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Environmental Impact Statement – Grima Environmental Services Pty Ltd – 88 Redfern St, Wetherill Park

Jackson Environment and Planning Pty Ltd
119 Willoughby Rd, Crows Nest NSW 2065
T: 02 9956 3866 | E: admin@jacksonenvironment.com.au
W: www.jacksonenvironment.com.au

This Environmental Impact Statement has been prepared by the following staff of Jackson Environment and Planning Pty Ltd, 119 Willoughby Rd, Crows Nest, NSW, 2065; in association with Jacobs Group Australia, Air Noise Environment Pty Ltd and Benbow Environmental Pty Ltd.

Author 1: Dr Mark Jackson, Director and Principal Consultant, B.Sc (Hons), PhD, Grad. Cert. Mgmt., Exec. Masters Public Admin.

Author 2: Tasneem Kanpurwala , Senior Consultant, B. Sc. (Elec. Eng.), Post Grad. Dip. Env. Std., Masters of Env. Mgmt.

Author 3: Rylan Loemker, Senior Consultant, B. Env. Sc. (Hons.), Unmanned Aerial Vehicle (UAV) Controller's Certificate 2016 (CASA), Cert IV Carbon Mgmt., MBA (in progress).

Author 4: John Brockhoff, Senior Consultant, B. Sc (Hons.), Masters Env. Planning, Exec. Masters Public Admin.

We declare that:
The statement has been prepared in accordance with clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation* 2000.

The statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates, and the information contained in the statement is neither false nor misleading.

Report version	Authors	Date	Reviewer	Approved for issue	Date
v1-4	M.Jackson, T.Kanpurwala, R.Loemker, Jacobs Group Australia, ANE and Benbow Environmental	7/8/16	M.Jackson	Peer review	7/8/16
v5	M.Jackson	22/08/16	J.Brockhoff	Client review	22/08/16
v6	M.Jackson	21/10/16	J.Brockhoff	Client review	27/10/16
FINAL	M.Jackson	29/11/16	J.Brockhoff	Submission to Fairfield City Council	29/11/16

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Executive Summary

This Environmental Impact Statement (EIS) has prepared by Jackson Environment and Planning Pty Ltd on behalf of Grima Environmental Services Pty Ltd. It presents the findings of a comprehensive environmental evaluation of planned upgrades to an existing resource recovery facility for paper, cardboard and plastic film. The focus of the project is to expand the approved capacity of the plant to 99,000 tonnes per year. The facility is located at 88 Redfern St, Wetherill Park.

The EIS study evaluates the social, environmental and economic impacts and benefits of the project. The EIS defines the context of the proposed development, and examines those issues considered to be relevant. This EIS considers the potential environmental effects of the proposal during demolition, construction and operation, and proposes mitigation measures to prevent, reduce or offset significant adverse impacts on the environment. The aims of this EIS are to:

- Identify all constraints affecting future development on the subject site;
- Consider the economic, social and environmental impacts of the proposed development; and
- Assess the capability of the subject site to support the proposed development.

In delivering this EIS, Jackson Environment and Planning has undertaken all statutory planning assessments, including the preliminary hazard analysis and environmental risk assessment, including stakeholder consultation. We consulted with neighbours, Fairfield City Council, NSW Department of Planning and Environment, the NSW Environment Protection Authority and Roads and Maritime Services. We have also conducted the soil, water, waste management, waste and chemical and heritage impact assessments. Air Noise Environment Pty Ltd has undertaken the specialist air, noise, and vibration impact assessment, and Jacobs Group Australia has undertaken the transport and traffic impact assessment. Benbow Environmental Pty Ltd has undertaken the fire and incident impact assessment.

The EIS addresses the NSW Department of Planning and Environment's Secretary's Environmental Assessment Requirements. Consent is now sought for the proposal under the *Environmental Planning and Assessment* Act 1979.

This EIS has been prepared in accordance with the requirements of the *Environmental Planning and Assessment Act* 1979, and Clause 6 and 7 of the *Environmental Planning and Assessment Regulation* 2000. The EIS has also been delivered to meet the Secretary's Environmental Assessment Requirements (SEARs), which were issued on 29 January 2016 by Chris Ritchie, Director, Industry Assessments as a delegate of the Secretary.

This EIS has assessed the potential environmental impacts associated with the upgrade to the Grima Environmental Services Pty Ltd's Resource Recovery Facility at 88 Redfern St, Wetherill Park. The proposal will enable an increase in the processing capacity of the site for paper, cardboard and plastic film, which will assist in meeting the current and future recycling demands of businesses in Sydney.

The EIS has considered a range of social, environment and economic factors of the project, with a focus on Ecologically Sustainable Development principles. The study found that there were no

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significant environmental impacts that could not be mitigated by appropriate mitigation measures and management strategies.

The environmental assessment process has been used to inform the upgrade to the site and ensure operations will be sustainable and create minimal disruption to neighbors and the local community. Paper, cardboard and plastic film operations have been designed to minimize traffic impact on local roads, avoid noise and dust emissions, effective management of wastes, protection of soils, surface and ground water quality, and minimisation of risk of fire at the site.

The upgraded facility will provide for additional paper, cardboard and plastics recycling in Western Sydney and broadly across the Sydney region. The current and proposed development features of the site are listed in Table E1 (over page). The proposed development can be implemented with minimal adverse environmental impacts as demonstrated throughout this assessment and is justified in terms of overall economic benefits to both local, state and national economies. The paper, cardboard and plastics recycling services to be provided by the upgraded Grima Recycling Resource Recovery Facility will better meet demand and assist in meeting community expectations for efficient and effective recycling of these materials. The facility is located in the Wetherill Park industrial area therefore providing an important employment role, not only at the facility itself, but also in related industries such as suppliers of equipment, waste collection and recycling services.

The proposed development involves the expansion of an existing paper and cardboard recycling facility, which is EPA licensed and is equipped with modern equipment. The development will allow for the improved efficiency of the site, with only a minor expansion in the built footprint. The facility will help achieve a significant reduction in solid waste to landfill and assist the NSW Government to reach it's recycling target of 70% for commercial and industrial waste by 2021. The proposal will have positive flow on effects throughout the local economy through the creation of four new direct jobs. An economic analysis of the project also suggests that development will inject $149.2M into the Western Sydney economy over the next 20 years.

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Table E1. Summary of the 'current', 'proposed' and 'net change' in development features of the Grima Resource Recovery Facility. The impacts of the proposed development have been carefully considered in this Environmental Impact Statement.

Site feature / operating conditions	Current	Proposed	Net change
Types of wastes that can be lawfully received at the facility for recycling	Paper and cardboard	Paper, cardboard and plastic film	Receipt of plastic film for recycling
Annual processing limit (tonnes per annum)	28,000 tonnes per annum	99,000 tonnes per annum	Increase in 71,000 tonnes per annum
Maximum amount of waste that can be stored on-site at any point in time	700 tonnes	1,000 tonnes	Increase in 300 tonnes
Baling equipment	One American Bale Press and conveyor in Main Processing Warehouse	One American Bale Press in Main Processing Warehouse and a second American Bale Press in new Warehouse extension / Workshop at rear of site; new double conveyor to replace single conveyor	One new American Bale Press; new double conveyor; new Warehouse extension / workshop
Storage of baled paper, cardboard and plastic film	Current in main processing warehouse	Demolition of maintenance workshop along northern boundary of site and construction of a new Recycled Products Storage Shed	Change in use – workshop demolished and replaced by a Recycled Products Storage Shed
Containment of firewater	None	New stormwater isolation value and 115,000 L underground firewater storage tank	New stormwater isolation value and 115,000 L underground firewater storage tank
Treatment of stormwater runoff from site	None	New Gross Pollutant Trap (Rocla CDS® Nipper)	New Gross Pollutant Trap (Rocla CDS® Nipper)
Bathroom amenities in main office building	Standard bathroom amenities	Modification of bathroom to provide disabled amenities	Disabled bathroom facilities

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1. Introduction

1.1. Overview

Grima Environmental Services Pty Ltd (Grima Environmental Services Pty Ltd) is a family owned company that operates a successful Resource Recovery Facility (Facility) located at 88 Redfern Street, Wetherill Park. The site comprises an existing fully enclosed warehouse, office and maintenance building on 5,466 m^2 of land on Lot 3, DP 262054. The company operates a facility for the recycling of paper, cardboard and plastic film that is collected from a range of commercial customers from all across Sydney. These materials are collected separately from other waste materials, are transported via truck to their Wetherill Park Facility, and materials are baled and compacted, ready for truck transport to markets.

Grima Environmental Services Pty Ltd provides important recycling services for many businesses, including shopping centres, shopping plazas, commercial office buildings and smaller commercial premises. The company supplies the majority of its recycled cardboard to Orora's Port Botany paper mill in Sydney, where the cardboard is made into new cardboard. Shredded office paper is baled and exported overseas to be made into new office and writing papers; and plastic film (mainly pallet wrap made of low density polyethylene) is made into a range of new plastic products overseas.

The company assists many businesses in Sydney to increase their recycling rate and meet recycling targets in the NSW Government's *Waste Avoidance and Resource Recovery Strategy, 2014-2021*[1]. In this strategy, the NSW Government has made a commitment for NSW businesses to reach a recycling target of 70% by 2021. The current recycling rate for businesses as per the latest 2010/11 data is 57%.

Grima Environmental Services Pty Ltd began operations at the Redfern Street location in 2009, receiving Development Consent from Fairfield City Council (DA1135.1/2008; see Appendix 10) for the purpose of consolidating waste paper to a maximum waste processing amount of 28,000 tonnes per year. Through business growth, Grima Environmental Services Pty Ltd is now exceeding its maximum annual tonnage consent condition, and is processing over 69,000 tonnes of recyclable paper, cardboard and plastic film in the 2014/15 financial year.

1.1. Proposed development

The Environmental Impact Statement (EIS) evaluates a proposal to upgrade the existing facility to increase the maximum waste processing amount to 99,000 tonnes per year and adjust the type of waste material that can be processed to include plastic film. The proposed upgrade will also involve construction of a new mechanical workshop and secondary baler at the rear of the site, a new double conveyor to boost baling capacity, a new recycled product storage shed, installation of a stormwater treatment unit and firewater containment system, and new disabled washroom amenities. The EIS also considers a proposal to store up to 1,000 tonnes of paper, cardboard and plastic film on site at any one point in time. The specific upgrades to the site are summarized in Table 1.1.

[1] NSW Environment Protection Authority (2014). NSW Waste Avoidance and Resource Recovery Strategy, 2014-2021. Internet publication: http://www.epa.nsw.gov.au/wastestrategy/warr.htm

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Table 1.1. Summary of the 'current', 'proposed' and 'net change' in development features of the Grima Resource Recovery Facility.

Site feature / operating conditions	Current	Proposed	Net change
Types of wastes that can be lawfully received at the facility for recycling	Paper and cardboard	Paper, cardboard and plastic film	Receipt of plastic film for recycling
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Maximum amount of waste that can be stored on-site at any point in time	700 tonnes	1,000 tonnes	Increase in 300 tonnes
Baling equipment and extension to Processing Warehouse	One American Bale Press and conveyor in Main Processing Warehouse	One American Bale Press in Main Processing Warehouse and a second American Bale Press in new Warehouse extension / Workshop at rear of site; new double conveyor to replace single conveyor	One new American Bale Press; new double conveyor; new Warehouse extension / workshop
Storage of baled paper, cardboard and plastic film	Current in main processing warehouse	Demolition of maintenance workshop along northern boundary of site and construction of a new Recycled Products Storage Shed	Change in use – workshop demolished and replaced by a Recycled Products Storage Shed
Containment of firewater	None	New stormwater isolation value and 115,000 L underground firewater storage tank	New stormwater isolation value and 115,000 L underground firewater storage tank
Treatment of stormwater runoff from site	None	New Gross Pollutant Trap (Rocla CDS® Nipper)	New Gross Pollutant Trap (Rocla CDS® Nipper)
Bathroom amenities in main office building	Standard bathroom amenities	Modification of bathroom to provide disabled amenities	Disabled bathroom facilities

Grima Environmental Services Pty Ltd is seeking to implement appropriate development consent for the site to enable the company to receive waste up to 99,000 tonnes per year. Fairfield City Council have advised that under part 1 clause 32 (b) (iii) of the *Environmental Planning and Assessment Regulation* 2000, the facility is considered a 'designated development' and an EIS is required as part of the development assessment process by Fairfield City Council.

The NSW Department of Planning and Environment in January 2016 issued the Secretary's Environmental Assessment Requirements (SEARs) for the project, and confirmed that an EIS is required to support the proposed upgrade to the site.

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Further, the site operations are required to have an Environment Protection Licence in accordance with recent changes to the *Protection of the Environment Operations (Waste) Regulation* 2014. Grima Environmental Services Pty Ltd has obtained an Environment Protection Licence (EPL No. 20647) and an Authorised Amount of 700 tonnes storage (of waste) at any one point in time. Fairfield City Council have advised that the proposed redevelopment is also defined as an Integrated Development and requires the concurrence of the Environment Protection Authority (EPA) pursuant to the provisions of the *Protection of the Environment Operations Act* 1997.

It is noted that a comprehensive analysis of alternative options for the proposed development was not done, as the purpose of the development is to upgrade current operations to improve efficiency and effectiveness, rather than considering a new site. The proposed upgrades to the site will involve relatively minor building works and changes to internal layout of plant and equipment, with minimal environmental impact. A justification for the proposal is given in Section 15.

1.2. Purpose of Report

The EIS has prepared by Jackson Environment and Planning Pty Ltd on behalf of Grima Environmental Services Pty Ltd. It presents the findings of a comprehensive environmental evaluation which has been undertaken to establish the potential impacts associated with upgrades to an existing resource recovery facility specifically for paper, cardboard and plastic to process up to 99,000 tonnes per year on a site located at 88 Redfern St, Wetherill Park.

The EIS study evaluates the social, environmental and economic impacts and benefits of the project. The EIS defines the context of the proposed development, and examines those issues considered to be relevant. This EIS considers the potential environmental effects of the proposal during demolition, construction and operation, and proposes mitigation measures to prevent, reduce or offset significant adverse impacts on the environment. The aims of this EIS are to:

- Identify all constraints affecting future development on the subject site;
- Consider the economic, social and environmental impacts of the proposed development; and
- Assess the capability of the subject site to support the proposed development.

In delivering this EIS, Jackson Environment and Planning has undertaken all statutory planning assessments, including the preliminary hazard analysis and environmental risk assessment, including stakeholder consultation. We consulted with neighbours, Fairfield City Council, NSW Department of Planning and Environment, the NSW Environment Protection Authority and Roads and Maritime Services. We have also conducted the soil, water, waste management, waste and chemical and heritage impact assessments. Air Noise Environment Pty Ltd has undertaken the specialist air, noise, and vibration impact assessment, and Jacobs Group Australia has undertaken the transport and traffic impact assessment. Benbow Environmental Pty Ltd has undertaken the fire and incident impact assessment.

The EIS addresses the NSW Department of Planning and Environment's Secretary's Environmental Assessment Requirements. Consent is now sought for the proposal under the *Environmental Planning and Assessment* Act 1979 from Fairfield City Council as the consent authority.

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This EIS has been prepared in accordance with the requirements of the *Environmental Planning and Assessment Act* 1979, and Clause 6 and 7 of the *Environmental Planning and Assessment Regulation* 2000. The EIS has also been delivered to meet the Secretary's Environmental Assessment Requirements (SEARs), which were issued on 29 January 2016 by Chris Ritchie, Director, Industry Assessments as a delegate of the Secretary (Appendix 1).

1.3. The Proponent

Grima Environmental Services Pty Ltd is the proponent and is seeking consent for the proposed upgrades to the facility. Grima Environmental Services Pty Ltd is a family owned business operating since 1989. The company provides seven day per week services for the collection of cardboard, paper and plastic film in the Sydney metropolitan area. Materials received at Resource Recovery Facility are baled and supplied to domestic and off shore markets. Grima Environmental Services Pty Ltd has 26 employees and service clients including Woolworths, IGA, BIG W, Target, Kmart and Aldi. Cardboard, paper and plastic film materials are also delivered to the site by various waste management companies including JJ Richards, Veolia, Remondis, SUEZ and Cleanaway.

The company operates a fleet of hook lift, compactor and HIAB type tipping vehicles which collect source separated recyclable materials including plastic film, paper and cardboard from shopping centres, shopping plazas, commercial office buildings and smaller commercial premises. Customer sites are equipped with a range of hydraulic balers and bulk bins to consolidate the materials on site. The materials received at the Facility are baled to one tonne blocks and are loaded onto semi-trailers for transport. Cardboard product is supplied to Orora in Port Botany for recycling, while the white paper and plastic film bales are exported to China and/or India for recycling.

The facility is an important piece of infrastructure in Western Sydney that assists large commercial organisations in their recycling needs. The facility plays an important role is assisting the NSW Government achieve its recycling rate of 70% for commercial and industrial waste by 2021, as defined in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021*.

1.4 Cost of the Development

The development is expected to have a total cost of $1,515,015 (ex. GST). This cost estimate is based on detailed quotations for the supply of processing equipment and building works (Appendix 11). An overview of the cost estimate for the development is shown in Table 1.2.

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Table 1.2. Expected costs of the development project. Please see Appendix 11 for written quotations.

Cost item	Supplier / contractor	Cost estimate ($, ex. GST)
New double conveyor		$351,700
New bale press	American Bale Press	$334,600
Building demolition and complete construction works	Carafa Constructions Pty Ltd	$828,715
TOTAL		**$1,515,015**

1.5 Secretary's Environmental Assessment Requirements (SEARs)

The SEAR's for the proposed development were issued by the NSW Department of Planning and Environment on 29 January 2016 to enable the EIS to commence.

The key project issues identified by the Secretary for consideration in the EIS are given in Table 1.3. Note that all these requirements have been addressed in the EIS, and the relevant sections are highlighted for easy cross-referencing.

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Table 1.3. Summary of the Secretary's Environmental Assessment Requirements (SEARs) and the relevant section within the EIS.

Secretary's Environmental Assessment Requirements	EIS Section where this requirement is addressed
Clause 6 of Schedule 2 of the *Environmental Planning and Assessment Regulation* 2000 – Form of environmental impact statement	
a) the name, address and professional qualifications of the person by whom the statement is prepared	Page 2
b) the name and address of the responsible person	Page 2
c) the address of the land: (i) in respect of which the development application is to be made, or (ii) on which the activity or infrastructure to which the statement relates is to be carried out	Section 1.1
d) a description of the development, activity or infrastructure to which the statement relates	Sections 1.4, 2.2 and 2.6
e) an assessment by the person by whom the statement is prepared of the environmental impact of the development, activity or infrastructure to which the statement relates, dealing with the matters referred to in this Schedule.	Sections 4-15
f) a declaration by the person by whom the statement is prepared to the effect that: (i) the statement has been prepared in accordance with this Schedule, and (ii) the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates, and (iii) that the information contained in the statement is neither false nor misleading.	Page 2
Clause 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation* 2000 – Form of environmental impact statement	
(a) summary of the environmental impact statement	Executive Summary
(b) a statement of the objectives of the development, activity or infrastructure	Section 2.2
(c) an analysis of any feasible alternatives to the carrying out of the development, activity or infrastructure, having regard to its objectives, including the consequences of not carrying out the development, activity or infrastructure	Section 1.1
(d) an analysis of the development, activity or infrastructure, including: (i) a full description of the development, activity or infrastructure (ii) a general description of the environment likely to be affected by the development, activity or infrastructure, together with a detailed description of those aspects of	Sections 2.1. and 2.2 Section 2.8

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Secretary's Environmental Assessment Requirements	EIS Section where this requirement is addressed
the environment that are likely to be significantly affected, and (iii) the likely impact on the environment of the development, activity or infrastructure, and (iv) a full description of the measures proposed to mitigate any adverse effects of the development, activity or infrastructure on the environment, and (v) a list of any approvals that must be obtained under any other Act or law before the development, activity or infrastructure may lawfully be carried out.	Section 2.8.7 Section 14 Section 12
(e) a compilation (in a single section of the environmental impact statement) of the measures referred to in item (d) above	Section 14
(f) the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development set out in subclause (4). Note: A cost benefit analysis may be submitted or referred to in the reasons justifying the carrying out of the development, activity or infrastructure	Section 15
Key issues	
The EIS must include an assessment of all potential impacts of the proposed development on the existing environment (including cumulative impacts if necessary) and develop appropriate measures to avoid, minimise, mitigate and/or manage these potential impacts. As part of the EIS assessment, the following matters must also be addressed:	Section 13
Strategic context - including: - a detailed justification for the proposal and suitability of the site for the development; - a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies; and - a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out; - a description of how the proposed expansion integrates with existing on-site operations; • a description of any additional licence(s) or approval(s) required to carry out in the proposed development; and - an environmental risk assessment of the potential impacts of the development identifying key issues for assessment.	Section 2
Waste management - including:	Section 4

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Secretary's Environmental Assessment Requirements	EIS Section where this requirement is addressed
- details of the type, quantity and classification of waste to be received at the site; - details of the resource outputs and any additional processes for residual waste; - details of waste handling including, transport, identification, receipt, stockpiling and quality control; and - a description of the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*.	
Air quality - including: - a description of all potential sources of air emissions; - an air quality impact assessment in accordance with relevant Environment Protection Authority Guidelines; and - a description and appraisal of air quality impact mitigation and monitoring measures.	Section 5
Noise and vibration - including: - a description of all potential noise and vibration sources during construction - and operation, including road traffic noise; - a noise and vibration assessment in accordance with the relevant Environment Protection Authority Guidelines; and - a description and appraisal of noise and vibration mitigation and monitoring measures	Section 5
Traffic and transport – including: - details of road transport routes, access to the site and parking; - road traffic predictions for the development during construction and operation; and - as assessment of the impacts to the safety and function of the road network; and - the details of any road upgrades required for the development	Section 10
Soil and water – including: - the details of stormwater, waste water and leachate management; - the details of soil and erosion controls during construction and operation; - an assessment of surface water, flooding and soil impacts	Sections 6 and 7
Heritage – including Aboriginal and non-Aboriginal cultural heritage	Section 9
Fire and incident management	Section 11
Environmental Planning Instruments and other policies The EIS must assess the proposal against relevant environmental planning instruments, including but not limited to: - State Environmental Planning Policy (Infrastructure) 2007; - State Environmental Planning Policy No, 33 Hazardous and Offensive Development	Section 2

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Secretary's Environmental Assessment Requirements	EIS Section where this requirement is addressed
- State Environmental Planning Policy No. 55 Remediation of Land; - Fairfield Local Environmental Plan 2013; and - Relevant development control plans and section 94 plans	
Consultation During the preparation of the EIS, we must consult with relevant local, State and Commonwealth government authorities, serviced providers and community groups, and address any issues they may raise in the EIS. In particular, we should consult with: - Environment Protection Authority - Roads and Maritime Services - Fairfield City Council; - The surrounding land owners and occupiers that are likely to be impacted by the proposal; and - Details of the consultation carried out and issues raised must be included in the EIS.	Section 3

1.6 Project team

Jackson Environment and Planning engaged a project team on behalf of Grima Environmental Services Pty Ltd to undertake the design and specialist investigations for the EIS. The roles of each team member is given below:

- Town planning – Jackson Environment and Planning Pty Ltd
- Community consultation – Jackson Environment and Planning Pty Ltd
- Waste management – Jackson Environment and Planning Pty Ltd
- Air quality, noise and vibration – Air Noise Environment Pty Ltd
- Water - Jackson Environment and Planning Pty Ltd
- Soils and contamination – Jackson Environment and Planning Pty Ltd
- Waste and chemicals – Jackson Environment and Planning Pty Ltd
- Fire and incident management – Benbow Environmental Pty Ltd
- Transport and traffic – Jacobs Group Australia
- Heritage – Jackson Environment and Planning Pty Ltd
- Engineering design – Fedele Design Pty Limited

1.7 Consultation

The preparation of the EIS has involved consultation with a number of government and non-government organisations and interest groups. The consultation was undertaken to identify the views and concerns of interested/affected parties with respect to the likely environmental, infrastructure and amenity impacts of the proposed development.

Consultation has continued throughout the preparation of the EIS with the following organisations:

- Fairfield City Council;

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- NSW Department of Planning and Environment;
- NSW Environmental Protection Authority;
- NSW Roads and Maritime Services; and
- 16 businesses surrounding the premises of Grima Environmental Services Pty Ltd in Wetherill Park

The consultation process has been important in determining issues surrounding the proposed development and in shaping the design and operational management of the subject site. A comprehensive review of the issues raised through the consultation process is provided in the consultation outcomes in Section 3 of the EIS.

1.8 Accompanying documentation

Table 1.3 outlines the appendices to the EIS.

Table 1.3. Documentation associated with this EIS and included in Appendices.

Title	Author	Date	EIS Appendix
SEARs	NSW Department of Planning and Environment	30 Jan 2016	1
EPA licence	NSW EPA	4 May 2016	2
Site plans, engineering plans and construction plans	Fedele Design Pty Limited	25 November 2016	3
Aboriginal and Non-Aboriginal Cultural Heritage Search Reports	NSW Office of Environment and Heritage	28 July 2016	4
Project Summary Report for Consultation	Jackson Environment and Planning	5 April 2016	5
Environmental Management Procedures	Jackson Environment and Planning	16 September 2015	6
Pollution Incident Response Management Plan	Jackson Environment and Planning	16 September 2015	7
Consultation with NSW EPA and RMS	Jackson Environment and Planning	22 April 2016	8
s149 Certificate	Fairfield City Council	28 April 2016	9
Existing development consent	Fairfield City Council	22 December 2009	10
Cost of development	Carafa Constructions Pty Ltd	16 November 2016	11

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2 Strategic context of the project and site

2.1 Subject site

The subject site is located at 88 Redfern St, Wetherill Park. The site is also identified as Lot 3, DP 262054. The site consists of 5,456 m^2 of industrial land located in the Fairfield City Council local government area (Figure 2.1).

Figure 2.1: Location of the subject site, 88 Redfern St, Wetherill Park. Source: Google Earth.

The site has an existing steel clad warehouse that is approved for consolidation of waste paper to be distributed to other waste recycling outlets off-site (Figure 2.2). The development consent was provided by Fairfield City Council on 22 December 2009 under Development Consent 1135.1/2008 (Appendix 10). Under clause 48 of the current development consent, the site is approved for receiving a maximum of 28,000 tonnes per year of waste paper products.

The site has an existing brick and tile office building, and an adjacent metal clad mechanical workshop along the northern boundary of the site (Figure 2.3). The site has an existing weighbridge located between the office and warehouse building where vehicles are weighed on entry and exit to determine the mass of recycled products either brought to the site for sorting, baling and consolidation, or shipping from the site to markets.

The site is located within the Wetherill Park industrial precinct. The nearest residence is approximately 600m away, south of Victoria Road. The closest waterway is Prospect Creek and runs approximately 500 m north of the site. Prospect Creek flows into Dhurawal Bay near Georges Hall and becomes the Georges River. The site is situated approximately one kilometre south east of

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Prospect Nature Reserve. The closest environmental conservation area is located 500 m south of the site, Wetherill Park Reserve (Figure 2.4).

Figure 2.2: Location of the subject site, 88 Redfern St, Wetherill Park. Source: NSW Department of Planning and Environment Planning Portal.

The facility is operated as paper, cardboard and plastic film recycling operation. Trucks collect either loose or baled plastics, paper or cardboard from commercial collections across Sydney. Trucks enter the site at the main entry gate (Figure 2.3), and proceed onto the weighbridge for gross weight recording. Trucks then reverse, approach the exit gate of the site and reverse into the processing warehouse where the loads are emptied. Plastics, paper and cardboard are moved via front end loader or forklift into the designated storage point in the warehouse. Any physical contaminants are removed by front end loader, then the clean materials are then fed onto a conveyor into a baling press, which creates ~1 tonne blocks of either cardboard, paper or plastic film (Figure 2.7). These blocks are then positioned in the warehouse ready for collection and export from the site. Generally, close to 100% of all recycled materials received at the site are recycled. Very small amounts of waste items are received in loads. These items are transferred to a skip bin at the entrance of the site, and is disposed off-site at a lawful facility.

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Figure 2.3. Detailed site layout of current operation, including vehicle movements.

Figure 2.4. Nearest sensitive receptors.

The site currently receives ~200 tonnes of cardboard, paper and plastic film on the site on a daily basis. Trucks after emptying materials will then return to the weighbridge for net weight analysis, and then exit the site through the designated exit gate.

Trucks that pick up recycled baled product enter the site through the entry gate (Figure 2.5), then proceed directly to the weighbridge for net weight analysis. The truck then moves to the loading

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area, where staff load the truck of recycled baled material with a forklift. Once loaded, the truck will reverse onto the weighbridge for gross weight analysis, then will reverse and exit through the exit gate in the forward direction.

The site has consent for operation 24 hours a day, 7 days per week (Clause 51 of Development Consent), though sorting and baling only occurs 6 days per week (not Sunday). Baling of cardboard in the sorting and processing warehouse occurs generally during the operating hours of 6am to 3pm, then paper and plastic film in the operating hours of 3pm to midnight.

Baled materials are not stored outdoors, though blocks of baled material are pre-loaded next to the weighbridge ready for forklifting onto trucks on arrival. The operational principle of the site is to maximise the efficiency of material delivery, baling and then export of the baled material to recycling markets, to minimise the storage of materials on-site. Generally, materials received at the site are baled and moved off site on the same day or next day, to maximise operational efficiency.

The site has a mechanical workshop, used to repair vehicles and mechanical items on the site. A fire hydrant pump room was installed in 2009 to comply with Clause 28 of the current Development Consent. This is located on the south west corner of the site. A fire hose reel system has been installed in the sorting and processing warehouse to comply with the consent conditions.

Note that the current site has an Environment Protection Licence from the NSW Environment Protection Authority (EPL 20647) for operating a paper and cardboard processing facility. The site has approval under Condition L2.2 to store up to 700 tonnes of waste materials on-site at any one point in time (Appendix 2).

The site is zoned IN1 General Industrial under the *Fairfield Local Environmental Plan 2013*. The site is surrounded by industrial warehousing, small manufacturing, product supplies and mechanical repairers.

A process flow diagram summarising the operational aspects of the facility is given in Figure 2.8.

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Figure 2.5. Entry to the site. Office and mechanical workshop are positioned on the left-hand side, and the paper and cardboard drop off, sorting and bailing warehouse is on the right.

Figure 2.6. Unloading area of recovered paper, cardboard and plastic film in the warehouse. Trucks after being weighed on the weighbridge enter the warehouse where the materials are inspected and sorted where required.

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Figure 2.7. Baling of cardboard into blocks (top photo). Loading of blocks of baled cardboard onto waiting truck for transport to recycling markets (bottom photo).

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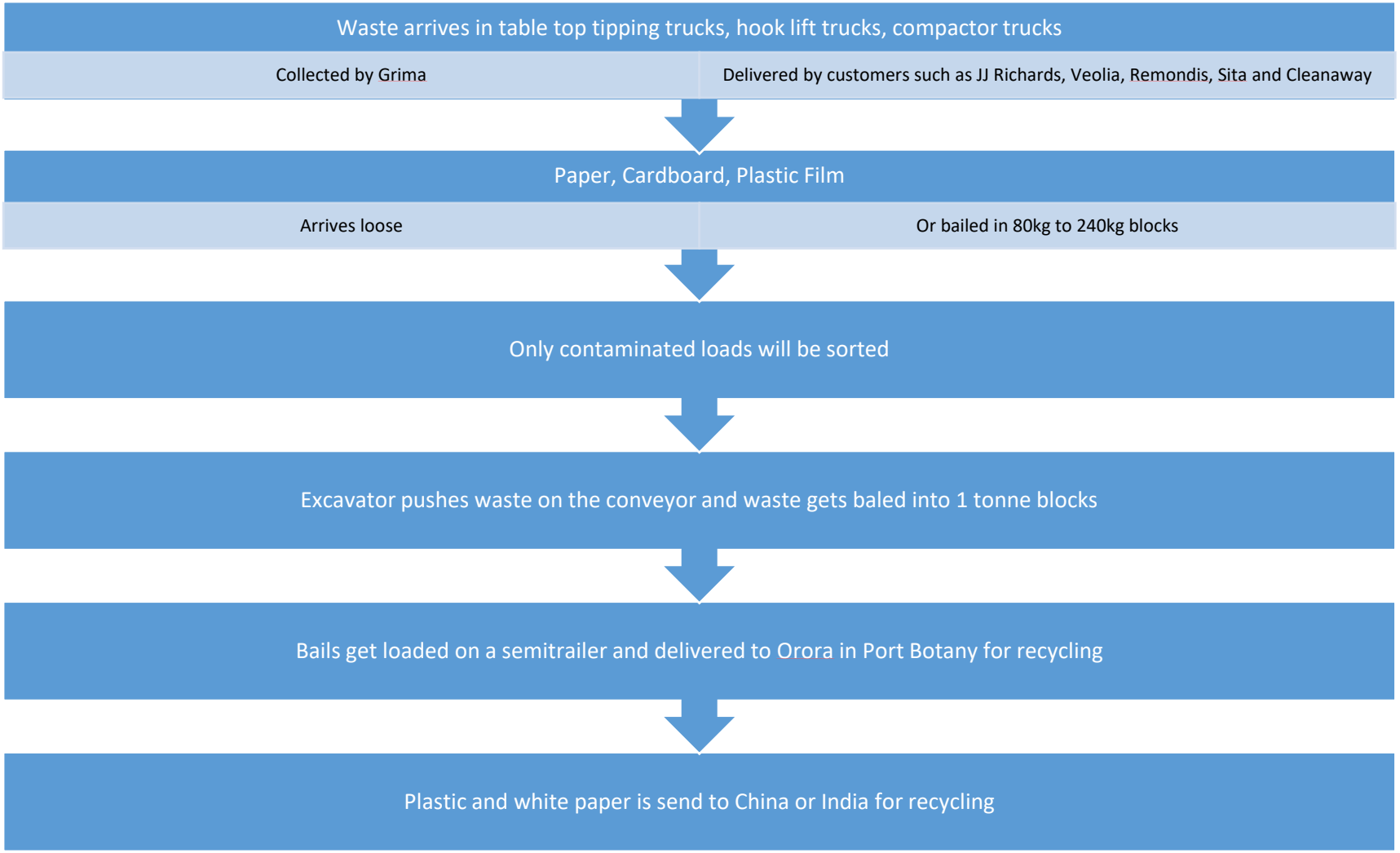
Figure 2.8. Process flow diagram of Grima Environmental Services Pty Ltd's Resource Recovery Facility.



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The surrounding development includes a mix of industrial uses. These are shown in the aerial photo in Figure 2.9. Directly to the north of the site is Workforce International (Lot 4, DP 584227), a road maintenance contractor. Further north is the Wetherill Park Electricity Sub-station. Adjacent to the site, on the south side, is a mix of industrial warehouse based premises, including a paint supplies company (FX Supreme Paints, Lot 21, DP 705818), a bakery (Southern Cross Continental Bakery) (Lot 22, DP 705818), a vacant warehouse (Lot 23, DP 705818), a door manufacturer (Sydney Doors) (Lot 24, DP 705818), and a glass and glazing business (Bronze & Silver Glass) (Lot 24, DP 705818). Bronze & Silver Glass is immediately adjacent to the eastern boundary of the subject site.

Further east in a food manufacturer (AB Maurie) (Lot 1, DP 3082). And further on the southern side of the subject site, along Redfern St, is a mix of warehouse based businesses, including an equipment supplier (Pivot Equipment) (SP 31495), a tank supplier (Tank Management Services) (Lot 9, DP 709052), an automative repairs workshop (Manufactured Alloy (Lot 8, DP 709052), and an office furniture supplier (DO Smith & Sons) (Lot 7, DP 709052).

Figure 2.9. Surrounding development and neighbours. Source: Six Maps.

Views of the streetscapes from to the south and north of the entrance to the facility are given in Figures 2.10 and 2.11.

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Figure 2.10. Streetscape along Redfern St, view south from Wetherill Park Electricity Sub-station looking towards the front entrance of the subject site.

Figure 2.11. Streetscape along Redfern St, view north from the front entrance of the subject site.

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2.2 Detailed justification for the proposal and suitability of the site for the development

The site is approved for the consolidation of waste paper products to be distributed to other waste recycling outlets off-site. This approval has been in place since 2009.

The development priorities for the site involve a site upgrade to improve the operational efficiency of the site, so that it can process up to 99,000 tonnes per year. Currently, the site has approval for 28,000 tonnes per year under Clause 48 of Development Content 1135.1/2008. Since establishment of the facility, and development of strong markets for recycled products, the tonnages of material received at the facility have increased to levels about the current development consent. An analysis of tonnages of materials received by the facility for the past three financial years is given in Table 2.1.

Table 2.1. Tonnage throughput of paper, cardboard and plastic film.

Financial year	Tonnes of paper received (tonnes)	Tonnes of cardboard received (tonnes)	Tonnes of plastic film received (tonnes)	Total amount of material received (tonnes)
2015/16	1,900.96	49,378.46	2,034.74	53,314.16
2014/15	2,882.90	63,674.85	2,811.92	69,369.67
2013/14	2,907.86	55,847.85	2,381.80	61,137.51
2012/13	3,727.52	46,895.70	1,686.92	52,310.14

The focus of the development has been outlined previously in Table 1.1 (Section 1.1).

The proposed development is consistent with current approved use and will enable additional material to be received, sorted and recycled by the facility to improve recycling outcomes for the Sydney region.

Of particular note, the rear extension of the warehouse to accommodate a new proposed maintenance shed and new bale press will permit the updating of the existing shed along the northern boundary of the site to store baled recycled paper, cardboard and plastic film under cover and protected from rain. This increased storage area will reduce the area required for storage of baled paper, cardboard and plastic film within the processing warehouse, resulting in greater operating area and a resulting increase in production capacity. This will permit an increase in the processing and receipt of 200 tonnes per day of paper, cardboard and plastic film to approximately 270 tonnes per day (or ~99,000 tonnes per year).

The proposed upgrades will be performed to the site will not result in any changes to the approved days of operation or hours of operation. Note that the site under Clause 51 of the Development Consent, deliveries to the site are restricted to 6am-6pm Monday to Friday, and 6am to 12 noon Saturdays. The site is also approved as a 24 hour a day 7 day per week operation. The upgrades will enable the more efficient entry, drop off of materials and loading of vehicles to the site, improving operational efficiency whilst not impacting on neighbouring land uses.

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The site is not constrained by any significant environmental issues. According to the *Fairfield Local Environmental Plan 2013*, the site is not encumbered by bushfire prone land; mine subsidence; acid sulfate soils; environmental conservation areas; landslide risk area; native vegetation protection; riparian lands and water courses; salinity; biodiversity or wetlands. The site is located 2.15 km from bulk water supply infrastructure (Prospect Reservior), though the land is not encumbered given the large distance between the site and this water reservoir.

2.3 Consistency with planning strategies and policies

In this section we review the relevant planning strategies and policies that need to be considered and potentially affect the proposed development. These planning strategies and policies are reviewed to help inform the proposed development.

2.3.1 Consistency with planning strategies and policy

2.3.1.1 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth Environment Protection and *Biodiversity Conservation Act* 1999 (EPBC Act) came into force from 16 July 2000. The EPBC Act requires actions which are likely to have a significant impact on matters of National Environmental Significance, or which have a significant impact on Commonwealth land, to be referred to the Commonwealth Minister for the Environment for approval.

The subject site is not listed as a national heritage place and the proposed development would not impact on any national heritage places. The proposed development would not impact on any threatened species or communities.

No National Environmental Significance matters would be impacted by the proposed development. As such, the proposed development has not been referred to the Commonwealth Minister for the Environment and approval pursuant to the EPBC Act is not required.

2.3.1.2 Environmental Planning and Assessment Act 1979

The proposed development is consistent with the overall objectives of the *Environmental Planning and Assessment Act* 1979. Section 5 of the *Environmental Planning and Assessment Act* 1979 and the accompanying Regulation provide the framework for environmental planning in NSW and include provisions to ensure that proposals which have the potential to impact the environment are subject to detailed assessment, and to provide opportunity for public involvement. The objectives of this Act as contained in Clause 5 are:

a) to encourage:
   i. the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,
   ii. the promotion and co-ordination of the orderly and economic use and development of land,
   iii. the protection, provision and co-ordination of communication and utility services,

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iv. the provision of land for public purposes,
v. the provision and co-ordination of community services and facilities, and
vi. the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and
vii. ecologically sustainable development, and
viii. the provision and maintenance of affordable housing, and

b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and
c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

The relevance to the proposed development is described as follows:

The proposed development is consistent with the nominated objectives of the Act and is considered capable of fulfilling the statutory requirements. The site investigations have determined that the proposed development will not result in any significant negative impacts that cannot be adequately mitigated or managed. This EIS confirms that the proposed development can be undertaken in a manner which will not adversely impact on natural resources but will promote the economic use of the land in a manner which will provide an improved level of resource management, employment and economic benefits for Western Sydney.

2.3.1.3 Environmental Planning and Assessment Regulation 2000

Under Clause 32(i) of Schedule 3 of the *Environmental Planning and Assessment Regulation* 2000, the proposed facility is considered to be a designated development:

Clause 32: Waste management facilities or works:

1) Waste management facilities or works that store, treat, purify or dispose of waste or sort, process, recycle, recover, use or reuse material from waste and:

   (iii) that have an intended handling capacity of more than 30,000 tonnes per year of waste such as glass, plastic, paper, wood, metal, rubber or building demolition material.

2.3.1.4 *Protection of the Environment Operations Act* 1997

The *Protection of the Environment Operation Act* 1997 (POEO Act) prohibits any person from causing pollution of waters, or air and provides penalties for air, water and noise pollution offences. Section 48 of the Act requires a person to obtain an Environment Protection License (EPL) from the NSW Environment Protection Authority before carrying out any of the premise based activities described in Schedule 1 of the Act.

Schedule 1 of the Act (34) details “Resource Recovery” as an activity. This clause applies to the following activities:

- Recovery of general waste, meaning the receiving of waste (other than hazardous waste, restricted solid waste, liquid waste or special waste) from off site and its processing, otherwise than for the recovery of energy.

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- Recovery of hazardous and other waste, meaning the receiving of hazardous waste, restricted solid waste or special waste (other than asbestos waste or waste tyres) from off site and its processing, otherwise than for the recovery of energy.
- Recovery of waste oil, meaning the receiving of waste oil from off site and its processing, otherwise than for the recovery of energy.
- Recovery of waste tyres, meaning the receiving of waste tyres from off site and their processing, otherwise than for the recovery of energy.

These activities are declared to be a scheduled activity if it meets the following criteria (Table 2.2).

Table 2.2. Scheduled activities as per Schedule 1 of the *Protection of the Environment Operations Act* 1997.

Activity	Criteria
Recovery of general waste	if the premises are in the regulated area:(a) involves having on site at any time more than 1,000 tonnes or 1,000 cubic metres of waste, or (b) involves processing more than 6,000 tonnes of waste per year. If the premises are outside the regulated area:(a) involves having on site at any time more than 2,500 tonnes or 2,500 cubic metres of waste, or(b) involves processing more than 12,000 tonnes of waste per year
Recovery of hazardous and other waste	involves having on site at any time more than 200 kilograms of waste
Recovery of waste oil	involves processing more than 20 tonnes of waste oil per year or having on site at any time more than 2,000 litres of waste oil
Recovery of waste tyres	involves having on site at any time (other than in or on a vehicle used to transport the tyres to or from the premises) more than 5 tonnes of waste tyres or 500 waste tyres, or involves processing more than 5,000 tonnes of waste tyres per year

The relevance to the proposed development is as follows:

The current facility has an EPL in place (EPL 20647) as it processes more than 6,000 tonnes per year, and is licensed under the *Protection of the Environment Operations Act* 1997. An application to modify the EPL to accommodate an increase in the processing capacity of the facility to 99,000 tonnes, and to include plastic film as an acceptable material for receival and processing at the site will be required.

An application to modify the EPL will need to be made to the NSW Environment Protection Authority following the issue of consent conditions.

2.3.1.5 *Roads Act* 1993

The *Roads Act* 1993 provides for a number of issues including the establishment of procedures for opening and closing public roads, acquisition of land for roadways in addition to regulating the carrying out of various activities on public roads including roadwork and road widening operations.

The relevance to the proposed development is as follows:

No closure of public roads would be required in order to gain access to the subject site. The site is already approved as an existing cardboard and paper waste recycling facility, with access to the site

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via Redfern St. The current application does not seek to alter the access arrangements from the public roadway.

2.3.1.6 NSW Waste Avoidance and Resource Recovery Strategy: 2014-2021

The *NSW Waste and Resource Recovery Strategy 2014-21* was released in December 2014. It sets clear directions for a range of priority areas over the next seven years and aligns with the NSW Government's waste reforms in *NSW 2021: A plan to make NSW number one*.

The strategy seeks to support investment in much-needed infrastructure, encourage innovation and improve recycling behaviour. The strategy also seeks to facilitate the development of new markets for recycled materials and reduce litter and illegal dumping.

The strategy sets the following targets for 2021–22:

- avoiding and reducing the amount of waste generated per person in NSW
- increasing recycling rates to:
    - 70% for municipal solid waste
    - 70% for commercial and industrial waste
    - 80% for construction and demolition waste
- increasing waste diverted from landfill to 75%
- managing problem wastes better, establishing 86 drop-off facilities and services across NSW
- reducing litter, with 40% fewer items (compared to 2012) by 2017
- combatting illegal dumping, with 30% fewer incidents (compared to 2011) by 2017.

The new strategy provides a clear framework for waste management to 2021-22 and provides an opportunity for NSW to continue to increase recycling across all waste streams.

The relevance to the proposed development is as follows:

The proposed development will increase and expand recycling infrastructure in Western Sydney, and will make an important contribution in increasing the recycling rate of business waste from 57% (in 2010/11) to 70% by 2021[2].

2.3.2 Consistency with environmental planning instruments

2.3.2.1 State Environmental Planning Policy (Infrastructure) 2007

The aim of the *State Environmental Planning Policy (Infrastructure)* 2007 is to facilitate the effective delivery of infrastructure across the State by improving regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services, and by providing greater flexibility in the location of infrastructure and service facilities.

Other key aims of the policy are to allow for the efficient development, redevelopment or disposal of surplus government owned land, and identify the environmental assessment category into which different types of infrastructure and services development fall (including identifying certain development of minimal environmental impact as exempt development). The policy also seeks to

[2] NSW EPA (2014). *NSW Waste Avoidance and Resource Recovery Strategy: 2014 – 2021*. Internet publication: http://www.epa.nsw.gov.au/wastestrategy/warr.htm

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help proponents identify matters to be considered in the assessment of development adjacent to particular types of infrastructure development, and providing for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing.

The following waste and recycling facilities are covered under Section 120 of the *State Environmental Planning Policy (Infrastructure)* 2007:

- "Resource recovery facility" means a facility for the recovery of resources from waste, including such works or activities as separating and sorting, processing or treating the waste, composting, temporary storage, transfer or sale of recovered resources, energy generation from waste gases and water treatment, but not including re-manufacture of material or goods or disposal of the material by landfill or incineration.
- "Waste disposal facility" means a facility for the disposal of waste by landfill, incineration or other means, including associated works or activities such as recycling, resource recovery and other resource management activities, energy generation from waste gases, leachate management, odour control and the winning of extractive material to generate a void for disposal of waste or to cover waste after its disposal.
- "Waste or resource management facility" means a waste or resource transfer station, a resource recovery facility or a waste disposal facility.
- "Waste or resource transfer station" means a facility for the collection and transfer of waste material or resources, including the receipt, sorting, compacting, temporary storage and distribution of waste or resources and the loading or unloading of waste or resources onto or from road or rail transport.

Under Section 121 of the Policy, the following activities are permitted with consent:

- Development for the purpose of waste or resource management facilities, other than development referred to below, may be carried out by any person with consent on land in a prescribed zone.
- Development for the purposes of a waste or resource transfer station may be carried out by any person with consent on land in a prescribed zone.

The policy defines ‘prescribed zones’ as being compatible with waste or resource recovery facilities:

- RU1 Primary Production
- RU2 Rural Landscape
- IN1 General Industrial
- IN3 Heavy Industrial
- SP1 Special Activities
- SP2 Infrastructure

The relevance to the proposed development is as follows:

The proposed development meets the definition of a “Resource recovery facility” or a “Waste or resource transfer station” under Section 120 of the *State Environmental Planning Policy (Infrastructure)* 2007. Given the proposed upgrade of the Grima Resource Recovery Facility is to occur in a prescribed IN1 General Industrial zoning, the development is considered to be consistent

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with Section 120 of the *State Environmental Planning Policy (Infrastructure)* 2007, being development which is permissible subject to development consent from the NSW Department of Planning and Environment.

2.3.2.2 State Environmental Planning Policy No. 33 Hazardous and Offensive Development

The aims of the State Environmental Planning Policy No. 33 Hazardous and Offensive Development are to amend the definitions of hazardous and offensive industries where used in environmental planning instruments. The policy also renders ineffective a provision of any environmental planning instrument that prohibits development for the purpose of a storage facility on the grounds that the facility is hazardous or offensive if it is not a hazardous or offensive storage establishment as defined in this Policy.

In addition, the policy sets out a requirement for development consent for hazardous or offensive development proposed to be carried out in the Western Division, and seeks to ensure that in determining whether a development is a hazardous or offensive industry, any measures proposed to be employed to reduce the impact of the development are taken into account. The policy also helps to ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact, and to require the advertising of applications to carry out any such development.

Development that is potentially hazardous and/or offensive is permissible under SEPP 33 if the facility is capable of securing an Environment Protection Licence from the NSW Environment Protection Authority.

Relevance to the proposed development is as follows:

A Preliminary Hazard Analysis has been prepared to address the proposed increase in receipt, sorting and processing of up to 99,000 tonnes of paper, cardboard and plastic film per annum, with associated waste storage, stockpile areas and ancillary structures (i.e. plant and equipment). The Preliminary Hazard Assessment addresses the requirements of State Environmental Planning Policy (SEPP) No.33 (Hazardous and Offensive Development); the *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33* (NSW Department of Planning, 2011)[3], AS/NZ ISO 31000: 2009 *Risk Management Principles and Guidelines*[4]*;* and *Hazardous and Offensive Development Application Guidelines- Risk Criteria for Land Use Safety Planning* (NSW Department of Planning, 2011)[5].

[3] NSW Department of Planning (2011). Hazardous and Offensive Development Application Guidelines - Applying SEPP 33. Published by NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/en/Policy-and-Legislation/~/media/3609822D91344221BA542D764921CFC6.ashx

[4] AS/NZ ISO 31000 (2009). Risk Management Principles and Guidelines. Published by SAI Global. Internet publication: http://infostore.saiglobal.com/store/Details.aspx?ProductID=1378670

[5] NSW Department of Planning (2011). Hazardous and Offensive Development Application Guidelines- Risk Criteria for Land Use Safety Planning. Published by NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/0D39F08E7889409BBA1FA88D5FB859FD.ashx

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The objective of this assessment was to identify the risks posed to people, property and the environment. The assessment also considers off-site risks to people, property and the environment (in the presence of controls) arising from atypical and abnormal hazardous events and conditions (i.e. equipment failure, operator error and external events). The hazard treatment measures that have been proposed assist in producing a 'low' to 'moderate' level of risk in accordance with the risk acceptance criteria.

The assessment also noted that the proposed development is not offensive under the *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33* (NSW Department of Planning, 2011), given that the receipt, sorting and processing of dry, source separated paper, cardboard and plastic film does not pose a risk or threat to air quality (e.g. odour) or water quality (e.g. stormwater contamination). All operations are performed indoors and are not considered to the offensive under SEPP 33.

The Preliminary Hazard Assessment is given in Section 2.8.

2.3.2.3 State Environmental Planning Policy No. 55 Remediation of Land

The aim of this Policy is to provide for a State-wide planning approach for the remediation of contaminated land. In particular, the Policy aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment:

(a) by specifying when consent is required, and when it is not required, for a remediation work;
(b) by specifying certain considerations that are relevant in rezoning land and in determining development applications in general and development applications for consent to carry out a remediation work in particular; and
(c) by requiring that a remediation work meet certain standards and notification requirements.

Under the provisions of *State Environmental Planning Policy No. 55 – Remediation of Land*, it is necessary to establish if the proposal is to be developed on land which has been declared or found to be contaminated, where rezoning of the land is proposed or where development contemplates a change of use. Specifically, clause 7(2) this requirement states:

(2) Before determining an application for consent to carry out development that would involve a change of use on any of the land specified in subclause (4), the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned carried out in accordance with the contaminated land planning guidelines.

Subclause (4) includes reference to *"land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines is being, or is known to have been, carried out".*

Relevance to proposed development:

The Soils and Contamination Study findings as given in Section 7 found that given the site since development as a warehouse has had an extensive concrete hardstand in place, the site is not likely to be contaminated from either previous or current operations as a resource recovery facility.

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The proposed development does not “involve a change of use”. The site is currently utilised and approved as a resource recovery facility for the consolidation of waste paper and cardboard, and the primary function of the site will be unchanged as a result of the current development application.

2.3.2.4 Fairfield Local Environmental Plan 2013

The following section provides the local planning and legislative framework for the proposed development. The purpose of this section is to outline the approval process and identify the applicable local planning controls that relate to the proposed development. This includes relevant local environmental plans, including *Fairfield Local Environmental Plan* 2013.

Site zoning

The *Fairfield Local Environmental Plan* 2013 is the planning instrument applying to Wetherill Park, within the Fairfield Local Government Area. The land is zoned IN1 General Industrial, and the development footprint of the site occurs entirely within this zoning (Figure 2.12).

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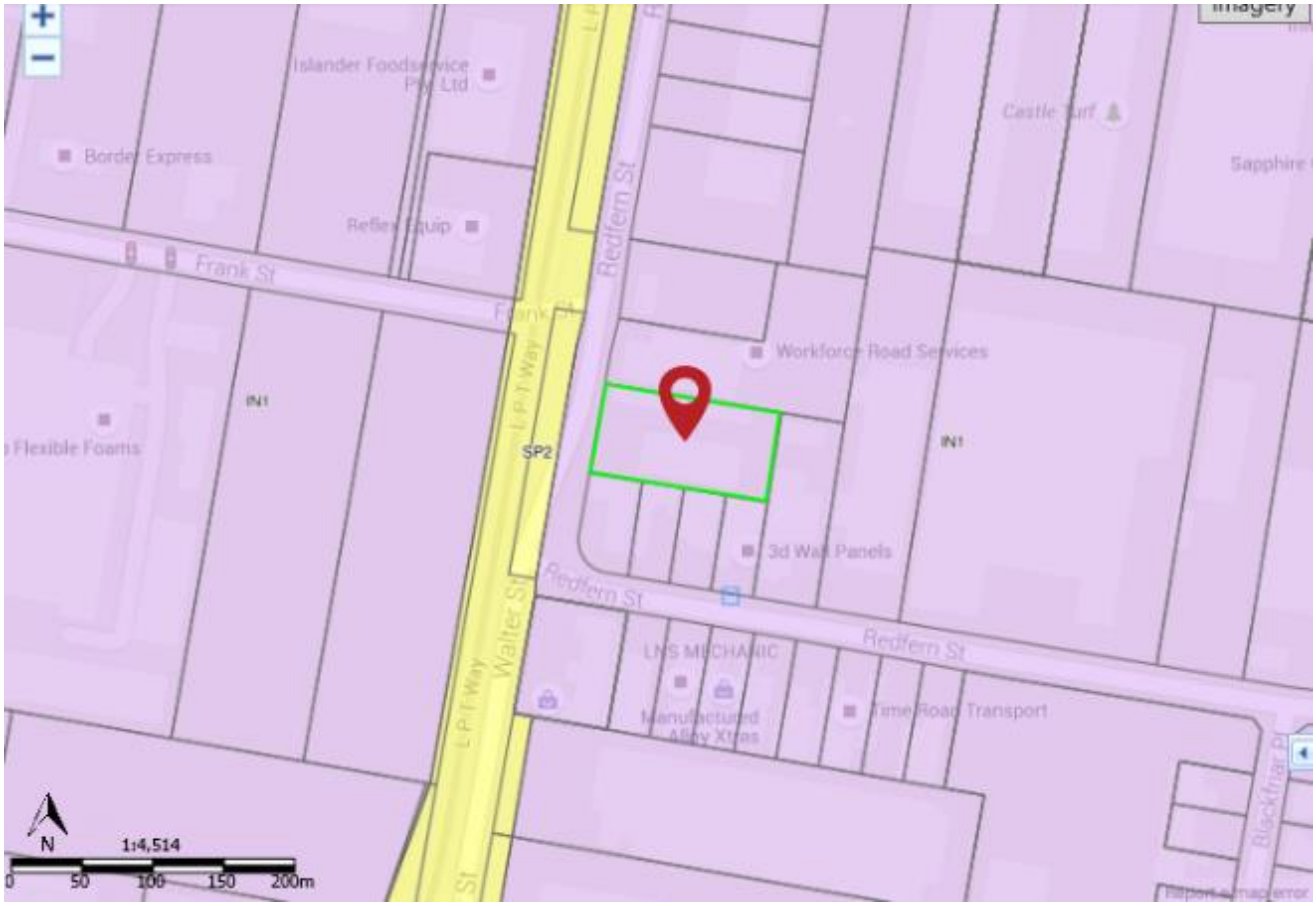
Figure 2.12. Zoning of the subject site pursuant to Fairfield Local Environmental Plan 2013. Light purple area is zoned as IN1 General Industrial. Source: NSW Department of Planning and Environment Planning Portal.



