations or standards, the potential for injuries or fatalities to workers, contractors or visitors to the site would be minimised. Designated first aid and emergency rescue facilities and equipment would be available at the site. Appropriately trained personnel will be on site throughout the life of the project and operation of the plant to provide first aid and respond to site emergencies. Any injuries incurred at the site would be reported and investigated in consultation with SafeWork NSW and other relevant authorities as required and as outlined in Tyrecycle's incident management procedure. Any recommendations or findings of investigation reports would be implemented by Tyrecycle where feasible and practical.
Environmental management and impacts	Refer to the SEE for key environmental risks and management measures. Table 2.3 provides a summary of mitigation measures/safeguards outlined in the SEE.

2.4 SEE safeguards

Table 2.3 lists additional mitigation measures required to reduce impacts from the modification, as outlined within the SEE.

Table 2.3: Summary of additional mitigation measures outlined within the SEE

Aspect	Mitigation measure
Hazardous substances and dangerous goods	▪ The Pollution and Incident Response Management Plan (PIRMP) will be updated as required by Tyrecycle to incorporate the modification.
Fire safety	▪ Site security measures to ensure that the facility remains enclosed and doors are locked during afterhours operations. ▪ Install additional thermal cameras alongside the three that are currently in place. ▪ Maintain stockpile configuration to ensure that the total tyre storage area of each pen is no greater than 30m^2 and stockpile height is no greater than 3.7 metres. ▪ Tyre stocks are monitored to ensure that no organic material builds anywhere in the facility. ▪ Thermal scans of all electrical wiring and major electrical systems to ensure thermal hot spots are detected. ▪ Ensure maintenance checklists are followed as per MEX system for all new and current equipment on-site. ▪ In addition to the existing emergency response plans on-site, Tyrecycle is to consider other approach to full extinguishment of burning tyres, how to separate potential sources of fuel in the case of ignition and staff training around early fire suppression tools. ▪ Granule product will be stored in the product storage racking. ▪ An additional fire extinguisher appropriate to addressing lead battery fires are to be provided adjacent to the battery storage cupboard.

[2] LOTO Lockout/Tagout, or Control of Hazardous Energy (29 CFR 1910.147), is an safety proecudre implemented to protect maintenance and service workers in the performance of their duties. It specifically addresses hazards that could inure employees from the unexpected energization or start up o machines or equipment, or when stored energy could be released, while servicing or maintain equipment. Employees are protected by LOTO to shut down the machine and ensure that it cannot activate while they are working on it.

Aspect	Mitigation measure
	▪ Each row of tyre crumb racks is to have a minimum of 6 m unobstructed access on each accessible side. ▪ Egress provisions are at minimum one metre width.

SYDNEY NEWCASTLE CENTRAL COAST MACKAY

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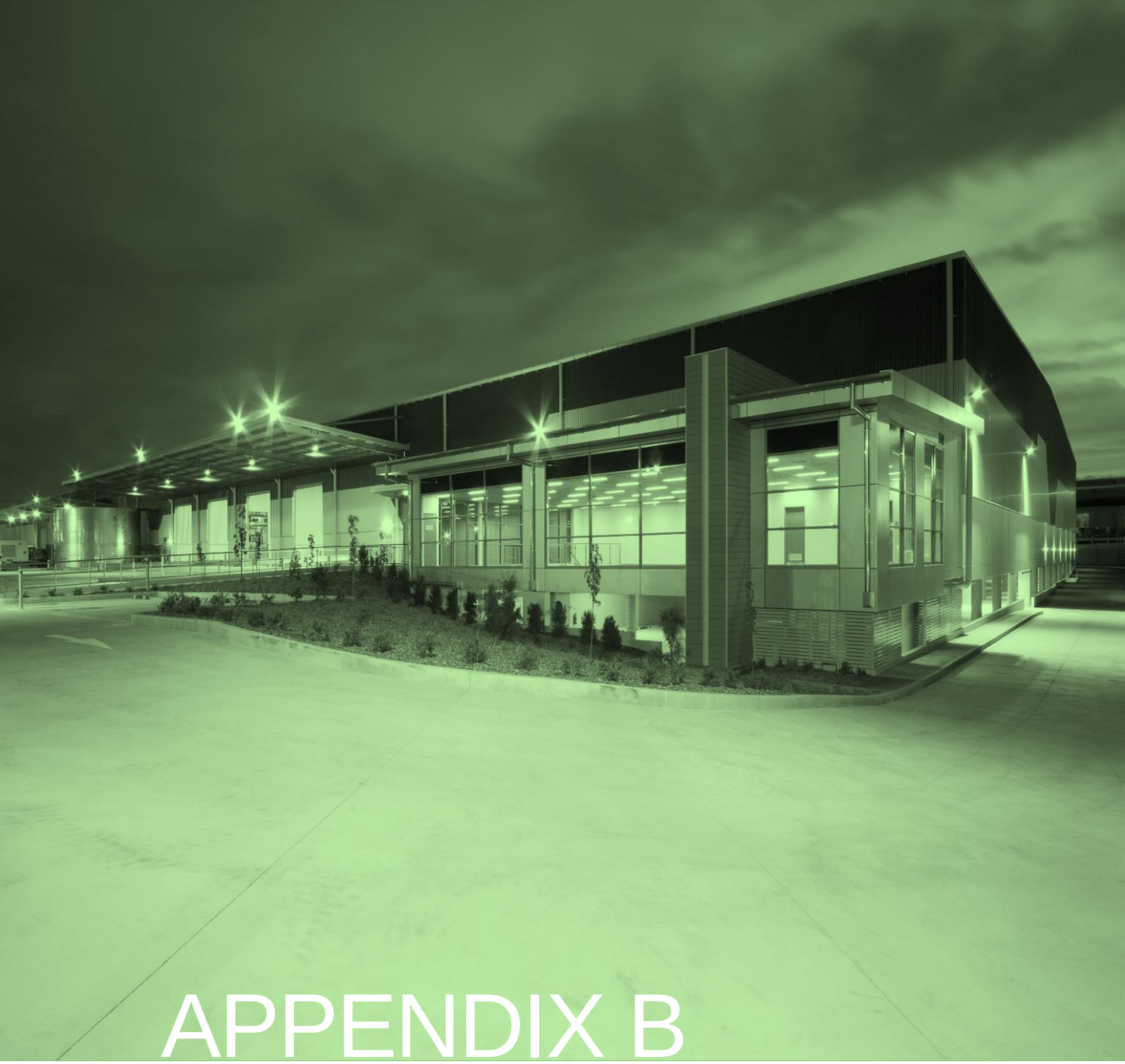


APPENDIX B

UPDATED WASTE MANAGEMENT PLAN

WASTE MANAGEMENT PLAN
DEMOLITION, CONSTRUCTION AND USE OF PREMISES

If you need more space to give details, you are welcome to attach extra pages to this form.

PLEASE COMPLETE ALL PARTS OF THIS FORM THAT ARE RELEVANT TO YOUR DEVELOPMENT APPLICATION (DA).

IF YOU NEED MORE SPACE TO GIVE DETAILS, YOU ARE WELCOME TO ATTACH EXTRA PAGES TO THIS FORM.

Council will assess the information you provide on this form along with your attached plans. We will take into account the types and volumes of waste that could be produced as a result of your proposed development, and how you are planning to:

- minimise the amount of waste produced
- maximise re-use and recycling
- store, transport and dispose of waste safely and thoughtfully.

APPLICANT DETAILS

First name: Jim

Surname: Fairweather

Postal Address

Street No.: 30-56

Street name: Encorce Avenue

Suburb: Somerton

Post code: 3062

Contact phone number: 03 8339 3518

Email address: Jim.Fairweather@tyrecyle.com.au

DETAILS OF YOUR PROPOSED DEVELOPMENT

Street No.: 1-21

Street name: Grady Crescent

Suburb: Erskine Park

Post code: 2759

What buildings and other structures are currently on the site?

Existing warehouse building approved by Council in 2013 (DA13/0139)

Briefly describe your proposed development

Tyrecycle propose to upscale existing operations at the Erskine Park tyre recycling facility to increase the quantity of tyres processed from 29,000 tpa to 60,000 tpa. Tyres will continue to be shredded and granulated within the existing industrial warehouse/building using existing infrastructure, plant and equipment.

Applicant Signature

Date

PENRITH CITY COUNCIL

SECTION 1: DEMOLITION

*Please include details on the plans you submit with this form, for example location of on-site storage areas/ containers, vehicle access point/s.

Materials		Destination		
		Re-use and recycling		Disposal
Material	Estimated volume (m^2 or m^3)	ON-SITE* Specify proposed re-use or on-site recycling	OFF-SITE Specify contractor and recycling facility	Specify contractor and landfill site
Excavation (eg soil, rock)				
Green waste				
Bricks				
Concrete				
Timber (Please specify type/s)				
Plasterboard				
Metals (Please specify type/s)				
Other				

SECTION 2: CONSTRUCTION

*Please include details on the plans you submit with this form, for example location of on-site storage areas/ containers, vehicle access point/s.

Materials		Destination		
		Re-use and recycling		Disposal
Material	Estimated volume (m^2 or m^3)	ON-SITE* Specify proposed re-use or on-site recycling	OFF-SITE Specify contractor and recycling facility	Specify contractor and landfill site
Excavation (eg soil, rock)				
Green waste				
Bricks				
Concrete				
Timber (Please specify type/s)				
Plasterboard				
Metals (Please specify type/s)				
Other				

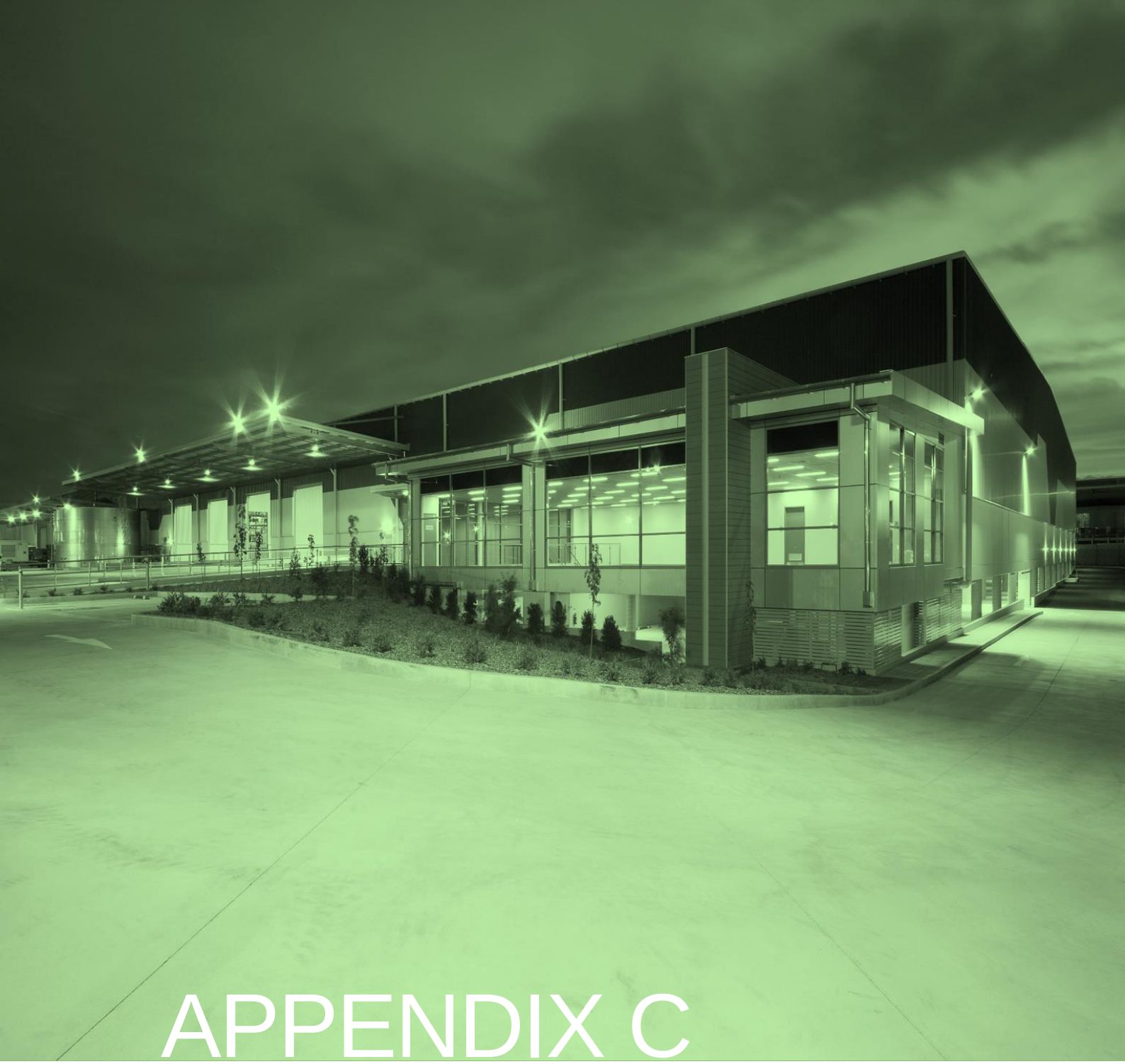
SECTION 3: WASTE FROM ON-GOING USE OF PREMISES

If relevant, please list the type/s of waste that may be generated by on-going use of the premises after the development is finished.	Expected volume (average per week)
Refer to Table 2.2 of the Statement of Environmental Effects (SEE).	

SECTION 4: ON-GOING MANAGEMENT OF PREMISES

If relevant, please give details of how you intend to manage waste on-site after the development is finished, for example through lease conditions for tenants or an on-site caretaker/manager. Describe any proposed on-site storage and treatment facilities. Please attach plans showing the location of waste storage and collection areas, and access routes for tenants and collection vehicles.

Refer to section 5.5.6 of the SEE



APPENDIX C

SWAAB LEGAL ADVICE

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swaab.com.au

10 November 2022

Ms Nicole Bennett
General Counsel
ResourceCo Pty Ltd
Level 1, 162 Fullarton Road
Rose Park, SA 5067

Dear Ms Bennett,

Proposed Modification to Handling Capacity at Tyre Recycling Facility –
1-21 Grady Crescent Erskine Park

Contact
Matthew Cole
Partner
+61 2 9777 8371
mxc@swaab.com.au

Our ref
224465

By email
council@penrith.city

1 Introduction

1.1 We refer to your request for advice regarding a proposal by Tyrecycle Pty Ltd (**Tyrecycle**) to lodge a modification application to development consent DA20/0589 (**MA**) to increase the handling capacity at its tyre recycling facility located at 1-21 Grady Street, Erskine Park (**Site**).

1.2 You have instructed us that:

(a) The MA will seek consent for an increase in the handling capacity of tyres at the Site from 30,000 tonnes per annum (**tpa**) to 60,000 tpa (**Proposed Modification**).

(b) Tyrecycle has met with Penrith City Council (**Council**) and Council has expressed concern regarding satisfaction of the necessary jurisdictional pre-requisites that enliven the power to modify a development consent.

(c) Council has also expressed concern that the Proposed Modification may be characterised as Designated Development (Waste Management Facilities) pursuant to Section 45 of Schedule 3 of the *Environmental Planning and Assessment Regulation 2021* (**EPA Regulation**).

1.3 You have sought our advice in respect of these matters. Specifically, we provide our legal opinion in respect of the following two questions:

Question 1. Does the Council or Sydney Western City Planning Panel (**Consent Authority**) have the power to modify the original development consent?

Question 2. Is the Proposed Modification properly characterised as Designated Development or not?

1.4 We set out our answers to these questions as follows.

2 Summary

2.1 Answer to Question 1 - In our opinion, the Consent Authority does have the power to modify the original development consent in accordance with the MA because, in having regard to the relevant legal principles and recent case law, the Proposed Modification is 'substantially the same' as the development for which the original development consent was granted.

2.2 In our view, Tyrecycle is able to lodge a modification application pursuant to section 4.55(1A) of the *Environmental Planning and Assessment Act 1979* (**EPA Act**) because the Proposed Modification involves minimal environmental impact.

2.3 Answer to Question 2 – In our opinion, the Proposed Modification is not Designated Development because it is an alteration to an existing approved development and the Consent Authority can be satisfied that the Proposed Modification will not significantly increase environmental impacts.

2.4 A more detailed explanation of this opinion is provided below.

3 The Original Development Consent

3.1 Development consent DA20/0589 was determined by the Sydney Western City Planning Panel (**Planning Panel**) on 18 December 2020 by way of approval, granting consent for:

> '*alterations and additions to an existing warehouse and use of premises as a Waste Management Facility (Tyre Recycling Facility) Operating 24 Hours and 7 days per week*.'
>
> (**Original Development Consent**).

3.2 The following documents, which are relevant to the Original Development Consent, are attached to this opinion:

(a) a copy of the Original Development Consent at **Tab A**;

(b) a copy of the *Determination and Statement of Reasons* issued by the Planning Panel for the decision to grant consent at **Tab B**; and,

(c) the Council Assessment Report at **Tab C**.

3.3 Relevantly, condition 8 of the Original Development Consent states (our emphasis added):

> '*To ensure that the development does not exceed the threshold for designated development the proposed operation of a tyre processing facility (waste management facility) with ancillary storage and transfer of oil filters, oil drums and car batteries, is limited to a* ***maximum handling capacity of no more than 30,000 tonnes per year of waste metal and rubber.*** *Handling capacity includes the sorting, consolidating or temporary storage or material recycling of waste materials.*'

3.4 Accordingly, the conditions of the Original Development Consent impose a handling capacity limit of 30,000 tpa.

4 Question 1 - Does the Consent Authority have the power to modify the Original Development Consent?

4.1 Yes, in our opinion the Consent Authority does have the power to modify the Original Development Consent in accordance with the MA.

4.2 The legal principles governing the power to modify a development consent were set out by Pepper J in *Agricultural Equity Investments Pty Ltd v Westlime Pty Ltd(No 3) [2015] NSWLEC 75* at [173] as follows:

(a) first, the power contained in the provision is to "modify the consent". Originally the power was restricted to modifying the details of the consent but the power was enlarged in 1985 (*North Sydney Council v Michael Standley & Associates Pty Ltd* (1998) 43 NSWLR 468 at 475 and *Scrap Realty Pty Ltd v Botany Bay City Council* [2008] NSWLEC 333; (2008) 166 LGERA 342 at [13]). Parliament has therefore "chosen to facilitate the modification of consents, conscious that such modifications may involve beneficial cost savings and/or improvements to amenity" (Michael Standley at 440);

(b) the condition precedent to the exercise of the power to modify consents is directed to "the development", making the comparison between the development as modified and the development as originally consented to (*Scrap Realty* at [16]);

(c) the applicant for the modification bears the onus of showing that the modified development is substantially

the same as the original development (*Vacik Pty Ltd v Penrith City Council* [1992] NSWLEC 8 (**Vacik**));

(d) the term "substantially" means "essentially or materially having the same essence" (*Vacik* endorsed in *Michael Standley* at 440 and *Moto Projects (No 2) Pty Ltd v North Sydney Council* [1999] NSWLEC 280; (1999) 106 LGERA 298 at [30] (**Moto**));

(e) the formation of the requisite mental state by the consent authority will involve questions of fact and degree which will reasonably admit of different conclusions (*Scrap Realty* at [19]);

(f) the term "modify" means "to alter without radical transformation" (*Sydney City Council v Ilenace Pty Ltd* [1984] 3 NSWLR 414 at 42, *Michael Standl*ey at 474, *Scrap Realty* at [13] and *Moto* at [27]);

(g) in approaching the comparison exercise "one should not fall into the trap" of stating that because the development was for a certain use and that as amended it will be for precisely the same use, it is substantially the same development. But the use of land will be relevant to the assessment made under s 96(2)(a) (*Vacik*);

(h) the comparative task involves more than a comparison of the physical features or components of the development as currently approved and modified. The comparison should involve a qualitative and quantitative appreciation of the developments in their "proper contexts (including the circumstances in which the development consent was granted)" (*Moto* at [56]); and

(i) a numeric or quantitative evaluation of the modification when compared to the original consent absent any qualitative assessment will be "legally flawed" (*Moto* at [52]).

4.3 Accordingly, the key issue in determining whether a development consent can be modified is whether the proposed modification meets the test of being *'substantially the same'* which is a condition precedent to the exercise of the power to modify.

4.4 The elements of the 'substantially the same' test and their application to the Proposed Modification in further detail as follows.

Statutory Requirement of the Substantially the Same Test

4.5 Section 4.55(1A) of the EPA Act provides a consent authority with the power to grant a modification application. That section states (our emphasis added):

'*A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:*

(a) it is satisfied that the proposed modification is of minimal environmental impact, and

(b) ***it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified*** *(if at all), and*

(c) it has notified the application in accordance with

(i) the regulations, if the regulations so require, or

(ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and

(d) it has considered any submissions made concerning the proposed modification within any period prescribed by the regulations or provided by the development control plan, as the case may be.

Judicial Consideration of the Substantially the Same Test

4.6 The leading authorities on the substantially the same test are *Vacik* and *Moto*.

4.7 In Vacik, Stein J held that the term 'substantially' means 'essentially have the same essence'. If a development as modified involves an additional and distinct use it is not substantially the same development. Specifically, Stein J stated [per Bignold J in Moto at 30]:

'Turning to the issue of s102(1)(a). Is the proposed modified development substantially the same development as that in the development consent (as already amended)? In my opinion substantially when used in the section means essentially or materially or having the same essence.'

4.8 In Moto, Bignold J set out the following principles for consideration in satisfying the precondition of substantially the same:

(a) the finding of fact requires the **comparison between the development as originally approved and the development as proposed to be modified** (at 55).

(b) the objective of the comparison is to determine whether the modification is **essentially or materially the same** as that which was originally approved (at 55).

(c) the comparative task **involves a quantitative as well as qualitative appreciation of the differences** - a numeric or quantitative evaluation of the modification when compared to the original consent absent any qualitative assessment will be "legally flawed" (at 52).

(d) the comparative task needs to be undertaken in the context, including the circumstances in which the original development consent was granted (at 56) (our emphasis added):

> '*The comparative task does not merely involve a comparison of the physical features or components of the development as currently approved and modified*
>
> *where that comparative exercise is undertaken in some type of sterile vacuum.* ***Rather, the comparison involves an appreciation, qualitative, as well as quantitative, of the developments being compared in their proper contexts (including the circumstances in which the development consent was granted)***.'

(e) the comparative task needs to assess the **physical features as well as the environmental impacts** of the changes (at 57-62).

(f) consideration should be given to **any feature of the development which is important, material or essential**. A change to such a feature is likely to mean that it is not substantially the same development (at 64).

4.9 More recently, in *Arrage v Inner West Council* [2019] NSWLEC 85 (**Arrage**) (at [27] to [28]), Preston CJ observed that in most cases the best way to identify whether a modified development is substantially the same as the originally approved development is to identify the material and essential features of the originally approved and modified developments in order to undertake the comparative exercise required.

4.10 Another important consideration when considering the power to modify a consent follows the recent decision of the NSW Court of Appeal in *Ku-ring-gai Council v Buyozo Pty Ltd* [2021] NSWCA 177 (**Buyozo**) in which the Court stated:

'*[55] The constraints on three of the powers, s 4.55(1A), s 4.55(2) and s 4.56(1), indicate that the modification of the development consent sought needs to effect some change to the development the subject of the development consent...*'

4.11 Accordingly, a modification application cannot be made that seeks to – for example – change a condition of development consent that does not effect a change to the development.

Application of the law to the facts

4.12 Applying the above legal principles, and recent decisions of the Land and Environment Court of New South Wales, there is a strong argument that the Proposed Modification is substantially the same as the development the subject of the Original Development Consent for the following reasons.

1.The material and essential features remain the same

4.13 Adopting the approach of Preston CJ in Arrage, the material and essential features of the originally approved development can be summarised as follows:

(a) alterations and additions to an existing warehouse facility to be used for the purposes of tyre recycling;

(b) the receival and temporary storage of tyres;

(c) the processing and shredding of tyres;

(d) the dispatch of processed Tyre Derived Fuel (**TDF**) and other Tyre Derived Products (**TDP**);

(e) the operation of the tyre recycling facility 7 days a week and 24 hours per day; and,

(f) that the tyre recycling facility is not designated development.

4.14 The material and essential features of the Proposed Modification are:

(a) that the existing warehouse facility and plant as originally altered remain unchanged and continue to be used for the purpose of tyre recycling;

(b) that the tyre recycling facility continue to receive and temporarily store tyres;

(c) that the processing and shredding of tyres uses the same plant and processes;

(d) the dispatch of the same processed Tyre Derived Fuel (**TDF**) and other Tyre Derived Products (**TDP**);

(e) the operation of the tyre recycling facility 7 days a week and 24 hours per day; and,

(f) that the tyre recycling facility is not designated development.

4.15 Accordingly, the material and essential features of the development the subject of the Original Development Consent and the Proposed Modification will remain unchanged as a result of the MA.

2. The 30,000-tonne limit is not an essential element of the original development

4.16 In our opinion, the numerical limit of 30,000 tpa is not an essential element of the development the subject of the Original Development Consent.

4.17 The quantitative limit must be assessed in the context and circumstances in which the Original Development Consent was granted (as outlined at paragraph 4.8(d) above).

4.18 There can be no doubt that the purpose of imposing the 30,000 tpa limit was to avoid the threshold of Designated Development for waste management facilities (being 30,000 tpa pursuant to clause 45(2)(b)(iii) of Schedule 3 of the EPA Regulation) as opposed to defining an essential element of the development itself. This is clear for two key reasons. EE

4.19 *Firstly*, condition 8 of the Original Development Consent expressly concedes that the purpose of the limit is:

> '*to ensure the development does not exceed the threshold for designated development…'*.

4.20 This condition was imposed by the Planning Panel as stated in the *Determination and Statement of Reasons*.

4.21 *Secondly*, there are two different limits referenced in the Original Development Consent. There is a limit of 30,000 tpa referenced at condition 8, and there is also a limit of 29,000 tpa referenced in the SEE (which is expressly incorporated into the consent by dint of condition 1 of the Original Development Consent*: Allandale Blue Metal Pty Ltd v Roads and Maritime Services (2013) 195 LGERA 182; [2013] NSWCA 103*). As there is no one clear numerical limit on the handling capacity, the 30,000 tpa limit – or for that matter any other specific numerical limit - cannot be said to be an essential element.

4.22 Importantly, consideration needs to be given to the principal in Moto set out in paragraph 4.8(c) above, that a numeric or quantitative evaluation of

the modification when compared to the original consent absent any qualitative assessment will be “legally flawed.”

4.23 Despite the above, it is clear that what is an essential element of the original development - and the purpose of the 30,000 tpa limit – is ensuring that the development is not classified as Designated Development. For the reasons explained at paragraph 5 of this opinion, this 'essential feature' will not be changed by the Proposed Modification.

4.24 In the recent decision of *Hunter Development Brokerage Pty Limited trading as HDB Town Planning and Design v Singleton Council* [2022] Duggan J addressed the approach to be taken when assessing whether the alteration of a single feature of a development can be said to be so significant that the development is no longer substantially the same. Her honour stated at [64] and [97]:

> *'it is relevant for the Court to not only compare the purpose of the development, or the physical differences between the original and modified proposals, but also the context in which the original consent was granted and the different environmental impacts of each proposal'*
>
> …
>
> *'The significance of a particular feature or set of features may alone or in combination be so significant that the alteration is such that an essential or material component of the development is so altered that it can no longer be said to be substantially the same development – this determination will be a matter of fact and degree depending upon the facts and circumstances in each particular case. Such an exercise is not focussing on a single element, rather it is identifying from the whole an element which alone has such importance it is capable of altering the development to such a degree that it falls outside the jurisdictional limit.'*

4.25 In our opinion, a change in the handling capacity limit from 30,000 tpa to 60,000 tpa cannot be said to be so radical or so significant that the development is no longer substantially the same. When considering the facts and circumstances of the handling limit in the context of the whole of the development the following conclusions can be drawn:

(a) the change in the handling capacity will not alter the essential features of the development being the purpose of the development, the processes it adopts, the plant and equipment utilised, the buildings utilised, the materials input or produced or the classification of the development as not being Designated Development; and,

(b) the change in the handling capacity will have minimal environmental impacts as discussed below.

3. The Proposed Modification will have minimal environmental impacts

4.26 In our opinion, the environmental impacts associated with the Proposed Modification will be 'minimal.'

4.27 The courts have given consideration to what is meant by the term '*minimal environmental impact*'. In the decision of *Bechara v Plan Urban Services Pty Ltd* (2006) 149 LGERA 41; [2006] NSWLEC 594 at [57] Jagot J (as she then was) stated:

> '*In King, Markwick, Taylor & Ors v Bathurst Regional Council [2006] NSWLEC 505 at [84], I said that "minimal", in the context of s 96 construed as a whole, must take its ordinary meaning of "very small" or "negligible". The "minimal" requirement qualifies the "environmental impact" of the proposed modification, rather than the proposed modification itself - which is subject to the "substantially the same" requirement in s 96(1A)(b). Hence, the focus must be on the impact or effect of the modification on the environment. Given the very broad and inclusive definition of "environment" in s 4(1) of the EPA Act, it is necessarily a matter for the consent authority to identify for itself the relevant categories of potential impacts*.'

4.28 Accordingly, a minimal impact is one which is very small or negligible.

4.29 The potential environmental impacts of the Proposed Modification relate to air, noise and traffic. You have provided us with reports prepared by experts in these fields which disclose that the respective environmental impacts associated with the Proposed Modification will be negligible.

4.30 Specifically, we have been provided with a report prepared by SCT Consulting dated 3 November 2022 (**Traffic Assessment**) which concludes that (at page 2):

> *'Based on forecast changes due to the Proposed Modification, there is likely to be minimal traffic impact on the surrounding road network. There is also likely to be minimal impact to walking and public transport modes due to the modification'*.

4.31 The Traffic Assessment is attached at **Tab D** of this opinion.

4.32 We have also been provided with a noise assessment prepared by Todoroski Air Sciences dated 10 November 2022 (**Noise Assessment**) which states, at page 5 (our emphasis added):

'*We also note that as a conservative measure, the scenario in the NIA* [the assessment completed for the Original Development Consent] *assumed daytime levels of plant activity, along with an F-class temperature inversion and light winds towards receivers. In reality, the modelled weather condition corresponds with night-time periods when there would likely be minimal site activity external to the warehouse building. Thus, the predicted noise levels in the NIA are conservative and would adequately account for the increased production associated with the Project.* ***There is not expected to be any additional noise associated with the operations above that already predicted for the Project***.'

4.33 Furthermore, we have been provided with an Air quality assessment dated 10 November, also prepared by Todoroski Air Sciences (**Air Quality Assessment**) which states (at page 4):

'*Based on the comparison of modelling predictions, it is concluded the Project will not result in any discernible additional impact above that presented in the Todoroski Air Sciences (2020) assessment* [the assessment completed for the Original Development Consent] *at any receptor locations*.'

4.34 A copy of the Noise Assessment is attached at **Tab E** of this opinion.

4.35 A copy of the Air Quality Assessment is attached at **Tab F** of this opinion.

4.36 In addition, we are instructed that the Proposed Modification will remain compliant with the environmental conditions imposed on the Original Development Consent. Specifically, we have been instructed that the Proposed Modification will continue to comply with conditions 16 to 26 regarding environmental matters including noise levels, storage tanks, storage of waste oils, stormwater drainage and pollution requirements.

4.37 Having regard to the nature of the impacts and the fact that the environmental conditions of the Original Development Consent will not be contravened, it is our view that the Proposed Modification can be classified as having 'minimal environmental impact.'

4.38 Modification applications can be made through one of two pathways: either an application under section 4.55(1A) of the EPA Act which is for modification applications that involve minimal environmental impact, or under section 4.55(2) for all 'other' modification applications (essentially those applications that do have significant impacts).

4.39 For the reasons outlined above, it is our view that the MA can be made under section 4.55(1A) of the EPA Act as a modification involving a minimal environmental impact.

4. The Proposed Modification will effect a change to the development

4.40 The Proposed Modification will comply with the principle enunciated in Buyozo. namely, it will effect a change to the development in the form of the volume of tyres handled and the associated changes with that increase in capacity. However, the proposed change will not alter the essence of the development, nor will it be accompanied by any more than a minimal environmental impact.

4.41 For the reasons outlined above, it is our firm view that the Consent Authority has the power to modify the Original Development Consent according to the MA pursuant to section 4.55(1A) of the EPA Act.

Other considerations – s 4.55(3)

4.42 Section 4.55(3) of the EPA Act requires the consent authority to take into consideration the reasons given by the (original) consent authority for the grant of the consent that is sought to be modified. In that respect, the *Determination and Statement of Reasons* issued by the Planning Panel stated:

> '*the impacts of the development are expected to be acceptable provided that the conditions of the consent are complied with'*

4.43 As the key environmental conditions of the Original Development Consent will remain complied with, the impacts of the Proposed Modification will remain acceptable.

4.44 In the Council Assessment Report, Council assessed the likely impacts of the development to include traffic and noise impacts (page 16). In respect of traffic impacts the Council stated:

> '*The existing road network is assessed to have capacity to accommodate the increased volume of vehicles.'*

4.45 In respect of noise emissions, the Council stated:

> '*all activities are contained within the site's warehouse and relevant conditions are included*.'

4.46 These reasons remain valid in the context of the Proposed Modification and should be given weight by the Consent Authority in making a determination to grant consent to the MA.

5 Question 2 - Is the Proposed Modification properly characterised as Designated Development or not?

5.1 In our opinion, the Proposed Modification is properly characterised as ***not*** being Designated Development.

5.2 Section 48(1) of Schedule 3 of the EPA Regulation provides for exceptions to Designated Development and states:

> *'(1) Development involving alterations or additions to development, whether existing or approved, is not designated development if, in the consent authority's opinion, the alterations or additions do not significantly increase the environmental impacts of the existing or approved development.'*

5.3 Accordingly, if the Proposed Modification satisfies the following two limbs, it is not Designated Development:

(a) it involves an alteration or addition to approved development: and,

(b) it will not significantly increase environmental impacts,

it is not Designated Development.

5.4 We explore these two limbs further as follows.

Is the Proposed Modification an alteration or addition to approved development?

5.5 There can be no argument that the Proposed Modification is an alteration to an approved development, being an alteration to the handling capacity limit of the Original Development Consent.

Will the alterations or additions significantly increase the environmental impacts of the existing or approved development?

5.6 For the reasons outlined above at paragraph 4.26, the Proposed Modification will have only minimal environmental impacts and consequently there will not be a significant increase in the impacts of the development the subject of the Original Development Consent.

5.7 Despite this, the Consent Authority must consider several 'relevant matters' when forming a view as to whether there will be a significant increase in impacts. Those matters are set out at section 48(2) of Schedule 3 of the EPA Regulation as follows:

> *'(a) the impact of the existing development, including the following—*
> *(i) previous environmental management performance, including compliance with the conditions of any consents, licences, leases or authorisations by a public authority and compliance with any relevant codes of practice,*
>
> *(ii) rehabilitation or restoration of any disturbed land,*

(iii) the number and nature of all past changes and their cumulative effects,

(b) the likely impact of the proposed alterations or additions, including the following—

(i) the scale, character or nature of the proposal in relation to the development,

(ii) the existing vegetation, air, noise and water quality, scenic character and special features of the land on which the development is, or will be, carried out and the surrounding locality,

(iii) the degree to which the potential environmental impacts can be predicted with adequate certainty,

(iv) the capacity of the receiving environment to accommodate changes in environmental impacts,

(c) proposals to mitigate the environmental impacts and manage residual risk,

(d) proposals to facilitate compliance with relevant standards, codes of practice or guidelines published by the Department or other public authorities.'

(**Relevant Matters**)

5.8 For the avoidance of any doubt, giving consideration to the Relevant Matters does not mean that the Consent Authority must be satisfied as to those matters in order to determine that any increase in impacts is not significant. Giving consideration to a relevant matter involves giving proper and genuine consideration and more than mere lip service: *Anderson v Director General of the Department of Environmental and Climate Change & Anor* [2008] NSWCA 337 at [58]. It is entirely permissible for a Consent Authority to consider a matter and find that it should be given no weight.

5.9 Importantly, the Relevant Matters at section 48(2) are 'jurisdictional fact' considerations that are necessary to make a determination under section 48(1), which is to say that the Relevant Matters are relevant only insofar as they give weight to whether there is a significant increase in impacts.

5.10 By way of example, the Relevant Matter relating to previous environmental performance and compliance with conditions of the Original Development Consent is a matter which must be considered but could only be given weight if the failure to comply with conditions resulted in an environmental impact. Put another way, if there was a failure to comply with a condition, but that failure did not result in a

change to environmental impacts, that Relevant Matter would be considered but given no weight.

5.11 In our opinion, none of the Relevant Matters would alter the view of the Consent Authority that there will not be a significant increase in environmental impacts resulting from the Proposed Modification.

Mischaracterisation of development enlivens right of appeal

5.12 The courts have held that the question of whether a development application is designated development is a jurisdictional fact which is appealable in judicial review proceedings. Accordingly, were the Applicant or the Council to mischaracterise the development as designated, an appeal right would be enlivened, and proceedings could be commenced in Class 4 of the Land and Environment Court of New South Wales: *Hollis v Shoalhaven City Council* [2002] NSWLEC 83.

6 Next Steps

6.1 If it would be of assistance, we are happy to meet with the relevant planning officers at Council to discuss the matters raised in this advice in greater detail and to provide them the necessary comfort they require to make an assessment of the MA.

6.2 If you have any questions or require further information in relation to the above matters, please contact me on the details provided on the first page.

Yours sincerely

Matthew Cole

copy Nicole.Bennett@resourceco.com.au; mazen.elfeky@tyrecycle.com.au; luke@elementenvironment.com.au; neville@elementenvironment.com.au

APPENDIX D

COUNCIL PRE-LODGEMENT NOTES

Our Ref: PL22/0052
Contact: Jacqueline Klincke
Telephone: (02) 4732 8391

15 September 2022

Element Environment
PO Box 1563
WARRIEWOOD NSW 2102

Dear Element Environment,

Pre-lodgement Advice
Proposed Development: Upscale Production of Tyre Recycling Facility
Address: Lot 9 DP 1261030, 1-21 Grady Crescent ERSKINE PARK NSW 2759

Thank you for taking part in Council's pre-lodgement meeting on 25 August 2022. The meeting was useful for Council in gaining a preliminary understanding of your proposal and the alterative approval pathways.

No objections are raised in relation to the proposal to increase production and storage capacities at the site noting that any future application would need to demonstrate compliance with the applicable plans and policies and site suitability.

Notwithstanding the above, much of the discussion held at the meeting centred around whether the proposal satisfies the provisions of Schedule 3 Clause 48 of the *Environmental Planning and Assessment Regulation 2021* (the Regulations).

As outlined herein, due to minimal technical information submitted ahead of the meeting, Council cannot be satisfied the proposal qualifies as an 'alteration or addition' and that the proposed is not 'designated development'. In this regard, the advice attached is for your consideration.

Council's preliminary advice, based on the project description and context is that the proposal is Designated Development, and an Environmental Impact Statement (**EIS**) is required.

In this respect, SEARs are to be requested from the Department of Planning and Environment (**DPE**) and an EIS is to accompany a development application with Council.

Should a secondary pre-lodgement be sought, any further information and technical advice or reports can be submitted for Council's review and to allow for the provision of more targeted advice in relation to the proposed upscale production of the site.

PENRITH CITY COUNCIL

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T 4732 7777
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penrithcity.nsw.gov.au

If we can help you any further regarding the attached advice, please feel free to contact me on (02) 4732 8391.

Yours sincerely,
Jacqueline Klincke

PRE-LODGEMENT ADVICE

Proposal Tyre Recycling Facility

Address Lot 9 DP 1261030
1-21 Grady Crescent ERSKINE PARK NSW 2759

Penrith City Council

Jacqueline Klincke – Development Assessment Planner
Stephen Masters – Senior Development Engineer
Paul Reynolds – Team Leader Environmental Health

Zoning: IN1 General Industrial – SEPP (Industry and Employment) 2021

Development Type: Upscale production and storage of an existing tyre recycling facility

The pre-lodgement panel will endeavour to provide information which will enable you to identify issues that must be addressed in any application. The onus remains on the applicant to ensure that all relevant controls and issues are considered prior to the submission of an application.

RELEVANT EPIs POLICIES AND GUIDELINES

- Environmental Planning and Assessment Act 1979
- Environmental Planning and Assessment Regulation 2021
- State Environmental Planning Policy (Industry and Employment) 2021
- State Environmental Planning Policy (Planning Systems) 2021
- State Environmental Planning Policy (Biodiversity and Conservation) 2021
- State Environmental Planning Policy (Resilience and Hazards) 2021
- State Environmental Planning Policy (Precincts – Western Parkland City) 2021
- Protection of the Environment Operation Act 1997
- Penrith Development Control Plan 2014

KEY ISSUES AND ITEMS OF CONCERN:

The proposal seeks to upscale production and storage of an approved and existing tyre recycling facility (Tyrecycle) as follows:

- Processing and shredding tyre waste from 29,000t p/a to 85,000t p/a
- Storage of material on site from 970 tonnes to 2,300 tonnes.

It is noted the facility also currently has approval for the storage of a maximum of 60 tonnes of waste lead acid batteries and/or waste oil at the premises at any time. It was confirmed verbally at the meeting that this is not proposed to be changed.

The proposed development represents almost a three-fold increase (293%) of the existing production and capacity.

As confirmed at the meeting, there are two (2) alternative pathways of approval which are discussed below:

Pathway 1 - Designated Development:

Under Schedule 3 Clause 45 of the *Environmental Planning and Assessment Regulations 2021* (the Regulations), a waste management facility (i.e., tyre recycling/processing facility) that has an intended handling capacity of more than 30,000 tonnes per year of waste or located within 500m of a residential zone is 'designated development'. In this regard, as the proposed development seeks approval for the processing of 85,000 tonnes (55,000 tonnes over the threshold) and is also located within 500m of a residential zone, the development is classed as 'designated development'.

Accordingly, a scoping report and a request for SEARs must be submitted to the NSW Department of Planning & Environment (DPE). A development application shall then be lodged to Council, accompanied with an Environmental Impact Statement (EIS).

In addition, Schedule 1 Clause 34 of the *NSW Protection of the Environment Operations Act 1997* outlines a resource recovery plant (including a tyre recycling facility) that processes in excess of 5,000 tonnes requires an Environmental Protection License (EPL). In this regard, under Section 4.46 of the *Environmental Planning and Assessment Act 1979*, the proposal is classed as 'integrated development' and general terms of approval from the Environmental Protection Authority is required.

Furthermore, Schedule 6 of the *State Environmental Planning Policy (Planning Systems) 2021* classifies waste management facilities as 'regionally significant development'. Accordingly, the Sydney Western City Planning Panel (SWCPP) is the determining authority.

Pathway 2 – Alterations or Additions under Clause 48 Schedule 3 the Regulations:

Under Schedule 3 Clause 48 of the *Environmental Planning and Assessment Regulations 2021* (the Regulations), proposals that involve alterations and additions to an existing / approved development does not have to be classed as 'designated development', so long as the proposal satisfies several provisions.

An excerpt of Clause 48 Schedule 3 of the Regulations is provided below:

48 Alterations or additions to existing or approved development

> *(1) Development involving alterations or additions to development, whether existing or approved, is not designated development if, in the consent authority's*

opinion, the alterations or additions ***do not significantly increase the environmental impacts of the existing or approved development.***

(2) In forming its opinion, a consent authority must consider the following—

(a) the impact of the existing development, including the following—

(i) previous environmental management performance, including ***compliance with the conditions of any consents****, licences, leases or authorisations by a public authority and compliance with any relevant codes of practice,*

(ii) rehabilitation or restoration of any disturbed land,

(iii) the number and nature of all past changes and their cumulative effects,

(b) the likely impact of the proposed alterations or additions, including the following—

(i) the ***scale****, character or nature of the proposal in relation to the development,*

(ii) the existing vegetation, ***air, noise*** *and water quality, scenic character and special features of the land on which the development is, or will be, carried out and the* ***surrounding locality,***

(iii) the ***degree to which the potential environmental impacts can be predicted with adequate certainty****,*

(iv) the ***capacity of the receiving environment to accommodate changes in environmental impacts****,*

(c) proposals to ***mitigate the environmental impacts and manage residual risk****,*

(d) proposals to facilitate compliance with relevant standards, codes of practice or guidelines published by the Department or other public authorities.

Note 1—

The Act, section 8.8 does not extend to development that is not designated development under this section even if it is State significant development.

Note 2—

This section does not apply in relation to an application for modification of a development consent.

In light of the above, Council is concerned that the proposed development will not satisfy a number of these provisions including:

- Condition 3 of DA20/0589 requires the installation of a 99kw (as a minimum) roof top solar system and be operational within 12 months of the issue of any Occupation Certificate. A review of a recent aerial photograph (dated 21 August 2022) indicates this system has not yet been installed, noting an Occupation Certificate was issued 22 October 2021). In this regard, a condition of consent has not yet been complied with.

