Environmental Impact Statement

Smeaton Grange Waste Recycling and Transfer Facility

52 Anderson Road, Smeaton Grange

Prepared for Benedict Recycling Pty Ltd
June 2016

EMM

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Smeaton Grange

Prepared for Benedict Recycling Pty Ltd | 17 June 2016

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Environmental Impact Statement

Final

Report J15135RP1 | Prepared for Benedict Recycling Pty Ltd | 17 June 2016

Prepared by	**Verity Blair**	Approved by	**Philip Towler**
Position	Associate Planner	Position	Associate Director
Signature		Signature	
Date	17 June 2016	Date	17 June 2016

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

Document Control

Version	Date	Prepared by	Reviewed by
V1	5 April 2016	Verity Blair	Philip Towler
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ENVIRONMENTAL IMPACT STATEMENT CERTIFICATION

For submission of an environmental impact statement (EIS) under Part 4 of the NSW *Environmental Planning and Assessment Act 1979.*

EIS prepared by

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Proponent

Benedict Industries Pty Limited

Proposed development

Development and operation of a waste recycling and transfer facility, Smeaton Grange.

Refer to to Chapter 2 of the EIS for a detailed description of the proposed development.

Land to be developed

52 Anderson Road, Smeaton Grange, Lot 319 DP 1117230

Certification

In relation to this EIS (25 May 2016) we certify that:

- it has been prepared in accordance with Schedule 2, Clauses 6 and 7 of the NSW Environmental Planning and Assessment Regulation 2000;
- it has been prepared with all available information that is relevant to the environmental assessment of the development to which this EIS relates; and
- the information contained in this EIS is nether false nor misleading.

Philip Towler
Associate Director

Verity Blair
Associate Planner

Executive Summary

Benedict Recycling Pty Ltd (Benedict Recycling) proposes to construct and operate a waste recycling and transfer facility (the facility) at 52 Anderson Road, Smeaton Grange (the site). The proposal will process up to 140,000 tonnes per annum of non-putrescible waste including building and demolition waste, selected commercial and industrial waste, soils, vegetation, virgin natural excavated material, excavated natural material, rail ballast and spoil.

The area surrounding the site is experiencing rapid residential and industrial growth, which is creating significant demand for mixed waste recycling services. There are currently no mixed waste recycling facilities in the region except for The Spring Farm Advanced Resource Recovery Park (ARRT), formerly the Macarthur Resource Recovery Park. The proposed Smeaton Grange facility will complement the activities of the Spring Farm ARRT by accepting waste from businesses and the general public and, allowing additional waste generated in the Narellan/Camden/Harrington Park area to be efficiently recycled, particularly as the ARRT does not recycle commercial and industrial waste or building and demolition waste.

The facility will import inert pre-classified general solid waste (non-putrescible), such as construction and demolition wastes, and selected commercial and industrial wastes, for processing(screening and sorting) to produce saleable recycled materials.

All of the materials brought onto the site will be taken from the site as products, recyclable residues needing further processing or as non-recyclable residues for disposal at a licensed landfill. There will be no materials land-filled or otherwise disposed anywhere within the site as a result of the proposal.

The site, is zoned IN1 General Industrial under the Camden Local Environmental Plan 2012 and the proposal is permissible with consent.

The site is ideally suited for the development of a waste recycling and transfer facility because it is: in an industrial area centrally located in Narellan area; readily accessible to light and heavy vehicles; and there are existing utilities and stormwater connections. Development of the proposal will provide an ongoing economic and social benefit from the site.

This environmental impact statement has been prepared in accordance with the Secretary's environmental assessment requirements Clauses 71 and 72 of the Environmental Planning and Assessment Regulation 2000 and advice provided by Camden Council following a pre-development application meeting. It describes the existing environment, the proposal, the legislative and policy context, proposed environmental management measures and the impacts of the proposal. Given the location and condition of the site, the proposed activities will only have minor environmental impacts.

The proposal is considered to be in the public's interest for the following reasons:

- the proposal provides an environmentally beneficial means of dealing with non-putrescible general solid waste by recycling up to 90% of the materials processed at the site, that would otherwise go to lower order uses such as landfill;
- the proposal provides recycled products for use in the construction industry, amongst others, and thereby helps reduce the amount of 'new' products required;
- the proposal provides a suitable use for an vacant industrial site;

- the proposal will provide socio-economic benefits through employment and stronger regional industrial activity; and
- the proposal's environmental and social amenity impacts are negligible with the implementation of the recommended mitigation and management measures.