Zone objectives

The objective of this land use zoning is to provide a wide range of industrial and warehouse land uses, including:

- To encourage employment opportunities;
- To minimise any adverse effect of industry on other land uses;
- To support and protect industrial land for industrial uses; and
- To ensure development is not likely to detrimentally affect the viability of any nearby business centre.

The site will continue to be used as a 'Resource Recovery Facility'[6], in adherence with the above objectives, which seek to encourage employment opportunities associated with an industrial use, and to ensure development is not likely to detrimentally affect the viability of any nearby business

[6] Under Section 120 of the *State Environmental Planning Policy (Infrastructure)* 2007, 'Resource Recovery Facilities' are defined as: "A facility for the recovery of resources from waste, including such works or activities as separating and sorting, processing or treating the waste, composting, temporary storage, transfer or sale of recovered resources, energy generation from waste gases and water treatment, but not including re-manufacture of material or goods or disposal of the material by landfill or incineration."

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centre. This EIS considers potential amenity impacts associated with the proposed development and provides appropriate mitigating strategies, also in accordance with the zone objectives.

Land use permissibility

The *Fairfield Local Environmental Plan* 2013 defines a 'Resource recovery facility' as:

"Resource recovery facility means a building or place used for the recovery of resources from waste, including works or activities such as separating and sorting, processing or treating the waste, composting, temporary storage, transfer or sale of recovered resources, energy generation from gases and water treatment, but not including re-manufacture or disposal of the material by landfill or incineration. Note. Resource recovery facilities are a type of waste or resource management facility — see the definition of that term in this Dictionary."

In addition, the *Fairfield Local Environmental Plan* 2013 also defines a 'Waste or resource management facility' that may also apply to the proposed project:

"Waste or resource management facility means any of the following: (a) a resource recovery facility; (b) a waste disposal facility; (c) a waste or resource transfer station, (d) a building or place that is a combination of any of the things referred to in paragraphs (a)–(c).

Relevance to proposed development:

Under the *Fairfield Local Environmental Plan* 2013, 'resource recovery facilities' and 'waste or resource management facilities' are not defined as prohibited development under the IN1 General Industrial zoning. Given the *Fairfield Local Environmental Plan* 2013 permits this type of development under 'Other development', and the fact that the upgraded sites' use is consistent with the existing development consent, it is considered the proposed project is compatible with the LEP.

Other LEP Provisions

1) Part 4.3 – Height of buildings

Under the LEP, proponents needs to consider the maximum height of buildings, to ensure that the height of buildings complements the streetscape and character of the area in which the buildings are located; and to minimise the visual impact, disruption of views, loss of privacy and loss of solar access to existing development.

Under Part 4.3 of the LEP, the maximum height of buildings cannot exceed those given in the Height of Buildings Map. For the subject site, no defined limit is given. However, under Part 4.3 1(b) and 1(c), the following restrictions apply to development:

- the height of buildings complements the streetscape and character of the area in which the buildings are located; and
- need to minimise the visual impact, disruption of views, loss of privacy and loss of solar access to existing development.

The proposed development will involve the construction of a new maintenance workshop and baling area at the rear of the site, with the height at the same level of the main processing warehouse (8.00m) (refer to plan DA06, Appendix 3). Note that the maintenance shed at the north of the site (currently 5.50m high) will be replaced with a recycled products storage shed that is higher (7.60m) (refer to plan DA07, Appendix 3). The increase in height of the recycled products storage shed is still

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lower than the main processing warehouse, and is considered to complement the streetscape with minimal visual impact. The proposed heights of buildings are consistent with the LEP.

2) Part 4.4 – Floor space ratio

Under Part 4.4 of the LEP, restrictions apply to the Floor Space Ratio (FSR) of buildings within the Fairfield Local Government Area. FSR is the ratio between the Gross Floor Area (GFA) of all buildings on the site, divided by the Site Area (SA). The subject site has a maximum allowable FSR under the LEP of 2:1. The site will have a GFA after building of the new warehouse extension and maintenance workshop at the rear of the site, and replacement of the storage shed at the north of the site of 2,046.80 m^2. The site has a total area of 5,456 m^2. The calculated FSR after development is 0.375, which is well below the maximum FSR of 2:1, indicating the development is compliant with the LEP.

3) Part 6.2 – Earthworks

Under Part 6.2 of the LEP, development consent is required for earthworks to ensure that works will not have a detrimental impact on environmental functions and processes, neighbouring uses. Before granting development consent for earthworks (or for development involving ancillary earthworks), the consent authority must consider the following matters:

- the likely disruption of, or any detrimental effect on, existing drainage patterns and soil stability in the locality of the development;
- the effect of the development on the likely future use or redevelopment of the land;
- the quality of the fill or the soil to be excavated, or both, the effect of the development on the existing and likely amenity of adjoining properties;
- the source of any fill material and the destination of any excavated material, the likelihood of disturbing relics;
- the proximity to, and potential for adverse impacts on, any waterway, drinking water catchment or environmentally sensitive area; and
- any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

As part of the proposed development, construction of a retaining wall and limited filling will be required to construct the concrete hardstand and maintenance workshop. Some excavation will also be required to install the proposed 115,000 L firewater storage tank beneath the new workshop and baling area.

Retaining wall construction and drainage will be performed as per the Building Code of Australia, to fully meet the requirements of the LEP.

2.3.2.5 Consistency with development control plans (DCP's) and section 94 plans

The *Fairfield Citywide Development Control Plan* 2013 (DCP) (Amendment 11) applies to all land in Fairfield City with the exception of certain town centres. The DCP contains more detailed development provisions than those found in the LEP and are considered by Council when making decisions about individual development proposals. Key parts of the DCP, specifically Chapter 9 that relate to Industrial Development are mapped in Table 2.3 below.

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Table 2.3. Key provisions in the *Fairfield Citywide Development Control Plan* 2013 that need to be considered in the EIS.

LEP Clause No.	Requirement	How this LEP clause will influence the proposed development	Compliance
s9.04	**Consultation with Electricity Supply Authorities – Wetherill Park** High voltage electricity assets are located within the Wetherill Park Industrial Estate, and the Wetherill Park Transgrid Electricity Sub-station is located 40 m to the north of the subject site.	The subject site is located in close proximity to the electricity assets. Assessment of potential fire risks from incident to be considered.	Yes – done as part of EIS Consultation – Section 3 and Fire Safety and Incident Management – Section 11
s9.1.1.1.1	**Site dimensions – Consolidation of allotments** Where new development is proposed on two or more existing allotments, a condition of approval will require the consolidation of such allotments into one title and registration with the Land Titles Office before occupation of the building.	Site has existing development consent and no consolidation of two or more allotments is proposed.	Not applicable
s9.1.1.2	**Lot frontage** The minimum frontage to all other roads is to be 30 metres.	Site has existing development consent and no changes to lot frontage are proposed.	Not applicable
s9.1.1.3	**Lot size** The Torrens Title subdivision of any allotment within the Wetherill Park, Bonnyrigg Precincts must not be less than 930 square metres as identified on the Fairfield LEP 2013 – Minimum Lot Size Map.	Not relevant. Site has existing development consent and no changes to lot size are proposed.	Not applicable
s9.1.2	**Building setbacks** Wetherill Park Precinct - the minimum setback for all land within Wetherill Park, other than those roads described immediately above is to be 10 metres, all of which is to be landscaped.	Site has existing development consent and no changes to building setbacks are proposed.	Not applicable
s9.2.1	**Traffic generating development** Detailed traffic studies need to be submitted for developments listed in Schedule 3 of *State Environment Planning Policy (Infrastructure)* 2007.	Traffic impacts from the development will be assessed as part of the Transport and Traffic Study as part of the EIS.	Yes – refer to Transport and Traffic Study – Section 10
s9.2.2	**Car parks** Sufficient car parking needs to be provided for customers and staff. Parking needs to also be provided to ensure environmental amenity, ensure efficient site operation, pedestrian and vehicle access safely and efficiently.	Car parking (22 spaces, including 1 parking space for disabled persons) is currently available on the site as per Condition 45 of the existing Development Consent. These will be maintained for the	Yes – Site and engineering plans given in Appendix 3

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		development to comply with Chapter 12 of the DCP.	
s9.2.3	**Loading facilities** The DCP sets out requirements for the type and configuration of loading facilities, to ensure that the development does not adversely impact on pedestrian and vehicle amenity.	The site has an existing semi-trailer loading facility and meets the current requirements of a large warehouse development (greater than 3,000 m^2 Gross Floor Area). The DCP requires that the semi-trailer loading area be 3.5 m x 17.5 m.	Yes - with the proposed development, the requirements for the truck loading area will not change.
s9.2.4	**On-site manoeuvring** The DCP requires that the development is performed to ensure adequate manoeuvring is performed to ensure that a large rigid truck is able to enter and leave the site in a forward direction, consistent with Australian Standard AS 2890.2 (2002).	Vehicles entering the site will not change from current operations. However, there will be an increase in vehicle movements, and the management of these impacts is considered as part of the EIS.	Yes – considered as part of Traffic and Transport Study - Section 10.
s9.2.5	**Vehicular access** This DCP requirement seeks to manage access arrangement according to the road functions, degree of traffic, and to ensure safe access arrangement are provided that do not interfere with traffic flow and improve pedestrian amenity. Specifically under Condition (f) of s9.2.5 of the DCP, for bulky goods premises, separate vehicular entry and egress points will be required.	Separate vehicle entry and exits points are already provided at the subject site, consistent with the existing development consent.	Yes – as per current development consent
s9.2.6	**Pedestrian movement** Pedestrian access through car parking areas should be clearly marked, and where possible emphasised by the use of raised and textured surfaces. As far as possible, pedestrian access through car parks should be kept separate from vehicle access ways. Development for the purposes of bulky goods premises will also be required to provide weather protection for pedestrians by way of awnings, colonnades or verandas where footpaths are adjacent to structures.	Pedestrian access is already provided at the subject site, consistent with the existing development consent.	Yes – as per current development consent
s9.2.7	**Splay corner setbacks and road widening** All corner lots at the intersections of public roads will be required to maintain a setback to the corner of the public road to improve site	Not relevant as subject site is not a corner lot.	Not applicable.

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	distances at intersections. In this splay corner setback no buildings, fences or other structures will be permitted. Landscaping will be restricted to lawn or low growing shrubs and other plant species. Splay corner setbacks will generally be required to be 6 metres x 6 metres		
s9.3.1	**Advertising signage** a) Total advertising area of up to 0.5 square metres for every metre of lineal street frontage is permitted. On corner allotments, the largest street frontage only can be used to calculate the advertising area allowed. This means that for a property with a frontage of 30 metres the total maximum advertising area for signs of any permitted kind will be 15 square metres of total advertising area. b) No single sign may be permitted to exceed an area of 30 square metres. c) Only one free standing commercial sign that identifies the name of the occupants and/or products manufactured on the site will be allowed. These signs must be contained wholly within the site. d) For factory units or other multiple occupancy buildings one free standing sign will be permitted and the owners of the building need to make sure that there is adequate provision for identifying all occupiers. For larger complexes more than one free standing commercial sign will be considered. e) Freestanding commercial signs in Wetherill Park must be setback a minimum distance of one third of the building line setback. For example, if the building line is 20 metres from the road, then the sign must be setback at least 6.6 metres.	Current signage at entrance to property is consistent with current development consent and will not change with the proposed development.	Yes – consistent with current development consent.
s9.4.1	**Landscaping** The use of decorative paving treatments such as paving bricks adds interest to large areas of hard paving. Open car parking areas should be landscaped to reduce the impact of hard paving. Established tall trees with wise spreading foliage provide desirable shade reducing the effects of heat.	Existing landscaping will be maintained at entrance to subject site consistent with current development consent.	Yes – consistent with current development consent.

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s9.4.2	**Fencing** a) For fencing along the front boundary or a boundary facing a classified (arterial) road, the requirements are: a. a maximum height of 2.4 metres on the boundary line b. solid construction up to 600 mm above natural ground level c. be constructed in an open style, such as powder-coated wrought iron pickets and be of dark colour d. for security fencing, only palisade fencing made from metal is permitted. b) Fencing requirements along the side or rear boundaries are: a. maximum height is 2.4 metres on the boundary line b. constructed in an open style such as powder-coated wrought iron pickets or chain wire. c) General requirements applying to all fencing are: a. access gates should swing inward. b. any fencing which in the opinion of Council is in a dilapidated condition should be replaced c. integrating landscaping around the fencing that is easy to maintain and will not act as a security risk when trees are fully mature d. solid fencing appropriately screened with landscaping is only permitted where required by Council or other legislation as an acoustic treatment.	Current fencing at entrance to the site and the southern site boundary will be maintained as part of the proposed development and is consistent with the current development consent. Fencing on the northern boundary of the site will comprise of a 7.6m high precast concrete fire wall to provide a permanent structure at the rear of the recycled product storage shed. Fencing at the rear of the site will comprise an 8 m high precast concrete wall associated with the rear wall of the warehouse extension. A 1.2 m high concrete wall will be built as a fence above the retaining wall along the remaining boundary of the rear fence line.	Yes – new fencing complies with the requirements of the DCP.
s9.4.3	**Streetscape and amenity – building materials** The DCP requires that all development applications for new buildings, extensions or renovations involving exterior cladding of existing buildings must be accompanied by the details of the building construction and the materials to be used on external facades.	Exterior cladding used will be consistent with current building materials used for exterior cladding on the site.	Yes - this requirement is addressed in the detailed design plans (Appendix 3).
s9.4.4	**Hours of operations** The DCP sets out allowed hours of operation of Mon to Friday 7am to 9pm; and Saturday 8am to 6pm.	In the existing development consent under Condition 50(d), deliveries to the site are restricted to 6am-6pm Monday to Friday, and 6am to 12 noon Saturdays. Under Condition 51 of the development consent, the approved hours of operation	Yes - the proposed development is consistent with this existing requirement.

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		of the premises are 24 hours, 7 days per week.	
s9.4.5	**Residue land** Undeveloped land must be kept in a clean and tidy state.	All land as part of the current subject site is currently used and is maintained to ensure a clean and tidy state.	Yes
Appendix E	**Waste Not Policy to manage demolition and construction waste** The DCP in Appendix E sets out Councils requirements where the demolition of buildings or structures is required as part of the development. The objectives of the policy is to effectively reuse and recycle materials from the demolition and construction associated with development where possible rather than dispose to land fill; and to provide guidance and controls on the on safe treatment and disposal of fibro.	As part of the EIS, a waste management plan has been prepared to address the requirements of the DCP.	Yes – see Waste Management Plan (Section 4)
s2.4	**Plan requirements** The DCP sets out a range of plans that are required as part of the development application process. This includes: • Site plan • Plans and elevation • Notification Plan (A4 size) • Survey Plan • Landscape Plan • Erosion and Sediment Control Plan • Stormwater disposal (drainage) plan • Shadow Diagram (required for all new buildings or additions where lot size, orientation, slope of site or adjoining buildings create the potential for overshadowing)	These plans have been prepared to support the EIS.	Yes – Refer to Appendix 3 for the detailed design plans for the proposed development.
1.8	**Section 94 Direct Development Contribution Plan 2011** The *Environmental Planning and Assessment Act* 1979 allows local government to levy contributions towards the capital cost of providing or improving facilities, infrastructure and services to meet increased demand created by additional development within their areas. Under Clause 2.7 of the Section 94 Development Contribution Plan 2011,	Under the Direct (Section 94) Development Contribution Plan, the subject site is outside of the area subject to payment of these contributions. Also, as adequate car parking is provided on site in compliance with the DCP, the Section 94 Direct Development Contribution Plan 2011 does not apply.	Not applicable

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	if the area of commercial or retail floor space where a developer cannot provide the required car spaces on site, Section 94 contributions apply.		
1.8	**Section 94A Indirect Development Contribution Plan 2011** The *Environmental Planning and Assessment Act* 1979 allows local government to levy contributions towards the capital cost of providing or improving facilities, infrastructure and services to meet increased demand created by additional development within their areas. Under Section 94A, this authorises the Council to impose as a condition of development or as a condition on complying development certificates, a requirement that the applicant pay to the Council a levy determined in accordance with the plan. It also applies to all land in the Fairfield Local Government Area.	Section 94A Indirect Development Contributions are based on the value of works. Under section 7.1 of the Section 94A *Indirect Development Contribution Plan* 2011, for works up to $100,000, the levy is nil; for works between $100,001 to $200,000, it is calculated at 0.5% of the proposed cost of development; and for developments valued at more than $200,000, it is levied at 1.0% of the proposed cost of development.	Yes – these fees will be payable as deemed by Fairfield City Council (at the 1.0% rate)

2.3.2.6 Western Sydney Regional Waste Avoidance and Resource Recovery Strategy 2014-2017

In 2014, the NSW EPA funded the Western Sydney Regional Organisation of Councils (WSROC) to prepare the Western Sydney Regional Waste Avoidance and Resource Recovery Strategy, for the period between 2014 and 2017. Fairfield City Council is one of the 10 participating councils in the region that have committed as part of this strategy to meet the recycling targets as defined in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021*.

The strategy sets the following targets for 2021–22:

- avoiding and reducing the amount of waste generated per person in NSW
- increasing recycling rates to:
    - 70% for municipal solid waste
    - 70% for commercial and industrial waste
    - 80% for construction and demolition waste
- increasing waste diverted from landfill to 75%
- managing problem wastes better, establishing drop off facilities in the region
- reducing litter, with 40% fewer items (compared to 2012) by 2017
- combatting illegal dumping, with 30% fewer incidents (compared to 2011) by 2017.

By 2021, it is estimated that additional recycling infrastructure of up to 300,000 tonnes per year will be required for treatment and recycling of municipal waste in Western Sydney alone. No data is available on the need for commercial waste recycling infrastructure in this strategy.

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2.3.2.7 NSW EPA Waste Less Recycle more funding program

Waste Less, Recycle More is a $465.7M five-year funding package of the NSW Government to assist business, industry and community to build new infrastructure, systems and services to help meet the NSW Government's 2021 recycling targets. The program commenced in 2013 and will be completed by June 2017.

The initiative is funded through the waste levy and is the largest waste and recycling funding program in Australia. The focus of Waste Less, Recycle More programs are to:

- encourage local communities to think differently about waste avoidance, recycling, littering and illegal dumping;
- deliver conveniently located, value-for-money waste infrastructure to make it easier for households and business to do the right thing; and
- drive innovative regulatory approaches to protect the environment and support investment in new waste programs.

In waste strategy modelling performed by SKM in 2013[7], evidence suggested that a further 1.1 million tonnes of commercial and industrial waste needs to be recycled across NSW each year to meet the NSW Government's recycling target of 70% by 2021.

In 2014, a waste audit of commercial and industrial waste funded under this program across 14 waste disposal and transfer stations across NSW found that paper, cardboard and plastic film make up ~20.8% of the commercial and industrial waste stream[8]:

- Paper – 10.16%; equivalent to 182,880 tonnes/yr is still disposed to landfill
- Cardboard – 5.54%; equivalent to 99,720 tonnes/yr is still being disposed to landfill
- Plastic film – 5.13%; equivalent to 92,490 tonnes/yr is still being disposed to landfill

In total, it is estimated that 375,090 tonnes/yr is available for further recycling comprising paper, cardboard and plastic film from commercial and industrial waste. Further investment in recovery and recycling infrastructure for these materials is clearly needed to reach the NSW Government's 70% recycling target by 2021.

The proposed development will involve an additional recycling infrastructure capacity of ~71,000 tonnes per year, which will be critical to assist in achieving these recycling targets.

2.4 Justification for any inconsistencies

The project proposal centres on an upgrade to Grima Environmental Services Pty Ltd's Resource Recovery Facility at 88 Redfern St, Wetherill Park. The project has current development consent and all aspects of the project comply with all identified planning strategies, policy and other laws affecting the proposed development.

[7] SKM (2013). Modelling and data analysis to inform new waste strategy. Report for NSW EPA. Internet publication: http://www.epa.nsw.gov.au/resources/wastestrategy/SKM-waste-model.pdf

[8] NSW EPA (2015). Disposal-based audit Commercial and industrial waste stream in the regulated areas of New South Wales Main report. Internet publication: http://www.epa.nsw.gov.au/resources/warrlocal/150209-disposal-audit.pdf

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2.5 List of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out

Under Clause 32(i) of Schedule 3 of the *Environmental Planning and Assessment Regulation* 2000, and Schedule 1 of the *Protection of the Environment Operations Act* 1997, the proposal is considered to be a designated and integrated development.

The site has an Environment Protection Licence from the NSW Environment Protection Authority (EPL 20647) as a Resource Recovery Facility under Schedule 1 of the *Protection of the Environment Operations Act* 1997 (see copy in Appendix 2).

Prior to the commencement of construction works on the site, a variation to the existing Environment Protection Licence will be required under Section 47 of the *Protection of the Environment Operations Act* 1997. The licence will require amendment to permit demolition and construction works on the site, to enable 'scheduled development work' to be undertaken. Under Section 47(3) of the *Protection of the Environment Operations Act* 1997, scheduled development work means:

"…work at any premises at which scheduled activities are not carried on that is designed to enable scheduled activities to be carried on at the premises."

As part of the integrated development assessment process, it is expected that a Construction Environmental Management Plan will be required as a condition of licence from the NSW Environment Protection Authority.

The proponent will need to also seek a Construction Certificate prior to works commencing under Section 109C of the *Environmental Planning and Assessment Act* 1979. This will permit the carrying out of construction works, involving the construction of the new hardstand and maintenance workshop and baling area at the rear of the site, installation of a new double conveyor, demolition and replacement of the material storage shed at the northern end of the site, new 115,000 L underground firewater storage tank, installation of a gross pollutant trap and stormwater isolation vale, and the installation of new disabled amenities as part of the office building.

Once construction works are completed, the proponent will require a further amendment to the sites' Environment Protection Licence under Section 48 of the *Protection of the Environment Operations Act* 1997. This licence variation will seek to enable the receipt and processing of additional waste materials as specified in this EIS (specifically plastic film), and increase the approved operating capacity of the facility to 99,000 tonnes per year. The licence variation will also accommodate an increase to the Authorised Amount from 700 tonnes to 1,000 tonnes at any one point in time.

And finally, under Section 109M of the *Environmental Planning and Assessment Act* 1979, an Occupation Certificate will be required for new building structures on the site.

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2.6 A description of how the proposed expansion integrates with existing on-site operations

Grima Environmental Services Pty Ltd's Resource Recovery Facility is currently used for the aggregation of cardboard, paper and plastic film. Currently, Grima Environmental Services Pty Ltd collects these materials from a range of commercial customers across Sydney. The materials are baled through a high efficiency baling system (American Bale Press, Model 8043HS-101) into 1 tonne blocks (Figure 2.7), and are then directly transported to markets. All materials generally received on the day are baled and moved to market either later in the day or immediately the next day. The only materials which are shipped less frequently are the wet strength cardboard bales (i.e. cardboard used in beer packaging) and bales of plastic film. These are shipped to markets every 2 to 4 weeks, depending on quantities available.

The following sections review the current operations, including an overview of the proposed operations. Integration of the new operations into the existing on-site operations is described.

2.6.1 Description of current operations

A site plan providing an overview of current operations is shown in Figure 2.13.

Trucks enter the dedicated entry of Grima Environmental Services Pty Ltd's premises from Redfern St. Trucks move directly onto the weighbridge, where the driverless weighbridge system (Accuweigh 60 tonne weighbridge) takes the gross weight of the vehicle. The truck then reverses towards the site entry, and then turns towards the exit of the site. Trucks then carefully reverse into the existing warehouse where separate loads of either cardboard, paper or plastic film are unloaded onto the concrete floor. The truck exits the warehouse in the forward direction, and where the net weight of the vehicle is already in the Grima Environmental Services Pty Ltd weighbridge records, the vehicle exits in the front direction through the dedicated exit gate. If the vehicle does not have a tare net weight in the Grima Environmental Services Pty Ltd weighbridge records, the truck will pass back over the weighbridge, before exiting the facility in the forward direction.

Following the unloading of materials onto the warehouse floor, materials are inspected for contamination. Contaminants are removed and then the materials are pushed via front end loader to a temporary storage point in the warehouse. Paper and plastics are stored loosely in piles near the entrance, and cardboard is aggregated near the baler, located at the rear of the warehouse.

Generally, cardboard, being the main material received by the facility, is loaded into the hopper of the conveyor, which feeds the horizontal baler, which bales the material into 1 tonne blocks. These blocks are tensioned strapped with steel wire to maintain block integrity. Blocks are then moved to the temporary storage area within the warehouse (Figure 2.13), then moved adjacent to the weighbridge and loaded onto a truck for export to markets. Note that baling of cardboard generally occurs between 6am and 3pm.

The materials handling process for paper and plastics is similar. Loose materials are stored in designated areas at the front of the warehouse, in bays which are formed through the use of either paper or plastic film blocks as a short side wall. These loose materials are transferred via front end loader, into the feed hopper conveyor, then baled into 1 tonne blocks. These blocks are transferred via forklift either back to the storage area, or directly onto a truck for export to market.

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Along the northern boundary, the existing maintenance shed is used for limited machinery repair and maintenance. In a separate section of the shed, along the eastern side, security shredding of paper occurs. This is done during business hours on either one or two days per week. Shredded paper is loaded into 1m^3 metal crates, which are then transferred via forklift and are emptied into the hopper within the main warehouse, where the paper is baled into 1 tonne blocks.

The office is used by staff at the site, and its use will continue as part of the upgrade to the site.

Trucks also enter the site from the dedicated entry point to transport baled cardboard, paper and plastic film to markets. Trucks proceed to the weighbridge where their tared weight is recorded, and blocks of recycled materials as appropriate are loaded onto the vehicle. These blocks are transferred from the warehouse generally before the vehicle arrives, and are stacked adjacent to the weighbridge for loading onto the vehicle.

2.6.2 Description of proposed operations

To improve the operational efficiency of the facility, and increase the processing capacity of the plant to 99,000 tonnes per year, and storage of up to 1,000 tonnes of product on site, some changes to the way the site is used are proposed and considered in this study. These changes are described as follows and shown in Figure 2.13. The position of the existing and new baler is shown in Figure 2.14.

- **Demolition of existing workshop shed, and construction of a new recycled products storage shed (under cover)**

  This new under cover storage shed will replace the existing maintenance workshop along the northern boundary of the site. This area will be used for storing baled cardboard, paper and plastic film, with walls on three sides, ready for transport. By minimizing the space occupied by baled material in the main processing warehouse, the processing capacity of the existing building and baling equipment is anticipated to comfortably increase to at least 99,000 tonnes per year.

  Baled material will then be moved via forklift and loaded directly onto trucks that will take the materials directly to market. Note that a 6.5 m high masonry fire wall will be built along the northern boundary of the product storage shed, to provide a robust wall the can support the placement of blocks of recycled material. It is anticipated that up to 1,000 tonnes of baled products[9] will be stored within the product storage shed. Security paper shredding will remain in a small part north-eastern corner of the product storage shed.

- **New maintenance workshop and secondary baling area, and awning**

  The existing maintenance workshop will be demolished to accommodate the new recycled products storage shed. A new mechanical workshop with a secondary baling area and

[9] If each bale is ~1.1m x 1.1m x 1.1m, and weighs one tonne, and with bales potentially stacked four-high beneath the 6.5m roofline, the total storage capacity of the recycled products storage shed is estimated to be 1,874 bales. This is equivalent to ~1,874 tonnes of product, well in excess of the desired storage capacity of 1,000 tonnes.

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awning will be installed at the rear of the processing warehouse. A new concrete hardstand and footings will be required.

A new high density American Bale Press (Model 8043 HS-10-T75) (Figure 2.15) will be installed at the western side of the new workshop. The existing bale press will be moved into the new extension to providing additional working space in the existing warehouse. The balers will be fed by a new electric double conveyor (Arex BE1800). The existing rear steel wall of the warehouse will be removed to open into the new extension.

An awning will be installed in front of the workshop to provide all weather usage and reduce the chance that bales would become wet under wet conditions when they are transferred to the recycled products storage shed via forklift.

- **Minor baler repositioning in the main processing warehouse and double conveyor**

  The maximize the area available for drop off of paper, cardboard and plastic film in the main processing warehouse, the existing bale press will be moved 4m further to the rear of the warehouse (Figure 2.14). As described above, a new double conveyor will be installed to feed this bale press and a new bale press to be positioned

  Note that the proposed additional baler and new double conveyor will have a combined processing capacity of 34 tonnes per hour. With an operating cycle of 12 hours per day, 6 days per week, the processing capacity of the baling system will exceed 127,000 tonnes per annum.

- **Underground firewater storage tank and firewater containment**

  Beneath the concrete floor of the new mechanical workshop and baling area, a basement will be constructed to house 115,000L firewater storage tank (4.6m wide, 8.6m long and 2.91m deep; refer to Appendix 3 for detailed plans). The basement will have a compacted base with waterproof membrane. The tank will be connected to downpipes from the warehouse roofline, and tank overflow to be connected to the existing stormwater system.

  A stormwater isolation value will also be installed prior to the council stormwater connection to the north-east corner of the site. This valve will be connected to the fire indication panel in the office and will be activated in the event of fire.

- **Treatment of stormwater runoff**

  A new Rocla CDS® gross pollutant trap will be installed at the north-east corner of the site prior to the council stormwater connection to further reduce gross pollutants, suspended sediments, nutrients, heavy metals and hydrocarbons in stormwater runoff.

- **New disabled bathroom amenities**

  Within the existing bathroom amenities on the site, these will be adapted to provide a separate disabled toilet and washroom facility.

The proposed changes to the site are minor, though they will permit the facility to receive more cardboard, paper and plastic film for recycling, and increase the operational efficiency of the site. These changes have been planned to integrate seamlessly within the existing site operations,

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without major changes to buildings, plant or equipment. As a consequence, minimal impacts on neighbours are expected with the minor change in use of the site.

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Figure 2.13. Site and locality plan showing how the proposed expansion integrates into existing on-site operations. See Appendix 3 for details.

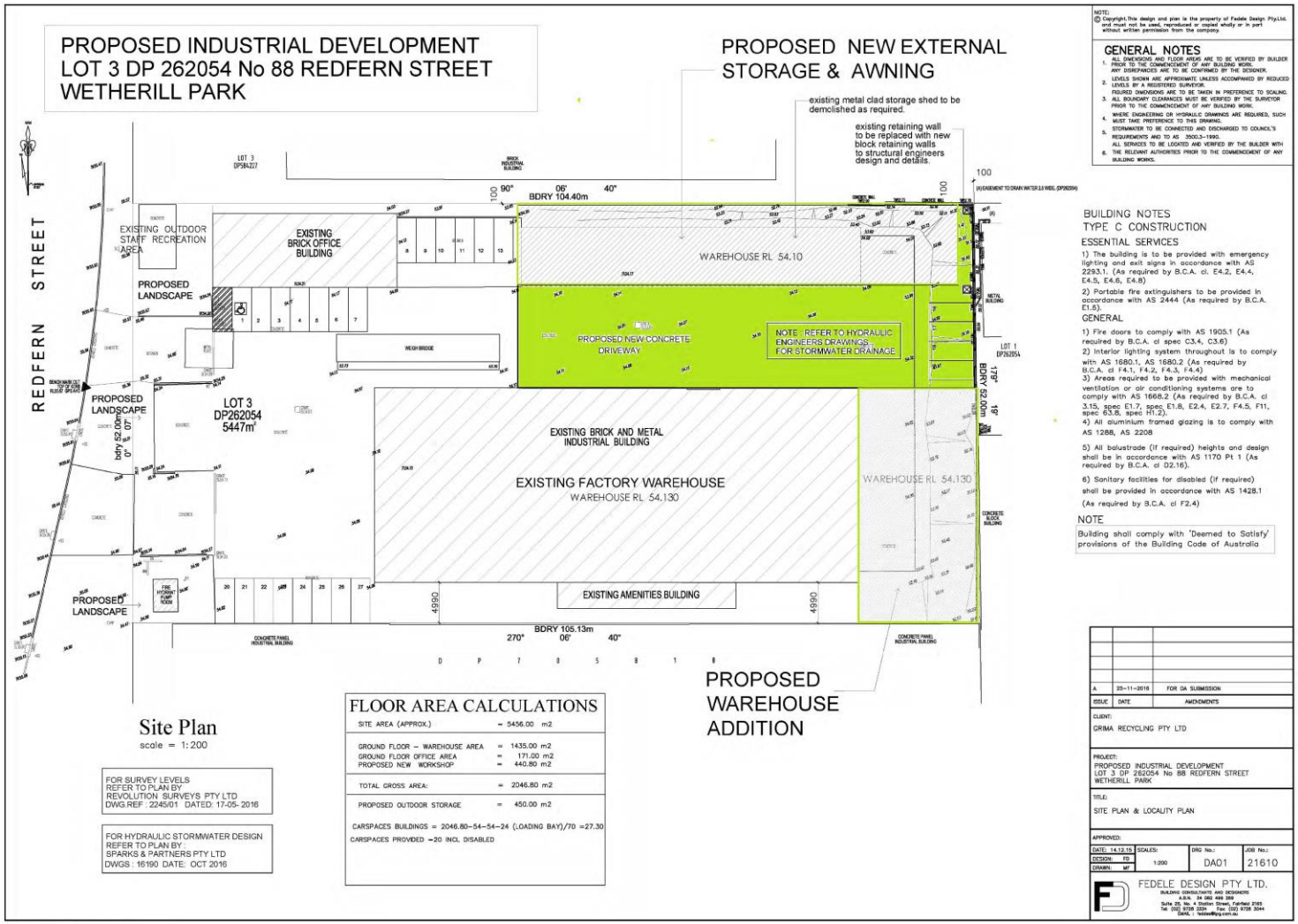

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Figure 2.14. Site plan showing how the repositioning of the existing baler, new double conveyor and the new baler in the mechanical workshop and baling area. See Appendix 3 for details.

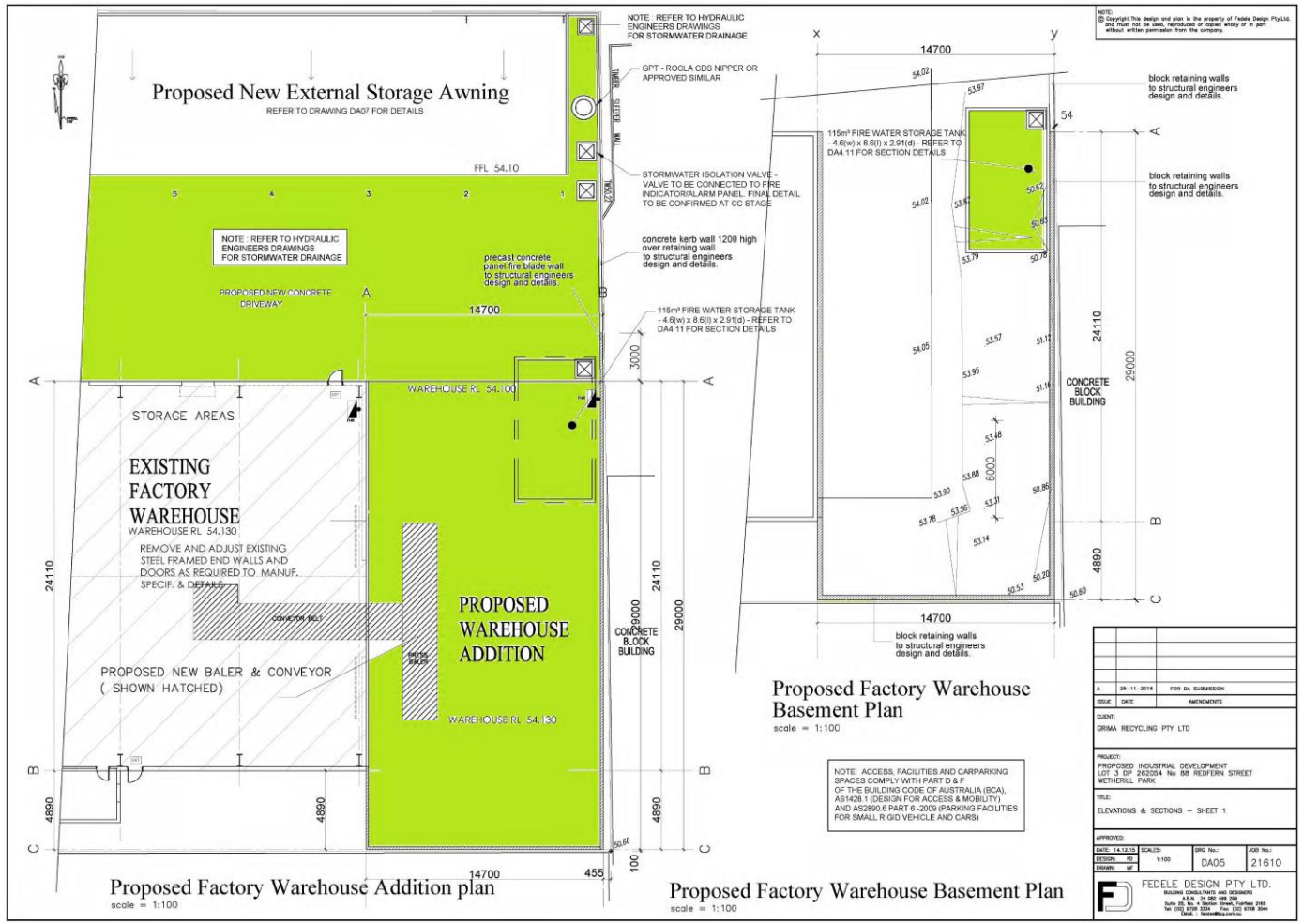

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Figure 2.15. Photo of the new secondary American Bale Press (Model 8043 HS-10-T75) to be installed in the new mechanical workshop and baling area.

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2.7 Description of any additional licence(s) or approval(s) required to carry out for the proposed development

All additional licensing or approvals required as part of the upgrade to the Grima Environmental Services Pty Ltd Resource Recovery Facility is given in Section 2.5 of this EIS.

2.8 An environmental risk assessment of the potential impacts of the development identifying key issues for assessment

A Preliminary Hazard Analysis and Environmental Risk Assessment has been performed to identify key potential impacts of the development, as well as potentially offensive or hazardous issues that need to be considered as part of the EIS process.

The assessment has been performed according to AS/NZS ISO 31000: 2009 *Risk Management – Principles and Guidelines* and the Preliminary Hazardous Analysis has been informed by the *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33* (NSW Department of Planning, 2011)[10]. We have also considered the following guidelines published by the NSW Department of Planning in 2011:

- *Hazardous Industry Planning Advisory Paper No 2 - Fire Safety Study Guidelines*[11]
- *Hazardous Industry Planning Advisory Paper No 3 - Risk Assessment*[12]
- *Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning*[13]
- *Hazardous Industry Planning Advisory Paper No 6 - Hazard Analysis*[14].

[10] NSW Department of Planning (2011). Hazardous and Offensive Development Application Guidelines - Applying SEPP 33. Published by the NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/en/Policy-and-Legislation/~/media/3609822D91344221BA542D764921CFC6.ashx

[11] NSW Department of Planning (2011). Hazardous Industry Planning Advisory Paper No 2 - Fire Safety Study Guidelines. Published by the NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/CCC734E980C4427DB95D319DF073C41A.ashx

[12] NSW Department of Planning (2011). Hazardous and Offensive Development Application Guidelines- Risk Criteria for Land Use Safety Planning. Published by NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/0D39F08E7889409BBA1FA88D5FB859FD.ashx

[13] NSW Department of Planning (2011). Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning. Published by the NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/0D39F08E7889409BBA1FA88D5FB859FD.ashx

[14] NSW Department of Planning (2011). Hazardous Industry Planning Advisory Paper No 6 - Hazard Analysis. Published by NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/3ACC37BE3EFE4BAAB3EBA5872AFBA8BD.ashx

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2.8.1 Scope

The assessment has been performed to identify the risks posed to people, property and the environment, and to identify potential hazardous and offensive issues that need to be addressed as part of the development to ensure compliance with SEPP 33. The assessment also considers off-site risks to people, property and the environment (in the presence of controls) arising from atypical and abnormal hazardous events and conditions (i.e. equipment failure, operator error and external events). The hazard treatment measures that have been proposed assist in producing a 'low' level of risk in accordance with the risk acceptance criteria.

2.8.2 Methodology

The methodology used to inform preliminary hazard analysis and environmental risk assessment has included the following steps:

- Identify and screen the hazards associated with the project;
- Examine the maximum reasonable consequence of identified events;
- Qualitatively estimate the likelihood of events;
- Proposed risk treatment measures;
- Qualitatively assess risks to the environment, member of the public and their property arising from atypical and abnormal events and compare these to applicable qualitative criteria;
- Recommend further risk treatment measures if considered warranted; and
- Qualitatively determine the residual risk assuming the implementation of the risk treatment measures.

It is important to note that this preliminary hazard analysis and environmental risk assessment has been undertaken at an early stage of the proposed development to help inform key issues to be considered in the EIS. All hazards need to be identified, and an assessment of the resultant risk levels on a cumulative basis is also undertaken as part of the study.

2.8.2.1 Risk management

The environmental risk assessment has been informed by AS/NZ 31000: 2009 *Risk Management Principles and Guidelines* and *Hazardous Industry Planning Advisory Paper No 3 - Risk Assessment* (NSW Department of Planning, 2011). The risk management process has been informed by the following elements:

- Establish the context;
- Identify the risks;
- Analyse the risks;
- Evaluate the risks; and
- Treat risks.

2.8.2.2 Risk criteria

The following principles have been adopted to identify and assess risk in this study. This has been informed by the *Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning* (NSW Department of Planning, 2011).

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- the avoidance of all avoidable risks;
- the risk from a major hazard should be reduced wherever practicable, even where the likelihood of exposure is low;
- the effects of significant events should, wherever possible be contained within the site boundary; and
- where the risk from an existing installation is already high, further development should not pose any incremental risk.

2.8.2.3 Qualitative measurement of consequence, likelihood and risk

To undertake a qualitative risk assessment, it is useful to describe the levels of consequence of a particular event, and the likelihood or probability of such an event occurring. Risk assessment criteria have been developed in AS/NZS ISO 31000: 2009 which allows the risk assessor to develop risk criteria during the establishment of the context.

In according with AS/NZS ISO 31000: 2009, the following tables have been reviewed as part of establishing the context of the project. These tables were considered to be consistent with the specific objectives of the preliminary hazard analysis and environmental risk assessment.

Table 2.4. Qualitative measures of probability.

Event	Likelihood	Description
A	Almost certain	Happens often
B	Likely	Could easily happen
C	Possible	Could happen and has occurred elsewhere
D	Unlikely	Hasn't happened yet but could
E	Rare	Conceivable, but only in extreme circumstances

Table 2.5. Qualitative measures of maximum reasonable consequence.

Event	People	Environment	Asset / Production
1	Multiple fatalities	Extreme environmental harm (e.g. widespread catastrophic impact on environmental values of an area)	More than $1B loss or production delay
2	Permanent total disabilities, single fatality	Major environmental harm (e.g. widespread substantial impact on environmental values of an area)	$100M to $1B or production delay
3	Minor injury or health effects (e.g. major lost workday case / permanent disability)	Serious environmental harm (e.g. widespread and considerable impact on environmental values of an area)	$5M - $100M loss or production delay

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Event	People	Environment	Asset / Production
4	Minor injury or health effects (e.g. restricted work or minor lost workday case)	Material environmental harm (e.g. localised and considerable impact on environmental values of an area)	$250K to $5M loss or production delay
5	Slight injury or health effects (e.g. first aid / minor medical treatment needed)	Minimum environmental harm (e.g. minor impact on environmental values of an area)	Less than $250K or production delay

Combining the probability and consequence tables, Table 2.6 provides a qualitative risk analysis matrix to assess risk levels.

Table 2.6. Qualitative risk analysis matrix used in this preliminary hazard analysis and environmental risk assessment.

Consequence	Probability[1]					
		A	B	C	D	E
	1	1 (H)	2 (H)	4 (H)	7 (M)	11 (M)
	2	3 (H)	5 (H)	8 (M)	12 (M)	16 (L)
	3	6 (H)	9 (M)	13 (M)	17 (L)	20 (L)
	4	10 (M)	14 (M)	18 (L)	21 (L)	23 (L)
	5	15 (M)	19 (L)	22 (L)	24 (L)	25 (L)

[1] Legend – L: low; M: Moderate; H: high; Risk numbering: 1 – highest; 25 – lowest risk. Colour coding: Green: tolerable risk; orange: ALARP – as low as reasonably practicable; red: intolerable risk.

Risk acceptance criteria for the project have been formulated following consideration of the *Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning* (NSW Department of Planning and Environment, 2011d) and AS/NZS ISO 31000 2009 – *Risk Management Principles and Guidelines.*

In assessing the tolerability of risk from potentially hazardous development, both qualitative and quantitative aspects need to be considered. Relevant general principles considered in this study as documented in the *Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning* (NSW Department of Planning, 2011):

- the avoidance of all avoidable risks;
- the risk from a major hazard should be reduced wherever practicable, even where the likelihood of exposure is low;
- the effects of significant events should, wherever possible be contained within the site boundary; and
- where the risk from an existing installation is already high, further development should not pose any incremental risk.

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2.8.3 Site description

The subject site is located at 88 Redfern St, Wetherill Park. The site is also identified at Lot 3, DP 262054. The site consists of 5,345 m^2 of industrial land located in the Fairfield City Council local government area.

A full site description is given in Section 2.1.

2.8.4 Process

A detailed overview of current and proposed operations is given in Section 2.6.

2.8.5 Hazardous materials stored on-site

The NSW Department of Planning (2011) in the *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33* sets out a process for screening potentially hazardous materials that are stored on site as part of a proposed development.

Potential risk typically of holding certain types of hazardous materials on site depends on:

- the properties of the substance(s) being handled or stored;
- the conditions of storage or use;
- the quantity involved;
- the location with respect to the site boundary; and
- the surrounding land use.

Risk screening needs to be undertaken as part of the SEPP 33 guidelines based on an estimate of the consequences of fire, explosion or toxic release from material(s) being handled. It takes into account information from the proponent on the properties of the materials, quantity, type of storage or use, and location. A risk screening analysis for the proposed development is given in Table 2.7 below.

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Table 2.7. Risk screening analysis of potentially hazardous materials held on site as part of the development.

Material / potential pollutant	Storage location	Dangerous Goods Class[1]	Packing Group[2]	Maximum quantity on site	Screening method[3]	Threshold[4]	Notes
Paper, cardboard and plastic film	Loose and baled in Processing Warehouse and Product Storage Shed	n/a	n/a	1,000 tonnes	n/a	n/a	Not a dangerous good but is flammable given quantities held on site
Diesel	Above ground bulk fuel tank in mechanical workshop	3	III	200 L	Table 1	10,000 L or kg	Below threshold
Engine coolant	Mechanical workshop	n/a	n/a	20 L	n/a	n/a	Not classified as a dangerous good
Hydraulic oil	Mechanical workshop	3	III	200 L	Table 1	10,000 L or kg	Below threshold
Engine oil	Mechanical workshop	3	III	1,000 L	Table 1	10,000 L or kg	Below threshold
Gear oil	Mechanical workshop	3	III	200 L	Table 1	10,000 L or kg	Below threshold
Transmission oil	Mechanical workshop	3	III	20 L	Table 1	10,000 L or kg	Below threshold
Degreaser	Mechanical workshop	3	III	200 L	Table 1	10,000 L or kg	Below threshold
Brake fluid	Mechanical workshop	3	III	<10 L	Table 1	10,000 L or kg	Below threshold
Grease drum cartridges	Mechanical workshop	3	III	< 10 L	Table 1	10,000 L or kg	Below threshold
Gas (LPG) – Forklift gas	Mechanical workshop	2.1	n/a	<500 kg	Table 3	10,000 kg	Below threshold

[1] Class 2.1 Dangerous Goods are classified as 'flammable gases'; Class 3 Dangerous Goods are classified as 'flammable liquids'; [2] Packing Group III is a group of dangerous goods that are classified as 'substances presenting lower danger'. [3] Screening method is the methodology used to assess dangerous goods in the NSW Department of Planning (2011) *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33*. [4] Where dangerous goods are stored on-site which exceed the nominated thresholds as per Department of Planning (2011) *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33*, the proposed development is considered to be hazardous and requires detailed assessment under SEPP 33.

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2.8.5.1 Paper, cardboard and plastic film

The current and proposed upgrade to the development will result in an increase in the receipt of paper, cardboard and plastic film for baling and recycling on-site. As the facility is operated principally as a transfer station, materials received on-site are generally baled, blocked and exported off-site the same day or the next day.

Whilst these materials are not classified as dangerous goods according to the Dangerous Goods Code, these materials are combustible if exposed to an ignition source, and are a possible fire risk. Up to 1,000 tonnes of loose and baled products will be stored in the processing warehouse and product storage shed at any one point in time. Principally baled product is stored under cover along the northern boundary of the site.

Though materials are stored in a dry state, and are less flammable when fully baled, strict procedures are in place at the premises to avoid any hot work during operations and smoking is strictly prohibited in all parts of the site. Generally, dust is not produced during baling and security shredding of paper, so the fire or explosion risk caused by dust is considered low.

Surrounding land uses are industrial with neighbours identified in Section 2.1 of this EIS. Surrounding land uses are not considered to be a fire risk, and the likelihood that fire could spread and impact on the proposed development is considered to be low.

2.8.5.2 Diesel

Diesel is classified as a Class 3 combustible liquid according to the Australian Dangerous Goods Code. Limited volumes of diesel will be stored in the mechanical workshop for the purpose of emergency fuelling of trucks on-site. In the event of a spill, diesel is damaging to soils and aquatic ecosystems and fires can occur if it is ignited (flash point 61 to 150°C).

The risks associated with this project include diesel storage and use. The use of diesel will be in accordance with the requirements of AS 1940: 2004 - *The storage and handling of flammable and combustible liquids*[15]. The above ground tank of diesel stored in the mechanical workshop will be appropriately bunded to ensure any spills are contained within the bunding. Given the small quantity to be stored on site (<200 L), this hazardous material is considered to be very low risk on the site.

2.8.5.3 Engine coolant

Very small quantities of engine coolant (<20 L) will be stored in the mechanical workshop for servicing on-site vehicles. Engine coolant, containing water and ethylene glycol mixes are not considered hazardous according to the Australian Dangerous Goods Code, but can be poisonous if ingested and can be toxic to aquatic organisms if leaked into waterways.

Engine coolant will be appropriately stored in a bunded container in the mechanical workshop, and stored and used in accordance with its approved Material Safety Data Sheet[16].

[15] AS 1940: 2004 - *The storage and handling of flammable and combustible liquids*. Published by SAI Global. Internet publication: http://infostore.saiglobal.com/store/Details.aspx?ProductID=253546

[16] Shell Australia (2016). Material safety data sheet – Shell HD N 50:50 engine coolant. Internet publication: http://www.shell.com.au/products-services/solutions-for-businesses/lubricants/products/types-oils-lubricants/coolants.html

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2.8.5.4 Hydrocarbons (including hydraulic oil, engine oil, gear oil, transmission oil, brake fluid, grease drum cartridges and degreaser)

Liquid hydrocarbons including hydraulic oil, engine oil, gear oil, transmission oil, brake fluid, grease and degreaser are classified as Class 3 combustible liquids according to the Australian Dangerous Goods Code. Limited volumes of these fluids are stored in the mechanical workshop for the purpose of servicing on-site vehicles. In the event of a spill, these hydrocarbons can be damaging to soils and aquatic ecosystems and fires can occur if it is ignited.

The risks associated with this project include storage and use of hydrocarbons. The use of these fluids will be in accordance with the requirements of AS 1940: 2004 - *The storage and handling of flammable and combustible liquids*. The above containers of these fluids stored in the mechanical workshop will be appropriately bunded to ensure any spills are contained within the bunding. Given the small quantity to be stored on site these hazardous material (<2,000 L in total) is considered to be low risk on the site.

2.8.5.5 Gas (LPG) – Forklift gas

Liquefied petroleum gas (LPG) used as a fuel in forklifts on site is classified as a Class 2.1 flammable gas under the Australian Dangerous Goods Code. Limited volumes of LPG are stored outside of the mechanical workshop for the purposes of fuelling the forklift units.

The risks associated with the storage of small volumes of LPG will be minimised in a dedicated space outside the mechanical workshop in an approved rack with safety chains consistent with the Material Safety Data Sheet[17].

2.8.6 Further hazard identification, scenarios, consequence, likelihood analysis and risk assessment

To help understand further hazards possible as part of the proposed development, a series of potential worst case scenarios have been assessed to determine possible consequences, likelihood and risk. The NSW Department of Planning's (2011) *Hazardous Industry Planning Advisory Paper No 6 - Hazard Analysis* has been used to assist in guiding this analysis.

As per the above guidelines, we have qualitatively assessed the impacts of the largest possible event on people, plant and the environment. The worst-case scenarios reflect any foreseeable factors that could exacerbate the severity of an accident, including abnormal process conditions, out of hours manning levels, and the potential for control measures to be disabled or rendered inoperable by the accident.

The worst case scenarios we have assessed include the following:

- Vehicle collision on entry to the site, resulting in fire and possible death;
- Leaks / spills on vehicle entry to the site, with potential impacts on stormwater and fire risk;

[17] ELGAS (2016). Material safety data sheet for storage of LPG gas cylinders. Internet publication: http://www.elgas.com.au/storage-handling-lpg-gas-bottles-cylinders

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- Vehicle theft and malicious damage, leading to equipment failure and injury to person(s);
- Vehicle collision in processing warehouse, resulting in fire and possible death;
- Leaks / spills in processing warehouse, with potential impacts on stormwater and fire risk;
- Vehicle theft and malicious damage in processing warehouse, leading to equipment failure and injury to person(s);
- Fire caused by excess dust and build-up of electrostatic electricity or spark and fire in the processing warehouse;
- Baler breakdown and excess stockpiling leads to stock increases stored in warehouse and product storage shed increases risk of vehicle collision or fire;
- Vehicle collision between delivery vehicles with other on-site vehicles through driver error, or pedestrian, resulting in possible fire or death near the product storage shed;
- Leak / spill from vehicle collision adjacent to product storage shed, with potential impacts on stormwater and fire risk;
- Fire caused by ignition source (e.g. cigarette) near the product storage shed;
- Leakage of fuel and oil containers in workshop, potentially igniting and/or moving into stormwater, through human error or malicious act;
- Vehicle or material within workshop stolen, and leads to equipment failure and possible safety risk to staff; and
- Fire caused by ignition source (e.g. cigarette, hot work such as welding) and flammable materials in workshop (e.g. fuels, oils) catch fire due to spark from cigarette or hot work.

Prevention and treatment measures to reduce the likelihood and resulting consequences from these worst-case scenarios are mapped out in Table 2.8 below. Note that a risk rating category has been prepared to understand the significance of these risks – on the environment and human health. Note that the risk ratings estimated as part of the qualitative analysis are specified after implementation of the risk prevention, treatment and detection measures.

As a result of this analysis, it is suggested that the worst-case scenarios modelled with risk prevention, treatment and detection measures are all moderate or low risks. All risks are low except those that involve fire caused by vehicle collections, fuel leakage, excess dust and smoking.

The proposed project is not considered a potentially hazardous development as per Figure 11 of the SEPP33 Guidelines, so no further Preliminary Hazard Analysis or Multi-Level Risk Assessment has been performed.

However, we have identified a number of moderate risks to the environment, people and property, and these will be evaluated further in this EIS. These risks are described in Section 2.8.7.

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Table 2.8. Hazard identification, scenario, consequence, prevention/treatment measures and risk rating table.

Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
Entry to site						
Vehicle collision	Possible collision of delivery vehicles with other on-site vehicles through driver error, or pedestrian, resulting in possible fire or death	Fire possible outside of processing warehouse, potentially spreading to processing warehouse and product storage shed with flammable paper, cardboard and plastic film. Possible impacts on stormwater from discharge of fire water.	+ Ensure vehicle speed limits and regular driver education + Firefighting equipment + Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan + Work health and safety plan + Hazardous material management plan + Operator and driver training + Spill response equipment and training + Contact emergency services (NSW Fire Service)	Possible (C)	3	13 (Moderate risk)
Leak / spill	Vehicle collision / damage causes spill / leak of hazardous material	Collision causes leakage of vehicle fuel or oil onto handstand and possible stormwater impacts and a fire risk	+ Ensure vehicle speed limits and regular driver education + Firefighting equipment + Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan	Possible (C)	5	22 (Low risk)

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Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
			+ Work health and safety plan + Hazardous material management plan + Operator and driver training + Spill response equipment and training + Emergency response + Communications + Spill containment and sweeping of hardstand + Contact emergency services (NSW Fire Service)			
Vehicle theft / malicious damage	Vehicle or material within truck stolen	Components of a truck are stolen and leads to equipment failure and possible safety risk to staff	+ Ensure staff compliance with site security measures + Emergency management / response plan + Traffic management plan + Work health and safety plan + Contact emergency services (Police) + Site security / limited access	Possible (C)	5	22 (Low risk)
Excess noise and vibration from truck movements on site	Increase truck vehicle movements results in excess noise and vibration impacts on neighbours	Increased truck movements results in excess noise and vibration nuisance impacts on neighbours	+ Ensure vehicle speed limits and regular driver education + Traffic management plan	Possible (C)	5	22 (Low risk)
Warehouse operations						
Vehicle collision	Possible collision of delivery vehicles with other on-site vehicles	Fire possible in processing warehouse, potentially spreading to	+ Ensure vehicle speed limits and regular driver education + Firefighting equipment	Possible (C)	3	13 (Moderate risk)

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Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
	through driver error, or pedestrian, resulting in possible fire or death	product storage shed with flammable paper, cardboard and plastic film	+ Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan + Work health and safety plan + Hazardous material management plan + Operator and driver training + Spill response equipment and training + Contact emergency services (NSW Fire Service)			
Leak / spill	Vehicle collision / damage causes spill / leak of hazardous material inside processing warehouse	Collision causes leakage of vehicle fuel or oil onto handstand and possible stormwater impacts and a fire risk	+ Ensure vehicle speed limits and regular driver education + Firefighting equipment + Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan + Work health and safety plan + Hazardous material management plan + Operator and driver training + Spill response equipment and training	Possible (C)	5	22 (Low risk)

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Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
			+ Emergency response + Communications + Spill containment and sweeping of hardstand + Contact emergency services (NSW Fire Service)			
Theft / malicious damage	Vehicle or material within truck stolen	Components of a truck are stolen and leads to equipment failure and possible safety risk to staff	+ Ensure staff compliance with site security measures + Emergency management / response plan + Traffic management plan + Work health and safety plan + Contact emergency services (Police) + site security / limited access + Contact emergency services (NSW Police)	Unlikely (D)	5	24 (Low risk)
Excess dust and fire	Fire caused by excess dust and build-up of electrostatic electricity or spark and fire	Excess build-up of dust during baling operations, and spark through electrostatic electricity or spark through baler electrical failure	+ Ensure staff compliance with hot work procedures + Regular machinery maintenance and safety inspections + Dust minimisation practices + Firefighting equipment + Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan + Work health and safety plan	Possible (C)	3	13 (Moderate risk)

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Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
			+ Hazardous material management plan + Operator and driver training + Spill response equipment and training + Contact emergency services (NSW Fire Service)			
Baler breakdown and excess stockpiling	Excess stock increases stored in warehouse and product storage shed increases risk of vehicle collision or fire	Collision of vehicles due to constrained operational area, possible fire as a result	+ Cease receipt of paper, cardboard and plastic film on the site and divert trucks to other facilities + Firefighting equipment + Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan + Work health and safety plan + Hazardous material management plan + Operator and driver training + Spill response equipment and training + Contact emergency services (NSW Fire Service)	Unlikely (D)	5	24 (Low risk)
Product storage shed						
Vehicle collision	Possible collision of delivery vehicles with other on-site vehicles	Fire possible in product storage shed	+ Ensure vehicle speed limits and regular driver education + Firefighting equipment	Possible (C)	3	13 (Moderate risk)

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Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
	through driver error, or pedestrian, resulting in possible fire or death		+ Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan + Work health and safety plan + Hazardous material management plan + Operator and driver training + Spill response equipment and training + Contact emergency services (NSW Fire Service)			
Leak / spill	Vehicle collision / damage causes spill / leak of hazardous material adjacent to product storage shed	Collision causes leakage of vehicle fuel or oil onto handstand and possible stormwater impacts and a fire risk	+ Ensure vehicle speed limits and regular driver education + Firefighting equipment + Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan + Work health and safety plan + Hazardous material management plan + Operator and driver training + Spill response equipment and training	Possible (C)	5	22 (Low risk)

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Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
			+ Emergency response + Communications + Spill containment and sweeping of hardstand + Contact emergency services (NSW Fire Service)			
Fire	Fire caused by ignition source (e.g. cigarette)	Baled paper, cardboard and plastic film is ignited through contact with an ignition source (e.g. cigarette)	+ Ensure strict non-smoking policy is enforced at all times + Firefighting equipment + Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan + Work health and safety plan + Hazardous material management plan + Operator and driver training + Spill response equipment and training + Contact emergency services (NSW Fire Service)	Possible (C)	3	13 (Moderate risk)
Mechanical workshop						
Storage of fuels and hydrocarbons	Leakage of fuel and oil containers in workshop	Spills of fuels and oils occur in workshop, and potentially ignite and/or move into stormwater,	+ Ensure all fuels and oils are stored in fully bunded containers + Staff training on safe storage of fuels and oils			

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Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
		through human error or malicious act	+ Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan + Work health and safety plan + Hazardous material management plan + Spill response equipment and training + Emergency response + Communications + Spill containment and sweeping of hardstand + Contact emergency services (NSW Fire Service)			
Theft / malicious damage	Vehicle or material within workshop stolen	Components in workshop are stolen and leads to equipment failure and possible safety risk to staff	+ Ensure staff compliance with site security measures + Emergency management / response plan + Traffic management plan + Work health and safety plan + Contact emergency services (Police) + Site security / limited access	Unlikely (D)	5	24 (Low risk)
Fire	Fire caused by ignition source (e.g. cigarette, hot work such as welding)	Flammable materials in workshop (e.g. fuels, oils) catch fire due to	+ Ensure strict non-smoking policy is enforced at all times + Follow correct procedures for full containment of any hot work	Possible (C)	4	13 Moderate risk)

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Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
		spark from cigarette or hot work)	+ Firefighting equipment + Emergency management / response plan +Pollution incident response management plan / Environmental management plan + Traffic management plan + Work health and safety plan + Hazardous material management plan + Operator and driver training + Spill response equipment and training + Contact emergency services (NSW Fire Service)			

Risk rankings: 1, highest risk; 25, lowest risk. Colour coding: Green: tolerable risk; orange: ALARP – as low as reasonably practicable; red: intolerable risk.

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2.8.7 Risks to the environment, people and property to be investigated in this EIS

In addition to the SEAR's requirements to be addressed as part of this EIS, the following issues have been identified for further analysis and assessment. These principal issues have already been identified as part of the Preliminary Environmental Assessment to inform the SEAR's requirements, however the Preliminary Hazard Analysis and Environmental Risk Assessment has identified as number of sub-issues which need to be addressed in the EIS.

The list of issues below (Table 2.9) have all been classified as moderate risk according to the risk assessment done. All risks that have been identified as low risk are within acceptable limits and will be controlled through the mitigation measures as defined in Section 14.

Table 2.9. Key risks to the environment, people and property to be considered in addition to the SEAR's requirements as part of this EIS.

Principal issue or risk	Description	Study to assess issue or risk
Vehicle collision – entry to site	Possible collision of delivery vehicles with other on-site vehicles through driver error, or pedestrian, resulting in possible fire or death	+ Traffic and transport study (Section 10) + Water impact assessment (Section 6) + Fire and incident management (Section 11)
Vehicle collision – warehouse operations	Possible collision of delivery vehicles with other on-site vehicles through driver error, or pedestrian, resulting in possible fire or death	+ Traffic and transport study (Section 10) + Water impact assessment (Section 6) + Fire and incident management (Section 11)
Excess dust and fire	Fire caused by excess dust and build-up of electrostatic electricity or spark and fire	+ Air impact assessment (Section 5) + Fire and incident management (Section 11)
Vehicle collision – product storage shed	Possible collision of delivery vehicles with other on-site vehicles through driver error, or pedestrian, resulting in possible fire or death	+ Traffic and transport study (Section 10) + Water impact assessment (Section 6) + Fire and incident management (Section 11)
Fire	Fire caused by ignition source (e.g. cigarette, hot work such as welding)	+ Fire and incident management (Section 11)

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3 Environmental Impact Statement - Consultation

3.1 SEARs consultation requirements

A consultation program has been delivered to help identify key issues for consideration in this EIS. The scope of the program has been informed by the SEAR's requirements, and involved consultation with government agencies, Fairfield Council and neighbours potentially affected by the development.

The following organisations and neighbours were consulted:

- NSW Department of Planning and Environment;
- Fairfield City Council;
- NSW Environment Protection Authority;
- Roads and Maritime Services; and
- Neighbours – 16 in total.

To assist in seeking formal feedback on the proposed project, Jackson Environment and Planning prepared a Project Summary Report for Consultation, outlining the following aspects of the project:

- Executive summary;
- About Grima Recycling;
- Neighbours;
- Sensitive receptors;
- Proposed upgrades to the facility;
- Planning approvals pathway and SEAR's requirements; and
- Consultation approach and feedback.

A copy of the Project Summary Report for Consultation is given in Appendix 5. The requests were issued is writing to all identified stakeholders on 5 April 2016. Stakeholders were asked to provide feedback on any aspect of the proposed by Thursday 28 April. A feedback form and reply paid envelope was provided via mail, as well as options for emailing or phoning in feedback on the project.

3.2 Consultation with Fairfield City Council

Prior to seeking the Secretary's Environmental Assessment Requirements, a pre-lodgment meeting was held with Fairfield City Council on 4 August 2015. Following the issue of the SEAR's, and as part of the consultation process, further feedback was sought from Fairfield City Council on the proposed development. Written feedback was received on Friday 29 April 2016 (Table 3.1).

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Table 3.1. Consultation feedback from Fairfield City Council.

Secretary's Environmental Assessment Requirements	Fairfield City Council Comment	How has this issue been addressed in the EIS?
Key issues		
The EIS must include an assessment of all potential impacts of the proposed development on the existing environment (including cumulative impacts if necessary) and develop appropriate measures to avoid, minimise, mitigate and/or manage these potential impacts. As part of the EIS assessment, the following matters must also be addressed:		
Strategic context - including: - detailed justification for the proposal and suitability of the site for the development; - a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies; - a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out; - a description of how the proposed expansion integrates with existing on-site operations; - a description of any additional licence(s) or approval(s) required to carry out in the proposed development; and - an environmental risk assessment of the potential impacts of the development identifying key issues for assessment.	Refer to the provision of Fairfield Local Environmental Plan 2013 Refer to Fairfield Citywide DCP 2013, introductory Chapters 1 to 3, and Chapter 9 Industrial development, as well as any of the relevant appendices.	Consideration of all Fairfield Local Environmental Plan 2013 requirements is provided in section 2.3 of this EIS. Consideration of all Fairfield Citywide DCP 2013 requirements is provided in section 2.3 of this EIS. Section 2.6 outlines how the development will be integrated into existing operations. Section 2.5 lists additional approvals and licenses required. Section 2.8 contains an environmental risk assessment to identify issues for assessment.
Waste management - including: - details of the type, quantity and classification of waste to be received at the site; - details of the resource outputs and any additional processes for residual waste; - details of waste handling including, transport, identification, receipt, stockpiling and quality control; and - a description of the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*. -	Waste management to include but not limited to waste from workshop (oils, waste water) and recycling facility generated waste.	

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Secretary's Environmental Assessment Requirements	Fairfield City Council Comment	How has this issue been addressed in the EIS?
Air quality - including: - a description of all potential sources of air emissions; - an air quality impact assessment in accordance with relevant Environment Protection Authority Guidelines; and - a description and appraisal of air quality impact mitigation and monitoring measures.	Dust and odour impact from demolition, construction and recycling facility operations.	This has been addressed in Section 5 of the EIS – Air quality impact assessment and Section 14 Compilation of mitigation measures.
Noise and vibration - including: - a description of all potential noise and vibration sources during construction and operation, including road traffic noise; - a noise and vibration assessment in accordance with the relevant Environment Protection Authority Guidelines; and - a description and appraisal of noise and vibration mitigation and monitoring measures	Noise and vibration to include but not limited to construction noise, vehicle movements, operational noise generated during processing and including maintenance workshop, mechanical plant.	This has been addressed in Section 5 of the EIS – Noise and vibration impact assessment and Section 14 Compilation of mitigation measures.
Traffic and transport – including: - details of road transport routes, access to the site and parking; - road traffic predictions for the development during construction and operation; and - as assessment of the impacts to the safety and function of the road network; and - the details of any road upgrades required for the development	Details of traffic volumes likely to be generated during construction and operation, including a description of haul routes An assessment of predicted impacts of traffic generation on the safety and capacity of the surrounding network and access points, using existing and proposed traffic Details of proposed site access, including detailed consideration of access options, justification for the proposed locations of main access points, and compliance with Australian Standards.	This has been addressed in Section 10 of the EIS – Transport and traffic impact assessment and Section 14 Compilation of mitigation measures
Soil and water – including: - the details of stormwater, waste water and leachate management;	No additional comment	Soil and water issues have been addressed as per SEAR's requirements in Sections 6 and 7. Mitigation measures are also given in Section 14 of the EIS.

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Secretary's Environmental Assessment Requirements	Fairfield City Council Comment	How has this issue been addressed in the EIS?
- the details of soil and erosion controls during construction and operation; and - an assessment of surface water, flooding and soil impacts		
Heritage – including Aboriginal and non-Aboriginal cultural heritage	No additional comment	Heritage issues have been addressed as per SEAR's requirements in Section 9 – Heritage impact assessment. Mitigation measures are also given in Section 11 of the EIS.
Fire and incident management	No additional comment	Fire and incident management issues have been addressed as per SEAR's requirements in Section 12 – Fire safety and management. Mitigation measures are also given in Section 14 of the EIS.
Environmental Planning Instruments and other policies The EIS must assess the proposal against relevant environmental planning instruments, including but not limited to: - State Environmental Planning Policy (Infrastructure) 2007; - State Environmental Planning Policy No, 33 Hazardous and Offensive Development - State Environmental Planning Policy No. 55 Remediation of Land; - Fairfield Local Environmental Plan 2013; and - Relevant development control plans and section 94 Plans	Refer to the provision of Fairfield Local Environmental Plan 2013 Refer to Fairfield Citywide DCP 2013, introductory Chapters 1 to 3, and Chapter 9 Industrial development, as well as any of the relevant appendices.	Consideration of all Fairfield Local Environmental Plan 2013 requirements is provided in section 2.3 of this EIS. Consideration of all Fairfield Citywide DCP 2013 requirements is provided in section 2.3 and 2.8 of this EIS.

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3.3 Agency consultation

3.3.1 NSW Department of Planning and Environment

Jackson Environment and Planning consulted the NSW Department of Planning and Environment to establish whether there were any additional issues to address in addition to the SEAR's requirements.

Thomas Piovesan, Planning Officer – Industry Assessments advised on 1 June 2016 that the Department has no additional issues that need to be addressed beyond the SEAR's requirements as issued on 29 January 2016.

3.3.2 NSW Environment Protection Authority

Jackson Environment and Planning consulted the NSW Environment Protection Authority to establish whether there were any additional issues to address in addition to the SEAR's requirements. Carla Thomas, Operations Officer, Waste Compliance confirmed by email on 20 April that no additional issues have been identified for consideration in the EIS (Appendix 9).

3.3.3 Roads and Maritime Services

Jackson Environment and Planning consulted the NSW Roads and Maritime Service (RMS) to establish whether there were any additional issues to address in addition to the SEAR's requirements. Hans Pilly Mootanah, Land Use Planner – Network Management confirmed by email on 29 April that no additional issues have been identified for consideration in the EIS (Appendix 9).

3.3.4 Commonwealth Department of Environment

Jackson Environment and Planning considered the potential impacts of the development on matters potentially of national significance, requiring consent under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act).

Given the subject site is not listed as a national heritage place, and will not impact on any national heritage places or any threatened species and communities, the proposed development was not referred to the Commonwealth Minister for the Environment. This is because approval of the development under the EPBC Act is not required.

3.4 Neighbours consulted

As part of the consultation process, the following neighbours were contacted to provide feedback on the proposed project. These are shown in Table 3.2 below, and are shown in the map given in Figure 2.9.

Table 3.2. Neighbouring businesses consulted in preparing the EIS.

Neighbour business name	Location
AB Mauri	74-76 Redfern Street
Bronze & Silver Glass Pty Ltd	78 Redfern Street
Sydney Doors	80 Redfern Street
DO Smith & Sons	81 Redfern Street
Thompson Transport Pty Ltd	82 Redfern Street
Fairfield Electric Motors P/L	83 Redfern Street

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Neighbour business name	Location
Southern Cross Continental Bakery	88 Redfern Street
Manufactured Alloy Xtras	1/85 Redfern Street
FX Supreme Paints	86 Redfern Street
Polar Electricians	2/87 Redfern Street
Atkins Removals Pty Ltd	3/87 Redfern Street
LNS Mechanic	4/87 Redfern Street
Tank Management Services Pty Ltd	89 Redfern Street
Pivot Equipment Pty Ltd	91 Redfern Street
Workforce international - Road Services	92-94 Redfern Street
Transgrid (Wetherill Park Sub-station 96 Redfern Street	96 Redfern St (via their Head Office, 180 Thomas St, Sydney)

Table 3.3. Feedback obtained during the consultation process, and how the issues have been addressed.

Organisation	Issue	How issue has been addressed in the EIS
AB Mauri	No feedback on the proposal was received	No further action taken in the EIS
Bronze & Silver Glass Pty Ltd	No feedback on the proposal was received	No further action taken in the EIS
Sydney Doors	No feedback on the proposal was received	No further action taken in the EIS
DO Smith & Sons	No feedback on the proposal was received	No further action taken in the EIS
Thompson Transport Pty Ltd	No feedback on the proposal was received	No further action taken in the EIS
Fairfield Electric Motors P/L	No feedback on the proposal was received	No further action taken in the EIS
Southern Cross Continental Bakery	No feedback on the proposal was received	No further action taken in the EIS
Manufactured Alloy Xtras	No feedback on the proposal was received	No further action taken in the EIS
FX Supreme Paints	No feedback on the proposal was received	No further action taken in the EIS
Polar Electricians	No feedback on the proposal was received	No further action taken in the EIS
Atkins Removals Pty Ltd	No feedback on the proposal was received	No further action taken in the EIS
LNS Mechanic	No feedback on the proposal was received	No further action taken in the EIS
Tank Management Services Pty Ltd	No feedback on the proposal was received	No further action taken in the EIS
Pivot Equipment Pty Ltd	No response – business premises vacant	No response – business premises vacant
Workforce international - Road Services	No feedback on the proposal was received	No further action taken in the EIS
Transgrid (Wetherill Park Sub-station 96 Redfern Street	No feedback on the proposal was received	No further action taken in the EIS

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3.5 Conclusions

The consultation program delivered as per the SEAR's requirements sought further advice from neighbours, Fairfield City Council, NSW Department of Planning and Environment, NSW Environment Protection Authority and Roads and Maritime Services on key issues to considered in the assessment.

Feedback suggested that Fairfield City Council is very comfortable with the proposed development, as long as the proposal addresses local planning policies. No further feedback from agencies or neighbours suggested that the scope of issues as documented in the SEAR's are comprehensive. Therefore, no additional issues were added to the SEAR's requirements for consideration in the assessment.

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4 Waste Management

4.1 Introduction

A detailed plan for management of waste materials during the demolition, construction and operation of the project has been prepared to address the SEAR's requirements. The plan provides an outline of:

- the type, quantity and classification of waste to be received at the site;
- resource outputs and any additional processes for residual waste;
- waste handling including, transport, identification, receipt, stockpiling and quality control; and
- a description of the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*.

4.2 Objective

The proposed project will involve an increase in the quantities of source separated paper, cardboard and plastic film received, sorted and baled at the site, from 28,000 tonnes to the processing limit of 99,000 tonnes per year. The upgrades to the site will improve the efficiency of materials handling and productivity of the site.

This will be achieved by demolishing the mechanical workshop along the northern boundary of the site and replacing it with a dedicated recycled products shed, to reduce the area occupied by materials storage in the processing warehouse. A new mechanical workshop and baling area will be built at the rear of the processing warehouse. These improvements will improve traffic flow and the efficiency of materials handling at the site. A breakdown of current waste materials received and processed at the site is given in Table 4.1.

The purpose of developing the waste management plan is to identify all potential impacts, as a result of the increased activities carried out on-site for handling:

1. the waste types received, processed, generated and managed on-site; and
2. recoverable resources and additional process requirements for residual waste.

4.3 Waste type classification

The waste generated as a result of the proposed construction works according to the NSW EPA's *Waste Classification Guidelines*[18] will be building and demolition waste. Individual waste materials that will be generated as part of the demolition of the mechanical workshop and construction of the new recycled products storage shed and mechanical workshop is as follows:

1. Soil, classified as Excavated Natural Material (ENM)
2. Steel
3. Concrete
4. Bricks
5. Timber

Very small quantities of wastes are generated as part of the ongoing operations of Grima's Resource Recovery Facility, given that all paper, cardboard and plastic film received at the site from commercial recycling collections

[18] NSW EPA (2014). Waste Classification Guidelines. Part 1 – Classifying Waste. Internet publication: http://www.epa.nsw.gov.au/resources/wasteregulation/140796-classify-waste.pdf

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are largely contaminant free. Close to 100% of all materials received at the site are recycled, with almost no residual waste (<1 tonne per month). Note that negligible waste is expected with the renovations to install the new disabled bathroom in the office building.

Table 4.1. 10 year projections for processing materials during ongoing operations.

Financial year	Projected tonnes of paper received (tonnes)	Projected tonnes of cardboard received (tonnes)	Projected tonnes of plastic film received (tonnes)	Projected total amount of material received (tonnes)
2014/15	2,882.90	63,674.85	2,811.92	69,369.67
2015/16	2,738.76	66,221.84	3,093.11	72,053.71
2016/17	2,601.82	68,870.72	3,402.42	74,874.96
2017/18	2,471.73	71,625.55	3,742.67	77,839.94
2018/19	2,348.14	74,490.57	4,116.93	80,955.64
2019/20	2,230.73	77,470.19	4,528.63	84,229.55
2020/21	2,119.20	80,569.00	4,981.49	87,669.68
2021/22	2,013.24	83,791.76	5,479.64	91,284.63
2022/23	1,912.57	87,143.43	6,027.60	95,083.60
2023/24	1,816.95	90,552.69	6,630.36	99,000.00

Projections are based on the following assumptions: a constant annual growth rate, and the material received at the facility are free of contamination. The projections assume that with the trend of paperless offices, paper received will decrease 5% per year. The projection is based on cardboard packaging usage growing, at an assumed rate of 4% per year. And given the low rates of plastic film recycling in Sydney, it has been assumed that plastics received at the facility will increase by 10% per year.

Note that contaminants at times can be received in sorted materials, and these are removed during the sorting process. These materials are classified according to the NSW EPA's *Waste Classification Guidelines* as General Solid Waste (non-putrescible). Examples of materials can include other recyclable plastics, plastic strapping and steel.

4.4 Legislative requirements

The specific requirements that need to be addressed under the *Waste Avoidance and Resource Recovery Strategy 2014-21* have objectives and targets for:

- Waste Avoidance
- Increase Recycling
  - Construction and Demolition to 80% by 2017
  - Commercial and Industrial Waste to 70% by 2017
- Divert more waste from Landfill to 75% by 2017
- Manage problem wastes better
- Reduce Litter
- Reduce Illegal Dumping

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The manner in which waste is to be managed is driven by the Ecologically Sustainable Development principles. Guidance in managing waste has been provided by the hierarchical chart below:

Figure 4.1. The waste hierarchy as published in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21.

The explicit details of managing particular types of wastes are clearly defined in the:

- *EPA Waste Classification Guidelines* of the *Protection of Environment Operations Act 1997 (POEO Act*) to manage different waste types generated on-site:
  - Managing specific types of waste – further requirements
    i. Taking waste to the right waste management facility
    ii. Specialised storage, handling, treatment and disposal requirements
- *Fairfield Citywide: Development Control Plan 2013 - Amendment 11 – Waste Not Policy*

  The Waste Not Policy of the local council details the requirements to manage demolition and construction specific waste and submit appropriate forms at the time of construction.

4.5 Waste management plan benefits

Implementing enhanced management practices within the waste management plan has triple bottom line benefits. Thorough planning and procurement of exacting measurements reduces the upfront cost of construction, and benefits the business directly.

Allocating an area for different types of wastes, particularly during the demolition and construction process reduces effort and assists in recycling of different waste materials.

The benefits are realised instantaneously by the business and the broader community in the form of reduced costs of disposal, reduced costs of legal liability and common good, when:

- waste is separated at source;
- maximising recovery of valuable resources; and
- exercising due diligence for safe disposal of waste.

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To help inform the waste management plan for the demolition, construction and operational phases of the project, each stage of the waste hierarchy in Figure 4.1 has been addressed in the following sections.

4.6 Waste avoidance

During the construction phase, waste avoidance will be achieved by:

- thorough planning of the requirements for carrying out the construction works on-site;
- order material to exacting measurements;
- site induction to include a brief on separation of waste material at designated areas to source separate – contractor will have bins for recyclable material type and signage for material type; and
- recycle all packaging material.

During the operational phase, measures and processes will be developed and implemented to minimise waste generation.

4.7 Resource recovery

Resource recovery from waste is to be addressed by sorting waste on-site as per existing site practices. This waste can then be shipped to waste processing facilities for recovery or reprocessing. Reuse and recovery options are as outlined below:

- cardboard, plastic films and paper waste will be sorted on-site and sent for further reprocessing/recycling - this being core business at the facility;
- metals, reusable timber during the demolition and construction phase of the project will be collected and transported to an appropriate recycling facility;
- timber pallets and packaging - on which the material is received during the construction phase – separated and transported to an appropriate recycling facility; and
- excavated soil removed during construction of footings for the hardstand area at the rear of the site, and excavation for the basement for rainwater tank installation will be used for filling and site levelling as required, with the remainder sent off site for recycling.

Waste generated during the operational phase of the project is expected to be minimal, consistent with current operations. A 5 m^3 skip bin is positioned at the front of the processing warehouse for general waste items that are removed from incoming paper, cardboard and plastic films separated during the sorting process. This waste is removed by a commercial contractor on an at-call basis.

The office building for four staff has an existing paper and cardboard recycling bin, where all paper and cardboard is recycled as part of the operations of the business. The office also has a small comingled recycling bin for all plastics, steel, aluminium and liquid paperboard food packaging. This is taken home periodically by staff and recycled through the council recycling collection. The office also has a 120 L general waste bin. This is emptied into the on-site waste disposal skip bin on a periodic basis.

4.8 Waste storage and disposal

Separate recycling bins and storage will be provided for different waste types during the demolition and construction phase of the project. The approximate size of bins is given based on estimated waste generation (see Table 4.2 and 4.3).

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- Steel – 20 m^3 hook lift bin
- Green waste – 5 m^3 skip
- Timber – 5 m^3 skip
- Bricks and concrete – 20 m^3 hooklift bin
- Excavated natural material - 20 m^3 hook lift bin

A 10m^3 general waste skip bin will be provided for materials that can't be easily recycled, though the amount of this waste is expected to be minimal.

These bins will be placed along the northern side of the processing warehouse to minimise traffic flow impacts during demolition and construction works.

4.9 Waste handling

To meet Work Health and Safety Regulations, waste will be handled and managed under supervision of experienced/trained staff.

Facility operations include handling of large quantities of recyclable waste. To adequately handle these large quantities of waste, heavy vehicles such as front loaders will be used on site. All the heavy vehicles on-site will be operated by trained and licensed drivers to comply with safe work methods.

For heavy vehicles (trucks) coming in to drop-off the material for sorting, baling and then transported further processing off-site, these will be monitored and directed at all times, to avoid accidents.

Currently, baled material is stored in open space between the weighbridge and office-block and at the back of the material unloading shed. Material will be baled and moved across to the new larger and improved recycled products storage shed in the site plan Figure 2.13.

The proposed external storage space will provide additional space for storing baled material, thereby enhancing the productivity of the site.

Contaminants will be hand sorted for quality control. Residual waste and sweepings from the floor (for good housekeeping practices) will be disposed safely and appropriately to avoid tripping/slipping hazard.

All waste removed from the site during construction, demolition and operations will be weighed over the weighbridge as per the requirements of the *Protection of the Environment Operations (Waste) Regulation* 2014.

4.10Management of hazardous, toxic and liquid waste

To best manage the hazardous, toxic and liquid wastes, these will be minimised prior to demolition works commencing, and will be moved off-site by a licence contractor for storage until the development works are completed.

4.11Incident management – spills

Spills on-site during the construction and operational phases likely to occur are oils and fuels. In the event of a spill incident, a Spill Response Kit will be deployed and appropriate notification made as per the site's existing Pollution Incident Response Management Plan (see Appendix 7).

The Materials Safety Data Sheet (MSDS) will be placed within sight and near the spill kit. The MSDS has clear instructions on spill response management, cleanup and disposal.

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4.12Impacts assessment and mitigation measures

During the demolition and construction process, a series of best practice resource recovery measures will be implemented to avoid, reduce/reuse and recover waste to minimize disposal to landfill.

To help in waste management planning during this stage of the project, an estimate of the types and quantities of waste to be generated during the demolition and construction process has been prepared. This analysis is given in Table 4.2 and Table 4.3.

It is noted that the majority of materials to be generated through the demolition process is steel posts, rafters and metal sheet cladding, given the existing mechanical workshop is a steel building. Minor amounts of low lying introduced species of shrubs / weeds[19] will need to be cleared at the rear of the site to permit the extension to the rear of the processing warehouse for the proposed new mechanical workshop and baling area, and an extension to the hardstand for building of the new recycled products shed. All waste materials will be sent to lawful recycling facilities for processing.

Given that the steel and green waste is recyclable, this phase of the project is expected to achieve a 100% recycling rate.

Table 4.2: Demolition waste materials to be generated during the project – car port and maintenance workshop.

Material on site	Found on site Yes/No	Estimated waste volume (m^3)	Estimated tonnage (tonnes)	Destination for re-use, recycling or disposal	Recovery rate anticipated (%)
Metals • **Corrugated steel roofing** • **Metal wall cladding** • **Steel framing and rafters**	Yes Yes Yes	40.6 9.0 1.76	4.9 1.1 0.2	Sims Metals, 76-100 Christie St, St Mary's EPA Licence No. 6934	100
Green waste	Yes	<5 m^3	0.5	Australian Native Landscapes, Badgery's Creek. For recycling through composting. 210 Martin Rd, Badgerys Creek EPA Licence No. 4625	100
Total tonnage generated (tonnes)			6.6		
Total tonnages expected to be recycled (tonnes)			6.6		
Expected recycling rate during demolition (%)					100

[19] Please note that this vegetation comprises introduced species of weed vegetation, and not trees as per Fairfield City Council's *Tree Preservation Order* (http://www.fairfieldcity.nsw.gov.au/downloads/file/73/tree_list).

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Wastes generated during the construction phase of the project will be mainly excavated natural material from excavation and preparation of the concrete hardstand and basement for rainwater tank installation at the rear of the site, and construction of the pre-cast concrete wall along the northern boundary of the site, associated with the recycled products storage shed. Timber waste will be generated through the use of formwork associated with the construction of footings, with minor amounts of concrete surplus to requirements. Small amounts of steel offcuts during construction of the recycled products storage shed and the mechanical workshop and baling area is expected.

All building materials for construction of the new recycled products storage shed, the new mechanic workshop and the disabled bathroom amenities will be largely fabricated off-site, and therefore the amount of waste generated on-site is expected to be minimal, except for excavated natural soil material generated during the preparation of footings for pre-cast concrete wall and piers beneath the concrete slabs for the mechanical workshop and eastern side of the recycled products storage shed. Construction waste estimates are given in Table 4.3. Note that tonnage estimates are based on waste density conversion factors published by the NSW Environment Protection Authority in the following publications:

- NSW EPA (2014). Waste Levy Guidelines. Internet publication: http://www.epa.nsw.gov.au/resources/wasteregulation/150489-waste-levy-guidelines.pdf
- NSW EPA (2015). Disposal-based audit Commercial and industrial waste stream in the regulated areas of New South Wales Main report. Internet publication: http://www.epa.nsw.gov.au/resources/warrlocal/150209-disposal-audit.pdf

To facilitate the recovery of waste materials generated during the construction phase, all waste materials will be sorted and dedicated recycling bins for excavated natural soil material, timber, brick / concrete, metals and non-recyclable mixed waste will be made available.

Table 4.3. Construction phase waste and materials management.

Material on site	Found on site Yes/No	Estimated waste volume (m^3)	Estimated tonnage (tonnes)	Destination for re-use, recycling or disposal	Recovery rate anticipated (%)
Metals	Yes	10	1.2	Sims Metals, 76-100 Christie St, St Mary's EPA licence No. 6934	100
Excavated natural material (soil)	Yes	78.1	117.1	Genesis Xero Waste - Landfill and Recycling, Honeycomb Dr, Eastern Creek. Environment Protection Licence No. 13426)	100
Timber	Yes	0.7	0.8	Genesis Xero Waste - Landfill and Recycling, Honeycomb Dr, Eastern Creek. Environment Protection Licence No. 13426)	100
Concrete	Yes	5	7.5	Genesis Xero Waste - Landfill and Recycling, Honeycomb Dr, Eastern Creek. Environment	100

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Material on site	Found on site Yes/No	Estimated waste volume (m^3)	Estimated tonnage (tonnes)	Destination for re-use, recycling or disposal	Recovery rate anticipated (%)
				Protection Licence No. 13426)	
Brick	Yes	5	7.5	Genesis Xero Waste - Landfill and Recycling, Honeycomb Dr, Eastern Creek. Environment Protection Licence No. 13426)	100
Non-recyclable mixed waste	Yes	10	15	Genesis Xero Waste - Landfill and Recycling, Honeycomb Dr, Eastern Creek. Environment Protection Licence No. 13426)	0
Total tonnage generated (tonnes)			149.1		
Total tonnages expected to be recycled (tonnes)			134.1		
Expected recycling rate during construction (%)					89.9

4.13 Conclusion

The upgrades to the Grima Resource Recovery Facility will involve the demolition of an existing mechanical workshop and construction of a new recycled products storage shed and mechanical workshop. These upgrades to the site will involve the generation of 6.6 tonnes of waste during the demolition phase, and a further 149.1 tonnes of waste during the construction phase. Best practice waste management, source separation and recycling off-site at EPA licensed facilities will see the project achieve a recycling rate of 100% during demolition works and 89% during construction works. Recycling rates exceed the NSW Government's target of 80% recycling of construction and demolition waste by 2021.

Waste generated during the operational phase of the upgrades plant is expected to be very minor (<1 tonne per month), given that materials brought to the site for sorting, baling then off-site processing / recycling is clean, source separated paper, cardboard and plastic film. Minor contaminants are received and these are recycled or disposed where required.

Waste management and recycling practices for the upgraded facility will result in a major boost of recycling infrastructure for paper, cardboard and plastic film in Western Sydney, and minimizing the disposal of up to 99,000 tonnes of waste per year to landfill when the plant reaches full capacity, expected in 2023.

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5 Air quality, noise and vibration impact assessment

5.1 Introduction

Jackson Environmental Planning commissioned Air Noise Environment Pty Ltd to undertake an air, noise and vibration assessment for the proposed upgrade to the Grima Recycling facility located at 88 Redfern Street, Wetherill Park.

The study has been undertaken to assess the potential impacts of the proposed upgrade on nearby receptors in accordance with the requirements of the New South Wales Environmental Protection Authority and the Secretary's Environmental Assessment Requirements (SEAR). Specifically, the following documents have been referenced:

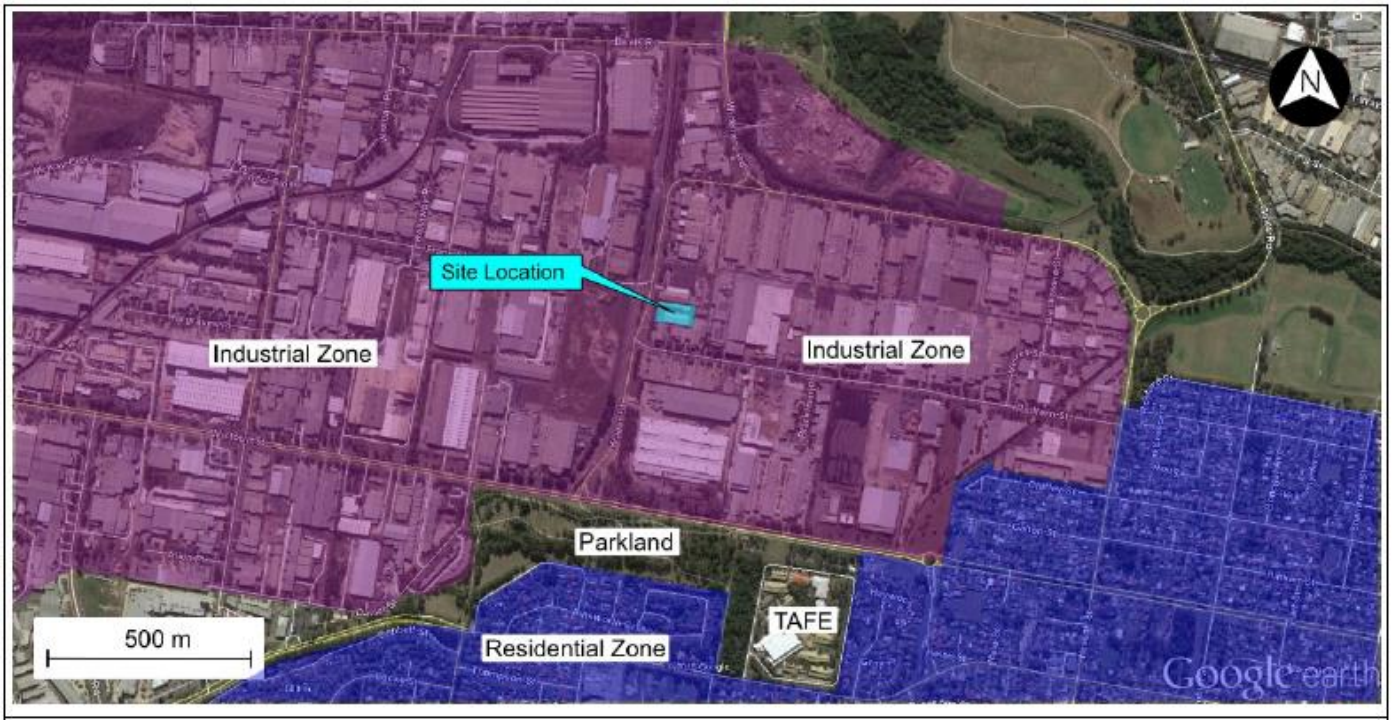
- SEAR Number 1014;
- NSW Industrial Noise Policy (2001) (INP);
- NSW Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (2005).

Computational modelling has been undertaken for assessing potential air and noise impacts.

5.2 Site Location

The Grima Recycling facility is located at 88 Redfern Street, Wetherill Park (identified as Lot 3 on DP 262054). The site is situated in an established industrial area. Existing industrial premises bound the site along the northern, eastern and southern boundary, and vacant industrial land is located on the eastern side of Redfern Street. The nearest residential receptors are located 625 metres to the south. Wetherill Reserve Park and an educational facility (TAFE) are also located 470 metres to the south and 600 metres to the south-east, respectively.

Figures 5.1. Development site location and surrounding land uses.



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5.3 Description of Operations

A description of the current operations is given in Section 2.6.1, and proposed upgrades is given in Section 2.6.2.

5.4 Potential Impacts

5.4.1 Air Quality

Overall, the potential for air quality impacts from the site are considered minimal given the use of the site (i.e. receival and baling of waste paper/plastic/film).

Particulate or dust emissions may be considered as the main air quality indicator for the site. Dust emissions may occur wherever large amounts of loose, recycled waste are transferred or unloaded.

Therefore, potential dust emission sources include:

- Unloading of loose waste from the rear of trucks (occurs inside the shed only);
- Transfer of loose waste from top of conveyor into balers; and
- Paper shredding.

Waste paper and plastic is not inherently dusty compared to other material such as sand and aggregates however, there is a potential for a small amounts of dust to be released through the above material handling activities, and shredding in particular.

The proposed upgrade is not expected to add new air emission sources to the site. The throughput is proposed to be increased and this may result in increased dust emissions due to the handling of additional material.

To reduce the potential for dust emissions, all processing of material occurs inside a warehouse building. These processes include unloading of material, baling and paper shredding.

5.4.2 Noise and Vibration

In summary, the key noise emission sources at the site include the following:

- truck movements;
- trucks unloading recyclable paper/plastic inside warehouse;
- bobcat loader activity inside warehouse;
- forklift activity for transporting baled product to new storage area and for loading trucks;
- existing baler and conveyor inside main warehouse;
- new bale press and conveyor in new workshop;
- existing shredder (to be relocated to north-eastern corner inside a sheet steel building); and
- maintenance activity in workshop (to be relocated to a new building on eastern end of main warehouse).

As with the air emission sources, the proposed upgrade is not expected to add new noise sources to the site however, an increase in throughput is expected to result in an increase in truck movements. Table 5.1 presents a summary of the existing and future anticipated vehicle movements at the site.

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Table 5.1. Existing and future anticipated vehicle movements at the site.

Vehicle Type	Existing	Future (2023)
Light Vehicles	2 per day	1 per hour (morning and evening peak)
Truck (Delivery/Collection)	82 per day	23 per hour (morning peak) 18 per hour (evening peak)

Operating times for the upgraded facility are not expected to change. Trucks may arrive at any time, while baling of material would occur between 3 am and midnight.

In terms of potential vibration impacts, the main vibration sources at the site include the bobcat loader and truck movements across the site. Vibration levels are expected to be similar with the proposed upgrade (i.e. same loader and type of trucks arriving) however, the frequency of vibration is expected to increase due to the increased number of trucks arriving at the site.

The potential for noise impacts will be minimised by locating all processing activity within buildings. The noisiest fixed plant items include the baler and shredder. The existing baler will remain in the existing warehouse building and the shredder will be located in a separate sheet steel in the north-eastern corner of the site. The new baler will be located in the new workshop area. The only external noise sources anticipated are truck and forklift movements. A 6.5 m precast concrete wall (see Figure 2.13) will be constructed along the northern boundary of the site, providing shielding to the adjacent industrial premise from site activity.

5.4.3 Construction

Construction activity will include demolition of the existing maintenance workshop, minor earthworks, concrete slab installation and erection of a sheet steel shed (new storage area and workshop).

Construction noise will primarily be associated with the use of hand tools, concrete truck operation for the laying of new concrete slab and heavy machinery for minor earthworks. Potential noise impacts associated with construction of the upgraded facility are expected to be minimal, given the large separation distance to the nearest residential receptors (625 metres to the south) and the standard construction methods to be adopted. Construction noise is expected to be audible at nearby industrial properties however, given the standard methods to be adopted (i.e. no piling, rock breaking), noise levels will be typical of any local construction site (e.g. house construction).

The main air pollutants associated with construction are particulates from minor earthwork activity and diesel emissions from the operation of any heavy machinery. Earthworks and the use of excavators is expected to be minimal and are only required for purpose of establishing the ground for concrete slabs. No deep excavation or significant changes to ground works are required. Beyond the excavation stage, air emissions are expected to be negligible and no more than current operations of the site.

Standard day-time construction hours are also expected to be adopted.

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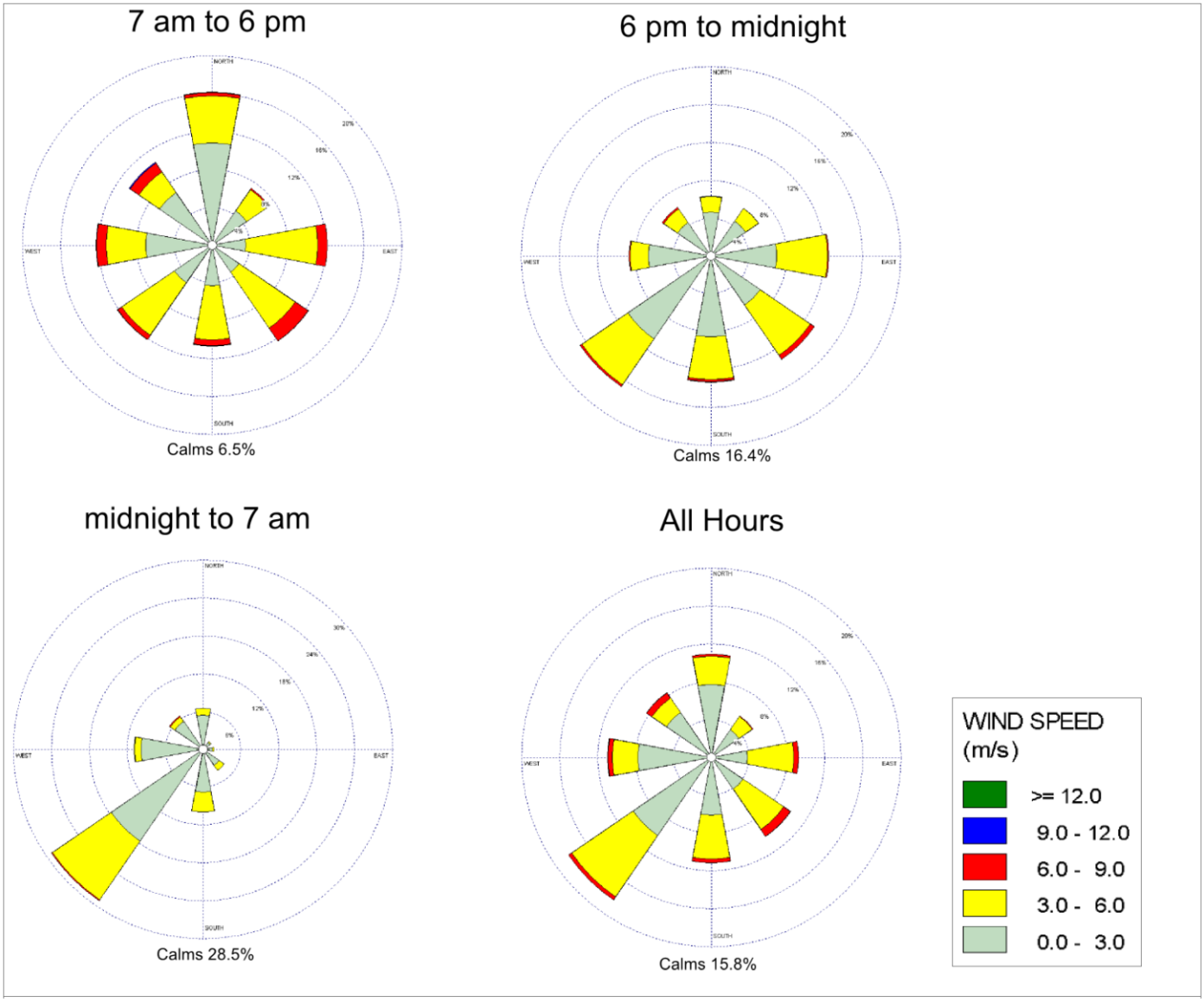
5.5 Existing Environment

5.5.1 Local Meteorology

Figure 5.2 presents 2010 to 2014 wind rose data for the NSW Bureau of Meteorology Horsley Park station (4.8 km west of the development site). The wind roses indicate a relatively even distribution of wind directions during the day period. However, during the early morning, wind conditions are dominated by a south-westerly component. Source-to-receptor winds (southerly) occur for approximately 11% of the time. Calm conditions occur for 16% of the time throughout the year and are highest during the early morning period (28.5% of the time).

The surrounding area receives approximately 762 mm of rain per year on average.

Figure 5.2. Figure 3.1: 2010-2014 Horsley Park NSW BOM Station.



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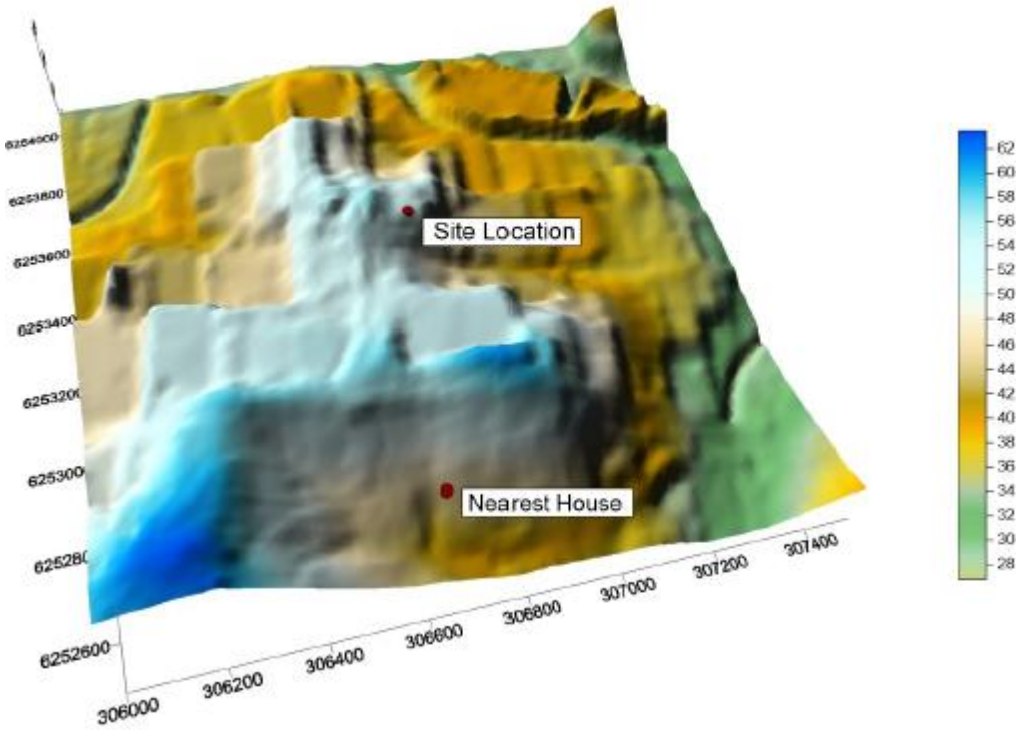
5.5.2 Surrounding Topography

The site is located approximately 50 m above sea level. There is some minor variation in topography between the site and the nearest sensitive receptors. Ground heights increase from an RL 54 m to an RL 60 m along Victoria Street south of the site, and then decreases to an RL 45 m at the nearest residential houses (610 m away to the south). The immediate surroundings of the development site are characterised by typical industrial/commercial buildings up to 8 metres high. Residential houses to the south are partially shielded from the site due to the presence of these buildings.

Figure 5.3. Surrounding topography.



5.6 Existing Acoustic Environment

5.6.1 Noise Monitoring Locations

Background noise monitoring was undertaken at three locations for a 1-week period to establish existing noise levels at the site and surrounding area. Table 5.2 and Figure 5.4 presents a summary of the noise monitoring locations.

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Table 5.2. Noise monitoring locations.

Position	Location	Purpose
1	Eastern boundary of development site (boundary with industrial premises)	Establish noise levels at boundary of neighbouring industrial premises for the purpose of deriving noise criteria in accordance with the NSW INP.
2	21 Maugham Crescent	Establish noise levels at the nearest residential area for the purpose of deriving noise criteria in accordance with the NSW INP. Noise from existing activities at the site was not audible at this position due to the separation distance and shielding, and local road traffic noise.
3	218 Victoria Street	Establish existing road traffic noise levels to provide a baseline for comparison with additional traffic from the proposed upgrade.

Figure 5.4. Noise monitoring locations.

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5.6.2 Noise Monitoring Methodology

Noise measurements were undertaken in accordance with the requirements of Australian Standard AS 1055-1997 Acoustics – Description and measurement of environmental noise and the NSW INP. The serial numbers and calibration information for the instruments used during the monitoring are presented in Table 5.3. An averaging time of 15 minutes was adopted and measurements were made over a 7-day period. The microphones were positioned at a height of 1.2 metres above ground level and fitted with a windshield throughout the measurements. The instruments were also situated in a free-field position.

A review of meteorological data for the Bureau of Meteorology Horsley Park station indicates up to 38 hours and 12 hours of wind and/or rainfall for the monitoring periods commencing 31 May and 16 June, respectively. For the first monitoring period (Position 1 only), it is noted that a large proportion of data was potentially affected from 6 pm 4 June to 10 pm 5 June due to heavy rain (23.25 hours, equivalent to 97% potentially affected).

Table 5.3. Noise instrument calibration information.

Position	Instrument/ Serial No.	Dates	NATA Calibration Current to:	Pre-Calibration	Post-Calibration
1	Nor140 (1405551)	31/5/16 – 10/6/16	7/7/2017	94.0	94.0
2	Nor140 (1405551)	16/6/16 – 23/6/16	7/7/2017	93.5	937
3	ARL Ngara (878065)	16/6/16 – 23/6/16	17/11/2017	94.1	94.0
-	Rion NC-74 (334483804)	-	16/11/2016	-	-

5.6.3 Noise Monitoring Results

Tables 5.4 and 5.5 presents a summary of the average noise levels of each monitoring period (day, evening and night) for Positions 1 and 2. The Assessment Background Level (ABL) value presented in these tables is the 10th percentile $LA_{90,15\text{-minute}}$ for the time period of interest (day, evening or night).

For the purpose of establishing noise criteria at sensitive receptors in accordance with the NSW INP, it is necessary to calculate the Rating Background Level (RBL) and LA_{eq} for the day, evening and night period. The RBL is the median of all ABL values for a given time period. Based on the monitoring data, the following RBL and LA_{eq} values are applicable at the nearest residential receptors to the south (Position 3):

- RBL – day 48 dB(A), evening 44 dB(A) and night 42 dB(A); and
- LA_{eq} – day 58 dB(A), evening 49 dB(A) and night 48 dB(A).

For industrial receptors (Position 1), the relevant LA_{eq} noise levels for deriving noise criteria are 65 dB(A), 62 dB(A) evening and 62 dB(A) night. RBL values for industrial receptors are not required to be calculated, as only the LA_{eq} amenity criteria derived from LA_{eq} noise levels is relevant for industrial premises. Table 5.6 presents a summary of measured $LA_{eq,15\text{-hour}}$ and $LA_{eq,9\text{-hour}}$ noise levels for the road traffic monitoring position.

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Table 5.4. Position 1 (site boundary) – summary of Noise Levels dB(A).

Date	Period	L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	ABL
31/05/16	Day	81.8	73.4	68.0	60.2	66.3	57.8
	Evening	78.1	69.9	65.1	56.5	62.8	54.4
	Night	76.5	67.9	62.8	54.2	61.6	51.6
01/06/16	Day	82.0	74.0	69.1	61.7	67.8	59.3
	Evening	80.7	70.9	66.4	58.4	64.4	56.0
	Night	83.2	73.3	67.9	58.7	65.8	57.0
02/06/16	Day	84.1	74.7	69.5	62.4	67.5	61.4
	Evening	83.6	73.6	67.5	58.3	65.5	55.8
	Night	81.9	71.8	65.6	57.6	63.6	54.9
03/06/16	Day	80.2	72.3	66.8	60.7	64.8	59.4
	Evening	82.3	73.9	67.5	57.4	65.3	55.1
	Night	78.9	69.5	63.2	53.5	61.6	50.3
04/06/16	Day	71.1	58.0	53.4	48.0	54.5	44.3
	Evening	59.2	49.4	46.5	42.8	45.4	41.9
	Night	65.6	56.6	52.0	46.4	51.0	46.4
05/06/16	Day[a]	-	-	-	-	-	-
	Evening	57.3	53.6	50.2	43.3	47.7	43.2
	Night	67.2	58.9	54.7	49.2	59.5	39.9
06/06/16	Day	77.2	70.2	65.9	60.4	64.1	57.9
	Evening	78.4	69.3	63.9	55.8	61.8	53.5
	Night	77.4	68.5	63.5	55.6	61.5	52.3
07/06/16	Day	76.8	69.6	65.2	59.8	63.3	57.5

[a] All data for this period was potentially affected by rain and/or wind

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Table 5.5. Position 2 (nearest residential receptors) – summary of Noise Levels dB(A).