- The proposed alterations are considered to be of a significant scale, noting the upscale production is representative of almost a three-fold increase (293%) to the existing processing and storage capacity of the premise (i.e. an additional 56,000 tonnes of tyre waste, and an additional 1,330 tonnes in waste storage). The proposed increase also substantially breaches the 'designated development' threshold and is within 500m of a residential zone.
- The applicant has confirmed the increased production capacity of the existing facility will potentially contribute additional air emissions, as well as potential for increased impacts to the road network and increased traffic noise associated with additional light and heavy vehicle movements to and from the site. However, no supporting information or technical advice has been submitted and therefore, the extent of the associated impacts of the proposed development remain largely unknown.
- Furthermore, it is unclear how an increase in production and capacity would not require any additional machinery, equipment or modifications to the internal layout of the premise.
- The proposal has also not adequately addressed any mitigation measures to appropriately reduce and manage any additional impacts.

In this regard, it is Council's opinion that the proposal in its current form does not qualify as an 'alteration or addition' under Schedule 3 Clause 48 of the Regulations and is Designated Development.

Further could be provided for further review by Council as part of a secondary pre lodgement meeting, to determine whether Schedule 3 Clause 48 of the Regulations is a viable submission pathway.

This additional information includes:

1. A Traffic Impact Assessment Report that has been prepared by a suitably qualified person that addresses the following:
    - Undertake a traffic survey of current light and heavy vehicular usage and movements operating from the site including number of delivery vehicles, number of collection vehicles, times of delivery and times of collection, existing capacity for queueing and manoeuvring. This survey is to be compared to the original traffic report submitted with DA20/0589.
    - Address the expected three-fold increase in heavy vehicle numbers operating from the site including capacity to cater for additional vehicles, queueing areas, delivery and collection areas; and the increase in the number of staff / visitors entering and exiting the site.
    - Assess the impact upon Council's local road network and intersection capacity from the expected increase in traffic volumes.
    - Undertake an assessment of existing staff and proposed staff numbers and the provision of staff carparking spaces on site with regard to the *Penrith Development Control Plan 2014.*

2. The application shall be supported by turning swept paths in accordance with AS2890 clearly demonstrating satisfactory manoeuvring on-site (both internal and external) for light and heavy vehicles with forward entry and exit to and from the public road, noting the increased use of the loading docks on site.

3. Updated set of plans are to be submitted if any changes are required for delivery and collection areas, additional staff parking requirements or internal modifications. The plan shall be fully dimensioned and demonstrate that car parking bays, car parking aisles and manoeuvring details comply with AS2890 Parts 1, 2 & 6 and the *Penrith Development Control Plan 2014*.

4. Acoustic and Air Quality Impact Assessments

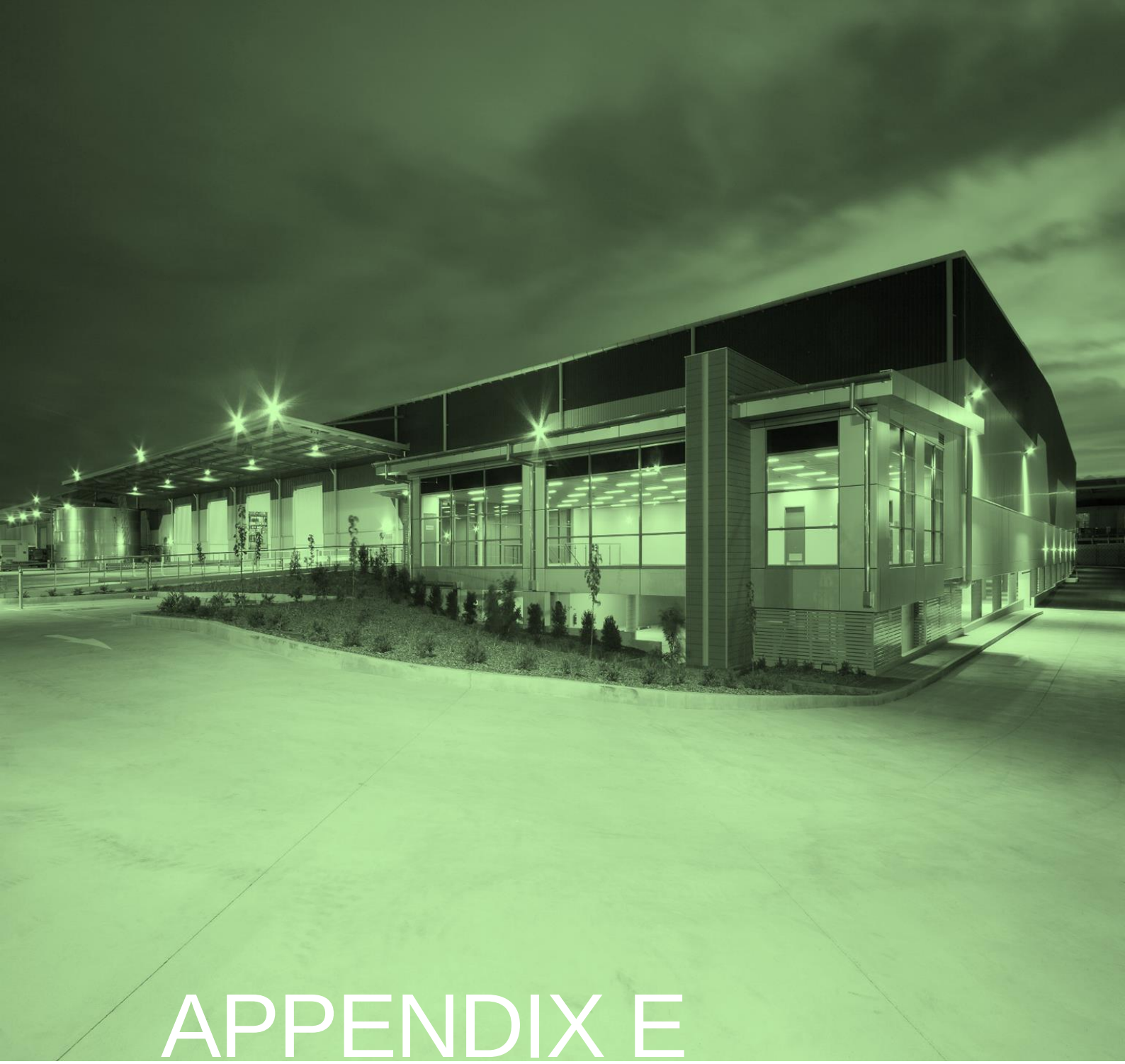
5. Updated Plan of Management

6. Updated Waste Management Plan

It is also noted the proposal would still be classed as 'integrated development, and the Sydney Western City Planning Panel would still be the determining authority.

Any further information and technical advice/reports can be submitted as part of a second pre-lodgement meeting for a more thorough review by Council to gain a better understanding of the increased impacts associated with the proposed upscale in production and capacity. Upon further review, Council can then provide advice regarding the recommended approval pathway. However, please note, Council is unable to confirm with compete certainty that the proposal would be considered as an 'alteration or addition' under Schedule 3 Clause 48 of the Regulations.

Traffic and parking impact of the proposed increase in storage and production are raised as a matter requiring further consideration. Any future application is to be accompanied by suitable plans and assessment reports demonstrating that the significant increase in production and storage is suitable for the site.



APPENDIX E

NOISE IMPACT ASSESSMENT

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12 November 2022

Luke Farrell
Principal Environmental Scientist
Element Environment
Via email: luke@elementenvironment.com.au

RE: Noise Assessment – Tyrecycle Modification

Dear Luke,
Todoroski Air Sciences has assessed the potential for noise impacts to arise due to the proposed development application to expand production at the Tyrecycle Pty Ltd (Tycrecyle) tyre recycling facility at Erskine Park (hereafter referred to as the Project). This report investigates the likely change in noise emissions associated with the Project relative to the approved operations.

This noise assessment has been prepared in general accordance with the NSW EPA document *Noise Policy for Industry* (**NSW EPA, 2017**).

Project description
Tyrecycle operates a tyre recycling facility at 1-21 Grady Crescent, Erskine Park, New South Wales (NSW). Tyrecycle was granted approval for the facility on 20 December 2020 (DA 20/0589).

The facility is located within an industrial area with all operations at the site occurring within an industrial building. The operations include the receival and storage of tyres for shredding and granulating at an approved production rate of 29,000 tonnes per annum (tpa) and stockpiling of up to 970 tonnes of material at the site at any one time.

Figure 1 presents the location of the Project site with reference to the surrounding assessment locations.

Tyrecycle is seeking development consent to allow for an increase in the annual production rate to 60,000tpa and allow for stockpiling of up to 2,300 tonnes of material at the site at any one time. The Project does not require a change to the approved processing activities, building infrastructure or footprint or hours of operation. Additional vehicle movements to and from the site will also result from transportation of additional received tyres and dispatched product due to the Project.

A qualitative assessment has been conducted to determine the potential change in noise emissions and associated noise impacts with the Project relative to the approved operations.

Figure 1: Project setting

Existing environment

Local meteorological conditions

Annual and seasonal windroses generated from data recorded at the Horsley Park Equestrian Centre AWS during 2021 are presented in **Figure 2**.

On an annual basis, the most dominant winds are from the southwest with variable winds from the other directions. In summer, winds predominately originate from the south-southeast, southeast and east. In autumn the most prevalent winds are from the southwest with few winds from the northeast. In winter, winds predominantly occur from the southwest to the north. Spring has varied winds from all directions with the most dominant winds from the southwest.

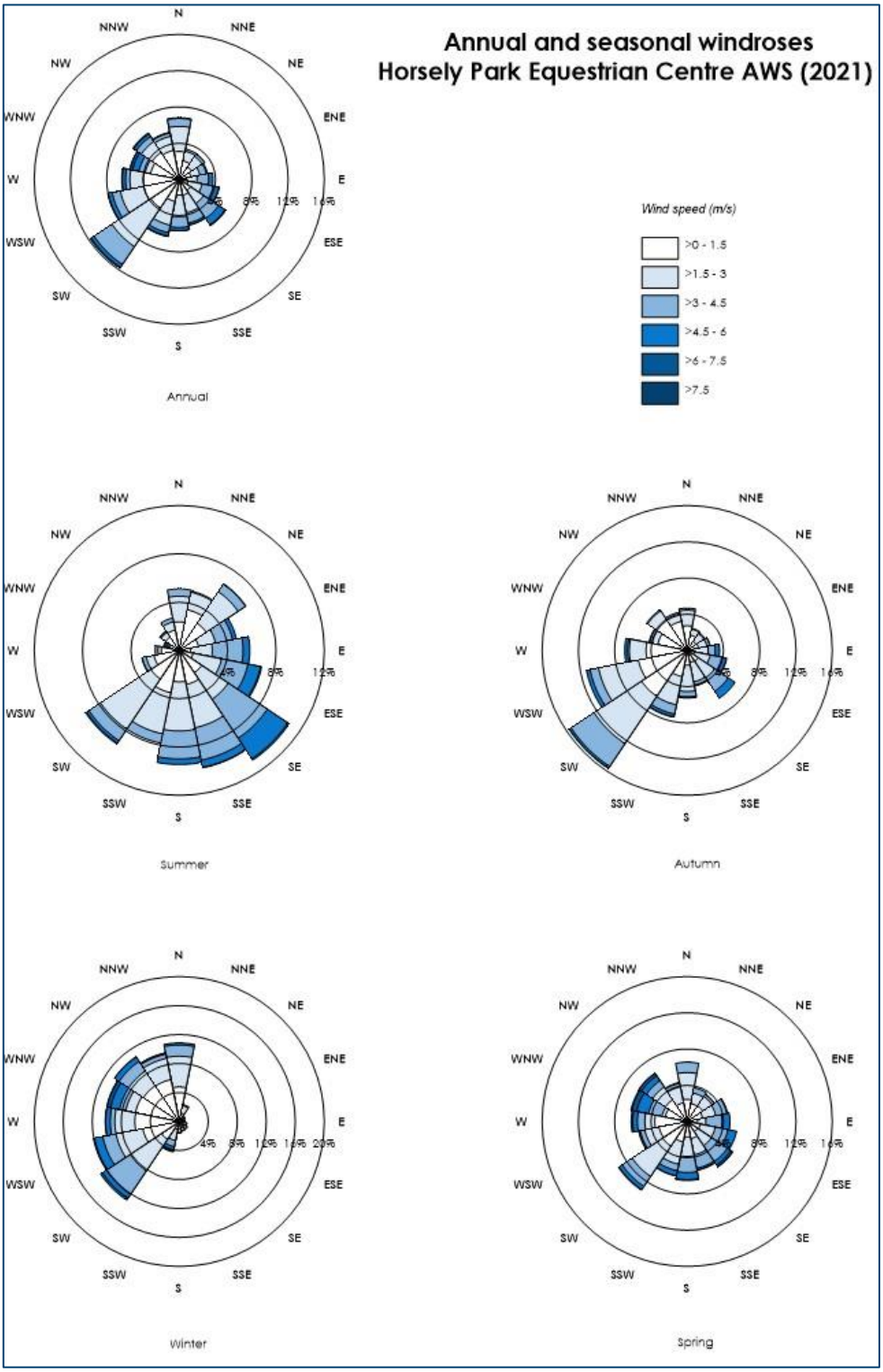


Figure 2: Annual and seasonal windroses – Horsley Park Equestrian Centre AWS (2021)

Review of noise monitoring

Attended noise monitoring was conducted at three locations in May 2022 in accordance with Environment Protection Licence (EPL) 21464 by **JTA Health, Safety & Noise Specialists (2022)**. The noise monitoring locations are shown in **Figure 3** and representative of the nearest receivers to the Project.

Figure 3: Noise monitoring locations

The measured noise levels are presented graphically in **Figure 4**. The noise levels measured on each occasion per day, evening or night are shown in the figure as points along with the applicable noise criteria which is shown as the solid red line. The prevailing conditions at the time of each measurement is split by calm periods, wind away from or to the receiver location.

The results show that winds towards the receiver locations are limited during the monitoring period and that extraneous noise sources appear to be influencing the measurements. This is apparent with the measured levels are above the Project specific noise criteria on multiple occasions when the wind is away from the receiver locations. Most of the periods when the wind is towards the receiver locations indicate noise levels below the Project specific noise criteria and suggests that noise from the site is largely inaudible. The noise monitoring report confirms that level of extraneous noise sources from traffic, wildlife and operations at adjacent industrial facilities made direct measurement of Project noise emissions difficult (**JTA Health, Safety & Noise Specialists, 2022)**.

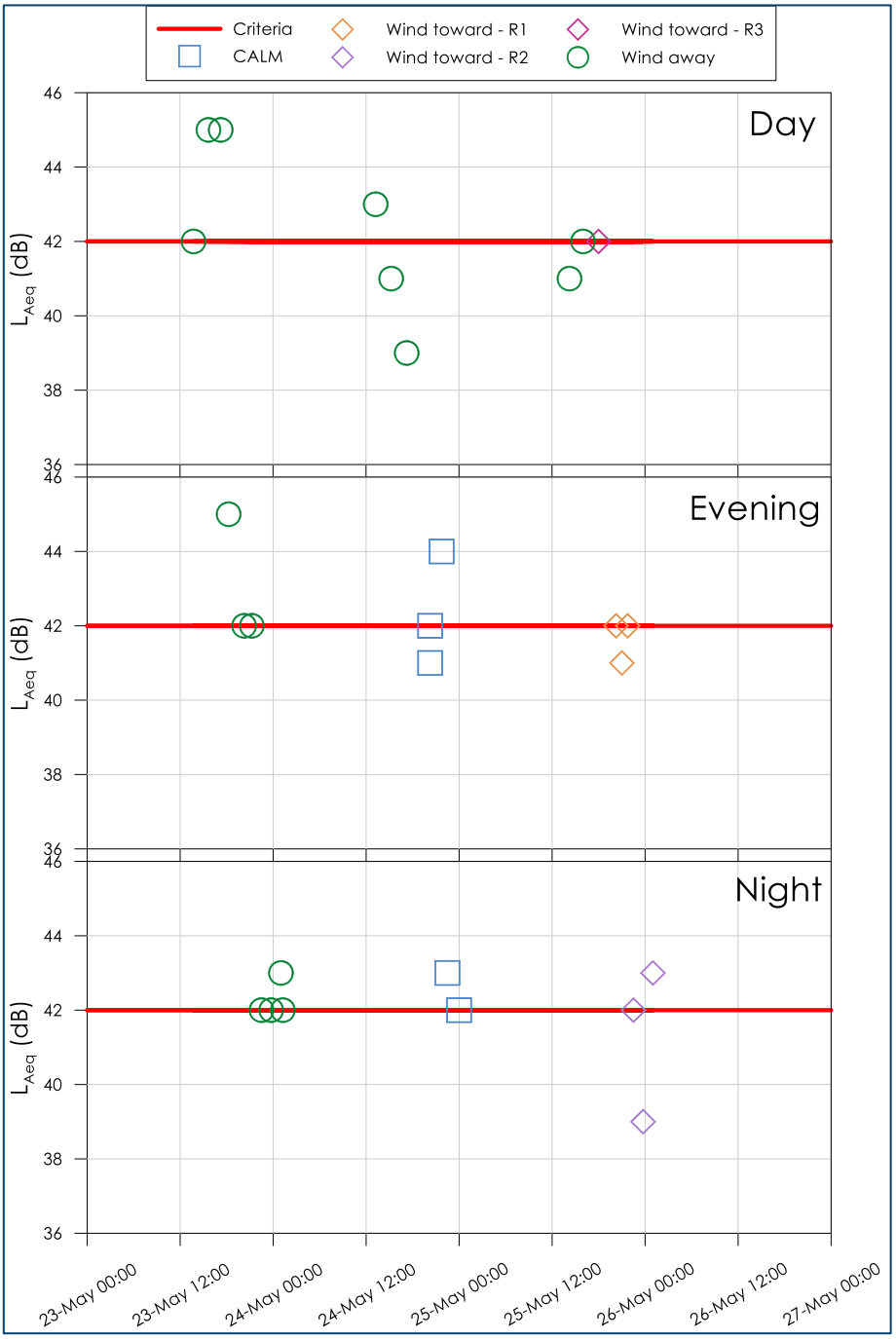
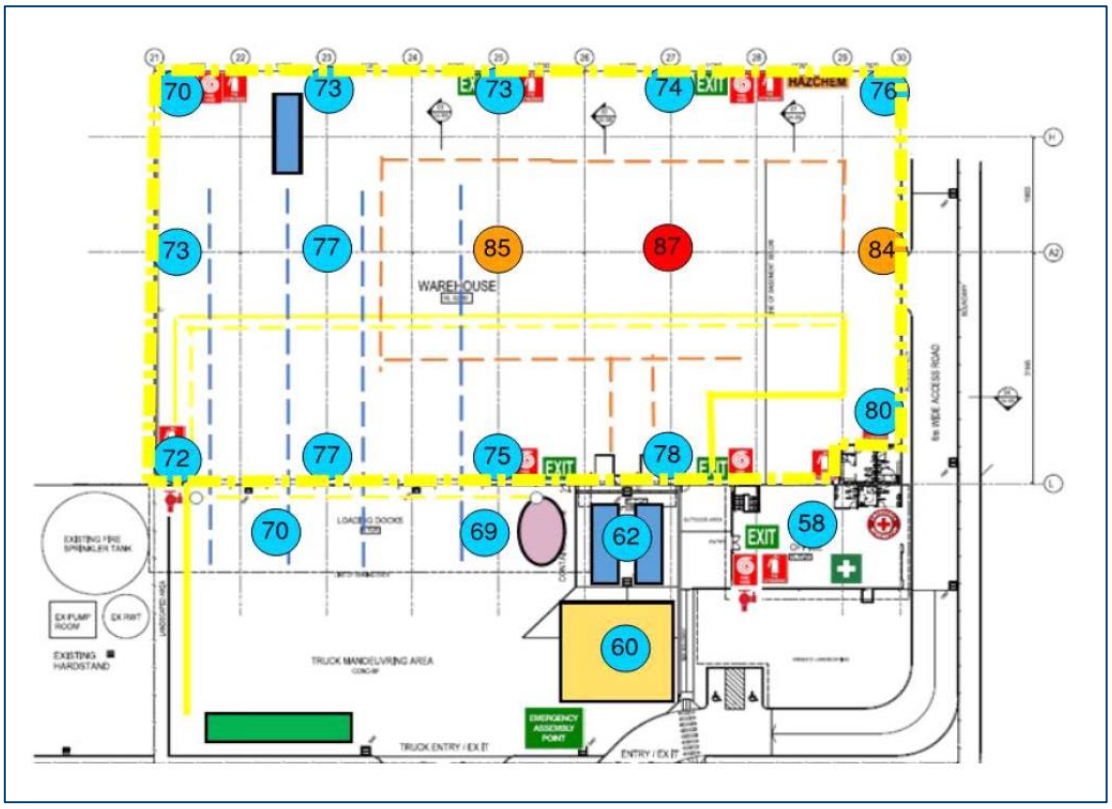


Figure 4: Measured noise levels at monitoring lcoations

An Occupational Noise Assessment (**JTA Health, Safety & Noise Specialists, 2021**) for the site was reviewed to assist with characterising the noise levels from the equipment within the warehouse. The report indicates the measure noise levels of the equipment are comparable to the noise levels for the equipment assumed in the *Noise Impact Assessment Tyrecycle Erskine Park* (NIA) (**Todoroski Air Sciences, 2020**).

A sound pressure map of the facility indicating continuous exposure over 8 hours is presented in **Figure 5**. Based on the sound pressure map the noise levels range from approximately 70dBA to 87dBA internally. The 8-hour exposure can be converted to an equivalent 15-minute period by increasing the noise level by 5dBA, the maximum noise level experienced near the walls of the facility would become 89dBA (i.e. 84 + 5).

A site visit was also conducted on 5th October 2022 to perform site specific noise measurements. During the site visit, there was an equipment failure, and a complete set of noise measurements could not be performed. However, based on the noise experienced whilst the equipment was running, the noise levels measured by the JTA and presented in the sound pressure map are considered sensible for the operations.



Source: JTA Health, Safety & Noise Specialists, 2021

Figure 5: Sound pressure level map

Assessment of potential noise impacts

To assess the noise impacts associated with the Project a qualitative approach has been applied that considers the potential change in noise levels associated with the Project relative to the approved operations.

As noted, the Project seeks to increase the annual production rate to 60,000tpa, up from 29,000tpa, with no change required to the approved processing activities, building infrastructure or footprint or hours of operation. The increase in the annual production will be achieved with the existing processing equipment operating for longer periods within the approved operational hours. Currently the equipment is only required to run intermittently to achieve the approved process rate.

The NIA assumed a potential worst-case scenario with all the equipment within the warehouse operating at a maximum capacity at the same time. A noise level of 93dBA was estimated for the within the warehouse with all equipment operating and applied in the modelling predictions. It was noted in the Occupational Noise Assessment some of the equipment was only operating part of the period which may explain the differences in the measured level. The modelled noise level is higher than the measurements conducted at the site and is considered suitably conservative for representing the operations.

Other noise sources included in the NIA are the operations truck movements and truck loading activity outside the warehouse in the driveway. Based on the Project, whilst there would be some additional truck movements these would occur intermittently over the day and there are no proposed changes to the approved morning and afternoon peak heavy movements. The NIA assessed the potential noise from the trucks based on the peak heavy movements which would represent that maximum and thus would already account for the worst-case conditions for the Project.

We also note that as a conservative measure, the scenario in the NIA assumed daytime levels of plant activity, along with an F-class temperature inversion and light winds towards receivers. In reality, the modelled weather condition corresponds with night-time periods when there would likely be minimal site activity external to the warehouse building. Thus, the predicted noise levels in the NIA are conservative and would adequately account for the increased production associated with the Project. There is not expected to be any additional noise associated with the operations above that already predicted for the Project.

Summary and conclusions

The report has assessed the potential for noise impacts associated with the proposed development application to increase production at the tyre recycling facility at 1-21 Grady Crescent, Erskine Park.

The Project would achieve an increase in the annual production rate by operating the existing processing equipment for longer periods within the approved operational hours. Currently the equipment is only operated intermittently. The modelling predictions presented in the NIA represents a potential worst-case operation assuming all equipment within the warehouse operates at the same time and would account for the change in production associated with the Project. Therefore, the Project would not result in any additional noise impact above that predicted in the NIA.

Please feel free to contact us if you would like to clarify any aspect of this report.

Yours faithfully,
Todoroski Air Sciences

Philip Henschke

References

JTA Health, Safety & Noise Specialists (2021)

"Occupational Noise Assessment Tyrecycle Pty Ltd – Erskine Park", prepared by JTA Health, Safety & Noise Specialists, December 2021.

JTA Health, Safety & Noise Specialists (2022)

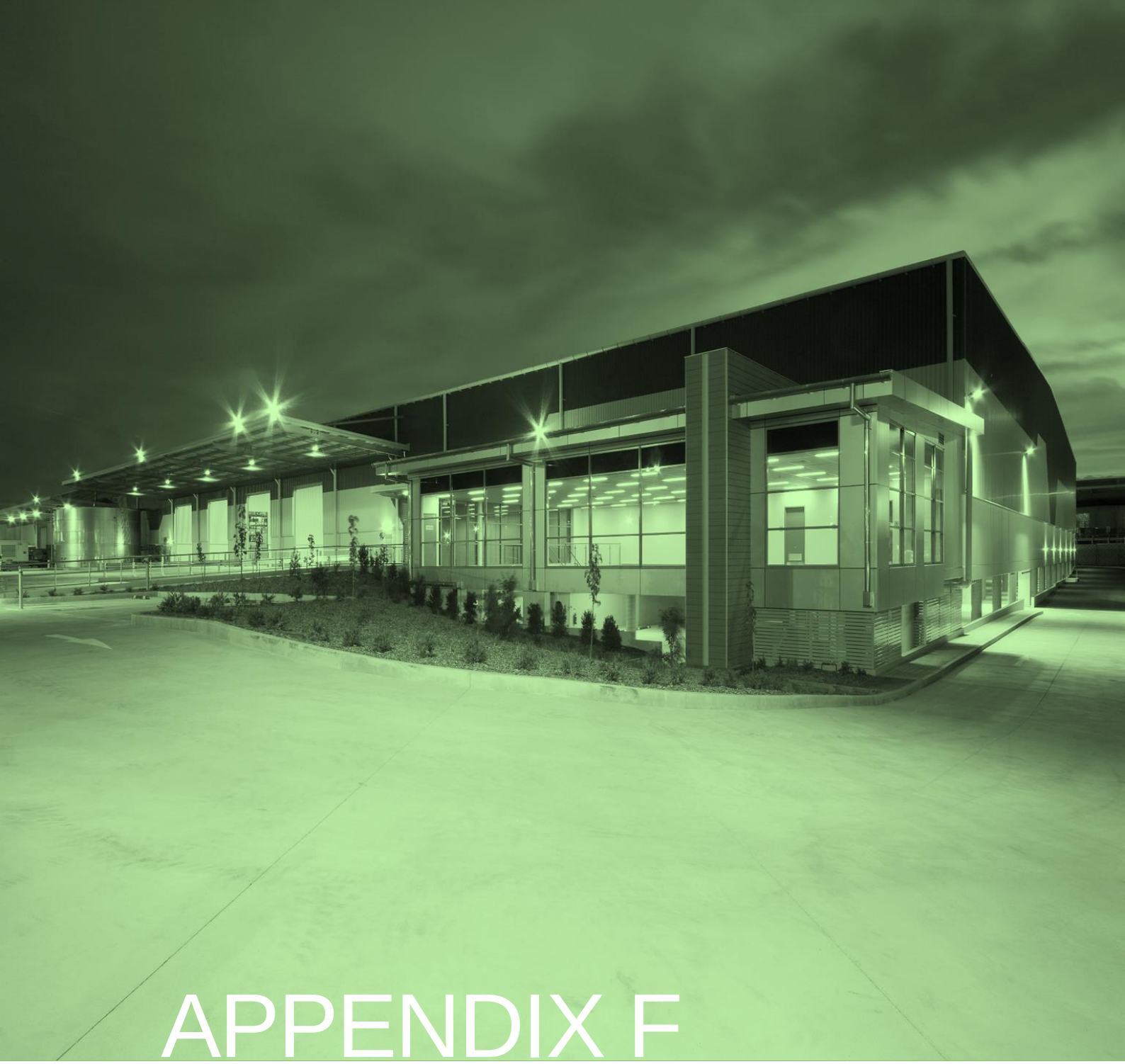
"Environmental Noise Assessment Tyrecycle Pty Ltd – Erskine Park", prepared by JTA Health, Safety & Noise Specialists, June 2022.

Todoroski Air Sciences (2020)

"Noise Impact Assessment Tyrecycle Erskine Park", prepared by Todoroski Air Sciences for Tyrecycle Pty Ltd, September 2020.

NSW EPA (2017)

"Noise Policy for Industry", NSW Environment Protection Authority, October 2017.



APPENDIX F

AIR QUALITY IMPACT ASSESSMENT

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22 February 2023

Luke Farrell
Principal Environmental Scientist
Element Environment
Via email: luke@elementenvironment.com.au

RE: Air Quality Assessment – Tyrecycle Modification

Dear Luke,
Todoroski Air Sciences has assessed the potential for air quality impacts to arise due to the proposed development application to expand production at the Tyrecycle Pty Ltd (Tyrecycle) tyre recycling facility at Erskine Park (hereafter referred to as the Project). This report investigates the likely change in dust emissions associated with the Project relative to the approved operations.

This air quality impact assessment has been prepared in general accordance with the New South Wales (NSW) Environment Protection Authority (EPA) document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2022**).

Project setting and description
Tyrecycle operates a tyre recycling facility at 1-21 Grady Crescent, Erskine Park, New South Wales (NSW). Tyrecycle was granted approval for the facility on 20 December 2020 (DA 20/0589).

The facility is located within an industrial area with all operations at the site occurring within an industrial building. The operations include the receival and storage of tyres for shredding and granulating at an approved production rate of 29,000 tonnes per annum (tpa) and stockpiling of up to 970 tonnes of material at the site at any one time.

Figure 1 presents the location of the Project site with reference to the nearest identified surrounding residential receptors.

Tyrecycle is seeking a development consent to allow for an increase in the annual production rate to 60,000tpa and allow for stockpiling of up to 2,300 tonnes of material at the site at any one time. The Project does not require a change to the approved processing activities, building infrastructure or footprint, or hours of operation. Additional vehicle movements to and from the site will also result from transportation of additional received tyres and dispatched product due to the Project.

A quantitative assessment has been conducted to determine the potential change in air quality impacts associated with the Project relative to the approved operations.

Figure 1: Project setting

Existing environmental conditions

Local climatic conditions

Long term climatic data collected at the closest Bureau of Meteorology (BoM) weather station; the Horsley Park Equestrian Centre Automatic Weather Station (AWS) (Station Number 067119) were analysed to characterise the local climate in the proximity of the Project. The Horsley Park Equestrian Centre AWS is located approximately 2.1 kilometres (km) west-southwest of the Project.

Table 1 and **Figure 2** present a summary of the data collected from the Horsley Park Equestrian Centre AWS over an approximate 13 to 25 year period for the various meteorological parameters. These data assist in characterising the local climatic conditions based on the long-term meteorological parameters.

The data indicate that January is the hottest month with a mean maximum temperature of 30.0 degrees Celsius (ºC) and July is the coldest month with a mean minimum temperature of 5.9ºC.

Rainfall declines during the second half of the year, with an annual average rainfall of 780.3 millimetres (mm) over 77 days. The data show February is the wettest month with an average rainfall of 124.5 millimetres (mm) over 7.6 days and August is the driest month with an average rainfall of 38.0mm over 4.0 days.

Relative humidity levels exhibit variability over the day and seasonal fluctuations. Mean 9am relative humidity levels range from 81 percent (%) in March to 61% in October. Mean 3pm relative humidity levels vary from 55% in June to 42% in August and September.

Wind speeds during the warmer months have a greater spread between the 9am and 3pm conditions compared to the colder months. The mean 9am wind speeds range from 8.9 kilometres per hour (km/h) in March to 12.5km/h in October. The mean 3pm wind speeds vary from 12.9km/h in June to 19.9km/h in December.

Table 1: Monthly climate statistics summary – Horsley Park Equestrian Centre AWS

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Temperature													
Mean max. temp. (°C)	30.0	28.6	26.7	23.9	20.6	17.6	17.4	19.1	22.3	24.7	26.4	28.4	23.8
Mean min. temp. (°C)	18.0	17.8	16.1	12.9	9.1	7.1	5.9	6.4	9.3	11.9	14.4	16.2	12.1
Rainfall													
Rainfall (mm)	74.3	124.5	94.5	69.2	44.7	68.6	53.0	38.0	38.3	64.3	77.4	66.2	780.3
No. of rain days (≥1mm)	7.8	7.6	8.8	6.7	5.2	6.1	5.5	4.0	5.0	6.1	7.0	7.2	77.0
9am conditions													
Mean temp. (°C)	22.0	21.5	19.4	17.5	13.8	11.1	10.3	12.0	15.6	18.1	19.2	20.9	16.8
Mean R.H. (%)	73	77	81	76	77	80	78	70	65	61	70	71	73
Mean W.S. (km/h)	10.1	9.7	8.9	10.5	10.7	10.3	10.8	11.7	12.2	12.5	11.8	10.7	10.8
3pm conditions													
Mean temp. (°C)	28.2	27.1	25.3	22.2	19.2	16.6	16.1	17.8	20.8	22.5	24.2	26.5	22.2
Mean R.H. (%)	49	53	54	53	52	55	50	42	42	45	50	48	49
Mean W.S. (km/h)	19.4	17.0	14.8	14.4	13.0	12.9	13.9	16.1	18.1	19.8	19.5	19.9	16.6

Source: **Bureau of Meteorology, 2022**

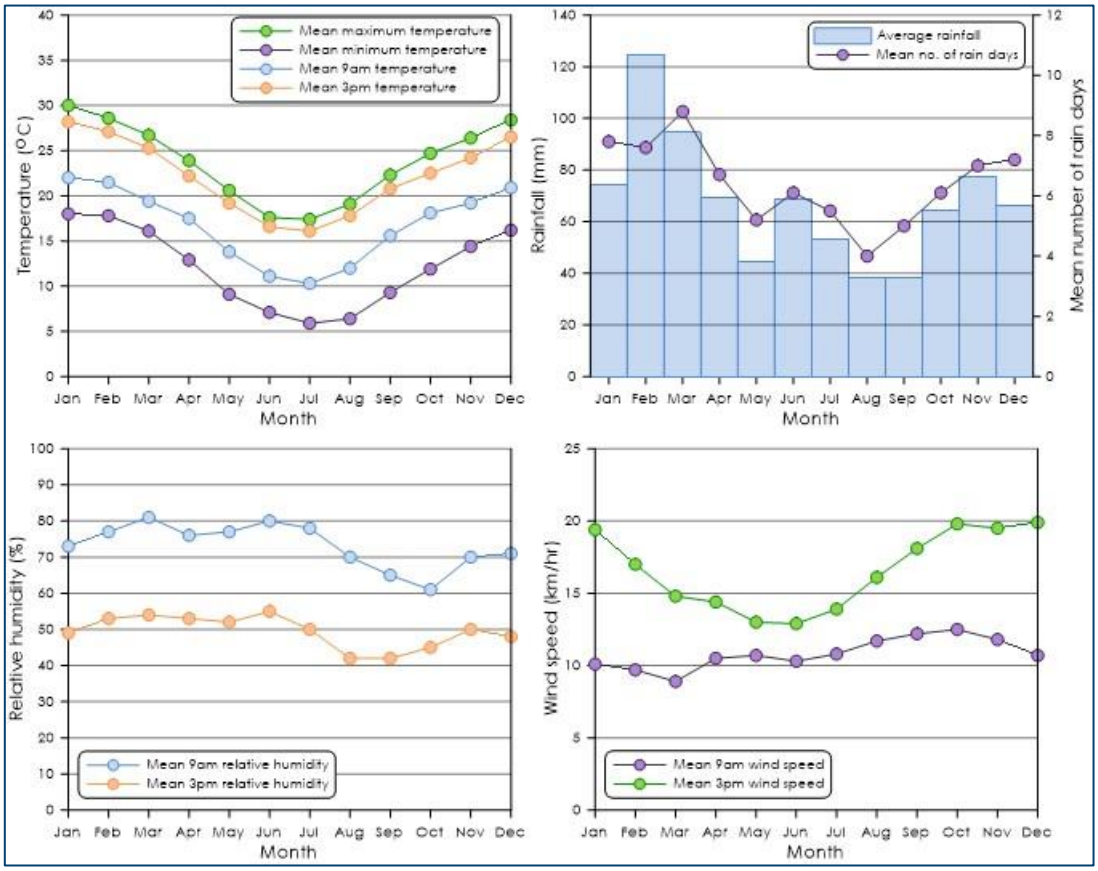


Figure 2: Monthly climate statistics summary – Horsley Park Equestrian Centre AWS

Annual and seasonal windroses generated from data recorded at the Horsley Park Equestrian Centre AWS during 2021 are presented in **Figure 3**.

On an annual basis, the most dominant winds are from the southwest with variable winds from the other directions. In summer, winds predominately originate from the south-southeast, southeast and east. In autumn the most prevalent winds are from the southwest with few winds from the northeast. In winter, winds predominantly occur from the southwest to the north. Spring has varied winds from all directions with the most dominant winds from the southwest.

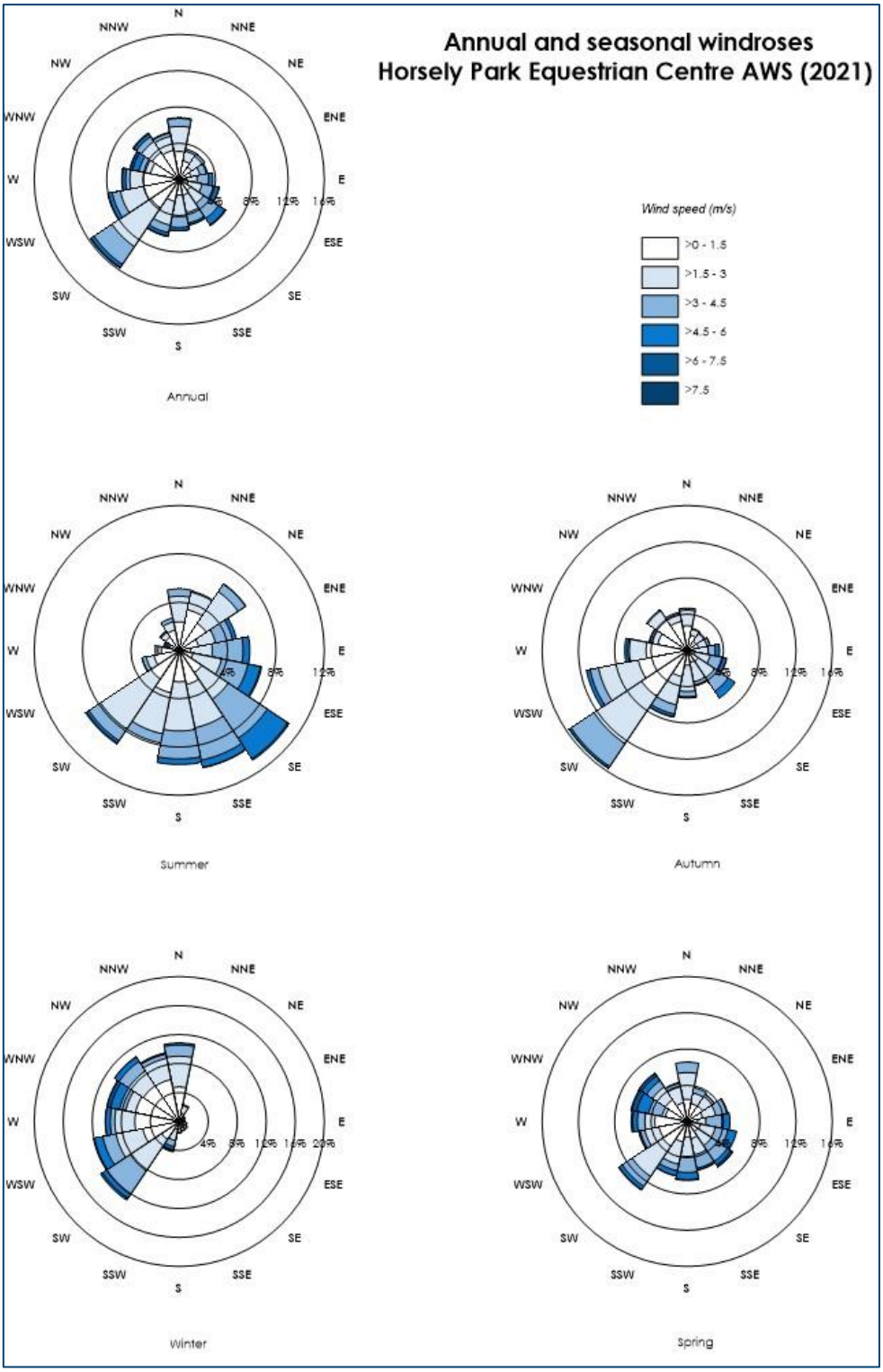


Figure 3: Annual and seasonal windroses – Horsley Park Equestrian Centre AWS (2021)

Local ambient air quality

The main sources of air pollutants in the wider area surrounding the Project include industrial and commercial operations and local anthropogenic activities such as wood heaters and motor vehicle exhaust. This section reviews the available ambient air quality monitoring data sourced from the nearest NSW Department of Planning and Environment (DPE) air quality monitors at St Marys and Prospect.

Recorded 24-hour average PM_{10} concentrations from 2015 to 2021 are presented in **Figure 4**. The maximum 24-hour average PM_{10} concentrations were found to exceed the relevant criterion of 50µg/m^3 on occasion for most years of the review period. **Figure 4** shows high PM_{10} concentration recorded at the monitor from November 2019 to January 2020 and is attributed to wildfires and the drought period affecting NSW.

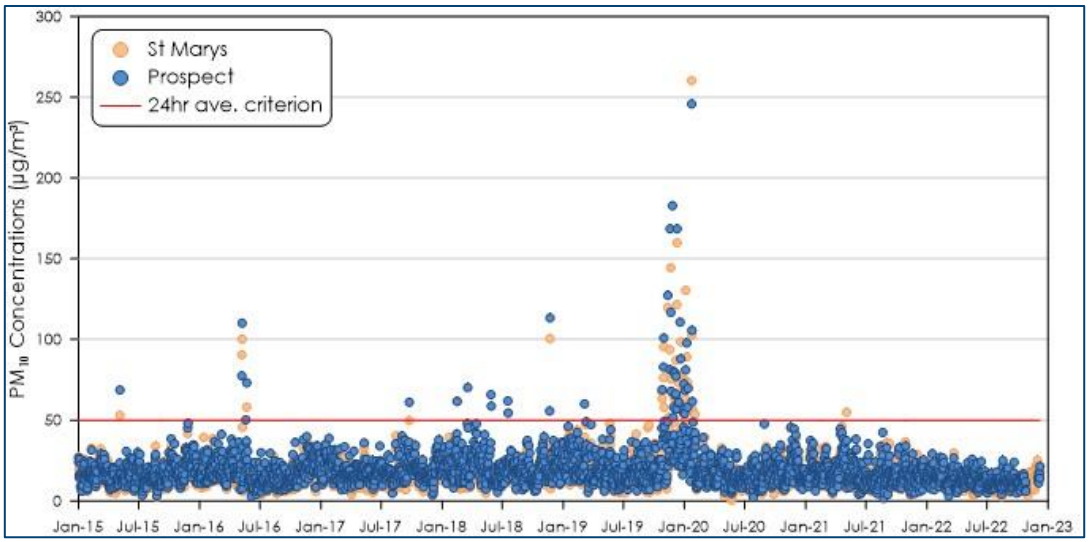


Figure 4: 24-hour average PM_{10} concentrations

Recorded 24-hour average $PM_{2.5}$ concentrations from 2015 to 2021 are presented in **Figure 5**. It is noted the high $PM_{2.5}$ levels seen in the monitoring data can be attributed to bushfire events, in particular those occurring in the November 2019 to January 2020 period, which coincide with the high levels in PM_{10}.

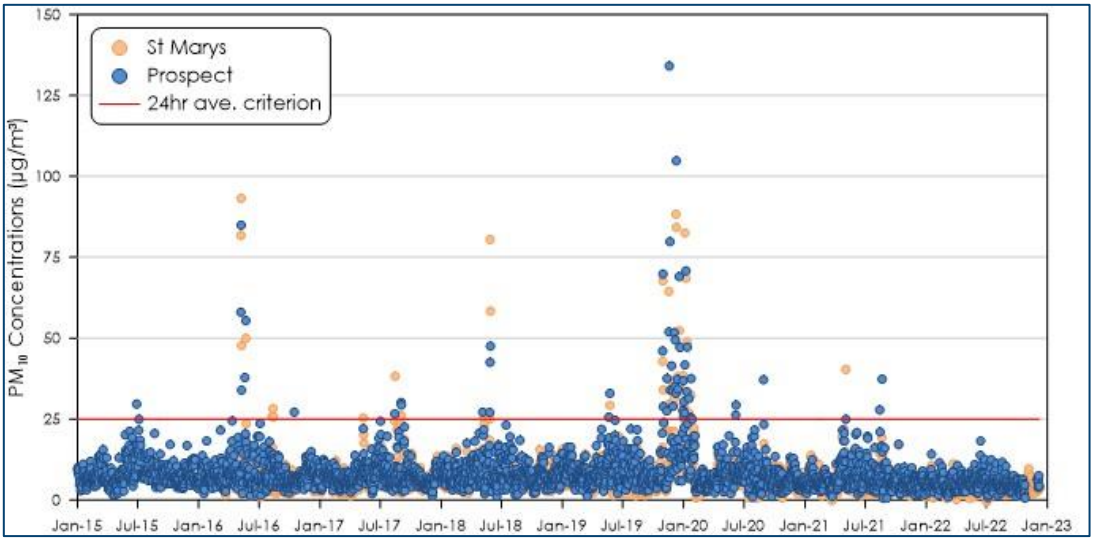


Figure 5: 24-hour average $PM_{2.5}$ concentrations

Assessment of potential air quality impacts

The Project has the potential to affect the quantum of dust emissions generated at the site. To investigate the potential effect the Project may have on dust emissions, an analysis was undertaken for the proposed change in dust levels associated with the Project relative to the dust levels associated with the approved operations as presented in the *Air Quality Impact Assessment Tyrecycle Erskine Park* (AQIA) (**Todoroski Air Sciences, 2022**).