It is, therefore, recommended that the proposed waste recycling and transfer facility is approved subject to the mitigation measures outlined in this EIS.

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1 Introduction

1.1 Proposal overview

Benedict Recycling Pty Ltd (Benedict Recycling) proposes to construct and operate a waste recycling and transfer facility (the facility) at 52 Anderson Road, Smeaton Grange (the site) that will[1] process up to 140,000 tonnes per annum (tpa) of pre-classified general solid (non-putrescible) waste including building and demolition waste, selected commercial and industrial waste, soils, vegetation, virgin natural excavated material, excavated natural material, rail ballast and spoil. The waste will be processed (screened and sorted) to produce saleable recycled materials.

Ready-to-use recycled products will include soils and a range of recyclable materials. Segregated recycled materials that will be transported to other Benedict recycling sites or sold to other recycling firms for further processing will include ferrous and non-ferrous metals, dry paper/cardboard, masonry (concrete, bricks, tiles, asphalt, gyprock etc) and plastics. All of these products will meet recycled feedstock specifications while recovering a range of materials that would otherwise be disposed to landfill. It is not proposed to compost, crush or shred any waste onsite.

Only 'pre-classified general solid waste (non-putrescible) waste' as defined by the *Waste Classification Guidelines - Part 1: Classification of Waste* (Environment Protection Authority (EPA) 2014a) will be accepted by the site. No special, liquid, hazardous, restricted solid waste or general solid waste (putrescible), as defined in EPA (2014a), will be accepted at the facility.

All of the materials brought onto the site will be taken from the site as products, as recyclable residues to a waste recycling and transfer facility or as non-recyclable residues for disposal at an EPA licensed landfill. There will be no materials land-filled or otherwise disposed of anywhere within the site as a result of the proposal.

The waste recycling and transfer facility will service the wider Narellan region and surrounding area, which is characterised by rapid residential and industrial growth which generates significant demand for waste disposal. The proposal provides an environmentally beneficial means of dealing with non-putrescible general solid waste by recycling 90% of the materials processed at the site.

[1] The project is a development proposal and its implementation is conditional on receiving relevant approvals. For reason of style however, the project and related proposed activities have been described in the active mood 'will' rather than 'would'.

1.2 The applicant

The applicant is Benedict Recycling which is part of Benedict Industries Pty Ltd, a New South Wales (NSW)-based group of companies with quarrying, resources and recycling businesses. Established in 1966, it is one of the largest producers of quarried materials in NSW and continues to be family owned and managed. The group supplies a range of sands, soils, sandstone, decorative aggregates and recycled products to customers in the greater Sydney Region and across NSW. It owns operations in Menai, Newcastle, Chipping Norton, Moorebank, Menangle, Belrose, Mittagong, Appin and Cowra. Major customers include Roads and Maritime Services (RMS), Sydney Water, Holcim, Boral Concrete, Concrite, Fulton Hogan, Hanson and most major construction and infrastructure companies as well as numerous local councils.

Benedict Recycling currently operates recycling facilities at Chipping Norton and Belrose, with operations in Newcastle and Canberra opening shortly.

1.3 Site description

1.3.1 Location and characteristics

The site is located at 52 Anderson Road, Smeaton Grange and is legally described as Lot 319 in DP 1117230. It is in the Smeaton Grange industrial estate and covers approximately 6,862 square metres (m^2) (refer to Figure 1.1). The site is flat, approximately 88 m Australian Height Datum (mAHD), and devoid of vegetation other than grass (Photograph 1.1).

The site is situated on former agricultural land that has been rezoned, subdivided and is in the process of being developed for industrial purposes. Benedict Recycling has entered into a joint venture (JV) with the land owner to purchase the site to develop the waste recycling and transfer facility so it has secure tenure to meet Narellan's and the surrounding area's needs for many years to come.

1.3.2 History

The site was previously used for agricultural purposes and has recently been rezoned and redeveloped by Investa Property Group for industrial purposes.

1.3.3 Surrounding environment

The site is located at the southern most end of Anderson Road at the end of a cul-de-sac. Land immediately to the south-west is developed with a large transport depot operated by Coles Logistics (Coles). It is noted that all vehicle traffic associated with this development uses the access points on Hartley Road to the south and the Coles site has no direct traffic connection to Anderson Road. A colourbond fence, about 2 m high, runs along the southern boundary of the Coles site at the top of an embankment.