Date	Period	L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	ABL
16/06/16	Day	67.7	61.7	55.3	47.3	64.9	45.4
	Evening	65.0	58.6	51.8	46.6	50.6	45.1
	Night	60.7	54.8	49.8	45.6	49.3	43.1
17/06/16	Day	67.2	60.7	55.7	50.3	53.8	49.4
	Evening	63.8	57.1	51.0	46.3	49.7	44.4
	Night	58.3	51.3	46.0	42.1	45.2	39.9
18/06/16	Day	66.6	58.9	51.8	43.2	54.2	41.4
	Evening	60.4	52.6	45.1	39.5	45.4	37.8
	Night	54.5	47.9	41.5	36.8	40.6	35.4
19/06/16	Day	63.7	55.5	48.4	39.9	46.5	37.5
	Evening	62.2	55.2	49.1	44.6	48.0	43.6
	Night	59.2	53.8	49.1	45.0	48.9	42.0
20/06/16	Day	69.1	60.8	55.7	49.7	53.9	48.4
	Evening	63.8	57.8	51.9	47.4	50.4	46.3
	Night	60.3	55.2	50.7	46.7	49.9	44.8
21/06/16	Day	68.6	61.5	56.8	50.9	55.1	48.4
	Evening	63.1	56.7	50.5	45.2	49.2	43.7
	Night	59.9	54.2	49.4	45.4	50.2	43.2
22/06/16	Day	68.6	61.4	55.8	48.9	55.4	47.6
	Evening	62.5	57.3	51.0	45.3	49.3	43.5
	Night	60.1	54.5	49.3	44.5	48.7	42.3

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Table 5.6. Position 3 (Victoria St road traffic) – summary of Noise Levels dB(A).

Date	$L_{Aeq(15\text{-}hour)}$	$L_{Aeq(9\text{-}hour)}$
16/06/16	67.8	64.3
17/06/16	68.0	59.3
18/06/16	63.6	56.2
19/06/16	60.8	63.5
20/06/16	68.1	63.7
21/06/16	67.9	63.1
22/06/16	68.0	64.3
Average	***66***	***62***

5.7 Assessment Criteria

5.7.1 Industrial Noise Policy Criteria

5.7.1.1 Overview

The acoustic assessment has been completed in accordance with the procedure identified in the NSW Industrial Noise Policy (INP) 2001, published by the Office of Environment and Heritage Protection (OEH). The policy sets two separate noise criteria to meet environmental noise objectives: one to account for intrusive noise and the other to protect the amenity of particular land uses. The derivation of the two sets of criteria in accordance with the NSW OEH are presented below.

5.7.1.2 Intrusiveness Noise Criteria

According to the INP, intrusive noise refers to noise that exceeds background noise levels (as defined by the Rating Background Level) by more than 5 dB. The intrusiveness criteria for the assessment has been summarised in Table 5.7 and applies only to sensitive receptors, such as residential dwellings.

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Table 5.7. Derived intrusive $L_{Aeq\ 15\ minute}$ Noise Criteria for Assessment.

Period	Rating Background Level dB(A)	Intrusiveness Noise Criteria $L_{Aeq,15\text{-}minute}$
Day	48	53
Evening	44	49
Night	42	47

5.7.1.3 Amenity Criteria

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels (ANL) specified in Section 2.2 of the INP. The ANL is dependent on the type of area being considered.

Table 5.8 presents ANL values for the type of receptors in the project area (urban residential, educational facility, public park and industrial premises). It is noted that where the existing acoustic environment is defined by traffic noise such that the existing industrial noise is inaudible at the monitoring location, the INP requires that the $LA_{eq,period(traffic)}$ is considered as representative of the existing industrial noise level at the monitoring location.

Table 5.8. INP Acceptable noise levels for residential receivers.

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level dB(A)	
			Acceptable	Recommended Maximum
Residence	Rural	Day	60	65
		Evening	50	55
		Night	45	50
School classroom-internal	All	Noisiest 1-hour period when in use	35	40
Area specifically reserved for passive recreation (e.g. National Park)	All	When in use	50	55
Industrial premises	All	When in use	70	75

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When the difference between the existing industrial noise levels and ANL is minus 6 dB or higher (i.e. Existing – ANL ≥ minus 6 dB), then the noise level from a new source must be controlled to preserve the amenity of the area. The control of the new source is achieved by applying an amenity criteria derived in accordance with Table 2.2 of the INP. Table 2.2 of Appendix 4 of the INP specifies adjustments to the existing noise level or ANL to derive an amenity criteria. For example, if existing noise levels are 2 dB or more higher than the ANL, then the maximum LA_{eq} noise level from a new source must be 10 dB below the existing noise level.

Table 5.9 presents the required adjustments for deriving the amenity criteria. Table 5.10 summarises the derived INP amenity criteria using the required adjustments.

Table 5.9: Modifications to the ANL for deriving the Amenity Criteria (NSW INP Table 2.2).

Total existing L_{Aeq} noise level from industrial sources dB(A)	Maximum L_{Aeq} noise level for noise from new sources alone dB(A)
≥ Acceptable noise level plus 2	If existing noise level is likely to decrease in future: ANL minus 10 If existing noise level is unlikely to decrease in future: Existing level minus 10
Acceptable noise level plus 1	Acceptable noise level minus 8
Acceptable noise level	Acceptable noise level minus 8
Acceptable noise level minus 1	Acceptable noise level minus 6
Acceptable noise level minus 2	Acceptable noise level minus 4
Acceptable noise level minus 3	Acceptable noise level minus 3
Acceptable noise level minus 4	Acceptable noise level minus 2
Acceptable noise level minus 5	Acceptable noise level minus 2
Acceptable noise level minus 6	Acceptable noise level minus 1
< Acceptable noise level minus 6	Acceptable noise level minus 8

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Table 5.10. Derived Amenity Criteria for Assessment.

Period	Existing L_{Aeq} Noise Level dB(A)	Acceptable Noise Level dB(A)	Modification to ANL dB(A)	Amenity Noise Criteria $L_{Aeq,period}$
Nearest Residential to the South				
Day	58	60	- 4	56
Evening	49	50	- 6	44
Night	48	45	Existing - 10	38
TAFE				
When in use	-	-	-	Internal 35
Public Park				
When in use (assumed day)	50	58	Existing - 10	48
Industrial				
Day	65	70	- 2	68
Evening	62	70	None	70
Night	62	70	None	70

5.7.1.4 Summary of Industrial Noise Criteria

As required by the NSW INP, the lower of the intrusive and amenity criteria is to be adopted for an assessment. The relevant criteria for the assessment are summarised in Table 5.11.

Table 5.11. Assessment noise criteria.

Period	Residential	TAFE	Public Park	Industrial
Day	53 $L_{Aeq,15\text{-}minute}$	Internal 35	48	68 $L_{Aeq,period}$
Evening	44 $L_{Aeq,period}$	Internal 35	-	70 $L_{Aeq,period}$
Night	38 $L_{Aeq,period}$	Internal 35	-	70 $L_{Aeq,period}$

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The noise criteria applies at the most-affected point (i.e. highest noise level) on or within the residential property boundary. If the actual property boundary is more than 30 metres from the house, then the criteria applies at the most-affected point within 30 m of the house.

In addition, reference has been made to the following criteria for sleep disturbance:

Sleep Disturbance Criteria ($LA_{1,1\text{-minute}}$ or LA_{Max}) = $LA_{90,15\text{-minute}}$ + 15 dB

The above criteria is referred to in the INP Application Notes. The NSW EPA recognises that this criteria is not ideal however, in the absence of additional research and evidence to replace it, the EPA continues to apply this as a guide for the likelihood of sleep disturbance. Where the criterion is met, sleep disturbance is not likely, but where it is not met, a more detailed analysis can be undertaken.

Based on an RBL of 42 dB(A), an LA_{Max} 57 dB(A) criteria is applicable.

5.7.2 Road Traffic Noise Criteria

The proposed upgrade is expected to increase truck movements to the site and along the surrounding road network due to the increased recycled waste throughput. Noise criteria applicable to traffic generating developments are specified in the NSW Road Noise Policy (2011). Table 5.12 presents a summary of the road noise criteria relevant to this assessment.

Review of the road traffic noise monitoring data indicates that existing $LA_{eq,15\text{-hour}}$ and $LA_{eq,9\text{-hour}}$ noise levels along Victoria Street are already above the set criteria by at least 6 dB. Therefore, the relative increase criteria is most applicable to this assessment.

Table 5.12. Road traffic noise criteria.

Criteria	Day (7 am to 10 pm)	Night (10 pm to 7 am)
Set criteria for sub-arterial roads	$L_{Aeq,15\text{-hour}}$ 55 dB(A)	$L_{Aeq,9\text{-hour}}$ 50 dB(A)
Relative increase criteria for sub-arterial roads	Existing $L_{Aeq,15\text{-hour}}$ + 12 (78 dB(A))	Existing $L_{Aeq,9\text{-hour}}$ + 12 (74 dB(A))

5.7.3 Construction Noise Criteria

The NSW Interim Construction Noise Guidelines (2009) specifies noise criteria for long-term construction activity (over three weeks). As construction is expected to take longer than 3 weeks, this criteria is considered applicable to the assessment. Tables 5.13 and 5.14 presents the NSW construction noise criteria for residential and other land uses. Construction works are expected to occur during standard hours only. Out of hour noise criteria is presented for information purposes only.

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Table 5.13. NSW EPA Construction noise criteria for residential uses.

Time of day[a]	Management level (Free-field) $L_{Aeq\ (15\ min)}$	How to apply
Recommended standard hours: Monday to Friday, 7 am to 6 pm Saturday, 8 am to 1 pm No work on Sundays or public holidays	**58 dB(A)** (Noise affected RBL + 10 dB)	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq\ (15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected **75 dB(A)**	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into

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Time of day[a]	Management level (Free-field) $L_{Aeq\ (15\ min)}$	How to apply
		account: • times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences • if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	**47 dB(A)** (Noise affected RBL + 5 dB)	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see Section 7.2.2.
[a] Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence.		

Table 5.14. NSW EPA construction noise criteria for other land uses.

Sensitive Land Use	$L_{Aeq,15\text{-}minute}$ Noise Criteria dB(A)
School Classrooms	Internal 45
Passive recreation	External 60 (free-field)
Industrial	75

5.7.4 Vibration Criteria

Guidelines and standards that can be referred to for assessing vibration impacts in NSW include the following:

- Environmental Noise Management – Assessing Vibration: A Technical Guide (2006), published by the NSW OEH;

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- BS 7385-2: 1993 - Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration.

The NSW technical guide provides vibration criteria associated with human annoyance for the three categories of vibration:

- Continuous vibration (e.g. road traffic, continuous construction activity);
- Impulsive vibration includes less than 3 distinct vibration events in an assessment period (e.g. occasional dropping of heavy equipment); and
- Intermittent vibration includes interrupted periods of continuous vibration (e.g. drilling), repeated periods of impulsive vibration (e.g. pile driving) or continuous vibration that varies significantly in amplitude.

Table 5.15 presents the criteria for continuous/impulsive vibration and intermittent vibration, respectively.

Table 5.15. Continuous/Impulsive Vibration Criteria – Peak velocity (mm/s).

Location	Assessment Period	Preferred Limit (mm/s)	Maximum Limit (mm/s)
Continuous Vibration			
Critical areas	Day/night-time	0.14	0.28
Residences	Day-time Night-time	0.28 0.20	0.56 0.40
Offices, schools, educational institutions and places of worship	Day/night-time	0.56	1.1
Workshops	Day/night-time	1.1	2.2
Impulsive Vibration			
Critical areas	Day/night-time	0.14	0.28
Residences	Day-time Night-time	8.6 2.8	17 5.6
Offices, schools, educational institutions and places of worship	Day/night-time	18	36
Workshops	Day/night-time	18	36

The above criteria is suitable for assessing human annoyance in response to vibration levels. In order to assess potential damage to buildings, reference has been made to British Standard BS 7385-2: 1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration. Table 5.16 presents vibration criteria for assessing the potential for building damage.

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Table 5.16. Transient Vibration Levels for Building Damage.

Type of Building	Peak Particle Velocity (mm/s)[a]	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures - industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Unreinforced or light framed structures – residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
[a] a 50% factor should be applied to the limits for the unreinforced or light framed structure vibration limits where low rise buildings are being considered or where resonance in the vibration is created.		

5.7.5 Air Quality Criteria

Air quality criteria for the NSW area is presented in the document Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (2005). Table 5.17 presents air quality criteria for particulate matter (TSP, PM10 and PM2.5).

Table 5.17. Assessment air quality criteria.

Pollutant	Air Quality Criteria (µg/m³)	Averaging Period
Total Suspended Particulates (TSP)	90	Annual
PM_{10}	50	24 hours
	30	Annual
$PM_{2.5}$	25	24 hours
	8	Annual

5.8 Noise Assessment

5.8.1 Modelling Methodology

For the purposes of predicting impacts associated with noise emissions from proposed development on nearby sensitive receptors, noise modelling of the sources was completed using the proprietary software CadnaA (Computer Aided Noise Abatement Model) developed by DataKustik. CadnaA incorporates the influence of meteorology, terrain, ground type and air absorption in addition to source characteristics to predict noise

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impacts at receptor locations. The prediction method incorporated into CadnaA is in accordance with ISO Standard 9613-2 (1996) Acoustics - Attenuation of sound during propagation outdoors.

The model is utilised to assess the potential noise emissions from the site under a range of operating scenarios and meteorological conditions. The noise modelling also allows investigation of possible noise management solutions, in the event that non-compliance with the assessment criterion is predicted. The following sections discuss the inputs, assumptions and results of the noise modelling.

5.8.2 Meteorology

For the proposed operations which could occur during the night period, worst-case meteorology for non-arid areas (more than 500 mm annual rainfall) as defined in the NSW INP has been considered (downwind conditions, 2 m/s wind speed and F Class Stability). For construction noise, which occur during standard day-time hours, light downwind conditions have been considered.

5.8.3 Topography

5 metre LiDAR data for the area surrounding the development was obtained from the Geoscience Australia Elevation Information System.

5.8.4 Noise Modelling Scenarios

5.8.4.1 Construction Phase

The following construction scenarios have been modelled:

- Demolition using an excavator;
- Clearing and minor excavation using an excavator;
- Concrete slab construction with a concrete truck and pump; and
- General construction of additional structures using hand tools (e.g. hammering, drill).

For all scenarios, up to 2 truck movements have been considered (for material delivery and removal of construction waste). Table 5.18 presents the noise modelling data used for the construction scenarios.

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Table 5.18. Construction - modelled noise source data.

Noise Source	Frequency Spectra (SWL, linear)									Total	
	31.5	63	125	250	500	1k	2k	4k	8k	A	Lin
Truck Movement	102	105	98	100	90	90	96	98	98	103	109
Excavator demolishing	108	108	111	104	101	100	98	97	94	106	115
Excavator minor earthworks	103	103	104	100	96	93	91	85	77	99	109
Concrete truck and pumping	107	107	108	101	100	97	96	87	81	103	113
Hand tools - drill	82	85	86	86	86	86	85	85	82	92	95
Hand tools - hammer[a]	105	108	109	109	109	109	108	108	105	115	118
[a] Includes + 5 dB correction for impulsiveness											

The NSW Interim Construction Noise Guideline specifies an $LA_{eq,15\text{-}minute}$ 75 dB(A) for industrial premises. The criteria is relevant at occupied external areas. A review of the neighbouring premises indicates that the nearest external areas to potential construction activity are car parks and traffic routes, instead of occupied work areas. Therefore, to assess construction noise impacts on the adjacent industrial premises, noise levels have been predicted at the entrance to the nearest warehouse buildings.

Figure 5.5 presents the modelled noise source and industrial receptor locations. Modelled receptor locations for other sensitive receptors (i.e. residential and TAFE) are presented in Figure 5.6.

Figure 5.5. Construction – Modelled Noise Source and Industrial Receptor Locations.

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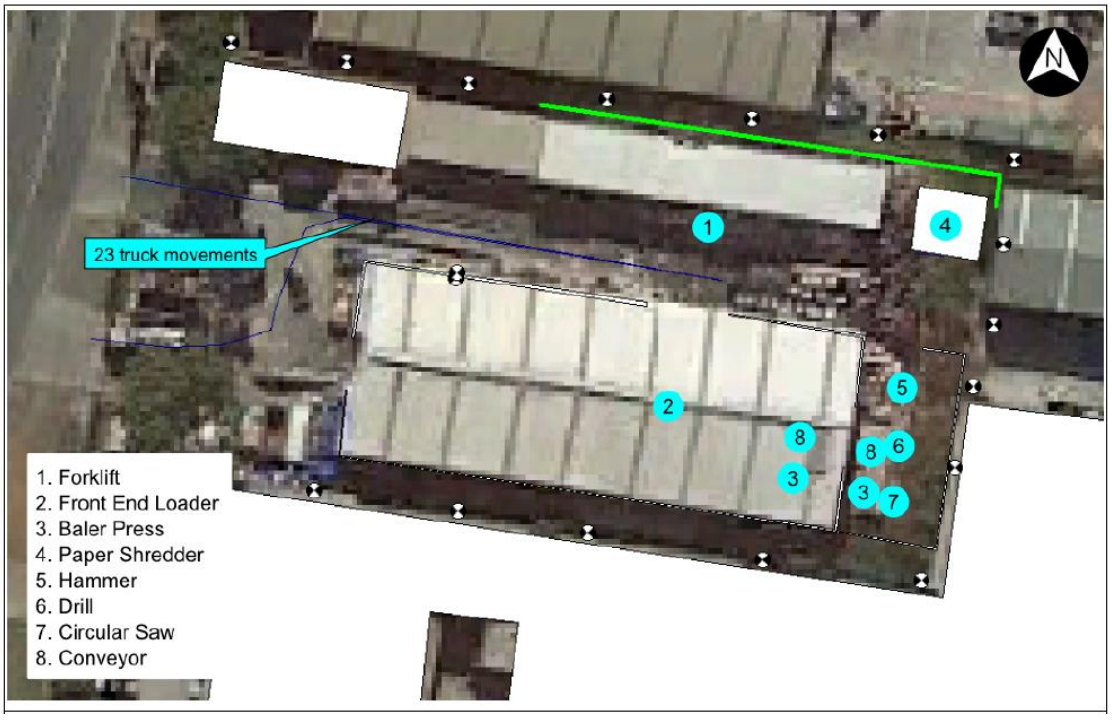
5.8.5 Operational Phase

Table 5.19 presents the modelled noise source data for the expected operational noise sources. Noise data has been obtained from on site measurements and available noise database literature. A total of 23 truck movements have been modelled to represent peak daytime operations. The modelling has assumed that all sources are operating simultaneously, during day, evening and night time periods.

Table 5.19. Operations – modelled noise source data.

Noise Source	Frequency Spectra (SWL, linear)									Total	
	31.5	63	125	250	500	1k	2k	4k	8k	A	Lin
Truck Movement	102	105	98	100	90	90	96	98	98	103	109
Front End Loader	102	102	94	92	92	91	88	87	78	96	106
Baler Press	104	106	103	97	92	93	92	86	80	98	110
Conveyor	97	99	96	90	85	86	85	79	73	91	103
Paper Shredder (entrance)[a]	94	100	93	92	96	93	86	82	76	97	103
Forklift	105	105	99	91	88	86	85	77	72	92	109
Workshop – general hand tools	82	85	86	86	86	86	85	85	82	92	95
Workshop – pneumatic tools	82	75	80	85	83	84	90	91	93	97	97
[a] Includes + 5 dB correction for tonality											

Figure 5.6: Operational - Modelled Noise Source Locations.



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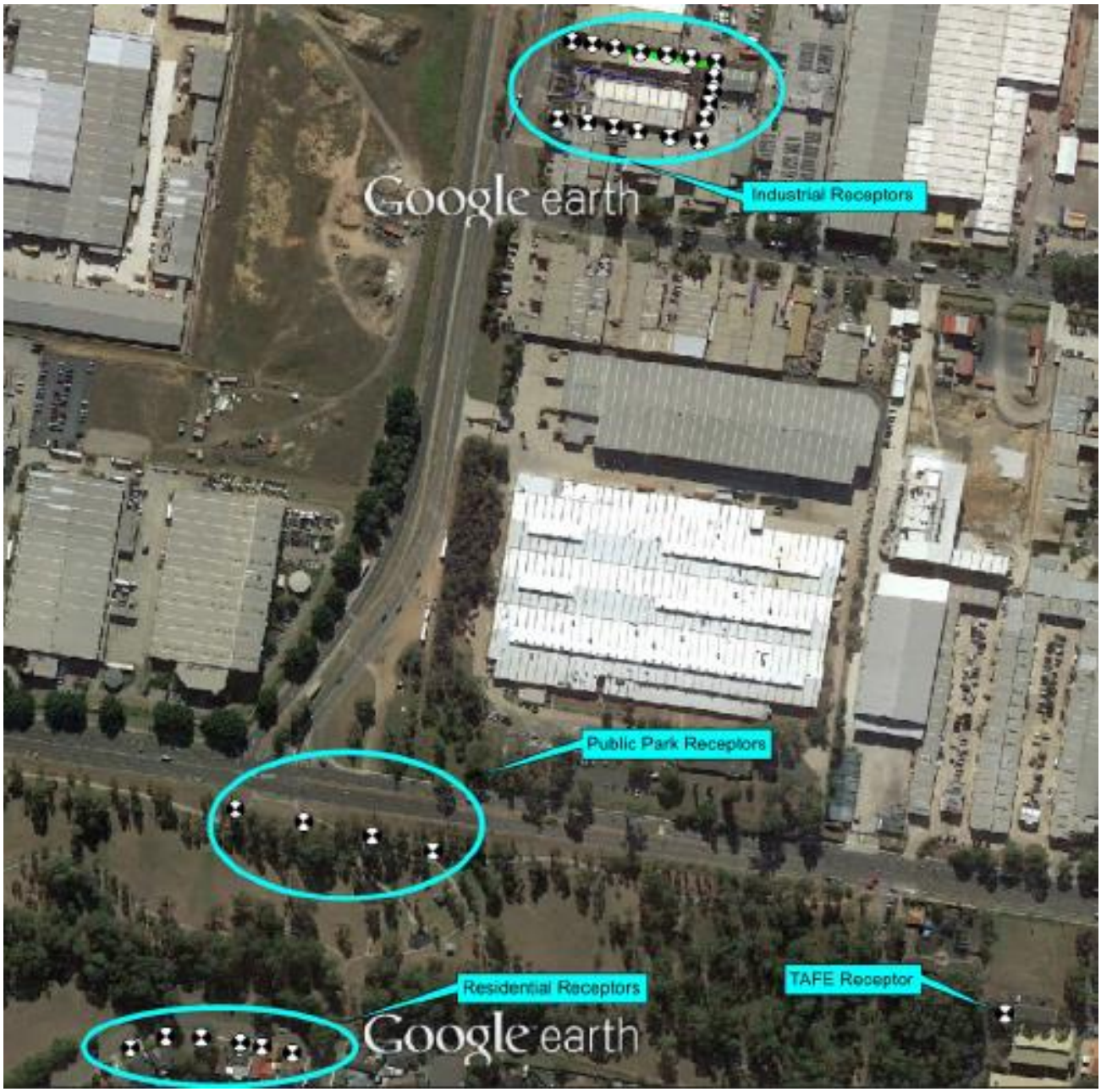
Discrete receptors have been modelled at the following locations:

- Residential receptors to the south;
- Wetherill Park Reserve;
- TAFE Wetherill Park; and
- Along the boundary of the site to represent the nearest industrial receptors.

Figure 5.7 presents the modelled discrete receptors.

Figure 5.7: Operational - Modelled Discrete Receptors.



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5.8.6 Predicted Noise Results

Tables 5.20 and 5.21 presents predicted LA_{eq} noise levels for the construction and operation of the upgraded facility.

Table 5.20. Construction – predicted LA_{eq} noise levels.

Receptor Group	Highest Predicted L_{Aeq} Noise Levels dB(A)				Noise Criteria dB(A)
	Demolition	Excavation	Concrete Pouring	Formworks	
Residential Houses	23	12	17	7	58
Wetherill Park Reserve	30	17	21	13	60
Wetherill Park TAFE	21	11	14	6	45 (Internal)
Industrial Premises	73	70	73	73	75

Table 5.21. Operations – predicted LA_{eq} noise levels.

Receptor Group	Highest Predicted L_{Aeq} Noise Levels dB(A)	Noise Criteria dB(A)
Nearest Residential Houses	27	53 / 44 / 38 (Day/Evening/Night)
Wetherill Park Reserve	31	48
Wetherill Park TAFE	22	35 (Internal)
Industrial Premises	63 northern boundary 68 eastern boundary 63 southern boundary	68 / 70 / 70 (Day/Evening/Night)

The results of the modelling demonstrate predicted compliance with the noise criteria for both construction and operational phases.

Noise levels at the nearest residential receptors are predicted to below the noise criteria by a significant margin – this is due to the large separation distance between the site and receptors.

Noise levels at the eastern boundary of the site are predicted to be the highest (68 dB(A)) though are still compliant with the industrial noise criteria. The higher noise levels along this boundary is due to the relocation of the paper shredder closer to the north-eastern corner of the site and the plus 5 dB correction applied to account for tonality.

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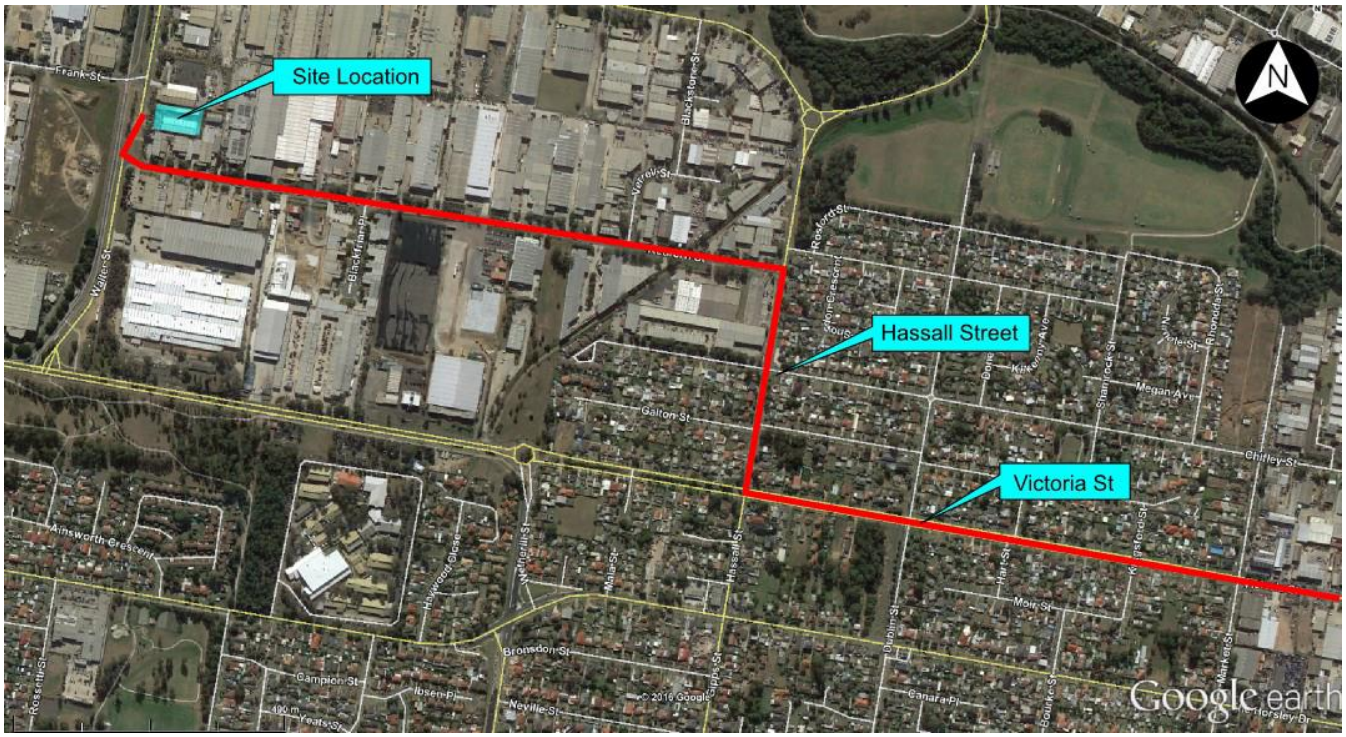
In terms of potential sleep disturbance impacts, predicted LA_{Max} noise levels from truck movements on site are predicted to be 28 dB(A), which is well below the adopted 57 dB(A) maximum criteria.

5.8.7 Road Traffic Noise Assessment

To assess the potential noise impacts associated with increased truck movements for the proposed upgrade, the noise level increase when the site is operating at full capacity has been estimated. It is assumed that the primary route for trucks is between the facility and the nearest inter-regional arterial road (Cumberland Highway to the east). Therefore, trucks are expected to pass through residential areas along Victoria Street and Hassall Street.

The increase in noise levels has been estimated for the sections of Victoria Street and Hassall Street, which are adjacent to residential houses. These road sections are shown in Figure 5.8.

Figure 5.8. Primary Haul Route and Modelled Road Sections.



Hourly traffic counts representative of peak AM and PM periods have been obtained from the project traffic study conducted by Jacobs2. The study also estimates the following additional traffic as a result of the upgrade (Year 2023 at full capacity):

- AM peak – 1 light vehicle, 23 heavy vehicles;
- PM peak hour – 1 light vehicle, 18 heavy vehicles.

Based on this data, road traffic source noise levels have been calculated using the Calculation of Road Traffic Noise (CoRTN) methodology for No Project and With Project scenarios. The noise level increase as a result of the proposed upgrade is determine by comparing the calculated source noise levels. Table 5.22 presents a summary of the analysis.

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Table 5.22. Estimated road traffic noise level increase during operations.

Parameter	AM Peak		PM Peak	
	LV	HV	LV	HV
Hassall Street				
Existing Peak Hour Traffic	1723	220	1923	130
Additional Peak Hour Traffic	1	23	1	18
With Project Peak Hour Traffic	1724	243	1924	148
Existing $L_{A10,1\text{-hour}}$ dB(A)	76.3		75.5	
Future $L_{A10,1\text{-hour}}$ dB(A)	76.6		75.7	
dB Increase	***0.3***		***0.2***	
Victoria Street				
Existing Peak Hour Traffic	695	284	997	155
Additional Peak Hour Traffic	1	23	1	18
With Project Peak Hour Traffic	696	307	998	173
Existing $L_{A10,1\text{-hour}}$ dB(A)	75.8		74.4	
Future $L_{A10,1\text{-hour}}$ dB(A)	76.1		74.7	
dB Increase	***0.3***		***0.3***	

The potential increase in noise levels due to the proposed upgrade is predicted to be minimal (0.3 dB only). The predicted 0.3 dB increase is well within the + 12 dB allowable increase for sub-arterial roads.

Additional vehicle movements during construction works are anticipated to be lower than during operations (up to 2 truck movements and 20 light vehicle movements). Therefore, the potential increase in traffic noise during construction is expected to be lower than 0.3 dB.

5.9 Vibration Assessment

5.9.1 Overview

The potential for vibration impacts during construction and operations has been assessed through predictive calculations of peak particle velocities (PPV mm/s). The predicted vibration levels have been compared to the criteria outlined in the guideline NSW Assessing Vibration: A Technical Guideline (February 2006) published by the NSW Department of Environment and Conservation (now the Office of Environment and Heritage (OEH)).

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In predicting vibration levels, it can be assumed that the vibration level is inversely proportional to distance (with the relationship varying between d-0.8 to d-1.6 based on field data). The US Department of Transportation's Transit Noise and Vibration Impact Assessment (May 2006) presents the following construction vibration propagation formula assuming an inverse relationship:

$PPV@d_2 = PPV@d_1 \times (d_1/d_2)^{1.5}$

where: d_1 = distance 1 (reference distance for source data) (m)

d_2 = distance 2 (separation distance for predicted PPV) (m) PPV = peak particle velocity (mm/s)

The above formula has been considered for predicted PPVs at various distances from truck movements and potential excavator operation during construction.

5.9.2 Vibration Predictions

The primary sources of vibration associated with the site include the following:

- Truck movement (construction and operational phase);
- Excavator (construction only).

Vibration data for truck movements were obtained from attended measurements as trucks entered and departed the site on the morning of 10 June 2016. Vibration measurements were completed using an Instantel MiniMate Plus (Serial No. BE18759, calibration due 26/11/16). Measurements were made at a distance of approximately 3 metres. A total of 13 measurements were completed, covering a range of truck types. Table 5.23 presents the results of the attended measurements.

The attended measurements show that vibration levels at 3 m range from 0.13 to 0.57 mm/s. Variations in levels may be attributable to the speed of entry and the payload of the truck.

Vibration data for an excavator during construction works is assumed to be 0.08 mm/s at 7.5 metres, based on data for a small bulldozer as presented in the US Department of Transportation's Transit Noise and Vibration Impact Assessment (May 2006).

Based on the above vibration source levels, peak particle velocities presented in Table 5.24 have been predicted at the nearest residential receptor along the haul route and adjacent industrial premises.

Predicted vibration levels due truck movements along the haul route and construction are within the human annoyance criteria for residential and industrial areas. Predicted vibration levels are also within the building damage criteria by a significant margin.

Table 5.23. Attended vibration measurement results.

Time of Measurement	Vehicle	Vibration (mm/sec)
7:23 am	Grima Recycling truck	0.46
7:26 am	Grima Recycling truck	0.13
7:29 am	Grima Recycling truck	0.57

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Time of Measurement	Vehicle	Vibration (mm/sec)
7:33 am	Grima Recycling truck	0.17
7:35 am	Tip truck	0.46
7:44 am	Small truck	0.27
7:54 am	Grima Recycling truck	0.19
8:04 am	Small truck	0.14
8:09 am	Grima Recycling truck	0.19
8:14 am	B double	0.13
8:19 am	Grima Recycling truck	0.14
8:26 am	Grima Recycling truck	0.27
8:30 am	Grima Recycling truck	0.16
Maximum		***0.57***
Average		***0.25***

Table 5.24. Predicted peak particle velocities.

Vibration Source	Estimated Vibration Levels (mm/s)	
	Nearest House along Haul Route	Adjacent Industrial Premises
Truck Movement	0.13[a]	0.03[b]
Excavator	Not Applicable	0.08[c]
Annoyance Criteria	***Day 0.28 (preferred) / 0.56 (max)*** ***Night 0.2 (preferred) / 0.40 (max)***	***1.1 (preferred) / 2.2 (max)***

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Vibration Source	Estimated Vibration Levels (mm/s)	
	Nearest House along Haul Route	Adjacent Industrial Premises
Building Damage Criteria	*15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz* *20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above*	*50 mm/s at 4 Hz and above*
a Based on a distance of 8 m from truck route to nearest house b Based on a distance of 20 m between northern industrial premise and on-site truck route across weigh-bridge c Based on distance of 7.5 m distance between northern industrial premise and potential excavator operating area		

Overall, the potential for vibration impacts from both construction and operation are expected to be minimal. It should be noted that residential houses and industrial premises are already exposed to a high level of vehicular and truck movements along the surrounding road network.

5.10 Air Quality Assessment

5.10.1 Modelling Methodology

The Ausplume model (version 6.0) has been used to assess air quality impacts. Ausplume is an approved Gaussian plume dispersion model for the assessment of air quality impacts in NSW. The model accounts for meteorological data, building wake effects and terrain effects in the prediction of ground level concentrations of pollutants from stack, area or volume sources. Ausplume assumes steady state meteorology for the field of influence of the source being considered.

Steady state meteorology assumes that for any given time period of model calculation (usually 1 hour), the wind and other meteorological conditions are uniform over the entire area being modelled, and that a plume is assumed to travel instantaneously to the edge of the modelled area in a straight line. A number of additional parameters are considered in the modelling. The following sections present the methodologies and findings of the air dispersion modelling.

5.10.2 Meteorological Data

For the dispersion modelling a 'synthetic' worst-case meteorological dataset has been utilised for the Level 1 air quality assessment, as required by the NSW OEH Approved Methods document.

5.10.3 Terrain Data

5 metre LiDAR data for the area surrounding the development was obtained from the Geoscience Australia Elevation Information System. Terrain heights for a grid of receptor points covering a 2 km x 2 km area surrounding the proposed development was included in the dispersion model to account for ground height variability. The gridded receptors were spaced at 20 metre intervals.

5.10.4 Background Air Quality

Year 2015 PM10 and PM2.5 background air quality data from the Chullora monitoring station Park has been adopted for the assessment of potential cumulative impacts. The monitoring location is approximately 5.4 km

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north of the site at William Lawson Park. No background data for TSP is available in the Sydney region. A summary of the data is provided in Table 5.24.

For PM10 and PM2.5 (24-hour average) predictions, a Level 1 assessment in accordance with NSW EPA Approved Modelling guideline requires a comparison of 100th percentile predictions plus maximum background concentration. Where existing background is above the ambient air quality goal, a proposed development should not increase the number of exceedences that occur.

Table 5.25. Chullora Background Air Quality Data for 2015.

Compound	Maximum (24-hour Average)	2nd Highest (24-hour Average)	Annual Average	Days Above Air Quality Goal
PM_{10}	64.6	48.2	17.5	1
$PM_{2.5}$	37.2	18.4	8.0	1

5.10.5 Air Emission Data

As discussed in Section 5.4.1, paper and plastic recycling is not an inherently dusty process. Therefore, dust emission factors for this type of process are not readily available. For the purpose of the assessment and in the absence of site specific emission data, reference has been made to US EPA AP42 emissions manual for general material handling. This approach is considered highly conservative, as the emissions data are normally adopted for processes involving aggregates and sand. Potential dust emissions from trucks driving across the site have also been considered. The following documents have been utilised to estimate emissions:

- AP 42 (5th Edition), Compilation of Air Pollutant Emission Factors, Vol. 1 Stationary Point and Area Sources, Chapter 13.2.1, Paved Roads.
- AP 42 (5th Edition), Compilation of Air Pollutant Emission Factors, Vol. 1 Stationary Point and Area Sources, Chapter 13.2.4, Aggregate Handling and Storage Piles, November 2006.

Table 5.25 presents emission factors sourced from the above literature.

In order to derive emission rates using the above emission factors, the following information has been considered:

- 270 tonnes/day material throughput;
- 99% reduction for material handling within enclosure; and
- 290 heavy vehicles per day travelling 100 metres across the site (50 metres to drop off or loading zone, and 50 metres back to exit).

Table 5.26 presents the estimated emission rates adopted in the air dispersion modelling. Only confidential paper requires shredding however, as a conservative approach it is assumed that all 270 tonnes of material processed is confidential paper.

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Table 5.25. Emission factors.

No.	Activity/Source	Units	TSP	PM_{10}	$PM_{2.5}$
F1	Unloading delivery truck[a]	kg/Mg	0.00046	0.00022	0.000033
F2	Loading baler press[a]	kg/Mg	0.00046	0.00022	0.000033
F4	Paper shredding[a]	kg/Mg	0.00046	0.00022	0.000033
F3	Truck movements[b]	g/VKT	47.6	9.1	2.2

a Derived from Equation 1 of AP 42 Chapter 13.2.4, assuming a wind speed of 0.5 m/s given that loose material handling would occur inside the warehouse shed only. A moisture content of 1% has also been adopted for dust related to loose material.

b Derived from Equation 1 of AP 42 Chapter 13.2.1, assuming concrete truck weight of 20 tonnes recycle truck and site pavement surface silt loading of 0.6 g/m^2 as per Table 13.2.1-2 (assumed similar to public road with minor traffic).

Table 5.26. Estimated emission rates (g/s).

Activity/Source	Factor Value	Factor Unit	Emission Rate (g/s)		
			TSP	PM_{10}	$PM_{2.5}$
Unloading delivery truck	270	tonnes/day	0.000014	0.0000067	0.0000010
Loading of baler presses	270	tonnes/day	0.000014	0.0000067	0.0000010
Paper shredding	270	tonnes/day	0.000014	0.0000067	0.0000010
Truck movements	29	Km/day	0.016	0.0031	0.00074

5.10.6 Source Parameters

The unloading of a delivery truck and loading of the baler press equipment have been modelled as a single volume source, as both sources are located within the warehouse and workshop sheds. Truck movements have been modelled as an area source. Table 5.27 presents the modelled emission parameters.

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Table 5.27. Modelled emission parameters.

Activity/Source	Type of Source Modelled	Parameters
Unloading of delivery truck and loading of baler press	Volume	Height 4.0 m Initial sigma Z 2.0 m Initial sigma Y 6.0 m
Paper shredding	Volume	Height 2.0 m Initial sigma Z 1.0 m Initial sigma Y 1.0 m
Truck movements	Area	Height 0.0 m Initial sigma Z 1.0 m

5.10.7 Predicted Air Quality Results

Table 5.28 presents predicted concentrations at the nearest sensitive receivers (residential houses to the south). The results of the modelling indicate compliance with the requirements of the NSW EPA for all size fractions. Compliance is predicted for TSP, and no additional exceedences (over and above those already occur, based on the available monitoring data) are predicted for PM 10 and PM2.5 as a result of the upgrade.

Table 5.28. Maximum Predicted Ground Level Concentrations at the Modelled Discrete Sensitive Receptors.

Compound	Averaging Period	Maximum Predicted Concentrations at Modelled Sensitive Receptors (µg/m³)			Air Quality Criteria (µg/m³)
		Source Only	Background	Cumulative	
TSP	Annual	0.080	-	-	90
PM_{10}	Annual	0.020	17.5	17.5	30
PM_{10}	24 hour	0.300	64.6 (max) 48.2 (2nd)	64.9 (max) 48.5 (2nd)	50
$PM_{2.5}$	Annual	0.004	8.0	8.0	8
$PM_{2.5}$	24 hour	0.100	37.2 (max) 18.4 (2nd)	37.3 (max) 18.5 (2nd)	25

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It is noted that the contribution from the site to total predicted dust loadings in the atmosphere is minimal (less than 1%). The site consists of paved surfaces and building enclosures for all processing activities, thus minimising the potential for dust emissions. On a regional and global level, the air emissions footprint is expected to be negligible.

5.11 Conclusion

An air, noise and vibration assessment has been completed for the proposed upgrade to the Grima Recycling facility at 88 Redfern Street, Wetherill Park. The conclusions and recommendations of the assessment are summarised below:

- The nearest receptors to the site include industrial premises along the site boundary, and a residential area, TAFE and public park between 470 m to 625 m to the south. Heavy vehicles associated with the site pass through residential areas along Hassall Street and Victoria Street.

Noise:

- The main operational noise sources at the site include truck movement, forklift movement, a front end loader, baler presses (2) and paper shredder. During construction, potential noise sources include an excavator for demolition and minor earthworks, concrete truck/pump and general hand tools;
- The proposed upgrade is expected to result in increased truck movements to and from the site however, no new noise sources will added to the site. The paper shredder will be relocated to the north-eastern corner of the site and will remain within an enclosed building. All other sources will remain at their current locations;
- Potential noise impacts during construction and operation are predicted to be within the noise criteria derived in accordance with the NSW EPA guidelines. The highest operational noise levels are predicted to be along the eastern boundary, due to the paper shredder being located to this area.

Vibration:

- The proposed upgrade is expected to result in increased truck movements. Therefore, there is a potential for more frequent vibrations from trucks at nearby industrial premises and residential houses along the truck haul route;
- Attended vibration measurements and calculations indicate that, while truck movements are expected to increase, vibration levels from trucks are well within acceptable limits for protection against nuisance impacts and building damage. Vibration levels associated with construction are also predicted to be within acceptable limits.

Air Quality:

- Dust emissions are considered the main air quality indicator for the site, though it is noted that the paper and plastic recycling process is not an inherently dusty procedure. Potential dust emission sources include handling of loose material (ie. unloading of trucks and loading of baler press equipment, shredder) and truck movement over paved surfaces;
- Predicted TSP, PM10 and PM2.5 concentrations are predicted to comply with the relevant air quality requirements defined in the NSW Approved Modelling guideline.

In summary, the assessment demonstrates that the potential for air quality, noise or vibration impacts during construction and operations of the upgraded facility are expected to be minimal.

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6 Water impact assessment

6.1 Introduction

A water impact assessment has been undertaken as part of the study to address the SEAR's requirements. The study presents an assessment of potential impacts of the proposed upgrade on the way that water is managed to maintain or improve water quality and to protect receiving waterways.

As part of the SEAR's requirements, the study evaluates current baseline conditions, impacts and mitigation measures for:

- stormwater, wastewater and leachate management;
- soil and erosion control works during construction and operations; and
- surface water, flooding and soil impacts.

In this section, all water management and assessment requirements are addressed. Soil issues are addressed in Section 7.

6.2 Objective

The water management plan aims to identify impacts on surface water and groundwater due to changes in water use on-site during the demolition, construction and ongoing operational phase of the Facility.

This section assesses impacts and identifies appropriate options for mitigating those impacts during construction, demolition and operational phases of the works. This will be achieved by considering:

- water use and requirements;
- wastewater generation;
- wastewater disposal requirements;
- stormwater; and
- stormwater discharge.

6.3 Legislative requirements

Regulatory requirements for water management plans must consider the under pinning regulations, planning policies and guidelines. Applicable legislation for the facility are:

1) *Water Management Act 2000*

2) *Water Act 1912 (partially repealed)*

3) *Protection of the Environment Act 1997 (POEO Act 1997*)
Schedule 1 of the *POEO Act 1997* regulates discharges to waters from premises. The EPA regulates discharges to water using conditions it places on a facility's EPL. These conditions include:

- restricting the amount of various pollutants that can be discharged
- requiring discharges to waters to be monitored and reported
- requiring that pollution control equipment operates properly and efficiently
- requires the licence holder to undertake a pollution reduction program to manage, investigate or address the discharges to waters.

The relevant considerations may include but are not necessarily limited to:

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- the pollution that will be caused and its impact on the environment
- practical measures that can be taken to prevent, control, abate or mitigate the pollution and protect the environment from harm
- the environmental values of water affected by the proposed discharge
- practical measures that can be taken to restore or maintain those values.

4) *Fairfield Citywide Development Control Plan 2013 (Amendment 11)*

Section 8B.6.3 Drainage and Stormwater Detention

Objective:

i) To control flooding, prevent stormwater damage and provide an adequate stormwater drainage system for the development.
ii) To ensure stormwater detention facilities in landscaped or open space areas enhance rather than detract from the development.
iii) To minimise increases in flood levels on the major trunk drainage network and on the creek system.
iv) To minimise downstream flooding caused by surcharging of the local drainage system.
v) To ensure that on-site stormwater detention (OSD) systems are considered at the very early stages of the design process so that adequate storage areas can be located in the most efficient, attractive and cost effective way.

5) Approved methods for Sampling and Analysis of Water pollutants in NSW (EPA 2004)

6) Australian Standards for water monitoring:
i) AS 5667.1:1998 (guidance on the design of sampling programs, sampling techniques, preservation and handling of samples)

6.4 Baseline conditions

The site area used for business operations is fully concrete hardstand, except for a small area of ~160m^2 at the very rear of the site. This area experiences very limited infiltration and will be concreted as part of construction of a new mechanical workshop and baling area at the rear of the processing warehouse.

6.4.1 Annual water use

Annual water use on-site is within the office building. Currently, water is used in the office for drinking, cooking, toilets flushing and cleaning of the office premises, and is estimated to be 292 kL per year (based on Sydney Water accounts).

6.4.2 Water Management Zone

The facility, as per the Water Sharing Plans under the *Water Management Act 2000*, is situated:

a) within the *Prospect Creek Management Zone*
b) of *the Southern Sydney Rivers Water Source*
c) in the *Greater Metropolitan Region unregulated river water sources.*

Prospect Reservoir is about 2 km to the north-west of the facility and Prospect creek is about 800 metres to the north. The site is identified by a flag in Figure 6.1.

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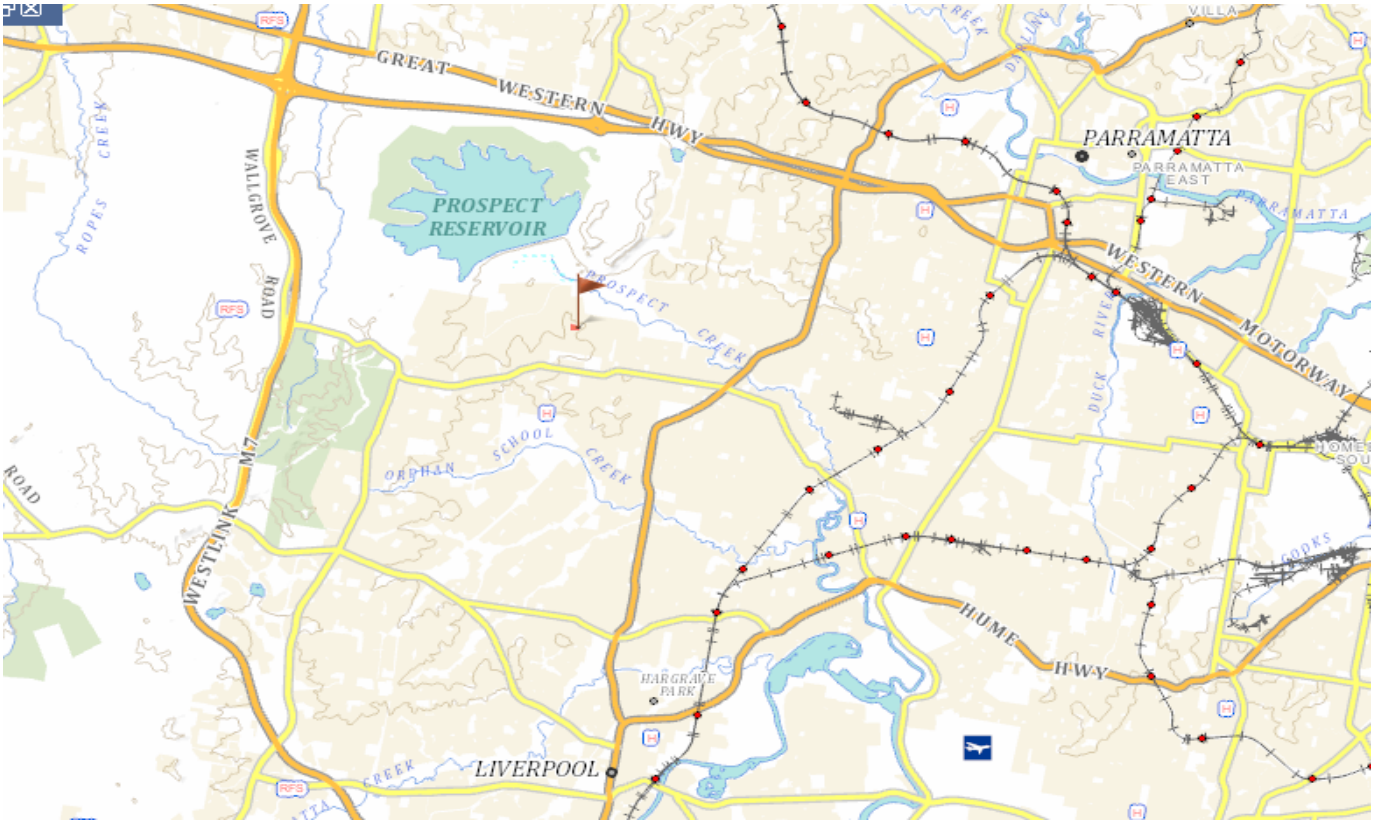
Figure 6.1. Location of the subject site (red flag) in relation to water courses and storages. Source: Land and Property Management Authority.



6.4.3 Surface water and flood impacts

The regional drainage pattern comprises of a series of major drainage channels, including Prospect Creek, which flows in the easterly direction and into the Georges River. The site is located to the South of the creek and south east of the Prospect Reservoir. Stormwater drainage runs towards the north into the Prospect creek.

6.4.4 Georges River Catchment

The facility is located in the uncontrolled streams and water bodies region of the Georges River Catchment Area. This is clearly identified in Figure 6.2.

Uncontrolled streams[20] and waterbodies are waterways that are not in the other categories or the estuary. Their flow patterns are largely natural but may have been altered in some way.

[20] Definition of Uncontrolled Stream as per the Georges River Water Quality and Flow objectives document, NSW Office of Water

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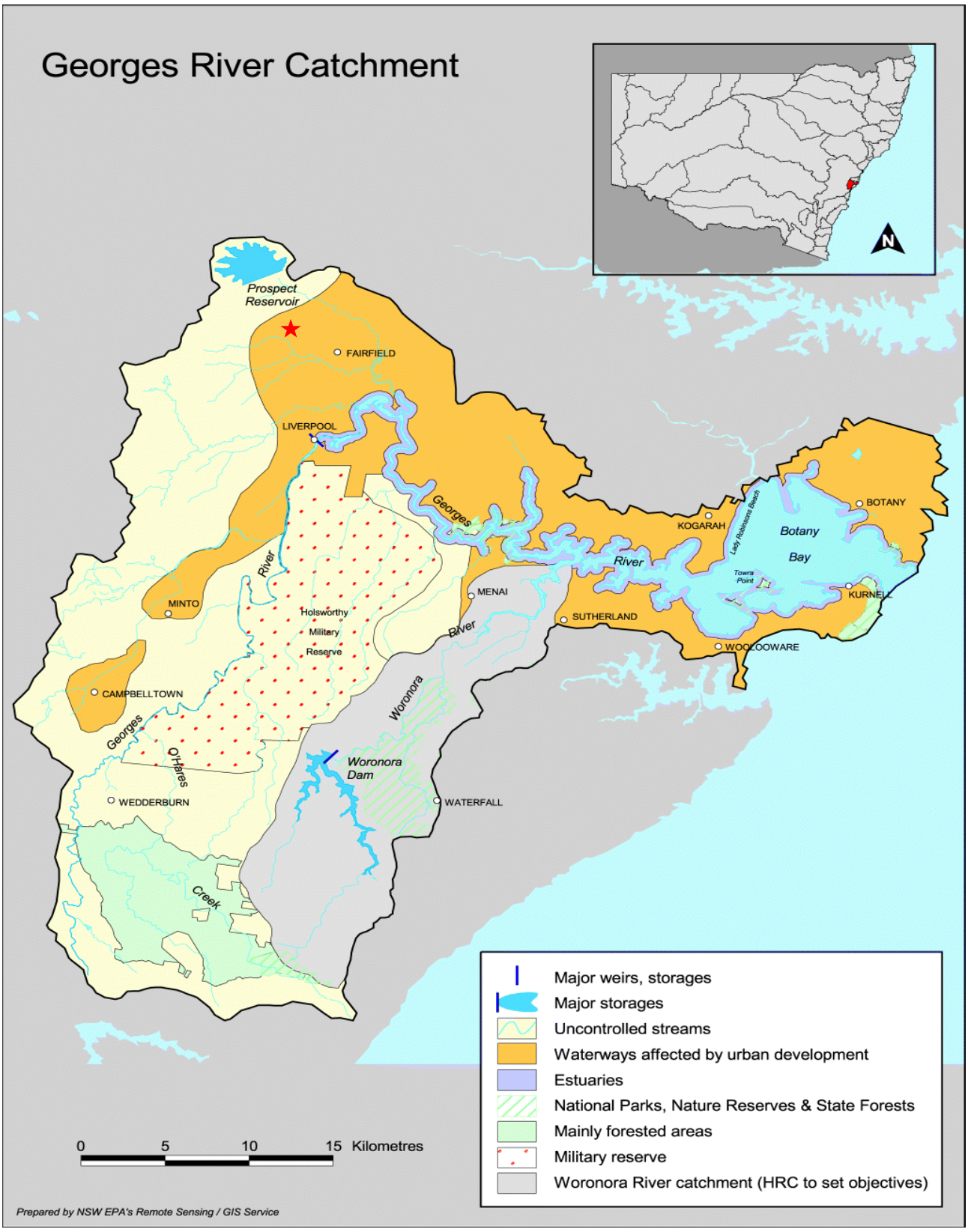
Figure 6.2. Overview[21] of the Georges River Catchment – subject site is shown as a red star near Prospect Reservoir.



[21] ***Source:*** ***http://www.environment.nsw.gov.au/ieo/GeorgesRiver/maplg.htm***

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Water Quality and River flow objectives for uncontrolled streams are listed in Table 6.1. River flow objectives are given in Table 6.2.

Table 6.1 Water Quality requirements as per the Georges River Water Quality and Flow objectives document, NSW Office of Water.

	Water Quality Criteria	Applicable to site
1.	Aquatic ecosystems	✓
2.	Visual amenity	✓
3.	Secondary contact recreation	
4.	Primary contact recreation	
5.	Livestock water supply	
6.	Irrigation water supply	
7.	Homestead water supply	
8.	Drinking water at point of supply-Disinfection only	
9.	Drinking water at point of supply-Clarification and disinfection	
10.	Aquatic foods (cooked)	

Table 6.2. River Flow Objectives as per the Georges River Water Quality and Flow objectives document, NSW Office of Water.