The estimated dust emissions for the Project reflects the current conditions at the site. This includes only one stack ventilation point servicing the cyclone filters emitting from the roof, with the other ventilation point emitting into the warehouse building. The location of the stack ventilation point has also been revised to the northwest corner of the warehouse roof, as shown in **Figure 6**, from the previously modelled location in the southwest corner. The manufacture specification for standard concentration of particulates in the cyclone filters has been revised to a level of 5mg/m^3, compared to a level of 10mg/m^3 as included in the AQIA.

Figure 6: Actual stack location

Other changes compared to the AQIA include a control efficiency of 80% being applied to the material handling activities at the Project as these processes are largely contained within the warehouse, which significantly reduces the potential for fugitive dust emissions. This control was not considered in the original modelling assessment and was a conservative (i.e., overestimate) for the operations at the time.

A summary of the estimated total fugitive dust emissions from the Project presented in **Table 2**. A detailed dust emissions inventory for the Project is presented in **Appendix A**.

Table 2: Summary of estimated dust emission rate for operational activities associated with the Project

Activity	Total suspended particulate (TSP) emission	Particulate matter ≤10µm (PM_{10}) emission	Particulate matter ≤2.5µm ($PM_{2.5}$) emission
Delivering material to site	204	39	9
Unloading material to stockpile in building	9	4	1
Rehandle material at stockpile	9	4	1
Loading material to shredder	9	4	1
Shredding material	32	14	3
Granulating material	150	52	3
Granulating material	150	52	3
Unloading processed material to stockpile in building	9	4	1
Rehandle material at stockpile	9	4	1
Loading processed material to truck	46	22	3
Hauling processed material offsite	206	39	10
Exhaust emissions	101	101	98
Cyclone venting in warehouse	175	175	88
Total emissions (kg/yr.)	**1,109**	**516**	**221**

A comparison of the estimated annual dust emissions for the approved operations (**Todoroski Air Sciences, 2020**) and the Project for all sources (fugitive and stack) is presented in **Table 3**.

Table 3: Comparison of estimated dust emission rate for the Project

Source type	Scenario	TSP emissions	PM_{10} emission	$PM_{2.5}$ emission
Fugitive	Approved	1,232	483	137
	Project	1,109	516	221
	Percent change (%)	**-10%**	**7%**	**61%**
Stack	Approved	7,884	7,884	3,942
	Project	3,066	3,066	1,533
	Percent change (%)	**-61%**	**-61%**	**-61%**

It is calculated that the net annual fugitive TSP emissions associated with the Project would decrease by approximately 10% relative to the approved operations, however, would see an increase in the estimated fugitive PM_{10} and $PM_{2.5}$ emissions. It is important to note that the total annual PM_{10} and $PM_{2.5}$ emissions are very low, thuis the increase is not significant relative to all other dust in the air.

The estimate change in total annual dust emissions due to the Project arises from a combination of the increase in the amount of material processed from 29,000tpa to 60,000tpa, and the control efficiency associated with the activities occurring within the warehouse and the incorporation of the ventilation point emitting into the warehouse building. For the stack sources, dust emissions associated with the Project are lower (by approximately 61%) as expected with the removal of one stack ventilation point and a reduction in particulate concentrations.

To further investigate the extent of the effects on air quality due to the Project, air dispersion modelling was performed using the detailed air dispersion model previously developed for the AQIA (**Todoroski Air Sciences, 2020**). The model was simply updated to reflect the Project.

The air dispersion model was setup identically (apart from the changes associated with the Project) to allow for a direct comparison with the previous assessment. Full details regarding the air dispersion model setup can be found in the AQIA (**Todoroski Air Sciences, 2020**).

Dispersion modelling predictions

The predicted air quality levels due to the Project are overlaid with the predictions for the approved operations (**Todoroski Air Sciences, 2020**). Overlaying these contours allows for a direct comparison of the potential change associated with the Project.

Overall, the modelling indicates the estimated increase in dust emissions due to the Project is minor in comparison to the approved operations with the greatest change occurring close to the site. Further afield and near the residential areas the predicted impact would be unlikely to be discernible beyond the existing approved levels of dust in the area surrounding the site.

The comparison of the results for all assessed dust metrics in all years (see dust isopleths in **Appendix B**) show that the Project has a negligible effect at the assessment locations and are not predicted to exceed the applicable air quality impact criteria.

A similar negligible change to cumulative impacts would also be anticipated and would not result in any significant additional impacts at the surrounding receptor locations.

Summary and Conclusions

The report has assessed the potential for air quality impact associated with the proposed development application to increase production at the tyre recycling facility at 1-21 Grady Crescent, Erskine Park.

The Project is predicted to generate less dust relative to the approved operations , and based on a direct comparison of the approved impacts, it is concluded the Project will not result in any discernible additional effect at any receptor location relative to the approved project presented in the **Todoroski Air Sciences (2020)** assessment.

Please feel free to contact us if you would like to clarify any aspect of this report.

Yours faithfully,
Todoroski Air Sciences.

Philip Henschke
CAQP

Emilie Aragnou

References

Bureau of Meteorology (2022)

Climate statistics for Australian locations, Bureau of Meteorology website, accessed December 2022. http://www.bom.gov.au/climate/averages

Todoroski Air Sciences (2020)

"Air Quality Impact Assessment Tyrecycle Erskine Park", prepared by Todoroski Air Sciences for Tyrecycle Pty Ltd, September 2020.

NSW EPA (2022)

"Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales", August 2022

Appendix A – Emission Estimation

Table A-1: Dust Emissions Inventory

Activity	TSP emission (kg/year)	PM10 emission (kg/y)	PM25 emission (kg/y)	Intensity	Units	Emission Factor - TSP	Emission Factor - PM10	Emission Factor - PM25	Units	Var. 1	Units	Var. 2	Units	Var. 3	Units	Var. 4	Units	Var. 5	Units	Var. 6	Units	Var. 7	Units
Delivering material to site	204	39	9	60,000	t/yr	0.0034	0.00065	0.000158	kg/t	9	t/load	0.4	km	0.07	0.01	0.00	kg/VKT	2	S.L/ g/m2	9	Ave GMV (tonnes)		
Unloading material to stockpile in building	9	4	1	60,000	t/yr	0.00076	0.00036	0.00005	kg/t	0.644	ave. wind speed (m/s)	2	M.C. %									80	%C
Rehandle material at stockpile	9	4	1	60,000	t/yr	0.00076	0.00036	0.00005	kg/t	0.644	ave. wind speed (m/s)	2	M.C. %									80	%C
Loading material to shredder	9	4	1	60,000	t/yr	0.00076	0.00036	0.00005	kg/t	0.644	ave. wind speed (m/s)	2	M.C. %									80	%C
Shredding material	32	14	3	60,000	t/yr	0.0027	0.0012	0.0002	kg/t													80	%C
Granulating material	150	52	3	60,000	t/yr	0.0125	0.0043	0.0003	kg/t													80	%C
Granulating material	150	52	3	60,000	t/yr	0.0125	0.0043	0.0003	kg/t													80	%C
Unloading processed material to stockpile in building	9	4	1	60,000	t/yr	0.00076	0.00036	0.00005	kg/t	0.644	ave. wind speed (m/s)	2	M.C. %									80	%C
Rehandle material at stockpile	9	4	1	60,000	t/yr	0.00076	0.00036	0.00005	kg/t	0.644	ave. wind speed (m/s)	2	M.C. %									80	%C
Loading processed material to truck	46	22	3	60,000	t/yr	0.00076	0.00036	0.00005	kg/t	0.644	ave. wind speed (m/s)	2	M.C. %										
Hauling processed material offsite	206	39	10	60,000	t/yr	0.0034	0.00066	0.000159	kg/t	14	t/load	0.4	km	0.11	0.02	0.01	kg/VKT	2	S.L/ g/m2	15	Ave GMV (tonnes)		
Exhaust emissions	101	101	98																				
Cyclone venting in warehouse	175	175	88	5.00	mg/m3	20,000	m3/hr															80	%C
Total TSP emissions (kg/yr.)	**1109**	**516**	**221**																				

Appendix B – Isopleth Diagrams

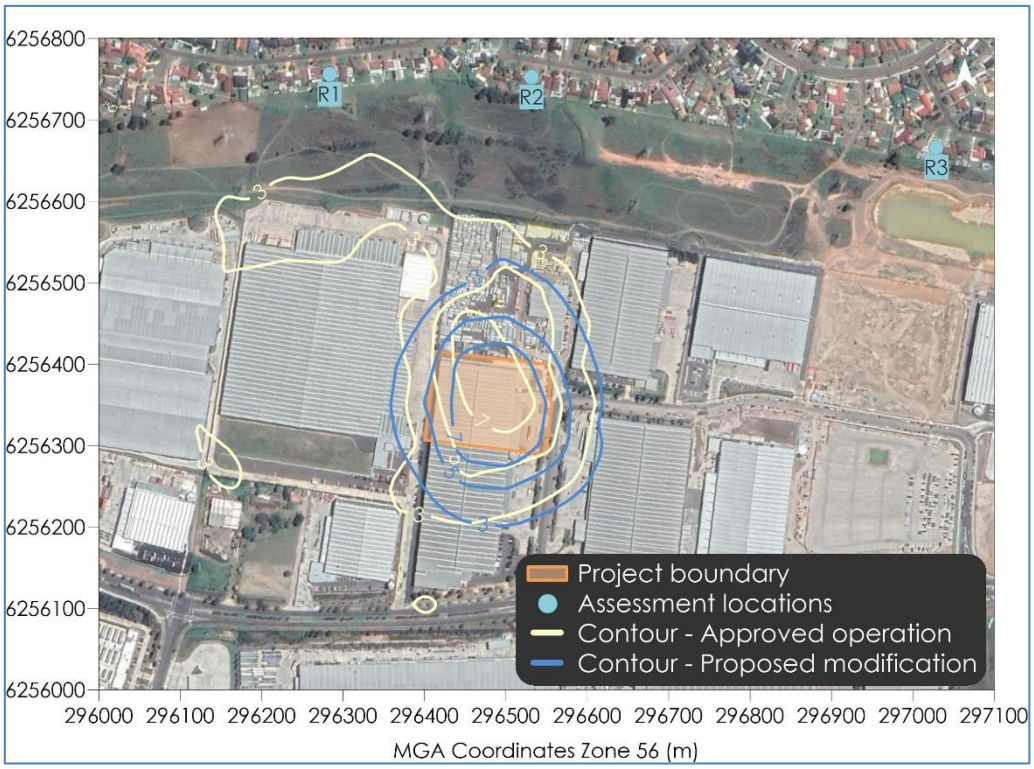


Figure B-1: Predicted incremental maximum 24-hour average $PM_{2.5}$ concentrations (µg/m³)

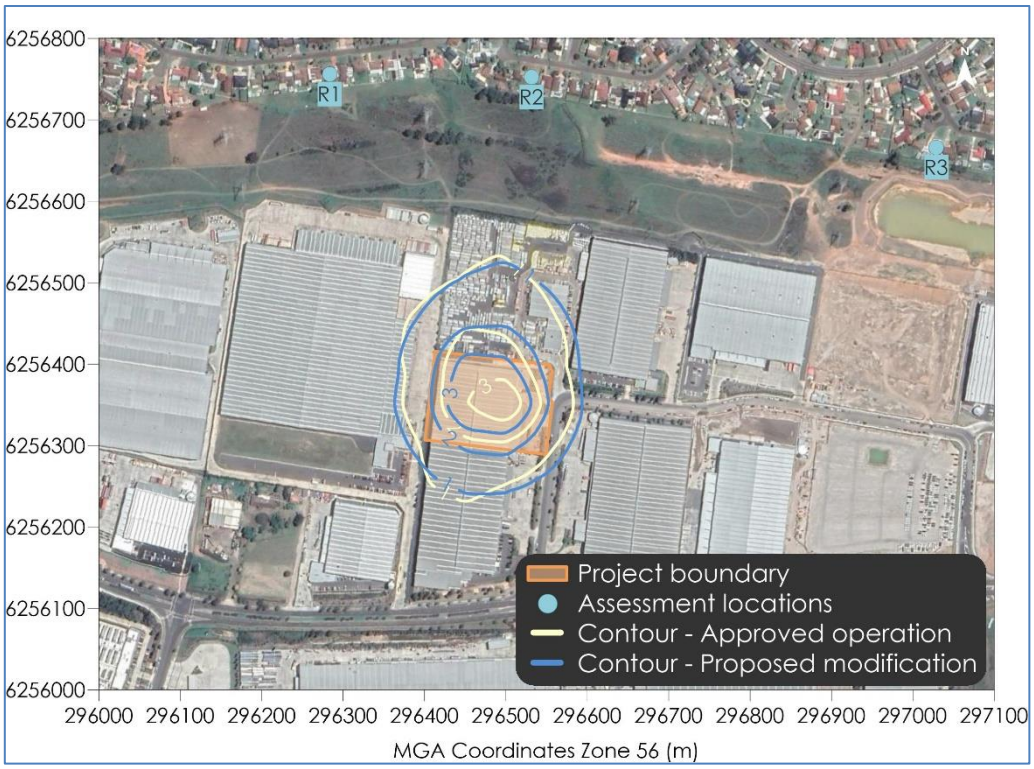


Figure B-2: Predicted incremental annual average $PM_{2.5}$ concentrations (µg/m³)

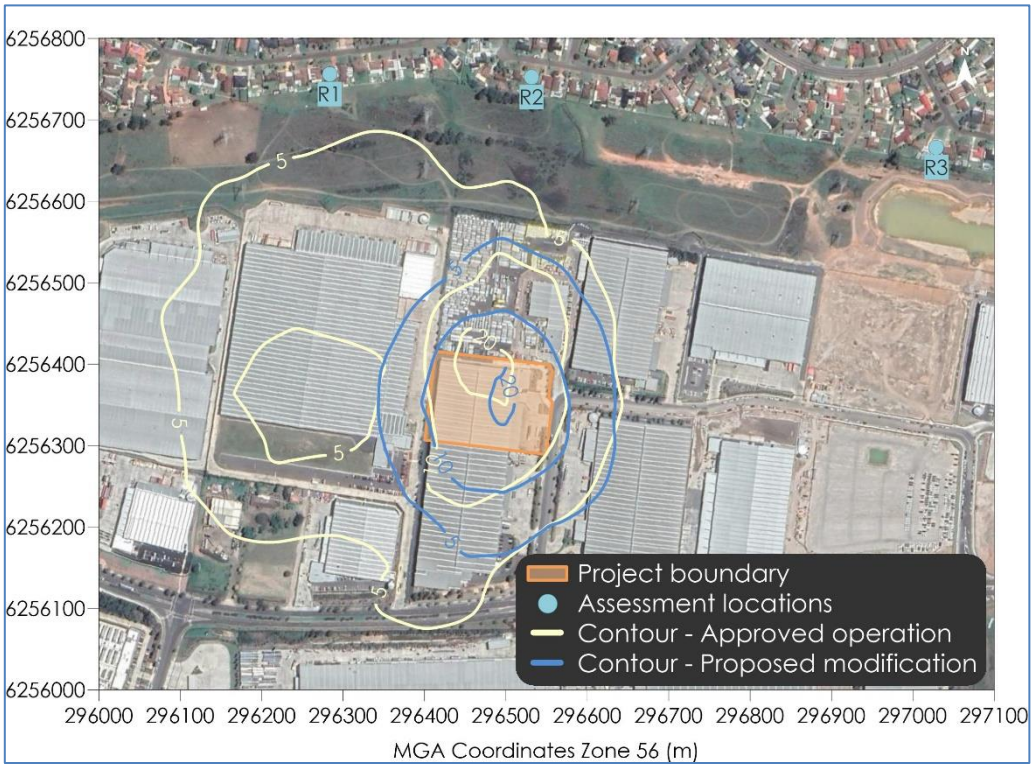


Figure B-3: Predicted incremental maximum 24-hour average PM_{10} concentrations (µg/m³)

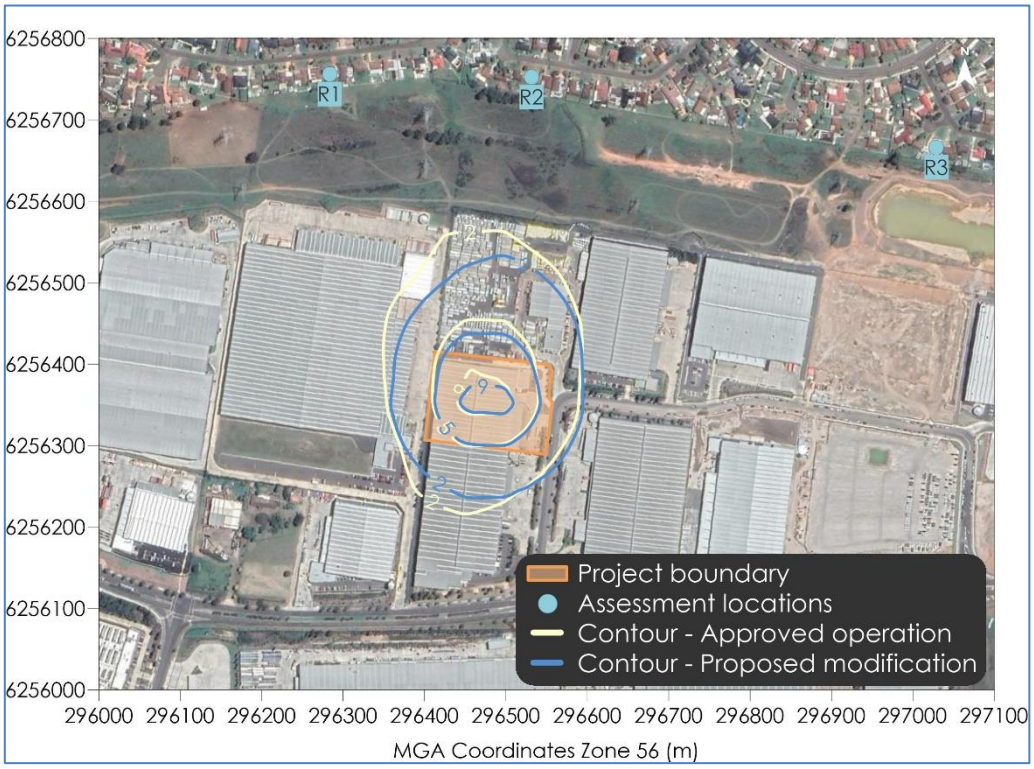


Figure B-4: Predicted incremental annual average PM_{10} concentrations (µg/m³)

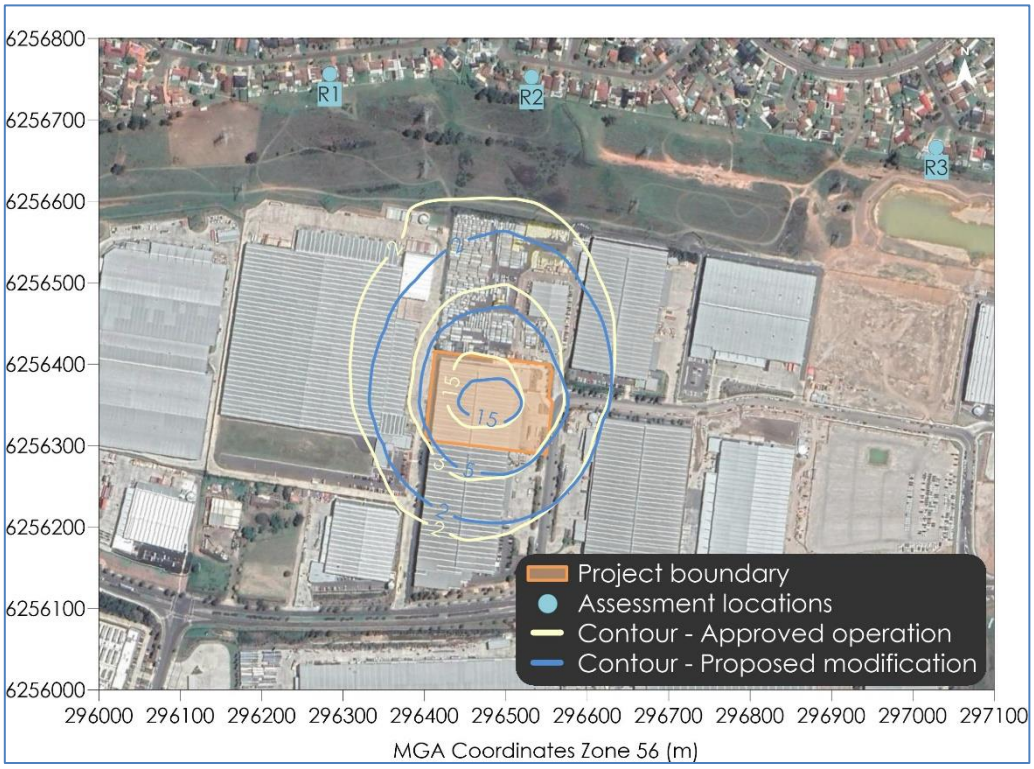


Figure B-5: Predicted incremental annual average TSP concentrations (µg/m³)

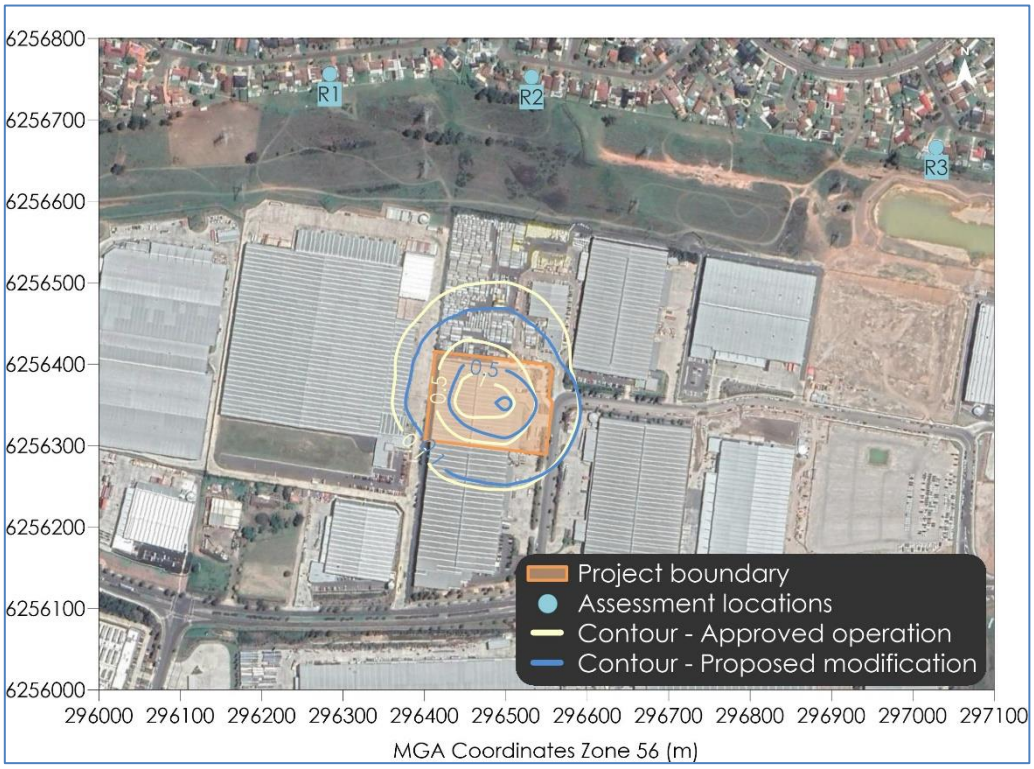


Figure B-6: Predicted incremental annual average dust deposition levels (g/m²/month)

APPENDIX G

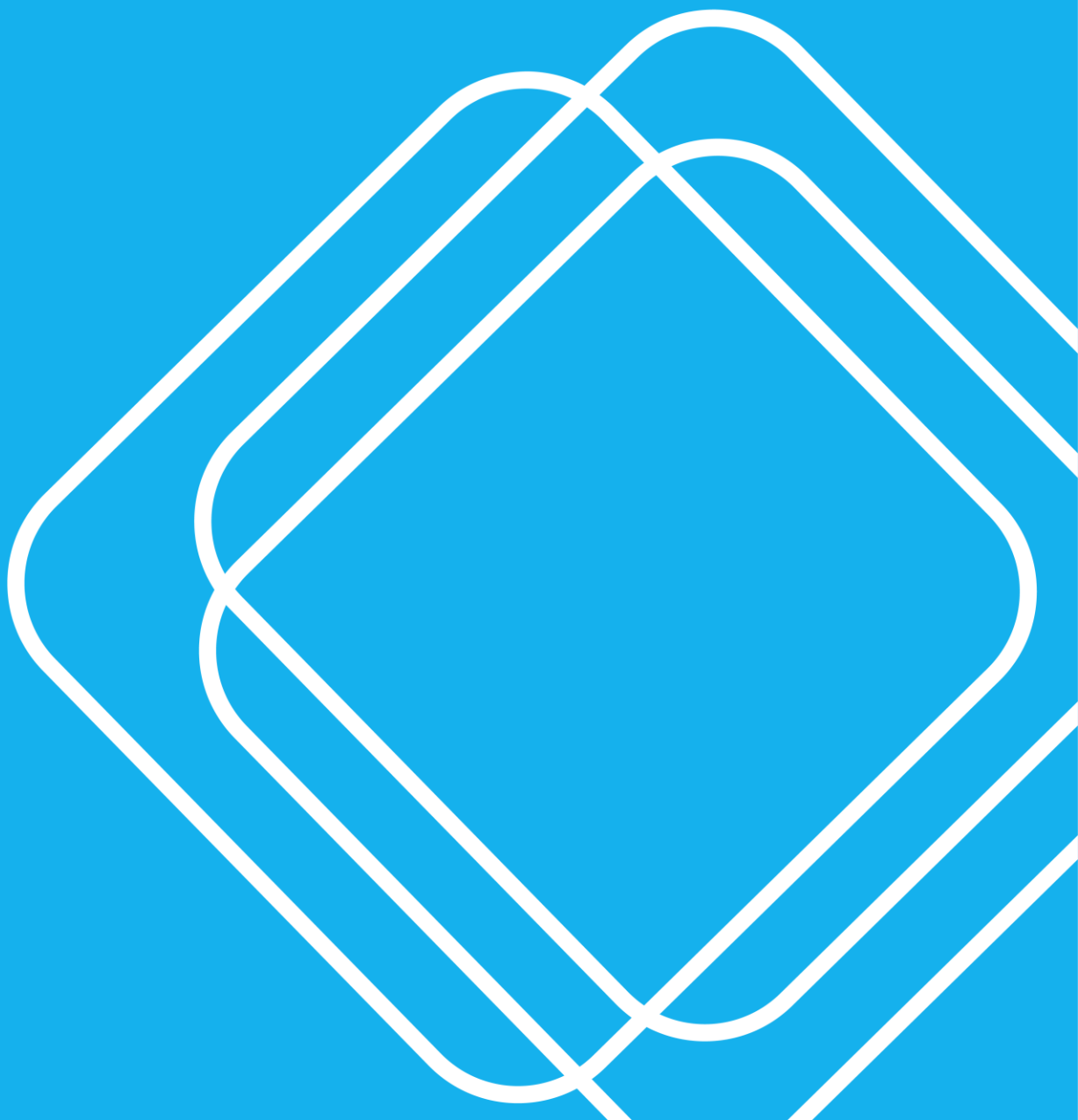
TRAFFIC IMPACT ASSESSMENT

SCT Consulting

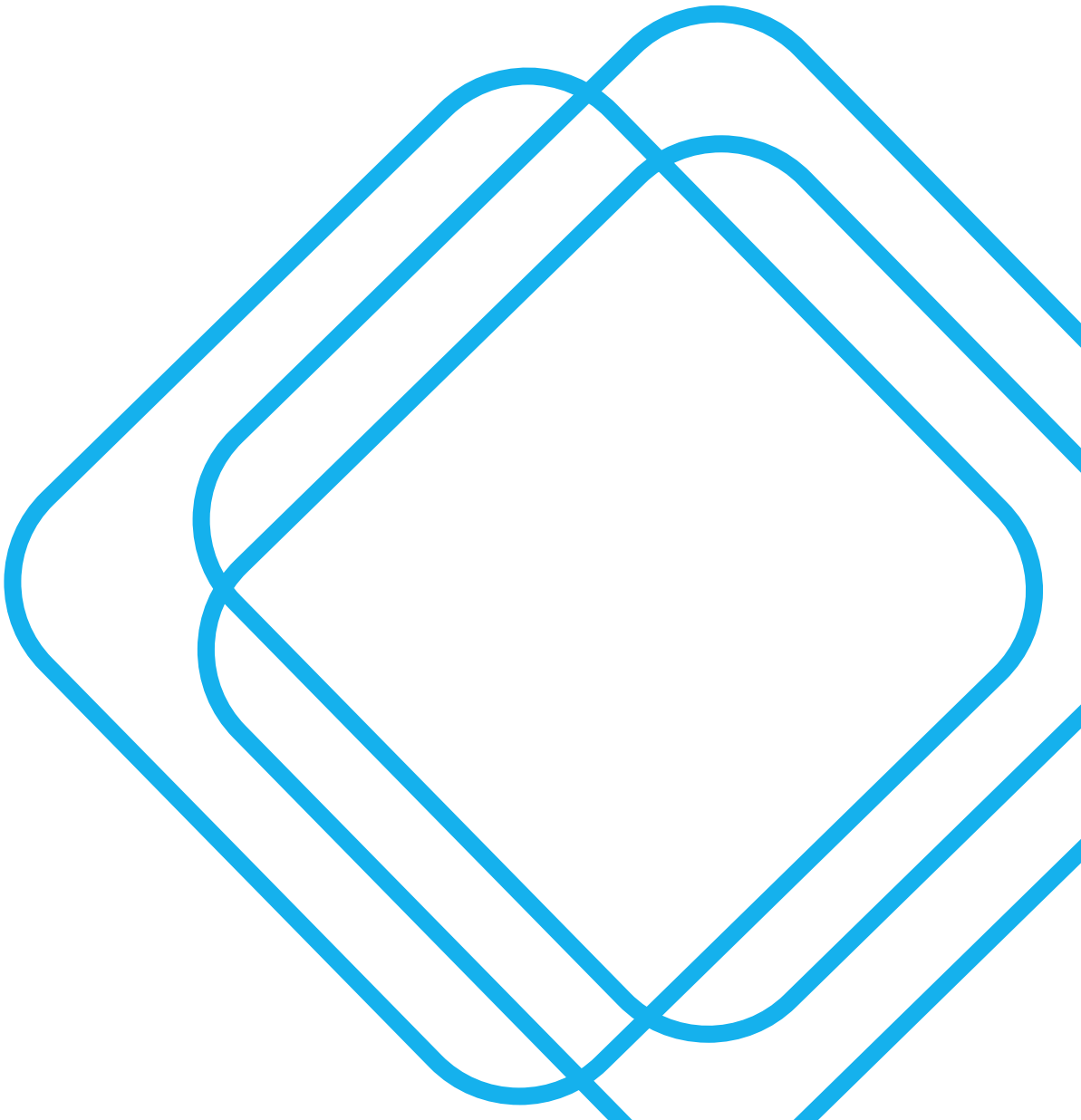
TYRECYCLE RECYCLING FACILITY, ERSKINE PARK

Traffic and Transport Impact Assessment

21 FEBRUARY 2023



SCT Consulting acknowledges the traditional owners of the lands on which we work.
We pay our respects to Elders past, present and emerging.



Quality Assurance

Project Name:	Tyrecycle Recycling Facility, Erskine Park		
Project Number:	SCT_00360		
Document name:	Tyrecycle Recycling Facility, Erskine Park		
Client:	Element Environment Pty Ltd	**ABN:**	45 162 835 083
Prepared by:	SCT Consulting PTY. LTD. (SCT Consulting)	**ABN:**	53 612 624 058

Information	Name	Position	Signature
Author:	Shawn Cen	Principal Consultant	
Reviewer:	Nick Bernard	Associate Director	

Version	Date	Details
1.0	12 January 2023	Draft report
2.0	9 February 2023	Final report
3.0	21 February 2023	Updated final report

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Executive Summary

Tyrecycle Pty Ltd (Tyrecycle) is one of Australia's largest tyre processing companies and currently operates a tyre processing facility at 1-21 Grady Crescent, Erskine Park (Lot 9 DP 1261030), which is approved to process up to 29,000 tonnes per annum of passenger, four-wheel drive and truck tyres.

This Traffic and Transport Impact Assessment was prepared to support a modification application, which is to increase the processing capacity of the tyre recycling facility from 29,000tpa of tyres to 60,000tpa. As the proposed increase in production capacity at the tyre recycling facility is forecast to result in minimal environmental impact, Tyrecycle propose to modify the existing development consent under section 4.55 (2) of the NSW Environmental Planning and Assessment Act 1979.

The Traffic and Transport Impact Assessment indicated that:

– There would be minimal impacts on traffic operations on the surrounding road network during the traffic peak hours, as:
  - No additional light vehicles would be generated
  - Changes in staff shift times would move employee shift change times further away from the AM and PM traffic peaks on the surrounding road network
  - There is no proposed change to heavy vehicle volumes in the traffic peak periods.
– Additional heavy vehicle generation at other times of the day are low.
– There is no forecast impact on the surrounding public transport and active transport networks.

The assessment confirmed that the proposed modification to increase the processing capacity of the tyre recycling facility from 29,000tpa of tyres to 60,000tpa is not forecast to have any significant impact on the traffic and transport system around the site.

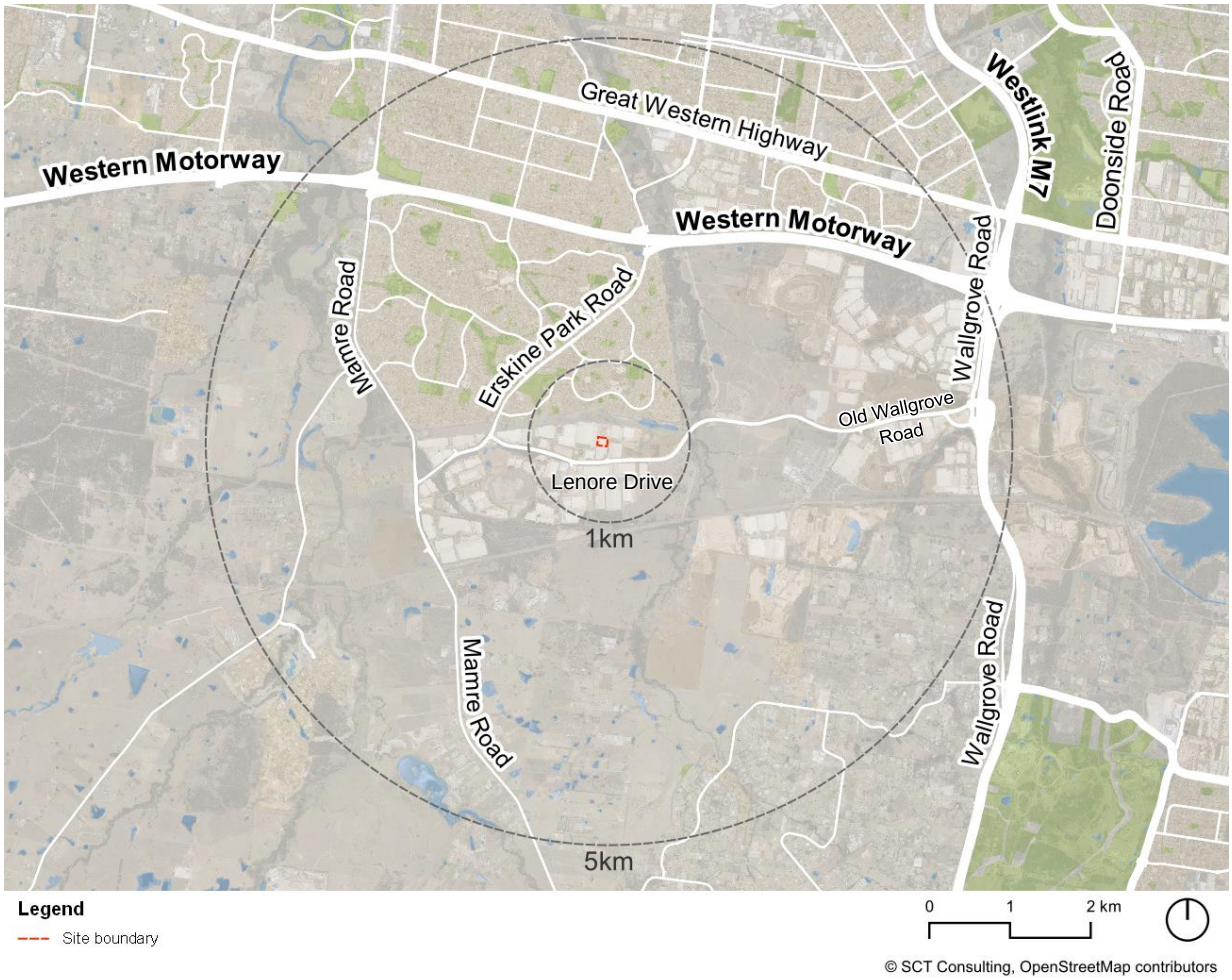
1.0 Introduction

1.1 Background

Tyrecycle Pty Ltd (Tyrecycle) is one of Australia's largest tyre processing companies and currently operates a tyre processing facility at 1-21 Grady Crescent, Erskine Park (Lot 9 DP 1261030) (hereafter referred to as 'the site'), which processes up to 29,000 tonnes per annum of passenger, four-wheel drive and truck tyres.

SCT Consulting has been engaged by Element Environment to prepare a Traffic and Transport Impact Assessment (TTIA) to support a proposed modification to an existing development consent at the site.

Figure 1–1 Site context



1.2 Existing consent and operations

The tyre recycling facility was approved by the Sydney Western City Planning Panel (SWCPP) on 20 December 2020 (DA 20/0589).

Used tyres are received at the site and are processed into tyre derived fuel (TDF) or other tyre derived products (TDP) rather than sending the tyres to landfill. The TDF is used for either energy recovery (i.e. co-processing for use within cement kilns) or for energy generation within export markets.

Tyres collected that are still attached to the rim are separated and the wheels sorted into steel and aluminium streams prior to being removed off-site for recycling. The majority of truck tyres are processed on site into crumbed rubber. Some truck tyres are also transported down to Tyrecycle's Somerton (Victoria) operations for further processing (into crumbed rubber products). Off the road (OTR) tyres are also received and processed on site.

By-products of the operational process, including steel and fibre textile are sold as recyclable materials. There are no unwanted or hazardous by-products from the shredding process. All tyres collected or received at the site are either processed into TDF or TDP, with steel and textile recovered as recyclable materials. There is no need for chemical processing or heating, with the processing of tyres via a mechanical size reduction process.

The existing tyre recycling facility includes:

– Receival and temporary storage of tyres.

– Processing and shredding of tyres (up to 29,000 tonnes per annum).

– Dispatch of processed TDF and other TDP.

1.3 Report purpose

As the proposed increase in production capacity at the tyre recycling facility is forecast to result in minimal environmental impact, Tyrecycle propose to modify the existing development consent under section 4.55 (2) of the NSW Environmental Planning and Assessment Act 1979.

This TTIA is prepared to support this modification application, which is to increase the processing capacity of the tyre recycling facility from 29,000tpa of tyres to 60,000tpa.

2.0 Existing traffic and transport conditions

2.1 Road network

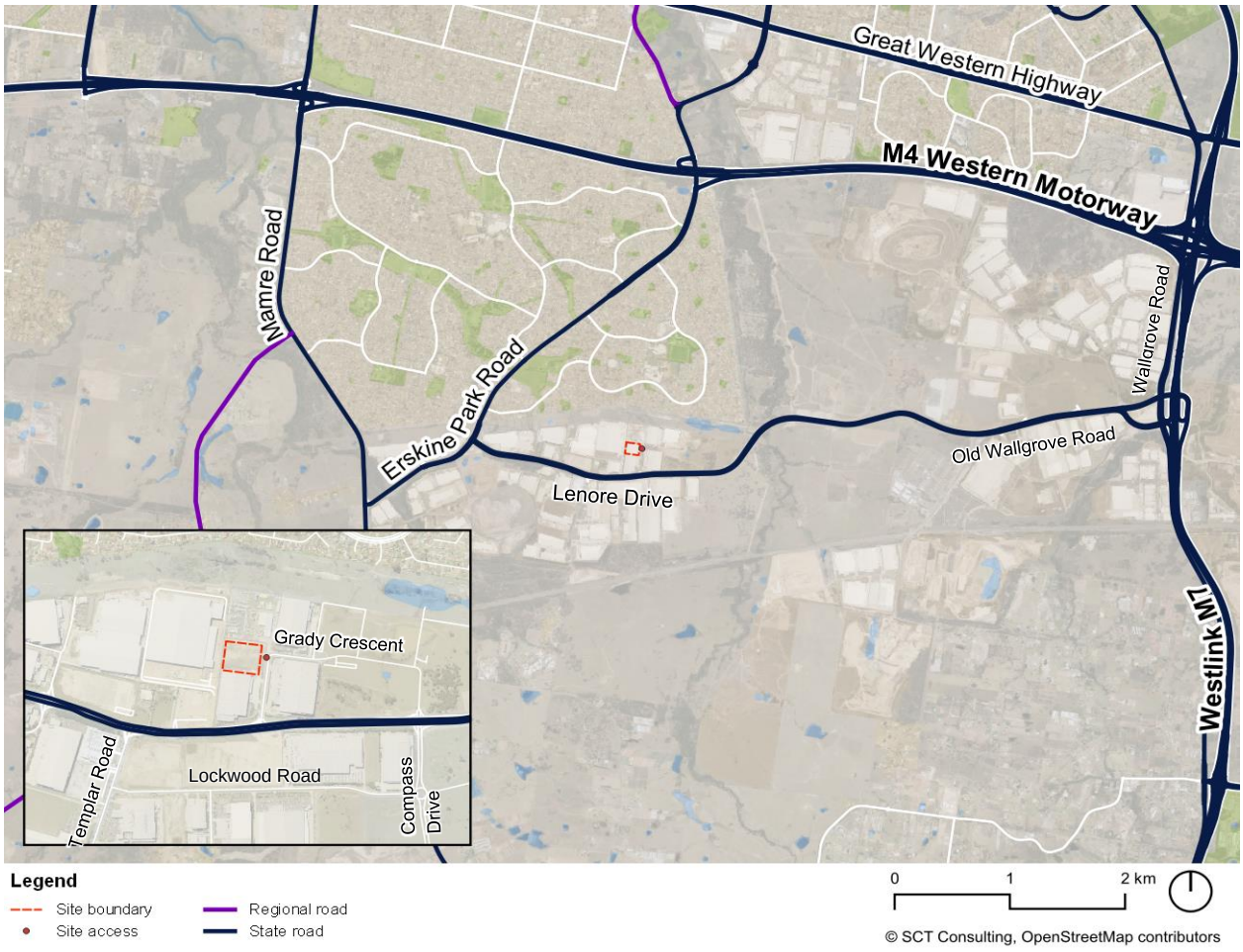
The road network surrounding the site is shown in **Figure 2–1.** Site vehicles access Grady Crescent, a 50 km/h local road, via Lenore Drive. Lenore Drive is an 80 km/h, dual-carriageway State Road, which forms the primary access to the Erskine Park Employment Lands. Unrestricted on-street parking is available on both sides of Grady Crescent with no on-street parking permitted along Lenore Drive.

To the east, Lenore Drive connects with Old Walgrove Road at Eastern Creek, which connects with Walgrove Road and the Westlink M7 Motorway, while to the west, Lenore Drive connects with Erskine Park Road, which connects to the M4 Motorway directly or via Mamre Road.

Grady Crescent connects to Lenore Drive at two intersections – a western intersection and an eastern intersection. The western intersection is closest to the site and is likely to be used by most of the vehicles accessing the site. It is a seagull T-junction configuration, allowing all movements, while the eastern intersection is a signalised intersection.

An intersection traffic survey undertaken at the western Lenore Drive / Grady Crescent intersection on Tuesday 6 September 2022 indicated that the AM and PM peak hours are 6.15am to 7.15am and 4pm to 5pm. Eastbound and westbound traffic on Lenore Drive is the main traffic movement with traffic predominantly turning into Grady Crescent in the AM peak hour and exiting Grady Crescent in the PM peak hour. There is significant spare capacity at the intersection. Traffic survey data is provided in **Appendix A**.