Land to the west of the site is currently under construction for industrial purposes, including Axis Constructions on land immediately to the west, while land further to the west on Lone Pine Place is now completely developed with industrial buildings.

The north-east boundary of the site abuts a vegetated creek corridor (Kenny Creek), with vegetation generally identified as re-vegetated dry sclerophyll forest (shrub understorey) (Photograph 1.4). Land on the northern side of the corridor is currently under development for industrial purposes, including Endeavour Energy and a number of large scale industrial developments.

There is an easement running north-east to south-west approximately 100 m east of the site, separating industrial land within Smeaton Grange from residential land at Currans Hill. Immediately to the south-east of the site is an area of vacant land, some 7,760m^2 in area, which forms part of the adjoining Coles lot. Land immediately to the south of the site is elevated some two to three metres higher than the site and is sparsely vegetated.

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Site location plan
Smeaton Grange waste transfer station
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Figure 1.1

Photograph 1.1 **View across the site from Anderson Road**

Photograph 1.2 **View north-west across site from embankment to the rear of the southern boundary**

Photograph 1.3 **View south-west to rear of adjacent Coles site**

Photograph 1.4 View along eastern site boundary to vegetated corridor beyond

Photograph 1.5 View to southwest of site and Coles depot beyond

1.4 Project justification and alternatives

1.4.1 Project justification

Recycling in Australia results in a wide variety of tangible and measurable environmental benefits compared with landfill disposal. These include energy savings, avoidance of greenhouse gas emissions, water savings, avoidance of waste, and significant reductions in natural resource use, eutrophication[2] and airborne pollutants. The environmental benefits are most apparent in the two significant stages of the waste process which are avoided: extraction of raw materials and disposal of waste to landfill.

The NSW Government has committed close to $500 million to transform waste and recycling in NSW. The *Waste Less, Recycle More: A Five-year $465.7 million Waste and Resource Recovery Initiative* (EPA 2013) states that "more effort is needed to continue increasing the recycling rate for waste from households, business and industry" and further, that "significant infrastructure investment is required in order to keep up with the increasing waste generation rates and meet the NSW recycling targets."

As an established recycling business in NSW, Benedict Recycling supports these strategies and their ongoing implementation. The waste recycling and transfer facility will contribute to meeting the NSW Government's recycling strategies and targets.

The area surrounding the site is one of Sydney's fastest developing residential areas (.id 2011) and the Smeaton Grange Industrial Estate has experienced rapid, large scale industrial development, particularly in the last five years. This development in the vicinity of the site has created a significant demand for mixed waste recycling facilities.

There are currently no mixed waste recycling facilities in the region except for the Spring Farm Advanced Resource Recovery Park (ARRT), formerly the Macarthur Resource Recovery Park and originally Jacks Gully Waste and Recycling Centre. The proposed Smeaton Grange facility will complement the activities of the Spring Farm ARRT, by accepting waste from businesses and the general public and, allowing additional waste generated in the Narellan/Camden/Harrington Park area to be efficiently recycled.

The proposal has many benefits from an economic, social and environment perspective. Specifically the waste recycling and transfer facility will:

- divert recyclable and reusable wastes from landfill, including co-mingled waste for which there are few recycling alternatives in the area;
- divert wastes from landfill to preserve space for less recyclable materials, thereby extending the life of landfills;
- produce ready-to-use recycled soil materials to assist construction firms and government agencies (including councils) to meet their environmental commitments to use recycled materials;
- produce segregated recycled materials (eg ferrous and non-ferrous metals, gyprock, timber and plastics) for further processing;
- produce 'crusher ready' materials for recyclers of masonry (bricks, concrete, tiles, asphalt);

[2] 'eutrophication' is the the artificial, often detrimental, enrichment of an aquatic system by the addition of nutrients of waterways.

- provide storage for vehicles and bins owned by small to medium sized waste contractors away from residential areas and with appropriate environmental controls such as surface water runoff controls;

- provide a commercial return, thereby contributing to the economy of NSW; and

- provide employment for eight people within the waste recycling and transfer facility and potentially further employment associated with ancillary waste activities.