	River Flow Objectives for Prospect Creek	Applicable to site
1.	Protect pools in dry times	
2.	Protect natural low flows	✓
3.	Maintain wetland and floodplain inundation	✓
4.	Maintain natural flow variability	✓
5.	Minimise effects of weirs and other structures	✓

6.4.5 Surface water

The site is managed to protect surface water runoff quality from outdoor operational areas, and to prevent pollution incidents involving spills of fuels and oils that could migrate into the stormwater system. The site's Pollution Incident Response Management Plan is given in Appendix 7. The site is sweeped daily to remove sediment and litter on paved surfaces, to avoid any pollutants being transferred into stormwater during a rain event (see Appendix 6).

6.4.6 Stormwater and stormwater detention drains

Three stormwater pits exist on the site; one in front of the processing warehouse, and two along the access along the existing mechanical workshop. These pits drain to the north east corner of the site, where there is a connection is with the council stormwater line.

Historic rainfall data for the past 10 years is shown in Table 6.3. Figure 6.4 shows how rainfall varies from year to year. Rainfall data for the month of April is also shown, to highlight inter-year rainfall variability on a monthly basis.

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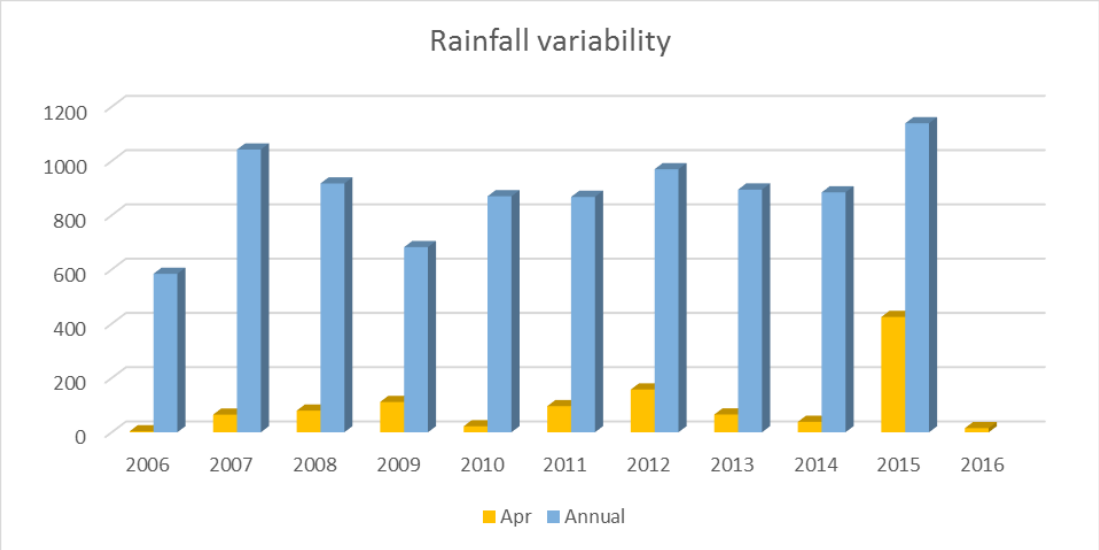
Table 6.3. 10 year historic rainfall data. [22]

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2006	109.9	69.9	37.0	3.8	13.7	62.7	43.4	45.5	114.3	5.7	26.6	51.6	584.1
2007	45.1	150.5	69.7	65.0	19.7	284.6	23.6	77.0	21.4	29.8	143.4	112.4	1042.2
2008	83.2	260.3	79.5	79.9	3.8	102.0	31.3	29.4	50.0	*53.5*	73.0	71.4	*917.3*
2009	22.4	140.5	54.1	111.8	91.4	52.6	27.6	5.9	16.3	*84.0*	12.5	63.3	*682.4*
2010	34.0	199.7	81.5	22.1	72.1	76.3	39.0	24.1	29.9	90.5	103.6	97.0	869.8
2011	68.5	18.7	83.4	96.4	62.4	49.7	85.2	33.6	57.7	42.5	151.8	117.7	867.6
2012	140.6	177.5	196.3	157.5	18.2	117.9	23.0	5.6	21.0	35.5	35.8	40.7	969.6
2013	134.8	164.1	82.4	65.5	40.0	146.1	11.1	8.6	20.9	9.7	179.1	32.3	894.6
2014	*20.9*	66.2	197.0	38.5	7.2	33.9	11.1	155.0	29.0	80.2	*38.1*	207.3	*884.4*
2015	191.8	*37.0*	*45.0*	*425.0*	*68.2*	60.1	*35.4*	*44.4*	*20.3*	*39.0*	*106.4*	*66.2*	*1138.8*
2016	*308.4*	*17.5*	*34.1*	*15.1*									
Ave.													885.1

Figure 6.4. Historic rainfall variability over past 10 years.



6.4.7 Flood zone

Section 7A of the S149 Certificate for the property in the "Flood related development control information" states that the property falls in the area where floodplain related development control applies or is subject to overland flooding (Appendix 9).

[22] Source: http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=139&p_display_type=dataFile&p_startYear=&p_c=&p_stn_num=067019

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6.4.8 Groundwater

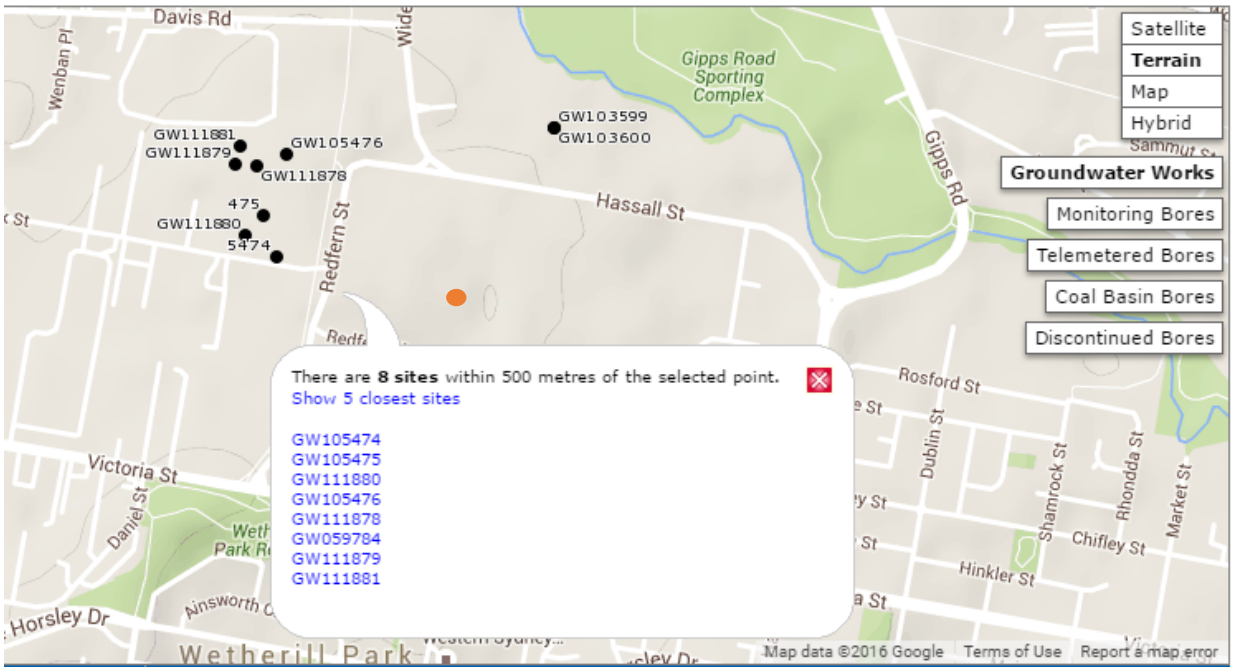
The facility is fully cemented with an impervious layer and is well maintained, to avoid uneven surfaces and cracks in the built ground surface.

Due to the impervious nature of the concreted hardstand, there is no possibility of leachate into the ground, except for a small area of the site which is currently unpaved. The extensive hardstand on the site reduces the risk of harm for potential pollution to groundwater.

The overall salinity of the groundwater in the western suburbs of Sydney is historic with a few bores located in the western region. The industrial zoning and built impervious layers in the area results in a lower rate of infiltration and already high salt concentrations require that the groundwater in this region remains unsuitable for agricultural, horticultural or farming use without treatment.

Eight groundwater works (GW) sites are situated within 500 metres of the site (Figure 6.5). The GW works are within the 40 metre elevation level and the site is at 50 metre elevation point. The drainage from the site flows in the north easterly directions, as per the contour mapping, flowing from a 50 metre (site location) to 40 metre (GW works and creek corridor).

Figure 6.5. Groundwater (GW)[23] works in the vicinity of the subject site.



6.5 Impacts assessment

6.5.1 Potential pollutants

SEPP 33 Hazardous and Offensive Development assessment has been conducted to identify risks posed to people, property and the environment (see Section 2.8). The study noted that the proposed development processing paper,

[23] All groundwater works data by NSW Office of Water, available at: http://allwaterdata.water.nsw.gov.au/water.stm.

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cardboard and plastic film and baled indoors is not offensive under the *SEP33 Hazardous and Offensive Development Application Guidelines – Applying SEPP 33 (Department of Planning, 2011a*).

However, the three main on-site source pollutants that may be introduced into the water cycle at discharge points include:

- Oil and fuel spill from leakage from vehicle-movement on site;
- Leaks from sewage pipes; and
- Combustion products from fire suppression wastewater.

It is noted that small quantities of chemicals will be stored in the new mechanical workshop (see Figure 2.13 and Appendix 3). Stormwater protection measures as defined in the site's existing Environmental Management Procedures (Appendix 6) and the Pollution Incident Response Management Plan (Appendix 7) are considered satisfactory to protect stormwater quality. Installation of a stormwater isolation value and gross pollutant trap and underground firewater storage on site will further protect stormwater in the unlikely event of fire or chemical spill. These measures are described in Sections 6.5.5 and 11 and further detailed in the design plans in Appendix 3.

6.5.2 Stormwater drainage and detention

Currently there is one stormwater drainage connection on the property, at the north-east corner of the site. No upgrades to the stormwater system are proposed on site, except for the installation of a gross pollutant trap and a stormwater isolation value to detain firewater or chemicals spilled on the site (for later pumpout and treatment at a licensed wastewater facility). These measures are detailed in Sections 6.5.5 and 11 and further detailed in the design plans in Appendix 3.

6.5.3 Flood impacts and management

Flood management studies conducted by Fairfield Council in 2010 suggests that the subject site lies outside the flood zone (see Figure 6.6).

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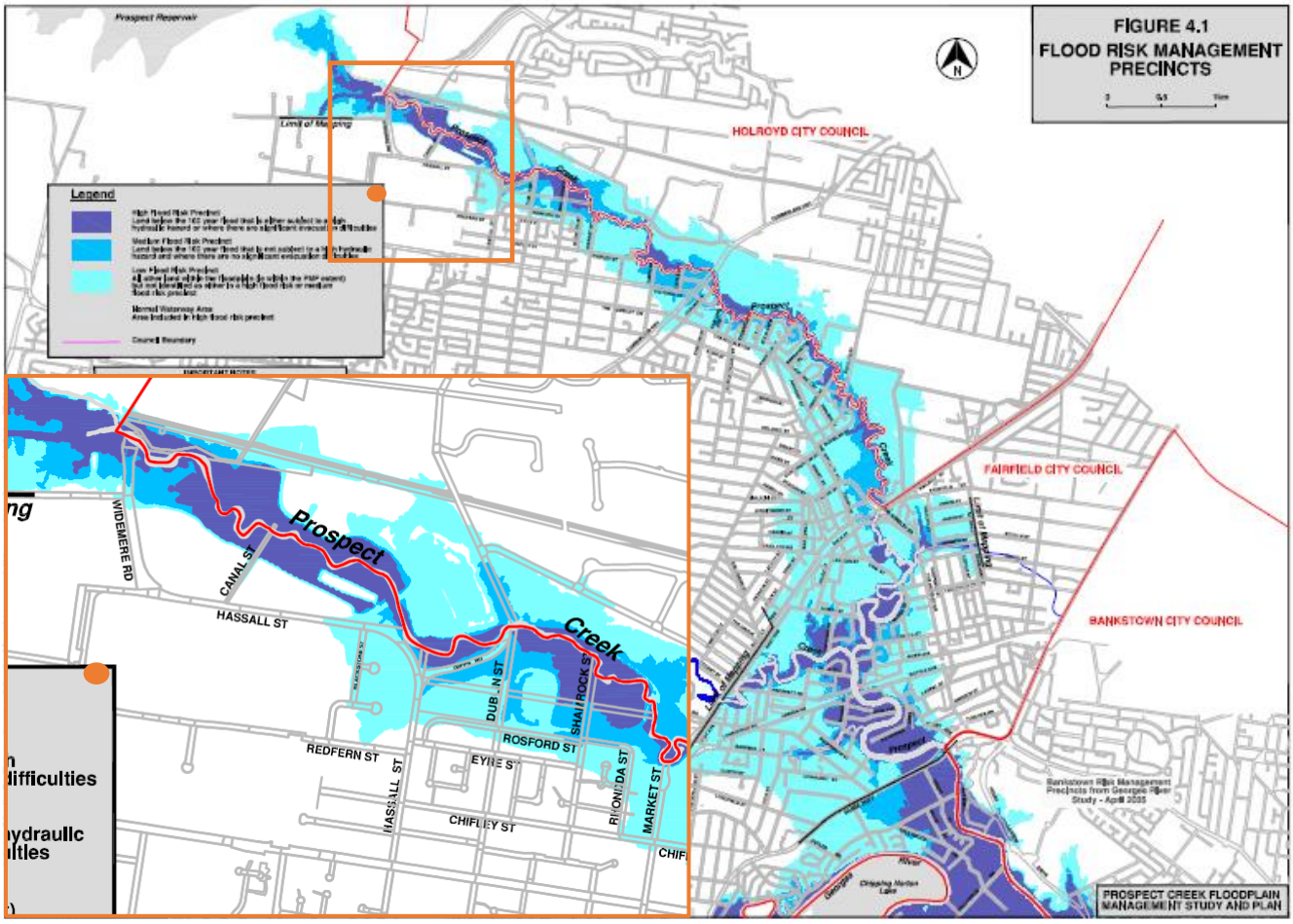
Figure 6.6. Flood maps. Inset map: enlarged portion from within the map – orange dot is the subject site. Source: Prospect Creek Flood Plain Management Plan Review 2010.



6.5.4 Impacts on receiving environment

Stormwater run-off currently drains into Prospect Creek that eventually discharges to Georges River. If not managed, stormwater from the subject site during the demolition, construction and operational phases could impact on this waterway. It is noted that Prospect Creek flows through differing land uses and supports the threatened community of shale (Cumberland Plain) and sandstone (Woronora Plateau) geologies, listed under the *NSW Threatened Species Conservation Act 1995.* The Cumberland Plain ecosystem, in particular is protected for conservation which is located further downstream. The water course also supports sensitive aquatic life, riparian corridors, aquatic ecosystems and fish habitat.

However, given that the operations are performed within buildings and covered areas, and good housekeeping is performed in terms of site sweeping daily and litter removal (see Appendix 6 for Environmental management procedures currently in operation at the site), the risk of stormwater contamination and impacts on Prospect Creek is considered low. This is further investigated in water cycle and pollutant load modelling in section 6.5.5.

6.5.5 Water balance and modelled pollutant loads

To help assess the water balance of the site pre- and post-development, the following site features pre- and post-development have been assessed in Table 6.4.

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Table 6.4. Pre- and post-development features and assumptions considered in the assessment of the site water balance.

Pre-development features	Total site area (m^2)	Roof area (m^2)	Exposed concreted hardstand area (m^2)	Pervious landscaped area (m^2)	Water consumption per annum (kL)	% Pervious area
Pre-development	5,456	1,863	2,902	691	292	12.6
Post development	5,456	2,538	2,752	165	292	3.0

As part of the development upgrades to the site, the following water sensitive urban design measures and changes to management of water on site will be introduced:

- An increase in the roofed area associated with the new recycled products storage shed and the new mechanical workshop and baling area. The percentage of permeable area on the site will reduce from 12.6% to 3.0 % (Table 6.4.);
- Installation of a Rocla CDS® Nipper gross pollutant trap to the site to reduce sediment and gross pollutants leaving the site. This stormwater pollution prevention device will assist in removing up 98% of gross pollutants (>5mm), 95% of sediments (>0.215mm), 90% of fine sediment (>75 µm), 70% of total suspended solids (TSS), 30% of total phosphorus, 80% of heavy metals and 90% of free hydrocarbons, oils and grease. All run-off from paved areas will be intercepted through the existing three stormwater pits and will be directed to the Rocla CDS® Nipper gross pollutant trap [24]. See Appendix 3 for construction plans. Configuration of the treatment train is shown in Figure 6.7.
- Installation of a stormwater isolation value prior to the council stormwater connection to prevent chemical spills or firewater leaving the site in case of incident; and
- A 115,000 L firewater storage tank beneath the mechanical workshop and new warehouse extension to contain at least 90 minutes of firewater in the event of fire (refer to Section 11 for fire water containment calculations).

The site water balance and water run-off quality from sources on site pre- and post-development were modelled using MUSIC (version 6.2.0) developed by E-Water CRC. Pollutant parameters were taken from *Australian Runoff Quality: A Guide to Water Sensitive Urban Design* (Engineers Australia, 2006)[25].

For the concreted pavement area and unpaved areas, parameters for 'industrial' were used from ARQ 2006. For the roofed areas, parameters for 'Roof' were used. Rainfall data with 6-minute time step intervals from the nearest meteorological station (Liverpool Michael Wenden Centre) was sourced from the Bureau of Meteorology for the maximum time period available (December 2001 to August 2012). Default potential evapotranspiration data for Sydney was used in the absence of any evapotranspiration data in the vicinity of Wetherill Park.

Also note that the impact of the stormwater isolation valve and the firewater storage tank was not modelled, as the devices do not affect the water balance of the site, or pollutant removal during normal site operations.

[24] Rocla (2016). CDS Unit Technical Summary. Internet publication: http://www.waterquality.rocla.com.au/Technical.php
[25] Engineers Australia (2006). Australian Runoff Quality: A Guide to Water Sensitive Urban Design. Internet publication: https://www.clearwater.asn.au/resource-library/guidelines-and-strategy/australian-runoff-quality-a-guide-to-water-sensitive-urban-design.php

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Table 6.5. Site water balance pre- and post-development as modelled with MUSIC v6.2.0.

Pre-development features	Roof water discharged to stormwater (ML/yr)	Runoff from industrial impervious areas (ML/yr)	Total modelled stormwater flow (ML/yr)	Water re-use demand (ML/yr)	Water re-use supplied (ML/yr)	% of demand met
Pre-development	1.05	1.82	2.87	0	0	0
Post development	1.44	1.61	3.05	0	0	0

The existing treatment train prior to development is shown in Figure 6.7. Run-off from the site occurs when rainfall comes into contact with the existing roofed buildings, and from the concrete paved surfaces across the site. Total modelled stormwater flow to the Prospect Creek, being the eventual receiving point for stormwater from the site is estimated to be 2.87 ML/yr.

Figure 6.7. Pre-development stormwater model and treatment train. Note that the receiving waterway is Prospect Creek (MUSIC v6.2.0).

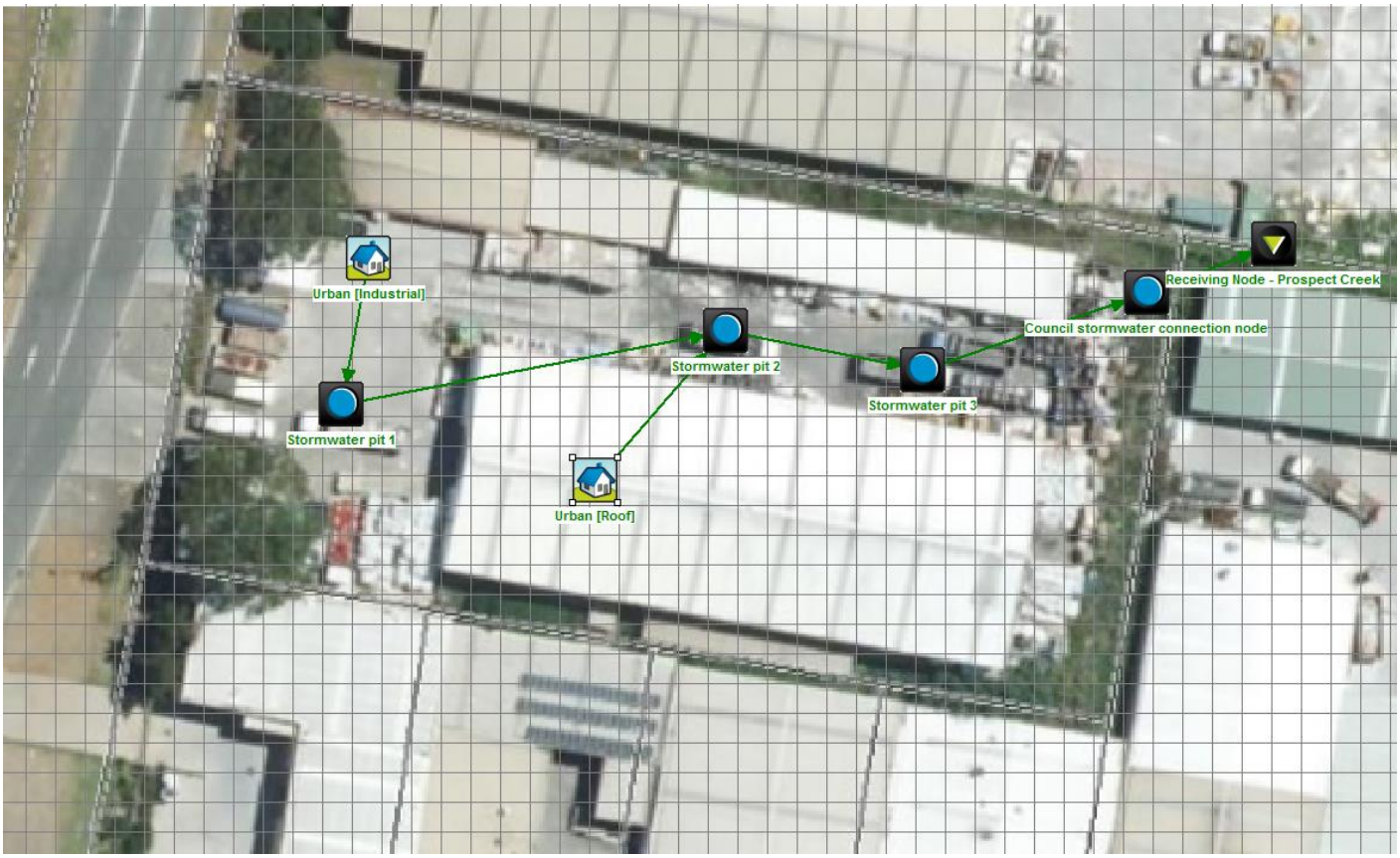

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Figure 6.8. Post-development stormwater model and treatment train. Note that the receiving waterway is Prospect Creek (MUSIC v6.2.0).

Post-development, the hydrological impacts of the site are increase slightly, with an increase in surface runoff into stormwater from a modelled 2.87 to 3.05 ML/yr (Figure 6.8 and Table 6.6). This is equivalent to a 6.27% increase in stormwater flows leaving the site. The modelled increase in flow occurs due to an increase in roofed and impervious areas across the site.

Following development, there will be a reduction in paved areas where surface runoff can occur, and a small increased in roofed areas. Furthermore, pollutant removal will occur through the Rocla CDS® Nipper gross pollutant trap. The pollutant loads to stormwater pre- and post-development is shown in Table 6.6.

Table 6.6. Pre- and post-development modelled stormwater pollutant loads leaving the site (mean annual load; modelled with MUSIC v6.2.0).

Pre-development features	Total flow (ML/yr)	Total suspended solids (kg/yr)	Total phosphorus (kg/yr)	Total nitrogen (kg/yr)	Gross pollutants (kg/yr)
Pre-development	2.87	358	0.702	6.32	87.5
Post development	3.05	99.3	0.489	6.66	1.81
% Reduction	-6.27	72.2	30.3	-5.37	97.9

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As a result of the development, there will be a small increase in total flow of runoff to stormwater, and a large reduction in pollutant loads measured as total suspended solids, gross pollutants and total phosphorus. There will be a small increase in total nitrogen in stormwater. The reduction in gross pollutants and total suspended solids is greater, due to the addition of the Rocla CDS® Nipper gross pollutant trap into the treatment train which is particularly effective in separating gross pollutants, though is less effective for dissolved pollutants such as nitrogen, and to a lesser extent, phosphorus.

It is important to note that pollutant loads from the site pre-development are low, as the operations of the facility are conducted indoors, preventing the chance of runoff occurring after coming into contact with waste materials. The small increase in roofed area, small decrease in exposed pavement areas and complete sealing of the site will result in result in small improvements to already good surface water runoff quality from the site.

6.5.6 Soil impacts

Minor earthworks will be required during the construction phase of the project. A series of erosion and sediment control measures will be implemented during the demolition, construction and operational phase of the project. These are described further in Section 7.4.

6.5.7 Impacts on groundwater quality and quantity

Following development, the entire site will be sealed with a concrete hardstand, protecting underlying soil and groundwater. As a result of the development, groundwater will be further protected from any minor chemical spills involving fuel or oil on the site.

Chemical clean up procedures are described in the Pollution Incident Response Management Plan and further in Section 8.

6.6 Mitigation measures

Mitigation measures proposed for the development are described in this section. These measures are described for the three stages of the development: demolition, construction and operational phases of the project.

6.6.1 Demolition phase

To reduce the risk of chemical spills in the existing workshop and impacts on water quality during the demolition process, measures as described in Sections 7.4.1 (Soils and contamination impact assessment) and 8.5 (Waste and chemicals impact assessment) will be implemented. A summary of measures to protect water quality include:

- Any chemical residues in the workshop to be fully removed and appropriately cleaned prior to commencement of demolition works;
- Erosion and sediment control measures will be installed around the perimeter of the site, and around existing stormwater pits on site; this will include the placement of sedimentation socks around existing pits, coverage of pits with geotextile filter fabric, including sediment fences as per the Sediment Control and Soil Erosion Plan (Appendix 3);
- Demolition works to occur in dry weather to prevent any surface runoff and transfer into stormwater;
- Prompt removal of sorted demolition waste materials in skip bins from the site, to reduce the risk of stormwater contamination and run-off of sediment into pervious areas at the rear of the site.
- Woody weeds will be carefully removed from the rear area of the site in a manner to avoid any soil disturbance;
- All erosion and sediment control structures will be inspected on a daily basis and any maintenance required will be performed immediately to ensure no sediment leaves the site.

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The strategies will assist in mitigating any potential impact on soils and water during the demolition phase of the project.

6.6.2 Construction phase

As part of the development upgrades to the site, and as described in Section 6.5.5, the following water sensitive urban design measures and changes to management of water on site will be introduced:

- Installation of a Rocla CDS® Nipper gross pollutant trap to the site to reduce sediment and gross pollutants leaving the site. This stormwater pollution prevention device will assist in removing up 98% of gross pollutants (>5mm), 95% of sediments (>0.215mm), 90% of fine sediment (>75 µm), 70% of total suspended solids (TSS), 30% of total phosphorus, 80% of heavy metals and 90% of free hydrocarbons, oils and grease. All run-off from paved areas will be intercepted through the existing three stormwater pits and will be directed to the Rocla CDS® Nipper gross pollutant trap [26]. See Appendix 3 for construction plans. Configuration of the treatment train is shown in Figure 6.7.
- Installation of a stormwater isolation value prior to the council stormwater connection to prevent chemical spills or firewater leaving the site in case of incident; and
- A 115,000 L firewater storage tank beneath the mechanical workshop and new warehouse extension to contain at least 90 minutes of firewater in the event of fire (refer to Section 11 for fire water containment calculations).

During the construction process, the following mitigation measures will be implemented to protect water quality, as described in Sections 7.4.2 (Soils and contamination impact assessment) and 8.5 (Waste and chemicals impact assessment). As part of the construction process, minor excavation will be required on the site for preparing footings and works for the:

- rear firewall associated with the recycled products storage shed;
- retaining wall along the eastern boundary of the site;
- concrete hardstand the eastern section of the recycled products storage shed / mechanical workshop and baling area;
- installation of a Rocla CDS® Nipper gross pollutant trap;
- installation of new stormwater pits and stormwater isolation value; and
- installation of a firewater storage tank beneath the new mechanical workshop and baling area at the rear of the site.

Erosion and sediment control measures as described in Section 7.4.1 will be maintained during the construction period and maintained to prevent any impacts on soils or surface run off water quality. It is noted that the daily monitoring of the erosion and sediment control measures will be required during the construction phase, given the low water holding capacity of the acidic and potentially sodic B-horizon material on the site, which will be exposed during excavation. Whilst soil slaking and dispersion of fine clays could occur when sub-soils are exposed and come into contact with water, the low pH of the subsoil is likely to minimise this effect which is caused by high sodium levels.

Appropriate care will be exercised during the entire construction period to ensure the ongoing functioning and performance of all erosion and sediment control structures on the site to ensure that water quality is protected at all times.

[26] Rocla (2016). CDS Unit Technical Summary. Internet publication: http://www.waterquality.rocla.com.au/Technical.php

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6.6.3 Operational phase

The operational processes carried out on-site can broadly be described as a transfer station. The operations involve receiving, sorting, compacting and transporting baled recycled materials to markets. An operational overview of the upgraded site is given in Section 2.6.2.

The works carried out on the property have minimal risk of contaminating water runoff, as use of hazardous chemicals are used in very small quantities and in the workshop only for maintenance of the equipment used on-site. All chemicals to be stored according to best practice guidelines in Section 2.8.

A small increase in stormwater flows from the site post development (6.27%) has been modelled, though it is considered that this will have negligible impact on the receiving council stormwater system. It is also noted that under Fairfield City Council's *Urban Area on Site Detention Handbook and Fairfield City Council DCP Amendment 11 - Section 8B.6.3 Drainage and Stormwater Detention*, on-site detention of stormwater is not a requirement for industrial development within Wetherill Park.

The development and sealing of the majority of the pervious areas of the site will further protect underlying soils and runoff from any chemicals which are spilled. Any chemicals that are spilled will be immediately cleaned up as per current practice and documented in Section 4.11 and the pollution incident response management plan (Appendix 7).

6.7 Conclusion

This section has focused on the management of water and protection of water quality during the demolition, construction and operational phases of the project.

The water impact assessment found that pre-development pollutant loads to stormwater and the receiving waterway associated with Prospect Creek are low. A series of water sensitive urban design measures have been proposed to reduce the impact of stormwater from the site, and to improve stormwater runoff quality. These measures include the installation of a gross pollutant trap to enable better capture of gross pollutants and hydrocarbons in runoff, a stormwater isolation valve to protect stormwater in the event of fire and an underground tank system for storage and containment of firewater in the event of fire or a chemical spill.

The study found that the proposed measures will reduce flow impacts on the stormwater system, reduce overall pollutant loads to the receiving waterway of Prospect Creek, and will prevent local waterways from contamination in the unlikely event of fire. The project therefore will result in a net improvement in water quality with a small increase in flows to local waterways.

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7 Soils and contamination impact assessment

7.1 Introduction

This soil and contamination impact assessment assesses baseline soil conditions, in terms of soil types and extent of soil contamination. We then assess the impacts of the proposed development, during the demolition, construction and operational phases of the project. This assessment considers likely impacts from disturbing any potentially contaminated soils, possible soil contamination during operation of the facility, subsidence or instability, soil erosion and issues associated with acid sulfate soils.

This assessment then considers a range of mitigation measures and their likely effectiveness during demolition, construction and operations of the facility. Erosion and sediment control measures, site remediation and management of any difficult soils on site are then considered in this assessment.

7.2 Legislative requirements and guidelines

Key regulatory requirements and guidelines that have been considered in this assessment are outlined as follows:

- Office of Environment and Heritage (2011). *Contaminated Sites - Guidelines for Consultants Reporting on Contaminated Sites;*
- NSW Environment Protection Authority (2003). *Contaminated Sites - Guidelines on Significant Risk of Harm from Contaminated Land and Duty to Report*;
- *Soil Conservation Act* 1938;
- *Protection of the Environment Operations Act* 1997 (POEO Act 1997);
- NSW Environment Protection Authority (2016). *Waste Classification Guidelines:* Part 4 Acid Sulfate Soils; and
- *Fairfield Citywide Local Environmental Plan* 2013 – Clause 6.1 – Acid Sulfate Soils.

The *Fairfield Citywide Local Environmental Plan* 2013 sets out specific measures for development in areas with acid sulfate soils within the Fairfield Local Government area. Under Clause 6.1, development shall not disturb, expose or drain acid sulfate soils and cause environmental damage.

7.3 Baseline conditions

7.3.1 Soil type, properties and contamination

The facility is extensively paved in concrete to accommodate the movements of heavy vehicles for most of the area. The shaded area at the western, northern and southern ends of the property are the open and soft surfaces as shown in the aerial photo (Figure 7.1) below. This area is approximately 691 m^2, or 12% by area of the entire site.

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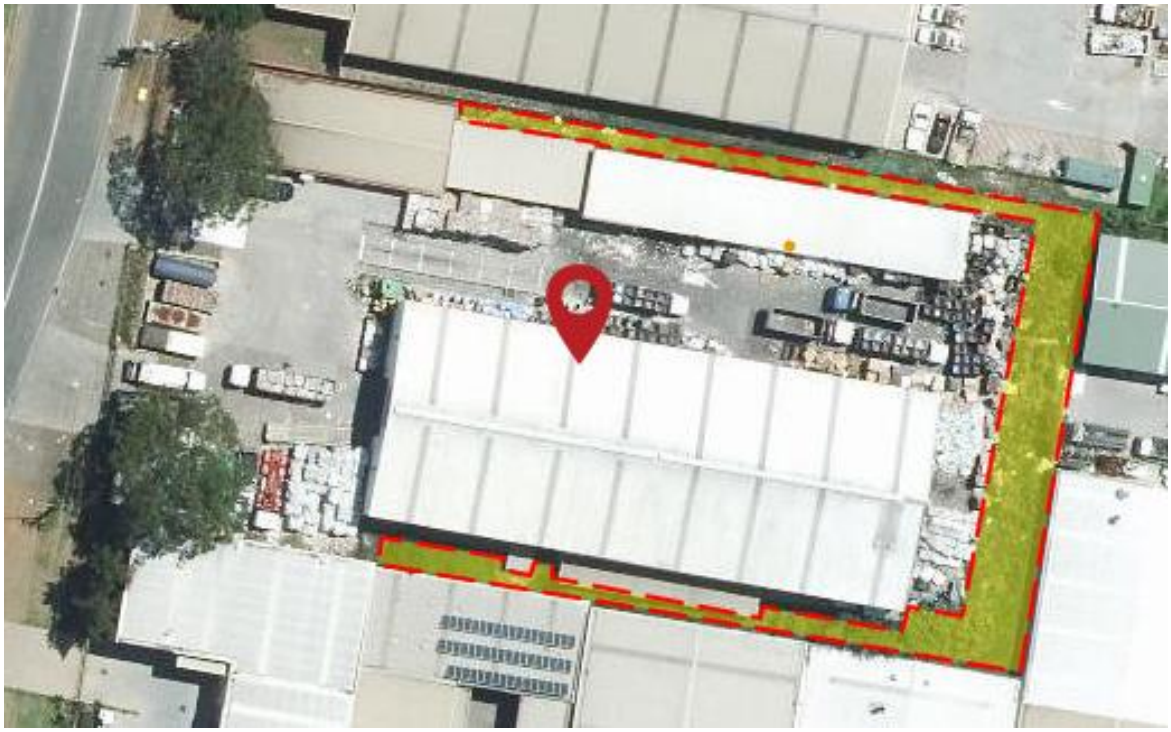
Figure 7.1. Aerial photo of site showing area which is currently unpaved. Source: NSW Department of Planning and Environment Planning Portal.



The site is established on soils defined under the Australian Soil Classification as kurosol soils[27]. Kurasols have a strong texture contrast (also known as a duplex soil) with a strongly acid B horizon that may or may not be sodic. Kurosols form from parent materials that are highly siliceous, siliceous to intermediate in composition. The surface of Kurosol soils is often acidic. They generally have very low agricultural potential with high acidity (pH < 5.5) and low chemical fertility. Kurosols commonly have low water-holding capacity and are often sodic[28]. These soil profiles have formed from in-situ weathering of parent material, comprising Wianamatta Shale, which is typical throughout the Cumberland Plain of Western Sydney.

A review of acid sulfate soil risk maps prepared by the Office of Environment and Heritage[29] showed that the subject site does not have acid sulfate soils on site. The nearest areas impacted by acid sulfate soils are at significant distance from the subject site, in the low lying areas associated with Liverpool and Cabramatta along the Georges River.

Furthermore, section 7 of the S149 Certificate for the subject site (Appendix 9) states that the land is:

[27] Office of Environment and Heritage (2016). Great Soil Group (GSG) Soil Type map of NSW. Internet publication: http://data.environment.nsw.gov.au/dataset/great-soil-group-gsg-soil-type-map-of-nsw1cf19
[28] CSIRO (2016). The Australian Soil Classification. Second edition. Internet publication: http://www.clw.csiro.au/aclep/asc_re_on_line/ku/kurosols.htm
[29] Office of Environment and Heritage (2016). Acid Sulfate Soils Risk. Internet publication: http://data.environment.nsw.gov.au/dataset/acid-sulfate-soils-risk0196c

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- not affected by landslip, subsidence or land instability;
- not in the bushfire prone area;
- does not restrict development due to likelihood of acid sulfate soils;
- does not restrict development due to likelihood of tidal inundation;
- not subject to overland flooding; and
- no other identified risks.

The risk of existing soils being contaminated on-site is considered to be very low, based on an assessment consistent with the NSW EPA's *Guidelines for Consultants Reporting on Contaminated Sites*. The existing site has only been used as a warehouse showroom for cranes, and post 2009, as a site for the consolidation and baling of paper and cardboard indoors by the current occupant, Grima Environmental Services Pty Ltd. Whilst some soil disturbance is likely due to a small amount of cutting and filling at the rear of the site performed as part of the Wetherill Park industrial sub-division development, the majority of the site has an impervious hardstand, protecting soils from any contamination due to minor fuel and oil spills that could have occurred in the past. Given the low risk uses, and the majority of the site is sealed, the presence of contaminated soils on site is considered to be very low.

7.4 Soil impacts assessment and mitigation measure

7.4.1 Demolition phase – impacts and mitigation measures

The demolition works to be performed on the site to permit the construction of a new recycled products storage shed and new maintenance workshop and baling area is described in section 2.2 and further in the Waste Management section (4.12). During the demolition of the carport and existing workshop, all chemicals will be safely packaged and move by a qualified contractor for off-site storage, recycling or disposal during the development phase of the project consistent with the *Australian Dangerous Goods Code*[30].

No soil disturbance will occur during the demolition phase, though the following best practice measures[31] will be implemented to avoid impacts on soil or soil contamination:

- Any chemical residues in the workshop to be fully removed and appropriately cleaned prior to commencement of demolition works;
- Erosion and sediment control measures will be installed around the perimeter of the site, and around existing stormwater pits on site; this will include the placement of sedimentation socks around existing pits, coverage of pits with geotextile filter fabric, including sediment fences as per the Sediment Control and Soil Erosion Plan (Appendix 3);
- Demolition works to occur in dry weather to prevent any surface runoff and transfer into stormwater;

[30] National Transport Commission (2016). The Australian Dangerous Goods Code- v7.4. Internet publication: http://www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/

[31] Landcom (2004). Managing urban stormwater – soils and construction. Published by the Office of Environment and Heritage. Internet publication: http://www.environment.nsw.gov.au/resources/water/BlueBookVol1.pdf

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- Prompt removal of sorted demolition waste materials in skip bins from the site, to reduce the risk of stormwater contamination and run-off of sediment into pervious areas at the rear of the site; and
- Woody weeds will be carefully removed from the rear 160 m^2 area of the site in a manner to avoid any soil disturbance.

All erosion and sediment control structures will be inspected on a daily basis and any maintenance required will be performed immediately to ensure no sediment leaves the site.

These strategies will assist in mitigating any potential impacts on soils during the demolition phase of the project.

7.4.2 Construction phase – impacts and mitigation measures

The construction works to be undertaken are described in Section 2.2, and management of waste materials is described in Section 4.12. Erosion and sediment control measures are described in Section 7.4.1 and Appendix 3 (construction plans).

It is noted that minor excavation will be required on the site for preparing footings for the:

- rear firewall associated with the recycled products storage shed;
- retaining wall along the eastern boundary of the site;
- concrete hardstand along the eastern section of the site for the recycled products storage shed / mechanical workshop and baling area;
- installation of the Rocla CDS Nipper gross pollutant trap and stormwater isolation value;
- installation of an additional stormwater pit; and
- installation of a 115,000 L firewater storage tank beneath the new mechanical workshop and baling area at the rear of the site.

Erosion and sediment control measures as described in Section 7.4.1 will be maintained during the construction period and maintained to prevent any impacts on soils or surface run off water quality. It is noted that the daily monitoring of the erosion and sediment control measures will be required during the construction phase, given the low water holding capacity of the acidic and potentially sodic B-horizon material on the site, which will be exposed during excavation. Whilst soil slaking and dispersion of fine clays could occur when sub-soils are exposed and come into contact with water, the low pH of the subsoil is likely to minimise this effect which is caused by high sodium levels.

Appropriate care will be exercised during the entire construction period to ensure the ongoing functioning and performance of all erosion and sediment control structures on the site.

7.4.3 Operational phase – impacts and mitigation measures

The operational works and processes carried out on-site can broadly be described as a transfer station. The works are receiving, sorting, compacted baling and transferred to the reprocessing facilities. An operational overview of the upgraded site is given in Section 2.6.2.

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The works carried out on the property have minimal risk of contaminating land, as hazardous chemicals are used in very small quantities in the workshop only for maintenance of the equipment used on-site. All chemicals to be stored according to best practice guidelines in Section 2.8.

The development and sealing of the rear of the site will further protect underlying soils from any chemicals which are spilled. Any chemicals that are spilled will be immediately cleaned up as per current practice and documented in Section 4.11, the existing Environmental Management Procedures used at the site (Appendix 6) and the Pollution Incident Response Management Plan (Appendix 7).

7.5 Conclusion

The soil and contamination impact assessment addresses current soil conditions and contamination to soil during upgrade works – demolition, construction and ongoing operational phase.

The assessment found that the existing soils on the site are characterised as Kurasol. Kurasols have a strong texture contrast with a strongly acid B horizon that may or may not be sodic. Kurosols commonly have low water-holding capacity and are often sodic. No acid sulfate soils are present on the subject site, and no other specific soil hazards or soil contamination is expected, based on existing soil survey data and the site's usage history.

A series of mitigation measures during the demolition, construction and operational phases of the project will serve to protect soils and runoff water quality. An increase to the impervious area as a result of the site upgrade will further protect soils from minor chemical spills that could occur during the operational phase of the project. The assessment found that the site upgrades and the use of the site into the future will have negligible impacts on soils on the site.

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8 Waste and chemicals impact assessment

8.1 Introduction

The waste and chemical impact assessment addresses the impacts and mitigation measures for the appropriate and sustainable management of wastes and chemicals during operations. Impacts and mitigation measures are considered for the demolition, construction and ongoing operational phase of the project, consistent with the Secretary's Environmental Assessment Requirements (SEARs).

In this section, we assess the adequacy of the proposed measures to minimize natural resource consumption and minimize impacts from handling, transporting, storing, processing and reprocessing of waste and/or chemicals.

Management and mitigation measures are then proposed to minimize the consumption of natural resources, maximize waste avoidance and recycling. We then outline how the project will contribute to recycling goals of regional waste strategies and the *NSW Waste Avoidance and Resource Recovery Strategy 2014 – 2021.* We also consider measures to prevent litter and waste blowing or tracking from the premises.

8.2 Legislative requirements

The following guidelines and legislation influence the management of chemicals in NSW:

- *Protection of the Environment Operations Act 1997 (POEO Act 1997)*
  Regulates chemical pollution and wastes, establishes management and licensing requirements along with offence provisions to deliver environmental outcomes.

- *Chemical Control Orders*
  Made under the *Environmentally Hazardous Chemicals Act 1985* when chemicals or chemical wastes pose serious threats to the environment and there are particular challenges in their management. Out of the five chemical control orders in place in NSW, the applicable CCO for the facility is the *Scheduled Chemical Wastes Chemical Control Order* 2004[32]. Scheduled chemical wastes are wastes containing chemicals defined by the schedule attached to the order and special care is required minimise their impacts on the environment. The CCO establishes requirements for the management and control of the wastes that contain scheduled chemicals at a combined concentration above 2 mg/kg. It covers certain activities such as generating, processing, storing, distributing, conveying and disposing of scheduled chemical wastes.

- *Waste Avoidance and Resource Recovery Act* 2001

[32] NSW EPA (2004). Environmentally Hazardous Chemicals Act 1985 – Chemical Control Order in Relation to Scheduled Chemical Wastes. Internet publication: http://www.epa.nsw.gov.au/resources/pesticides/scwcco2004.pdf

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This Act underpins the NSW Government's *Waste Avoidance and Resource Recovery Strategy 2014 – 2021,* setting targets for recycling and reduction of litter in six key result areas.

- NSW Environment Protection Authority (2014). *Waste Classification Guidelines: Part 1, Classifying waste.*
- NSW Department of Planning (2011). *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33.*

8.3 Baseline Conditions

8.3.1 Generation and management of waste – current operations

A full description of the processes for avoiding the generation of waste, recovering and processing waste for recycling, and management of residual waste for disposal is provided in Section 4 of this study. For brevity, this content is not repeated in this section.

8.3.2 Chemical use, handling and storage

A small range of fuels, oils, fluids and gases are stored in the current mechanical workshop for the principal purpose of servicing on site vehicles and equipment, including the conveyor, baler, forklifts and front end loaders.

These chemicals are stored in a cool, shaded area of the workshop, on bunded stands and shelves as per the requirements of the Australian Dangerous Goods Code.

The material processed on site is paper, cardboard and plastic film. The absence of putrescible waste on the site ensures that no vermin, pests or insects are attracted to the site.

Chemicals currently stored on site are given in Table 8.1. These chemicals and their Australian Dangerous Goods classification are also given in Table 2.7, within the Environmental Risk Assessment section of the EIS (see Section 2.8.5).

Table 8.1. List of chemicals stored on-site during operational phase.

Liquid chemicals	Quantities stored
Diesel	200 L
Engine coolant	20 L
Hydraulic oil	200 L
Engine oil	1,000 L
Gear oil	200 L
Transmission oil	20 L
Degreaser	200 L
Brake fluid	<10 L
Grease drum cartridges	< 10 L
Gas (LPG) – Forklift gas	<500 kg

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It is noted that an audit of licenced sites by the NSW EPA in 2008[33] found that the main chemicals stored at regulated sites that pose risks to the environment are hydrocarbons, such as fuels, oils and lubricants (46% of sites), followed by metals and metalloids and other halogenated organic compounds. Management of these chemicals according to best practice is required to minimise impacts on soils, waterways and public health.

As a result, all fuels, oils, lubricants and chemicals will be moved off-site during the demolition and construction phases of the project. All areas where chemicals have been stored will be removed by a licenced contractor and transported off-site for lawful storage, recycling or disposal consistent with the *Australian Dangerous Goods Code*[34]. Once the construction phase is completed, chemicals as per Table 8.1 will be safely stored in the new mechanical workshop according to *Code of Practice for Managing the Risks of Hazardous Chemicals in the Workplace*[35].

It is noted that as part of the Environment Protection Licence for the existing facility, the site uses a Pollution Incident Response Management Plan, outlining procedures and practices in the event of an incident or chemical spill on the site (Appendix 6). Procedures for the protection of stormwater in the event of a spill are given in Appendix 6.

8.4 Impact assessment

8.4.1 Management of wastes during the demolition, construction and management phase of the project

A full description of the potential impacts from waste generation and recycling operations during the demolition, construction and operational phases of the project is provided in Section 4 of this study. For brevity, this content is not repeated in this section.

8.4.2 Chemicals use and Code of Practice

The chemicals on-site are fuels – diesel and LPG, oils - grease and degreasers. Risk of harm to environment is due to leaks, spills and fire during the construction and operation phases of the facility.

Commercial and industrial users of hazardous chemicals such as petrochemicals, flammable oils and fluids have a duty of care to manage the risks associated with hazardous chemicals in the workplace. This includes ensuring the safe use, handling and storage of chemicals, as well as specific duties under the model Work Health and Safety Regulations and the *Code of Practice for Managing the Risks of Hazardous Chemicals in the Workplace*.

[33] NSW EPA (2009). New South Wales State of the Environment Report. Chapter 5. Internet publication: http://www.epa.nsw.gov.au/soe/soe2009/chapter5/chp_5.2.htm

[34] National Transport Commission (2016). The Australian Dangerous Goods Code- v7.4. Internet publication: http://www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/

[35] Safe Work Australia (2012). Model Code of Practice - Managing Risks of Hazardous Chemicals in the Workplace. http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/managing-risks-of-hazardous-chemicals-in-the-workplace

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A substance is deemed to be a hazardous substance if it meets the classification criteria specified in the *Approved Criteria for Classifying Hazardous Substances (NOHSC:1008, 2004]*[36].

8.4.3 Chemicals use – demolition and construction phase

To avoid the impacts of chemicals on the environment during the demolition phase, all fuels, oils, lubricants and chemicals will be moved off-site during the demolition and construction phases of the project. All areas where chemicals have been stored will be cleaned to remove any chemical residues that could become mobile once the demolition phase of the project commences.

All areas where chemicals have been stored will be removed by a licenced contractor and transported off-site for lawful storage, recycling or disposal consistent with the *Australian Dangerous Goods Code*[37]. Once the construction phase is completed, chemicals as per Table 8.1 will be safely stored in the new mechanical workshop according to *Code of Practice for Managing the Risks of Hazardous Chemicals in the Workplace*[38].

8.4.4 Risk to Environmentally Sensitive Areas

There are no major sources of water, protected zones and/or Environmentally Sensitive Areas (ESA's) that can be directly affected by an incident at the facility.

The nearest waterway is Prospect Creek, located at a distance of about 500 metres from the subject site. Prospect Reservoir is about 800 metres and the Prospect Nature Reserve at about 1 Km from the site (see Figure 2.4, Section 2.1). Given the large distance between the subject site and these ESA's, a small chemical spill that is appropriately contained and cleaned up as per the existing Pollution Incident Response Management Plan (Appendix 7), the risk to ESA's is considered to be very low.

8.5 Mitigation measures

8.5.1 Waste management and mitigation measures

A full overview of measures proposed to avoid, reduce and recycle wastes is defined in Section 4 of this EIS, and is not repeated here again. Please note that the contribution of the project to regional waste and recycling strategies in Western Sydney and at a state level are given in Sections 2.3.1.6 and 2.3.2.6.

[36] Available at: http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/ns2004criteriaforclassifyinghazardous

[37] National Transport Commission (2016). The Australian Dangerous Goods Code- v7.4. Internet publication: http://www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/

[38] Safe Work Australia (2012). Model Code of Practice - Managing Risks of Hazardous Chemicals in the Workplace. http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/managing-risks-of-hazardous-chemicals-in-the-workplace

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8.5.2 Chemical use risk mitigation

The risk of chemical contamination occurring on site is mainly due to spills and leaks. To reduce these risks, mitigation measures have been proposed to reduce risk to 'As low as reasonable practicable'. These are defined in Table 8.2.

Table 8.2. Risk, likelihood and mitigation measures proposed during the demolition and construction phases of the project.

Risk	Likelihood	Impact	Mitigation
Demolition and Construction Phase			
Spills & Leaks	High	Low	Remove all chemicals from the site prior to demolition works. No chemical storage on site during demolition and construction works. Cleaning of all areas of the mechanical workshop prior to demolition to remove all chemical residues. Maintain spills management response kit onsite – immediate clean-up of spill as per Pollution Incident Response Management Plan (Appendix 7)
Fire Hazard	Low	Medium	Fire safety measures as per Fire Safety Procedures (Appendix 6)
Operational Phase			
Spills	High	Medium risk - Potential to cause contamination to land and waters	Maintain spills management response kit onsite – immediate clean-up of spill as per Pollution Incident Response Management Plan (Appendix 7)
Leaks from vehicles onsite	Medium	Low risk	Maintain spills management response kit onsite – immediate clean-up of spill as per Pollution Incident Response Management Plan (Appendix 7)
Fire risk	Medium	High Risk	Fire safety measures as per Fire Safety Procedures (Appendix 6) Installation of a firewater isolation value and firewater containment tank to prevent the off-site movement of firewater into the stormwater system. This will be installed as per Section 6.6 and Appendix 3.

Impacts from spills will be remediated by using a spill response management system as addressed in Section 4.11 and the Pollution Incident Response Management Plan as per Appendix 7.

Risk from fires is identified as a hazard, but the quantities are below threshold and can be easily managed with a fire suppressant. A fire hose reel with high pressure water sprayer to control

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medium fires are also installed on the site and these will be used in accordance with the Fire Safety Procedures already in existence at the site (Appendix 6). It is also noted that as per Section 6.6 and Appendix 3, a firewater isolation value will be installed at the main council stormwater connection node, with 115,000 L of firewater tank storage to contain 90-minutes use of firewater. This is further outlined in Section 11 (Fire Study) and the construction plans (Appendix 3).

Once the construction phase is completed, chemicals will be stored in the new mechanical workshop using the following approaches:

- Double skinned tanks;
- Chemicals stored in cooler areas;
- Bunded areas – containment of leaks and spills;
- Incorporate spill prevention and control mechanisms in process controls; and
- Warning systems.

8.5.3 Other Reporting requirements

If there is an incident involving a chemical spill, a chemical pollution event or a possible misuse of a chemical or pesticide, there is a 24-hour Environment line (131 555) that can be contacted to report the incident. This procedure is defined in the Pollution Incident Response Management Plan (Appendix 7).

The health, safety and welfare of people at workplaces where chemicals are used and stored are regulated by WorkCover NSW, through Worksafe *Australia Model Code of Practice-Managing Risks of Hazardous Chemicals in the Workplace* under the *Work Health and Safety Act* 2011. There is an additional requirement for people conducting business or undertaking use of chemicals in their workplace to help manage health and safety risks associated with hazardous chemicals.

8.6 Conclusion

This section has focused on the management and handling of chemicals during the demolition, construction and operational phases of the project. Waste management issues are addressed in detail in Section 4 of the report. The assessment found that the risk of harm due to chemicals spills and leaks during the demolition, construction and operational phases of the project is deemed low. Containment measures and clean-up of the incident will address the negligible harm to environment, consistent with existing pollution incident response procedures in place at the site.

A range of mitigation measures are proposed to minimise impacts from chemicals during the different stages of the project. A new firewater containment system is discussed, which will help improve the isolation of the site from the stormwater system in the event of a chemical spill or fire, thereby reducing the potential for harm to receiving waterways.

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9 Heritage impact assessment

9.1 Introduction

An Aboriginal and non-Aboriginal cultural heritage assessment has been performed as part of the EIS to document existing conditions, potential impacts and proposed mitigation measures to ensure that the development does not impact on any relics or places of heritage significance.

9.1.1 Aboriginal heritage assessment

A desktop Aboriginal heritage assessment was undertaken for the proposed development in accordance with:

- *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW South Wales* (DECCW, 2010);
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010); and
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010).

Given the proposed development will disturb the ground surface, a basic search of the NSW Office of Environment and Heritage's Aboriginal Heritage Information Management Systems (AHIMS) database[39] was undertaken on 27th July 2016.

9.1.2 Non-Aboriginal heritage assessment

A desktop non-Aboriginal heritage assessment was also undertaken to identify any items listed as part of the Office of Environment and Heritage's State Heritage Register[40]. The State Heritage Register is a list of heritage items in New South Wales including Aboriginal Places, State Heritage Register, Interim Heritage Orders, State Agency Heritage Registers and Local Environmental Plans.

The State Heritage Register lists a diverse range of places, buildings and objects including: Aboriginal places, buildings, objects, monuments, gardens, natural landscapes, archaeological sites, shipwrecks, relics, streets, industrial structures, public buildings, shops, factories, houses, religious buildings, schools, conservation precincts, jetties, bridges and movable items such as church organs and ferries.

It is not only grand mansions or well-known public buildings that are listed on the State Heritage Register. Many different kinds of historical evidence and remains provide information to help us understand our past and present.

A search of the Office of Environment and Heritage's State Heritage Register was undertaken on 27 July 2016.