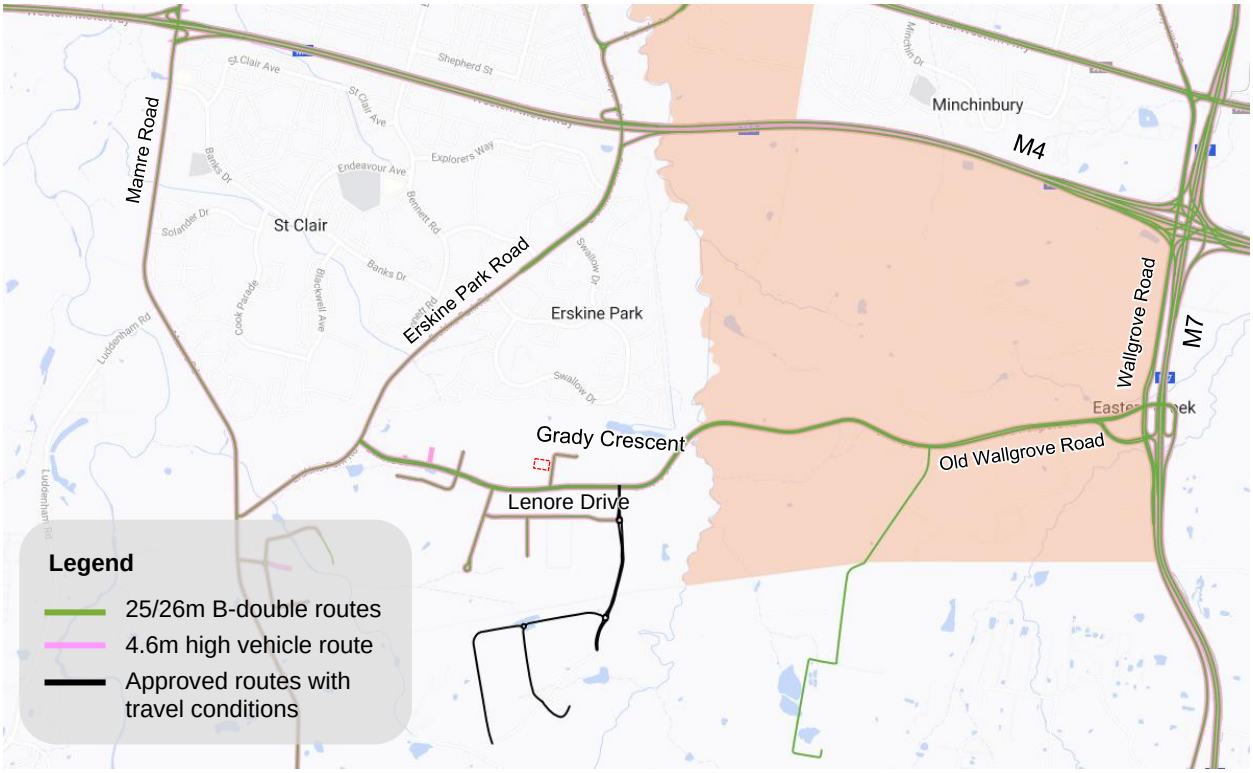
Figure 2–1 Road network



2.1.1 Heavy vehicle approved routes

As shown in **Figure 2–2**, both Lenore Drive and Grady Crescent are part of the Restricted Access Vehicles (RAV) approved routes for B-doubles and 4.6m high vehicles.

Figure 2–2 Restricted Access Vehicle (RAV) route map



Source: Transport for NSW

2.2 Active transport network

Limited active transport infrastructure is available around the site. There are footpaths on both sides of Grady Crescent and on the northern side of Lenore Drive.

No pedestrian movements were captured in the intersection survey at the western Lenore Drive / Grady Crescent intersection and there are no pedestrian crossing facilities at the intersection.

2.3 Public transport network

Two bus routes operate on Lenore Drive, with the closest bus stops located to the east of the Lenore Drive / Grady Crescent intersection, as shown in **Figure 2–3**. The eastbound bus stop is within 300m walking distance of the site. However, there is no pedestrian connection across Lenore Drive to the bus stop on the westbound carriageway.

The 779 route operates between Kemps Creek and St Marys with services generally once per hour, while the 835 route only operates in the weekday AM and PM peak periods between Penrith and Prairiewood.

Figure 2–3 Bus network

3.0 Proposed modification

3.1 The proposal

The proposed modification to the existing development consent seeks to increase the processing capacity of the tyre recycling facility from 29,000tpa of tyres to 60,000tpa.

There is no proposed change to the following approved aspects of the development:

– Operating methodology or site infrastructure
– Building and infrastructure footprints
– Vehicle parking requirements
– Vehicle access and internal movement pathways
– Hours of operation
– Employment
– Land ownership
– Landscaping
– Stormwater management
– Utility services
– Lighting, security and signage.

The following changes in staff shift times are proposed:

– Day shift: 7am to 3pm changing to 5am to 1pm
– Afternoon shift: 3pm to 11pm change to 1pm to 9pm
– Night shift: 11pm to 7am changing to 9pm to 5am.

3.2 Trip generation

The proposed changes in traffic generation and operations are indicated in **Table 3–1**.

Table 3–1 Proposed changes in traffic generation and operations

Existing operations	Proposed operations
– Morning peak (4am to 7am) – seven outbound heavy vehicles trips and 30 light vehicle trips (25 inbound and 5 outbound). – Afternoon peak (4pm to 6pm) – seven inbound heavy vehicles trips and 30 light vehicle trips (5 inbound and 25 outbound).	– Current peak hour traffic movements would remain the same.
– About six trucks collect and drop-off tyres and products per day	– Collection and drop-off trucks would increase from six to 10 trucks per day and would enter and leave site between 8pm and 4am.
– About 50 pallets are loaded and dispatched per day, equating to two B-double collections per day.	– A maximum of 100 pallets would be loaded and dispatched per day, equating to four B-double collections per day.

4.0 Traffic and transport impact assessment

4.1 Road network impact

There is no proposed change to staff / employee numbers, so no additional light vehicles would be generated. Changes in staff shift times appear to move employee shift change times further away from the AM and PM traffic peaks on the surrounding road network reducing impacts.

There is no proposed change to heavy vehicle volumes in the AM and PM traffic peak periods. Therefore, there would be no additional impact on traffic operations in these peak periods.

The additional heavy vehicle generation is:

– Collection and drop-off truck volumes would increase from six to 10 trucks but are planned to arrive and leave between 8pm and 4am. There would be minimal impact on traffic operations in this night-time period.

– B-doubles would increase from two to four B-doubles per day, which again would have minimal impact to traffic operations.

4.2 Public transport impact

Given there is no change that would not generate additional public transport demand, there would be no impact on the public transport network. The additional vehicles are forecast to have minimal impact on intersection performance and therefore for travel times for the bus services in the area.

4.3 Active transport impact

There is also likely to be minimal impact to active transport due to the modification. No additional active transport demand would be generated, given there is no change in staff volume. The additional vehicles entering and exiting the site are likely to have minimal impact on any active transport movement in the area.

5.0 Conclusion

This assessment indicated that:

– There would be minimal impacts on traffic operations on the surrounding road network during the traffic peak hours, as:
  - No additional light vehicles would be generated
  - Changes in staff shift times would move employee shift change times further away from the AM and PM traffic peaks on the surrounding road network
  - There is no proposed change to heavy vehicle volumes in the traffic peak periods.

– Additional heavy vehicle generation at other times of the day are low.

– There is no forecast impact on the public transport and active transport networks.

Therefore, the assessment confirmed that the proposed modification to increase the processing capacity of the tyre recycling facility from 29,000tpa of tyres to 60,000tpa is not forecast to have any significant impact on the traffic and transport system around the site.

APPENDIX A

Traffic survey data

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY trafficsurvey.com.au

Intersection of Lenore Dr and Grady Cres, Erskine Park

GPS -33.815705, 150.801684

Date:	Tue 06/09/22
Weather:	Fine
Suburban:	Erskine Park
Customer:	SCT

North:	Grady Cres
East:	Lenore Dr
South:	N/A
West:	Lenore Dr

Survey	AM:	6:00 AM-9:00 AM
Period	PM:	4:00 PM-7:00 PM
Traffic	AM:	6:15 AM-7:15 AM
Peak	PM:	4:00 PM-5:00 PM

All Vehicles

Time		North Approach Grady Cres			East Approach Lenore Dr			West Approach Lenore Dr			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
6:00	6:15	0	2	2	0	3	63	0	164	9	1187	
6:15	6:30	0	3	3	0	4	60	0	222	12	1242	Peak
6:30	6:45	0	1	5	0	4	55	0	220	22	1219	
6:45	7:00	0	2	8	0	9	57	0	235	22	1230	
7:00	7:15	0	1	2	0	6	79	1	190	19	1224	
7:15	7:30	0	4	0	0	5	61	0	200	11	1195	
7:30	7:45	0	10	2	0	9	73	0	204	20	1163	
7:45	8:00	0	3	6	0	12	77	0	202	27	1124	
8:00	8:15	0	6	5	0	8	74	4	159	13	1035	
8:15	8:30	0	6	4	0	9	69	0	148	13		
8:30	8:45	0	4	2	0	5	83	1	168	16		
8:45	9:00	0	11	2	0	10	73	0	129	13		
16:00	16:15	0	31	7	0	5	205	8	79	5	1143	Peak
16:15	16:30	0	17	8	0	5	229	1	52	3	1091	
16:30	16:45	0	14	8	0	5	187	4	39	3	1078	
16:45	17:00	0	9	5	0	2	154	3	47	8	1092	
17:00	17:15	0	18	2	0	1	209	7	47	4	1069	
17:15	17:30	0	16	2	0	0	225	5	52	2	1003	
17:30	17:45	0	9	7	0	2	195	2	55	4	838	
17:45	18:00	0	7	1	0	0	136	1	58	2	680	
18:00	18:15	0	12	6	0	4	134	11	51	4	551	
18:15	18:30	0	7	1	0	1	79	2	45	2		
18:30	18:45	0	2	2	0	1	65	1	43	2		
18:45	19:00	0	1	0	0	0	44	0	31	0		

Peak Time		North Approach Grady Cres			East Approach Lenore Dr			West Approach Lenore Dr			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
6:15	7:15	0	7	18	0	23	251	1	867	75	1242
16:00	17:00	0	71	28	0	17	775	16	217	19	1143

Pedestrians Crossing

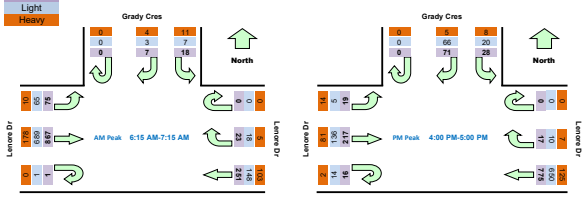
Time		North Approach Grady Cres		East Approach Lenore Dr		West Approach Lenore Dr		Hourly Total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Southbound	Northbound	
6:00	6:15	0	0	0	0	0	0	0
6:15	6:30	0	0	0	0	0	0	0
6:30	6:45	0	0	0	0	0	0	0
6:45	7:00	0	0	0	0	0	0	0
7:00	7:15	0	0	0	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0
7:30	7:45	0	0	0	0	0	0	0
7:45	8:00	0	0	0	0	0	0	0
8:00	8:15	0	0	0	0	0	0	0
8:15	8:30	0	0	0	0	0	0	
8:30	8:45	0	0	0	0	0	0	
8:45	9:00	0	0	0	0	0	0	
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	
18:30	18:45	0	0	0	0	0	0	
18:45	19:00	0	0	0	0	0	0	

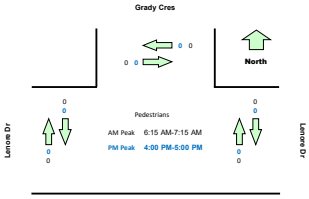
Peak Time		North Approach Grady Cres		East Approach Lenore Dr		West Approach Lenore Dr		Peak total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Southbound	Northbound	
6:15	7:15	0	0	0	0	0	0	0
16:00	17:00	0	0	0	0	0	0	0

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy






SCT
Consulting

APPENDIX H

FIRE RISK ASSESSMENT

ARUP

Tyrecycle

Tyrecycle Erskine Park

Fire Risk Assessment

Reference: 283146-10 FRA I1 Tyrecycle Erskine Park

Issue 1 | 9 September 2022

Job number 283146-10

Arup Australia Pty Ltd | ABN 76 625 912 665

Arup Australia Pty Ltd
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ARUP

Document Verification

Project title	Tyrecycle Erskine Park
Document title	Fire Risk Assessment
Job number	283146-10
Document ref	283146-10 FRA I1 Tyrecycle Erskine Park
File reference	283146-10 FRA I1 Tyrecycle Erskine Park

Revision	**Date**	**Filename**	283146-10 FRA D1 Tyrecycle Erskine Park		
Draft 1	09/08/2022	**Description**	Draft 1 for Review		
			Prepared by	**Checked by**	**Approved by**
		Name	Andrew Chak	Lizzie Sieverts	Nigel Cann
		Signature			
Issue 1	09/09/2022	**Filename**	283146-10 FRA I1 Tyrecycle Erskine Park		
		Description	Issue 1		
			Prepared by	**Checked by**	**Approved by**
		Name	Andrew Chak	Lizzie Sieverts	Nigel Cann RPEQ 12979
		Signature			
		Filename			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			

Issue Document Verification with Document ☑

Contents

Appendices

Executive Summary

Fire Risk Assessment – Tyrecycle Erskine Park

The intent of this report is to provide additional information to the EPA regarding the Statement of Environmental Effects (SEE) for the Tyrecycle facility at 21 Grady Crescent, Erskine Park (subject site)

This fire assessment will include the following:

- Identification of possible fire hazards and their potential causes at the premises;
- Assess the risks to human health and the environment from identified hazards;
- Identify adequate controls to minimise the risk of harm from fire; and
- Describe how controls will be checked for their effectiveness, and actions to improve the site's risk management and how this process will be verified.

To meet these requirements the following activities have been undertaken:

- Undertaken site visits and met with key Tyrecycle personnel to review the relevant site and process documentation;
- Identification of additional fire hazards of increased tyre storage, including exposures, potential causes of ignition, and potential fire growth and spread rates;
- Management plan for critical controls and functional tests reviewed and verified;
- Assess the risks of significant tyre fires based upon the consequences of tyre fires and the management of the controls to prevent, reduce and mitigate fire risks;
- Review of appropriate codes and standards and guidelines, including the NSW Tyre Guidelines.

Based on the assessment undertaken within this report, the maximum storage capacity will be conditional on the requirements and restrictions outlined in Section 9 within this report being met. i.e. the amount of tyre (and associated components) stored may be increased up to the amount where the restrictions can no longer be met, it is expected this is ultimately determined by available floor space within the facility.

Amongst other requirements outlined in Section 9, the following key requirements are to be noted:

Primary Pre-processed Tyre Stockpile

- The total tyre storage stockpile area of each pen are to be no greater than 60m^2
- The total storage stockpile height of each pen are to be no greater than 3.7m
- The storage pen are to be bound by construction achieving an FRL of 120 minutes on three sides.
- The construction is to extend 1m above the stockpile height and at least 2m beyond the outermost stockpile edge.
  - This is dependent on the preferred nominated stockpile limits.
- Construction and management of the pens is to be in accordance with Clause 8.2 of FRNSW Fire Safety Guideline – Fire Safety in Waste Facilities

Tyre crumb storage racking

- an ESFR sprinkler system per AS2118.1-1999 is provided to serve the building throughout. It is recognised that this system is considered to be an enhanced system over a typical AS2118.1 sprinkler system used in general warehouses. The racking (and associated storage) is installed so that it complies with the restrictions/ limitations of the ESFR system.
- thermal cameras will be (if not already) used to provide constant monitoring of the racking areas and will notify staff members in the event that a 'hot spot' is identified.

- The racking is to be provided with a minimum 6m of unobstructed access on the accessible side to facilitate the use of machinery with ease. This will also provide spatial separation from the pre-processed tyre stockpiles mentioned above.

Tyre Derived Fuel Storage (TDF) or WIP Stock (Granules)

- TDF pile or granule bags to be grouped such that each 'group' does not have an area of over 50m^2 to be arranged in 7m x 7m piles with a height no greater than 3.7m.
- Groups of TDF piles or granule bags are to be spatially separated from each other by a minimum distance of 6m.
- However, the TDF or granule storage need not be located more than 2.5m of the loadbearing columns provided that the loadbearing columns are provided with an FRL of 120 minutes.
- If the TDF or granule storage is located within 6m of the workshop, the external wall of the workshop is to be bound by fully non-combustible and enclosed walls (i.e. no meshing permitted). In addition, the workshop may not be used for storage of goods other than minor tools.

An indicative markup of the key tyre (and associated products) storage location is provided in Figure 33.

The current existing EPA License applicable to the subject site is attached in Appendix F.1.

1. Abbreviations

The following abbreviations have been used in this report.

Abbreviation	Meaning
CCTV	Closed-circuit Television
CHF	Critical Heat Flux
CRWM	Combustible Recyclable and Waste Material
DG	Dangerous Goods
EPA	Environment Protection Authority Victoria
EPU	Equivalent Passenger Unit
ERP	Emergency Response Plan
ESFR	Early Suppression Fast Response
FEMA	Federal Emergency Management Agency
FER	Fire Engineering Report
FIP	Fire Indicator Panel
FRNSW	Fire & Rescue New South Wales
HRR	Heat Release Rate
MoC	Management of Change
MRP	Multi-Purpose Rasper
NSW	New South Wales
PAN	EPA Pollution Abatement Notice
PtW	Permit to Work
SBR	Styrene Butadiene Rubber
SEE	Statement of Environmental Effects
SFPE	Society of Fire Protection Engineers
SMS	Safety Management System
TBD	Threat Barrier Diagram
TDF	Tyre Derived Fuel
TRP	Thermal Response Parameter
WIP	Work in Progress

2. Introduction

2.1 Scope of Report

The intent of this report is to provide additional information to the EPA regarding the Statement of Environmental Effects (SEE) for the Tyrecycle facility at 1-21 Grady Crescent, Erskine Park (subject site).

Tyrecycle proposes to increase the storage capacity of tyre storage (and associated components such as TDF, shred and granules etc.) within the subject processing plant.

The purpose of the fire risk assessment is to develop a clear understanding of the fire risks associated with the proposed increase in storage capacity at the Tyrecycle site at Erskine Park in order to allow Tyrecycle to manage any fire risks.

The assessment within this report will also determine the maximum increase in tyre storage capacity permitted within the subject site.

2.2 Existing Performance Solution Captured in Previous FER/FEA

The below list of non-compliances are captured within the FER by Exova WarringtonFire (Report No. 2320004-RPT02-1 Issue 1 dated 30/10/2013) associated with the original warehouse base building.

The Performance Solutions and associated non-compliances captured in the existing report are shown in abstract below:

OVERVIEW

Exova Warringtonfire Aus Pty Ltd has been engaged by FDC Construction & Fitout Pty Ltd for professional fire engineering services to formulate a fire safety design solution against stakeholder agreed fire safety objectives defined in the Fire Engineering Brief process. This is in relation to the development at Grady Crescent, Erskine NSW.

The following variations have been identified:

1) The access road for fire brigade vehicles being more than 18m from the building to the north east corner of the building due to the distance of the driveway from the proposed office area.

2) Exit travel distances within the warehouse of more than 40m (approximately 65m) to an exit.

3) Travel distances between alternative exits of more than 60m (approximately 130m).

4) The provision of suppression mode (ESFR) sprinklers throughout the warehouse storage areas with smoke clearance fans for FRNSW use, in lieu of a control mode sprinkler system throughout with a smoke exhaust system or smoke-and-heat vents.

The existing alternative solutions for the existing building from the existing FER[1] that do not form part of this report are as follows:

1) Suppression mode (ESFR) sprinklers being provided throughout the warehouse storage areas, with smoke clearance fans for NSWFB use, in lieu of a control mode sprinkler system throughout with a smoke exhaust system or smoke-and-heat vents.

2) Provision for an access road for fire brigade vehicles as follows:

   - Stage 1: The southern side and to the S/E corner (adjacent to the staff carparking) features restricted access, due to the first floor office over the car parking area and as such, access is further than 18 m from the building. A temporary access road is to be constructed adjacent to Lenore Drive whilst the road extension works to Lenore Drive are being carried out at the same time as the building. Also, a temporary access road is to be constructed to the north at GL 17.
   - Stage 2: For the construction of Stage 2, the Stage 1 temporary access road (GL 17) is to be demolished and relocated further north to the edge of the Stage 2 warehouse (GL 22).

3) The variation to the BCA DtS Provision is based on exit travel distances within the warehouse as follows:

   - Stage 1 - up to 65 m to an exit (GL B/8-11); and
   - Stage 2 - up to 70 m to an exit (GL B/19-20)

4) Travel distances between alternative exits within the building as follows:

   - up to 130 m within the warehouse area; and
   - up to 75 m within the basement car park

5) Fire hydrant fire brigade booster assembly not being located at the boundary of the site or within sight of the main entrance of the building.

6) Fire hose reels within the building part being located more than 4 m from an exit.

Note1: In addition to the above, comment will be required from the Fire Safety Engineer that confirms that the deletion of the exit door in the northern wall of the existing PMA facility has no impact on the worst case egress distances in the PMA warehouse area and as such does not impact on the existing FER that applies to that building.

Note2: The perimeter vehicular access during construction will not be provided to the existing warehouse.

Figure 1: Exova WarringtonFire FER No. 2320004-RPT02-1 Issue 1 dated 30/10/2013 – Abstract of Performance Solutions

Note that the above is for information only. This report does not undertake a review of the building with respect to compliance with the BCA DtS provisions. Any review of the BCA DtS provisions should be undertaken by a qualified Building Certifier. It is assumed that there are no additional BCA DtS non-compliances associated with the Tyrecycle tenancy.

3. Methodology

The key elements in Arup's fire risk assessment process includes:

- Understand the site, tyre storage and recycling process to set the context for fire risk assessment through meetings with key Tyrecycle personnel, and review of the relevant site and process documentation.
  - Identify additional fire hazards of indoor tyre storage (tyres and associated components such as tyre shred), including exposures, potential causes of ignition, and potential fire growth and spread rates
  - Management plan for controls and functional tests, such as Management of change (MoC), permit to work (PtW) and other safety management system (SMS) critical procedures.
  - Multiple site visits.
- Assess the risks of significant tyre fires based upon the likelihood of fires starts and the management of the controls to prevent, reduce and mitigate fire risks.
- Assess the risks of significant tyre fires based upon the consequences of tyre fires and the management of the controls to prevent, reduce and mitigate fire risks.
- Review workshop with key Tyrecycle personnel to review maintenance systems, records around existing controls and audit program assessment.
- Review of appropriate codes and standards and guidelines, including current NSW Guideline for Bulk Storage of Tyres [1] and FRNSW – Fire Safety Guideline, Fire safety in waste facilities [2].
- Recommendations on improvements to mitigate risks, incorporate in an updated bowtie diagram, based on the standard hierarchy of risk controls.

4. Description of the Facility

4.1 Site Location

The site address of subject Tyrecycle facility is 21 Grady Cres, Erskine Park, NSW. The site has been operational since October 2021

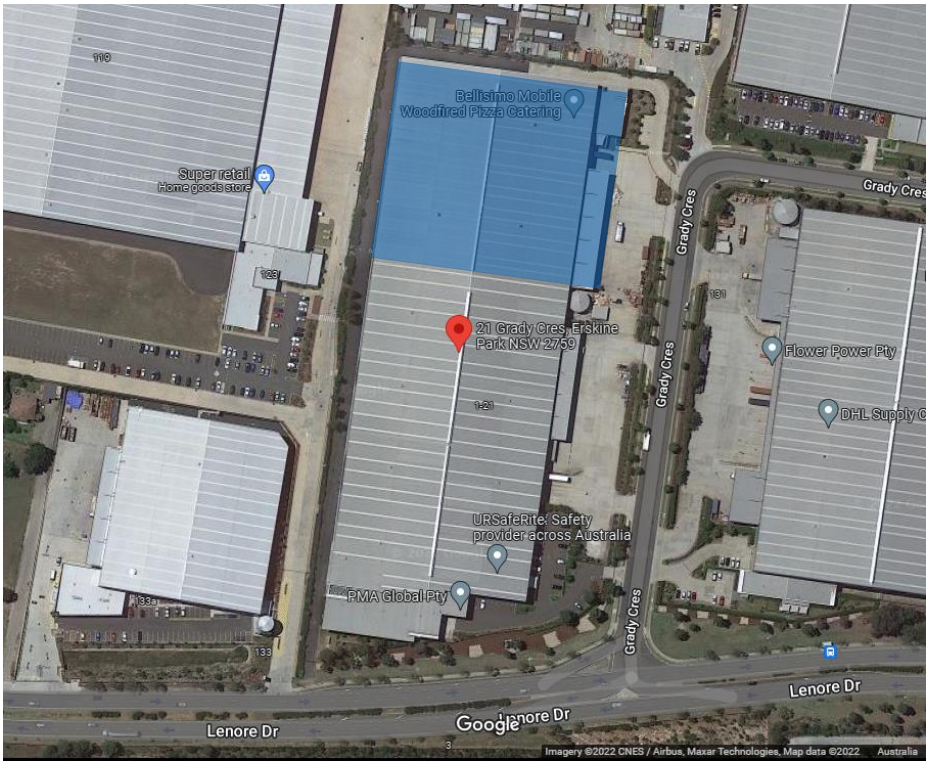


Figure 2: Tyrecycle Erskine Park Site View - 21 Grady Cres, Erskine Park

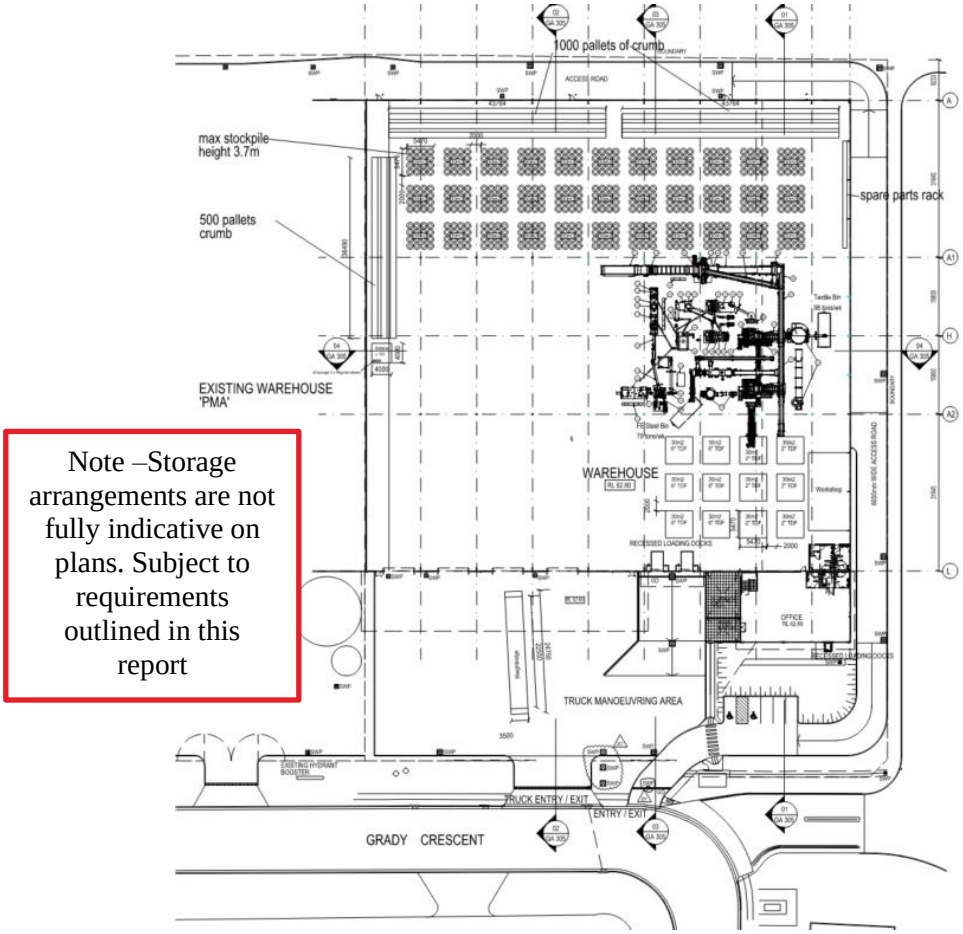


Figure 3: Tyrecycle Erskine Park Site Drawing - 21 Grady Cres, Erskine Park

4.1.1 Fire Brigade Access

The fire brigade access to the site is off Grady Crescent, the truck entrance provides access to the front of the Tyrecycle tenancy (south elevation), the office/ carpark entrance provides access to the sites perimeter access road and the Tyrecycle tenancy's north and east sides. The three nearest fire stations have been identified below:

Fire station	Distance (Google maps)
Ropes Crossing Fire Station 1a Ellsworth Dr, Tregear NSW 2770	13.0 km
St. Marys Fire Station 1 Marsden Rd, St Marys NSW 2760	7.0 km
Mount Druitt Fire Station 81 Railway Street, Mount Druitt NSW 2770	10.0km

4.2 Site Layout

Broadly, the site consists of the northern section of a partitioned multi-occupancy warehouse building with adjoining office block..

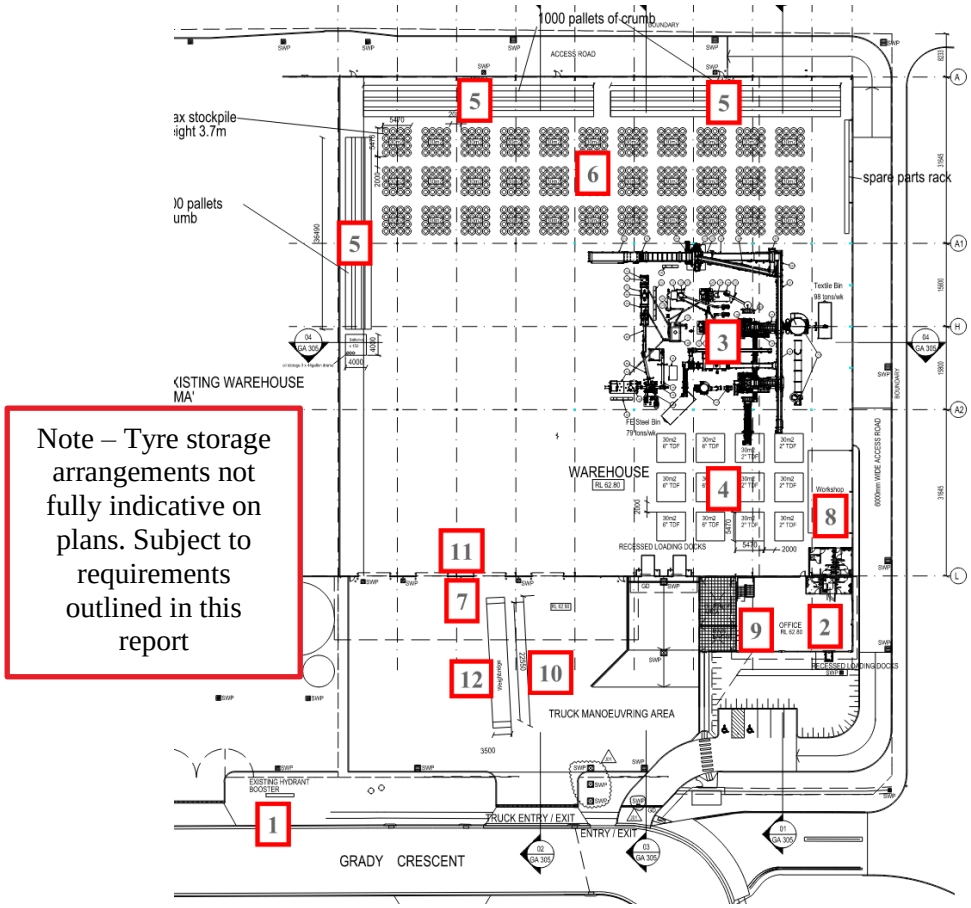


Figure 4: Current Site Layout – Key Features

Key:

1. Hydrant Booster
2. Office area
3. Primary plant & Equipment area (Tyre shredded and processor)
4. Tyre Derived Fuel (TDF) Storage
5. Tyre crumb rack storage
   - Whilst largely comprised of tyre crumb, note that some TDF and WIP stock may also be stored
6. Pre-processed tyre storage area
7. Loading / entry roller doors
8. Internal workshop space
9. Mimic Panel Location (FIP located in the main entry lobby of the warehouse in accordance with BCA Spec E1.8 in the southern occupancy of the partitioned warehouse)
10. Hardstand location / Truck area
11. Lead acid battery storage
12. Weighbridge

The main road leading into the site is Grady Crescent, however the subject building is also bound by internal access roads providing access to the north and west sides of the building.

4.2.1 Site Activities

The Tyrecycle site primarily receives waste tyres (whole) and recycles them either by shredding or crumbing, the product of which is then on-sold to others.

Tyrecycle stores a maximum of 970 tonnes of tyres (and associated products) on site as permitted under the current license. Stocktake is done monthly by the operation team and is recorded in a spreadsheet system. It is expected that Tyrecycle would stop receiving any incoming truckloads when they exceed the storage limits.

A brief high-level description of the current site processes are as follows:

1. Trucks carrying tyres arrive and are measured on the weighbridge
2. Tyres are deposited onto a general stockpile in the designated area within the warehouse floor
    a. As it currently stands, these stockpiles are generally stored randomly or thread on thread
    b. Refer Section 4.2.4
3. Large truck tyres are shipped to Melbourne for processing
    a. Truck tyres are piled in a tread-on-tread manner at the end of the day for overnight storage. Note that stock may build up due to transport delays.
4. The tyres are processed through the Superchopper (which has shredding and crumbing capabilities) which will produce a number of products:
    a. Tyre crumbs, shred, TDF, WIP stock, waste steel and general waste material.
    b. It is noted that stockpile of tyre shred will generally build up faster than tyre crumbs due to different rates of production.
5. The TDF / WIP stock are stored in piles on the ground or into bags stored on the ground.
    a. Refer Section 4.2.4
    b. This can also include some piles of processed waste material.
6. Some tyre crumbs will also be bagged and stored onto dedicated storage racks.
    a. Refer Section 4.2.4
7. The post-processed materials (Tyre crumbs, TDF etc…) will then be moved into shipping containers where they will be shipped off to external facilities.

Note that some of the occurrences listed above can happen concurrently or independently. The overall presence of rubber fuel loads within the subject facility will ultimately be down to the rate of incoming stock, processing capacity/rate and outgoing stock.

The amount of storage to be permitted within the subject facility will ultimately be limited to storage of tyres within the restrictions outlined in Section 9 of this report. Restrictions will include:

- Limited storage pile sizes
- Spatial separation between pile sizes
- Construction of fire-rated storage bays
- Available floor space
- Rack storage configuration compliant with the fire sprinkler system limitations

The estimated storage provided by Tyrecycle based on the expected restrictions are as follows:

Storage Type	Existing Storage Capacity	Proposed Storage Capacity	Increase in Capacity
Pre-processed tyre stacks	Up to 300 Tonnes	Up to 700 Tonnes	+400 Tonnes
Crumb storage (Stored in bags within racking)	Up to 500 Tonnes	Up to 650 Tonnes	+150 Tonnes
TDF storage	Up to 140 Tonnes	Up to 150 Tonnes	+10 Tonnes
WIP Stock (Granules) In bulk bags (Stored alongside TDF Storage)	Up to 100 Tonnes	Up to 100 Tonnes	No increase
TOTAL Note 1	**<970 Tonnes** Note 2	**Up to 1,600 Tonnes**	+620 Tonnes (+ ~63%)

Note 1: This total is not cumulative of the above, as some of the storage will need to be balanced with others. E.g. TDF storage may be reduced if WIP Stock is at full capacity.

Note 2: The current licence for the subject Tyrecycle facility permits storage of up to 970 Tonnes of Tyres (and associated materials).

Based on the above, it is estimated that the tyre storage capacity (including associated tyre products) will increase from 1,040 to 1,600 Tonnes.

Note that the above is intended to provide an estimation of the possible storage capacity based on restrictions outlined in Section 9 of this report. It is not intended to permit or limit the amount of storage noted. The storage capacity may change based on different storage configurations whilst meeting the outlined requirements / restrictions within this report.

Tyrecycle have their own fleet of trucks that collect scrap tyres and bring them to site for processing. Trucks enter the site and are weighed at the weighbridge prior to offloading their contents typically into the primary stockpile. Overflow is currently stored in the general floorspace as part of a stockpile.

In general, tyres are received during the day shift with unloading occurring from morning until evening (approx. 8am-3pm Monday to Friday) with processing ongoing throughout site operating hours, and stock is outgoing in the afternoon. The site receives approximately 20 truckloads of incoming tyres a day and approximately 2 truckloads outgoing from the facility.

The operation of the plant facilities are generally as follows:

- Shredding Operations – Occurs 24 hours
- Granulation Operations – 1pm to 6am
- Cracker Mill Operations – 24 Hours

4.2.2 Site Personnel

The site currently operates 24 hours 5 days a week and over the weekend a 12 hour shift each day as listed in Table 1.

Table 1: Typical staff numbers within facility

Shift	Office	Plant
Morning Shift – 5am- 1pm	6	5
Afternoon Shift 1pm – 9pm	6	5
Night Shift 9pm – 5am	-	3

During these shifts, the plant staff will be on site and provides an inherent level of security and monitoring throughout the day.

The site is provided with an outer entry gate which will be closed and locked between 5pm and 5am Monday to Friday and fully secured over the weekend.

Free access to the building itself are only available between 7.30am to 4.30pm on weekdays (noting staff will be present on site), outside these times, an access key would be required.

In general, tyres are received during the day shift with unloading occurring from morning until evening (approx. 8am-3pm Monday to Friday) with processing ongoing throughout site operating hours, and stock is outgoing in the afternoon. The site receives approximately 20 truckloads of incoming tyres a day and approximately 2 truckloads outgoing from the facility.

As per the Emergency Response Plan, the approximate minimum and maximum populations on site are 3 persons and 25 persons (and up to 10 contractors/visitors) respectively.

4.2.3 Used Tyres/Tyre Composition

The typical composition of tyres is outlined in Table 1 below. Multiple references including [3] and [4] refer to the Scrap Tire Management Council (now Rubber Manufacturers Association: www.RMA.org)

Table 2: Typical tyre composition

Composition	Passenger Tyre	Truck Tyre
Natural rubber	14 %	27 %
Synthetic rubber	27%	14%
Carbon black	28%	28%
Steel	14 - 15%	14 - 15%
Fabric, fillers, accelerators, antiozonants, etc.	16 - 17%	16 - 17%
Average weight - New:	11.3 kg	54.4 kg
Average weight - Scrap:	9.1 kg	45.4 kg

Based on the Tyre Stewardship Australia Guidelines [5], one end-of-life Equivalent Passenger Unit (EPU) is taken to be 8 kg. The EPU for some of the different types of tyres is listed below:

Tyre Type	EPU
Motorcycle	0.5
Passenger Car (excludes people movers, 4WD, & 1 tonne commercials etc.)	1
Light Truck (1 tonne vans, 4WD, people mover, campervans)	1.5
Truck Small (2-10 tonne rigid truck)	2
Truck Large (prime movers & semi trailers)	5
Super Single (replaces a double wheel on a semi or prime mover)	10
Small Solid OTR Truck Tyre	3
Medium Solid OTR Truck Tyre	5
Large Solid OTR Truck Tyre	7
Extra Large OTR Truck Tyre	9
Small Tractor Tyre	15
Large Tractor Tyre	25
Standard 1.5T Forklift Tyre (solid)	2
Medium (2-4 tonne) Forklift Tyre (solid)	4
Large (5-10 tonne) Forklift Tyre (solid)	6
Grader Tyre	15

The tyres on site are currently stored in loose piles. The number of tyres in a pile depends on the type of tyre, the length of time the tyres have been on the pile and the height of the pile. The longer tyres are in a pile and the higher the storage, the more tyres are likely to be in the pile and the effective number of tyres per cubic

metre is likely to be higher due to higher compressive forces on the tyres at the base. This is demonstrated clearly by [6] which provides estimates of the number of whole tyres stored, for example for loose storage types like the storage type at Tyrecycle:

Table 3: Number of tyres per cubic metre

Storage Height	< 3.0 m	3.0m – 4.6 m	> 4.6 m
Passenger / light truck tyres stored less than 15 years	7.6 tyres/m³	9.2 tyres/m³	10.7 tyres/m³
Passenger / light truck tyres stored 15 years or more	9.2 tyres/m³	10.7 tyres/m³	12.2 tyres/m³
Semi truck tyres stored less than 15 years	1.9 tyres/m³	2.1 tyres/m³	2.3 tyres/m³
Semi truck tyres stored 15 years or more	2.3 tyres/m³	2.7 tyres/m³	3.1 tyres/m³

4.2.4 Primary Storage

The primary storage areas within the building are #4, 5 & 6 from Figure 4. Specifically:

Tyre Derived Fuel (TDF) Storage

The TDF storage area is an area designated within the floor space of the subject warehouse for processed tyre products (i.e. TDF) straight off the plant and initially stored as piles on the floor. Following this, the TDF will be either moved into shipping containers to be transported off site/ sold, or stored in 1T bags as WIP stock to be crumbed

Figure 5: TDF storage

Tyre crumb storage

This storage comprises of bags of tyre crumbs approximately1 tonne of material each.

Each 'vertical shelf' comprises of 4 deep bags of crumbs and 3 bags high. Each bag of crumb weighs approximately 1 tonne.

It is noted that whilst the rack storage largely comprised of tyre crumb, note that some TDF and WIP stock may also be stored in this area as well.

Figure 6: Tyre crumb rack storage

Primary tyre stockpile

This is essentially a designated area where tyres are unloaded and stored, either by hand or machinery. Typically, tyres are arranged as one large pile, however the size of the piles need to be controlled to limit the fuel load exposed to an ignition source/ fire event , as such multiple smaller sized piles may be required for processing.

The tyres stored in this area include randomly stacked tyres for processing and tread-on-tread truck tyres for external delivery.

The tyre pile is central to the operations on site and generally has the highest concentration of tyres at any given time, see Figure 7. Currently, the tyre pile(s) are stacked up to approximately 3 m high. The area is generally bound by concrete barriers (approx. 1m high) to maintain some distance from the rack storage and provide vehicle access. Whilst generally designated for pre-processed tyre pile storage, the pile area may occasionally be used interchangeably to store either in transit truck tyres, bag storage on the floor or TDF piles depending on the make-up of stock at the time of processing.

Due to the high concentration of storage in these areas, they do not currently comply with the recommendations under the NSW Guideline for Tyre Storage for the following key reasons:

- Current unconstrained tyre storage arrangements (i.e. thread to thread and random stacking) are not in accordance with the guideline.
- Insufficient spatial separation between tyre piles (minimum 2m recommended).

- Tyres stacked more than 1.5m in height without being in a constrained stacking system.
- Tyre stacks exceeding 30m^2 in area

For a typical month, the incoming (received) tyres closely matches the quantity of outgoing (exported) material. However, accumulation of stocks can occur and may include storage of finished product (TDF or tyre crumb) or whole tyres which have not been processed. Accumulation can be due to a number of or a combination of factors including:

- Plant down time due to breakdown,
- Maintenance,
- Availability of containers; and
- Rate of incoming stock much greater than outgoing stock or capacity to process stock.

During operation of the shredder there are staff constantly within and around the periphery of the pre-processed tyre stockpile. The pre-processed tyre stockpile is also monitored by CCTV from cameras mounted in various areas of the building.

Figure 7: Primary Tyre Storage Area

Figure 8: Various smaller tyre storage piles

5. Standards and Guidelines

As a result of major fire incidents around the world involving extremely large piles of tyres and the resulting difficulty in extinguishing the fires within piles once a fire has taken hold, there are a number of standards and guidelines available both nationally and internationally with respect to the storage of tyres. A summary of these standards and guidelines is captured in Section 11.1.

Generally, the main focus is on fire prevention and then minimising the size and impact of any fires should any develop. Central to all these guidelines is:

- Limiting the size of storage piles and adequate separation of piles.
- Fire lanes to provide access for effective firefighting operations.
- Clearance from other storage piles and other combustible materials.

The pre-planning and firefighting requirements in the standards and guidelines include:

- First aid firefighting equipment, extinguishers and fire hose reels
- Protection of buildings that contain the shredding or tyre rubber crumb machines with systems such as automatic sprinkler systems, and with a fire water supply adequate both to supply the fire sprinkler system and to provide water for fighting tyre pile fires.
- Additional equipment for removing fuel load not involved in the fire (tyres not on fire)
- Training requirements
- Pre-planning and Emergency Response Plan.

The review of national and international standards and guidelines shows a considerable variation in the acceptable area of externally stored tyre pile from 60 m² in NSW to 5,700 m² in parts of the US. Although this is not directly relevant to the subject building, it is nonetheless worth noting that there would be considerable variation in separation distances between piles, numbers of piles in a cluster, and distances of piles to a boundary.

This wide variation suggests there is no fundamental or theoretical size of tyre pile but that an acceptable size is one that will depend on a range of risk factors, including operational procedures, prevention measures and management of consequences.

As such, the assessment methodology approach taken in this assessment also considered the range of risk factors present in this site. This is discussed and assessed in more detail in Sections 6 and 7.

6. Fire Hazards Identified and Consequences

The principal fire event of interest in this fire risk assessment is an internal tyre fire (inclusive of loose tyre or TDF) within one of the storage piles.