The *NSW Waste Avoidance and Resource Recovery Strategy 2014–21* (EPA 2014b) provides a framework for actions to minimise environmental harm from waste generation through to disposal, as well as maximising efficient resource use. The strategy sets targets for preventing waste generation, increasing the recovery and use of secondary resources, reducing toxic substances in products and materials, and reducing litter and illegal dumping. The strategy aims to increase the recovery and use of materials from the construction and demolition sector. The waste recycling and transfer facility will assist to achieve this aim through recycling construction and demolition waste.

1.4.2 Site location

Benedict Recycling entered into a joint venture (JV) agreement with the landowner to purchase the site at Smeaton Grange for the sole purpose of developing a waste recycling and transfer facility. The site is ideally suited for the development of such a facility because:

- it is centrally located in within the Narellan area;

- the region is experiencing rapid residential and industrial growth and the site is well located to meet the resulting demand for waste recycling;

- Anderson Road is not a designated main road or 'spine' road, it is readily accessible from roads suitable for heavy vehicle use; and

- there are existing utilities and stormwater connections.

1.4.3 Consideration of alternatives

i Do nothing

The site is currently undeveloped. If it is not developed with a waste recycling and transfer facility, it will be developed for some alternative industrial purpose. Under this scenario, waste will need to be processed at Spring Farm ARRT or another waste facility.

ii Alternative land use

The land is zoned industrial, thereby preventing residential and/or commercial development. The proposed waste recycling and transfer facility is classed as industrial use and is therefore a suitable use for the site.

1.5 Purpose of report

This EIS accompanies a development application (DA) for the proposal under Part 4 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). The consent authority for the DA is the Minister for Planning and the determining authority is anticipated to be the Planning Assessment Commission (PAC).

This EIS has been prepared in accordance with the EP&A Act and Environmental Planning and Assessment Regulation 2000 (EP&A Regulation), and addresses the requirements of the relevant government agencies as described in the SEARs and matters raised during consultation with Camden Council (CC), agencies and surrounding neighbours that are likely to be impacted by the proposal.

A development application (DA) was lodged with Camden Council for site establishment works with the intention that site establishment works could be commenced while approval for the waste recycling and transfer facility was being sought.

In order to streamline the approvals process and mitigate inconsistencies that may arise form having multiple consents, Benedict has now withdrawn the site establishment DA with CC and seeks consent for both the construction and use of the waste transfer and recycling facility through this state signficant development (SSD) application (SSDA).~~A development application (DA) is currently being made forwas lodged with Camden Council for site establishment works (refer to Section 1.1). This State Significant development application (SSDA) assumes that the site establishment DA is approved and the permitted works completed.with the intention that~~

~~This approach is being taken to allow site establishment works tocould be commenced while approval for the waste recycling and transfer facility iswas being sought.~~

~~In order to streamline the approvals process and mitigate inconsistencies that may arise form having multiple consents, Benedict has now withdrawn the site establishment DA with CC and seeks consent for both the construction and use of the waste transfer and recycling facility through this SSD DA.In the event that this facility is not approved, the established site will be used for an alternative industrial use, with the appropriate additional approvals where necessary.~~

1.6 Camden Council requirements

The CC letter (dated 9 December 2015) regarding the pre-lodgement meeting held on 7 December 2015 lists issues to be addressed in the assessment of the proposal. A copy of the letter is provided in Appendix A. At this stage, it had not been determined that the proposal would be an SSD. These requirements, and where they are addressed in this EIS, are summarised in Table 1.1. It is noted that development control plans do not apply to SSD (refer to Section 3.3) and therefore the Camden Development Control Plan (DCP) 2011 has not been specifically considered.

Table 1.1 Camden Council requirements

Assessment requirement	Reference in EIS
• Relevant EPI's and DCP's including:	
• SEPP (State and regional development) 2011;	Section 3.3.2
• SEPP 33 Hazardous and Offensive Development;	Section 3.3.2