[39] Office of Environment and Heritage (2016). Aboriginal Heritage Information Management System (AHIMS). Internet publication: http://www.environment.nsw.gov.au/licences/WhatInformationCanYouObtainFromAHIMS.htm

[40] Office of Environment and Heritage (2016). State Heritage Register. Internet publication: http://www.environment.nsw.gov.au/Heritage/listings/stateheritageregister.htm

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9.2 Existing environment

The Aboriginal Heritage Information Management System (AHIMS) basic search within a 50m and 200m radius of the facility did not identify any objects or places of Aboriginal heritage significance. However, one aboriginal site was identified within 880m north of the facility (Figure 9.1). The site contains an Aboriginal artefact located on 31 Widemere Rd, Wetherill Park (Lot 21, DP 1058013).

As a result, an AHIMS extensive search was undertaken. Table 9.1. presents a summary of the AHIMS extensive search results, while a full copy of all AHIMS search results are provided in Appendix 4.

Figure 9.1. Aboriginal site records within the locality of the study area. The subject site is located at the red marker, and the Aboriginal artefact site is shown as the green marker. Source: NSW Department of Planning and Environment Planning Portal.

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Table 9.1. Summary AHIMS Extensive Search Results.

Site ID	Site Name	Context	Site status	Site features
45-5-2746	PH1	Open site	Valid	Artefact

A search of the Office of Environment and Heritage's State Heritage Register found no buildings or sites of non-Aboriginal significance within a 1km radius of the facility. However, four sites were identified at significant distance from the facility, including:

- Prospect Reservoir Value House, located 1.8 km north of the facility;
- Horsley Complex (homestead, outbuildings, garden and farm), located 3.9 km west of the facility;
- Fairfield Railway Station group, located 5.4 km south east of the facility; and
- Land Next to Male Orphan School, located 6.2 km south of the facility.

9.3 Potential impacts

One object or place of Aboriginal heritage significance was identified approximately 880 m north of the facility. Given both the existing site and the rear of the facility where the mechanical workshop is to be built is highly disturbed (i.e. the land at both sites have previously been excavated and backfilled), it is considered highly unlikely that objects of Aboriginal heritage significance will be impacted as a result of the proposed development.

Nevertheless, the following mitigation measures will be implemented to ensure any potential Aboriginal heritage impacts are minimised and managed appropriately.

9.4 Mitigation measures

In accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010), a conservative approach will be adopted at the site. The following mitigation measures will be implemented:

- All staff, contractors and others involved in the construction works will be made aware of the statutory legislation protecting sites and places of heritage significance; and
- All works will cease in the immediate area should any indigenous artefacts or relics be uncovered and the Cultural Heritage Division of the NSW National Parks and Wildlife Service (OEH) contacted.

9.5 Conclusions

The findings of this Heritage impact assessment are summarised as follows:

- A desktop assessment of Aboriginal and non-Aboriginal cultural heritage was undertaken to determine the existence of any sites, artefacts or buildings on in the vicinity of the facility with Aboriginal or non-Aboriginal cultural heritage significance.
- A search of the Office of Environment and Heritage's Aboriginal Heritage Information Management Systems (AHIMS) database and the State Heritage Register was undertaken.
- The search found one site of Aboriginal heritage significance, located some 880m north of the facility, located on 31 Widemere Rd, Wetherill Park (Lot 21, DP 1058013).

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- No other items of Aboriginal or non-Aboriginal cultural heritage significance were found within a 1 km radius of the facility.
- Given that the existing facility is built on disturbed land, and the area at the rear of the site to be developed as a mechanical workshop has been excavated and filled, it is unlikely that any items of Aboriginal heritage significance will be found.

Staff and contractors will be briefed on statutory responsibilities with regard to protection of places and sites of Aboriginal heritage significance, and appropriate notification will be done if any relics are found.

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10 Transport and traffic impact assessment

10.1 Introduction

An assessment of transport and traffic impacts has been performed to understand how the current and proposed upgrades to the subject site will influence daily and peak traffic moments. In particular, the assessment has documented existing daily and peak traffic moments and flows, parking, service vehicle movements, and how traffic movements are likely to increase as a result of the upgraded facility.

The assessment also considers the likely toxicity levels of loads transported on arterial and local roads, with a range of mitigation measures proposed to reduce the impact of vehicles on the local environment. This assessment addressed the Secretary's Environmental Assessment Requirements, including key issues raised by Roads and Maritime Services.

10.1.1 Site location

The facility is located at 88 Redfern Street, Wetherill Park. A location map is presented in Figure 10.1. This traffic impact assessment assumes the vehicle access route between the facility and the nearest inter-regional arterial road (Cumberland Highway) is via Redfern Street, Hassall Street and Victoria Street.

Figure 10.1. Location of facility and haulage route.

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10.1.2 Scope of the study

Jacobs Group (Australia) Pty Ltd was commissioned by Jackson Environment and Planning to review the traffic implications of the three phases of the proposal – demolition, construction and operation. This study details the outcomes of traffic impact assessment.

The reminder of the study is structured as follows:

- Section 10.2 details the existing transport environment and provides the local context within which the assessment has been undertaken
- Section 10.3 details the potential impacts of traffic generated by the three phases of the proposal and assesses their impacts on the transport network
- Section 10.4 provides a summary and conclusion.

10.2 Existing conditions

This chapter details the existing transport environment and provides the local context within which this assessment has been undertaken.

10.2.1 Road network

It is usual to classify roads according to a hierarchy in order to determine their functional role within the road network. Roads are classified according to the role they fulfil and the volume of traffic they can appropriately convey. Changes to traffic flows on roads can then be assessed within the context of the road hierarchy. The guidelines for the functional classification of roads were developed by Roads and Maritime Services (Roads and Maritime) and have been adopted for this study. They are detailed below:

- Arterial road: Typically a main road carrying over 15,000 vehicle per day and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour)
- Sub-arterial road: Defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles per day (500 to 2,000 vehicles per hour). These roads supplement arterial roads in providing for through movement, to an individually determined limit that is sensitive to both roadway characteristics and abutting land uses
- Collector road: Provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day (250 to 1,000 vehicles per hour). At volumes greater than 5,000 vehicles per day, residential amenity designs decline noticeably. Trunk collector and spine roads with limited property access can reasonably carry traffic flows greater than 5,000 vehicles per day
- Local road: Provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day (250 vehicles per hour).

Key roads in the study area are described below.

- Redfern Street, shown in Figure 10.2 is a local road running east-west between Hassall Street and Walter Street and north-south between Walter Street and Hassall Street. The road is one lane in each direction with an additional lane for on-street parking on each side of the road. The speed limit of the road is 50 kilometres per hour. It is an approved road for use by B-Double vehicles between Hassall Street and Walter Street.

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- Hassall Street, shown in Figure 10.3, is a collector road running north-south between Gipps Road and The Horsley Drive and east-west between Gipps Road and Redfern Street. The road is two lanes in each direction and has a speed limit of 60 kilometres per hour. It is an approved road for use by B-Double vehicles (entire length) and 4.6 metre high vehicles (between Gipps Road and The Horsley Drive).

Figure 10.2. View along Redfern Street in the westbound direction.

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Figure 10.3. View along Hassall Street in the southbound direction.

- Victoria Street, shown in Figure 10.4, is a sub-arterial road running east-west and is the main link between the Wetherill Park industrial area and the Cumberland Highway. The road is two lanes in each direction, with a physical median west of Market Street and a painted median east of Market Street. The speed limit of the road is 60 kilometres per hour. It is an approved road for use by B-Double vehicles (west of Cumberland Highway) and 4.6 metre high vehicles (between Cumberland Highway and Elizabeth Street).

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Figure 10.4. View along Victoria Street in the westbound direction.

- Cumberland Highway, shown in Figure 10.5, is an inter-regional arterial road and forms part of the A28 corridor that links the M5 South Western Motorway, Liverpool, the Smithfield / Wetherill Park industrial areas, M4 Western Motorway, Greater Parramatta, M2 Motorway, Hornsby and the M1 Pacific Motorway. In the study area, the road is three lanes in each direction with a speed limit of 70 kilometres per hour. It is an approved road for use by B-Double vehicles and 4.6 metre high vehicles.

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Figure 10.5. View along Victoria Street in the southbound direction.

10.2.2 Traffic volumes and intersection performance

Morning and evening peak hour turning movement surveys were undertaken at the following signalised intersections:

- Hassall Street / Redfern Street
- Victoria Street / Hassall Street
- Victoria Street / Market Street
- Victoria Street / Justin Street
- Cumberland Highway / Victoria Street

The surveys were undertaken on Tuesday 31 May 2016 between 6.00 am and 10.00 am, and 3.00 pm and 7.00 pm. Traffic volumes at each intersection during the morning and evening peak hours are shown in:

- Figure 10.6 (Hassall Street / Redfern Street)
- Figure 10.7 (Victoria Street / Hassall Street)

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- Figure 10.8 (Victoria Street / Market Street)
- Figure 10.9 (Victoria Street / Justin Street)
- Figure 10.10 (Cumberland Highway / Victoria Street).

Figure 10.6. Morning and evening peak hour volumes at the intersection of Hassall Street and Redfern Street.

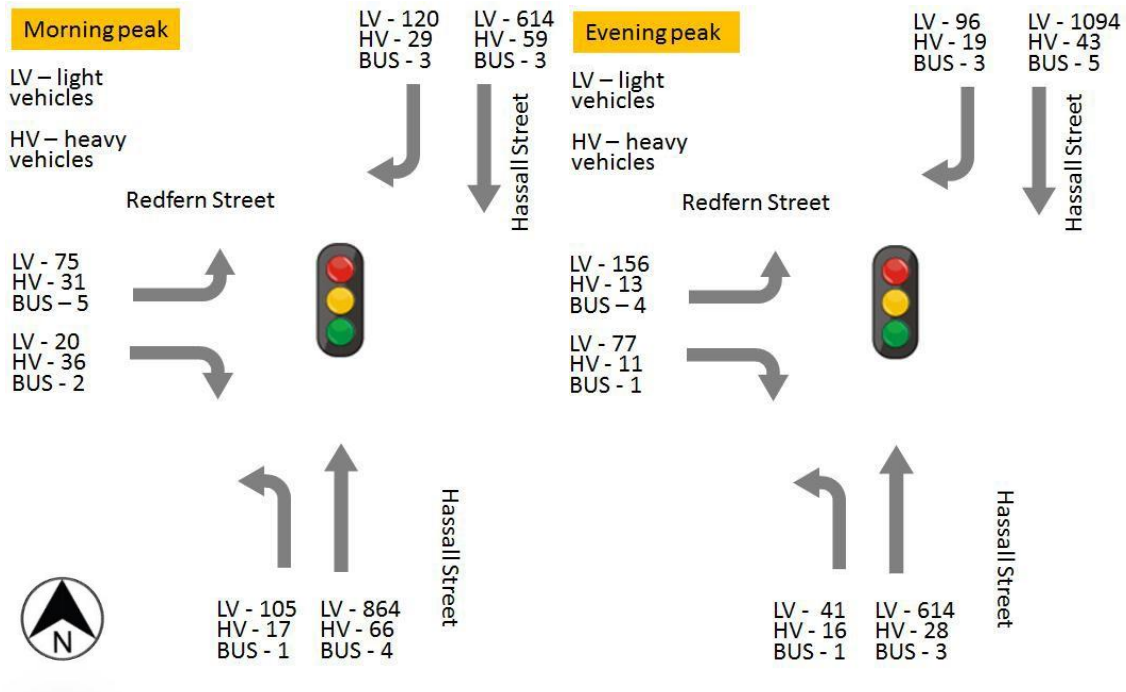

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Figure 10.7. Morning and evening peak hour volumes at the intersection of Victoria Street and Hassall Street.

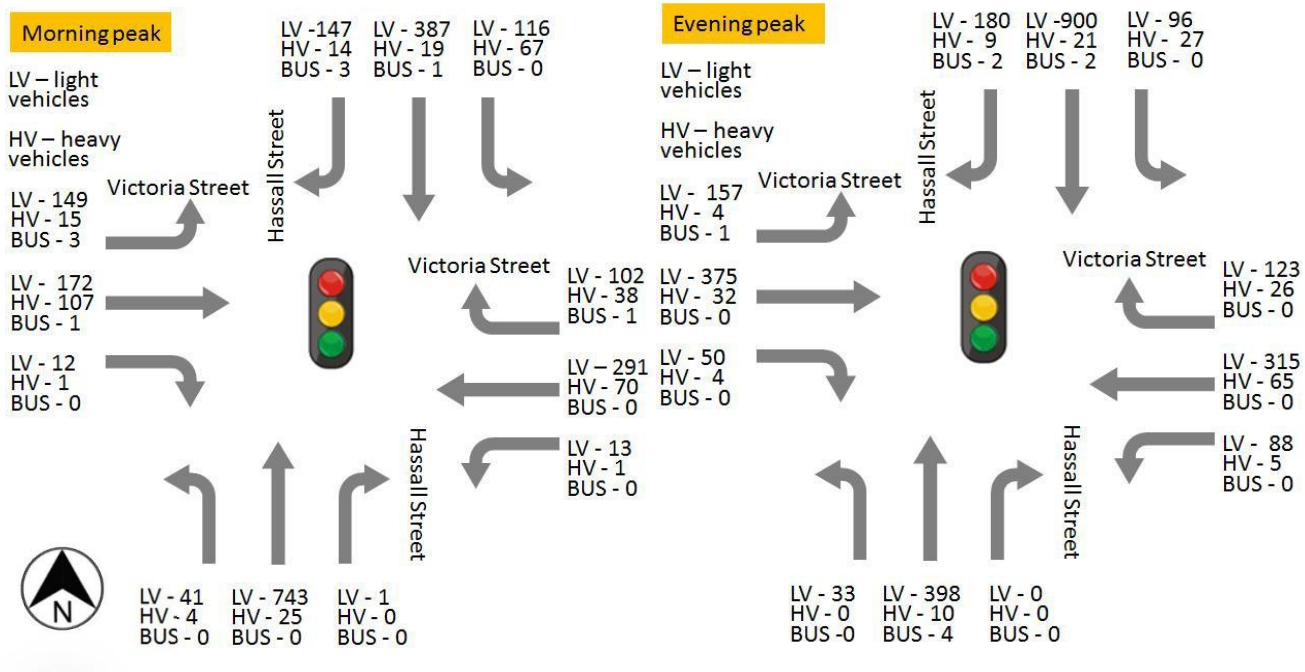

Figure 10.8. Morning and evening peak hour volumes at the intersection of Victoria Street and Market Street.

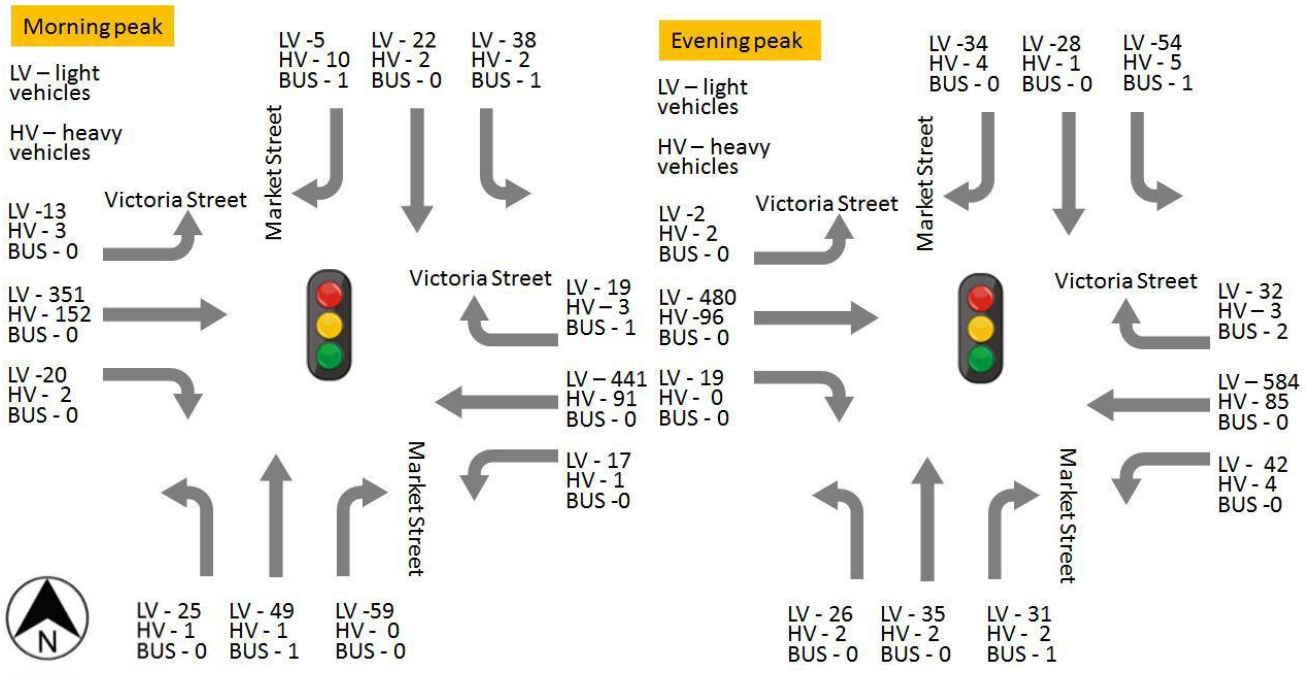

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Figure 10.9. Morning and evening peak hour volumes at the intersection of Victoria Street and Justin Street.

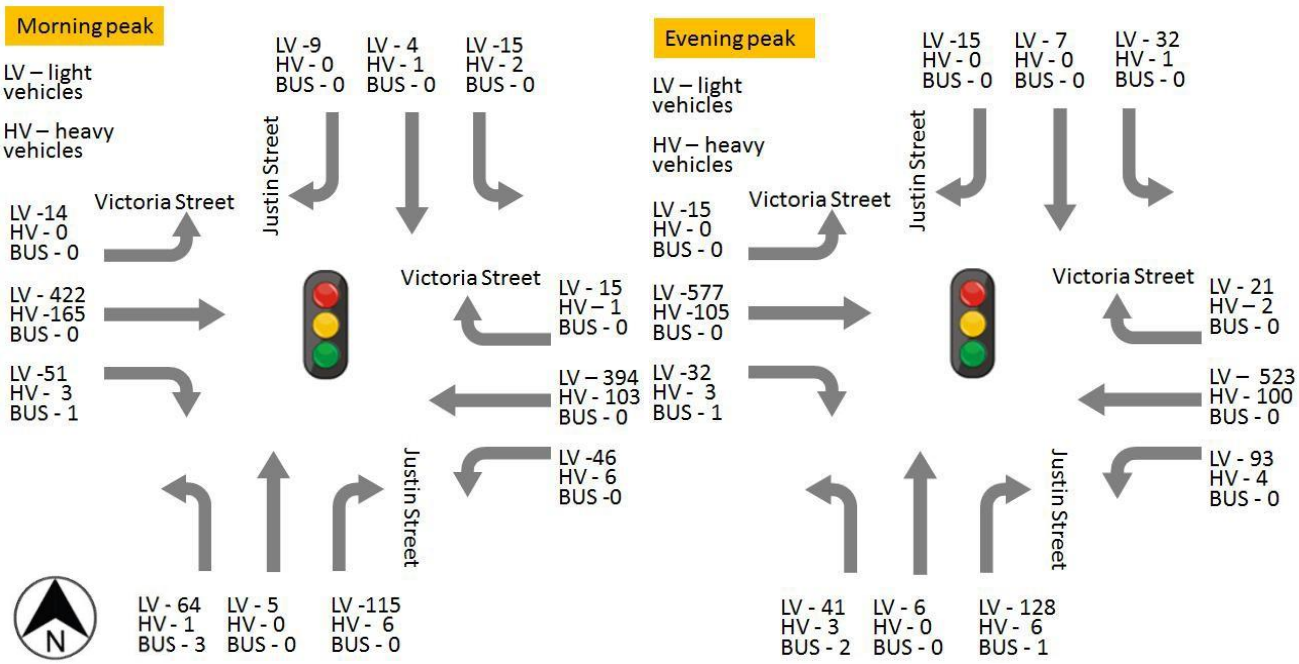

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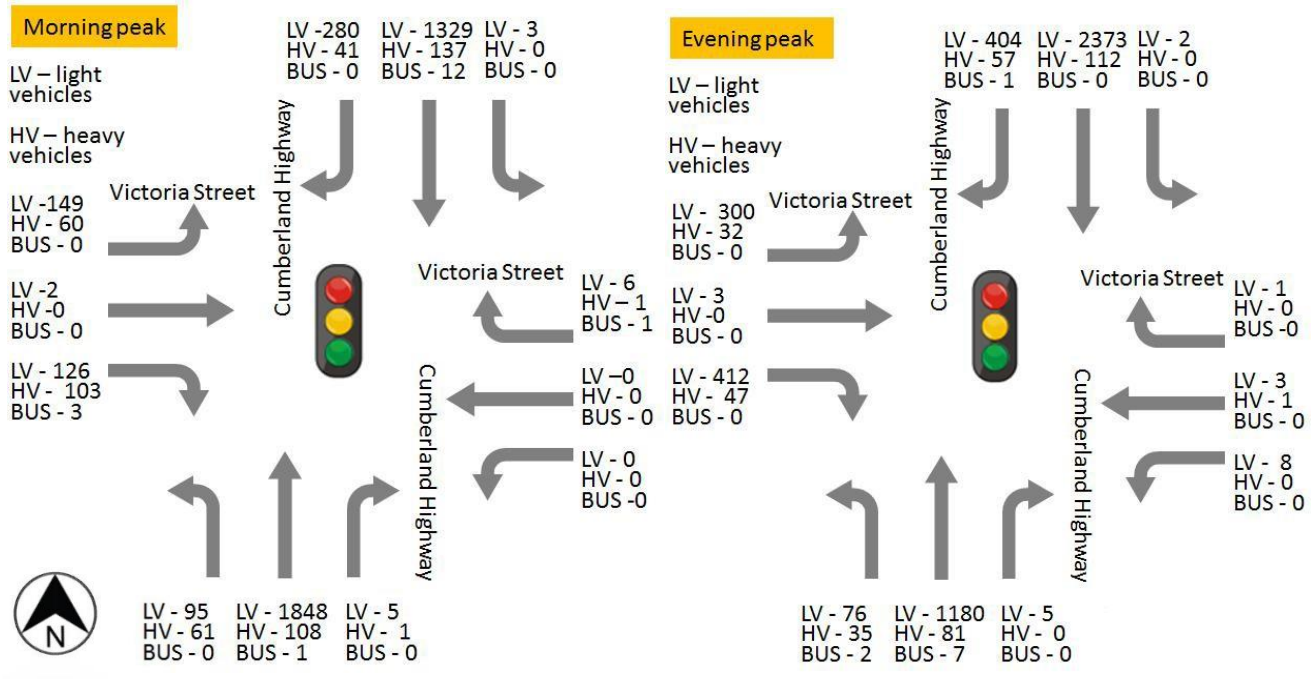
Figure 10.10. Morning and evening peak hour volumes at the intersection of Cumberland Highway and Victoria Street.



Traffic modelling was undertaken for the five intersections to gain an understanding of current performance.

Modelling was undertaken using SIDRA Intersection (version 6), which is a micro-analytical tool for evaluation of intersection performance in terms of capacity, level of service (LOS), delay and queue lengths, and is an appropriate tool for modelling individual intersections.

The assessment of intersection performance is based on criteria outlined in Table 10.1 and defined in the *Guide to Traffic Generating Developments* (Roads and Traffic Authority 2002). The average delay assessed for signalised intersections is for all movements, and for priority (sign-controlled) intersections is for the worst movement, and is expressed in seconds per vehicle. It is generally accepted that in the long term (15 years and beyond), when future conditions have been taken into account, LOS should be D or better. In the short term, intersections should be operating at LOS C or better.

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Table 10.1 : LOS criteria for intersections.

LOS	Average delay per vehicle (seconds / vehicle)	Traffic signals and roundabouts
A	Less than 15	Good operation
B	15 to 28	Good with acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity; at signals, incidents will cause delays Roundabouts require other control mode
F	Over 70	Extra capacity required

Source: Roads and Traffic Authority, Guide to Traffic Generating Developments, *2002*

The modelling results for the morning and evening peak periods are presented in Table 10.2 and Table 10.3, respectively.

Table 10.2. Existing intersection operation – morning peak.

Intersection	Total vehicles (per hour)	Average delay (seconds)	LOS	Degree of saturation	Maximum queue length (metres)	Occurs on approach
Hassall Street / Redfern Street	2,162	10.9	A	0.54	91	Hassall Street, northbound
Victoria Street / Hassall Street	2,677	36.5	C	0.64	188	Hassall Street, southbound
Victoria Street / Market Street	1,401	18.8	B	0.62	60	Victoria Street, eastbound
Victoria Street / Justin Street	1,522	13.1	A	0.43	52	Victoria Street, eastbound
Cumberland Highway / Victoria Street	4,608	39.5	C	1.06	272	Cumberland Highway, northbound

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Table 10.3. Existing intersection operation – evening peak.

Intersection	Total vehicles (per hour)	Average delay (seconds)	LOS	Degree of saturation	Maximum queue length (metres)	Occurs on approach
Hassall Street / Redfern Street	2,342	11.6	A	0.60	87	Hassall Street, southbound
Victoria Street / Hassall Street	3,081	42.1	C	0.73	254	Hassall Street, southbound
Victoria Street / Market Street	1,660	8.8	A	0.33	38	Victoria Street, westbound
Victoria Street / Justin Street	1,808	14.6	A	0.49	63	Victoria Street, westbound
Cumberland Highway / Victoria Street	5,413	45.1	D	0.90	448	Cumberland Highway, southbound

The traffic modelling results indicate the intersections are currently operating satisfactorily during the morning and evening peak periods with the exception of the Cumberland Highway / Victoria Street intersection, which operates at LOS D in the evening peak hour. This is a result of high traffic volumes in both directions on Cumberland Highway and a high proportion of heavy vehicles on Victoria Street.

10.3 Public transport

Buses in the study area provide connections to Liverpool, Parramatta, Blacktown, Fairfield, Merrylands and Bonnyrigg. Bus routes are shown in Figure 10.11 and a summary of scheduled services is provided in Table 10.4.

Figure 10.11. Bus routes in the study areas. Source: Transit Systems, Transit Systems Western Sydney Bus Network, 2014.

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Table 10.4. Summary of scheduled bus services (current as at June 2016).

Route number	Origin – destination	Weekday frequency of services (in each direction)	Number of services per weekday
800	Fairfield to Blacktown via Fairfield West, Prairiewood, Greystanes, Pemulwuy and Prospect	• Peak: 15 minutes • Off-peak: 30 minutes	44
806	Parramatta to Liverpool via Merrylands, Greystanes, Wetherill Park, Prairiewood, Abbotsbury, Edensor Park, Bonnyrigg and Mount Pritchard	• Peak: 30 minutes • Off-peak: 30 minutes	34
814	Fairfield to Smithfield and return	• Peak:30 minutes • Off-peak: 60 minutes	10
T80	Parramatta to Liverpool via Transitway, Prairiewood, Bonnyrigg and Miller	• Peak: 5-10 minutes • Off-peak: 15 to 30 minutes	111

10.4Active transport

10.4.1 Cycle network

The cycle network in the study area consists of the following facilities:

- Redfern Street, between Blackfriar Place and Walter Street – designated as a 'moderate difficulty' on-road cycle route
- Hassall Street, between Blackstone Street and Widemere Road – designated as a 'moderate difficulty' on- road cycle route
- Victoria Street, between Little Street and O'Connell Street – designated as a 'moderate difficulty' on-road cycle route
- Gipps Road, between Hassall Street and Prospect Creek – designated as a 'moderate difficulty' on-road cycle route
- Shared path running adjacent to the Liverpool to Parramatta Transitway
- Shared path running adjacent to Prospect Creek
- Shared paths through Wetherill Park Reserve

The cycle network in the study area is shown in Figure 10.12.

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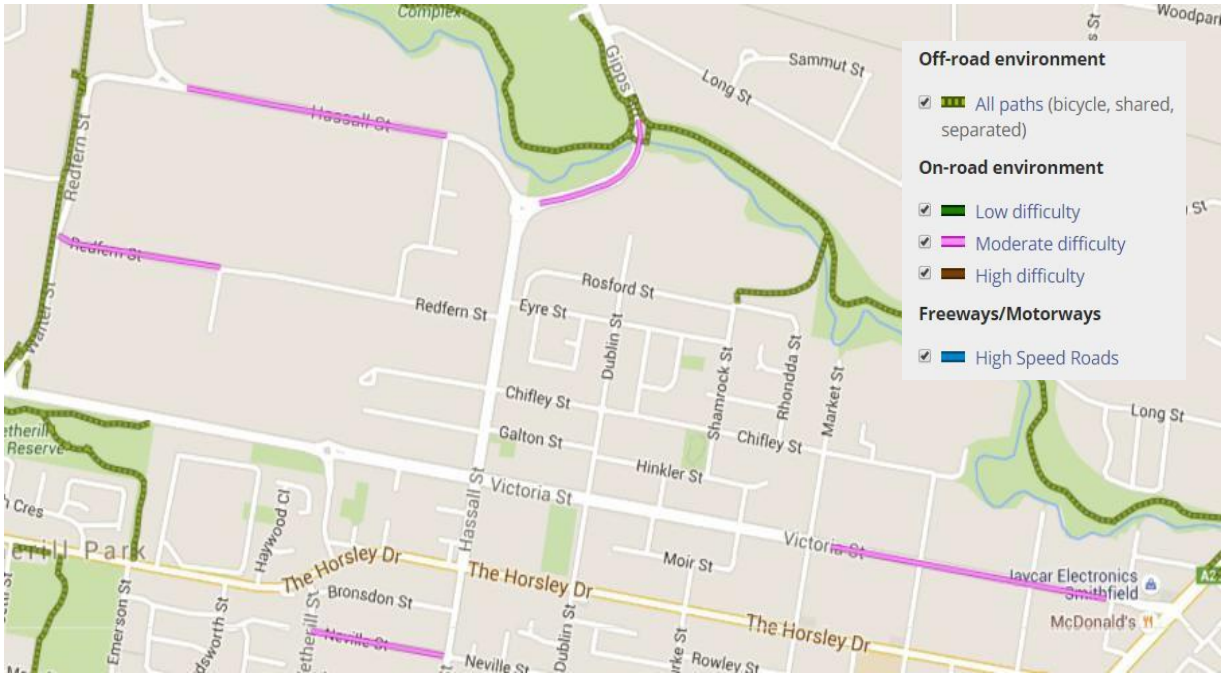
Figure 10.12.Cycle network in the study area. Source: Roads and Maritime, Cycleway Finder V3, 2016.



10.4.2 Pedestrian network

The pedestrian network in the study area consists of the following facilities:

- Signalised pedestrian crossings on the southern and western legs of the Hassall Street / Redfern Street intersection
- Signalised pedestrian crossings on the southern, western and northern legs of the Victoria Street / Hassall Street intersection
- Signalised pedestrian crossings on the southern, western and northern legs of the Victoria Street / Market Street intersection
- Signalised pedestrian crossings on the southern and western legs of the Victoria Street / Justin Street intersection
- Signalised pedestrian crossings on the southern and western legs of the Victoria Street / Justin Street intersection
- Signalised pedestrian crossings on the southern, western and eastern legs of the Cumberland Highway / Victoria Street intersection
- Paved footpath along the northern side of the Redfern Street
- Paved footpath along the both sides of Hassall Street
- Paved footpath along the southern side of Victoria Road between Hassall Street and Hart Street, northern side between Hart Street and Justin Street, and both sides between Justin Street and Cumberland Highway
- Paved footpath along both sides of Cumberland Highway.

Low density industrial and residential land uses in the study area, combined with the lack of significant pedestrian generators and attractors, suggests that the level of pedestrian activity is

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limited, which was confirmed during site inspection and analysis of intersection survey data. During the morning and evening peaks, there were no more than ten pedestrians crossing at each of the five intersections.

10.5 Impact assessment

This chapter details the potential impacts of traffic generated by the three phases of the proposal and assesses their impacts on the transport network

10.5.1 Scenarios tested

The following scenarios were assessed to reflect the three phases of the proposal:

- Scenario 1 – demolition (2016)
- Scenario 2 – construction (2017)
- Scenario 3 – operation in the opening year (2017 / 2018)
- Scenario 4 – operation at full capacity (2023 / 2024)

10.5.2 Trip generation

Demolition

During demolition works, the total amount of waste material that is required to be removed from the site is 6.6 tonnes / 60 cubic metres in volume using three steel bins, one green waste bin and one general waste bin. The estimated number of trips that would be generated during the demolition phase is as follows:

- One inbound and one outbound truck movement in the morning peak hour and one inbound and one outbound truck movement in the evening peak hour
- Ten personnel in ten light vehicles, arriving during the morning peak hour and departing during the evening peak hour.

Construction

During construction works, the total amount of material that is required to be transported to the site is 150 tonnes / 110 cubic metres in volume. It is estimated that five loads of excavated natural material (soil) and one load each for other materials including metal, timber, concrete and bricks, are required. The estimated number of trips that would be generated during the construction phase is as follows:

- Two inbound and two outbound truck movements in the morning peak hour and two inbound and two outbound truck movements in the evening peak hour
- 20 personnel in 20 light vehicles, arriving during the morning peak hour and departing during the evening peak hour.

Operation

Existing operational traffic generation at the facility can be attributed as follows:

- Up to two light vehicles dropping off material per day
- 70 heavy vehicles dropping off material per day

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- Up to 12 heavy vehicles collecting bales per day
- The majority of material drop offs occurs between 7.00 am and 3.00 pm
- The majority of bale collections occurs between 9.00 am and 11.00 am.
- Upon commencement of operation of the upgraded facility in 2017 / 2018, the estimated number of trips that would be generated is as follows:
- One inbound and one outbound light vehicle movement in the morning peak hour and one inbound and one outbound light vehicle movement in the evening peak hour
- 18 inbound and 18 outbound truck movements in the morning peak hour and 14 inbound and 14 outbound truck movements in the evening peak hour.

The total amount of material received by facility is projected to increase from 74,840 tonnes in 2017 / 2018 to 99,076 tonnes in 2023 / 2024. To estimate the number of trips generated in 2023 / 2024, the proportional increase in the amount of material received by the facility between 2017 / 2018 and 2023 / 2024 has been applied to the estimated number of trips generated in 2017 / 2018 and is as follows:

- One inbound and one outbound light vehicle movement in the morning peak hour and one inbound and one outbound light vehicle movement in the evening peak hour
- 23 inbound and 23 outbound truck movements in the morning peak hour and 18 inbound and 18 outbound truck movements in the evening peak hour.

Summary of trip generation

Trip generation during each phase of the proposal is summarised in Table 10.5.

Table 10.5. Estimated trip generation during the morning and evening peak hours.

Scenario	Morning peak hour				Evening peak hour			
	Light vehicles		Heavy vehicles		Light vehicles		Heavy vehicles	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Scenario 1 – demolition (2016)	10	0	1	1	0	10	1	1
Scenario 2 – construction (2017)	20	0	2	2	0	20	2	2
Scenario 3 – operation in the opening year (2017 / 2018)	1	1	18	18	1	1	14	14
Scenario 4 – operation at full capacity (2023 / 2024)	1	1	23	23	1	1	18	18

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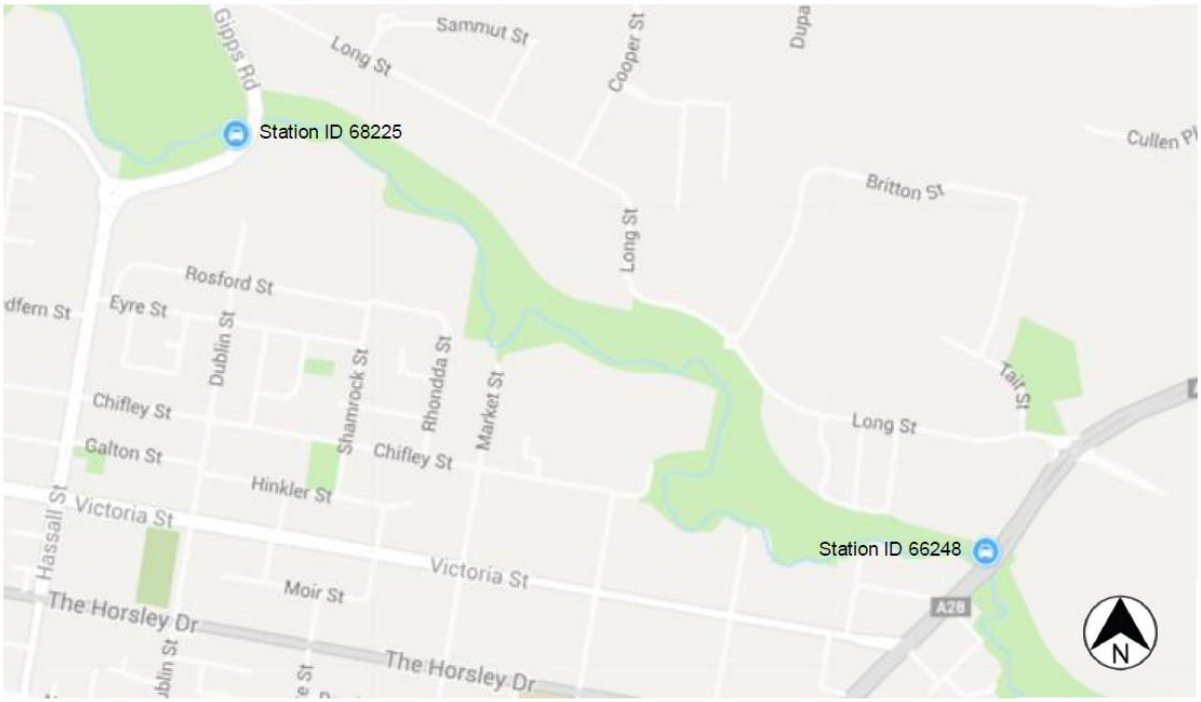
10.5.3 Traffic growth

Historical traffic volumes obtained from Roads and Maritime permanent count stations at two locations in the study area were analysed to gain an understanding of traffic growth. The count stations are presented in Figure 3.1 and include:

- Station ID 68225 – Gipps Road, 280 metres south of Long Street, Smithfield
- Station ID 66248 – Cumberland Highway at Prospect Creek, Smithfield

Figure 10.13. Roads and Maritime permanent count station locations.



Growth rates at the two count station locations are presented in Table 11.6. Traffic volumes fluctuated over the six-year analysis period with no obvious growth or decline trend. Comparing the annual average daily traffic (AADT) volume of 18,820 vehicles in 2009 to 18,142 vehicles in 2015 shows a growth rate of -3.6 per cent. Traffic volumes on Cumberland Highway have generally shown a consistent yearly increase, with a growth rate of 3.4 per cent between 2008 and 2015. This equates to an annual growth rate of 0.5 per cent, which has been applied to existing traffic volumes to forecast future background traffic volumes for the purposes of future year assessment.

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Table 10.6. Traffic growth rate at Roads and Maritime permanent count station locations.

Location	AADT								Growth rate over period
	2008	2009	2010	2011	2012	2013	2014	2015	
Station ID 68225 – Gipps Road, 280 metres south of Long Street, Smithfield	-	18,820	19,185	19,506	19,488	19,603	18,257	18,142	-3.6%
Station ID 66248 – Cumberland Highway at Prospect Creek, Smithfield	61,176	59,656	61,688	62,557	62,986	63,620	-	63,273	3.4%

10.5.4 Intersection performance

This section details the impact of the trips generated during demolition, construction and operation on intersection performance.

Demolition

Results of the intersection analysis for the demolition phase are presented in Table 10.7 (morning peak) and Table 10.8 (evening peak). Comparison of the 'with demolition trips' and 'without demolition trips' scenarios shows the addition of trips associated with the demolition phase has minimal impact on intersection performance with minor increases in average delay and queue lengths in both the morning and evening peak periods. The intersections are expected to continue to operate satisfactorily with the exception of the Cumberland Highway / Victoria Street intersection, which would continue to operate at LOS D in the evening peak hour.

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Table 10.7. Intersection operation during demolition phase – morning peak.

Intersection	Total vehicles (per hour)	Average delay (seconds)	LOS	Degree of saturation	Maximum queue length (metres)	Occurs on approach
Intersection operation without demolition trips						
Hassall Street / Redfern Street	2,162	10.9	A	0.54	91	Hassall Street, northbound
Victoria Street / Hassall Street	2,677	36.5	C	0.64	188	Hassall Street, southbound
Victoria Street / Market Street	1,401	18.8	B	0.62	60	Victoria Street, eastbound
Victoria Street / Justin Street	1,522	13.1	A	0.43	52	Victoria Street, eastbound
Cumberland Highway / Victoria Street	4,608	39.5	C	1.06	272	Cumberland Highway, northbound
Intersection operation with demolition trips						
Hassall Street / Redfern Street	2,184	11	A	0.55	93	Hassall Street, northbound
Victoria Street / Hassall Street	2,703	36.7	C	0.65	190	Hassall Street, southbound
Victoria Street / Market Street	1,419	19	B	0.63	60	Victoria Street, eastbound
Victoria Street / Justin Street	1,542	13.1	A	0.43	52	Victoria Street, eastbound
Cumberland Highway / Victoria Street	4,645	40.5	C	0.90	397	Cumberland Highway, northbound

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Table 10.8. Intersection operation during demolition phase – evening peak.

Intersection	Total vehicles (per hour)	Average delay (seconds)	LOS	Degree of saturation	Maximum queue length (metres)	Occurs on approach
Intersection operation without demolition trips						
Hassall Street / Redfern Street	2,342	11.6	A	0.60	87	Hassall Street, southbound
Victoria Street / Hassall Street	3,081	42.1	C	0.73	254	Hassall Street, southbound
Victoria Street / Market Street	1,660	8.8	A	0.33	38	Victoria Street, westbound
Victoria Street / Justin Street	1,808	14.6	A	0.49	63	Victoria Street, westbound
Cumberland Highway / Victoria Street	5,413	45.1	D	0.90	448	Cumberland Highway, southbound
Intersection operation with demolition trips						
Hassall Street / Redfern Street	2,364	12.4	A	0.59	87	Hassall Street, southbound
Victoria Street / Hassall Street	3,108	42.7	C	0.74	259	Hassall Street, southbound
Victoria Street / Market Street	1,678	8.8	A	0.33	39	Victoria Street, westbound
Victoria Street / Justin Street	1,831	14.6	A	0.49	64	Victoria Street, westbound
Cumberland Highway / Victoria Street	5,452	48.1	D	0.92	477	Cumberland Highway, southbound

Construction

Results of the intersection analysis for the construction phase are presented in Table 11.9 (morning peak) and Table 10.10 (evening peak). Comparison of the 'with construction trips' and 'without construction trips' scenarios shows the addition of trips associated with the construction phase has minimal impact on intersection performance with minor increases in average delay and queue lengths in both the morning and evening peak periods. The intersections are expected to continue to operate satisfactorily with the exception of the Cumberland Highway / Victoria Street intersection, which would decrease from LOS C to LOS D in the morning peak hour and would continue to operate at LOS D in the evening peak hour.

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Table 10.9. Intersection operation during construction phase – morning peak.

Intersection	Total vehicles (per hour)	Average delay (seconds)	LOS	Degree of saturation	Maximum queue length (metres)	Occurs on approach
Intersection operation without construction trips						
Hassall Street / Redfern Street	2,162	10.9	A	0.54	91	Hassall Street, northbound
Victoria Street / Hassall Street	2,677	36.5	C	0.64	188	Hassall Street, southbound
Victoria Street / Market Street	1,401	18.8	B	0.62	60	Victoria Street, eastbound
Victoria Street / Justin Street	1,522	13.1	A	0.43	52	Victoria Street, eastbound
Cumberland Highway / Victoria Street	4,608	39.5	C	1.06	272	Cumberland Highway, northbound
Intersection operation with construction trips						
Hassall Street / Redfern Street	2,197	11.1	A	0.56	95	Hassall Street, northbound
Victoria Street / Hassall Street	2,716	36	C	0.66	200	Hassall Street, southbound
Victoria Street / Market Street	1,432	19.1	B	0.65	62	Victoria Street, eastbound
Victoria Street / Justin Street	1,555	13.1	A	0.44	53	Victoria Street, eastbound
Cumberland Highway / Victoria Street	4,658	45.5	D	0.89	382	Cumberland Highway, northbound

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Table 10.10. Intersection operation during construction phase – evening peak.

Intersection	Total vehicles (per hour)	Average delay (seconds)	LOS	Degree of saturation	Maximum queue length (metres)	Occurs on approach
Intersection operation without construction trips						
Hassall Street / Redfern Street	2,342	11.6	A	0.60	87	Hassall Street, southbound
Victoria Street / Hassall Street	3,081	42.1	C	0.73	254	Hassall Street, southbound
Victoria Street / Market Street	1,660	8.8	A	0.33	38	Victoria Street, westbound
Victoria Street / Justin Street	1,808	14.6	A	0.49	63	Victoria Street, westbound
Cumberland Highway / Victoria Street	5,413	45.1	D	0.90	448	Cumberland Highway, southbound
Intersection operation with construction trips						
Hassall Street / Redfern Street	2,377	12.9	A	0.60	86	Hassall Street, southbound
Victoria Street / Hassall Street	3,121	42.4	C	0.74	261	Hassall Street, southbound
Victoria Street / Market Street	1,691	8.8	A	0.33	39	Victoria Street, westbound
Victoria Street / Justin Street	1,843	14.6	A	0.49	66	Victoria Street, westbound
Cumberland Highway / Victoria Street	5,466	53.4	D	0.93	499	Cumberland Highway, southbound

Operation in the opening year (2017 / 2018)

Results of the intersection analysis for the construction phase are presented in Table 10.11 (morning peak) and Table 10.12 (evening peak). Comparison of the 'with operational trips' and 'without operational trips' scenarios shows the addition of trips associated with the operational phase has minimal impact on intersection performance with minor increases in average delay and queue lengths in both the morning and evening peak periods. The intersections are expected to continue to operate satisfactorily with the exception of the Cumberland Highway / Victoria Street intersection, which would continue to operate at LOS D in the evening peak hour.

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Table 10.11. Intersection operation during operational phase – morning peak.

Intersection	Total vehicles (per hour)	Average delay (seconds)	LOS	Degree of saturation	Maximum queue length (metres)	Occurs on approach
Intersection operation without operational trips						
Hassall Street / Redfern Street	2,184	10.9	A	0.55	93	Hassall Street, northbound
Victoria Street / Hassall Street	2,704	41	C	0.78	243	Hassall Street, southbound
Victoria Street / Market Street	1,415	18.9	B	0.63	61	Victoria Street, eastbound
Victoria Street / Justin Street	1,537	13.1	A	0.44	53	Victoria Street, eastbound
Cumberland Highway / Victoria Street	4,655	48.3	D	0.91	319	Cumberland Highway, northbound
Intersection operation with operational trips						
Hassall Street / Redfern Street	2,223	11.9	A	0.58	100	Hassall Street, northbound
Victoria Street / Hassall Street	2,741	40.2	C	0.94	184	Hassall Street, southbound
Victoria Street / Market Street	1,454	19.4	B	0.66	65	Victoria Street, eastbound
Victoria Street / Justin Street	1,577	13.1	A	0.46	56	Victoria Street, eastbound
Cumberland Highway / Victoria Street	4,693	46.6	D	0.94	278	Cumberland Highway, northbound

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Table 10.12. Intersection operation during operational phase – evening peak.

Intersection	Total vehicles (per hour)	Average delay (seconds)	LOS	Degree of saturation	Maximum queue length (metres)	Occurs on approach
Intersection operation without operational trips						
Hassall Street / Redfern Street	2,366	11.6	A	0.60	88	Hassall Street, southbound
Victoria Street / Hassall Street	3,112	42.3	C	0.74	258	Hassall Street, southbound
Victoria Street / Market Street	1,677	8.8	A	0.33	39	Victoria Street, westbound
Victoria Street / Justin Street	1,827	14.6	A	0.49	64	Victoria Street, westbound
Cumberland Highway / Victoria Street	5,467	46.6	D	0.91	466	Cumberland Highway, southbound
Intersection operation with operational trips						
Hassall Street / Redfern Street	2,396	12.7	A	0.60	88	Hassall Street, southbound
Victoria Street / Hassall Street	3,143	43.3	D	0.77	274	Hassall Street, southbound
Victoria Street / Market Street	1,706	8.8	A	0.34	41	Victoria Street, westbound
Victoria Street / Justin Street	1,856	14.8	A	0.55	65	Victoria Street, westbound
Cumberland Highway / Victoria Street	5,499	52.8	D	0.94	510	Cumberland Highway, southbound

Operation at full capacity (2023 / 2024)

Results of the intersection analysis for the construction phase are presented in Table 10.13 (morning peak) and Table 10.14 (evening peak). Comparison of the 'with operational trips' and 'without operational trips' scenarios shows the addition of trips associated with the construction phase has minimal impact on intersection performance with minor increases in average delay and queue lengths in both the morning and evening peak periods. The intersections are expected to continue to operate satisfactorily with the exception of the Victoria Street / Hassall Street and Cumberland Highway / Victoria Street intersections, which would both continue to operate at LOS D in the evening peak hour.

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Table 10.13. Intersection operation during operational phase – morning peak.

Intersection	Total vehicles (per hour)	Average delay (seconds)	LOS	Degree of saturation	Maximum queue length (metres)	Occurs on approach
Intersection operation without operational trips						
Hassall Street / Redfern Street	2,238	11.1	A	0.56	96	Hassall Street, northbound
Victoria Street / Hassall Street	2,771	44	D	0.84	283	Hassall Street, southbound
Victoria Street / Market Street	1,450	19.1	B	0.64	63	Victoria Street, eastbound
Victoria Street / Justin Street	1,575	13.2	A	0.45	55	Victoria Street, eastbound
Cumberland Highway / Victoria Street	4,770	48.7	D	0.92	438	Cumberland Highway, northbound
Intersection operation with operational trips						
Hassall Street / Redfern Street	2,287	12.6	A	0.62	108	Hassall Street, northbound
Victoria Street / Hassall Street	2,819	39.9	C	0.77	217	Hassall Street, southbound
Victoria Street / Market Street	1,499	19.9	B	0.68	69	Victoria Street, eastbound
Victoria Street / Justin Street	1,626	13.2	A	0.48	59	Victoria Street, eastbound
Cumberland Highway / Victoria Street	4,822	47.2	D	0.94	466	Cumberland Highway, northbound

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Table 10.14. Intersection operation during operational phase – evening peak.

Intersection	Total vehicles (per hour)	Average delay (seconds)	LOS	Degree of saturation	Maximum queue length (metres)	Occurs on approach
Intersection operation without operational trips						
Hassall Street / Redfern Street	2,424	12	A	0.62	92	Hassall Street, southbound
Victoria Street / Hassall Street	3,189	43.7	D	0.77	275	Hassall Street, southbound
Victoria Street / Market Street	1,718	8.9	A	0.34	40	Victoria Street, westbound
Victoria Street / Justin Street	1,872	14.8	A	0.54	65	Victoria Street, westbound
Cumberland Highway / Victoria Street	5,602	54.3	D	0.95	540	Cumberland Highway, southbound
Intersection operation with operational trips						
Hassall Street / Redfern Street	2,462	13.2	A	0.63	98	Hassall Street, southbound
Victoria Street / Hassall Street	3,225	54.5	D	0.88	369	Hassall Street, southbound
Victoria Street / Market Street	1,756	8.8	A	0.35	43	Victoria Street, westbound
Victoria Street / Justin Street	1,911	14.8	A	0.53	70	Victoria Street, westbound
Cumberland Highway / Victoria Street	5,641	54.4	D	0.95	542	Cumberland Highway, southbound

Summary

Comparison of the 'with additional trips' and 'without additional trips' scenarios during the demolition, construction and operational phases shows the additional trips will have minimal impact on intersection performance with minor increases in average delay and queue lengths.

10.5.5 Impacts on public transport

The minimal increase in traffic activity during demolition, construction and operation of the facility is not anticipated to result in any significant impacts on the operation of bus services or bus stops.

10.5.6 Impacts on active transport

The minimal increase in traffic activity during demolition, construction and operation of the facility is not anticipated to result in any significant impacts on pedestrians and cyclists.

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10.5.7 Parking

Under Condition 45 of the existing development consent for the facility (Appendix 10), there is a requirement for a minimum of 22 parking spaces, including 1 parking space for disabled persons. A small increase in parking spaces is proposed to account for additional service vehicle movements to and from the facility. The number of parking spaces will be increased to 27 in total, including one space for disabled parking.

The parking plan is provided in the site plan in Appendix 3.

10.6 Conclusions

The findings of this traffic impact assessment can be summarised as follows:

- The traffic modelling results indicate the signalised intersections along the vehicle access route are currently operating satisfactorily during the morning and evening peak periods with the exception of the Cumberland Highway / Victoria Street intersection, which operates at LOS D in the evening peak hour. This is a result of high traffic volumes in both directions on Cumberland Highway and a high proportion of heavy vehicles on Victoria Street.
- Increases in traffic activity during demolition, construction and operation of the facility are not anticipated to result in any significant impacts on intersection operation, the operation of bus services or bus stops, or pedestrians and cyclists.
- Overall it is concluded that the demolition, construction and operation of the facility will not have a significant impact on the surrounding traffic and transport network.
- A small increase in the number of parking spaces is proposed on the site to accommodate additional service vehicle movements to and from the site.

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11 Fire safety and incident management

11.1 Introduction

This Fire Safety Study (FSS) has been prepared by Benbow Environmental to assess the potential fire risk associated with the proposed expansion of a Resource Recovery and Waste Transfer Facility at 88 Redfern Street, Wetherill Park. The proposed development is to increase the annual production from 28,000 tonnes to 99,000 tonnes per year.

The FSS has been prepared to the guidelines outlined in the Hazardous Industry Planning and Advisory Paper No 2 – Fire Safety Study Guidelines (HIPAP No 2, Department of Planning and Environment 2011). The assessment of the fire risks draws heavily on the following reference documents:

- HIPAP No. 2 Fire Safety Study Guidelines.
- NFPA 46: Recommended Safe Practice for Storage of Forest Products 1996 Edition (NFPA: National Fire Protection Association, USA).
- Fire Risk Analysis.Fire Protection Engineering SFPE 3rd Edition
- Industrial Fire Hazards Handbook NFPA, 3rd Edition.

Guidelines specifically from NFPA46 support the findings of the FSS. The Fire Safety Study identifies the hazards relating to fire, resulting from the intended uses of the site. Assessments of the fire threats have then been undertaken and used to develop the fire prevention and fire protection strategy. Essential steps in this process that have been undertaken included:

- Examination of the heat loads from a fire involving waste paper and waste plastic;
- Examination of heat flux levels at adjoining premises; and
- Provide the storage requirements for diesel oils and fuel which are stored onsite in minor quantities.

The outcome of this approach is a facility with reduced risks. The site has in place engineered fire services with a hydrant booster pump, extensive hydrant system and hose reels.

Means of ensuring access to these is not hindered and their locations are clearly visible. The site is well positioned and has limited potential to cause significant off-site impacts. Community areas are distant from the site.

An electrical substation is within proximity however heat of radiation calculations show that a large fire would not cause damage to this facility.

The risk of fire is low. Operation experiences at this site and a larger similar facility at Smithfield has found that arson would be potentially the most likely source of a fire.

This facility has minimal external storage hence risk of an arson attempt being successful is very low. The site has security fencing and a security contractor monitors the site. Operational procedures are in place to limit the risk of a source of fire and these relate to hot work permits, contractor induction and a well trained workforce.

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The risk of a dust explosion is negligible as there are no operations which generate a fine dust. Baling of the cardboard and paper is not a dust generating activity.

Shredding of security documents generate coarse dust particulates which are >100 micron in size and are not associated with forming a “dust cloud” that could lead to an explosion.

Surfaces do accumulate a coating of particulates of paper and this presents a hazard. Adherence to hot work permits is therefore critical.

Accumulation of paper particulates on surfaces of electric motors driving the conveyor that transfers material into the baler and hydraulic power packs are also areas that require routine cleaning.

The proposed development is to increase the annual production from 28,000 tonnes to 99,000 tonnes.

These aspects have been analysed in the Hazard Identification section of the Fire Safety Study.

The existing fire services have been evaluated for adequacy in terms of providing sufficient fire fighting water and found to be adequate. Additional hose reels are required in the extension to the main building and in the proposed new external storage area. The site currently does not have fire fighting water containment. A system has been devised that would contain the first 90 minutes of fire fighting water.

11.2 Description of the site

The site exists as shown on the aerial view of the site presented as Figure 11.1 and Figure 11.2. This view of the site shows its location in a predominantly industrial/commercial area. The site is well located as it is relatively isolated from sensitive receptors.

The site borders on the western end of an industrial estate and the site gently slopes to the east. The site has been in use for the same purpose since it was occupied by Grima Environmental Services. Only access to the site is off the far western end of Redfern Street and this is the only access able to be used by emergency services.