The fire hazards are reviewed in detail in this section:

- Identification of potential ignition and fuel sources
- Understand the behaviour of the tyre fires in relation to its ignition, fire growth and fire suppression method
- Review of the major fire incidents that has occurred in Australia and internationally
- Impact of a tyre fire

6.1 Potential Ignition and Fuel Sources

As there is no centralised dataset on the frequency and type of waste fire in Australia, there is no collated information on the main cause of tyre pile fire and its frequency of the tyre pile fire incidents that has occurred in Victoria.

However, based on available US data, it has been identified that the leading cause of fire in tyre piles is arson, including juvenile arson.

Aside from arson, some other sources of ignition, applicable to the subject site include:

- Adjacent hot works, e.g., welding, cutting and grinding activities
- Delivery of already smouldering incoming loads
- Fire originating from accumulation of fine fuels around the stored tyres
- Ignited machinery equipment and vehicles on-site
  - It is noted that diesel-powered machinery are used on site.
- Lightning strikes
- Smoking
- Spontaneous combustion of the finer rubber stockpiles, e.g., crumbs, TDF, etc.
- Wind-borne embers from close proximity grass or bushfire from neighbouring site

Some of the potential fuel sources present on the subject sites could be from:

- Tyre stockpiles – e.g., loose tyre, TDF etc.
- Machinery or vehicles on-site in close proximity to the fire.
- Adjacent shed/building structures in close proximity to the fire.

6.2 Behaviour of a Tyre Fire

6.2.1 Tyre Ignition

Tyres (inclusive of car and truck tyres) are relatively difficult to ignite compared with timber and other plastic and cellulosic materials. This is because of the tyre's ability to absorb radiant heat and then transfer that heat to the internal steel belts and bead wires found in most modern tyres.

When tyres are shredded, this reduces the particles size and produces a lower density, porous material through which air may percolated. Total surface area of tyre shred may be large compared with the volume occupied. Both of these factors in combination leads to these shredded tyres being more susceptible to spontaneous combustion [7]. Albeit from a different state, EPA Victoria [8] has also identified that the particle size of stored combustible recyclable and waste material (CRWM) will influence the potential for spontaneous combustion, with smaller particle sizes having a higher risk, as shown in Figure 9. Hence, risk of spontaneous combustion would be higher in shredded type compared to loose tyres.

As noted by the Scottish Home Office [9] there is potential for smouldering ignition of a tyre rim from a fire source as small as a match. However, the size of the ignition source will greatly affect the length of the smouldering/ignition phase prior to the propagation stage and the other combustion stages as outlined below. Anecdotally, tyres can smoulder for a significant length of time (days) before developing into a tyre fire where there is flame propagation.

The State of California Guidelines [10] indicate that that tyres will typically begin to decompose at between 410 °C and 538 °C in the presence of radiant heat.

The received radiation flux which would cause ignition after 5 minutes and 10 minutes of exposure is estimated to be a minimum of 29 kW/m² and 24 kW/m² respectively (refer Appendix A.1). Prior to this flaming ignition, tyres may heat up to a point where they decompose, smoulder and begin to give off smoke in a pre-ignition phase. This can be detected by olfactory cues by occupants on site.

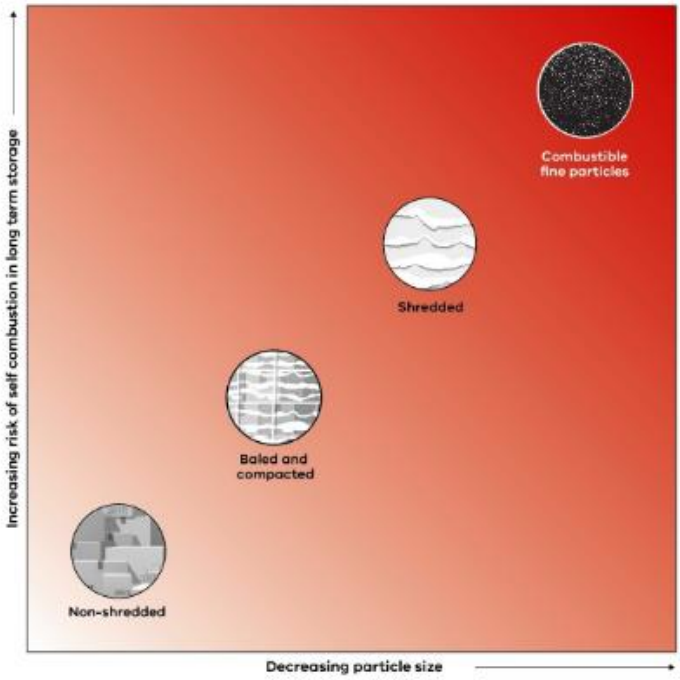


Figure 9: Illustration of correlation between particle size against risk of self-combustion in long term storage particle size [8]

6.2.2 Fire Growth

The following table is replicated from USFA-TR-093 [11]. The table summarises the combustion stages of whole tyre fires chronologically.

Table 4: Combustion phases of tyre pile fires

Stages of Tyre Combustion	Time	Whole Tyre Fire Progress	Action
Ignition/ Propagation Stage	0 to 5 minutes	Active tyre burning of individual tyres but has not extended to the entire pile.	Early extinguishment with water, class A foam or wetting agents may be possible.
	15 to 30 minutes	Once fire extends to the pile, the flame spread is two square feet every five minutes	Separate unburned tyre/product from the burning pile; downwind direction first.
Compression Stage	30 to 60 minutes	The top layers of the tyres will collapse on themselves. The visible flaming is reduced. The fire then is seated deep in the pile.	Focus efforts on separation; build containment berms and oil run-off collection ponds.
Equilibrium/ Pyrolysis and Smouldering Stages	60 minutes and beyond	Fuel consumption and heat production equalizes. Combustion is efficiently producing sufficient heat to consume most combustion products. Downward pressure of the encompassing pile causes the run-off oil flow to increase.	Contain fire spread Contain run-off oil Option 1 – using the excavator separate burning debris into manageable piles and extinguish with fog streams. Option 2 – allow tyre/product fire to burn until the pile can be buried.

The ignition and propagation phase represents the highest risk phase for fire spread from the pile of origin to adjoining storage, buildings, equipment and property. This is when the flaming is at its highest as is the radiant heat flux, there may also be embers which can contribute to piloted ignition. As such the ignition and propagation phase and corresponding risk of fire spread from an incident radiant heat flux has been analysed further below.

6.2.3 Fire Suppression

A significant factor in dealing with the fire risk of tyre piles is the tyre's geometry. Their hollow doughnut shape traps oxygen and allows flames to develop on the inner surface. This geometry also shields the deep-seated tyre fire from extinguishing agents. The tyres shape and the fact that they are water repellent means that most extinguishing agents like water and foam are relatively ineffective against large tyre fires.

As stated previously, the very early extinguishment in the first 5-10 minutes may be possible using water, Class A foam or other suitable extinguishing agents. However, removal and separation of any burning tyres from the remaining non-burning tyres is generally the most effective strategy.

Once any significant number of tyres in the pile are burning, the Federal Emergency Management Agency (FEMA) advice is that ***"the direct application of water and/or foams generally does not provide effective extinguishment in tyre fires. Rather, water is best used to keep the unburned tyres from igniting".***

This is similar to piles of shredded tyres and rubber crumb, once the fire is established, combustion within these large piles is difficult to suppress [7]. However, fires in piles of shredded tyres are reportedly less intense and produce less smoke since shredded piles tend to burn at the surface [5].

The only effective approach for a larger scale burning pile of tyres (loose tyres, shredded tyres or rubber crumbs) is separation of the unburnt tyres from the non-burning tyres. They will then need to be submerged under water or be buried under soil to complete extinguishment.

6.3 Review of the Major Tyre Fire Incidents

There have been some high-profile large waste tyre fires across Australia and internationally over the years as shown in the summary table in Appendix B.1.

There is limited information publicly available, however the tyre fire was often caused by arson or was a secondary fire event from machinery, building fire or bush/grass fire.

The majority of major fire events have been at sites with storage greatly in excess of both the FRNSW guidance and the intended proposed storage capacity at the Tyrecycle site.

In general, it can be seen from Appendix B.1 that major tyre fires can continue for hours, or days before extinguishment is complete, which again is why surveillance, early detection, and rapid intervention are the most critical elements of any fire risk management plans for outdoor tyre storage.

6.4 Impact of a Tyre Fire

While the tyres themselves are reasonably difficult to ignite, the presence of quantities of other cellulosic fuels or flammable liquids in or around the tyre piles may provide the initial path to fire ignition of these materials, and subsequently lead to secondary ignition of tyres. Once there is substantial flaming combustion of a significant number of tyres (as per Table 4), a fire can spread along the surface of a tyre pile rapidly and can be difficult to extinguish.

A major tyre fire can generate a range of products of combustion which can impact on personnel, property and the environment. These impacts could be in the form of:

- Heat – convective and radiated heat, leading to ignition of other materials and facilities
- Smoke, carrying a range of toxic materials, which can contaminate air
- Contaminated water from run-off, carrying a range of toxic and corrosive materials
- Pyrolytic oil, produced by heating of tyres

The generation of these combustion products from tyre fires can lead to consequences in terms of:

- Risks to life of site personnel, neighbours
- Risk to life of attending fire brigade personnel
- Asset damage to the site and/or neighbouring property
- Interruption to Tyrecycle operations
- Environmental damage (air, water, soil)
- Increased insurance premiums or additional policy conditions

Therefore, this highlights one of the critical approaches to management of tyre storage is to have in place strict mitigation measures to minimize the likelihood of fire ignition, deal with any ignitions before spread occurs, and avoid the consequences of a major tyre fire.

7. Fire Risk Assessment

7.1 General

The risk of fire is a combination of the likelihood of fire and the consequences of fire. To identify and understand better the fire risk involved, a review is conducted on the following list of factors that influence the level of fire risk associated with the subject site:

- Review of past Tyrecycle fire incidents
- Review of the identified additional risk factors to the likelihood and consequences of a tyre fire
- Review of the existing fire safety measures
- Recommendation of required additional fire safety measures

7.2 Review of Past Tyrecycle Fire Incidents

The subject Erskine Park site has been operational since October 2021. A site incident report provided by Tyrecycle (see Appendix C.1) between the dates 01/03/22 to 08/08/22 indicates that there have been no smouldering/fire incidents related to the tyre piles. However, there are reported fires from machinery ignition:

1. 02/08/22 – Small flame produced by MPR (i.e. plant).
   - It is noted that spark detection automatically activated, extinguishing the small fire.
   - In this case, the spark and subsequent flame had been automatically detected by a spark detection system attached to the rasper. and subsequently extinguished at an early stage by the building fire suppression system.
2. 28/07/22 – Fires from the Rasper work platform
   - A small fire had been identified by an afternoon shift operator
   - The staff's intervention was able to prevent the incident from becoming a larger fire.

Refer to following section for more details on the fire prevention measures that are implemented on site.

7.3 Existing Fire Prevention Measures

Based on the workshop discussion held with Tyrecycle, the following list details the existing fire prevention controls that are provided on site which help to minimise the likelihood of fire ignition of tyres piles.

- ESFR Sprinkler (AS2118.1) fitted throughout the building. Refer Section 9.1.10.
- Warehouse is secured from general public access. Only authorised personnel permitted access into the storage building after hours. Building will always be staffed.
- Inward (and outbound) trucks are all measured on the weighbridge, which is an inherent control point. Note, no thermal checks are completed at the weighbridge.
- Manual unloading of tyres provides inherent check by truck drivers for smouldering tyres
- CCTV cameras provided throughout the building.
- Thermal cameras for finding hot spots in tyre piles if a smouldering fire is detected by occupants via olfactory cues
- Hot work permit system – refer to document R613 Reference Sheet & Permit - Hot Works V2.0.pdf
- Ad hoc monitoring of tyre piles
- Visitors accompanied on site or inducted on the site fire risks

- Regular maintenance of plant, equipment and vehicles
- Thermal scans of switchboards, control panels and operating plant seeking areas of elevated temperatures for repair before they become ignition sources
- Operating procedure: Regular inspections and audits of the plant and yard storage
- Procedure (SOP-COL-002) Unloading Truck Procedure

7.4 Assessment of Tyre Storage Configurations

Based on the contents stored within the subject Tyrecycle Erskine Park warehouse, it is recognised that the key storage loads posing the highest fire risks are as below:

1. Primary pre-processed tyre stockpile
2. Tyre crumb storage racking
3. Tyre Derived Fuel storage
4. Other storage present within facility

Of relevance to this assessment, the NSW Tyre Storage guidelines [1] provide the following recommendations (amongst others) for tyre (and related subsidiary products such as tyre crumbs and shreds) storage in a sprinkled building:

- Tyres are generally to be stacked in a constrained manner and is not to be loosely stacked or thread-on-thread. i.e.
  - Bundled Tyres
  - Pallet Systems
  - Horizontal Systems
  - Portable systems
- Each tyre stacks are to be no greater than 3.7m in height.
- Each tyre stack is to be no greater than 30m^2 in area.
- A minimum clearance of 2m should be provided between tyre stacks.
- A minimum clearance of 1.5m should be provided between tyre stacks and any building structural members.

The primary fire risks and subsequent protection measures for each of the three storage types will be discussed further below.

7.4.1 Primary Pre-processed Tyre Stockpile

The subject Tyrecycle Erskine Park warehouse will feature a large amount of pre-processed tyres in various stockpiles within the floor space of the warehouse. As the intent is to increase the stockpile capacity, the existing arrangement of tyre storage will be adjusted based on our recommended requirements.

These include randomly stacked tyres for processing and tread-on-tread truck tyres for external delivery.

The location of the current stockpile arrangement are shown in the figures below

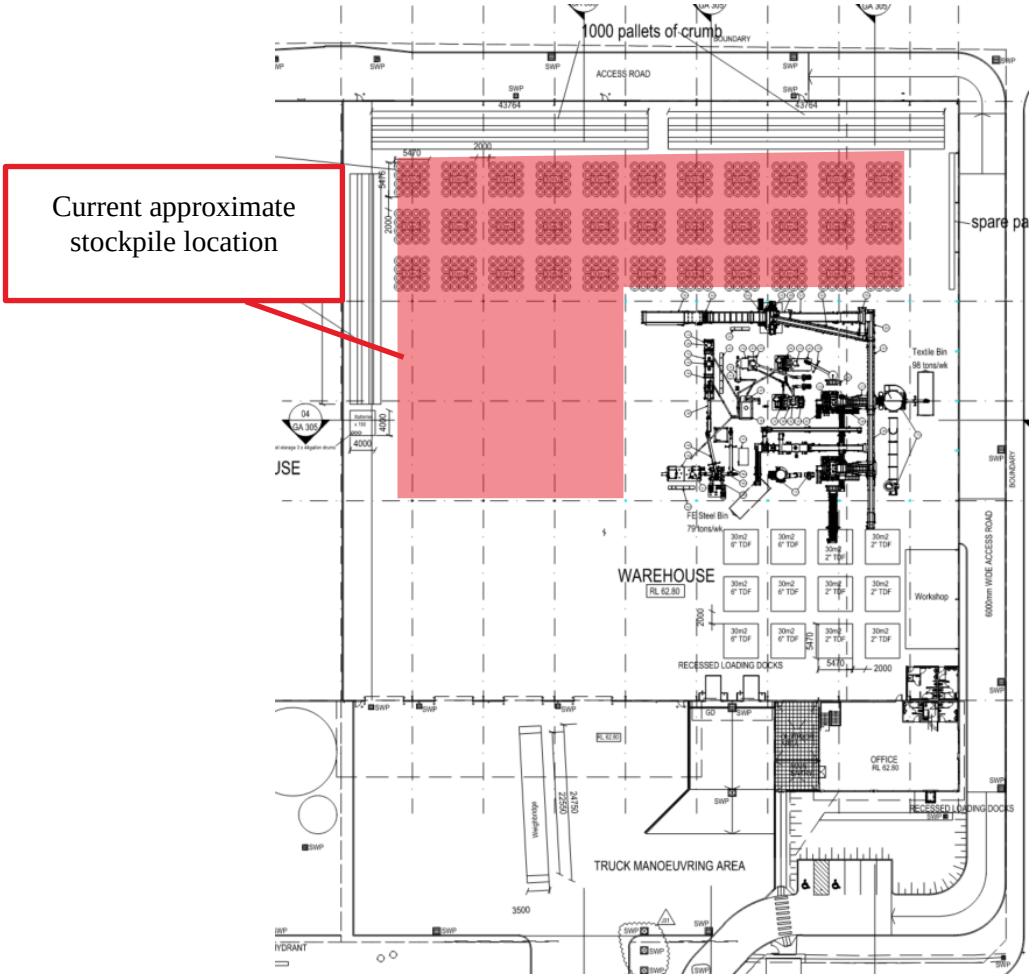


Figure 10: Current Site Layout – Truck tyre stockpile (only indicative for current arrangement)

Figure 11: Site Photo 1 – Truck Tyre storage – Existing Condition to be revised

Figure 12: Site Photo 2 – Various Tyre stockpile storage – Existing Condition to be revised

In its current arrangement, the general floor space of the warehouse is used to store pre-processed tyres. These tyres are typically stored in the following:

- Truck tyres stacked in a thread-to-thread manner for delivery to Melbourne or
- Various tyre stockpiles randomly piled within a designated area bound by 1m high concrete barriers.

Contrary to recommendations by the NSW Tyre Storage Guideline, the current tyre stockpile storage is:

- Not stored in a constrained manner as recommended within the guidelines.
- Stacks of tyres are much greater than 30m^2
- No minimum 2m separation between stacks of tyre stockpile.

It is recognised that as these tyres are not stored in a constrained manner and are in high volumes, in the event of a fire, the stockpile may easily spread to other areas and storages within the building.

Thus, in order to mitigate the risk of fire as low as reasonably practicable, in addition to the full list of requirements outlined in Section 9, the following key requirements to address this fire hazard is outlined below:

- The total tyre storage stockpile area of each pen are to be no greater than 60m^2
- The total storage stockpile height of each pen are to be no greater than 3.7m
- The storage pen are to be bound by construction achieving an FRL of 120 minutes on three sides.
- The construction is to extend 1m above the stockpile height and at least 2m beyond the outermost stockpile edge.
  - This is dependent on the preferred nominated stockpile limits.

- Construction and management of the pens is to be in accordance with Clause 8.2 of FRNSW Fire Safety Guideline – Fire Safety in Waste Facilities

An indicative stockpile pen is shown below:

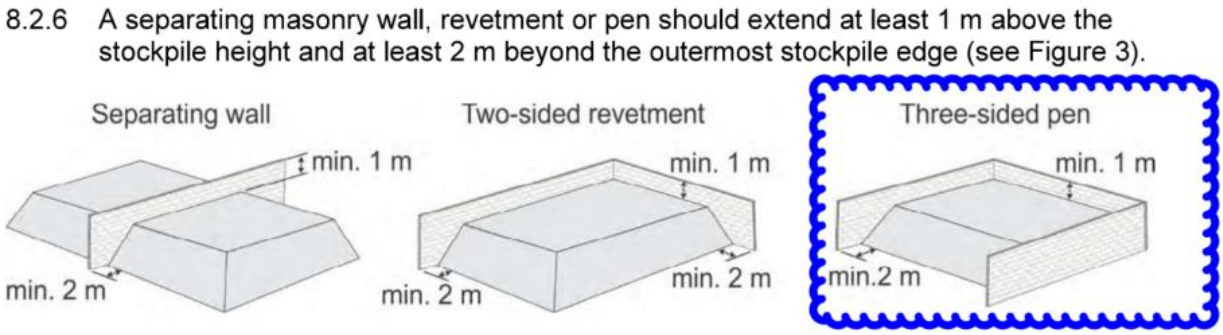


Figure 3 Example separating masonry wall, revetment or pen

Figure 13: Based on FRNSW Fire Safety Guideline – Fire Safety in Waste Facilities

It has been proposed that the fire-rated storage pens be constructed and located in the following locations:

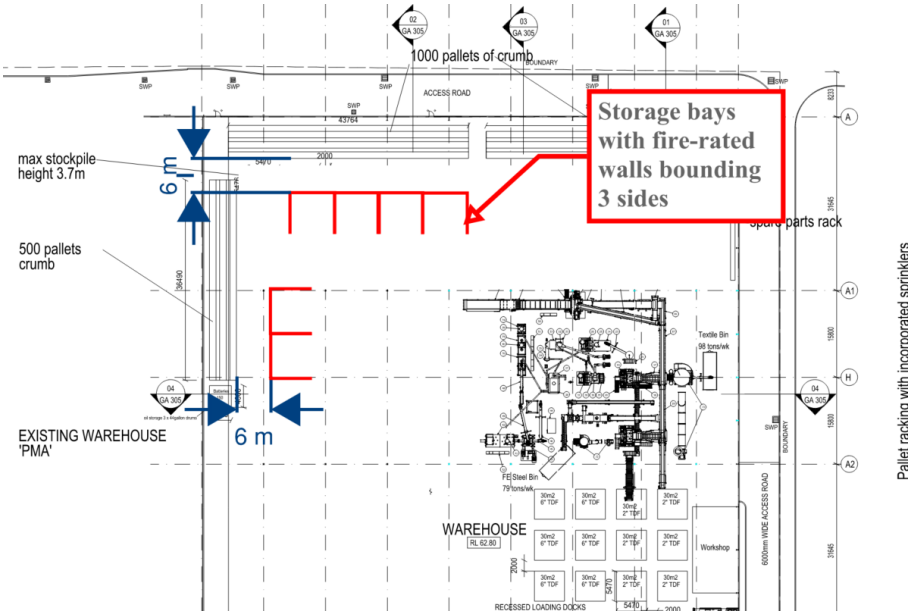


Figure 14: Location of proposed fire-rated storage pens

To minimise the risk of fire spread, the measures outlined in Section 9 are also implemented. In addition, an ESFR sprinkler system per AS2118.1-1999 is provided to serve the building throughout. It is recognised that this system is considered to be an enhanced system over a typical AS2118.1 sprinkler system used in general warehouses. Furthermore, the sprinkler system is understood to be designed with the key features outlined in Section 9.1.10.

It is noted that the coverage of the sprinkler system over a given area is broadly represented in the simplified diagram in Figure 15.

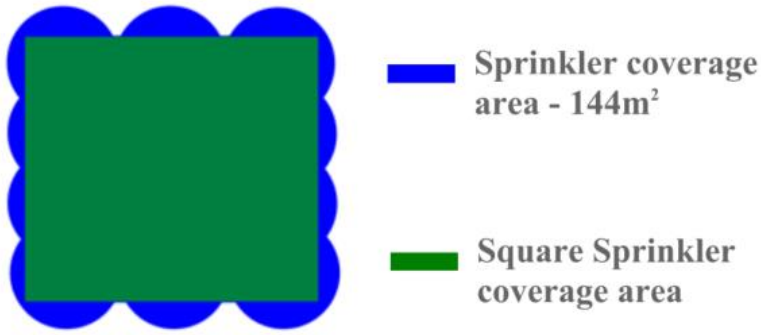


Figure 15: Simplified sprinkler coverage diagram

For the purposes of this evaluation and based on an operating sprinkler coverage area of 144m^2, it is assumed conservatively to be a circular coverage, a square area (i.e. shape of the proposed storage arrangement) within this circular coverage area is expected be approximately 91.5m^2. This is considered to be a conservative approximation, as in reality the 'square sprinkler coverage area' will be a greater proportion of the circular sprinkler coverage area.

A visual representation of this is shown below.

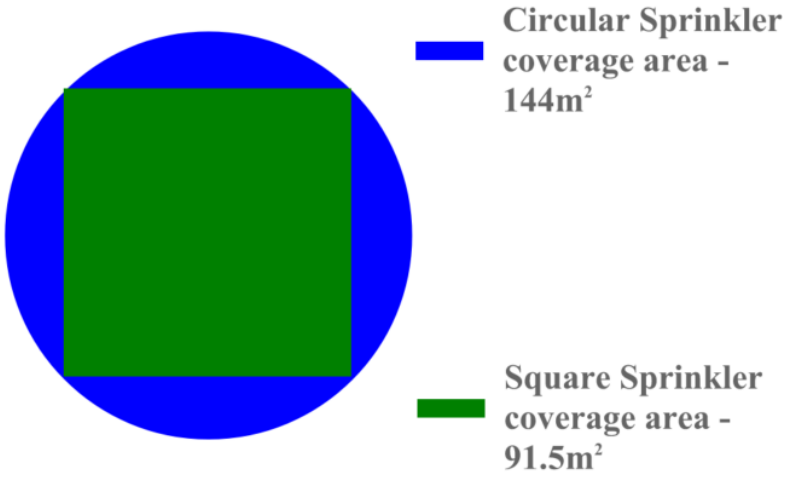


Figure 16: Simplified sprinkler coverage diagram

To further offset any uncertainties, a safety factor or 1.5 will be applied. Therefore, a reliable sprinkler coverage area of 60m^2 is assumed. Thus, in the unlikely event of a fire (noting there are preventative measures in place), the ESFR sprinkler system within the building is expected to be capable in controlling a fire seat of up to 60m^2, which is restricted size of each storage bay. Such that fire will not spread out of the storage pile of fire origin if not extinguish it entirely.

Further to the above, the fire separated walls provided will serve to minimise spread of fire between adjoining stockpile groups, such that in an unlikely event a bay is fully fire compromised (noting there are preventative measures in place), it will be contained by the fire-rated wall construction.

With the measures above in place, it is expected that the risk of fire spread due to the storage of the tyre stockpile are managed as low as reasonably practicable.

Based on the restrictions above, it has been advised by Tyrecycle that up to an estimated 700 Tonnes of pre-processed tyres will be possible. Note that this value is conditional on the tyres being stored as per the restrictions noted in this section.

7.4.2 Tyre crumb storage racking

The subject Tyrecycle Erskine Park warehouse will feature storage of tyre crumb bags located towards the west and southwest side of the warehouse. The location of these racking are shown in the figures below.

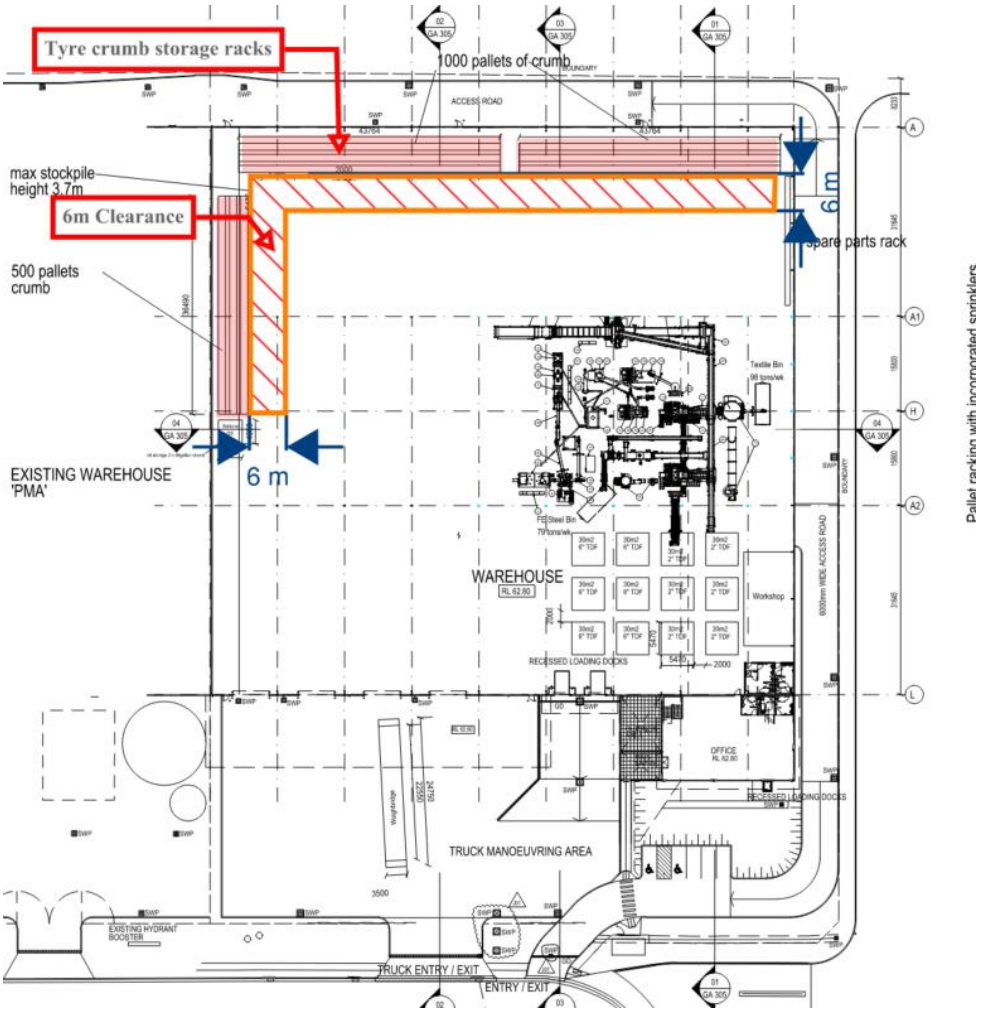


Figure 17: Current Site Layout – Location of crumb storage racking

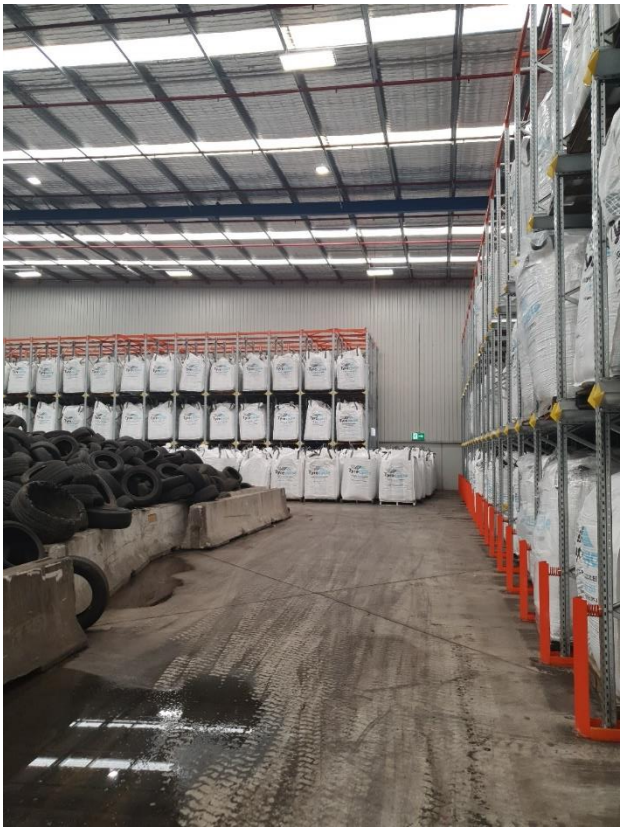


Figure 18: Site Photo 1 – Location of crumb storage racking

Each 'vertical shelf' comprises of 4 deep bags of crumbs and 3 bags high. Each bag of crumb weights approximately 1 Tonne.

Although not strictly tyres, they effectively comprise of the same material, however given that there is less air gaps (when compared to tyres), the fuel load density is significantly higher. On the other hand, reduced gaps reduces the amount of oxygen available for combustion and is expected fire will be largely limited to the top and outer surfaces of each bag.

Contrary to recommendations by the NSW Tyre Storage Guideline, these crumb storage is:

- Stacked greater than 3.7m in height
- No minimum 2m separation between stacks of no greater than 30m^2.

As a result, it is recognised that this may increase the risk of a fire spread in the event that a fire occurs in any of the crumb bags.

To minimise the risk of fire spread, the measures outlined in Section 9 are implemented. In addition, an ESFR sprinkler system per AS2118.1-1999 is provided to serve the building throughout. It is recognised that this system is considered to be an enhanced system over a typical AS2118.1 sprinkler system used in general warehouses. The racking (and associated storage) is installed so that it complies with the restrictions/ limitations of the ESFR system.

Further, thermal cameras will be (if not already) used to provide constant monitoring of the racking areas and will notify staff members in the event that a 'hot spot' is identified. Following that, trained staff will be able to investigate and undertake early fire intervention actions which may include, utilising forklifts (or similar machinery) to remove the affected bags as well as utilising early fire suppression provisions such as hose reels or fire extinguishers.

The racking is to be provided with a minimum 6m of unobstructed access on the accessible side to facilitate the use of machinery with ease. This will also provide spatial separation from the pre-processed tyre stockpiles mentioned above. The spatial separation, sprinklers and fire-rated wall construction is expected to minimise the risk of fire spread between the two different stockpile types.

With the measures above in place, it is expected that the risk of fire spread due to the tyre crumb storage racking is managed. Based on the restrictions above, it has been advised by Tyrecycle that up to 650 Tonnes of crumb storage will be possible.

7.4.3 Tyre Derived Fuel Storage (TDF) or WIP Stock (Granules)

The subject Tyrecycle Erskine Park warehouse currently features storage of tyre derived fuel storage (TDF) in piles or WIP stock (granules) in bags located next to the plant area of the warehouse. The location of these storages is shown in the figures below:

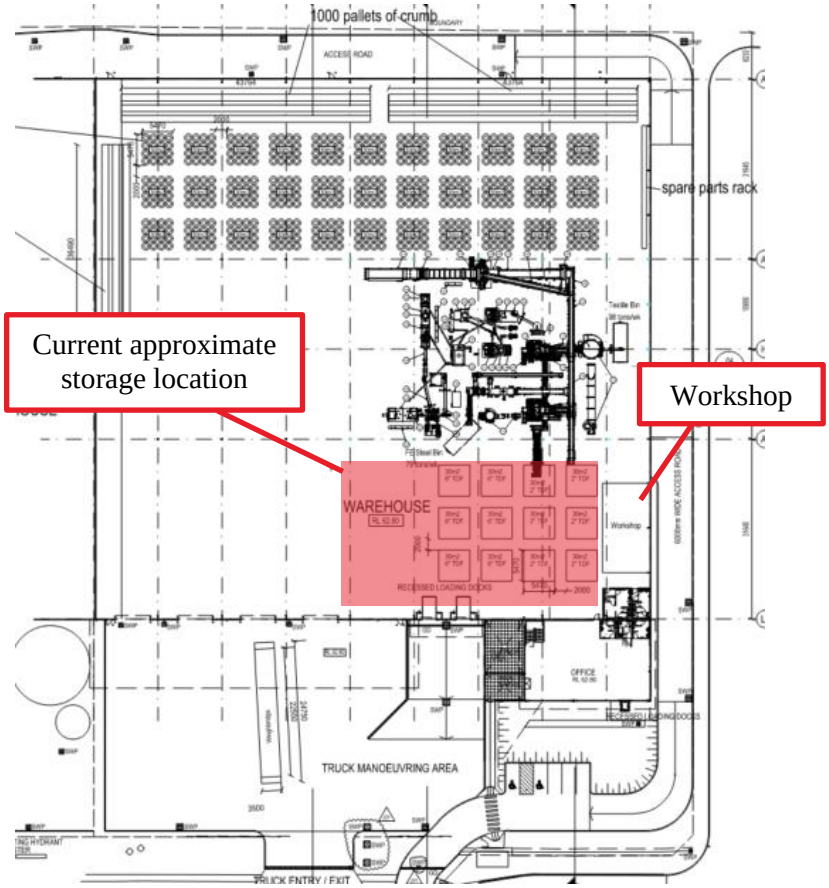


Figure 19: Current Site Layout – Location of TDF Pile / Granule Bag storage

Figure 20: Site Photo 1 – Granule storage in bags – Existing condition to be revised

Figure 21: Site Photo 1 – TDF storage in piles – Existing condition to be revised

Although not strictly tyres, they effectively comprise of the same material, however given that there is less air gaps (when compared to tyres), the fuel load density is significantly higher. On the other hand, reduced gaps also reduces the amount of oxygen available for combustion and fire is expected to be largely limited to outer surfaces of each pile or bag.

Contrary to recommendations by the NSW Tyre Storage Guideline, these TDF/granule storage has:

- No minimum 2m separation between stacks of no greater than 30m^2; and
- Located within 2.5m of loadbearing columns

Thus, in order to mitigate the risk of fire as low as reasonably practicable, in addition to the full list of requirements outlined in Section 9, the following key recommendations are made to address this fire hazard is outlined below:

- TDF pile or granule bags to be grouped such that each 'group' does not have an area of over 50m^2 to be arranged in 7m x 7m piles with a height no greater than 3.7m.
- Groups of TDF piles or granule bags are to be spatially separated from each other by a minimum distance of 6m.
- However, the TDF or granule storage need not be located more than 2.5m of the loadbearing columns provided that the loadbearing columns are provided with an FRL of 120 minutes.
- If the TDF or granule storage is located within 6m of the workshop, the external wall of the workshop is to be bound by fully non-combustible and enclosed walls (i.e. no meshing permitted). In addition, the workshop may not be used for storage of goods other than minor tools.

To minimise the risk of fire spread, the measures outlined in Section 9 are also implemented. In addition, an ESFR sprinkler system per AS2118.1-1999 is provided to serve the building throughout. It is recognised that this system is considered to be an enhanced system over a typical AS2118.1 sprinkler system used in general warehouses. Furthermore, the sprinkler system is understood to be design with the key features outlined in Section 9.1.10.

It is noted that the coverage of the sprinkler system over a given area is broadly represented in the simplified diagram in Figure 15 above.

For the purposes of this evaluation and based on an operating sprinkler coverage area of 144m^2, it is assumed conservatively to be a circular coverage, a square area (i.e. shape of the proposed storage arrangement) within this circular coverage area is expected be approximately 91.5m^2. This is considered to be a conservative approximation, as in reality the 'square sprinkler coverage area' will be a greater proportion of the circular sprinkler coverage area.

A visual representation of this is shown below.

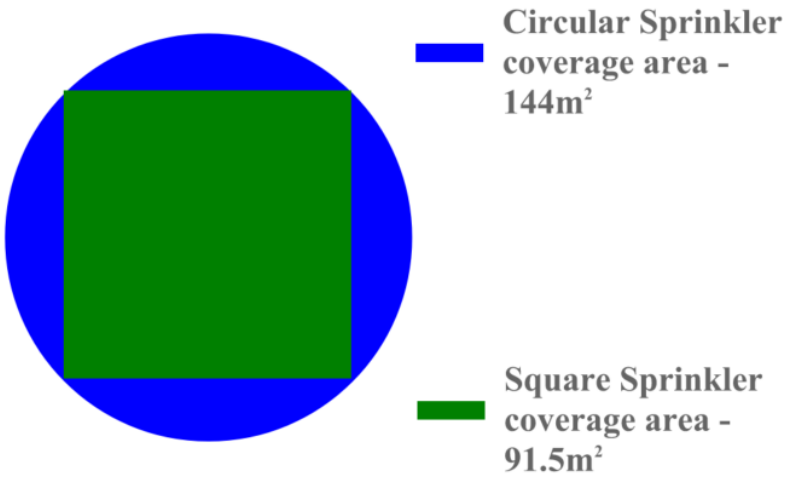


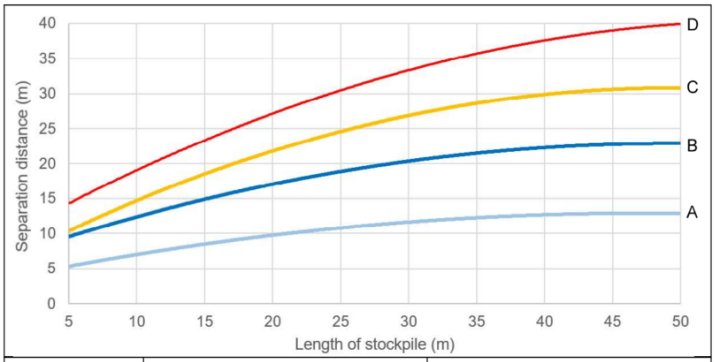
Figure 22: Simplified sprinkler coverage diagram

To further offset any uncertainties, a safety factor or 1.5 will be applied. Therefore, a reliable sprinkler coverage area of 60m^2 is assumed. Thus, in the unlikely event of a fire (noting there are preventative measures in place), the ESFR sprinkler system within the building is expected to be capable in controlling a fire seat of up to 60m^2, which is greater than the size of each TDF or granule storage group. Such that fire will not spread out of the storage pile of fire origin if not extinguish it entirely.

Spatial separation of 6m will also be provided to both minimise the risk of fire spread but to allow space for machinery (such as forklifts) to intervene during early stages of a deep seated fire.

It is noted that the NSW Fire Safety in Waste Facilities Guidelines [2] provides guidance for spatial separation between external stockpiles. Abstract shown below:

8.4.3 Minimum separation should be maintained between external stockpiles, depending on storage method and fire risk of materials, as given in Table 3 (see also Figure 5).



Length of stockpile (m)	Ordinary fire risk (i.e. ≤ 1000°C)		High fire risk (i.e. >1000°C)	
	Loose pile (A)	Baled (B)	Loose pile (C)	Baled (D)
5	5 m	9 m	10 m	14 m
10	7 m	13 m	15 m	19 m
15	9 m	15 m	18 m	24 m
20	10 m	17 m	23 m	27 m
30	11 m	20 m	26 m	34 m
50	13 m	23 m	31 m	40 m

Table 3 Minimum separation distances between external stockpiles

Figure 23: Abstract from NSW Fire Safety in Waste Facilities Guidelines – Clause 8.4.3

It is noted that Clause 7.2.6 of the same guideline defines rubber products as a high fire risk with a burn temperature of >1,000ºC, however, this considers a non-sprinkler-controlled fire. In the subject building, the presence of sprinklers are expected to reduce this temperature below 1,000ºC. As such, in this case, the hazard can be considered more akin to Type A hazard in table above. i.e. Loose pile storage, ordinary fire risk.

For a stockpile length of 7m in the subject building, interpolating from the graph yields a recommended spatial separation of approximately 5.8m, which will be rounded up to 6m. This is in line with the spatial separation provided in the subject building.

An indicative arrangement of the storage piles are shown in below.

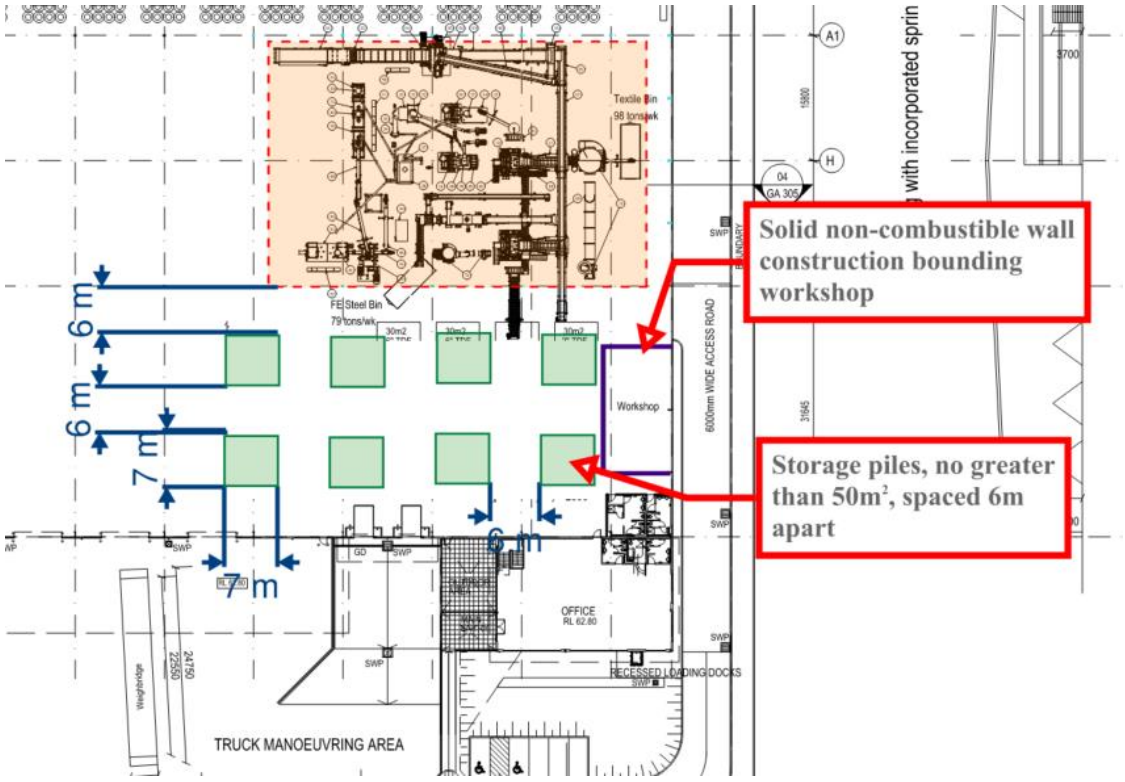


Figure 24: Indicative storage arrangement

With the measures above in place, it is expected that the risk of fire spread due to the tyre derived fuel storage (TDF) in piles or WIP stock (granules) in bags are managed.

Based on the restrictions above, it has been advised by Tyrecycle that up to estimated 150 and 100 Tonnes of TDF storage and WIP stock (in granules) in bulk bags, respectively, will be possible. Note that this value may change but must be stored as per the restrictions noted.