Table 1.1 Camden Council requirements

Assessment requirement	Reference in EIS
• SEPP (Infrastructure) 2007;	Section 3.3.2
• SEPP 55 Remediation of Land;	Section 3.3.2
• SEPP 20 Hawkesbury-Nepean River;	Section 3.3.2
• Camden LEP 2010; and	Section 3.3.2
• Camden DCP 2011.	Section 1.6
• Designated development – the proposal constitutes designated development, requires SEARs from Department of Planning and Environment (DPE) for the EIS.	Section 3.2.2
• Nominated integrated development – within 40m of a watercourse, Controlled Activity Approval required.	Section 3.2.3
• Integrated development – referral to NSW EP&A required.	Section 3.2.3
• DCP including:	N/A
• setback must be 10 m of which 5 m must be utilised for landscaping - D4.5.2 of the Camden DCP 2011;	N/A
• building height maximum height is 11 m;	N/A
• fencing to form important security role and compliment development;	N/A
• maximum fence height 2.1 metres; and	N/A
• location of future signage and identification of signage zones.	N/A
• Acoustic assessment in accordance with Council's Environmental Noise Policy.	Section 6.4 and Appendix F
• Bushfire report by qualified bushfire consultant demonstrating consideration and management of bushfire in accordance with NSW RFS *'Planning for Bushfire Protection' 2006*, requirement for an Asset Protection Zone.	Section 6.8 and Appendix I.
• Air quality – assessment of air quality and odour impacts.	Section 6.2 and Appendix E
• Traffic report – addressing traffic impacts, frequency and types of vehicles, impacts on intersection queuing lengths and times.	Section 6.1 and Appendix D
• Swept paths for the largest vehicle for service entry.	Site establishment DA
• Drainage/water quality – stormwater management plan in accordance with Council's engineering specifications.	Section 0 and Appendix G
• A construction and operational waste management plan addressing waste types, generation rates, storage and collection and disposal.	N/A

1.7 Secretary's environmental assessment requirements

This EIS accompanies an SSDA for designated development as defined in Schedule 3 of the EP&A Regulation. The EIS has been prepared to address specific requirements provided by the DPE and other relevant agencies. These Secretary's Environmental Assessment Requirements (SEARs) were issued on 16 December 2015 (reference SSD 7424) and are provided in Appendix B. As required under Section 78A of the EP&A Act, this EIS has been prepared in accordance with the SEARs. The SEARs and where they are addressed in this EIS are summarised in Table 1.2.

Table 1.2 Secretary's environmental assessment requirements

Assessment requirements	Reference in EIS
Strategic context:	
• a detailed description of the development;	Chapter 2

Table 1.2 Secretary's environmental assessment requirements

Assessment requirements	Reference in EIS
• a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, DCPs, or justification for any inconsistencies;	Chapter 3 and throughout the EIS
• a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out;	Section 3.2.3
• a consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments; and	Table 7.1
• A capital investment value report from a quantity surveyor.	Appendix J
Waste management:	
• details of the type, quantity and classification of waste to be received at the site;	Section 2.3
• details of the resource outputs and any additional processes for residual waste;	Sections 2.4 and 2.5
• details of waste handling including, transport, identification, receipt,	Sections 2.4 and 2.5
• stockpiling and quality control; and	Section 2.3.4
• 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 2014-2021.	Section 1.4.1 and Chapter 2
Traffic and transport	
• details of road transport routes and access to the site;	Section 6.1 and Appendix D
• road traffic predictions for the development during construction and operation; and	Section 6.1.2 and Appendix D
• an assessment of impacts to the safety and function of the road network; and the details of any road upgrades required for the development.	Section 6.1.2 and Appendix D
Air quality and odour	
• an air quality impact assessment in accordance with EPA Guidelines;	Sections 6.2.1 and 6.2.2 and Appendix E
• details of buildings and air handling systems, justification for any material handling, processing or stockpiling external to a building;	Chapter 2 and Appendix E
• greenhouse gas assessment; and	Section 6.3 and Appendix E
• a description and appraisal of air quality impact mitigation and monitoring measures.	Sections 6.2.1 and 6.2.2 and Appendix E
Noise and vibration	
• a description of all potential noise and vibration sources during construction and operation, including road traffic noise;	Section 6.4.1 and Appendix F
• a noise and vibration assessment in accordance with the relevant Environment Protection Authority Guidelines; and	Sections 6.4.1 and 6.4.3 and Appendix F
• a description and appraisal of noise and vibration mitigation and monitoring measures.	Section 6.4.2, Table 7.1 and Appendix F
Soil and water	
• a description of local soils, topography, drainage and landscapes;	Sections 1.3 and 3.3.2 and Appendix H
• the details of stormwater and wastewater management;	Section
• the details of sediment and erosion controls;	Appendix H
• the details of water usage including water supply and licences;	Appendix H
• an assessment of impacts to surface and groundwater resources, flooding impacts,	Sections 0 and 6.5.4 and