Figure 11.3 shows the location of the main features of the site.

The stormwater drains are shown. These discharge at the eastern end of the site as the site has a slight gradient west to east.

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Figure 11.1. Aerial view of the site.

Figure 11.2. Close up aerial view of the site.

Figure 11.3. Main features of the site.

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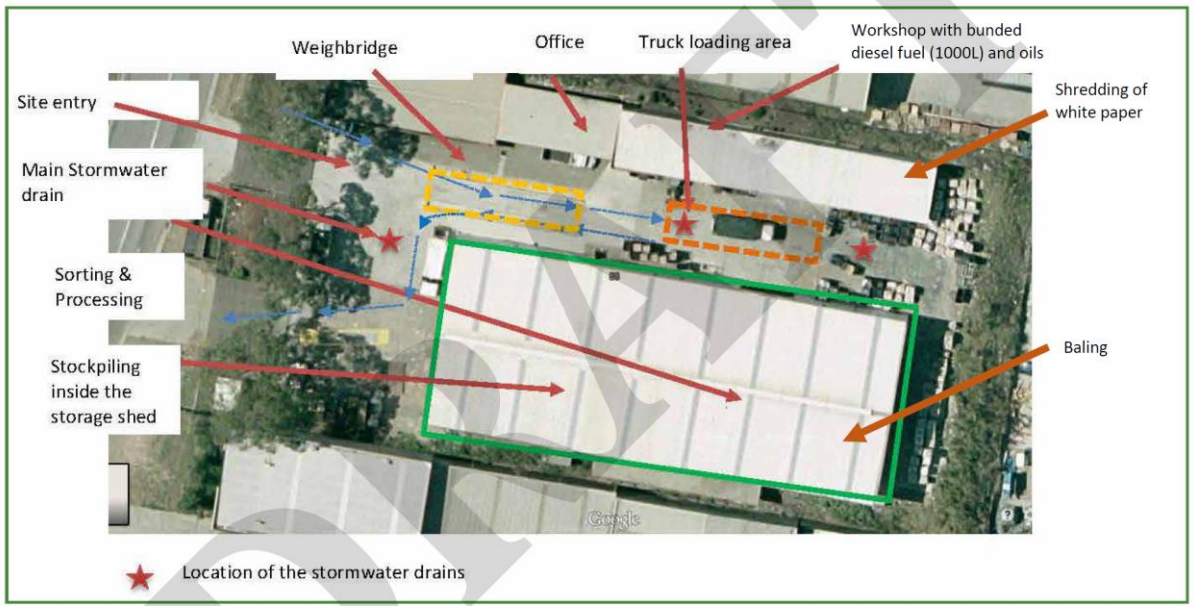

11.2.1 Proposed development

An overview of the operational processes to be undertaken within the site is provided below. The site currently consists of two buildings and a small shed for the fire pump on site and with reference to the site layout, these have the following uses:

1. Major building–southern half of site

This is the building with the majority of the potential fire load.

Low density plastic shrink wrapping and similar polyethylene films are collected, baled and stored in the north-western corner of this building.

Paper and cardboard are stored in a stockpile that runs down the middle of the building.

A front end loader and excavator are used to work the stockpile by adding materials delivered by trucks and unloaded from the trucks within this building.

The front end loader feeds the paper and cardboard material into a baler. A second baler may be added as part of the expansion of the facility.

The baler is located in the south-eastern corner of this building. Bales are pushed across the eastern end of the building where these are stacked waiting for delivery off-site.

This building would be extended as shown in Appendix 3. The extension comprises an addition to the warehouse and an awning. A basement is within these additions and this provides fire water storage.

The construction materials are shown on these figures and comprise 120/120/120 FRL walls on the boundary.

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There would be an opening between the existing warehouse and the proposed warehouse addition. A conveyor would transfer material into balers (up to 2) which would be located in the warehouse addition.

2. Building 2

The building along the northern wall houses the white paper shredding and baling, the workshop and spare parts store, the bunded diesel and oils storage and offices. This building would be altered as shown in Appendix 3. The northern boundary wall is metal clad.

3. Building/Shed 3

This is a small shed that houses the booster pump for the fire services.

11.2.2 Hours of operation

Site operations would be 24 hours per day, six days per week. This would allow services to be offered in peak waste collection times and minimise congestion and travel time associated with operations during peak hours. Sufficient storage would be incorporated to enable off peak deliveries to and from the facility.

11.2.3 Process description

There are no processes that involve flammable or combustible liquids. There is minor storage of C1 (GHS Category. 4 flammable liquid – diesel) and C2 combustible liquids – lubricating and hydraulic oils. These are kept in a workshop area on bunded pallets and spill trays.

There are the following process areas:

- Within the main building, two types of materials are processed.
    - The processing involves simple baling of the materials, short term storage and transport off site.
    - The materials in use are cardboard packaging and paper and plastic wrapping. These materials are unloaded from trucks within the building and adjacent to the stockpile.
    - A diesel fuelled front end loader pushes the new deliveries into the stockpile. The size of the stockpile is limited by the front end loader and is generally 2–3 m in height. Photographs in the EIS support this information.
    - A diesel powered excavator loads the stockpiled paper based materials into a ground hopper. Within the ground hopper is a conveyor that uses a rubber belt. The conveyor elevates the loose materials so that these fill the hopper that sits above a baler.
    - The baler compresses the loose material into a bale and ties the bale using wires or a strapping material. The baler pushes the compressed bale out onto the floor of the building where the excavator (or front end loader) are able to stockpile the bales and then load these for immediate delivery.
    - The recycling facility operates so that the baled materials are regularly despatched, usually every day.

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- Within the main building, the other material that is stored and baled is plastic wrapping materials.
    - The plastic wrapping is a low density polyethylene. It is also processed through the same baling process.
    - Within the second building on site, at the eastern end, white paper is shredded and baled in a smaller version of the process in the main building.
    - The workshop is within the same building as the white paper shredding and baling. Within an area of the workshop, the combustible liquids are stored.

11.2.4 Materials

The materials in use are cardboard packaging and paper, and plastic wrapping. The plastic wrapping material is commonly seen as shrink wrapping on cartons stacked on pallets, as protective covering on white goods.

The materials are stored in bulk and being in stockpiles are generally compacted. The outer surfaces would need to be exposed to sufficient radiant heat to cause the materials to be ignited. These aspects are discussed further below.

The stockpiling of paper based materials and the process of baling does not size reduce these materials such as occurs in a shredding operation.

Coarse fibres of paper may build up on horizontal surfaces of the walls of the buildings. Similarly from experience elsewhere, paper based fibres may accumulate on the hydraulic power packs that are associated with the balers.

Characteristics of the materials

A study of the materials that are to be used or processed on the site is discussed below. Firstly discussed are the characteristics of the combustible liquids.

A study of the characteristics of combustible liquids and when stored in drums and IBCs has been undertaken for this Fire Safety Study.

Ignition of combustible liquids

The ignition of a combustible liquid is necessary for a fire to erupt. The ignition of such a liquid requires a source of heat that has sufficient energy to cause the temperature of the liquid to exceed the flash point of the liquid. The flash point is determined by a method that includes heating the liquid in a cup and a gas pilot is enabled to cause a flash of flame just above the surface of the liquid. The fire point is a slightly higher temperature and at this temperature the fire on the surface will be sustained. The liquid also needs to be present in a vapour mixture with air that is sufficiently rich in presence of the combustible liquid that ignition may occur.

The combustible liquid may be heated to a temperature, in the absence of a source of ignition, where a spontaneous ignition occurs or where flammable vapour is released due to the heat that is present. For the activities and processes on this site, heat may be generated by a conveyor belt drive where the belt is unable to move and the friction caused by the steel rollers driving the belt cause the rubber to increase in temperature until auto ignition occurs.

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A similar experience can occur at hydraulic power packs where a malfunction causes excessive heat which in turn causes oil to evaporate and ignition occurs.

Routine maintenance and good housekeeping prevent such events from occurring.

Ignition of bulk materials

The ignition of paper based materials is very similar to the ignition of wood, however wood has a far higher heating value based on information collated from the References.

There are four stages in the ignition of the surface of a stockpiled material.

Stage 1: In this first stage in the ignition process, the temperature reaches 200°C. The gradual heating of the surface of the material is endothermic meaning it consumes energy. Therefore if the source of heat is removed or interrupted, the ignition process would cease.

Stage 2: On the basis of the temperature being able to rise further to 280oC, water is being driven out of the material. Carbon monoxide begins to be released and being combustible, is able to lead to the next stage.

Stage 2 is still endothermic. The flame anchors itself to the surface of the material in the "ignition zone" of the fire.

Smoke being unburnt particulates and highly odorous, would be easily observed during this early formative stage of a fire.

For the processes occurring at this site, heat generating activities are very limited to the mechanical equipment and lighting.

Once the equipment is not being operated, sources of heat are limited then to lighting.

During the operation of equipment, operators in the cabins of the mobile equipment are there moving materials and would readily see smoke being emitted.

Stage 3: Stage 3 occurs within the temperature range of 280oC–500oC. This temperature range is able to cause pyrolysis to occur. The pyrolytic process enables gases to be released from a combustible material.

As vapours burn within the flame area of the "ignition zone", heat is clearly released and the heat flux is transferred beyond the "ignition zone". Further gasification of the material occurs and enables the flame to anchor itself over an increasing surface area.

This layer burns the surface of the material with increasing flame height and an increasing chemical heat release rate causes the heat of radiation to be transferred ahead of the pyrolytic zone of the fire. The rate of movement will depend on these factors and the availability of air for combustion and would be expected to result in a high fire propagation rate.

This stage is exothermic producing considerable quantities of energy.

By comparison, the following are the amounts of heat able to be generated by wood and wood-fibre based materials:

- Wood – Douglas Fir: 51,376 kJ/kg

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- Cardboard – corrugated: 13,866 kJ/kg
- Newspaper: 18,336 kJ/kg

Once the fire enters the pyrolytic stage it would be expected to spread rapidly. This stage would release further carbon monoxide and many other flammable gases.

Stage 4: Above 500°C the materials are gasified and the radiant heat generated is able to rapidly cause other surfaces to enter this stage of the process. Flames would rapidly envelop the outer surfaces of the stockpile.

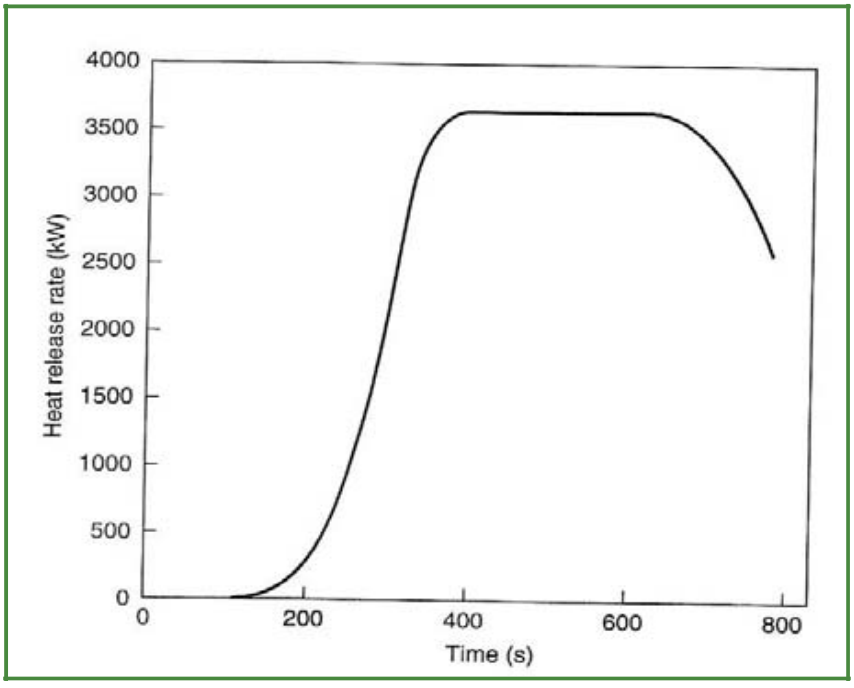
The heat of radiation would enter the body of the stockpile and cause the pyrolysis of the material providing further fuel and increasing the flame height. The difficulty for fire fighters is to be able to get water to enter the stockpile and quench the materials so that re-ignition and flare-up do not occur.

The quantities of water required are discussed further on in the FSS but are significant and are able to be provided by the existing fire services design.

The heat release rate of wood has been studied extensively and an extensive number of tests have been conducted with pallets of pine timber. Although not equivalent to a stockpile of cardboard and paper, what is of interest is the length of time a stack of pine timber requires to be fully enveloped by fire.

The following graph Figure 12.4 demonstrates the relationship between heat release rate (HRR) and time.

Figure 12.4: Heat release rate of a typical wood pallet stack (1.22 x 1.22 x 1.22 m high).



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The diagram shows that the time available for the necessary response to fire needs to be within the first three minutes otherwise the heat being released would be life threatening to site personnel and fire fighting would require use of hydrants which is beyond the capability of most site personnel unless specifically trained.

Polyethylene requires a constant exposure to flame to undergo the same process and is usually found to char.

A fire engulfing the stockpile of the cardboard and paper would have sufficient heat flux to cause the bales of polythene (plastic) to provide a secondary fuel source.

The bales being compressed would have minimal exposure to air to enable the body of the bale to be consumed until the temperature melted the polythene (plastic). Presence of the polythene does not increase the fire risk but would increase the duration of the fire and the quantity of firefighting water needed.

11.2.5 Adjoining premises

The adjoining premises are shown below (Figure 11.5). The site is located in an industrial area, and is surrounded by industrial and commercial premises to the north, east and south. The site is only accessible through Redfern Street.

Figure 11.5. Immediate neighbors of Grima Environmental Services.

The following table summarises the premises which may present an increased fire risk due to the nature of their operations.

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Table 11.2. Adjoining properties with increased fire risk.

Name of Premises	Nature of Risk	Safeguard
FX Australia Location: Immediately south of site	• Manufacturers of world leading quality architectural paints. These are water- based, very low risk of contributing to a fire. • May store minor quantities of solvent based paint within the building.	Minor storage of hydrocarbon solvent based paints. These paints are stored within their building. No ignition sources are of concern in production as the firm only produces water-based paints. Useful separation distance
Workforce International Location: Immediately north of site	• Storage of line marking machinery and paint. • Paint is water-based.	No ignition source as paint is water-based. No highly combustible materials between this site and Grima site. Partial shielding by fire-rated wall along the northern boundary of Grima site.
Electrical Substation Location: North of Workforce International	• Combustible liquid present in transformers. • Structures supporting power cables could fail due to high levels of heat radiation.	Shielding by fire rated wall along northern boundary of Grima site and the Workforce International building. Overall risk category: **VERY LOW**

11.2.6 Sensitive receptors

Grima Recycling's Resource Recovery Facility is located within the Wetherill Park industrial precinct. Sensitive land uses or receptors are located at substantial distance from the site.

The nearest residence is approximately 600 m away, south of Victoria Road.

11.2.7 Nearest waterway

The closest waterway is Prospect Creek and runs approximately 500 meters north of the site. Prospect Creek flows into Dhurawal Bay near Georges Hall and becomes Georges River. The site is situated ~1 kilometre south east of Prospect Nature Reserve. The closest environmental conservation area is located 500 meters south of the site being Wetherill Park Reserve (Figure 11.6).

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Figure 11.6: Nearest Sensitive Receptors.

11.3 Hazard identification and assessment of the fire threat

This section of the report analyses the hazard and applies an engineering design framework based on the following methodology.

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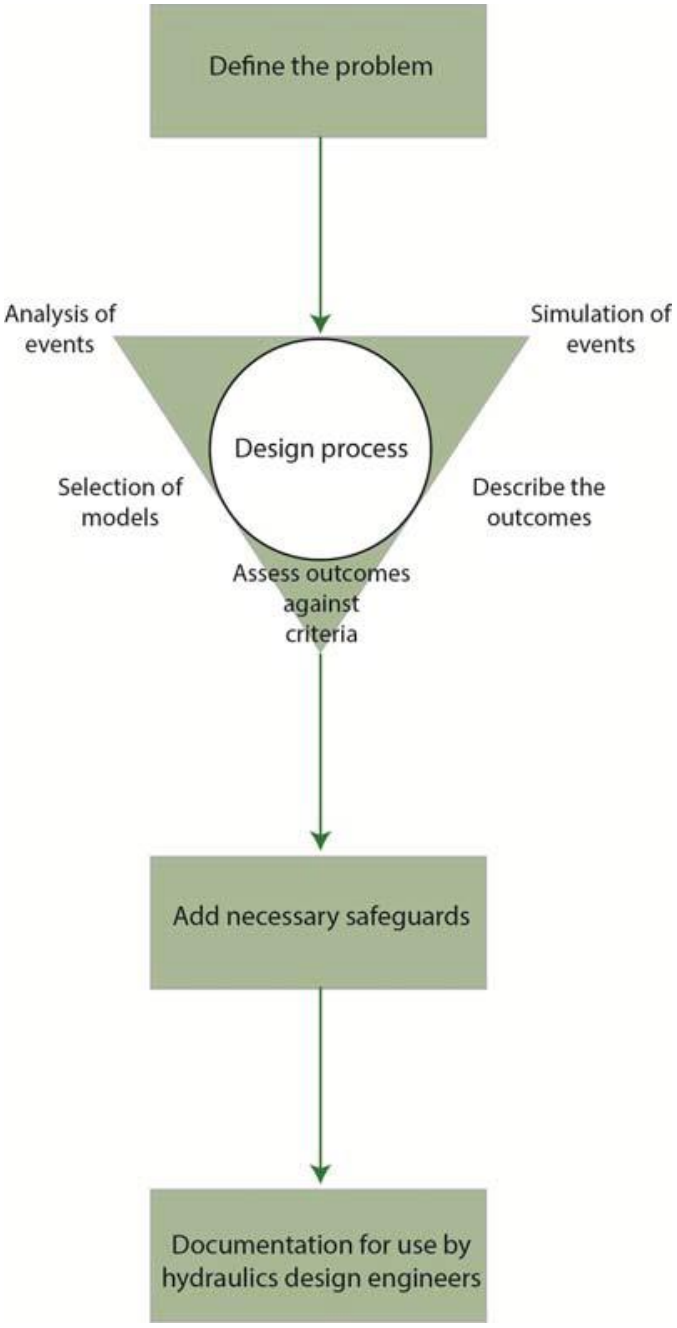

The report through to the final documentation section will detail the recommended safeguards. Within the design process the methodology is described below.

11.3.1 Site characteristics

The specifics of the site location have been detailed in Section 11.2.

The nature of the fire threat is dependent on the type of fuel and its burning characteristics. There have been major fires involving outdoor storage of timber and the intensity of the fires is significant and has resulted in destruction of property. The fire risks with this site are reduced due to the characteristics of the site.

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Flaming combustion involves the oxidation of gases released from the cardboard and paper. The ability of the fire is to heat the stockpile so that pyrolysis occurs and larger quantities of flammable vapours are emitted. Otherwise the surface of the stockpile will char and generate larger volumes of smoke.

In undertaking the hazard identification and assessment of the fire threat, the following are examined:

An examination of this logic diagram shows that although the sources of the fire may be a simple common material as combustible solids, the consequences would be very significant to adjoining properties.

11.4Hazard analysis

11.4.1 Level of assessment

Risk criteria for potentially hazardous development provide both a qualitative and quantitative risk criteria.

Three levels of assessment may be conducted as summarised below from two sources:

- Multi–Level Risk Assessment developed by NSW Department of Planning and Infrastructure.

For major developments the Level 2 analysis is considered to be satisfactory if the associated risk estimates fall within the ALARP zone as shown on the F-N diagram used to classify societal risk (Figure 11.7).

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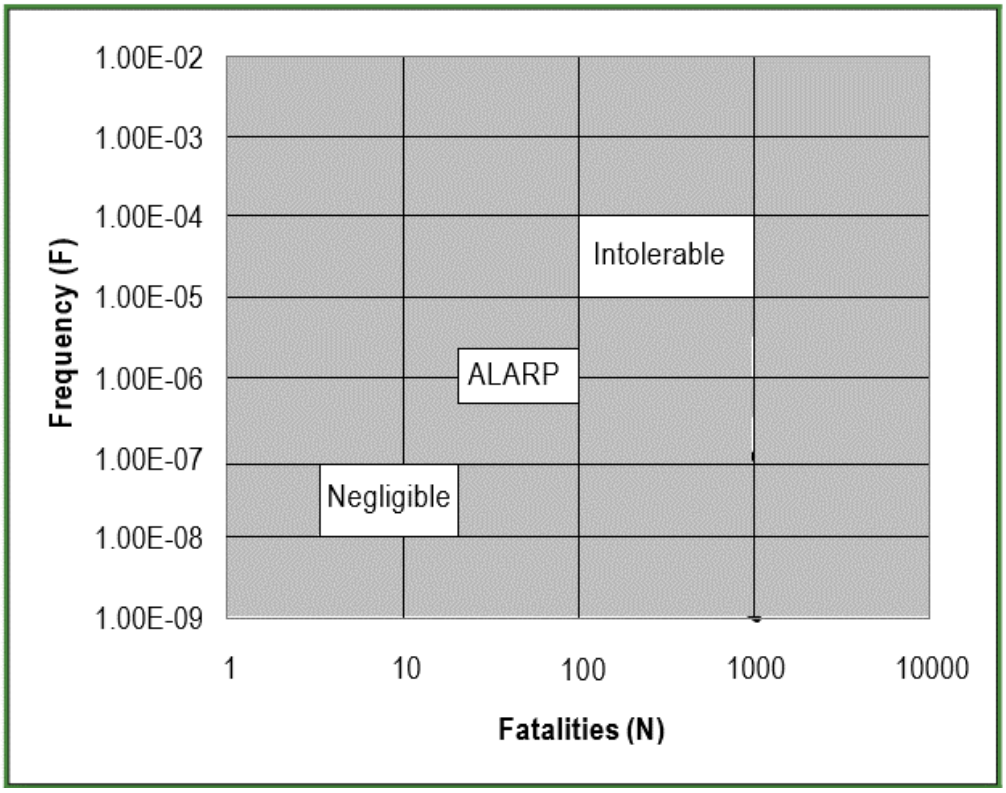
Figure 11.7. IAEA F-N Curve – Indicative Societal Risk Criteria.



The site expansion as proposed falls into the Negligible ALARP zone of this diagram and warrants limited quantitative analysis to determine if off-site hazards would occur.

Level 1 – Qualitative Analysis: primarily based on the hazard identification techniques. A level 1 assessment can be justified if the analysis of the facility demonstrates Societal Risk in the negligible zone and there are no potential accidents with significant off-site consequences.

Level 2 – Partially Quantitative Analysis: using hazard identification and the focused quantification of key potential off-site risk contributors. A level 2 assessment can be justified when the Societal Risk estimates fall within the middle ALARP zone or if one or more significant risk contributors had been identified but the frequency of risk contributors having off-site consequences is relatively low.

Level 3 – Fully Quantitative Risk Analysis: based on the full and detailed quantification of risks. A level 3 assessment is required where the Societal Risk from the facility estimates fall within the intolerable zone or where there are significant off-site risk contributors, and a level 2 assessment is unable to demonstrate that the risk criteria will be met.

Only a level 1 analysis has been required.

11.5Methodology

The procedures adopted in assessing hazardous impacts, depending on the level of risk assessment required, may involve the following steps:

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Step 1: Hazard identification;

Step 2: Hazard analysis (consequence and probability estimations); and

Step 3: Risk evaluation and assessment against specific criteria.

The following sections of the report discuss the hazard identification process as prescribed by the Department of Planning and Infrastructure (DoPI 2011) in the documents Multi-Level Risk Assessment and Hazardous Industry Planning Advisory Paper No 4 (HIPAP No. 6) – Guidelines for Hazard Analysis.

11.5.1 Hazard Identification

This is the first step in the risk assessment. It involves the identification of all theoretically possible hazardous events as the basis for further quantification and analysis. This does not in any way imply that the hazard identified or its theoretically possible impact will occur in practice. Essentially, it identifies the particular characteristics and nature of hazards to be further evaluated in order to quantify potential risks.

To identify hazards, a survey of operations was carried out to isolate the events which are outside normal operating conditions and which have the potential to impact outside the boundaries of the site. In accordance with HIPAP 6, these events do not include occurrences that are a normal part of the operation cycles of the site but rather the atypical and abnormal, such as the occurrence of a significant liquid spill during product transfer operations.

11.5.2 Hazard Analysis

After a review of the events identified in the hazard identification stage and the identification of prevention/protection measures incorporated into the design of the site, any events which are considered to have the potential to result in impacts offsite or which have the potential to escalate to larger incidents are carried over to the next stage of analysis.

11.5.3 Consequence Estimation

This aspect involves the analysis and modelling of the credible events carried forward from the hazard identification process in order to quantify their impacts outside the boundaries of the site. In this case, these events typically include fire and the potential effects on people and/or damage to property.

11.5.4 Probability Likelihood Estimation

If necessary, the likelihood of incidents are quantified by adopting probability and likelihood factors derived from published data.

11.5.5 Risk Evaluation and Assessment against Specific Criteria

The risk analysis includes the assessment of consequences for each hazardous event and the frequencies of each initiating failure. Whether it is considered necessary to conduct the predictions would depend on the probability figures, likelihood estimations, and if the risk criteria are exceeded.

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11.6Assessment criteria

The risk criteria applied by the Department of Planning and Infrastructure as published in the document Hazardous Industry Planning Advisory Paper No 4 (HIPAP No. 4) - Risk Criteria for Land Use Safety Planning (DoPI 2011) are applied. The following is a general discussion of the criteria that is used to assess the risk of a development on the surrounding community and environment.

11.6.1 Individual fatality risk levels

The following paragraphs have been reproduced from HIPAP No. 4 to describe individual fatality risk levels:

"People in hospitals, children at school or old-aged people are more vulnerable to hazards and less able to take evasive action, if need be, relative to the average residential population. A lower risk than the one in a million criteria (applicable for residential areas) may be more appropriate for such cases. On the other hand, land uses such as commercial and open space do not involve continuous occupancy by the same people.

The individual's occupancy of these areas is on an intermittent basis and the people present are generally mobile. As such, a higher level of risk (relative to the permanent housing occupancy exposure) may be tolerated. A higher level of risk still is generally considered acceptable in industrial areas." (DoPI, 2011).

The risk assessment criteria for individual fatality risk are presented below.

Table 11.3. Individual Fatality Risk Criteria (HIPAP No. 4).

Heat Flux Level	Effect
4.7 kW/m^2	Heat radiation level for possibility of injury to persons exposed. This heat radiation level is regarded to be high enough to potentially cause pain in 15-20 seconds and injury after 30 seconds of exposure.
12.6 kW/m^2	Heat radiation level for possibility of fatality at extended exposure and structural failure of nearby affected structures. At this level, injury is highly probable with a significant possibility for fatality to occur. Thin steel may undergo structural failure due to thermal stress and the temperature of wooden structures may increase to a heat where exposure to a naked flame can trigger ignition.
23 kW/m^2	Heat radiation level for possibility of fatality at instantaneous exposure and definite structural failure of nearby unprotected structures. The possibility for fatality is likely at this level, with spontaneous ignition of wood after long exposure and structural failure of unprotected steel due to thermal stress.
35 kW/m^2	Cellulosic material will pilot ignite within one minute's exposure. Significant chance of fatality for people exposed instantaneously.

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Figures in the table above have been utilised in this assessment.

11.6.2 Injury Risk Levels

HIPAP No. 4 provides guideline criteria for heat of radiation, explosion overpressure and toxic exposure.

The quoted requirements from the referenced document have been summarised as follows:

- Guideline criteria for heat of radiation:
  - "Incident heat flux radiation at residential and sensitive use areas should not exceed 4.7 kW/m^2, at frequencies of more than 50 chances in a million per year."
- Guideline criteria for explosion overpressure:
  - "Incident explosion overpressure at residential and sensitive use areas should not exceed 7 kPa at frequencies of more than 50 chances in a million per year."
- Guideline criteria for toxic exposure:
  - "Toxic concentrations in residential areas should not exceed a level that would be seriously injurious to sensitive members of the community following a relatively short period of exposure at maximum frequency of 10 in a million per year."

  and

  - "Toxic concentrations in residential areas should not cause irritation to the eyes or throat, coughing or other acute physiological responses in sensitive members of the community over a maximum frequency of 50 in a million per year."

Please note that a risk hazard assessment only examines events that are considered to have the potential for significant off-site consequences and may not entirely reflect all variations in people's vulnerability to risk.

11.6.3 Risk of property damage and accident propagation

HIPAP No. 4 indicates that siting of a hazardous installation must account for the potential for propagation of an accident, causing a "domino" effect on adjoining premises. This risk would be expected within an industrial estate where siting of hazardous materials on one site may potentially cause hazardous materials on an adjoining premises to further develop the size of the accident.

The criteria for risk of damage to property and of accident propagation are stated as follows:

- "Incident heat flux at neighbouring potentially hazardous installations or at land zones to accommodate such installations should not exceed a risk of 50 in a million per year for the 23 kW/m2 heat flux level."

and

- "Incident explosion overpressure at neighbouring potentially hazardous installations, at land zoned to accommodate such installations or at nearest public buildings should not exceed a risk of 50 in a million per year for the 14 kPa explosion overpressure level."

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11.6.4 Criteria for Risk Assessment to the Biophysical Environment

The assessment of the ultimate effects from toxic releases into the natural ecosystem is difficult, particularly in the case of atypical accidental releases. Consequence data is limited and factors influencing the outcome are variable and complex. In many cases, it may not be possible or practical to establish the final impact of any particular release. Because of such complexity, it is inappropriate to provide generalised criteria to cover any scenario. The acceptability of the risk will depend upon the value of the potentially affected zone or ecosystem to the local community and wider society.

The suggested criteria for sensitive environmental areas relate to the potential effects of an accidental release or an emission on the long-term viability of the ecosystem or any species within it and are expressed as follows:

- "Industrial developments should not be sited in proximity to sensitive natural environmental areas where the effects or consequences of the more likely accidental emissions may threaten the long-term viability of the ecosystem or any species within it."

and

- "Industrial developments should not be sited in proximity to sensitive natural environmental areas where the likelihood or probability of impacts that may threaten the long-term viability of the ecosystem or any species within it is not substantially lower than the existing background level threat to the ecosystem."

11.7 Assessment criteria applicable to the proposed development application

In accordance with HIPAP No 4 Risk Criteria for Land Use Safety Planning, the following discussion of the risk assessment criteria considered applicable to the proposed development has been provided.

11.7.2 Heat-Flux Radiation Criteria

As the chemical to be stored on site include Class 3 flammable goods, the heat flux radiation criteria have been deemed applicable to the site. Heat radiation models have been conducted to determine compliance with these criteria.

The effects of various heat fluxes (radiation) as a result of a fire incident are given in Table 11.4. The HIPAP No 4 paper suggests a heat flux of 4.7 kW/m^2 and a frequency of 50 in a million per year to be used as the risk injury criterion for thermal effects at residential and sensitive use areas.

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Table 11.4. Heat Radiation Impact (HIPAP No. 4).

Heat Flux	Effect
4.7 kW/m^2	Heat radiation level for possibility of injury to persons exposed. This heat radiation level is regarded to be high enough to potentially cause pain in 15- 20 seconds and injury after 30 seconds of exposure.
12.6 kW/m^2	Heat radiation level for possibility of fatality at extended exposure and structural failure of nearby affected structures. At this level, injury is highly probable with a significant possibility for fatality to occur. Thin steel may undergo structural failure due to thermal stress and the temperature of wooden structures may increase to a heat where exposure to a naked flame can trigger ignition.
23 kW/m^2	Heat radiation level for possibility of fatality at instantaneous exposure and definite structural failure of nearby unprotected structures. The possibility for fatality is likely at this level, with spontaneous ignition of wood after long exposure and structural failure of unprotected steel due to thermal stress.
35 kW/m^2	Cellulosic material will pilot ignite within one minute's exposure. Significant chance of fatality for people exposed instantaneously.

11.7.3 Explosion Over-Pressure Criteria

As no explosive materials will be stored onsite, the explosion over-pressure criteria has been deemed not applicable.

11.7.4 Toxic Criteria

The toxic exposure criteria have been deemed applicable due to the storage of Class 3 paints which can produce toxic combustion products. HIPAP No. 4 indicates that citing of potentially hazardous developments also needs to consider the risk from accidental releases into the biophysical environment.

The National Institute for Occupational Safety and Health (NIOSH) and the American Industrial Hygiene Association (AIHA) provides the following 4 categories of health impact criteria which are of relevance during an emergency event:

- Immediately Dangerous to Life or Health (IDLH).
- Emergency Response Planning Guideline 1 (ERPG1).
- Emergency Response Planning Guideline 2 (ERPG2).
- Emergency Response Planning Guideline 3 (ERPG3).

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The purpose of the values given for each of these limits for a particular chemical is to assess the capabilities of mitigation safeguards and emergency or accident response plans for the workplace.

The IDLH limit is defined by the Occupational Safety and Health Administration (OSHA) as:

- "An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere."

The following are definitions for each ERPG level as defined by American Industrial Hygiene Association, 2008 Emergency Response Planning Guidelines (ERPG) and Workplace Environmental Exposure Levels (WEEL) Handbook:

- "The ERPG-1 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing more than mild, transient adverse health effects or without perceiving a clearly defined objectionable odour."

The ERPG-2 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action.

The ERPG-3 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

The ERPG-2 level can be considered synonymous to the IDLH limit, although it has been observed that both slightly vary from each when comparing values for each contaminant. For this reason, both IDLH and ERPG limits were required to be considered in this assessment.

The toxic exposure criteria adopted in this assessment for the toxic chemicals potentially emitted from the site are defined in Table 11.5.

Table 11.5. Adopted Health Criteria Based of Potential Pollutants.

Chemical	Health Limits (in			
	IDLH	ERPG-1	ERPG-2	ERPG-
Carbon Monoxide	1,374.72	229.12	400.96	572.80
Carbon Dioxide	72,000	-	-	-

11.7.5 Biophysical Environment Risk Criteria

The site is located within an established industrial area. The site is fully paved.

Any leaks/spills resulting from incidents involving the workshop diesel and oil would be captured within the corresponding bunds provided. Spill kits would be provided at all areas that are identified to be prone to spills. A housekeeping inspection would be undertaken regularly to ensure that no leaks or spills would occur on site. The site has a history of operating without leaks and spills occurring.

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Best practice in housekeeping and operational procedures would be implemented on site. Stormwater isolation to achieve 90 minutes of fire fighting water containment would be accomplished using mats to cover stormwater pits as well as the internal bunding of the chemical storage area. Given this consideration, the proposed development would not introduce any additional risk that may threaten the long-term viability of the development and its effect to the local environment. Consequently, the biophysical environmental risk-based criteria have been determined to be readily satisfied and no further analyses or discussions were considered necessary.

11.8 Hazard identification

A level 2 risk assessment involves the hazard identification step, which examines all possible failure scenarios and their consequences to ensure that all incidents with possible off-site consequences are identified. Those events that could contribute to off-site risk will then be examined in further detail of the consequences and likelihood in order to demonstrate that quantitative risk criteria will not be exceeded.

11.8.2 Hazardous materials

The potentially hazardous chemicals to be stored on site are minor quantities of C1 and C2 combustible liquids. A summary of the properties and potential hazards of these substances is given below.

11.8.3 Hazard Identification Chart

A Hazard Identification Chart has been prepared for the proposed site based on operating scenarios that are relevant to the proposed development. This chart outlines the outcomes from the hazard identification phase of the assessment.

The chart consists of four columns:

Column 1

Heading: Functional/Operation Area

The area of the site involved with the potential event is listed.

Column 2

Heading: Possible Initiating Event

The individual events that are considered to be likely or realistic are then listed. Where the possible consequences are similar the events are listed together, each one individually numbered.

Column 3

Heading: Possible Consequences

The outcomes of an event if it occurred are listed.

Column 4

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Heading: Prevention/Protection Measures

The measures designed into the functional/operation area and the site are listed. These measures may include for example safeguards, design features, management methods and/or operator training.

The hazard identification chart is presented in Table 11.6 below.

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Table 11.6. Event / consequence analysis table.

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
1. Main building	• 1. Recyclable paper and cardboard subjected to sufficient heat to catch alight.	• Fire engulfs stockpile of paper/cardboard and consumes the stockpile. • Fire fighting water is generated which escapes into the stormwater system. • Fire unable to be immediately controlled and engulfs larger tonnages of stored waste materials.	• A hot-work permit system is in place. • A first response fire crew exists on site. • The site is able to contain the first 90 minutes of fire fighting water. • No smoking is permitted on site except in a designated low risk area. • Site has BCA compliant fire services.
2. Baling	• Failure of a bearing causes excess heat. • Failure of an electrical motor causes a fire.	• Fire within the machinery, substantial fuel available.	• Operators always present during the process. • Building ventilation causes air flow within the machinery that would provide cooling. • Preventative maintenance programme. • First response fire services available. • Operators trained in use of these services.
	• Oil leakages collect under the machinery and soak cardboard/paper with oil allowing an exothermic reaction to occur with ufficient heat to cause ignition.	• Fire external to the machinery sufficient fuel available to cause rapid spread of fire to cardboard and paper.	• Preventative maintenance programme. • Routine cleaning of machinery. • Oil leakages promptly attended to. • Operations under surveillance cameras so release of smoke would be observed.

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Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
3. Diesel fuel	• Spillage occurs onto a vehicle, hot surface vaporises the fuel and a fire erupts	• Fire is unable to be contained and causes rupture of the diesel storage tank, pool fire occurs.	• Diesel tank is bunded. Pool fire would be contained to the bunded area and be able to be contained. • Fire extinguishers stored nearby in accordance with AS 1940–2004 and fire immediately controlled. • Site has trained first response fire crew. • Fire services on-site comply with BCA.

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Hazard Identified for Further Analysis

The potential hazards identified for further analysis have been analysed in a scenario based risk assessment.

The hazardous scenarios identified for further analysis are described below:

- Scenario A1: Fire involving 100 T of cardboard.
- Scenario A2: Fire involving 100 T of plastic.
- Scenario B1: Fire involving 700 T of cardboard.
- Scenario B2: Fire involving 700 T of plastic.
- Scenario C1: Fire involving 1000 T of cardboard.
- Scenario C2: Fire involving 1000 T of plastic.

Scenarios A to C have been analysed for heat of radiation levels as listed in Table 11.7 to Table 11.11.

Following a review of the Hazard Identification Charts, a series of potentially hazardous events or scenarios were considered to require a comprehensive qualitative analysis. Each event or scenario is discussed in detail and the need for further quantitative analysis considered.

The heat of radiation calculations are based on worst case scenarios where the materials held on site in the event of fire are unbaled or 'loose' materials held on the floor in the main processing warehouse.

The following calculations and assumptions were considered in the modelling of effects for each scenario:

- A paper/cardboard density of 152 kg/m^3. This represents "medium density" waste paper based on the Waste Materials–Density data obtained from the Victorian EPA Environment and Resource Efficiency Plans (EREPs) toolkit for waste management.
- NSW EPA values are lower for loose cardboard and plastic film under low compaction. The scenarios have been analysed with the materials in a loose condition.
- Each of the on-site and off-site buildings may be exposed to a fire that radiates heat from different sides of the stockpile. Therefore the surface areas of the stockpile directed to these buildings was used to determine the heat of radiation from a fire that has fully formed and therefore has significant flame heights.
- Flame heights were determined from the following relationship:

$$L = A_0 Q^{\frac{2}{5}} - 1.02D$$

where: L = fire flame height (m)
Q = fire heat release rate (kW)
D = fire diameter (m)
A_o = constant = 0.235

- Heat of radiation levels were determined from the following relationship:

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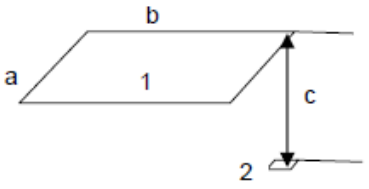
$$F_{1-2} = \frac{1}{2\pi} \times \left(\frac{X}{\sqrt{1+X^2}} \times \tan^{-1}\left(\frac{Y}{\sqrt{1+X^2}} \right) + \frac{Y}{\sqrt{1+Y^2}} \times \tan^{-1}\left(\frac{X}{\sqrt{1+Y^2}} \right) \right)$$



where: F_{1-2} = Fraction of radiation leaving 1 and arriving at 2
X = a/c
Y = b/c

$$F_{12} = \frac{2}{\pi \cdot X \cdot Y} \cdot \left\{ \begin{array}{l} \ln\left\langle \left[\frac{(1+X^2)\cdot(1+Y^2)}{1+X^2+Y^2} \right]^{0.5} \right\rangle - X \cdot a\tan(X) - Y \cdot a\tan(Y) + X \cdot (1+Y^2)^{0.5} \cdot \\ a\tan\left[\frac{X}{(1+Y^2)^{0.5}} \right] + Y \cdot (1+X^2)^{0.5} \cdot a\tan\left[\frac{Y}{(1+X^2)^{0.5}} \right] \end{array} \right\}$$

where: F_{12} = Fraction of radiation leaving 1 and arriving at 2
X = b/c
Y = a/c

11.8.4 Scenario A1: Fire involving 100 T of Cardboard

This scenario describes the event that a moderate sized fire has occurred involving the combustion of 100 T of cardboard in the smaller of the two buildings.

This building has a fire rated wall along the northern boundary of the site. Flame height reached 19.3 metres. The heat of radiation levels that could cause structures to be damaged are contained on site.

Table 11.7. Heat Radiation Distances for Scenario A1.

Level	Heat Radiation Distance from Fire Boundary
4.7 kW/m^2	31.0
12.6 kW/m^2	17.1
23 kW/m^2	11.1
35 kW/m^2	7.7

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Figure 11.7. Heat Radiation Contours for Scenario A1: Fire involving 100 T of cardboard. Note: Isopleths illustrate the heat of radiation contours: Blue = 4.7 kW/m^2; Red = 12.6 kW/m^2; Green = 23 kW/m^2, Orange = 35 kW/m^2.

11.8.5 Scenario A2: Fire involving 100 T of Plastic

This scenario describes the event that a moderate sized fire has occurred involving the combustion of 100 T of plastic in the smaller of the two buildings.

This building has a fire rated wall along the northern boundary of the site. Flame height reached 9.9 metres. The heat of radiation levels that could cause structures to be damaged are contained on site.

Table 11.8. Heat Radiation Distances for Scenario A2.

Level	Heat Radiation Distance from Fire Boundary
4.7 kW/m^2	13.4
12.6 kW/m^2	6.8
23 kW/m^2	3.8
35 kW/m^2	1.9

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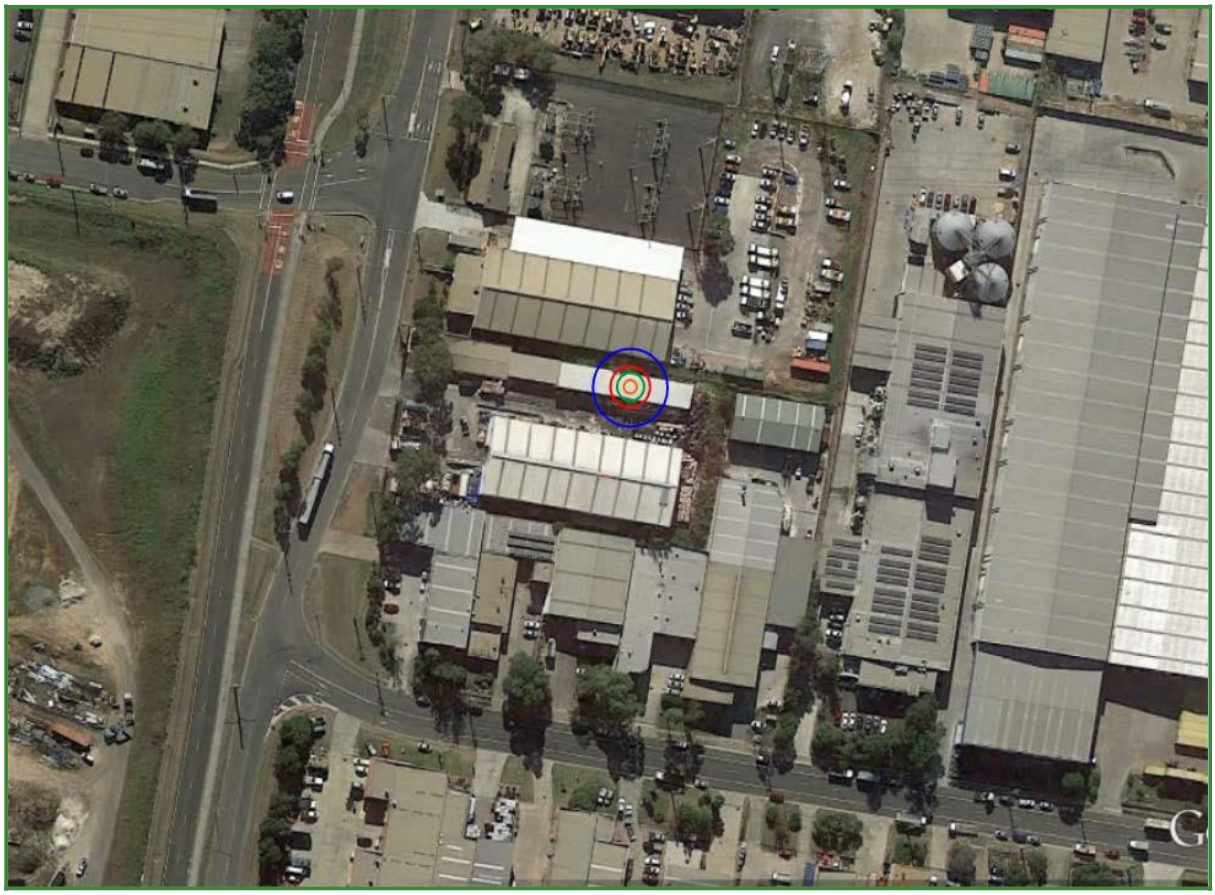
Figure 11.8. Heat Radiation Contours for Scenario A1: Fire involving 100 T of Plastic. Note: Isopleths illustrate the heat of radiation contours: Blue = 4.7 kW/m^2; Red = 12.6 kW/m^2; Green = 23 kW/m^2, Orange = 35 kW/m^2.



11.8.6 Scenario B1: Fire involving 700 T of Cardboard

This scenario describes the event that a large fire had occurred involving the combustion of 700 T of cardboard.

The heat radiation distances and heat radiation contours are presented in Table 11.9 and Figure 11.9 respectively. Flame height reached is 35 m.

Table 11.9: Heat Radiation Distances for Scenario B1.

Level	Heat Radiation Distance from Fire Boundary
4.7 kW/m^2	65.1
12.6 kW/m^2	36.4
23 kW/m^2	23.9
35 kW/m^2	16.8

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Figure 11.9. Heat Radiation Contours for Scenario B1: Fire involving 700 T of Cardboard. Note: Isopleths illustrate the heat of radiation contours: Blue = 4.7 kW/m^2; Red = 12.6 kW/m^2; Green = 23 kW/m^2, Orange = 35 kW/m^2.

The damage would be expected to the southern half of the adjoining building in the adjacent site to the north. The substation would not be at risk. The main building on site would experience levels of heat of radiation that would damage the cladding but be unlikely to spread the fire into this building unless doorways were open.

11.8.7 Scenario B2: Fire involving 700 T of Plastic

This scenario describes the event that a very large fire had occurred involving the combustion of 700 T of plastic in the main building – these walls provide no reduction in the heat of radiation.

The heat radiation distances and heat radiation contours are presented in Table 11.10 and Figure 11.10 respectively.

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Table 11.10. Heat Radiation Distances for Scenario B2.

Level	Heat Radiation Distance from Fire Boundary
4.7 kW/m^2	27.9
12.6 kW/m^2	14.3
23 kW/m^2	8.0
35 kW/m^2	4.1

Figure 11.10: Heat Radiation Contours for Scenario B2: Fire involving 700 T of Plastic. Note: Isopleths illustrate the heat of radiation contours: Blue = 4.7 kW/m^2; Red = 12.6 kW/m^2; Green = 23 kW/m^2, Orange = 35 kW/m^2.

Damage is confined to the site.

11.8.8 Scenario C1: Fire involving 1000 T of Cardboard

This scenario describes the event that an even larger fire envelops the main building.

The heat radiation distances and heat radiation contours are presented in Table 11.11 and Figure 11.10 respectively. Flame height would reach 39.6 m.

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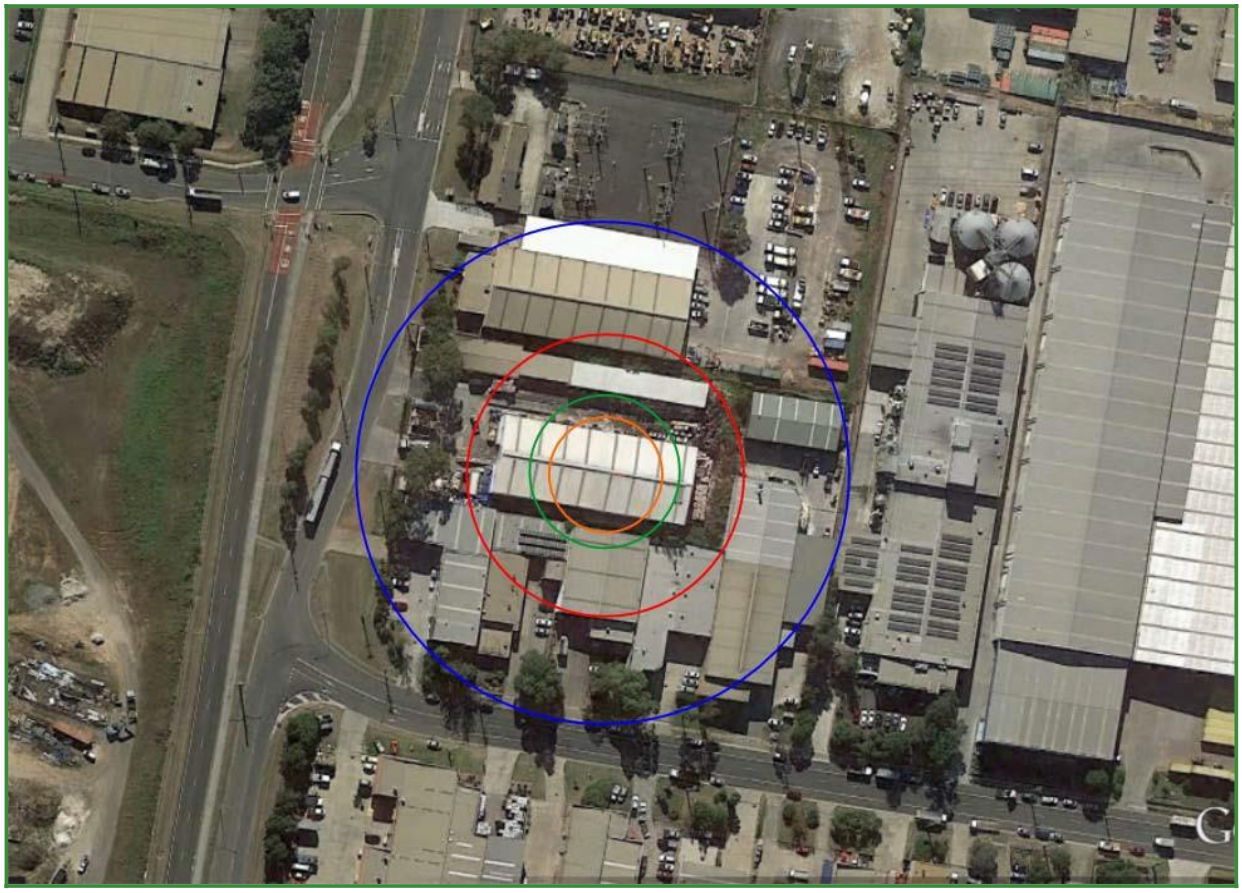
Table 11.11. Heat Radiation Distances for Scenario C1.

Level	Heat Radiation Distance from Fire Boundary
4.7 kW/m^2	75.7
12.6 kW/m^2	42.4
23 kW/m^2	27.9
35 kW/m^2	19.6

Figure 11.11. Heat Radiation Contours for Scenario C1: Fire involving 1000 T of Cardboard. Note: Isopleths illustrate the heat of radiation contours: Blue = 4.7 kW/m^2; Red = 12.6 kW/m^2; Green = 23 kW/m^2, Orange = 35 kW/m^2.



Damage would be caused to the sites to the immediate south of the site.

Evacuation of these site would be necessary due to the potential levels of heat of radiation. As well, smoke would present an irritation to the respiratory system of personnel on these sites.

11.8.9 Scenario C2: Fire involving 1000 T of Plastic

This scenario describes the event that an even larger fire envelops the main building.

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The heat radiation distances and heat radiation contours are presented in Table 11.12 and Figure 11.12 respectively.

Flame height would reach 19.7 m.

Table 11.12. Heat Radiation Distances for Scenario C2.

Level	Heat Radiation Distance from Fire Boundary
4.7 kW/m^2	32.3
12.6 kW/m^2	16.6
23 kW/m^2	9.3
35 kW/m^2	4.7

Figure 11.12. Heat Radiation Contours for Scenario C2: Fire involving 1000 T of Plastic. Note: Isopleths illustrate the heat of radiation contours: Blue = 4.7 kW/m^2; Red = 12.6 kW/m^2; Green = 23 kW/m^2, Orange = 35 kW/m^2.

Damage would be caused to the sites to the immediate south of the site.

Evacuation of these site would be necessary due to the potential levels of heat of radiation. As well, smoke would present an irritation to the respiratory system of personnel on these sites.

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11.8.10 Discussion of results

The scenarios analysed show that under normal conditions there would be no potential off site impacts.

Under worst case scenarios for major fires that would involve the whole of the quantities of paper/cardboard stored in the main building, the heat of radiation levels could expose adjoining premises to conditions that would require evacuation. This would be expected during a fire emergency event.

The scenarios analysed are worst case and do not allow for any reduction of the heat of radiation levels provided by the fire fighting water that would be applied.

The fire fighting services provided are considered to be sufficient to prevent incidents as analysed from occurring to the degree of severity calculated.

11.9 Fire prevention and protection strategy

This section outlines the fire protection strategy including fire protection equipment provided at the Site.

11.9.2 Building and construction

Building summary is provided Table 11.13.

Table 11.13. Building Classification Summary.

Characteristic	Description
Construction	Main building – Structural steel framework clad with steel. Reinforced concrete floor. Roller door access. Smaller building – Metal clad wall along the north facing side. Structural steel framework clad with steel. Reinforced concrete floor. Roller door access. Roof height 7 m and floor area 547 m^2.
Floor area	Main building – 1437 m^2. Smaller building (main office) – 204 m^2. Note that the carport adjacent to the office has a floor area of 105 m^2 and the workshop along the northern boundary of the site has a floor area of 301 m^2. Additional warehouse area and awning with the floor area 426 m^2 and roof height 8.8 m.
Height of the building	Height of the carport is 2.5 m and the height of the mechanical workshop is 4.5 m.

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11.9.3 Ventilation

Natural ventilation would be provided in accordance with the BCA.

This would be more than adequate for the type of activities being undertaken.

11.9.4 Ignition sources

There would be a non-smoking policy throughout the site.

11.9.5 Security and signage

The site would be locked and secure to prevent unauthorised access to the site outside of operating hours. The site has security monitoring.

11.9.6 Provision for escape

Site operators are trained and practice simulations of emergency evacuation procedures.

11.9.7 Fire detection

The main system for fire detection would be the staff on the site as they would be able to quickly detect any leaks of materials, via visual or odour recognition, which may lead to an increased fire risk. Once such situations are detected appropriate first response action would be taken.

Alarms

The following alarms would be in place:

- Offices
  Satisfy the requirements of BCA and AS 3786 Smoke alarms using scattered light, transmitted light or ionization and AS 1670 Fire detection, warning, control and intercom systems – System design, installation and commissioning – Fire for common areas.

11.9.8 Fire protection equipment

The fire protection consists of fire extinguishers, hose reels and hydrants.

Fire Hydrants

Section E1.3 of the BCA states:

a) A fire hydrant system must be provided to serve a building-
   (i) having a total floor area greater than 500 m2; and
   (ii) where a fire brigade is available to attend a building fire.

Fire Hose Reels

Section E1.4 of the BCA states:

b) A fire hose reel system must be provided-
   (i) to serve the whole building where one or more internal fire hydrants are installed; or

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(ii) where internal fire hydrants are not installed, to serve any fire compartment with a floor area greater than 500 m^2.

The two nearest hose reels to the chemical storage area are to be equipped with foam induction and 20 L containers of foam. The fire contractor would provide training in the use of foam.