7.4.4 Other Fire Hazards within Site

Lead Acid Battery Storage

The subject Tyrecycle Erskine Park warehouse currently also features storage of lead acid battery. The location of this storage is shown in the figure below:

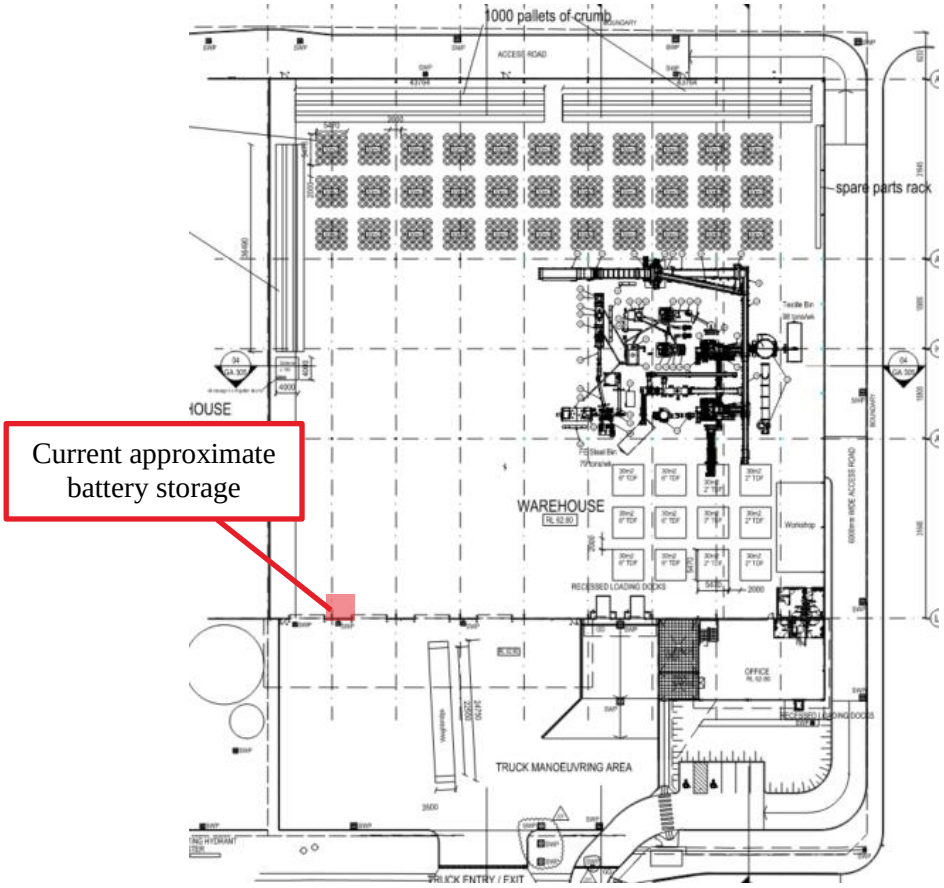


Figure 25: Current Site Layout – Location of lead battery storage

Up to 150 lead acid batteries may be stored within this cupboard, and as such it is recognised that this may pose a fire risk within the facility.

Thus, in order to mitigate the risk of fire as low as reasonably practicable, in addition to the full list of requirements outlined in Section 9, the following key requirements to address this fire hazard is outlined below:

- The lead batteries are to be stored at least 6m away from any tyre or tyre product storage areas.
- An additional fire extinguisher appropriate to addressing lead battery fires are to be provided adjacent to the battery storage cupboard. This is to be provided as per AS2444-2001.
  - Specifically, this is to by powder type extinguishers (BE or ABE) as per Table B1 of AS 2444 for an E class Fire.

In the event of a battery fire, it is expected to be controlled by the sprinkler system within the building if not by manual intervention using available extinguishers.

Should the battery fire not be controlled, it is expected to be largely isolated to the immediate area and unlikely to spread to other areas of the building due to its spatial separation to storage areas.

With the measures above in place, it is expected that the risk of fire spread due to the lead battery storage is considered to be managed.

Primary Plant Area

The subject Tyrecycle Erskine Park warehouse features a large tyre processing plant within the facility. This plant is shown in the figure below:

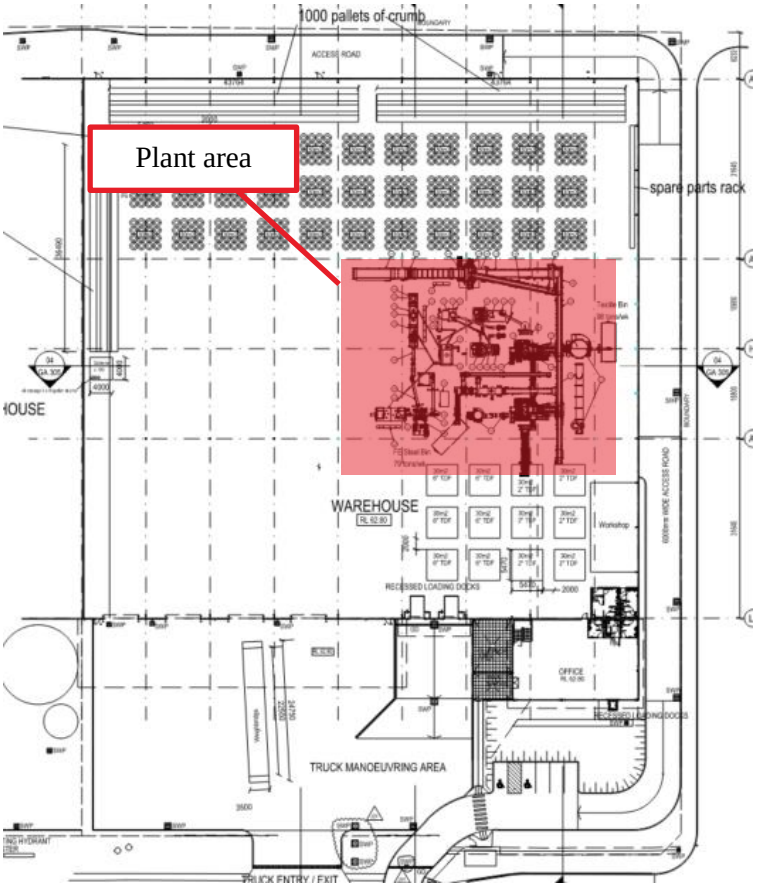


Figure 26: Current Site Layout – Location of processing plant

The primary function of the plant area is to process the tyres into shreds and crumbs. Aside from the processed material itself, the plant largely comprises of non-combustible construction. It is recognised however, whilst not a major source of fuel load itself, it does present a risk of ignition due to the inherent mechanical and electrical components.

Thus, in order to mitigate the risk of fire as low as reasonably practicable, in addition to the full list of requirements outlined in Section 9, the following key requirements to address this fire hazard is outlined below:

- Thermal cameras will be provided and aimed at the plant facility to monitor any unusual increase in temperature.
- Staff will be present within the facility at all times whilst the machinery is operational.
- The plant is to be located at least 6m from any combustible storage.

In the event of a fire, it is expected that they will quickly be noticed by staff present on site. A combination of early staff intervention and sprinklers within the building is expected to largely control the fire.

With the measures above in place, it is expected that the risk of fire spread due to the plant area is considered to be managed.

Workshop Area

The subject Tyrecycle Erskine Park warehouse features a workshop within the facility. This workshop is shown in the figure below:

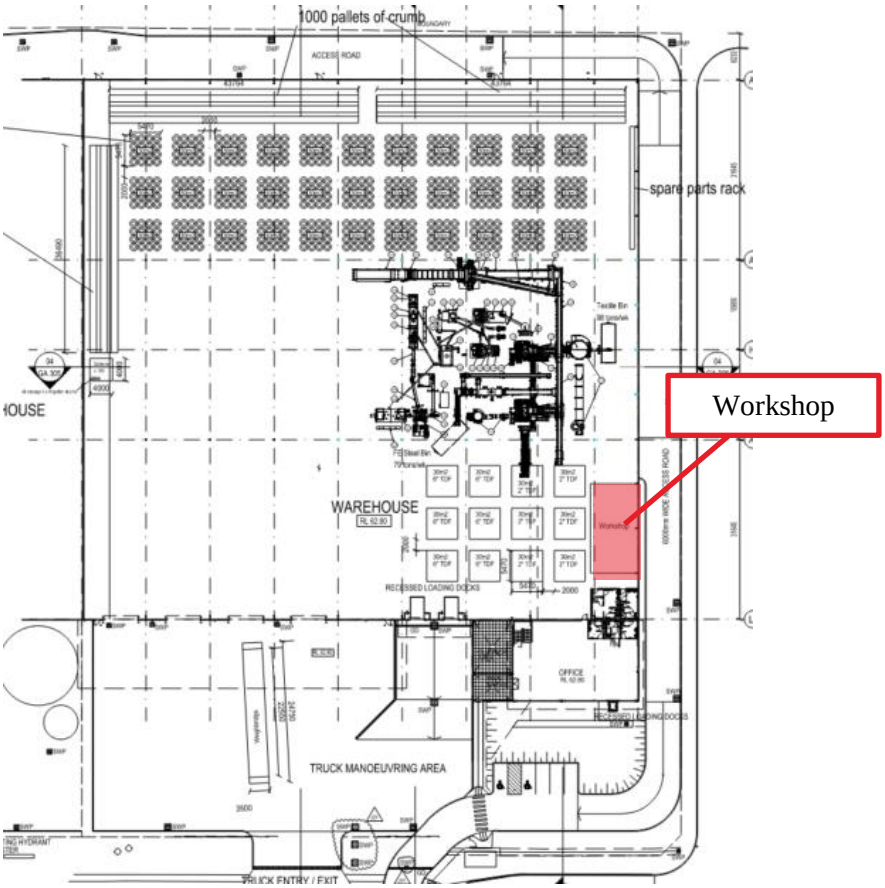


Figure 27: Current Site Layout – Location of workshop

Figure 28: Small package Flammable Liquids Cabinet – Location workshop

The primary function of the workshop is used for general repair and maintenance work. The workshop primarily comprise of tools and equipment and no major storage of goods. Nevertheless, it is recognised that this may be a source of fire ignition which may affect the adjacent TDF/granule storage.

Thus, in order to mitigate the risk of fire as low as reasonably practicable, in addition to the full list of requirements outlined in Section 9, the following key requirements to address this fire hazard is outlined below:

- The external wall of the workshop is to be bound by fully non-combustible and enclosed walls (i.e. no meshing permitted). In addition, the workshop may not be used for storage of goods other than minor tools.
- A 250 L Flammable Goods cabinet (compliant with AS 1940: *The storage and handling of flammable and combustible liquids*) is provided for the storage of a minor quantity of flammable liquids. See Figure 27..
- No ignition sources is permitted within 3m of this cabinet. Any flammable liquid containers taken from this cupboard is to be returned as soon as possible, this is to be managed by Tyrecycle management.
- An additional fire extinguisher appropriate to addressing flammable liquids stored within the workshop are to be provided adjacent to the flammable liquid cupboard. This is to be provided as per AS2444-2001.
  - Specifically, this is to by powder type extinguishers with a rating of at least 2A 60B(E) and a capacity of 9kg as recommended under AS1940 Clause 11.4.2.

Inherently, the workshop will only be used when there is staff present within. The provision of a portable fire extinguisher will allow any staff to undertake early fire suppression in the event of a small fire.

Furthermore, the provision of a non-combustible wall bounding the workshop will also minimise any ignition sources such as sparks that may be produced from the workshop. Due to the general lack of large amount of combustibles, it is unlikely a fire will be able to grow to a size

With the measures above in place, it is expected that the risk of fire spread due to the workshop area is considered to be managed.

Other minor stockpiles

It is noted in some instances, minor stockpiles of various combustible goods such as

- Loose tyres
- Metal shreds with a mixture of rubber within
- Loose rubber products (e.g. tyres, shreds or other rubber products)
- And other similar forms of combustible storage

These stockpiles, whilst generally minor can act as a conduit for facilitating fire spread between various rubber storage piles within the facility and needs to be managed appropriately.

Thus, in order to mitigate the risk of fire as low as reasonably practicable, in addition to the full list of requirements outlined in Section 9, the following key requirements to address this fire hazard is outlined below:

- Temporary storage (less than 1 hour) on the ground that is not containerised should be in long thin rows rather than square or round piles (subjected to the available free floor space). This is the preferred configuration of the piles for firefighting purposes as it allows for the rapid creation of fuel fire breaks in the piles either side of the burning area, therefore resulting in a more manageable fire size.
- For longer term storage (more than 1 hour), all storage is to be in accordance with NSW Tyre Storage guidelines [1] and to be treated as rubber products (including piles of metal shred with rubber products). Specifically (amongst other requirements under the guidelines):
  - Tyres are generally to be stacked in a constrained manner and is not to be loosely stacked or thread-on-thread. i.e.
    - Bundled Tyres

  - Pallet Systems
  - Horizontal Systems
  - Portable systems
- Each stacks are to be no greater than 3.7m in height.
- Each stack is to be no greater than 30m^2 in area.
- A minimum clearance of 2m should be provided between combustible groups.

With the measures above in place, it is expected that the storage of loose combustible materials are broadly in line with the recommendations under the NSW Tyre Storage guidelines [1].

7.5 Threat Barrier Diagrams

As indicated, the overall risk of a major tyre fire at the subject Erskine Park site is a combination of the likelihood of a fire developing and the consequences.

A threat barrier diagram has been developed for the tyre related fire scenarios at Tyrecycle.

A Threat-Barrier Diagram (TBD) is an effective way of organising and communicating hazard management processes and structures. They are designed to provide a clear visual representation of the development of a threat or hazard to a consequence, and the mechanisms by which that development can be either prevented or mitigated. They are also commonly referred to as Bowties.

The main elements of a TBD are:

- Threats: scenarios that may lead to a loss of control (LOC);
- Loss of Control (LOC): the moment when control is lost after the threat materialises and a negative consequence may occur;
- Consequences: potential results of an LOC; and
- Barriers: precautions and controls which may prevent threat scenarios leading to LOC and those that reduce the magnitude of the consequences.

Barriers are almost never one hundred percent effective as there will almost always be at least one failure mode for any control. A highly resilient system will incorporate multiple independent controls for the same threat scenario.

In general, barriers should aim to prevent a LOC occurring before attempting to prevent consequences of a LOC that has already occurred. That is, barriers should not be placed after the LOC at the expense of controls which would act before the LOC.

On the left of the diagram are all the sources of ignition and the preventative measures to ensure ignition does not occur. On the right of the diagram are the impacts or consequences of fire and the measures in place to minimize those impacts or consequences.

The TBD for the Tyrecycle Erskine Park site is presented in Appendix A.1. TDB's have been developed for the following fire scenario's:

- Fire in the MPR
- Fire in the Superchopper
- Tyre fire during truck delivery
- Fire in main tyre pile
- Fire in TDF pile
- Fire in crumb storage racks, and

- Workshop fire.

8. Fire Risk Reduction

8.1 Fire Prevention Strategy

The fire risk management strategy has now been developed further as a result of this fire risk assessment, consultation with Tyrecycle operational managers, is based on the following:

- Tyres are difficult to ignite and burn slowly initially. They usually burn as a result of initial burning of other combustible materials, including cellulosic materials and flammable liquids. The history of fires nationally and internationally is that they have often involved arson.
- Due to their donut shape, fires are able to burn on the internal tyre lining, and this largely prevents extinguishing agents to get to these burning surfaces. As a result, use of water or foam extinguishing agents, except in the very first 5-10 minutes of a tyre fire, are not effective in extinguishing fires but rather should be retained to cool non-burning tyres or other nearby combustible exposure surfaces.
- Chopping and grinding of tyres produces a low density and porous material that air may percolate. The total surface area of tyre shred/crumb may be larger compared with the volume occupied. The combination of permeability to airflow and a high exposed surface area means that a combustible material such as rubber is potentially susceptible to spontaneous combustion

8.1.1 Existing Fire Protection Measures

The key elements of the fire management strategy, based on the fire risk assessment, are:

- Have in place site surveillance with a full range of fire prevention measures
- Manage a tidy site to separate potential ignition sources from piles of tyres
- Have administrative controls in place such as Permit to Work, maintenance schedules and periodic thermal scans of electrical and rotating equipment to control potential ignition sources.
- Training for workers on how to recognise the initial stage of fire and symptoms of the onset of spontaneous combustion of tyre shred and how to respond before an out-of-control fire develops
  - Staff who have basic procedures to identify and separate burning tyres from other tyres using portable equipment and excavators or front-end loaders.
- Have procedures and equipment on site to separate initial slow burning tyres from other unburnt tyres in piles of tyres
- Provide quick notification, good access and water supply for effective fire brigade operations
- Manage any run-off of fire-fighting water or other contaminants
- Manage the impacts of any large-scale fire events in close consultation with EPA and FRNSW
- Tyres keep in limited size piles with trafficable access paths in between
- The largest tyre pile generally constrained by the concrete barriers of the pre-processed tyre stockpile (although this is noted to be insufficient due to the height of the piles and to be replaced by a fire-rated tyre pen)
- Portable extinguishers and fire hose reel coverage for subject building, including the pre-processed tyre stockpile and on all vehicles (portable fire extinguishers only). Fire extinguisher checks are completed daily during pre-start activities.
- Fire hydrant coverage to the west and east end of the site (i.e. factory and office, and surrounding areas including the pre-processed tyre stockpile). Fire hydrant checks are done every 1-2 weeks
- Available perimeter access for brigade appliance and entry from three sides of the site.
- The building is also provided with an ESFR automatic fire suppression system meeting AS2118.1-1999 throughout.

- It is understood that the ESFR sprinkler system is capable of providing a sprinkler coverage area of 144m^2; and
- Able to operate continuously for up to 90 minutes.

It is noted however, as the intention is to increase the storage capacity within the site, the existing fire protection measures noted above alone will not be sufficient. Additional fire safety measures outlined in Section 9 are to be implemented.

The existing risk management control measures at the Tyrecycle site at Erskine Park have been identified through consultation with Tyrecycle staff and by review of existing Tyrecycle policies, plans and procedures for the site.

The existing control measures; preventative controls including management procedures and mitigation measures at Tyrecycle, Erskine Park, are strongly focussed on fire prevention and a rapid response to potential or small tyre fires to keep fire risks at very low levels. Tyrecycle already have a considerable range of fire prevention measures on site, as well as a range of fire protection/ mitigation measures in terms of equipment and management procedures for dealing with the unlikely event of ignition of tyres.

Tyrecycle are committed to site and operational improvements at Erskine Park to reduce further the likelihood and the consequences of fire involving the outdoor tyre storage piles.

8.2 Fire-Fighting Approach

The first approach has to be for staff to take quick action to remove a smouldering or a burning tyre or tyres from the tyre pile.

If the fire has started to spread with flaming combustion to multiple tyres then heavier excavator or other equipment may need to be used to separate out the burning tyres from the non-burning ones, while using hose streams to keep non-burning tyres in the pile cool.

If the fire progresses past that point, the consequences of a large fire involving one of the indoor tyre storage piles could potentially impact on site personnel, the attending fire brigade personnel, the Erskine Park plant operations and the local environment. Such fires can burn for hours or days depending on a range of factors.

A major fire at Erskine Park would clearly impact significantly on plant operations and have the potential to impact on the environment through run-off of TDF and other contaminated fire-fighting water, air pollution, and ground seepage.

Fire brigades have their own standard operating procedures to protect and minimize risks to fire fighters.

8.3 Water Containment

It is expected that the Tyrecycle facility be provided with facilities which makes all efforts to contain all fire water within the premises (amongst other requirements) under the current EPA license:

The existing water containment measures are:

- Storm water drains available to the sunken loading dock with an isolator shut off valve.
- Four of six roller doors to the building are provided with an internal slope to drain water into the loading dock area.
- Additional bunding (drive-over fire retardant bunding) will be provided at the roller doors to direct flow to the recessed area beneath the loading area

9. Required Fire Safety Measures

To ensure that the risk of a fire at Tyrecycle is reduced so far as reasonably practicable, a management program is in place to monitor the controls that are in place to mitigate and reduce the risks of fire.

The process that has been followed is to identify the fire hazards and potential causes of fire onsite

- To develop controls that prevent a fire starting;
- To develop controls that reduce the opportunity of a fire developing once initiated;
- To develop controls that mitigate the consequences of a fire; and
- To have management systems in place to monitor, review and maintain the controls.

This section summarise the hazards and controls and depicts them in bowties so that the integrated control strategy can be visualised. The management processes in place for each control are described, followed by the processes in place for management oversight.

Through this Risk Assessment recommendations have been made for additional controls or changes to additional controls. These are also identified and discussed.

All requirements listed below are to be adopted and implemented by the Tyrecyle facility.

For each of the control measures (barriers) depicted in the TBD in A.1, a summary of the management of that control is provided.

9.1.1 Site Security

The following elements make up the site security arrangements at Tyrecycle:

- Storage site is an enclosed secured warehouse.
- Doors and sliding doors providing access to the building is expected to be locked and secured during after-hour times.
- It has been advised that there will be at least a staff member (security or workers) on site at any given time during a 24 hour period.
- Existing CCTV coverage is generally provided throughout the site, both internally and externally to cover key access areas. There are a total of 25 cameras with currently three being thermal cameras. Refer figures below
- Note that additional thermal cameras to be installed, refer Section 9.1.6

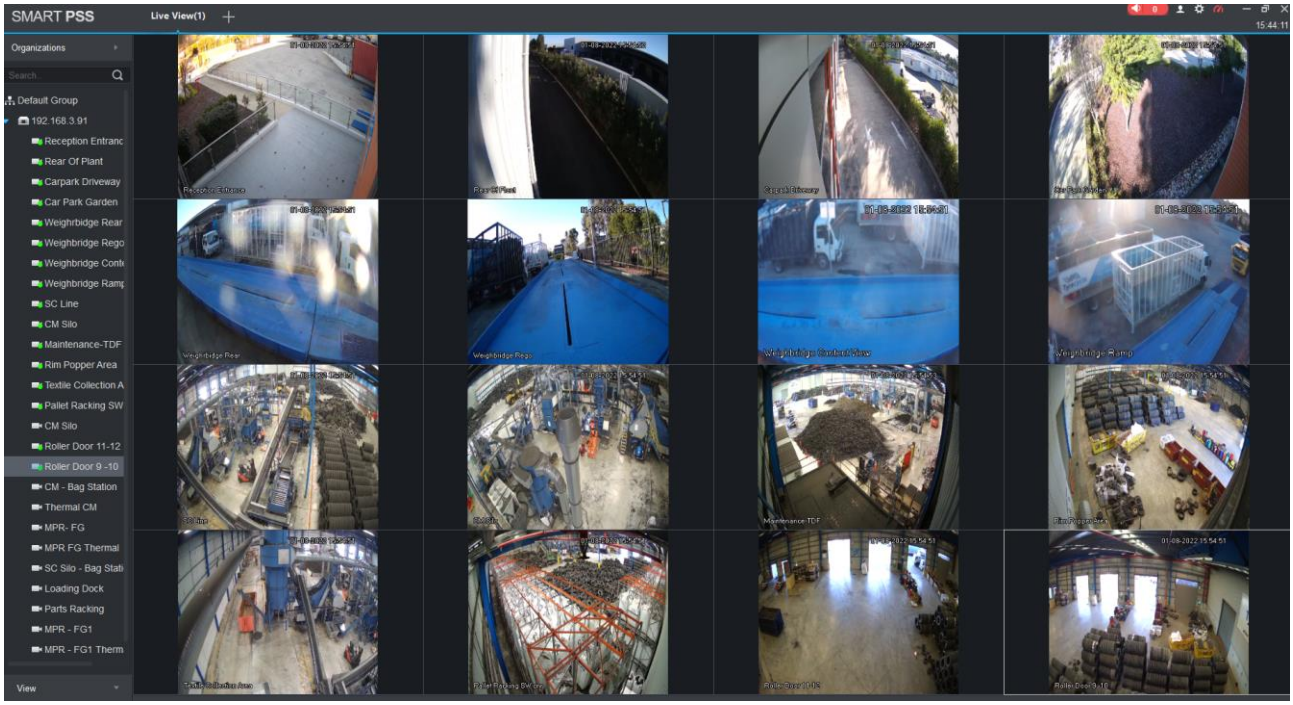


Figure 29: CCTV Coverage of Tyrecyle Site

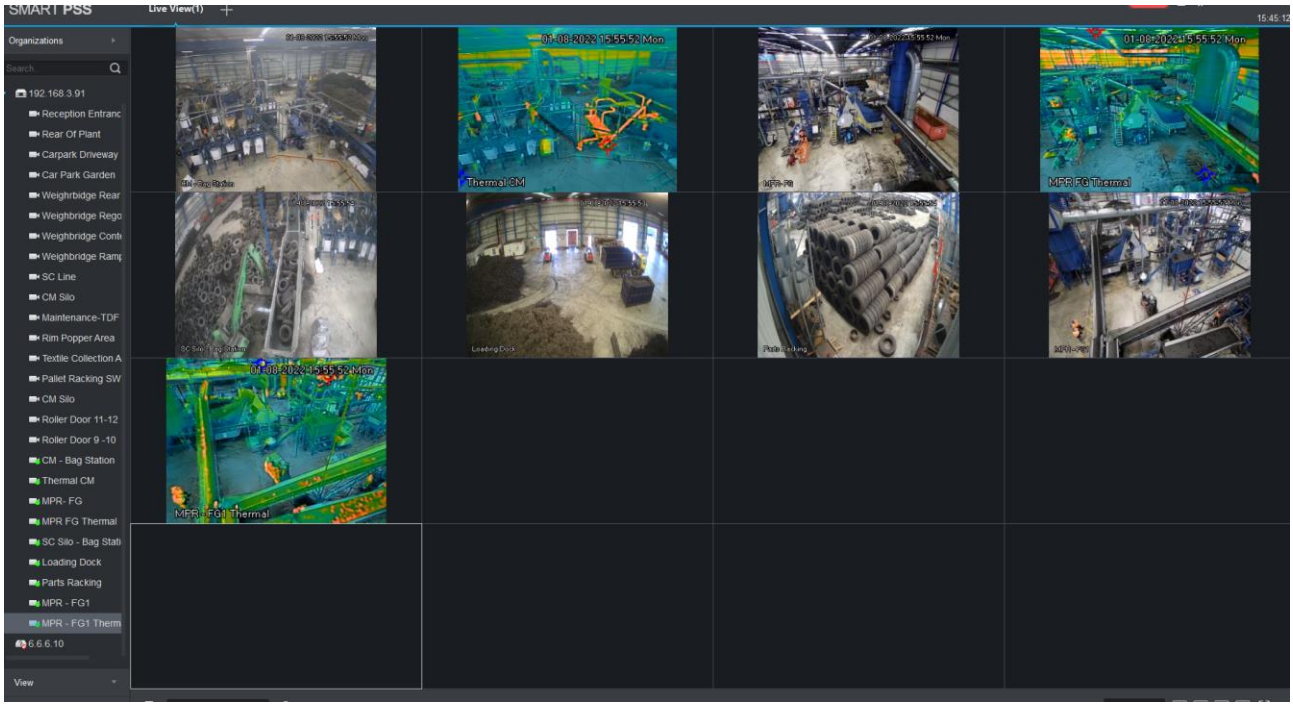


Figure 30: CCTV Coverage of Tyrecycle Site

9.1.2 Stock Control

The stocking levels on site are maintained to control the maximum fuel load onsite. The proposed capacity is based on available storage space to meet the storage constraints outlined in this report and this is tracked through the weighbridge checks of tyres coming onto site and tyre recycled products leaving the site. Periodically, inventory audits are completed to verify stock levels.

Tyre piles are managed visually to maintain separation distances and inventories in each pile to ensure they do not exceed the area sizes or height.

9.1.3 Ignition Source Control

Ignition sources are controlled on site, with controls on the use of naked flames and spark producing activities through the Hot work permit system – refer to document R613 Reference Sheet & Permit – Hot Works V2.0.pdf

9.1.4 Contamination Control

The tyre shred and crumb piles are monitored to ensure that no organic material contamination is present that could provide more readily ignitable material from heat accumulation in the piles. Tyres are checked before being fed to the crumbing conveyor.

9.1.5 Thermal Scans – Electrical systems

Thermal scans of all major electrical systems are recommended to be undertaken annually to ensure that thermal hot spots in circuits through poor connections and other deterioration are detected before they lead to potential ignition sources.

Note that frequency of tests may need to be reviewed depending on results.

9.1.6 Thermal Cameras

Thermal cameras are to be provided to manage and observe any unusual heat signatures within the building. Specifically, they are to be provided to cover the following areas:

- Unloading areas where tyres are offloaded from incoming trucks
- Tyre crumb storage racks
- TDF Storage piles
- Main tyre stockpile (storage pens)
- Plant area (currently in place)

Thermal cameras are to be configured such that an auto call out to plant manager will occur at 50°C.

9.1.7 Permit to Work – Hot Works

The permit to work system controls maintenance activities on site and ensures any hot work is completed with additional controls to avoid ignition of a fire. Hot work permit system – refer to document R613 Reference Sheet & Permit – Hot Works V2.0.pdf.

9.1.8 Maintenance Schedule

Tyrecycle is understood to run maintenance planning schedule through the MEX system. This provides a planned schedule of maintenance on equipment on site as well as initiating checks on the fire equipment systems on site. It also provides a detailed list of spare parts for the equipment.

Check lists are also used to assess equipment before use including:

- Truck and trailer pre-operational checklist;
- Mobile plant checklist;
- Pre-startup checks for the shredding and crumbing plants.

9.1.9 Emergency Response Plan

Tyrecycle maintains an Emergency Management Plan (ERP) referred to as ‘Tyrecycle Emergency Response Procedure’ (current version 3.1) that has defined procedures for the following events to respond to the following emergency scenarios:

- Medical emergencies;
- Fire and/or smoke;
- Bomb threat;

- Personal threat;
- Internal emergencies i.e. power failure and floods;
- External emergencies i.e. wildfire or an incident at a neighbouring property; and
- Evacuations.

In addition to the existing plan, the following are to be included:

- Tyrecycle to develop their respective procedure in their emergency management plan considering other appropriate approach to perform full extinguishment of the burning tyres.
- ERP to also include staff training and procedures to utilise machinery (e.g. forklifts) to separate the fire-involved material (if safe to do so) from various storage piles within the facility.
- Staff training to also be provided to enable staff to effectively undertake early fire suppression using tools such as portable fire extinguishers or hose reels.

9.1.10 Fire Suppression Systems

The building is also provided with an ESFR automatic fire suppression system meeting AS2118.1-1999 throughout. Refer Appendix D.

- The ESFR sprinkler system must be capable of providing a sprinkler coverage area of 144m^2 with 12 sprinkler heads operating simultaneously; and
- Able to operate continuously for up to 90 minutes.

Note that in-rack sprinklers (if necessary under the relevant standards) may be required to be installed. This is to be checked with a fire services engineer to determine the level of protection appropriate to the storage.

9.1.11 Fire Protection / Early Manual Fire Intervention Measures

9.1.11.1 Available Machinery

Machinery such as forklifts are to be provided within the facility and to be operation at any time to facilitate early fire intervention in the event a deep seated fire occurs and cannot be accessed by conventional means.

Whilst the subject Tyrecycle facility is operational, at least one staff members must be trained and present to operate such machinery.

9.1.11.2 Fire extinguishers and hose reels

Throughout the Tyrecycle Erskine Park site, fire extinguishers and hose reels (achieving full coverage of the site) are to be located (if not already) for ready access for trained personnel to utilise at the first signs of a hotspot or small fire to apply extinguishing media.

The following key requirements are to be noted:

- Depending on the revised arrangement of the storage locations, additional fire hose reels may need to be provided to ensure full coverage within the building is provided.
- In addition to fire extinguishers required to be provided under E1.6, additional fire extinguishers are to be provided to the following as follows:
  - An additional fire extinguisher appropriate to addressing lead battery fires are to be provided adjacent to the battery storage cupboard. This is to be provided as per AS2444-2001.
    - Specifically, this is to by powder type extinguishers (BE or ABE) as per Table B1 of AS 2444 for an E class Fire.
  - An additional fire extinguisher appropriate to addressing flammable liquids stored within the workshop are to be provided adjacent to the flammable liquid cupboard. This is to be provided as per AS2444-2001.

- Specifically, this is to by powder type extinguishers with a rating of at least 2A 60B(E) and a capacity of 9kg as recommended under AS1940 Clause 11.4.2.

9.1.12 Fire Protection Measures for Main Warehouse Floor

9.1.12.1 Primary Tyre Stockpile(s)

The primary stockpiles of tyres are to be arranged within storage pens. These include randomly stacked tyres for processing and tread-on-tread truck tyres for external delivery.

Specifically, the pens are to meet the following criteria:

- The total tyre storage stockpile area of each pen are to be no greater than 60m^2
- The total storage stockpile height of each pen are to be no greater than 3.7m
- The storage pen are to be bound by construction achieving an FRL of 120 minutes on three sides.
- The construction is to extend 1m above the stockpile height and at least 2m beyond the outermost stockpile edge.
  - This is dependent on the preferred nominated stockpile limits.
- Construction and management of the pens is to be in accordance with Clause 8.2 of FRNSW Fire Safety Guideline – Fire Safety in Waste Facilities

An indicative stockpile pen is shown below:

8.2.6 A separating masonry wall, revetment or pen should extend at least 1 m above the stockpile height and at least 2 m beyond the outermost stockpile edge (see Figure 3).

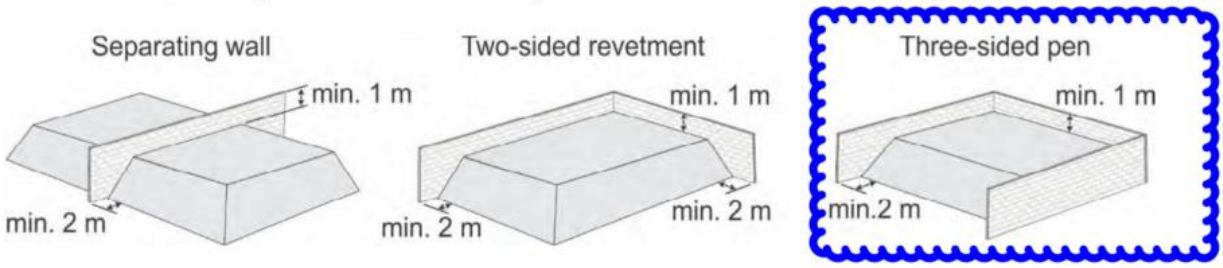


Figure 3 Example separating masonry wall, revetment or pen

Figure 31: Based on FRNSW Fire Safety Guideline – Fire Safety in Waste Facilities

An indicative arrangement of the primary tyre stockpile pens are outlined in Figure 14.

9.1.12.2 Tyre Crumb Storage Racks

As the fuel load density of the tyre crumb storage racks are extremely high, the racking (and associated storage) is to installed such that it complies with the restrictions/ limitations of the ESFR system. If the existing ESFR Sprinkler system is insufficient to accommodate the desired storage capacity, upgrades to the existing system may be required. This may included the provision of in-rack sprinklers if required under the relevant AS2118.1-1999 standard.

In addition, each row of racks is to have a minimum of 6m unobstructed access on each accessible side.

An indicative arrangement of this storage is outlined in Figure 17.

9.1.12.3 Tyre Derived Fuel (TDF) and WIP Stock (Granules) Storage Pile(s)

A significant control measure to limit the maximum size of a fire at the Tyrecycle Erskine Park site is to limit the size of combustible material and to ensure there is sufficient separation between fuel load to prevent ignition of other piles or buildings within the facility.

Specifically in the cases of the TDF storage piles or Granule bags, they are to be arranged in groups with a combined area of no greater than 50m^2 to be arranged in 7m x 7m piles with a height no greater than 3.7m. Subsequently, each of these ‘groups’ are to be located greater than 6m from each other.

Allocated areas (i.e. 7m x 7m bays with 6m separation) are to be clearly marked on the ground.

An assessment on the tyre pile sizes and the separation distances has been discussed in section 7.4.4 of this report. An indicative arrangement of this storage is outlined in Figure 24.

9.1.13 Egress Provisions

It is noted that in consideration of storage location for various piles, they must be arranged such that impact to egress is not hindered. Specifically:

- Travel distances to exits are not to be increased
  - Note that existing Performance Solutions applicable to the base building has permitted limited extension of travel distances. Refer Section 2.2. Specifically:
    - Exit travel distances within the warehouse of more than 40m (approximately 65m) to an exit
    - Travel distances between alternative exits of more than 60m (approximately 130m).
  - Otherwise travel distances are to comply with BCA DTS Provisions D1.4 and D1.5.
- Minimum exit width clearance of 1m is to be maintained for paths of travel in accordance with BCA DTS D1.6.
- No storage racks may be permitted above paths of egress.
- All exit signage is to be updated to reflect the revised arrangement of storage areas within the building. i.e. the new arrangement of storage areas is expected to have impacted the existing travel paths.

Other potential impacts on fire services equipment (e.g. fire hydrants, fire hose reels, portable fire extinguishers etc…) as well as possible impact to brigade intervention are to be reviewed and coordinated by a fire services engineer.

9.1.14 Fire brigade facilities

Fire hydrants connected to a ring main are provided at the site for the FRNSW to connect hoses to supply larger quantities of water to a fire. A fire hydrant extension is understood to be provided to serve the warehouse in accordance with AS2419.1-2005 and BCA Clause E1.3.

It is recognised however that the subject facility is a sprinkler-protected building. As such, it is expected that any fires will be suppressed or controlled such that it will not evolve into a large fire.

In the unlikely event that the fire is not successfully suppressed or controlled, it is understood that the brigade is unlikely to utilise fire hydrants and will instead focus on limiting further fire spread to adjoining buildings as well as search and rescue.

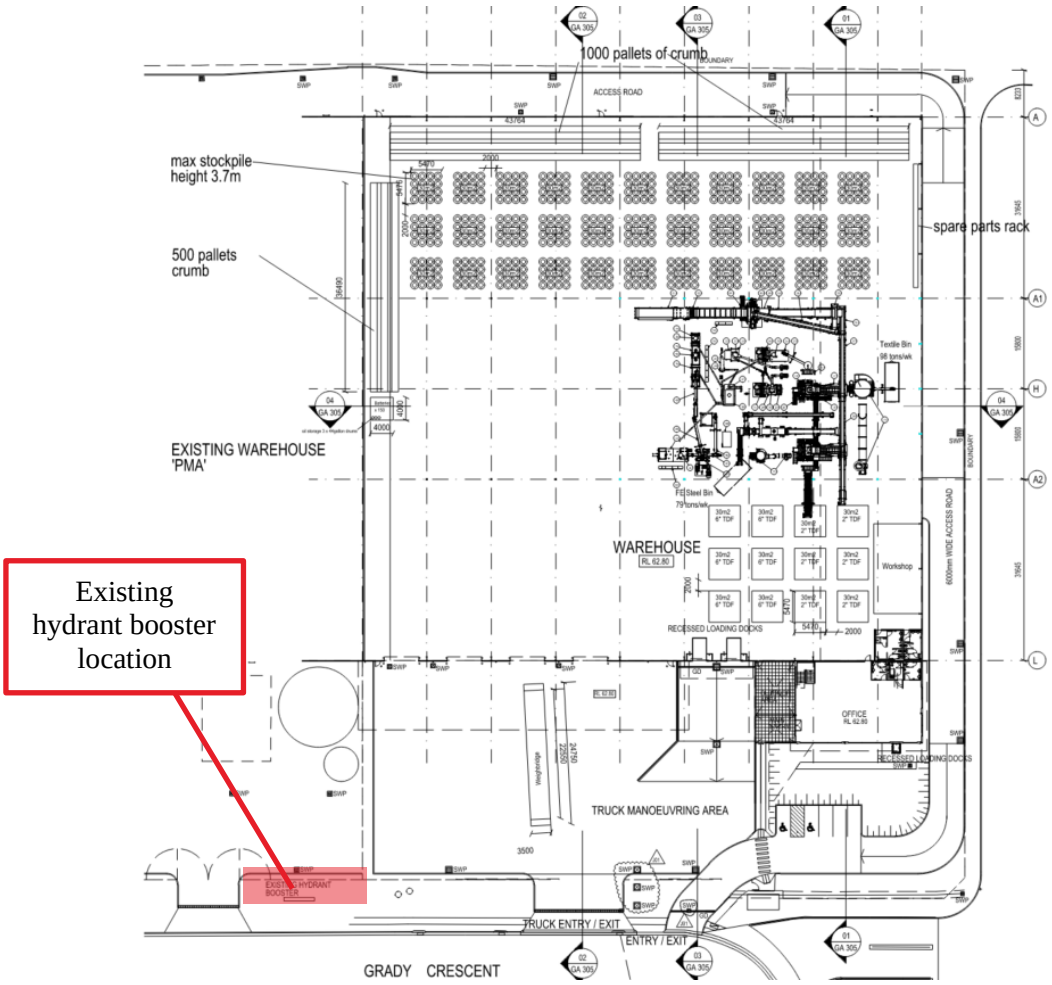


Figure 32: Location of Hydrant Booster

9.1.15 Other General and Construction requirements

Existing loadbearing columns within the building are to be retrospectively fire-rated to achieve an FRL of 120 minutes where within 2m of a storage pile. This is to be provided from the floor up to the underside of the ceiling.

The external wall of the workshop is to be bound by fully non-combustible imperforate and enclosed walls (i.e. no meshing permitted). In addition, the workshop may not be used for storage of goods other than minor tools.

- Unless otherwise varied by requirements within this report, the building is to adhere to the requirements of any existing applicable FERs.
- It is expected that the Tyrecycle facility be provided with facilities which makes all efforts to contain all fire water within the premises (amongst other requirements) as required under the current EPA license. Specifically:
  - Storm water drains available to the sunken loading dock with an isolator shut off valve.
  - Four of six roller doors to the building are provided with an internal slope to drain water into the loading dock area.
  - Additional bunding (drive-over fire retardant bunding) will be provided at the roller doors to direct flow to the recessed area beneath the loading area
- Tyrecycle is to stop receiving any incoming truckloads when they exceed the storage limits.

  - It is noted that there may be logistical challenges for short term changes, however Tyrecycle is responsible in anticipating a build-up of storage and plan accordingly ahead of time as far as practicable.
  - It is recommended that Tyrecycle make arrangements to allocate some 'backup' storage areas (such as one storage pit) to act as a buffer for any unexpected increase in storage requirements.
- The only exception is that a flame-proof cabinet for the storage of flammable liquid is permitted within the workshop.
- A revised Emergency Evacuation Diagram and Emergency Response Procedure is to be produced to reflect the requirements/changed required within this report.
  - It is noted that the current existing Emergency Evacuation Diagram is incomplete and only shows half of the subject facility.
- No ignition sources is permitted within 3m of this cabinet. Any flammable liquid containers taken from this cupboard is to be returned as soon as possible, this is to be managed by Tyrecycle management.
- Temporary storage (less than 1 hour) on the ground that is not containerised should be in long thin rows rather than square or round piles (subjected to the available free floor space). This is the preferred configuration of the piles for firefighting purposes as it allows for the rapid creation of fuel fire breaks in the piles either side of the burning area, therefore resulting in a more manageable fire size.
- Tyre shreds shall be free of fragments of wood, wood chips and other fibrous organic matter
- Tyre shreds shall have less than 1% (by weight) of metal fragments that are not at least partially encased in rubber
- All exit doors located on the west side of the building (i.e. behind the tyre shred racks) are to be provided with vision panels.
- For longer term storage (more than 1 hour), all storage is to be in accordance with NSW Tyre Storage guidelines [1] and to be treated as rubber products (including piles of metal shred with rubber products). Specifically (amongst other requirements under the guidelines):
  - Tyres are generally to be stacked in a constrained manner and is not to be loosely stacked or thread-on-thread. i.e.
    - Bundled Tyres
    - Pallet Systems
    - Horizontal Systems
    - Portable systems
  - Each stacks are to be no greater than 3.7m in height.
  - Each stack is to be no greater than $30m^2$ in area.
  - A minimum clearance of 2m should be provided between combustible groups.

Note that any other storage in any other location not designated within this report or arranged per above is not permitted. An indicative markup of the key tyre (and associated products) storage location is provided in figure below.

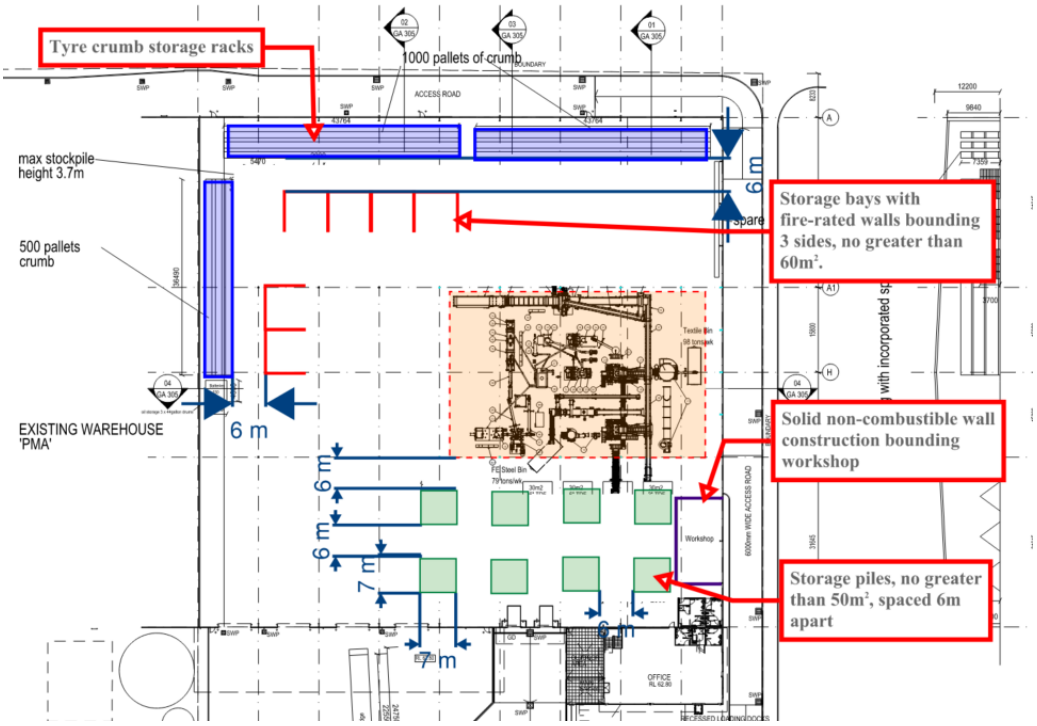


Figure 33: Indicative key rubber storage arrangement (subject to variation within restrictions)

10. Conclusion

Aside from the existing fire prevention and fire protection measures on site, additional fire risk reduction measures are recommended to further minimize the risk of fire at the facility as summarised in Section 9.