Table 1.2 Secretary's environmental assessment requirements

Assessment requirements	Reference in EIS
and impacts to groundwater dependant ecosystems; and	Appendix H
• a description and appraisal of impact mitigation and monitoring measures.	Section 6.6 and Appendix H
Hazards and risk	
• the Environmental Impact Statement must include a preliminary risk screening completed in accordance with *State Environmental Planning Policy No. 33 - Hazardous and Offensive Development* and Applying SEPP 33 (Department of Planning (DoP) 2011a), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development. Should preliminary screening indicate that the project is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No.6 - Guidelines for Hazard Analysis (DoP 2011b) and Multi-Level Risk Assessment (DP&I 2011).	Chapter 5
Visual	
• an assessment of the potential visual impacts of the project on the amenity of the surrounding area	Section 6.9

2 Project description

2.1 General

Benedict Recycling proposes to construct and develop a waste recycling and transfer facility on the site and undertake ancillary activities. The proposal will have two main components:

- waste recycling and transfer; and
- ancillary activities including temporary storage of commercial vehicles, bins and containers.

This chapter describes the proposed waste recycling and transfer facility and the activities that are proposed. It also introduces site-wide environmental controls. A plan showing the intended site layout is provided in Figure 2.1 while full plans for the project are provided in Appendix C. A flowchart outlining the key steps in the proposed waste recycling and transfer process are provided in Figure 2.2.

~~A description of the site establishment works that would be under a separate consent is provided in Section 1.1.~~

2.2 Site components

This SSDA seeks consent for the following components:

- a shed, constructed in colourbond, between approximately 45.67 m and 61.96 m in length, 24 m in width and 11 m high with a floor area of approximately 1,300 m^2;
- a concrete slab for the shed;
- hard surfacing of the site in a material such as concrete or asphalt, with a perimeter curb;
- ~~amenities;~~
- a surface water management system;
- landscaping;
- ~~Seven~~eight on-site parking spaces for staff, including one disabled space;
- ~~boundary fencing to a maximum height of 3 m;~~
- ~~2.1 m high metal palisade fence with automatic colourbond gates at the ingress and egress point;~~
- connection to services~~; and~~
- ~~signage.~~
- ;
- a weighbridge area with weighbridges~~,~~;
- wheel washes for outbound vehicles;

- a demountable office;
- demountable amenities including lunch room and toilets;
- seven product bays, which will be four metres high and blockwalled;
- an enclosed, above ground bunded diesel storage tank (approximately 30,000 L);
- establishment of hand unloading area (to replace 'waste storage area' under site establishment DA);
- a sprinkling site irrigation system to minimise airborne dust;
- a flip-flow screen waste sorter (housed in main shed);
- an enclosed picking line inside the main shed that extends outside along a portion of the southern boundary;
- boundary fencing to a maximum height of ~~3~~10 m on the south-eastern boundaries, 4 m along a portion of the eastern boundary, 3 m on the western boundary and 2 m at the rear and sides of the shed (see Figure 2.1);
- 2.1 m high metal palisade fence with automatic colourbond gates at the ingress and egress point;
- ~~extension of the southern and part of the south-eastern side boundary fencing to a maximum height of 10 metres;~~
- waste/product stockpiles; and
- out-of-hours bin storage and waste truck parking.