Additional hose reels will be needed in the extension to the warehouse.

11.9.9 Existing fire services

Existing fire services are detailed in the following drawings of M.J. Harvey & Associates Pty Ltd:

- Site plan

Project No. 08084 Dwg No. A1 Revision A

- Warehouse plan

Project No. 08084 Dwg No. A3 Revision A

- Smaller building

Floor plan – Project No. 08084 Dwg No. A4 Revision A

- Pump Room Detail

Project No. 08084 Dwg No. A5 Revision A

- Details of Radiant Heat Protection Project No. 08084 Dwg No. A6 Revision A

The block plan is shown in Figure 11.12. There is no requirement for fire sprinklers.

11.10 Management practices

Presented in Appendix 6 is the procedure used in the Fire and Emergency Response Procedure of the site. This procedure identifies fire hazards to human health and the environment. The document is comprehensive. It is used during induction of site personnel and contractors.

Presented in Appendix 7 is the Pollution Incident Response Management Plan for the facility.

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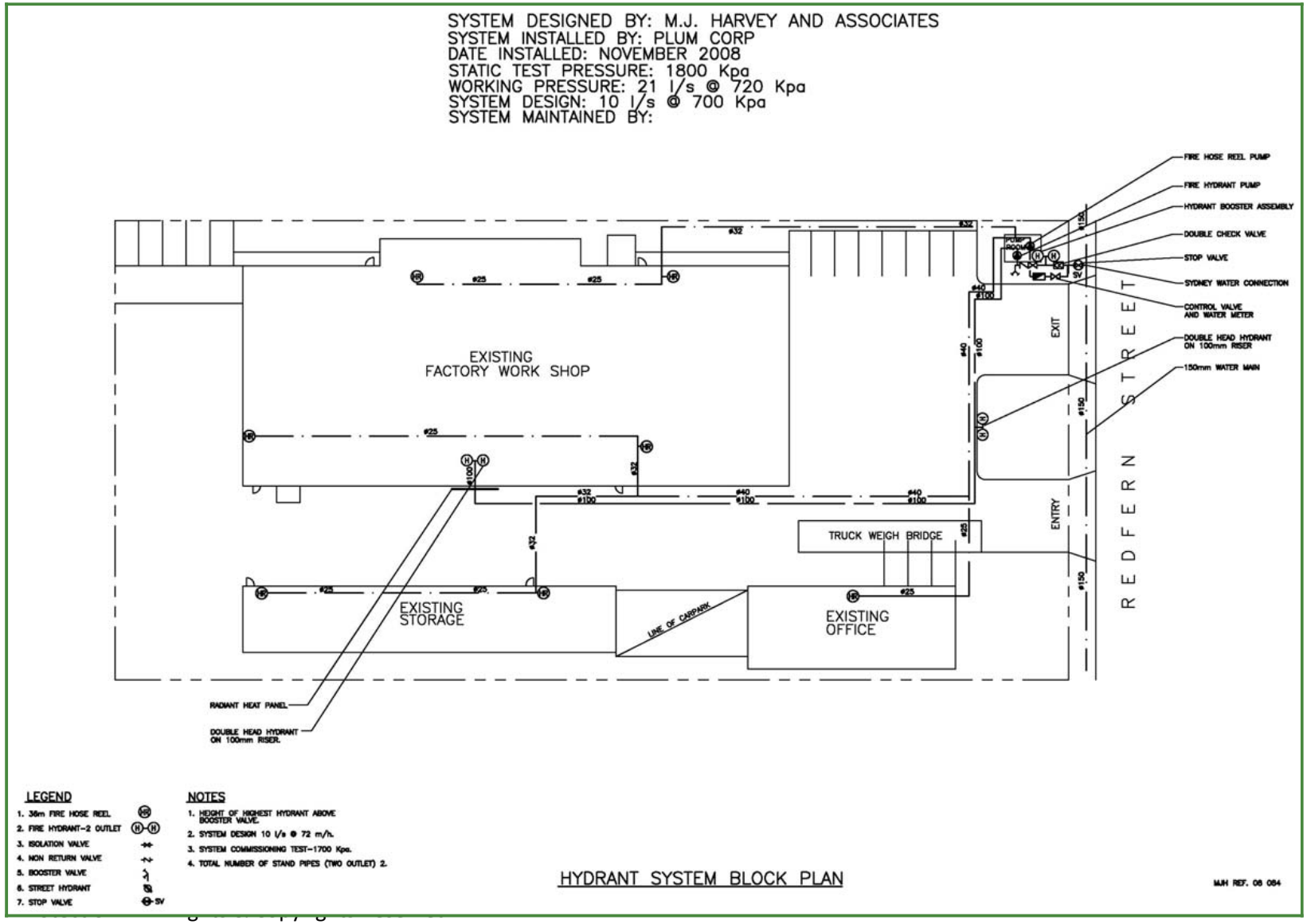
Figure 11.12. Site block plan.



11.10.2 Sydney Water mains supply enquiry

Sydney WATER

Statement of Available Pressure and Flow

Jessica Roy
13 Daking Street
North Parramatta, 2151

Date: 04/07/2016

Pressure & Flow Application Number: 85936
Your Pressure Inquiry Dated: 2016-06-16
Property Address: 88 Redfern St, Wetherill Park 2164

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

Street Name: Redfern Street	Side of Street: East
Distance & Direction from Nearest Cross Street	100 metres North from Walter Street
Approximate Ground Level (AHD):	57 metres
Nominal Size of Water Main (DN):	150 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	41 metre head
Minimum Pressure	19 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	19
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5 10 15 20 26 30	21 20 20 19 18 17
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5 10 15 20 26 30	19 18 18 17 16 15
Maximum Permissible Flow	36	13

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

connections@sydneywater.com.au

Sydney Water Corporation ABN 49 776 225 038
1 Smith St Parramatta 2150 | PO Box 399 Parramatta 2124 | DX 14 Sydney | T 13 20 92 | www.sydneywater.com.au
Delivering essential and sustainable water services for the benefit of the community

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General Notes

This report is provided on the understanding that (i) the applicant has fully and correctly supplied the information necessary to produce and deliver the report and (ii) the following information is to be read and understood in conjunction with the results provided.

1. Under its Act and Operating Licence, Sydney Water is not required to design the water supply specifically for fire fighting. The applicant is therefore required to ensure that the actual performance of a fire fighting system, drawing water from the supply, satisfies the fire fighting requirements.
2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.
3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.
4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.
5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are lodged through Quick Check Agents (List available on Sydney Water Website - www.sydneywater.com.au). Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.
6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.
2. Regular updates of the models are conducted to account for issues such a urban consolidation, demand management or zone change.
3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.
4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.
5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.
6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.

11.11 Containment of contaminated firefighting water

The methodology for calculating the amount of contaminated firefighting water to be contained and the methodology of containment follow the recommendations in the document HIPAP No. 2 - Fire Safety Study Guidelines (2011) and the *Best Practice Guidelines for Contaminated Water Retention and Treatment Systems* (NSW Gov. 1994).

11.11.2 Identification of materials and hazards

The principal potential hazard that could occur on the site that would produce contaminated water would be a fire. It is expected that the firewater used to fight or contain a fire would become contaminated with some of the hazardous materials that are kept at the site.

During a fire event it is expected that, depending on the location and extent of the fire, part of these hazardous materials would be combusted.

11.11.3 Consequences of contaminated fire water

If no system were in place to contain used firewater then it would enter the site stormwater system, and would flow off site, into local waterways. If the water was contaminated with significant levels of hazardous materials, there is the potential for an impact on the waterways. In recognition of this a containment system has been devised and has been put into place.

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11.11.4 Estimation of potential contaminated firewater volumes

A worst-case fire scenario at the site has been used to calculate the maximum amount of contaminated firewater that would be generated in such an event. This would involve a fire consuming a large proportion of the site and Fire & Rescue NSW using a large number of services available, which include the following:

- 2 Fire Hydrants; and
- 4 Hose Reels;

Thus the discharges of these for 90 minutes will be equal to (see Table 11.14).

Table 11.14. Containment of Contaminated Firewater.

Total Containment Required	
Warehouse	
Hose reels Operational discharge of 0.3 L/s 0.3 L/s x 60 s/min x 90 min = 1,620 L 4 x 1,620 L = 6,480 L	6,480 L
Fire Hydrants Operational discharge of 10L/s 10L/s x 60s/min x 90 min. = 54,000 L 2 x 54,000 L = 108,000 L	108,000 L
Total firewater containment required	**114,480 L**
Total Containment Provided (if bunding is installed)	
Main building bunding Area 1437 m^2, bund height 100 mm	**143,702 L**
Site area approximate (does not include minor buildings or sloping front of the site) 2,050 m^2 kerb height 100 mm	**205,200 L**
Total firewater containment provided	**348,900 L**

Based on the calculations shown above, the site would have a sufficient amount of water containment to contain 90 minutes of firefighting water on the site.

11.11.5 Firewater containment system

The facility includes a number of provisions for spill containment and firewater retention. The system compromises of the following:

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- All oils and fuel although in minor quantity, are stored on bunding and the building area housing these materials would have doorways bunded.
- Drainage arrangements have been included in the site to allow for on-site detention of the stormwater system (115,000 L storage; see Appendix 3 for plans). These would be able to be isolated during a fire event. This is the second tier of fire water containment protection and the final stormwater outlet pit would have a manually operated sluice valve fitted. The location of the valve would be shown on site with signage. Its operation would be included in any emergency plans and PIRMPs prepared for the site. Its location would also be shown at the fire pump house to assist fire officers.

11.11.6 Analysis of contaminated fire fighting water, treatment and disposal

Firefighting water would require analysis prior to being removed from the site. Pending the results, the water would be either disposed off-site by a licensed liquid disposal contractor or discharged to stormwater.

Analysis would involve sampling the firewater with the subsequent analysis conducted by a NATA accredited laboratory. The water would be analysed for specific analytes based on the location of fire and the types of contaminants that may have potentially contaminated the firewater. The results of the analysis would be compared against the current Australian water quality benchmarks. If the criteria are satisfied, the water would be discharged to stormwater. Otherwise the water would have to be pumped into a series of road tankers and disposed by a licensed liquid disposal contractor.

The firewater would be held on site for the time taken for analysis to be completed. The maximum time expected would be 24 hours. If at any stage rain threatened the contaminated firewater storage to overflow then the contained waters would be immediately assumed to be contaminated and a licensed contractor commissioned to pump the contaminated water and remove from site.

11.12 Conclusions

Due to the nature of the operations and the hazard prevention and protection measures proposed for the site, it is expected that there would be no increase in hazardous risks to the occupants of the industrial area or distant residents.

It is the conclusion of this assessment that the proposed site and its operations would meet necessary safety requirements. Hence, this facility would not be considered to be an offensive or hazardous development.

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12 List of approvals and licences

A number of approvals and licences will be required on issue of designated development consent conditions from Fairfield City Council. An overview of these approvals and licenses is provided in Section 2.5 of this EIS.

A summary of these approvals and licences is provided in Table 12.1 below, including the relevant laws, regulations and consent authority.

Table 12.1. List of approvals and licenses for the upgrade to Grima Environmental Services Pty Ltd's Resource Recovery Facility located at 88 Redfern St, Wetherill Park.

Licence or approval required	Underpinning legislation	What is the approval or licence required for?	Consent authority
Approval as a Designated and Integrated development	Clause 32(i) of Schedule 3 of *the Environmental Planning and Assessment Regulation* 2000	Planning consent for the upgraded facility	Fairfield City Council
Variation to existing Environment Protection Licence – Scheduled Development Work	Section 47 of the *Protection of the Environment Operations Act* 1997.	A variation to the existing site Environment Protection Licence (EPL 20647) is needed to permit scheduled demolition and construction work to commence	NSW Environment Protection Authority
Construction Certificate	Section 109C of the *Environmental Planning and Assessment Act* 1979	Approval to commence construction works as per consent conditions	Principal Certifying Authority
Variation to existing Environment Protection Licence – Scheduled Activity	Section 48 of the *Protection of the Environment Operations Act* 1997.	A variation to the existing site Environment Protection Licence (EPL 20647) is needed to permit the receipt of plastic film for processing and to receive up to 99,000 tonnes of waste per year for sorting and processing and to store up to 1,000 tonnes at any one point in time (Authorised Amount)	NSW Environment Protection Authority
Occupation Certificate	Section 109M of the *Environmental Planning and Assessment Act* 1979	Approval to occupy new buildings on the site	Principal Certifying Authority

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13 Cumulative impact assessment

13.1 Introduction

This cumulative impacts assessment addresses the cumulative environmental impacts of the proposed redevelopment of the Grima Recycling Resource Recovery Facility at 88 Redfern Street, Wetherill Park, as well as to address the Secretary's Environmental Assessment Requirements (SEARs). The proposed redevelopment seeks to modify the current Development Consent to increase the maximum tonnage of waste processing per year (to 99,000 tonnes per year); extend the range of materials able to be received at the site to include cardboard and plastic film; and to store up to 1,000 tonnes of material on site at any one point in time. A small extension to the hardstand area to the rear of the site intends to increase the storage capacity for baled end product materials and a proposed maintenance workshop will also form part of the redevelopment proposal. This includes a secondary baler and an upgraded double conveyor.

A cumulative impacts assessment is an environmental assessment that examines both the positive and negative environmental impacts of a proposal where there is a clustering of a particular land use type. A cumulative impact on the environment results from the incremental impact of human activities with consideration to the historic, current and foreseeable planned activities for a particular area. Cumulative impacts from a cluster of premises will vary between locations but typically cumulative impacts are a product of the location, the number and type of facilities present in the vicinity, the way they are managed, and the capacity of the local environment to accommodate these facilities.

13.2 Objective

This cumulative impacts assessment aims to achieve the following objectives:

- Identify the extent that the receiving environment is already stressed by existing development and background levels of emissions to which this proposal will contribute;
- Assess the impact of the proposal against the long term air, noise and water quality objectives for the area;
- Identified infrastructure requirements flowing from the proposal; and
- Assess the likely impacts from such additional infrastructure and measures reasonably available to the proponent to contain such requirements or mitigate their impacts.

13.3 Assessment of stress level of existing environment

The subject site is located at 88 Redfern St, Wetherill Park. The site is also identified at Lot 3, DP 262054 and consists of 5,345 m^2 of industrial land located in the Fairfield City Council local government area. The site is located a considerable distance from residential or other sensitive receivers and the proposal would not require a change to the existing land use.

The site is located within the Wetherill Park industrial precinct. The Wetherill Park industrial precinct is populated by more than 1,000 manufacturing, wholesale, transport and service firms making it the largest industrial estate in the southern hemisphere, and the hub of manufacturing and distribution in Greater Western Sydney.

The site is not constrained by any significant environmental issues. According to the *Fairfield Local Environmental Plan 2013*, the site is not encumbered by bushfire prone land; mine subsidence; acid sulfate soils; environmental conservation areas; landslide risk area; native vegetation protection; riparian lands and water courses; salinity; biodiversity or wetlands, or artefacts or places of Aboriginal or non-Aboriginal cultural heritage significance. The

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site is located 2.15 km from bulk water supply infrastructure (Prospect Reservior), though the land is not encumbered given the large distance between the site and this water reservoir.

The site is situated approximately one kilometre south east of Prospect Nature Reserve. The closest environmental conservation area is Wetherill Park Reserve, located 500 metres south of the site. The closest waterway is Prospect Creek which runs approximately 500 metres north of the site. Prospect Creek is approximately 26 kilometres long and starts at the Prospect Reservoir at the top of the catchment and flows to the Georges River at Georges Hall.

The creek is typical of an urban waterway and is threatened by a range of activities and associated infrastructure. The area is heavily built up with a population of over 190,000 people. The dominant landuse within the creeks catchment is a mix of light industrial and residential. In many places, vegetation along the creek banks has been cleared down to the edge of the channel, leaving it more vulnerable to urban and industrial runoff, weed invasion, erosion and rubbish dumping.

The industrial nature of the surrounding area would indicate a highly impervious surface area. With respect to water quality and run-off from surrounding land use, it is difficult to determine how adequate surrounding sites manage stormwater before it is released into the environment and therefore the environmental impacts on Prospect Creek. The impervious ground surface throughout the property does not allow any seepage or percolation of water into the ground or groundwater and therefore eliminating the risk of changes to the groundwater levels, groundwater quality or surface water runoff quality.

The nearest receptors to the site include industrial premises along the site boundary, and a residential area, TAFE and public park between within 700m to the south. The Cumberland Highway, Victoria Street and Hassall Street are the primary route for trucks to the Wetherill Park Industrial Precinct. Heavy vehicles servicing the area currently pass through residential areas along Hassall Street and Victoria Street. The residential houses and industrial premises are already exposed to a high level of vehicular and truck movements due to the surrounding road network. Therefore, the increased traffic movements associated with the proposal will have a low cumulative impact.

Consequently the potential cumulative impacts associated with the proposal, with respect to historic and current land use is considered minor. Furthermore, as the existing facility provides an important service to domestic and commercial markets with respect to resource recovery activities, should the proposal not be approved, resource recovery would be restricted into the future and likely result in recoverable materials being sent to landfill.

13.4 Assessment of the long term impacts of the proposal

As identified within the respective chapters and technical studies, the proposals environmental impacts, such air, noise and water quality meet all relevant environmental legislation, policies and objectives. The following sections provide a summary of the key long-term environmental impacts of the proposal.

13.4.1 Traffic

The traffic impact assessment technical study calculated that the proposed upgrade is expected to result in increased truck movements to and from the site. However, the cumulative traffic impacts (the level of service, delay and queue lengths) of existing signalised intersections off-site will not be affected by the operation phases of the facility and the current infrastructure is sufficient to handle any additional capacity that the facility might introduce.

13.4.2 Noise

The main future operational noise sources include trucks and fixed and mobile plant such as a forklift, front end loader, baler presses, conveyor and paper shredder. The proposed upgrade is expected to result in increased truck

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movements to and from the site however, no new noise sources will added to the site. All sources will remain at their current locations with the exception of the paper shredder which will be relocated to the north-eastern corner of the site and will remain within an enclosed building, and a secondary baler to be installed in the new mechanical workshop and baling area at the rear of the existing processing warehouse. A 6.5 m high precast concrete fire wall will be constructed along the northern boundary of the site, providing shielding to the adjacent industrial premise from site activity.

The potential noise impacts during the construction and operational phases are predicted to be within the noise criteria derived in accordance with the NSW EPA guidelines. The highest operational noise levels (68 dB(A)) are predicted to be along the eastern boundary due to the paper shredder being relocated to this area.

Noise levels at the nearest residential receptors are predicted to be below the noise criteria by a significant margin – this is due to the large separation distance between the site and receptors. In terms of potential sleep disturbance impacts, noise levels from truck movements on site are predicted to be well below the adopted 57 dB(A) maximum criteria.

13.4.3 Vibrations

An increase in truck movements has the potential for more frequent vibrations at nearby industrial premises and residential houses along the truck haul route. Vibration measurements and calculations indicate that, while truck movements are expected to increase, vibration levels from trucks are well within acceptable limits for protection against nuisance impacts and damage to buildings.

A long-term traffic management plan will be implemented which will include onsite speed limits and driver education to ensure excess noise and vibration nuisance impacts on neighbours are mitigated. The proponent will also ensure that equipment is regularly maintained, serviced and replaced (when required).

13.4.4 Air Quality

Dust emissions are considered the main air quality indicator for the site. Potential dust emission sources include handling of loose material (ie. unloading of trucks and loading of baler press, shredder) and truck movement over paved surfaces. All processing of material occurs inside a warehouse building. These processes includes unloading of material, baling and paper shredding. Therefore, the impacts on air quality are consider low due to the operations being fully enclosed. Concentrations of dust are predicted to comply with the relevant air quality guidelines.

An Air Quality Management Plan will be developed to provide specific long mitigation measures for managing air quality. These measures will include but not be limited to:

- Turning off engines of on-site vehicles and plant when not in use;
- Machinery and vehicles on-site would be maintained and serviced according to the manufacturer's specifications;
- Restricting vehicle traffic to designated routes;
- Imposing speed limits; and
- Covering vehicle loads when transporting material off-site.

13.4.5 Soil

The soil will remain undisturbed during the operational phase. This is due to the construction of a walled fence to support a concrete slab floor to cover and enclose remaining open spaces. The impervious nature of the site, as well as improved drainage will ensure that soils and groundwater will remain undisturbed by the operations of the

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facility. During the construction and demolition phase, sediment and erosion controls as well as best practice construction methods will be utilised to ensure that minimal harm is caused to the environment.

13.4.6 Water Quality

There are a number of ongoing risks to water quality that are associated with the site activities. Diesel fuels, oils and LPG will be stored on site and there is potential for these substances to spill on to the ground and spread to the surrounding environment during refueling activities, transport and delivery if not managed appropriately. Quantities of materials will be stored well under the thresholds for potential harm, all fuels and oils will be stored in fully bunded containers. Staff training will be provided to ensure safe use and handling of these materials.

The additional concrete hardstand and roof areas will result in an increase in impervious area, resulting in a small (6%) increase in annual total stormwater flows. This should have negligible impact on the receiving stormwater system, given that there is no requirement for on-site detention of stormwater in Wetherill Park under Council's *Urban Area on Site Detention Handbook and Fairfield City Council DCP Amendment 11 - Section 8B.6.3 Drainage and Stormwater Detention*.

Construction of a gross pollutant trap (Rocla CDS® Nipper) to receive surface water run-off from the site will further reduce gross pollutants and hydrocarbons leaving the site. Controls for drainage and stormwater detention plans have been prepared in conjunction with the Council's *Urban Area on Site Detention Handbook and Fairfield City Council DCP Amendment 11 - Section 8B.6.3 Drainage and Stormwater Detention*.

A stormwater isolation valve system will be installed and activated in the event of a fire or chemical spill, with all water stored in a 115,000 L firewater tank system installed underground, beneath the warehouse and workshop extension at the rear of the site. Wastewater from fire suppression, potentially containing harmful by-products and fire retardant chemicals, will be retained on site to avoid impacts to stormwater. This wastewater will be collected by a wastewater contractor to be disposed of off-site before the isolation valve is reopened. This isolation valve can be activated at any time in response to other incidents such as fuel and oils spills.

13.4.7 Fire

The fire safety study assessed the hazards resulting from the proposed expansion of the facility, and the receipt and processing of plastic film. The study found that facility is well positioned and has limited potential to cause significant off-site impacts. Residential areas are also at significant distance from the site.

The fire safety study found that the risk of fire is low, validated through operational experience at the site and at other nearby paper and cardboard recycling plants. The site is also serviced with high capacity engineered fire services with a hydrant pump, and an extensive hydrant system and hose reels.

The study found arson would be the most likely source of a fire. Given existing security fencing, security contractor monitoring and minimal external storage of flammable materials, the risk of arson was considered low. The proposed redevelopment is currently well placed to ensure that the risk of arson is low, and the successful containment of a fire is high. This is due to the provision of adequate firefighting equipment and strict non-smoking and hot works procedures. The enclosed nature of the facility also means that the facility has a low fire risk rating.

The fire safety study has recommended the installation of a stormwater isolation value and firewater containment on site (for the first 90 minutes of firefighting water). These upgrades as part of the redevelopment will have a net positive environmental benefit and will improve the environmental performance of the facility.

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13.4.8 Heritage

The heritage impact study found that no Aboriginal or non-Aboriginal cultural heritage artefacts or places were found within 200m of the facility, and the nearest site of Aboriginal heritage significance is located some 880m north of the facility. The study found that no other items of Aboriginal or non-Aboriginal cultural heritage significance were found within a 1 km radius of the facility.

Given that the existing facility is built on disturbed land, and the area at the rear of the site to be developed as a mechanical workshop has been excavated and filled, it is unlikely that any items of Aboriginal heritage significance will be found.

It is considered that the proposed development will have nil impact on local Aboriginal or non-Aboriginal cultural heritage.

13.5 Infrastructure requirements flowing from the proposal

The following specific infrastructure is required to mitigate any potential environmental impacts the proposal may cause:

- Undercover areas – an undercover area will be constructed for the storage of baled paper and cardboard to minimise impacts on stormwater (i.e. leachate from wet material), prevent litter, and provide extra security for material to prevent arson;
- Pavement sealing – the majority of the site will be sealed to ensure no erosion can occur and subsequently eliminate the transport of sediment from site;
- Stormwater isolation value – A stormwater isolation valve will be installed so as to be activated in the event of fire or chemical spill. This will ensure that all waste water used for fire suppression will be contained to avoid stormwater pollution. The wastewater will be removed from site for proper disposal;
- Construction of a gross pollutant trap (Rocla CDS® Nipper) to receive surface water run-off from the site will further reduce gross pollutants and hydrocarbons leaving the site; and
- Firewater containment system – a 155,000 L tank is to be installed beneath the warehouse extension and mechanical workshop to contain all water during a chemical spill or during a fire event.

13.6 Assessment of impacts from additional infrastructure and measures available to mitigate impacts

The above-mentioned infrastructure and mitigation measures have been designed to ameliorate potential impacts associated with individual risks and minimise the potential for overall cumulative impacts by the proposal. It is not anticipated that the additional infrastructure will introduce additional environmental risks and that the infrastructure is an improvement on current environmental practices. This should result in a net improvement in environmental outcomes for water, air and noise quality.

Mitigation measures, in the form of management plans, will be included for long-term environmental management of the site. These plans will require the proponent to train staff in environmental assessment and management, undertake periodic reviews of management plans and implement a reporting and continuous improvements processes to ensure that the system in place are effective at maintaining the environmental risks to an acceptable level.

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13.7 Conclusions

The demolition, construction and operational phase of the upgraded facility is expected to have a very minor impact on the environment and the proposed infrastructure and other mitigation measures will ensure that the environmental risks are maintained to an acceptable level. The proposed development will see a net improvement in environmental management at the facility and the surrounding industrial area.

There are numerous long-term cumulative benefits of the proposed development, including a contribution to the attainment of waste management objectives including the aims and objectives of relevant legislation by minimising the disposal of up to 99,000 tonnes of waste to landfill per year. The longer-term environmental benefits from diverting this type and quantity of waste from landfill far outweighs the potential, albeit minor and short term, environmental impacts from the proposed development.

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14 Compilation of mitigation measures – Environmental management plan

14.1 Introduction

A wide range of mitigation measures to prevent or minimise environmental impacts which may be generated by the proposal have been detailed throughout this EIS. This section of the report is a compilation of the recommended mitigation measures. Implementation of these measures would be considered necessary to minimise impacts and maximise positive outcomes on the physical, social and economic environments of the local area and wider region.

14.2 Objective

The objective of this section of the EIS is to outline how the recommended environmental protection measures will be implemented and managed in an integrated manner so as to demonstrate that the proposal is capable of complying with statutory obligations under EPA licenses or approvals. This includes the environmental management and cleaner production principles which will be followed when planning, designing, establishing and operating the proposal.

14.3 Cleaner Production Principles

Cleaner production is a practical method for protecting human and environmental health. This is achieved through the continuous application of an integrated, preventive environmental strategy towards processes, products and services. Cleaner production increases the overall efficiency of products and services and reduce damage and risks for humans and the environment. A proactive approach to the reduction in the risk and consequence of potential environmental impacts at the source results is a decreased reliance on reactive environmental mitigation measures.

The cleaner production techniques that are applicable to the Project and the respective implementation stage are summarised below.

14.3.1 Design

Cleaner production principles that will be adopted during the design phase include:

- Contracting design and supply companies with established sustainable waste management practices;
- Designing the Project with consideration of procuring pre-fabricated materials to reduce the quantity of waste produced;
- Selecting and using the most appropriate technology and materials to reduce the quantity of resources used and to minimise the amount of waste generated;

14.3.2 Demolition and construction

Cleaner production principles that will be adopted during the demolition and construction phase include:

- Purchase of materials cut to standard sizes, use of pre-cast concrete panels, and source separation and segregation of all recoverable materials;

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- Separating skip bins to maintain segregation and maximise economic reuse and recycling, in preference to disposal to landfill;
- Contracting licensed waste management contractors to supply bins, transport waste and dispose of non-recyclable waste at local licensed landfills; and
- Utilising best proactive construction and demolition techniques to minimise environmental harm and reduce the amount of waste produced

14.3.3 Operational

Cleaner production principles that will be adopted during the operational phase include:

- Improved operation and maintenance practices to reduce the quantity of resources used and to minimise the amount of waste generated;
- Employing processes that are efficient in their consumption of energy, materials and natural resources and reduce greenhouse gas emissions;
- Selecting energy efficient plant and equipment for use in the facility;
- Installation of a Rocla CDS® Nipper (gross pollutant trap) to reduce gross pollutant loads and hydrocarbons in run-off from the site;
- Capture of any contaminated water from the site;
- Safely disposing of any residual wastes and process residues; and
- Promoting the safe use, handling, recycling and disposal of waste products through an understanding of their life cycle.

Where cleaner production principles can no more remove environmental risk or consequence, mitigation strategies must be considered to ensure the remaining potential environmental harm is reduced to the lowest risk level possible.

14.4 Mitigation Strategies

Without appropriate environmental management measures being incorporated in the design of the Project and the contractual arrangements associated with the proposed works, there will be the potential for adverse impacts on the environment. Effective implementation is necessary to ensure the Project has minimal impact on the physical, social and economic environments of the local area and wider region.

Table 14.1 summarises the mitigation measures identified in this EIS to ameliorate impacts and safeguard the environment so that the desired environmental outcomes are achieved for the various components of the Project for design, demolition, construction and operation.

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Table 14.1. Compiled Environmental Mitigation Measures.

DESIRED OUTCOME	MITIGATION MEASURES	IMPLEMENTATION STAGE			
		Design	Demolition	Construction	Operation
General					
Establish environmental management procedures for the protection of the environment	Prepare and implement a Construction Environment Management Plan and an Operational Environmental Management Plan		✓	✓	✓
Air Quality (Dust and Other Emissions)					
Minimise impacts on air quality by controlling dust and other emissions	Purchase products or services that have less environmental and human health impacts than otherwise comparable products or services	✓			✓
	Construct a 6.5 m high pre-cast concrete fire wall along the northern boundary of the site to provide shielding to the adjacent industrial premise	✓			
	Minimise the amount of waste stored on site in stockpiles		✓	✓	✓
	Provide dust suppression during adverse weather conditions or when dust is generated		✓	✓	✓
	Cease works, or implement further suppression measures, if excessive fugitive dust emissions are observed		✓	✓	✓
	Inspect the site regularly for litter and ensure the site boundaries are always kept clean		✓	✓	✓
	Throttle down or switch off idle plant and equipment		✓	✓	✓
	Switch off truck engines while waiting to access the site and while being loaded or unloaded		✓	✓	✓
	Impose site speed limits		✓	✓	✓
	Cover vehicle loads when transporting material off-site		✓	✓	✓
	Provide and maintain vegetation/landscaping around the perimeter				✓
	Process and store all waste material undercover to minimise dust and litter				✓
	Regularly maintain all plant and equipment as per manufacturers specifications to ensure optimum performance				✓
	Store baled paper and cardboard to provide extra security for material to minimise litter				✓

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DESIRED OUTCOME	MITIGATION MEASURES	IMPLEMENTATION STAGE			
		Design	Demolition	Construction	Operation
Water Quality					
Minimise impacts on water quality to protect natural ecosystem	Prepare and implement a Soil and Water Management Plan as part of the Construction and Operational EMPs		✓	✓	✓
Reduce the potential for dispersion of sediment and other pollutants in to the stormwater system	Conduct training to ensure workers are aware of water quality issues and act to minimise water pollution where possible		✓	✓	✓
	Implement erosion and sedimentation controls in accordance with Council's Erosion and Sedimentation Control Policy and the Soil and Water Management Plan prior to the commencement of works to contain soil erosion and sediment on the site		✓	✓	
	Remove all stored chemicals in the maintenance workshop prior to demolition works, and clean all surfaces within the workshop where chemical residues are evident, to avoid transfer of residual chemicals to stormwater during the demolition phase. No chemicals to be stored on site during construction works		✓	✓	
	Inspect and maintain erosion and sediment control measures in an effective condition until the works have been completed		✓	✓	
	Installation of a gross pollutant trap to assist in reducing gross pollutants and hydrocarbons in run-off				✓
	Provide and maintain vegetation/landscaping around the perimeter				✓
	Protect drains with metal mesh and geofabric filters				✓
	Clean drain filters weekly				✓
	Store baled paper and cardboard undercover to avoid leachate from wet material				✓
Manage risk of water quality impacts from spills	Design, install and maintain a stormwater isolation value and containment system to contain all firewater or chemical spills on site (for the first 90 minutes of firefighting water)	✓			✓
	Design bunding of any chemical storage area to sufficiently collect a minimum 110% of the total capacity stored on site	✓			
	Regularly inspect plant and equipment to identify any leaks		✓	✓	✓
	Provide spill response kits, in easily accessible areas, to contain minor spills		✓	✓	✓
	Refuel plant and equipment away from drainage points with drip trays		✓	✓	✓
	Maintain and update the Pollution Incident Response Management Plan in accordance with NSW EPA requirements				✓
	Train staff in spill clean-up procedures and use of spill kits				✓

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DESIRED OUTCOME	MITIGATION MEASURES	IMPLEMENTATION STAGE			
		Design	Demolition	Construction	Operation
	Ensure contaminated firewater is collected by an approved contractor and disposed of at an appropriately licenced facility				✓
Soil					
Reduce the potential for dispersion of sediment in to the stormwater system	Prepare and implement a Soil and Water Management Plan as part of the Construction and Operational EMPs		✓	✓	✓
	Implement erosion and sedimentation controls in accordance with Council's Erosion and Sedimentation Control Policy and the Soil and Water Management Plan prior to the commencement of works to contain soil erosion and sediment on the site		✓	✓	
	Inspect and maintain erosion and sediment control measures in an effective condition until the works have been completed		✓	✓	
	Seal the entire site to ensure no erosion can occur and subsequently eliminate the transport of sediment from site				✓
Noise					
Minimise noise impacts on the surrounding environment	Construct a 6.5 m high masonry wall along the northern boundary of the site to provide shielding to the adjacent industrial premise	✓			
	Throttle down or switch off idle plant and equipment		✓	✓	✓
	Switch off truck engines while waiting to access the site and while being loaded or unloaded		✓	✓	✓
	Impose site speed limits		✓	✓	✓
	Ensure the site complies with restrictions on operating hours		✓	✓	✓
	Conduct training to ensure workers are aware of noise issues and act to minimise noise where possible		✓	✓	✓
	Reduce noise levels from diesel powered machinery by fitting noise control kits to machinery, where practical		✓	✓	✓
	Maintenance of a phone number to receive and address any concerns from the public regarding noise		✓	✓	✓
	Plan work to avoid simultaneous noisy activities		✓	✓	
	Provide and maintain vegetation/landscaping around the perimeter				✓
	Regularly maintain all plant and equipment as per manufacturers specifications to ensure optimum performance				✓

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DESIRED OUTCOME	MITIGATION MEASURES	IMPLEMENTATION STAGE			
		Design	Demolition	Construction	Operation
Emergency and Incident Response (Spills and Fires)					
Minimise and control the risk of a pollution incident	Maintain and update the Fire and Emergency Response Procedure to identify fire hazards and procedures to be following an emergency event such as a spill, explosion or fire		✓	✓	✓
	Provide Safety Data Sheets for all chemicals stored on site		✓	✓	✓
	Report all pollution and environmental incidents to the Environment Line: 131 555 or info@environment.nsw.gov.au		✓	✓	✓
	Prepare a Hazardous Material Management Plan to document procedures for the purchasing, storage, use, and disposal of hazardous materials used on site		✓	✓	✓
	Maintain and update the Pollution Incident Response Management Plan in accordance with NSW EPA requirements				✓
	Install and maintain a stormwater isolation value and firewater containment system for all firewater on site				✓
Ensure the site has an effective fire prevention system	Maintain a complete system of emergency lighting and exit signs in the warehouse to comply with the relevant clauses of the Building Code of Australia (BCA)	✓	✓	✓	✓
	Maintain the portable fire extinguisher system in the warehouse to comply with the relevant clauses of the BCA	✓	✓	✓	✓
	Maintain the fire hose reel system in the warehouse to comply with the relevant clauses of the BCA	✓	✓	✓	✓
	Maintain strict non-smoking and hot works procedures		✓	✓	✓
	Store baled paper and cardboard to provide extra security for material to prevent arson				✓
Traffic					
Minimise traffic impacts	Site layout to include suitable parking, loading and unloading areas	✓			
	Develop a Traffic Management Plan as part of the Construction and Operational EMPs		✓	✓	✓
	Implement measures to ensure that Redfern Street will not be affected by loading/unloading, queuing and reversing		✓	✓	✓
	Implement measures to protect pedestrians, cyclists and other motorists in the vicinity of the site		✓	✓	✓
	Implement restrictions on delivery hours		✓	✓	✓
	Identify and document preferred haulage routes		✓	✓	✓

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DESIRED OUTCOME	MITIGATION MEASURES	IMPLEMENTATION STAGE			
		Design	Demolition	Construction	Operation
	Impose site speed limits		✓	✓	✓
Waste					
Minimise the amount of waste generated and sent to landfill from site during all phases of the development and maximise the recovery of resources and comply with waste disposal requirements and guidelines	Purchase products or services that generate less waste than otherwise comparable products or services	✓			✓
	Purchase products that are made from reused or recycling materials (where applicable)	✓			✓
	Prepare and implement a Waste Management Plan as part of the Construction and Operational EMPs		✓	✓	✓
	Appropriately, store, classify, transport and dispose of excavation soil in accordance with NSW EPA requirements		✓	✓	
	Store demolition wastes which are not suitable for reuse, but are able to be recycled, in dedicated and secure skips prior to recycling		✓		
	Store demolition wastes which cannot be recycled in dedicated and secure skips prior to disposal. The skips must be collected by a licensed waste contractor on a regular basis and transported for disposal to a licensed landfill facility		✓		
	Minimise construction waste that requires disposal by accurately calculating materials brought to the site and limiting materials packaging			✓	
	Return excess construction materials which are suitable for reuse to the supplier or store for future use			✓	
	Store construction wastes which are not suitable for reuse, but are able to be recycled, in dedicated and secure skips prior to recycling			✓	
	Store, in separate skips, construction wastes for recycling and disposal. The skips will be collected by a licensed waste contractor on a regular basis and transported for disposal to a licensed landfill or recycling facility			✓	
	Minimise operation waste that requires disposal by accurately calculating materials brought to the site and limiting materials packaging				✓
	Separate waste so that materials can be sent for recycling where appropriate				✓
	Store, handle and dispose of all dangerous waste, including oils and fluids from maintenance activities in accordance with the relevant Australian Standards, NSW Dangerous Goods and NSW EPA Requirements				✓
	Appropriately collect and store waste for reuse or removal from site by a licensed waste contractor in accordance with the relevant Australian Standards, NSW Dangerous Goods and NSW EPA Requirements				✓
Health and Safety					
Ensure the health and safety of workers, visitors and contractors at the site	Develop a Work Health and Safety Plan to establish and maintain an effective health and safety workplace during all phases on the redevelopment		✓	✓	✓

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DESIRED OUTCOME	MITIGATION MEASURES	IMPLEMENTATION STAGE			
		Design	Demolition	Construction	Operation
	Maintain fencing along on the boundary line of the site to prevent unauthorised access		✓	✓	✓
	Provide Safety Data Sheets for all chemicals available on site		✓	✓	✓

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14.5 Environmental Management

Adopting detailed Environmental Management Plans (EMPs) and a monitoring program, for both the construction and operational phases, is an important component of the proposal to demonstrate Grima Environmental Services Pty Ltd's commitment to implementing the measures outlined in this EIS.

The construction environmental management plan will be prepared prior to the commencement of the demolition works and cover the specific construction (and demolition) works for the Project. The operational environmental management plan will be prepared prior to the commencement of operations at the newly redeveloped facility.

To ensure an integrated approach, the EMPs will include sub plans, specifically created to address the management and mitigation of the following environmental issues, as compiled in the table above. These sub plans include:

- Air quality;
- Soil and water;
- Noise and vibration;
- Traffic;
- Waste; and
- Work health and safety.

The key objectives of the EMPs will be to ensure:

- works are carried out in accordance with relevant environmental statutory requirements and relevant non-statutory policy, as detailed throughout this EIS;
- works are carried out in accordance with the goals and requirements presented in this EIS;
- works are carried out in such a way as to minimise the likelihood of environmental degradation;
- works are carried out in such a way as to manage the impact of the works on neighboring properties;
- all employees engaged in the works comply with the terms and conditions of the EMPs;
- clear procedures for management of environmental impacts, including corrective actions;
- continual improvement of environmental management; and
- responsibilities and reporting requirements to ensure compliance with the EMP.

The EMPs will be prepared following assessment and approval of the Project, and will serve as working documents to be used throughout the detailed design, construction and operational stages. They will be integrated into Grima Environmental Services Pty Ltd's existing management systems, procedures and plans for its activities within the facility, to ensure consistency in approach.

Each EMP developed for the site will contain, but not be limited to, the following information:

- goals and objectives;
- licenses, permits, approvals and statutory requirements;
- lists of required actions, timing and responsibilities (including relevant environmental authorities);
- operational procedures for preventing environmental impacts;
- reporting requirements and procedures
- corrective and preventative action procedures
- procedures and forms for documentation and reporting of issues;
- standard specifications for incorporating environmental safeguards;
- environmental awareness and environmental management training and education requirements
- guidelines for emergencies;

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- surveillance, review and auditing procedures for modification of the EMPs;
- complaint procedures;
- maintenance and monitoring programs; and
- quality assurance procedures

Adherence to the EMPs will enable environmental safeguards and mitigation measures to be effectively implemented and sustainable work practices adopted for the entire Project. This also demonstrates the Grima Recycling's commitment to preventing environmental pollution, minimising the impact of the proposal on the environment and complying with all relevant legislation.

14.6 Environmental Monitoring and Reporting

Environmental monitoring will be a fundamental component of both the Construction and Operational EMPs for the proposal. Monitoring programs will be developed and presented in EMPs, in accordance with the conditions of approval and Licence requirements. At the time of the preparation if this EIS, Grima Recycling is not required to operate any environmental monitoring or measuring equipment, therefore requirements for calibration or validation are not specified.

Monitoring requirements will be focused on ensuring compliance with the relevant environmental sub plans, for example:

- ensuring compliance with the NSW EPA's Interim Construction Noise Guideline;
- ensuring that the necessary erosion and sediment control measures are in place;
- visually monitoring dust generation from work zones to ensure that excessive dust is not being produced;
- monitoring noise and vibration generation from work zones to ensure that excessive noise and vibration is not being produced; and
- inspecting waste receptacles to ensure that they are not being overfilled and that they are being collected on a regular basis and evaluating the effectiveness of waste storage and collection practices

Monitoring requirements will also be focused on ensuring current mitigation/management systems remain fit for purpose and are in good working order to ensure they will remain effective, for example:

- inspecting and maintaining bunds, pipelines and shut-off valve to ensure that they are in a good state of repair and are operating as per specification;
- checking that trucks are not overloaded, that they adhere to speed limits, that their loads are covered and that materials are loaded and unloaded carefully; and
- inspecting plant and equipment to ensure that they are in good working condition and no leaks are present.

Operational monitoring may also result from investigative monitoring or regulatory compliance monitoring, such as conducting investigative noise monitoring in response to a specific complaints.

Environmental performance reporting is a key decision support tool that provides management with the information to make meaningful and positive change. To ensure that relevant authorities are appropriately informed of how Grima Environmental Services Pty Ltd is managing its environmental performance, periodic reports will be prepared by the contractor during the construction phase and by Grima Environmental Services Pty Ltd during the operational phase. Reporting requirements will be details in the EMPs for the relevant implementation phases.

The identification of actual and potential non-conformities contribute to continual improvement of the environmental management system through corrective action and preventive action, respectively. If the reports

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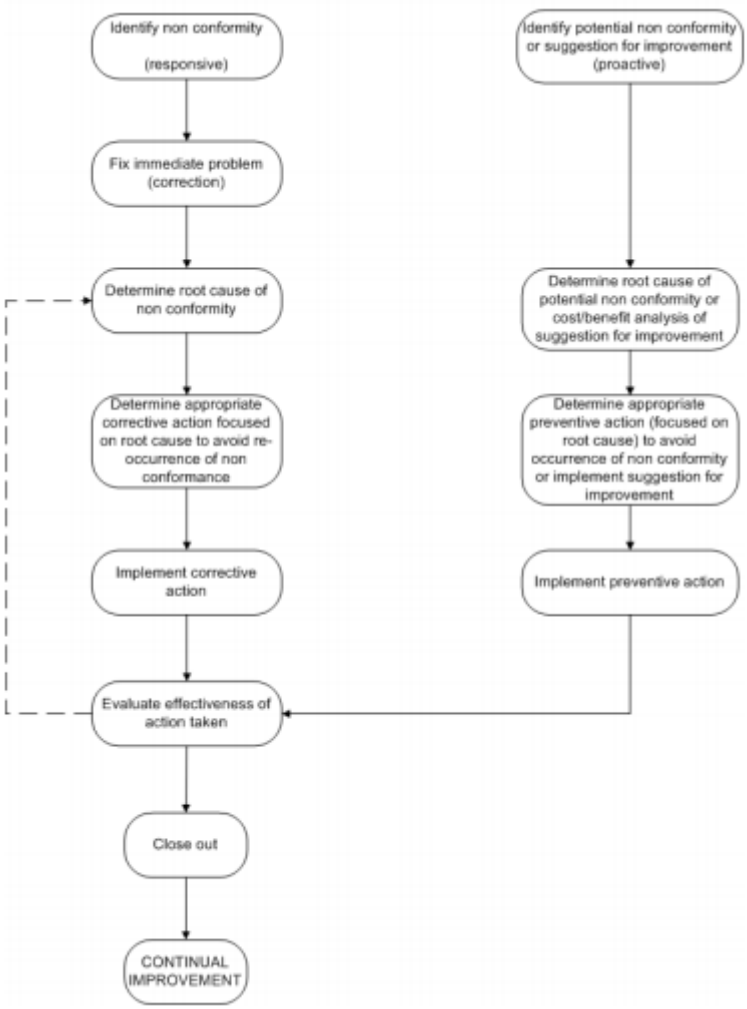
identify any shortcomings in the way that the construction activities or the operations are being conducted, or in the performance of environmental control structures, the necessary changes will be made to the EMPs to reflect these changes. The NSW EPA will receive all relevant reports and prompt notification of any incidents or deviations in performance as well as updated EMPs as required.

14.7 Environmental Auditing and Continual Improvement

Environmental system audits will be conducted in accordance with a schedule nominated in the EMP. This will include a schedule of independent audits by accredited external auditors. Quantified and unquantified information contained in the EIS will be assessed to ensure that the construction and operational phases of the Project meet acceptable environmental standards. Audits will be based on available information and observations. Environmental audits will also assess the Project against any Conditions of Approval imposed by statutory authorities. The register that is completed during compliance audits become a record of the evaluation of compliance. All detected non-compliances will followed up with corrective actions as per the flow chart below.



Actual and potential non-conformities identified and suggestions for improvement are made by the following means:

- internal audit;
- external audit;
- site inspections;

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- feedback from external parties;
- complaints from customers or other stakeholders;
- suggestions for improvement from staff and contractors;
- occurrence of environmental emergencies and accidents;
- testing of emergency preparedness and response; and
- management review.

The above flowchart illustrates the organisation's process for non-conformity, corrective action and preventive action, through:

- identifying actual and potential environmental nonconformities;
- recording suggestions for improvement;
- taking appropriate action to correct non-conformities and mitigate environmental impacts;
- taking corrective action to avoid recurrence of non- conformities; and
- taking preventive action to avoid occurrence of non-conformity.

Grima Environmental Services Pty Ltd or their environmental representative will be responsible for maintaining a register of environmental nonconformity and suggestions for improvement to environmental management. Each record is associated with a corrective and/or preventive action. Corrective and preventive action will require a change environmental management documentation in a continual process for document control.

This process has the ultimate goal of driving continual improvement.

14.8 Conclusion

The objective of this section of the EIS is to outline how the recommended environmental protection measures will be implemented and managed in an integrated manner so as to demonstrate that the proposal is capable of complying with statutory obligations under EPA licenses or approvals.

The preceding sections of this chapter have described the mitigation measures to be implemented for potential impacts of the proposal that have been identified throughout this EIS. This section provides an outline of the proposed environmental management measures, and additional strategies, including cleaner production principles, which will be followed when planning, designing, establishing and operating the proposal. These measures and processes will be incorporated into EMPs and monitoring programs to ensure a commitment to implementing the requirements of relevant legislation outlined in this EIS. Monitoring the efficacy of those measures will inform a process to drive continual improvement.

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15 Justification of proposal

15.1 Introduction

This chapter presents a justification for the proposal. An examination of ecologically sustainable development as related to the proposed production increase is also given.

15.2 Ecologically sustainable development

The NSW Government is committed to encouraging Ecologically Sustainable Development, and this is a key objective of the State's environmental laws. The *Protection of the Environment Administration Act* 1991 defines ecologically sustainable development under Section 6(2) as: 'ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes.'

The National Strategy for Ecologically Sustainable Development (NSESD) (1992) states that there are two main features which distinguish an ecologically sustainable approach to development. These features are:

- The need to consider in an integrated way the wider economic, social and environmental implications of our decisions and actions for Australia, the international community and the biosphere; and
- The need to take a long-term rather than a short term view when taking those decisions and actions.

The *Protection of the Environment Administration Act* 1991 highlights four key principles of ecologically sustainable development under Section 6(2) (a)-(d). These principles are:

- Precautionary principle – namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:
    - (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and
    - (ii) an assessment of the risk-weighted consequences of various options.
- Intergenerational equity – namely, 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.
- Protecting Biodiversity – conservation of biological diversity and ecological integrity-namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.
- Improved valuation – improved valuation, pricing and incentive mechanisms should be promoted to ensure the full costs, including the cost to environmental and social systems, are included in the final valuation of the product or service. Environmental factors should be included in the valuation of assets and services, such as:
    - (i) polluter pays-that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement;
    - (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste; and
    - (iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

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The principles of ESD have been considered throughout the preparation of this EIS. The section summarises what steps have been taken to achieve the principles of ESD.

15.3 Achieving ESD

The proposed upgrade of the Grima Recycling Resource Recovery Facility has been designed to minimise impacts and where possible, improve the natural, social and economic environment of the region. This includes ensuring the protection and management of air quality, soil and surface waters as well as the appropriate storage, management and disposal of wastes and hazardous substances. Impacts on social systems, such as noise, vibration, traffic and transport, fire and heritage have been managed and improved through the proposed mitigation measures.

The increased processing capacity of the Grima Recycling Resource Recovery Facility will result in considerable social and economic benefits at both the local and regional level.

These upgrades to the site will improve operational efficiency and enable the facility to receive, sort and bale up to 99,000 tonnes per year of source separated paper, cardboard and plastic film sourced principally from commercial recycling collections across Sydney.

The development is consistent with current approved use and will enable additional material to be received, sorted and recycled by the facility to improve recycling outcomes for the Sydney region. Of particular note, the rear extension of the warehouse to accommodate a new proposed maintenance shed will permit the updating of the existing shed along the northern boundary of the site to store baled recycled paper, cardboard and plastic film under cover and protected from rain. The existing paper shredding room will be placed in this shed too. This increased storage area will reduce the area required for storage of baled paper, cardboard and plastic film within the sorting and baling warehouse, resulting in greater operating area and a resulting increase in production capacity. Together with a secondary baler to be positioned in part of the mechanical workshop and double conveyor, these site changes will permit an increase in the processing and receipt of paper, cardboard and plastic film to approximately 270 tonnes per day.

The proposed upgrades to the site will not result in any changes to the approved days of operation or hours of operation. The upgrades will enable the more efficient entry, drop off of materials and loading of vehicles at the site, improving operational efficiency whilst not impacting on neighbouring land uses.

The project will enable development of an additional 71,000 tonnes per year of recycling capacity for paper, cardboard and plastic film for the Sydney region. The project will create an additional four full time jobs in Western Sydney. The total expected capital cost of the project is estimated to be $2.197M and a separate economic analysis of the project by Jackson Environment and Planning estimates that the project will inject a further $149.2M into the local economy over the next 20 years. The project will also help deliver on the NSW Government's *Waste Avoidance and Resource Recovery Strategy*[41] target of 70% recycling of business waste by 2021.

The expansion of the facility will better service the recycling needs of many businesses in Sydney, both existing demand and projected future demand, particularly from major customers such as shopping centres, major retail outlets and waste and recycling collection companies. The existing site is strategically located within the Wetherill Park industrial area, being in close proximity to existing industries and recycling businesses.

15.4 Precautionary approach

A precautionary approach to the identification and management of environmental issues has been taken throughout the preparation of this EIS. In some instances, where information was not fully obtainable for reasons outside the

[41] NSW Government (2014). *NSW Waste Avoidance and Resource Recovery Strategy, 2014-2021.* Published by the NSW EPA. Internet publication: http://www.epa.nsw.gov.au/wastestrategy/warr.htm

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control of Jackson Environment and Planning, a precautionary approach has been taken to ensure all appropriate measures were employed to prevent any associated environmental degradation.

15.5 Benefits to current and future generations

The benefits to future generations include the protection and improved environmental management, increased employment opportunity, improved recycling infrastructure to respond to increasing demand (and community expectations) for efficient and effective plastics, paper and cardboard recovery and recycling facilities. Benefits also include the subsequent economic and social benefits which will be vital for the sustainable expansion and growth of the Wetherill Park industrial area.

15.6 Protection of biodiversity

The proposal is to take place on already developed and partly disturbed land within an existing industrial warehouse development at 88 Redfern St, Wetherill Park. The site is already cleared of vegetation, except for woody weeds, so the proposed development is expected to have no impact on flora and fauna species.

15.7 Valuation of resources

The assessment of environmental, social and economic issues undertaken in this study has allowed for the improved valuation of these resources when considering the merits of the proposed development. The environmental and social costs with the proposed development have been minimized through the proposed mitigation measures, while it is expected that the proposed development will result in the creation of four new full time jobs and will inject $149.2M into the local economy over the next 20 years.

15.8 Conclusions

This EIS has assessed the potential environmental impacts associated with the upgrade to the Grima Recycling's Resource Recovery Facility at 88 Redfern St, Wetherill Park. The proposal will enable an increase in the processing capacity of the site for paper, cardboard and plastic film, which will assist in meeting the current and future recycling demands of businesses in Sydney.

The EIS has been prepared having regard to the biophysical, economic and social considerations and principles of ESD. There were no significant environmental impacts identified during the preparation of the EIS that cannot be mitigated by appropriate mitigation measures and management strategies.

The environmental assessment process has been used to inform the upgrade to the site and ensure operations will be sustainable and create minimal disruption to neighbours and the local community. Paper, cardboard and plastic film operations have been designed to minimize traffic impact on local roads, avoid noise and dust emissions, effective management of wastes, protection of soils, surface and ground water quality, and minimization of risk of fire at the site.

The upgraded facility will provide for addition paper, cardboard and plastics recycling in Western Sydney and broadly across the Sydney region. The proposal can be implemented with minimal adverse environmental impacts as demonstrated throughout this assessment and is justified in terms of overall economic benefits to both local, state and national economies. The paper, cardboard and plastics recycling services to be provided by the upgraded Grima Recycling Resource Recovery Facility will better meet demand and assist in meeting community expectations for efficient and effective recycling of these materials. The facility is located in the Wetherill Park industrial area therefore providing an important employment role, not only at the facility itself, but also in related industries such as suppliers of equipment, waste collection and recycling services.

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The proposed development involves the expansion of an existing paper and cardboard recycling facility, which is EPA licensed and is equipped with modern equipment to be able to meet the proposed increase in processing capacity. The development will allow for the improved efficiency of the site, with only a minor expansion in the built footprint. The facility will help achieve a significant reduction is solid waste to landfill and assist the NSW Government to reach it's recycling target of 70% for commercial and industrial waste by 2021. The proposal will have positive flow on effects throughout the local economy through the creation of four new direct jobs.

All potential environment impacts of the proposed development have been considered and mitigation measures developed to minimize impacts as detailed in this EIS report.

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Appendix 1 – Secretary's Environmental Assessment Requirements (SEARs)

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Appendix 2 – Current Environment Protection Licence

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Appendix 3 – Site plans, engineering designs and construction plans

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Appendix 4 – Aboriginal and Non-Aboriginal Cultural Heritage Search Reports

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Appendix 5 – Project Summary Report for Consultation

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Appendix 6 – Environmental Management Procedures

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Appendix 7 – Pollution incident response management plan

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Appendix 8 – Consultation with the NSW EPA and RMS

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Appendix 9 – s149 Certificate

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Appendix 10 – Existing development consent

Please note that the existing Development Consent for 88 Redfern St, Wetherill Park is included in Appendix 6.

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Appendix 11 – Cost of development

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