Amongst other requirements outlined in Section 9, the following key requirements are to be noted:

Primary Pre-processed Tyre Stockpile

- The total tyre storage stockpile area of each pen are to be no greater than 60m^2
- The total storage stockpile height of each pen are to be no greater than 3.7m
- The storage pen are to be bound by construction achieving an FRL of 120 minutes on three sides.
- The construction is to extend 1m above the stockpile height and at least 2m beyond the outermost stockpile edge.
  - This is dependent on the preferred nominated stockpile limits.
- Construction and management of the pens is to be in accordance with Clause 8.2 of FRNSW Fire Safety Guideline – Fire Safety in Waste Facilities

Tyre crumb storage racking

- an ESFR sprinkler system per AS2118.1-1999 is provided to serve the building throughout. It is recognised that this system is considered to be an enhanced system over a typical AS2118.1 sprinkler system used in general warehouses. The racking (and associated storage) is installed so that it complies with the restrictions/ limitations of the ESFR system.
- thermal cameras will be (if not already) used to provide constant monitoring of the racking areas and will notify staff members in the event that a 'hot spot' is identified.
- The racking is to be provided with a minimum 6m of unobstructed access on the accessible side to facilitate the use of machinery with ease. This will also provide spatial separation from the pre-processed tyre stockpiles mentioned above.

Tyre Derived Fuel Storage (TDF) or WIP Stock (Granules)

- TDF pile or granule bags to be grouped such that each 'group' does not have an area of over 50m^2 to be arranged in 7m x 7m piles with a height no greater than 3.7m.
- Groups of TDF piles or granule bags are to be spatially separated from each other by a minimum distance of 6m.
- However, the TDF or granule storage need not be located more than 2.5m of the loadbearing columns provided that the loadbearing columns are provided with an FRL of 120 minutes.
- If the TDF or granule storage is located within 6m of the workshop, the external wall of the workshop is to be bound by fully non-combustible and enclosed walls (i.e. no meshing permitted). In addition, the workshop may not be used for storage of goods other than minor tools.

Based on the evaluation above, with the existing fire safety (prevention and protection) measures on site and the recommendations noted in the abovementioned sections, the fire risk in relation to fire hazards within the facility is expected to be reduced to as low as reasonably practicable.

The maximum storage capacity will be conditional on the requirements and restrictions outlined within this report being met. i.e. the amount of tyre (and associated components) stored may be increased up to the amount where the restrictions can no longer be met, it is expected this is ultimately determined by available floor space within the facility. An indicative markup of the key tyre (and associated products) storage location is provided in Figure 33.

11. References

11.1 Project Documentation

This report is based on the documentation listed below:

Item	Provided by	Date/Revision
Relevant Drawings		
Architectural Drawings 21 Grady Crescent, Erskine Park Project No. TCGRCR-110221-R0 Sheet 1 *Floor Plans*	Ogtec	21/02/21
Relevant Email Correspondences		
Subject: RE: Tyrecycle Erskine Park - Proposed Measures *Subject facility operation information & estimated tyre storage capacity*	Lathen Loibl - Tyrecycle	Tue 2/08/2022 3:33 PM
Subject: RE: Tyrecycle Erskine Park - Proposed Measures *Staff schedule information*	Lathen Loibl - Tyrecycle	Fri 8/07/2022 9:11 AM
Subject: RE: Tyrecycle Erskine Park - Proposed Measures *Subject facility general operation information*	Lathen Loibl - Tyrecycle	Tue 12/07/2022 2:57 PM
Subject: FW: Tyrecycle Erskine Park - Pallet Racking *Info regarding sprinkler operation*	Lathen Loibl - Tyrecycle	Tue 10/05/2022 8:54 AM
Relevant Standards		
AS1940	Standards Australia	2017
AS2118.1	Standards Australia	1999
AS2419.1	Standards Australia	2005
AS2444	Standards Australia	2001
Other Relevant Documentation		
Best Practice Guidelines for Tyre Storage and Fire and Emergency Preparedness	Tyre Stewardship Australia	March 2019
Fire Safety Guideline Fire Safety in Waste Facilities	Fire and Rescue NSW	27/02/2019
Fire Safety Guideline Guideline for Bulk Storage of Tyres	Fire and Rescue NSW	05/12/2014
Tyrecycle Emergency Response Procedure	Tyrecycle	April 2021 V3.1
Fire Engineering Report (Base Build) Report No. 2320004-RPT02-1	Exova WarringtonFire	30/10/2013 Issue 1

11.2 Information References

[1] FRNSW, Guideline for bulk storage of rubber tyres - Version 03, Sydney, 2014.

[2] FRNSW, Fire Safety Guideline - Fire Safety in Waste Facilities, 2020.

[3] "P2RIC," [Online]. Available: http://infohouse.p2ric.org/ref/11/10504/html/intro/tire.htm.

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[6] Cal Recycle, [Online]. Available: http://www.calrecycle.ca.gov/tires/enforcement/inspections/NumberTires.htm .

[7] Health and Safety Executive UK, "Spontaneous heating of piled tyre shred and rubber crumb - Briefing note," [Online]. Available: https://www.hse.gov.uk/rubber/spontaneous.htm. [Accessed 2022].

[8] EPA Victoria, Management and storage of combustible recyclable and waste materials - guideline - Publication 1667.3, 2021.

[9] Home Office/ The Scottish Office, Fire safety for tyre sites, 1995.

[10] Office of the State Fire Marshal, Rings of Fire Revisited Tire Fire Prevention and Suppression, State of California, Undated.

[11] FEMA, Scrap and shredded tire fires, USFA-TR-093, 1998.

[12] Society of Fire Protection Engineers, SFPE Handbook of Fire Protection Engineering, Fourth Edition, Quincy, Massachusetts: NFPA, 2008.

[13] Integrated Waste Management Board, Assessment of markets for fiber and steel produced from recycling waste tires, California, 2004.

Appendix A

Calculations

A.1 Tyre Ignition Calculations

Time to ignition was estimated using literature values for CHF and TRP based on:

$$\sqrt{\frac{1}{t_{ig}}} = \frac{(\dot{q}''_e - \mathrm{CHF})}{\mathrm{TRP}}$$

t_{ig} Time to ignition [s]

CHF Critical Heat Flux, from experimental data source:
SFPE Handbook Table 3-4.2, values as outlined in assumptions

TRP Thermal Response Parameter, from experimental data source:
SFPE Handbook Table 3-4.2, values as outlined in assumptions

q_e" Incident heat flux [kW/m²] as calculated in the following section

The critical heat flux (CHF) is the minimum heat flux at or below which a material cannot generate the combustible mixture. The thermal response parameter (TRP) is the resistance of a material to generate a combustible mixture. The higher the CHF and TRP values, the longer it takes for the material to heat up, ignite, and initiate a fire, and thus the lower the fire propagation rate. [12]

A primary component in tyres is synthetic rubber which is usually styrene butadiene rubber (SBR), [13] states 60% of a tyre is synthetic.

As such the properties of SBR are the basis of the consequence analysis.

SFPE Handbook Table 3-4.2 [12]provides Critical Heat Flux (CHF) and Thermal Response Parameters (TRP) for both the synthetic material: Styrene-Butadiene Rubber (SBR), as well as SBR Conveyor Belts. The composite nature of conveyor belts is similar to tyres (i.e. contains steel, fabric, fillers etc.).

Therefore, where fire hazard properties are available to SBR conveyor belts these will be used in preference over ‘pure’ SBR properties.

Using the CHF and TRP parameters the required received heat flux has been calculated to cause ignition at 5 minutes and 10 minutes.

Time to ignition	SFPE Handbook 4th ed
$\sqrt{\frac{1}{t_{ig}}} = \frac{(\dot{q}''_e - \mathrm{CHF})}{\mathrm{TRP}}$	
t_{ig}	Time to ignition [s]
CHF	Critical Heat Flux, from experimental data source: SFPE Handbook Table 3-4.2, values as outlined in assumptions
TRP	Thermal Response Parameter, from experimental data source: SFPE Handbook Table 3-4.2, values as outlined in assumptions
q_e"	Incident heat flux [kW/m²]

Reference
SFPE Handbook 4th ed

Table 3 -4.2	SBR Conveyor belts		SBR (material only)	
CHF	10 - 15	kW/m²	10 - 15	kW/m²
TRP	336 - 429	kW.s$^{1/2}$/m²	198	kW.s$^{1/2}$/m²

	SBR Conveyor belts					SBR (ordinary polymer)	
t_{ig} 5 min	300	300	300	300		300	300
t_{ig} 10 min	600	600	600	600		600	600
CHF	10	10	15	15		10	15
TRP	336	429	336	429		198	198
q_e" 5 min	**29.4**	**34.8**	**34.4**	**39.8**		**21.4**	**26.4**
q_e" 10 min	**23.7**	**27.5**	**28.7**	**32.5**		**18.1**	**23.1**

Worst case parameters

Figure 34: Calculated incident heat flux required to have an SBR material ignited in 5 and 10 mins

The ignition times assume the heat flux is received from time zero to the ignition time of interest (5 minutes of 10 minutes). i.e., 29.4 kW/m² is the incident heat flux for the whole time. In a real fire event, the received heat flux would gradually increase as the remote fire event grows, the heat flux will also vary with time, with the flame front likely move across the tyre pile and the fire progresses through the combustion phases.

Using the worst case parameters for SBR conveyors, the ignition time has been calculated for various incident heat fluxes.

	Received/ Incident Heat Flux [kW/m²]							
Worst case parameter	**11**	**12**	**15**	**20**	**25**	**30**	**35**	**40**
CHF	10	10	10	10	10	10	10	10
TRP	336	336	336	336	336	336	336	336
Time to ignition [s]	112896	28224	4516	1129	502	282	181	125
[min]	1882	470	75	19	8	5	3	2
[hrs]	31.4	7.8	1.3					

Figure 35: Calculated ignition time based on a range of received/incident heat flux

Based on the figure above, tyres could be exposed to an incident heat flux of 10 kW/m² for over a day (31 hours) before ignition. It can also be exposed to an incident heat flux of 20 kW/m² for 19 minutes before ignition.

Appendix B

Fire Incidents

B.1 Major Fire Incidents

Table 5:Australian and International major tyre fire events:

Fire location	Pile size	Fire duration	Ignition Source	Sources of info
Brisbane, QLD, AUS 19/03/2021	-	-	Suspicious	ABC Media release
Perth, WA, AUS 04/12/2020	-	12 hours	Unknown	9NEWS Media release
Brisbane, QLD, AUS 2/4/2016	-	2 days	-	QFRS Media release
Tottenham, VIC, AUS 13/02/2016	10 m x 25 m x 2 m	6 hrs	-	EPA Vic website MFB Media Release
Broadmeadows, VIC, AUS. 16/01/2016	100 m x 30 m x 4 m	23 hours	Electrical fault in nearby Machinery	MFB news releases Jan 11 2016
Moyston Jan 2015	30,000 tyres	-	Bush Fire	EPA Victoria news report
Numurkah, VIC, AUS, 2/05/2013	50 m x 50 m area	4 hrs	Suspicious	CFA news and media website
Villawood, NSW, AUS 01/01/2013	50 m x 30 m factory	1.5 days	Grass fire	Fire & Rescue News: May 2013
Longford, TAS, AUS 15-17/02/2012	~12,000 tyres 65 m x 55 m	2.5 days	-	EPA Tas report
Essex, UK March 2015	50 m x 20 m x 2 m	2 days	-	Essex County Fire & Rescue Incident report, March 2015
North Yorkshire, UK January 2014	15,000 tonnes of tyres	2 weeks	Suspicious	BBC news report, January 2014
Fforestfach Swansea, Wales 2011	5,000 tons of shredded tyres	3 weeks	-	BBC news report, July 2011
Lockport, New York, USA Jan 27, 2012		22 hrs	Live industrial power line fell on the tyres and short circuited	Lockport Journal Report Jan 29 2012
Tulsa, Oklahoma, USA July 2013	'several stories tall'	24 hrs	Lightning strike	News 9 Report July 2013
Devon Meadows, VIC 1999	30,000 tyres	Several hours	-	Aap news report 1999
Washington, USA February 1997	1.7 million tyres 50 ft high piles with no separation	14 days	Arson	US Fire Administration/Technical Report Series

Fire location	Pile size	Fire duration	Ignition Source	Sources of info
Arizona, USA August 1997	26 piles each 150 ft x 60 ft x 35 ft	7 days	Suspicious	Special Report: Scrap and Shredded Tire Fires December 1998
Maryland, USA March 1997	4,800 whole tyres (plus 800 tyre planters)	12hrs	Tyres stored too close to combustibles	
New York, April 1995	7 piles 30 feet high (2 million tyres)	9 days		

Appendix C

Tyrecycle Documents

C.1 Tyrecycle Incident Record

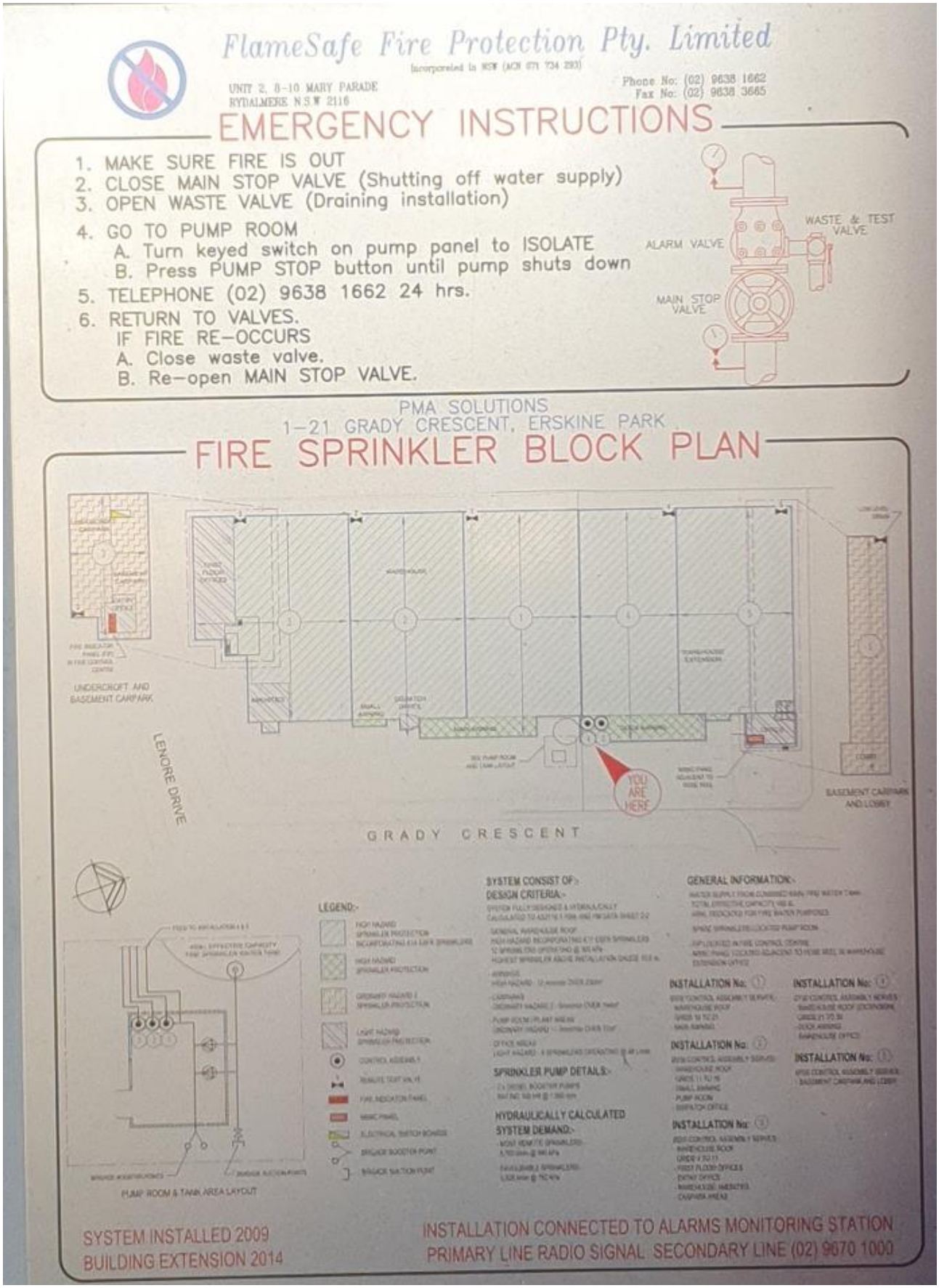
Incidents From: 01/03/2021 *To:* 08/08/2022
Business Unit: All
Department: All
Location/Project: All
Area: All
Outcome: All
Injury Type: All
Injured Person: All
Company Equipment/Property: All
Investigation Status: All
Entered By: All

Business Unit	ID	Internal Reference ID	Description
Erskine Park	4759	02/08/22	Senior Supervisor was conducting routine plant walkthrough, when he had noticed a small flame coming from MPR - Spark Detection automatically activated, extinguishing small fire.
Erskine Park	4745	28/07/22	@ approx. 6:30pm An afternoon shift operator , manning the steel bin noticed flames coming from the Rasper work platform.
Erskine Park	4616	26/05/22	All In One Recycling Driver - Benny Hunjan was reversing truck into whole tyre stockpile to deliver tyres when he has collected the main hydrant along the column and the protective barriers.
Erskine Park	4620	25/05/22	Operator approached State Operations Manager to report that he is feeling a pulling pain on his left, back thigh before he left after completing his shift. Following day when he reported back to work, he was accompanied to the company doctor for consultation. No bruising observed by attending physician, but he was scheduled for a scan (27/5) since the employee has a history of the same symptoms on the same part of the his body. He also consulted our company doctor way back January of this year. He is currently on light duty until final assessment will be done on 30/5 to include the result of the scan. Further update will be given.
Erskine Park	4535	22/04/22	Maintenance employee was changing the spike in the cracker mill silo when he jerked his knee.
Erskine Park	4514	14/04/22	Contractor labourer was swapping bins out when he felt a small twinge in left arm
Erskine Park	4418	09/03/22	Driver went to lift the tailgate not realising how close it was to the door. As it rose up, it damaged the front door leaving a hole in it.
Erskine Park	4361	08/02/22	Employee was reversing comapny vechicle when he struck the concrete barrier, causing minimal damage to the front guard of the car
Erskine Park	4357	02/02/22	ACFS Front Mover hit the Side rail of the weight bridge on his way in to be weighted. Rego: BF63RC
Erskine Park	4358	11/01/22	Operator was reversing the Front end loader when he clipped the brace of the Rack. Base on the Operator's statement it was a miscalculation on his part.
Erskine Park	4306	16/12/21	Employee was picking up a tyre when right foot slip a bit and suddenly felt severe pain on the back of his left thigh. Ice pack was applied on the affected body part. Employee brought to the company Doctor for further assessment. Employee good to work following day on duties he can tolerate.
Erskine Park	4277	13/12/21	Operator was sweeping floor in Parts racking area when he felt faint. He has then walked out of the plant, via the rear fire exit door. After this, he has then passed out for an unknow period.
Erskine Park	4279	08/10/21	Maintenance Supervisor has tested Positive to Covid 19
Erskine Park	4144	06/10/21	Swift container truck entered EP site - Driver was instructed to go over weighbridge for weights. Driver has reversed to line up ramps, he has then tried to go up the ramp on an angle, causing the prime mover to drive off the bridge itself.
Erskine Park	4136	09/02/22	Operator was driving forklift with an empty bulk bag attached when he struck one of the center columns

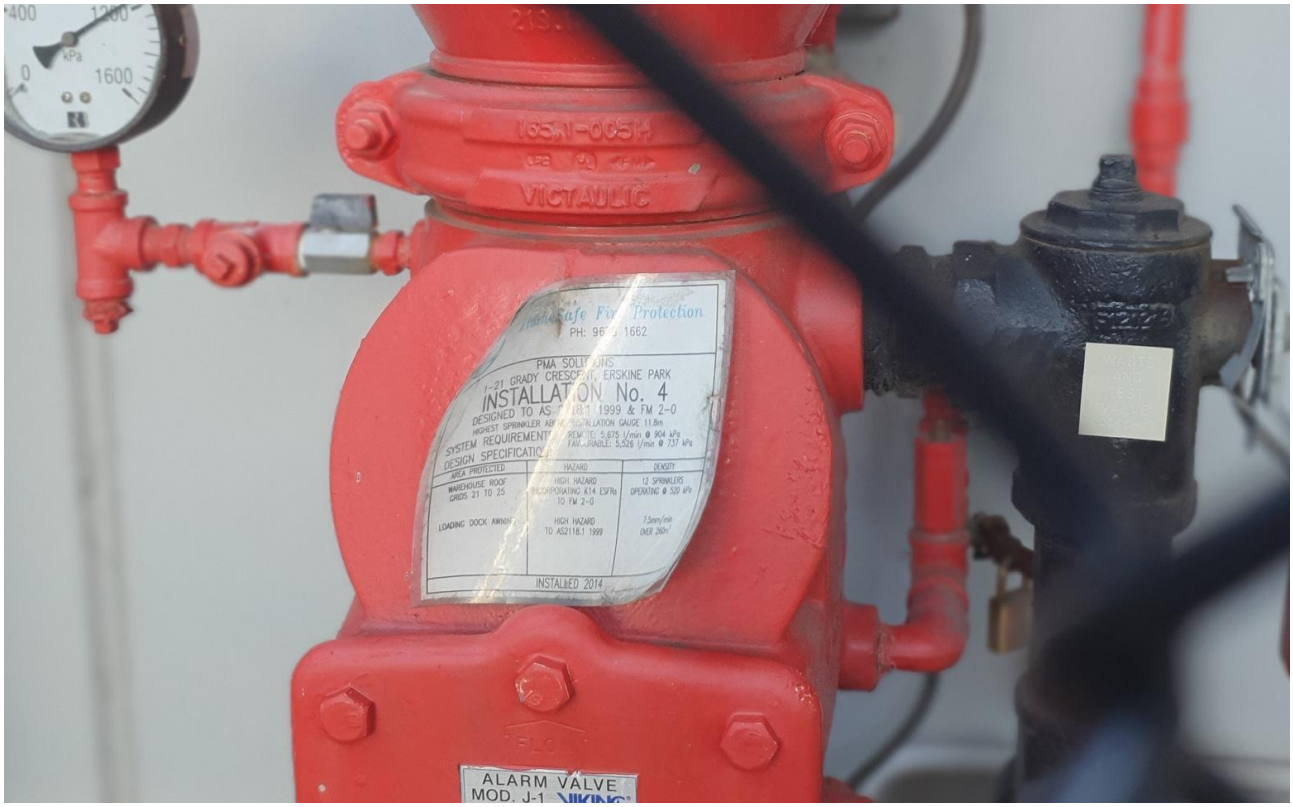
Appendix D

Additional Services Information

D.1 Site Photo of Fire Sprinkler Block Plans



D.2 Site Photo of Sprinkler Valve



Appendix E

Threat Barrier Diagrams

E.1 Bowtie Diagrams

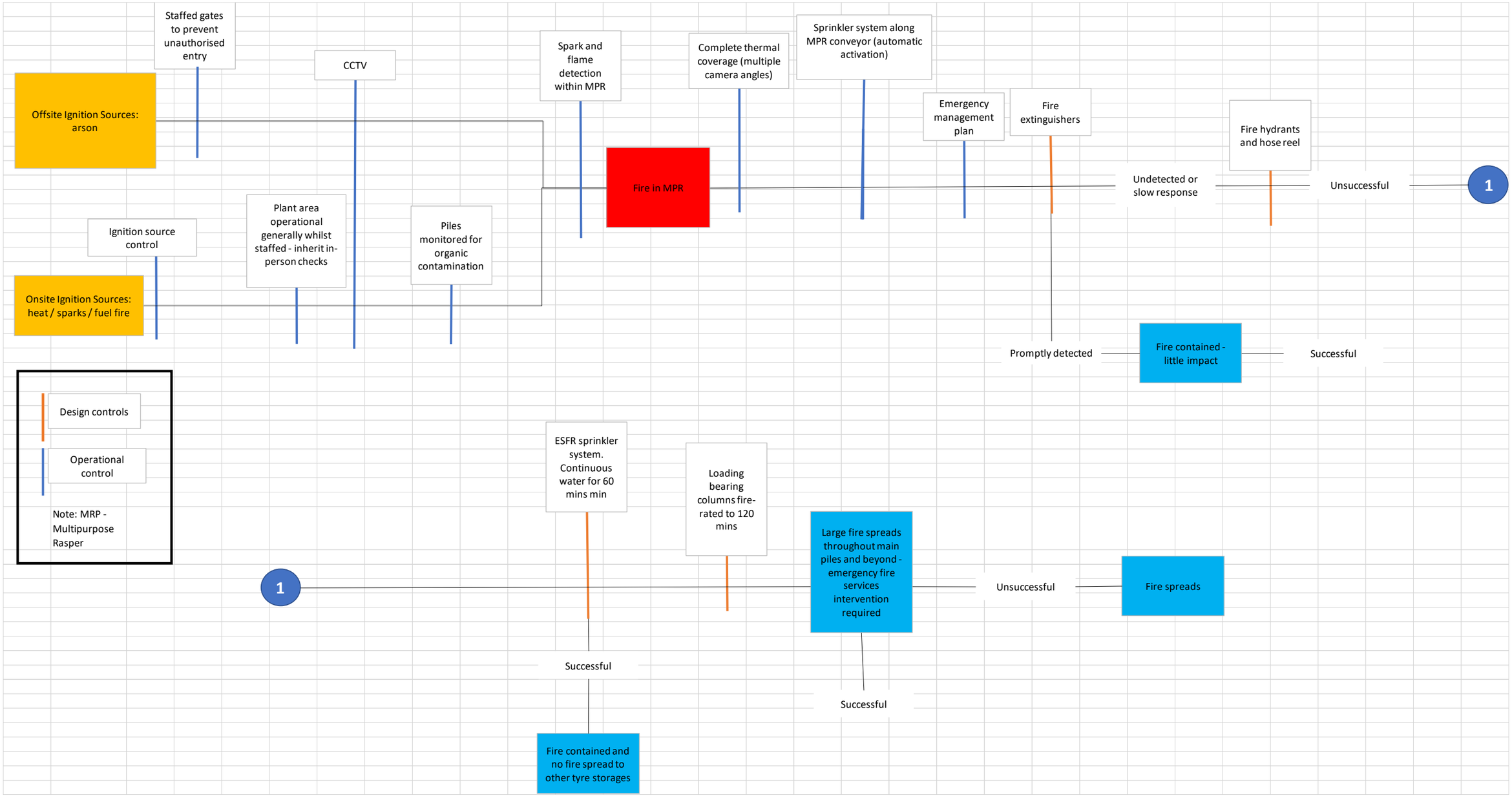


Figure 36: Bowtie Diagram – Fire in MPR

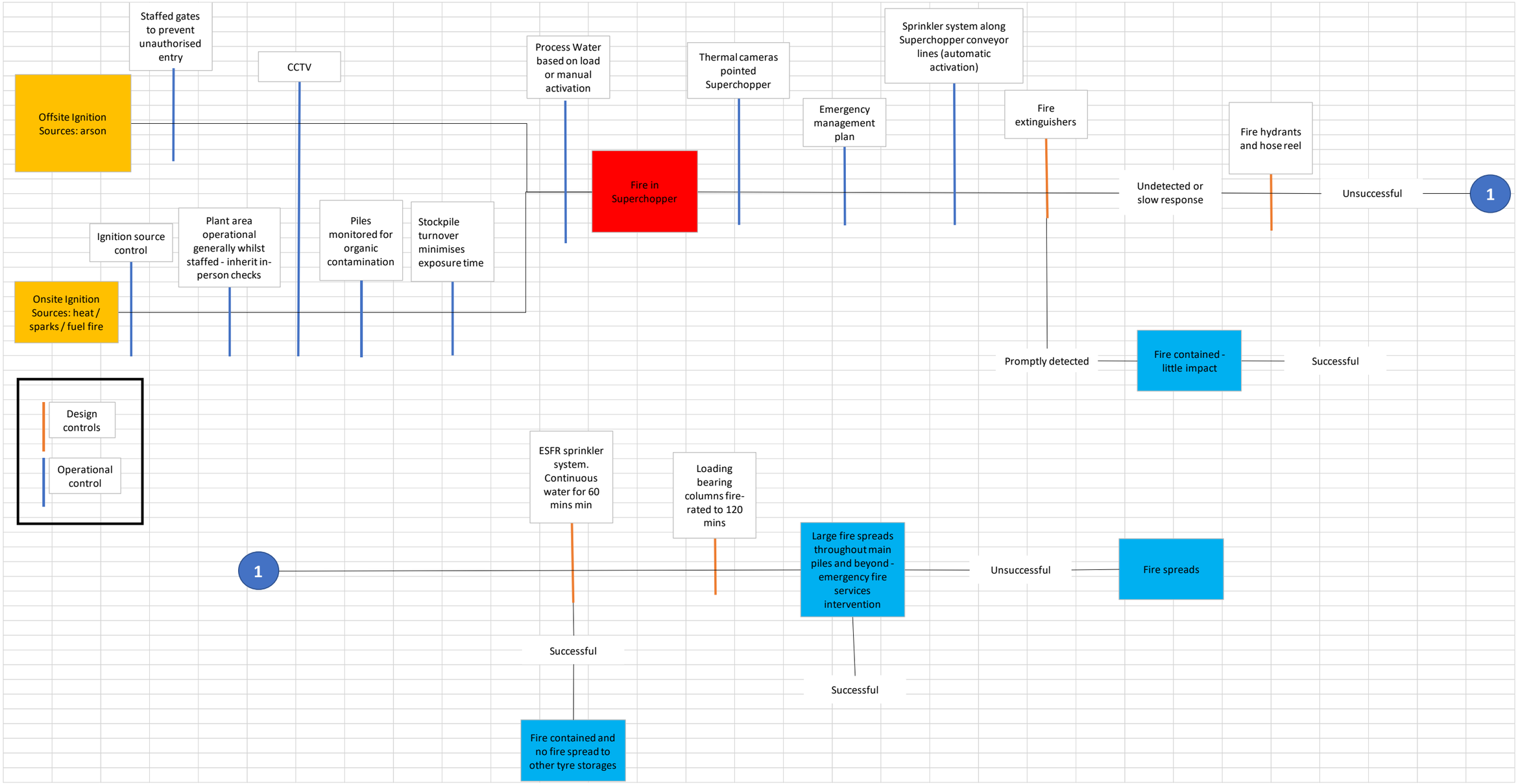


Figure 37: Bowtie Diagram – Fire in Superchopper

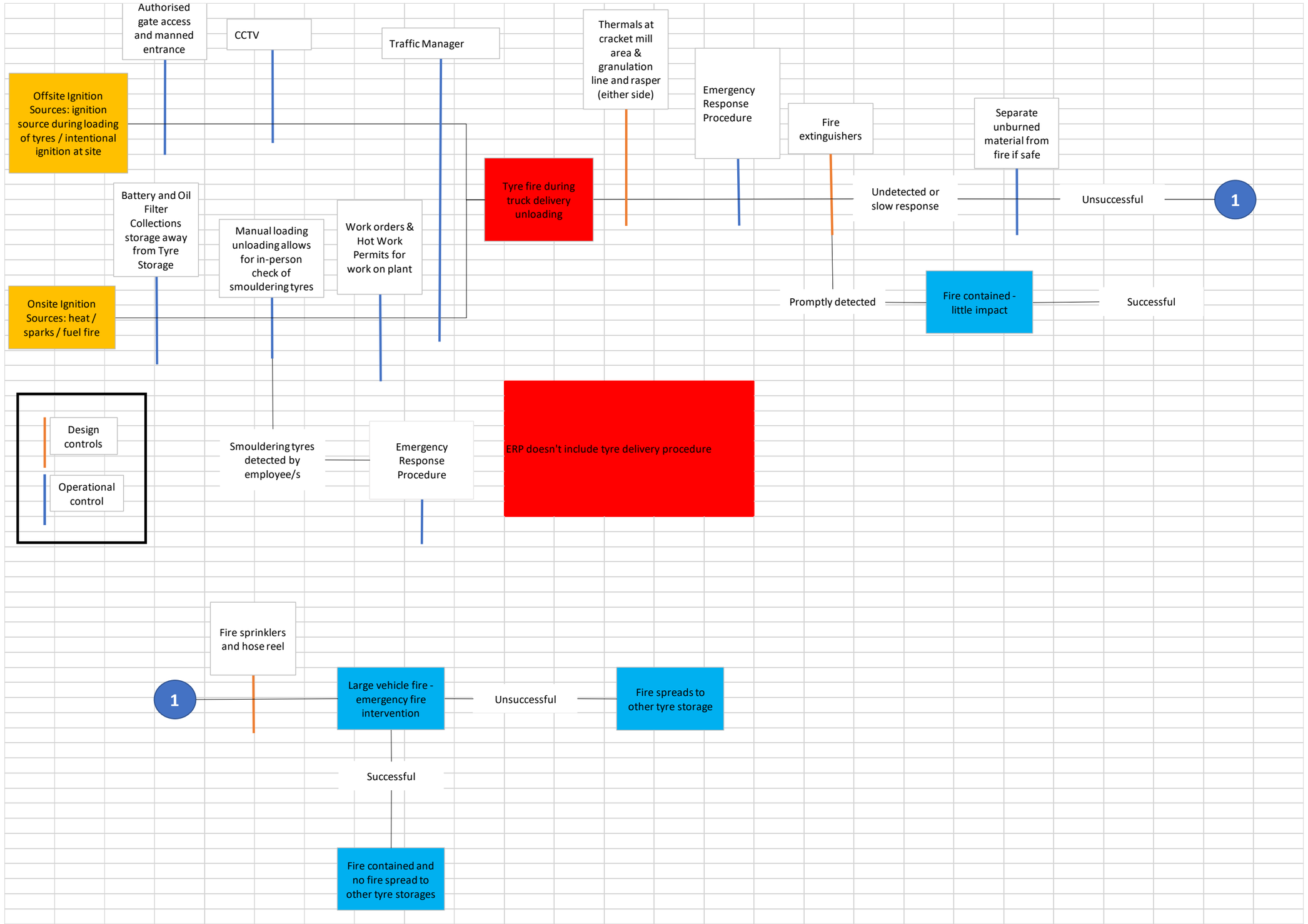


Figure 38: Bowtie Diagram – Tyre fire during Truck Delivery

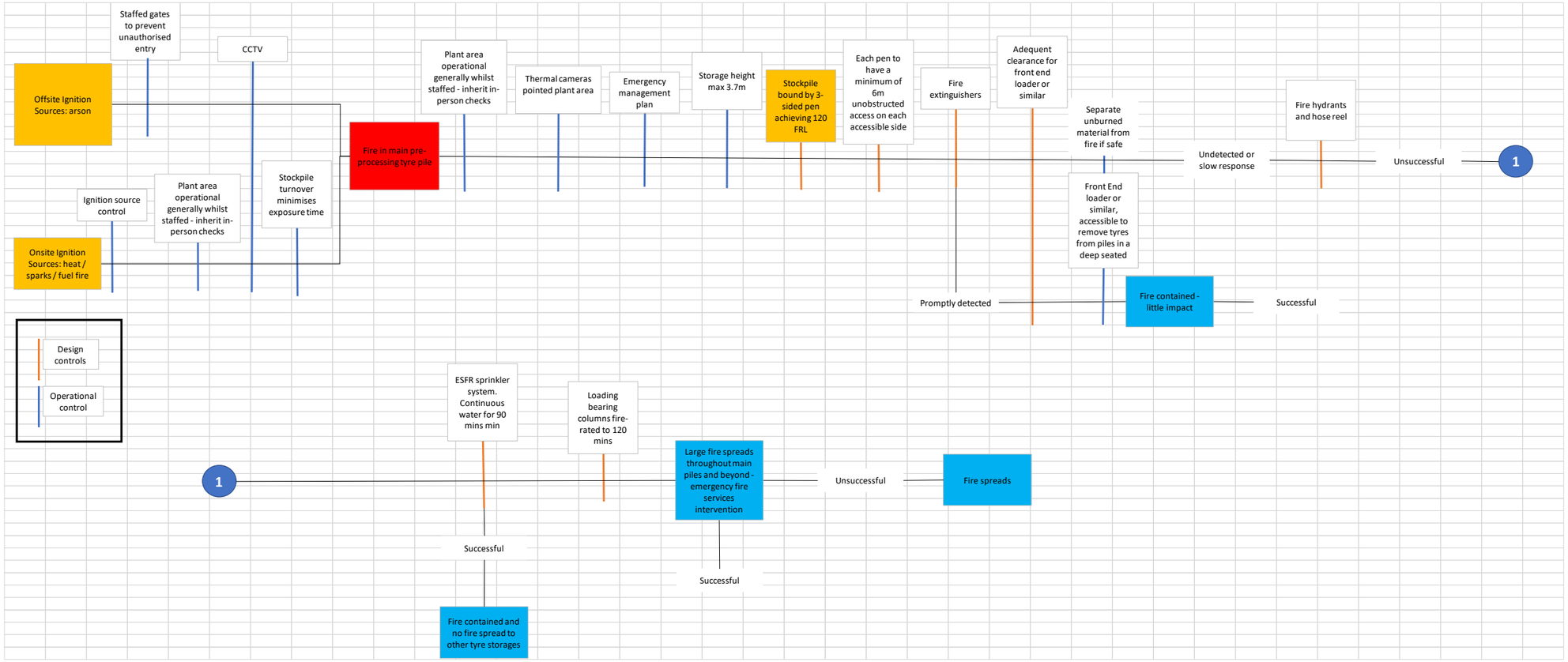


Figure 39: Bowtie Diagram – Fire in main tyre stockpile

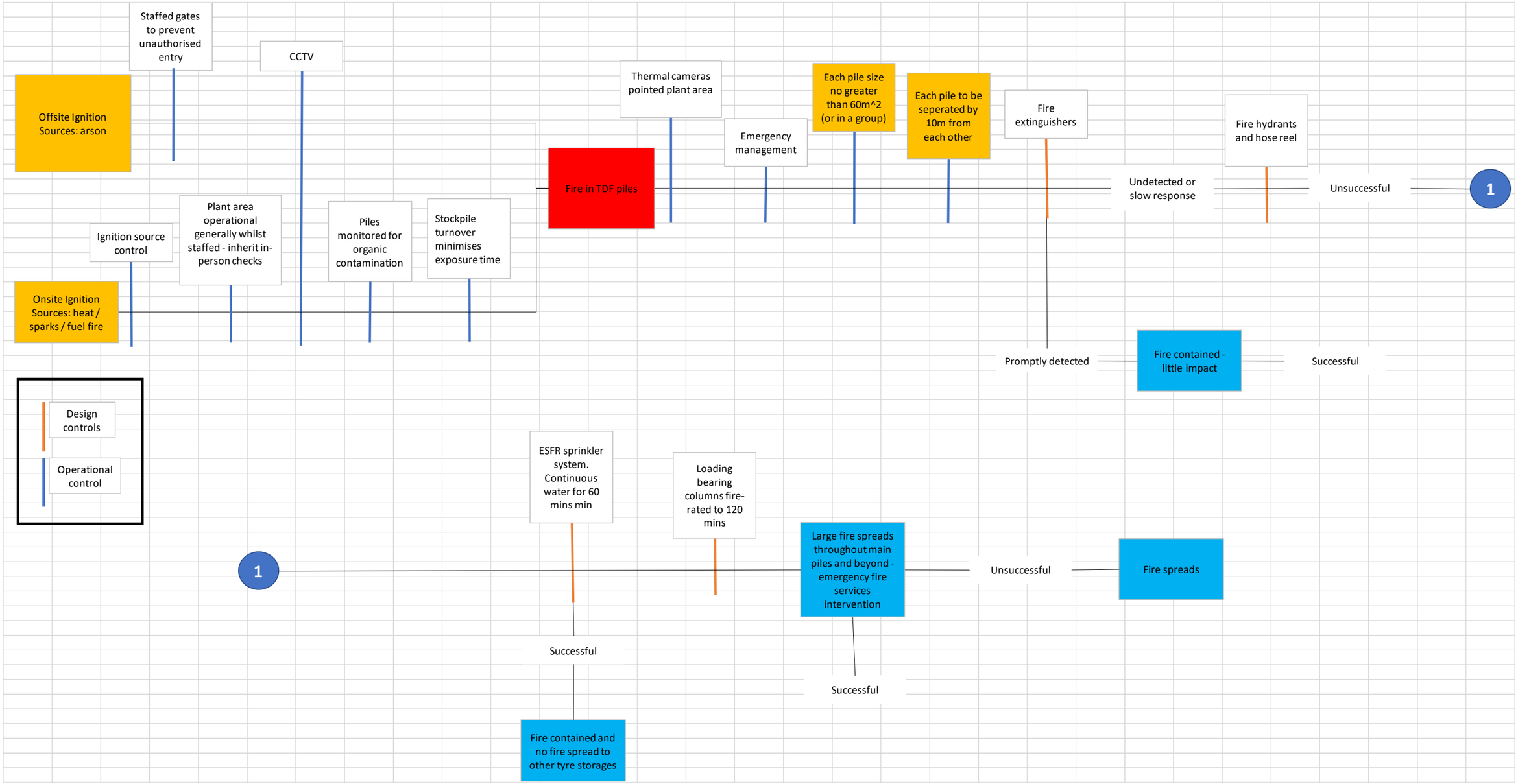


Figure 40: Bowtie Diagram – Tyre fire in TDF Piles

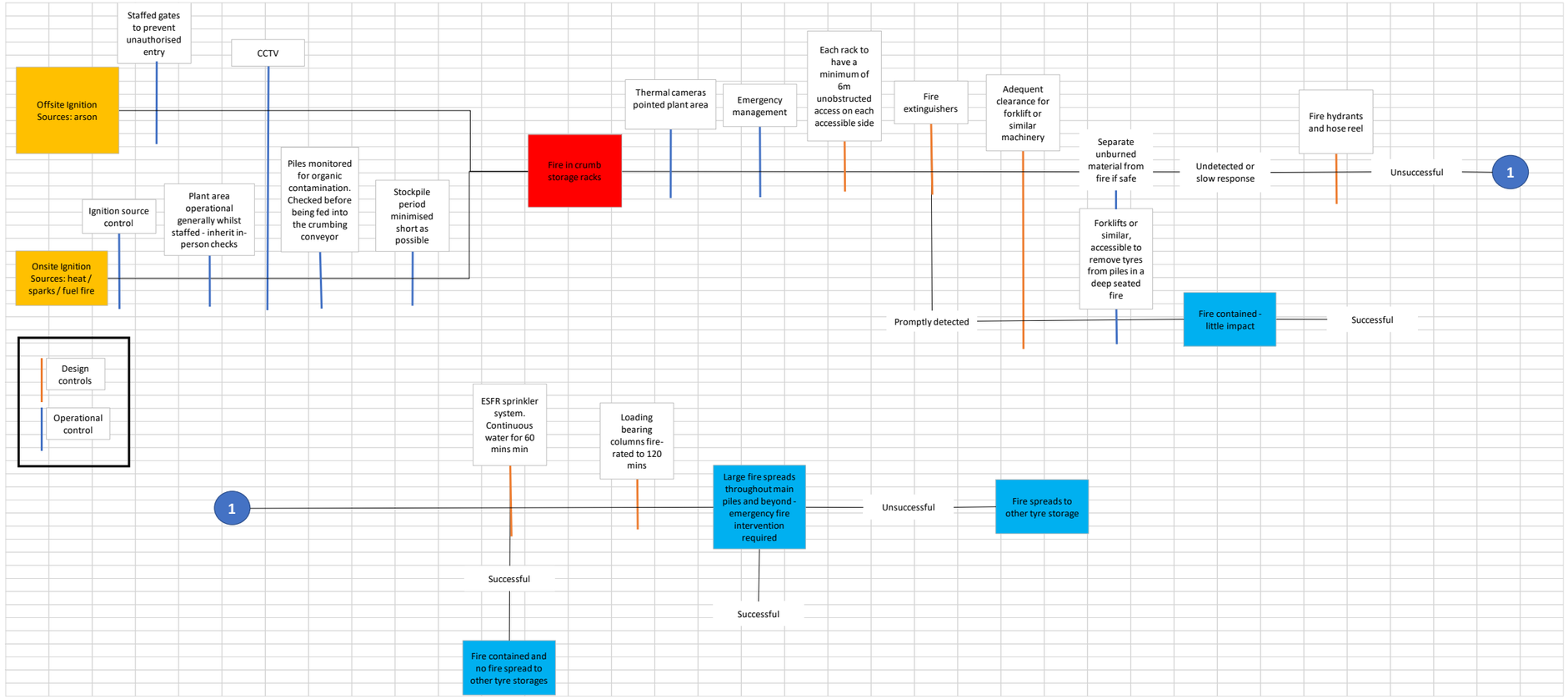


Figure 41: Bowtie Diagram – Tyre fire in Crumb Storage Racks

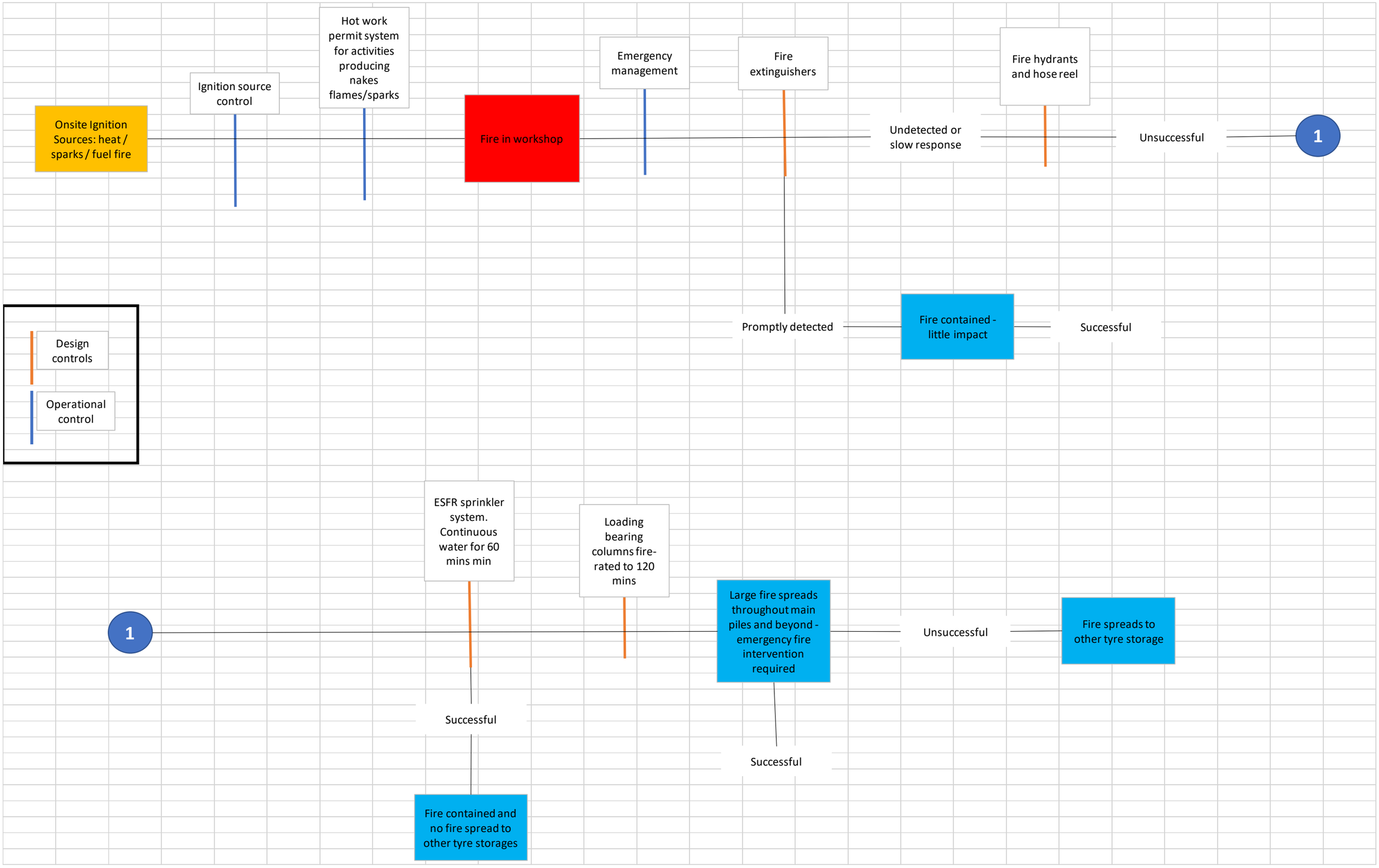


Figure 42: Bowtie Diagram – Workshop Fire

Appendix F

EPA Licence

F.1 Current Tyrecycle EPA Licence 21464

Environment Protection Licence

Licence - 21464

Licence Details	
Number:	21464
Anniversary Date:	19-May

Licensee

TYRECYCLE PTY LTD

1-21 GRADY CRESCENT

ERSKINE PARK NSW 2759

Premises

TYRECYCLE

1-21 GRADY CRESCENT

ERSKINE PARK NSW 2759

Scheduled Activity

Resource recovery

Waste processing (non-thermal treatment)

Waste storage

Fee Based Activity	Scale
Non-thermal treatment of waste tyres	Any annual processing capacity
Recovery of waste tyres	Any waste tyres recovered
Waste storage - waste tyres	> Any tyres stored

Contact Us

NSW EPA

4 Parramatta Square

12 Darcy Street

PARRAMATTA NSW 2150

Phone: 131 555

Email: info@epa.nsw.gov.au

Locked Bag 5022

PARRAMATTA NSW 2124

Environment Protection Licence

Licence - 21464

Environment Protection Licence

Licence - 21464

Environment Protection Licence

Licence - 21464

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

Environment Protection Licence

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

TYRECYCLE PTY LTD
1-21 GRADY CRESCENT
ERSKINE PARK NSW 2759

subject to the conditions which follow.

Environment Protection Licence

Licence - 21464

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Waste processing (non-thermal treatment)	Non-thermal treatment of waste tyres	Any annual processing capacity
Resource recovery	Recovery of waste tyres	Any waste tyres recovered
Waste storage	Waste storage - waste tyres	> tyres stored

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
TYRECYCLE
1-21 GRADY CRESCENT
ERSKINE PARK
NSW 2759
PART LOT 4 DP 1253870

A2.2 The premises location is shown on the map below.

Environment Protection Licence

Licence - 21464

Note: Premises boundary is within the red border of the aerial map in Condition A2.2

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.

Noise/Weather

Environment Protection Licence

Licence - 21464

EPA identification no.	Type of monitoring point	Location description
1	Noise monitoring	22 Regulus Street, Erskine Park NSW 2759
2	Noise monitoring	28 Shaulua Crescent, Erskine Park
3	Noise monitoring	116 Weaver Street, Erskine Park

3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Waste

L2.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below.
Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below.
Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below.
This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
J120	Waste oil/hydrocarbons mixtures/emulsions in water	As defined in Schedule 1 of the POEO Act as in force from time to time	Waste storage	A maximum of 60 tonnes of waste lead acid batteries and/or waste oil is permitted to be stored at the premises at any time.
NA	Waste tyres	As defined in Schedule 1 of the POEO Act as in force from time to time	Waste processing (non-thermal treatment) Waste storage	A maximum of 29,000 tonnes to be received at the premises in a 12 month period.
D220	Lead acid batteries	As defined in Schedule 1 of the POEO Act as in force from time to time	Waste storage	A maximum of 60 tonnes of waste lead acid batteries and/or waste oil is permitted to be

	stored at the premises at any time.

L2.2 The authorised amount of waste permitted on the Premises cannot exceed 970 tonnes at any one time.

L2.3 A maximum of 29,000 tonnes of waste tyres is permitted to be received at the premises in a 12 month period.

L2.4 A maximum of 60 tonnes of waste lead acid batteries and/or waste oil is permitted to be stored at the premises at any time.

L2.5 All waste processing and waste storage activities must be undertaken within the enclosed building at the Premises, as outlined in Condition A2.2. No waste is to be stored and/or processed in the outside areas of the Premises.

L3 Noise limits

L3.1 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

POINT 1,2,3

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	Yearly	42
Evening	Evening-LAeq (15 minute)	Yearly	42
Evening	Night-LAeq (15 minute)	Yearly	42
Night	LAFmax	Yearly	56

L3.2 For the purpose of condition L3.1:
a) Day means the period from 7 am to 6 pm Monday to Saturday and the period from 8 am to 6 pm Sunday and public holidays.
b) Evening means the period from 6 pm to 10 pm
c) Night means the period from 10 pm to 7 am Monday to Saturday and the period from 10 pm to 8 am Sunday and public holidays

L3.3 Noise-enhancing meteorological conditions
a) Unless referred to in condition L3.3 (b), the noise limits that apply are the noise limits in condition L3.1 plus 5 dB.
b) The noise limits set out in condition L3.1 apply under the following meteorological conditions:

Environment Protection Licence

Assessment period	Meteorological Conditions
Day	Stability Categories A, B, C and D with wind speeds up to and including 3 m/s at 10 m above ground level
Evening	Stability Categories A, B, C and D with wind speeds up to and including 3 m/s at 10 m above ground level
Night	Stability Categories A, B, C and D with wind speeds up to and including 3 m/s at 10 m above ground level; or Stability category E and F with wind speeds up to and including 2 m/s at 10 m above ground level

L3.4 For the purposes of condition L3.3:
a) the meteorological conditions are to be determined from meteorological data obtained from the meteorological weather station identified as Bureau of Meteorology AWS at Horsley Park
b) Stability category shall be determined using the following method from Fact Sheet of the Noise Policy for Industry (NSW, EPA, 2017) - Use of sigma-theta data (section D1.4)

L3.5 To assess compliance:
a) with the LAeq (15 minute) or the LAFmax noise limits in condition L3.1 and L3.3, the noise measurement equipment must be located:

(i) approximately on the property boundary, where any residence is situated 30 metres or less from the property boundary closest to premises; or where applicable,
(ii) in an area within 30 metres of a residence façade, but not closer than 3 metres where any residence on the property is situated more than 30 metres from the property boundary closest to the premises; or , where applicable,
(iii) in an area within 50 metres of the boundary of a National Park or Nature Reserve,
(iv) at any other location identified in condition L3.1

b) with the LAeq (15 minute) or the LAFmax noise limits in condition L3.1 and L3.3, the noise measurement equipment must be located:

(i) at the reasonably most affected point at a location where there is no residence at the location; or,
(ii) at the reasonably most affected point within an area at a location prescribed by condition L3.5 (a).

L3.6 A non-compliance of conditions L3.1 and L3.3 will still occur where noise generated from the premises is measured in excess of the noise limit at a point other than the reasonably most affected point at the locations referred to in condition L3.5 (a) or L3.5 (b).

Note: For conditions L3.5 and L3.6: the reasonably most affected point is a point at a location or within an area at a location experiencing or expected to experience the highest sound pressure level from the premises.

L3.7 For the purpose of determining the noise generated from the premises, the modifying factor corrections in Table C1 in Fact Sheet C of the Noise Policy for Industry (NSW EPA, 2017) may be applied, if appropriate, to the noise measurements by the noise monitoring equipment.

L3.8 Noise measurements must not be undertaken where rain or wind speed at microphone level will affect the acquisition of valid measurements.

Note: Additions to Definition of Terms of the Licence

• Noise Policy for Industry - the document entitled *"Noise Policy for Industry"* published by the NSW Environment Protection Authority in October 2017.

- Noise - 'sound pressure levels' for the purposes of conditions L3.1 to L3.8:

1. LAeq (15 minute) - the value of the A-weighted sound pressure level of a continuous steady sound that, over a 15 minute time interval, has the same mean square sound pressure level as a sound under consideration with a level that varies with time (Australian Standard AS 1055:2018 Acoustics: description and measurement of environmental noise).
2. LAFmax - the maximum sound pressure level of an event measured with a sound level meter satisfying Australian Standard AS IEC 61672.1-2013 Electroacoustics - Sound level meters - Part 1: Specifications set to 'A' frequency weighting and fast time weighting.

L4 Hours of operation

L4.1 All construction works at the premises must be conducted between 7 am and 6 pm Monday to Friday and between 8 am and 1 pm Saturdays and at no time on Sundays and Public Holidays.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 All operations and activities occurring at the premises must be carried out in a manner that prevents and minimises the emission of air pollutants from the premises.

O3.2 The premises must be maintained in a manner that prevents and minimises the emission of air pollutants.

O3.3 Trucks entering and leaving the premises that are carrying loads must have their loads covered at all times, except during loading and unloading.

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O4 Idling

O4.1 Idling of trucks must be minimised where possible.

O4.2 Vehicle and plant engines must be switched off when not in use.

O5 Emergency response

O5.1 The licensee must prepare, maintain and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises. The licensee must keep the incident response plan on the premises at all times. The incident response plant must document systems and procedures to deal with all types of incidents (e.g spills, explosions or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment. The licensee must develop their PIRMP in accordance with the requirements of Part 5.7A of the *Protection of the Environment Operations Act 1997* and the Protection of the Environment Operations (General) Regulation 2009.

O6 Processes and management

O6.1 Any waste for processing, storage or resource recovery at the premises must be assessed and classified in accordance with the EPA Waste Classification Guidelines as in force from time to time.

O6.2 There must be no burning or incineration of waste at the premises.

O6.3 Tyre processing must not involve heat (thermal) or chemical processing.

O6.4 All processing, including shredding and granulating, and stockpiling of tyres must occur within the enclosed building.

O7 Waste management

O7.1 All Waste tyres stockpiled at the premises must be stored in accordance with the current version of the NSW Fire & Rescue *NSW Fire safety guideline: Fire management in waste facilities 2020* and NSW Fire & Rescue *Guidelines for Bulk Storage of Rubber Tyres 2014*.

O7.2 All Waste tyres (including whole tyres, shredded or crumbed tyred and tyre pieces) must be contained within the tyre and tyre crumb piles in the enclosed facility.

O7.3 The maximum height of any processed or unprocessed waste tyres stored at the Premises cannot exceed 3.7 metres in height above ground level.

O7.4 Waste oil must be stored in a covered and bunded area and regularly removed to a waste oil recycle operation.

O7.5 All vehicles that enter or leave the Premises for the purpose relating to the operation of the Premises must be weighed at the Premises' weighbridge on entering and leaving the Premises.

O8 Other operating conditions

O8.1 The licensee must ensure that no material, including rubber pieces, sediment or oil, is tracked from the premises.

O8.2 All plant and equipment must be maintained in accordance with manufacturer requirements to minimise malfunction that could result in abnormal air quality emissions.

O8.3 All stormwater systems and stormwater treatment devices (including drainage systems, sumps and traps) must be regularly maintained.

Noise

O8.4 Noise management and mitigation measures detailed in the planning application's noise assessment (*Statement of Environmental Effects*, prepared for Tyrecycle Pty Ltd, dated 16 September 2020, Element Environment Pty Ltd) must be implemented at the premises. These measures must include the following:
a. Keep roller doors closed where possible,
b. truck engines to be switched off when not in use for extended periods; and
c. complaints should be logged and investigated.

Tyre management

O8.5 All tyre processing activities must occur within an enclosed building, in accordance with Condition A2.2.

5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.

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M2 Weather monitoring

M2.1 At the point(s) identified below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1 of the table below, using the corresponding sampling method, units of measure, averaging period and sampling frequency, specified opposite in the Columns 2, 3, 4 and 5 respectively.

POINT 1,2,3

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Temperature at 2 metres	AM-4	Celsius	1 hour	Continuous
Wind Direction at 10 metres	AM-2 & AM-4	Degrees	15 minutes	Continuous
Wind Speed	AM-2 & AM-4	metres per second	15 minutes	Continuous
Sigma Theta	AM-2 & AM-4	Degrees	15 minutes	Continuous
Rainfall	AM-4	millimetres	15 minutes	Continuous
Relative humidity	AM-4	percent humidity	1 hour	Continuous

M3 Recording of pollution complaints

M3.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M3.2 The record must include details of the following:
a) the date and time of the complaint;
b) the method by which the complaint was made;
c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the licensee, the reasons why no action was taken.

M3.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M3.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M4 Telephone complaints line

M4.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M4.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M4.3 The preceding two conditions do not apply until 3 months after the date of the issue of this licence.

M5 Other monitoring and recording conditions

M5.1 Attended noise monitoring must be undertaken in accordance with condition L3.5 and must:

1. occur annually in a reporting period;
2. occur at each location in condition L3.1;
3. occur during each day, evening and night period as defined in the Noise Policy for Industry for a minimum of:

- 1.5 hours during the day;
- 30 minutes during the evening; and
- 1 hour during the night.

4. occur for three consecutive operating days,

M5.2 A log book or similar record containing evidence of total material tonnage received and stored per annum, is to be kept at the premises and is to be made available for the EPA, upon request.

M6 Noise monitoring

M6.1 To assess compliance with the noise limits specified within this licence, the licensee must undertake operator attended noise monitoring at each specified noise monitoring point in accordance with the table below.

POINT 1,2,3

Assessment period	Minimum frequency in a reporting period	Minimum duration within assessment period	Minimum number of assessment period
Day	Yearly	1.5 hours	3 consecutive operation days

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee notification that the Annual Return is due.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
a) the licence holder; or
b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening

material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
a) where this licence applies to premises, an event has occurred at the premises; or
b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
a) the cause, time and duration of the event;
b) the type, volume and concentration of every pollutant discharged as a result of the event;
c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

Noise monitoring report

R4.1 A noise compliance assessment report must be submitted to the EPA within 30 days of the completion of the annual monitoring. The assessment must be prepared by a competent person and include:

1. an assessment of compliance with noise limits presented in condition L3.1 and L3.3; and
2. an outline of any management actions taken within the monitoring period to address any exceedences of the limits in condition L3.1 and L3.3.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

8 Special Conditions

E1 Financial Assurance

E1.1 A financial assurance in the form of an unconditional and irrevocable and on demand guarantee from a bank, building society or credit union operating in Australia as "Authorised Deposit-taking Institutions" under the *Banking Act* 1959 of the Commonwealth of Australia and supervised by the Australian Prudential Regulatory Authority (APRA) must be provided to the EPA prior to the issuing of the licence.

E1.2 The financial assurance must be favour of the NSW Environment Protection Authority (EPA) in the amount of $100,000. The financial assurance is required to secure or guarantee funding for works or program required by or under this licence. The financial assurance must contain a term that provides that any monies claimed can be paid to the EPA, or at the written direction of the EPA, to any other person. The licensee must provide to the EPA, along with the original counterpart guarantees, confirmation in writing that the financial institution providing the guarantees is subject to supervision by APRA.

E1.3 The financial assurance must be maintained during the operation of the facility and thereafter until such time as the EPA is satisfied the premises is environmentally secure.

E1.4 The EPA may require an increase in the amount of the financial assurance at any time as a result of reassessment of the total likely costs and expenses of rehabilitation of the premises.

E1.5 The EPA may claim on a financial assurance under s303 of the POEO Act if the licensee fails to carry out any work or program required to comply with the conditions of this licence.

E2 Environmental obligations of licensee

E2.1 While the licensee's premises is being used for the purpose to which the licence relates, the licensee must:

1. Clean up any spill, leak or other discharge of any waste(s) or other material(s) as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents.
2. In the event(s) that any liquid and non-liquid waste(s) is unlawfully deposited on the premises, such waste(s) must be removed and lawfully disposed of as soon as practicable in accordance with any

direction given by the EPA.
3. Provide all monitoring data as required by the conditions of this licence or as directed by the EPA.

E2.2 In the event of an earthquake, storm, fire, flood or any other event where it is reasonable to suspect that a pollution incident has occurred, is occurring or is likely to occur, the licensee must:

1. Make all efforts to contain all fire water on the premises,
2. Make all efforts to control air pollution from the premises,
3. Make all efforts to contain any discharge, spill or run-off from the premises,
4. Make all efforts to prevent flood water entering the premises,
5. Remediate and rehabilitate any exposed areas of soil and/or waste,
6. Lawfully dispose of all liquid and solid waste(s) stored on the premises that is not already securely disposed of,
7. At the request of the EPA, monitor groundwater beneath the premises and its potential to migrate from the premises,
8. At the request of the EPA, monitor surface water leaving the premises, and
9. Ensure the premises is secure.

E2.3 After the licensee's premises cease to be used for the purpose(s) to which the licence relates or in the event that the licensee ceases to carry out the activity that is the subject of this licence, that licensee must:

1. Remove and lawfully dispose of all liquid and non-liquid waste stored on the licensee's premises, and
2. Rehabilitate the premises, including conducting an assessment of the site and if required remediation of any site contamination.

E3 Air Quality Management Plan

E3.1 An air quality management plan must be developed and implemented prior to the commencement of any dust generating activities associated with the premises.

The air quality management plan must include as a minimum:

1. Risk assessment
2. Proactive and reactive mitigation measures of all significant, and potentially significant, emissions sources
3. Key performance indicators(s)
4. Monitoring method(s)
5. Location, frequency and duration of monitoring
6. Record keeping
7. Response mechanisms and contingency measures
8. Responsibilities and
9. Compliance monitoring

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E4 Post Commissioning Monitoring

E4.1 Within the first six months of operations and during a period of maximum operations, the proponent must undertake a monitoring program to confirm the air emission performance of the discharge points servicing the two cyclone filters. The monitoring required by this condition is contained in Table 1 below. The monitoring must be undertaken at a suitable location selected in accordance with TM-1 contained in the *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW*.

Pollutant	Unit of Measure	Sampling Frequency	Sampling Method
Solid Particles (total)	Milligrams per cubic metre	Special Frequency 1	TM-15
Volumetric flow rate	Cubic metres per second	Special Frequency 1	TM-2
Velocity	Metres per second	Special Frequency 1	TM-2

Note: Note: Special Frequency 1 means one round of monitoring for the associated pollutant.

For each of the pollutants and parameters outlined in Table 1, the sampling methods are those contained in the *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW*.

E4.2 Within six weeks of completion of the monitoring program, the licensee must provide the EPA with a report that includes:

1. The analytical results of monitoring undertaken for each discharge point
2. A comparison of the emission rates determined from monitoring with the emissions rates contained in the Air Quality Impact Assessment (AQIA) prepared by Todorski Air Sciences (September 2020)
3. Where a comparison in condition E2.2(2) shows emission rates from monitoring results are greater than the emission rates contained in AQIA, the report must identify mitigation measures to achieve emission performance commensurate with the AQIA.

The EPA may utilise the information contained in the report submitted to revise or include additional conditions in this EPL.

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environmen t Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder describe d at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 mo nths. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste

Ms Ruth Owler

Environment Protection Authority

(By Delegation)

Date of this edition: 19-May-2021

End Notes

ARUP

Technical Note

Project title	Tyrecycle Erskine Park
Job number	283146-10
File reference	
cc	
Prepared by	Elizabeth Sieverts
Date	7 December 2023
Subject	Site Review against FRNSW 'Guideline for Bulk Storage of Rubber Tyres' Fire Safety Guideline

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1. Introduction

The intent of this technical note is to provide additional information for the Tyrecycle facility at 1-21 Grady Crescent, Erskine Park (the Site) to facilitate its *Modification Application: PPSSWC-326 – Penrith – MOD230058 – 1-21 Grady Crescent, Erskine Park.*

The existing development was approved as integrated development by the Sydney Western City Planning Panel (SWCPP) on 20 December 2020 under Part 4, Division 4.3 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act) (DA20/0589), which permits up to 29,000 tonnes per annum (tpa) of passenger, four-wheel drive and truck tyres are processed at the site. The authorised amount of waste permitted at the Premises under the Site's EPL cannot exceed 970 tonnes at any one time.

Tyrecycle are seeking approval through the modification application to increase production at the Site from 29,000 tpa to 60,000 tpa (the modification), to accommodate the increased market demand for recycled tyre products.

The modified EPA licence under application is to authorise the increase tyre receival and processing from 29,000 tpa to 60,000 tpa, however the following existing licence conditions remain the same: that the maximum amount of waste permitted on the Premises cannot exceed 970 tonnes at any one time; and the maximum of 60 tonnes of waste lead acid batteries and/or waste oil is permitted to be stored at the premises at any time.

This technical note updates the aspects of the Fire Risk Assessment Report (FRA) by Arup (283146-10 FRA I1 Tyrecycle Erskine Park, dated 9 September 2022) relating to storage arrangements. The FRA was based on the Site increasing its maximum storage capacity, however this is no longer part of the conditions sought through the modification application. The proposed storage arrangement therefore differs from the FRA.

This technical note is to be read in conjunction with the FRA and where conflicts exist between the documents this technical note is to take precedence.

This is intended an interim update to the FRA to facilitate the modification application, this document in and of itself is not an FRA nor a fire safety study.

The proposed storage arrangement is shown in Appendix A.

2. Review against the FRNSW Guideline

The new storage arrangement is reviewed against the *FRNSW 'Guideline for Bulk Storage of Rubber Tyres' Fire Safety Guideline*'s (FRNSW guideline).

The application of the FRNSW guideline, as per the guideline:

> *The guideline should be used by managers of … any existing facility that is being modified to store rubber tyres in bulk quantities.*
>
> *Note: related subsidiary products include the by-products of used tyre waste processing such as shredded or granular tyre scrap.*
>
> *This guideline provides the minimum recommended requirements for both internal (i.e. within a building or structure) and external bulk storage of rubber tyres.*

The Site and the proposed storage arrangement has been reviewed against section 7 of the FRNSW guideline, internal tyre storage (i.e. buildings).

Section 7 Heading	Guideline Requirements	Comment
General requirements	Buildings with a floor area of 2000m² or more and contain more than 20 tonnes of tyres should have a sprinkler system complying with AS 2118.1.	Building is sprinkler protected, in accordance with BCA Spec. E1.5, AS2118.1-1999 & Fire Engineering Report No. 2320000-PPT02-3 by Bodycote issued on 27/04/09 and FER prepared by Exova Warrington Fire no. 2320004-RPT02-1 dated 30/10/13.[1] Rack storage shall be configured to maintain compliant coverage requirements. As documented in the FRA • The ESFR sprinkler system must be capable of providing a sprinkler coverage area of 144m² with 12 sprinkler heads operating simultaneously; and • Able to operate continuously for up to 90 minutes. Note that in-rack sprinklers (if necessary under the relevant standards) may be required to be installed. This is to be checked with a fire services engineer to determine the level of protection appropriate to the storage.

[1] As per the building's Annual Fire safety Statement

Section 7 Heading	Guideline Requirements	Comment
	Buildings with a floor area of 2000m² or more and contain more than 10 tonnes of tyres should have smoke and heat vents complying with specification E2.2c of the BCA (Volume one).	Smoke clearance fans are provided to the warehouse, in accordance with Fire Engineering Report No. 2320000-PPT02-3 by Bodycote Warrington issued on 24/04/09 and FER prepared by Exova Warrington Fire no. 2320004-RPT02-1 dated 30/10/.[1]
	Individual tyre stacks within the building or structure should not exceed 3.7m in height and 30m² in area.	Individual tyre stacks (whole tyres) will comply with this requirement, refer section 4.
	Stored tyres must remain at least 1m clear in all directions from the underside of the building's roof or ceiling, roof structural members, lights (including light fixtures) and sprinkler heads.	Stored tyres (whole tyres and recycled tyre products) will comply with this requirement, refer section 4.
	A minimum clearance of 1m must be maintained along paths of travel to required exits and firefighting equipment (e.g. hose reels, extinguishers, hydrants). The paths of travel must be kept clear and unobstructed at all times.	Stored tyres (whole tyres and recycled tyre products) will comply with this requirement, refer section 4.
Unsprinklered buildings	-	N/A – Building is sprinkler protected.
Sprinklered buildings	Where installed, the sprinkler system design should be suitable to for the hazard (i.e. rubber tyres).	ESFR Sprinkler (AS2118.1) fitted throughout the building.
	A minimum clearance of 2m should be provided between tyre stacks in a sprinklered building.	Stored tyres (whole tyres and recycled tyre products) will comply with this requirement, refer section 4.
	A minimum clearance of 1.5m should be provided between tyre stacks and any building structural member in a sprinklered building.	Stored tyres (whole tyres and recycled tyre products) will comply with this requirement, refer section 4.
Site water containment	If the tyre storage facility has a hydrant of sprinkler system, provision should be made for the retention of contaminated water run off. …	As per the FRA

3. Site Activities

Below is a summary of section 4.2 of the FRA.

The Tyrecycle site primarily receives waste tyres (whole) and recycles them either by shredding or crumbing, the product of which is then on-sold to others.

A brief high-level description of the current site processes are as follows, and as show in Figure 2:

- Trucks carrying tyres arrive and are measured on the weighbridge.
- Tyres are deposited onto a general stockpile in the designated area within the warehouse floor.
- Large truck tyres are separated to be shipped to Melbourne for processing.
- The tyres are processed through the Superchopper (which has shredding and crumbing capabilities) which will produce a number of products and by products: Tyres are shredded to

produce feed stock (WIP stock) or be used as tyre derived fuel (TDF), WIP stock is further process to become tyre crumb/ granules. By-products include waste steel and general waste material.

- Tyre crumbs/ granules are bagged and stored in dedicated storage racks.
- TDF is stored in piles until it is loaded into shipping containers.
- The post-processed materials (Tyre crumbs, TDF etc…) are then moved to external facilities.

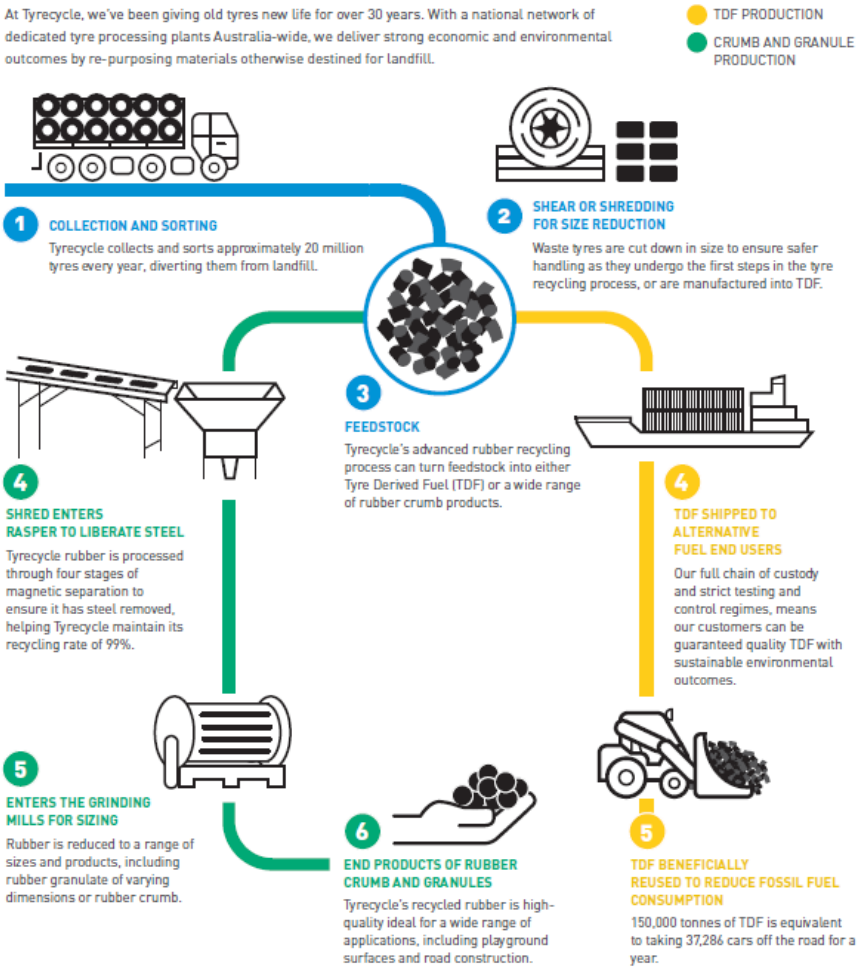


Figure 1: Tyrecycle Process [Source: https://tyrecycle.com.au/what-we-do/the-process/]

Note: there is also a wash bay to clean incoming tyres, if required. The wash bay system is a closed system with a reticulated water supply.

4. Stockpile Management Plan

Stockpiles will be in stored according to the following principles:

- Whole tyre stacks within the building or structure should not exceed 3.7m in height and 30m² in area. Unless specifically noted any other storage piles/ bays will also maintain the same storage configurations.
- A minimum clearance of 2m should be provided between tyre stacks in a sprinklered building.
- A minimum clearance of 1m must be maintained along paths of travel to required exits and firefighting equipment (e.g. hose reels, extinguishers, hydrants). The paths of travel must be kept clear and unobstructed at all times.
- Stored tyres must remain at least 1m clear in all directions from the underside of the building's roof or ceiling, roof structural members, lights (including light fixtures) and sprinkler heads.
- A minimum clearance of 6m between the rack storage and other storage piles/ bays.

This will be controlled by:

- Storage bays/ piles areas demarcation, depending in the location is to be identified by, as a minimum by painted line markings on the floor. Additional controls depending on the location and the accessibility requirements of the piles include bounding by concrete barriers (approx. 1m high), pens created by non-combustible (steel) walls.
- Columns are to have a height marker of 3.7m painted on to them to provide a reference to the maximum storage height.

The stockpiles on Site are to be controlled as outlined in Table 1 below.

Table 1: Stockpile Management by Stockpile Type

Stockpile	Management Plan
OTR bays	Bays painted on the floor, located to comply with the separation requirements identified above. Note: Tyres should not be stored 'thread up' unless suitable retained.
Car tyre stockpiles	Bays painted on the floor, located to comply with the separation requirements identified above. Concrete barriers may be used to provide physical separation between the racking and the stockpiles.
Active tyee feeding bay	Bays painted on the floor, located to comply with the separation requirements identified above. Concrete barriers may be used to provide physical separation between the racking and the feed bay.
Product bay	Bays painted on the floor, located to comply with the separation requirements identified above.
Product steel bay	Bays painted on the floor, located to comply with the separation requirements identified above.
TDF piles (including steel active pile)	Storage area proposed to be 7m x 7m (refer pile size assessment in FRA, note the FRNSW guidelines limits the storage area of pile for whole tyres only) Interim measure: Bays painted on the floor, located to comply with the separation requirements identified above.

Stockpile	Management Plan
	Pens with at least 2 sides to be created with steel partition walls, example shown in Figure 3 is a 3-sided pen installed onsite, additional pens to be progressively installed.
Oil and battery storage	Stored in a bunded area, aluminium bunding to the floor. Alternative or optional additional measure is to be stored on bunded pallets.
Steel storage bins	Recommend area is demarcated with line markings painted on the floor.
Finished product storage	The racking (and associated storage) is installed so that it complies with the restrictions/ limitations of the ESFR system. Note that in-rack sprinklers (if necessary under the relevant standards) may be required to be installed. This is to be checked with a fire services engineer to determine the level of protection appropriate to the storage.

The stock management plan is shown below in Figure 1, a higher resolution markup is also provided in Appendix ADOCUMENT CHECKING.

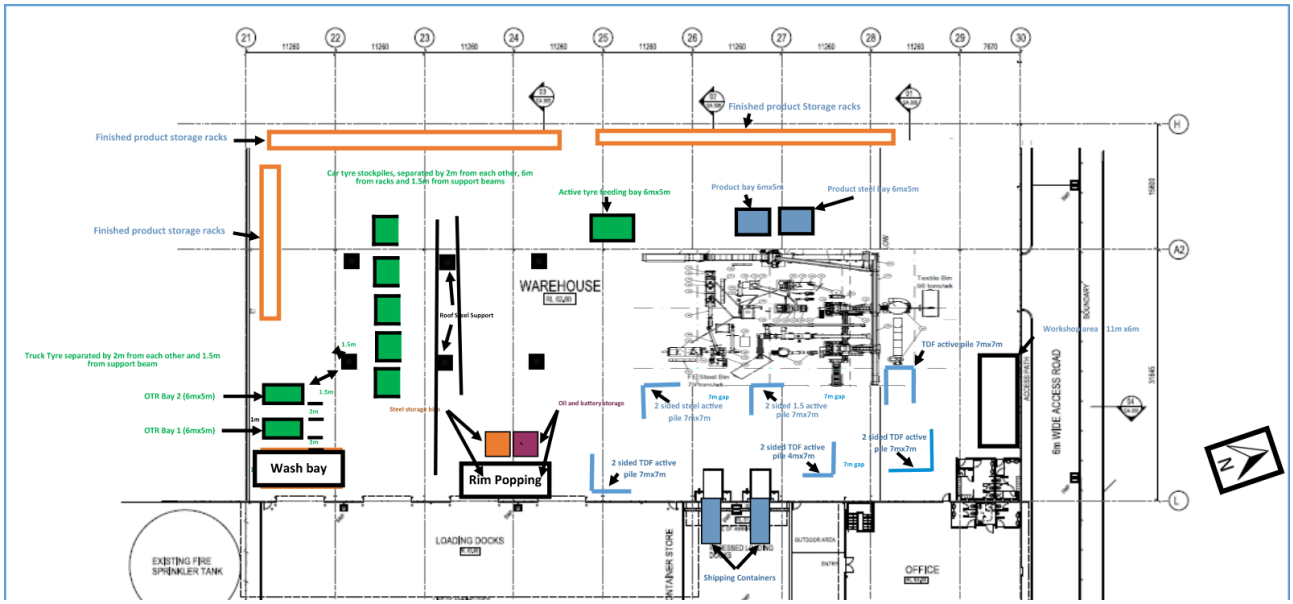


Figure 2: Stockpile Management Plan

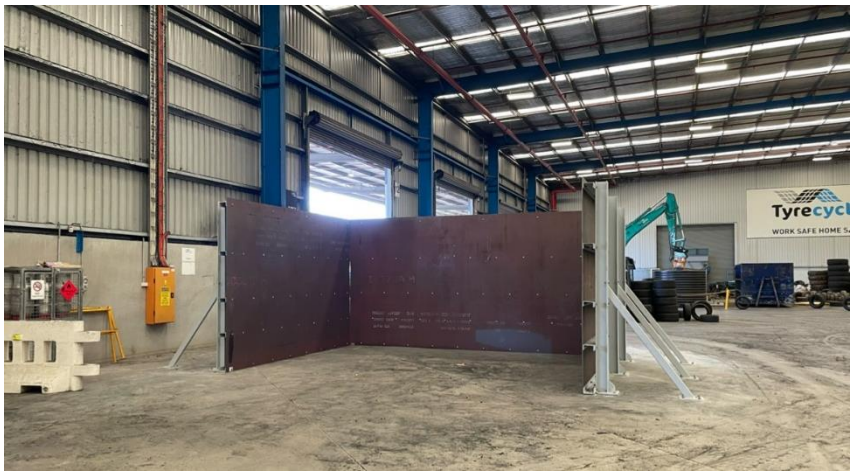


Figure 3: 3-sided TDF Stockpile Pen

It is noted that there is no long-term whole tyre storage on this site as it is predominantly a processing facility. It is expected that Tyrecycle would stop receiving any incoming truckloads when they reach the storage limits. In the event that tyres are required to be stored for an extended period of time (more than one shift), due to equipment break down or other unforeseen circumstances, the stockpiles shall be converted from loose piles to stacked so that they are stored in a method approved by section 4 of the FRNSW guidelines i.e.

- Bundled Tyres
- Pallet Systems
- Horizontal Systems
- Portable systems

Note: Tyres should not be stored 'thread up' unless suitably retained to prevent rolling.

5. Other Fire Safety Measures

Of the fire safety measures recommended by the FRA, Tyrecycle have confirmed[2], the following have been implemented:

- Site security measures associated with doors and sliding doors providing access to the building to be locked and secured during after-hour times.
- Tyre stocks are monitored to ensure that no organic material contamination is present that could provide more readily ignitable material from heat accumulation in the piles. Note the wash bay has been installed to clean incoming tyres as required.

[2] Adoption of the fire safety measures have *not* been independently verified in the preparation of this technical note.

- Thermal scans of all major electrical systems are recommended to be undertaken annually to ensure that thermal hot spots in circuits through poor connections and other deterioration are detected before they lead to potential ignition sources.
- Maintenance checklists are followed in accordance with the MEX system for all new and existing equipment on-site.
- Emergency response plans have been updated to include:
  - an appropriate approach to perform full extinguishment of the burning tyres,
  - how to separate the fire-involved material (if safe to do so) from various storage piles within the facility.
  - Staff training to be provided to enable staff to effectively undertake early fire suppression using tools such as portable fire extinguishers or hose reels.
- A fire extinguisher appropriate to the lead-acid batter risk has been installed adjacent to the battery storage cupboard.

6. Conclusion

This technical note has been provided to outline an update to the proposed stockpile management requirements.

This can be read in conjunction with the Fire Risk Assessment Report (FRA) by Arup (283146-10 FRA I1 Tyrecycle Erskine Park, dated 9 September 2022). The FRA was based on the Site increasing its maximum storage capacity, this is no longer part of the conditions sought through *Modification Application: PPSSWC-326*.

The basis of this technical note is the that the following existing licence conditions remain unchanged, being: that the maximum amount of waste permitted on the Premises cannot exceed 970 tonnes at any one time; and the maximum of 60 tonnes of waste lead acid batteries and/or waste oil is permitted to be stored at the premises at any time. Any change in the building including use and storage conditions outside the parameters of this report may invalidate the conclusions of this report.

The conclusions of this technical note may not apply if all requirements are not fully implemented as described in this technical note.

DOCUMENT CHECKING

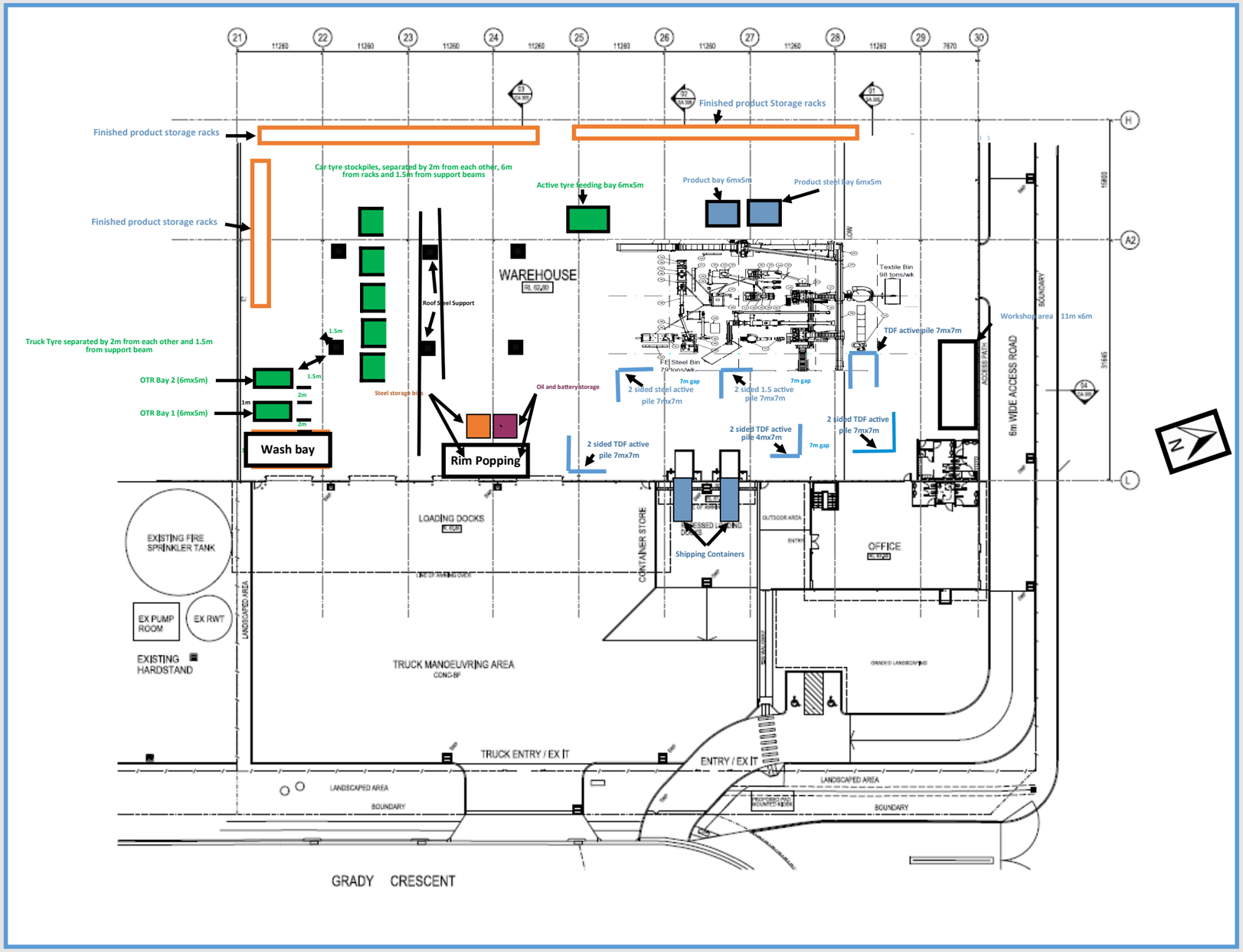
	Prepared by	Checked by	Approved by
Name	Lizzie Sieverts	Nigel Cann	Nigel Cann
Signature			

Appendix A

STOCKPILE MANAGEMENT PLAN

NSW — 1 - 21 Grady Crescent, Erskine Park, NSW 2759

Tyrecycle



V 3.0 December 2023

LEGEND

Product	Tyre Bays	Product Racks	Indoor tyre piles = no >30m² x 3.7m high
	Oil filters and battery storage	Steel Storage Bins	Roof Support steel beams

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