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Site layout plan

Smeaton Grange waste transfer station

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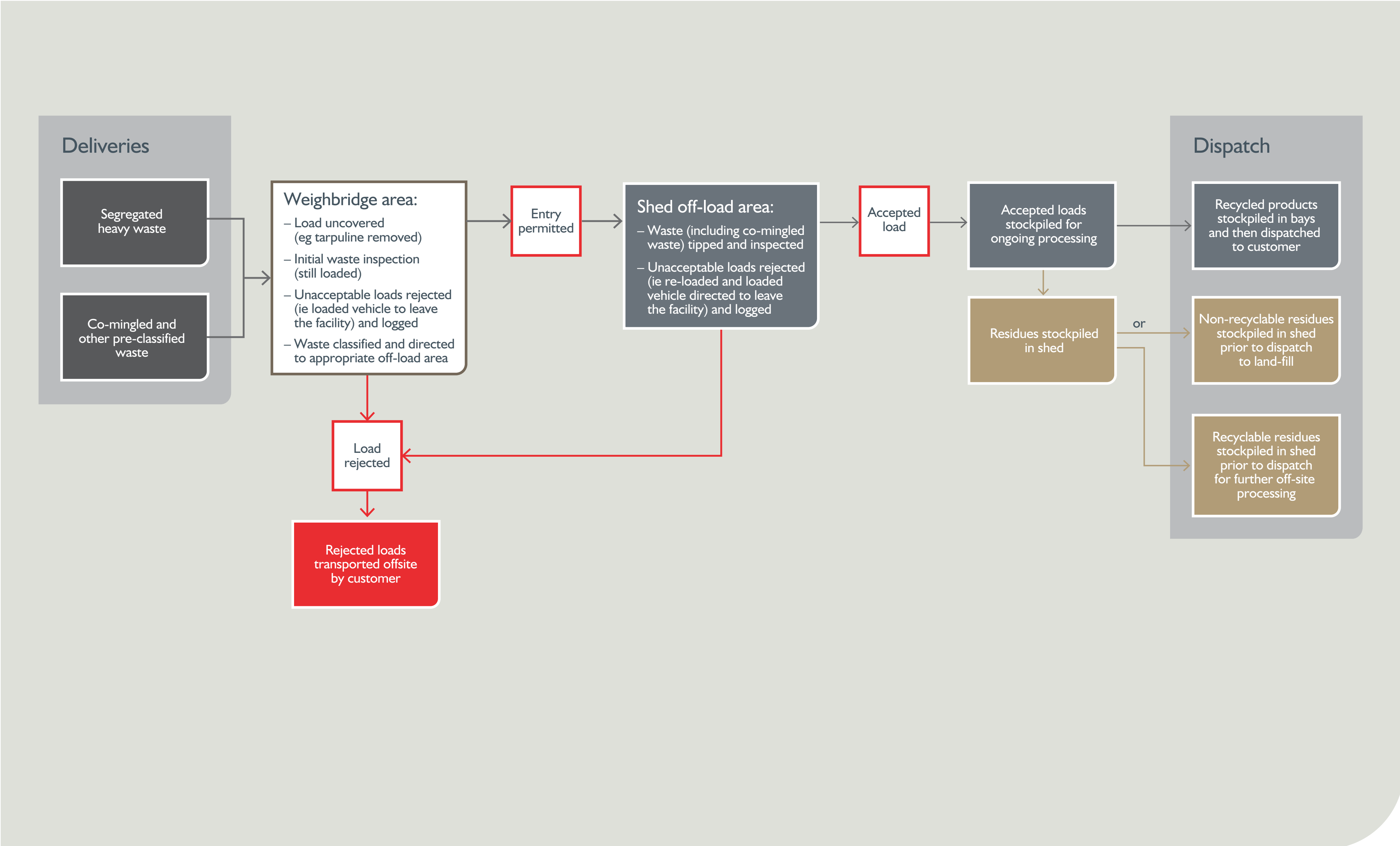
Figure 2.1



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Waste flowchart

Recycling Facility, Smeaton Grange

Figure 2.2

2.2.1 Weighbridge and office area

i Site establishment

The weighbridge and office area in the north of the site will contain weighbridges, wheel washes, the site office in addition to an automatic gate for ingress and egress, and amenities and on-site parking as approved as part of the site establishment DA.

ii Recycling and waste transfer facility

Initially, two above-ground weighbridges will be used for incoming and outgoing vehicles. It is anticipated that a third above-ground weighbridge will be installed as demand requires, to improve servicing of incoming vehicles.

An above-ground self-contained wheel wash will be provided in front of the weighbridge for trucks leaving the site in addition to an additional wheelwash should the second outbound weighbridge/exit become utilised. Water used in the wheel wash will be lost through evaporation, and on tires leaving the wash, so periodic replenishment will be required. Sediment in the wheel wash will be regularly removed using an excavator.

2.2.2 Main processing shed

The majority of waste storage, processing and product storage will occur within the main processing shed, to be constructed as part of the site establishment works. The shed will be built in colourbond steel, in 'windspray' colour (refer to Figure 4.1),and enclosed on three sides (along the north-west, south-west and southern boundaries). The side facing the interior of the site will be open.

The main processing shed forms part of the site establishment DA.

The shed will be approximately between 45.67 m and 61.96 m long and 24 m wide. It will have a maximum wall height of 10 m, a maximum roof height of 11 m, and a floor area of around 1,300 m^2. The floor of the shed will be level concrete with an internal block wall, around 4 m in height, following the length of the three external walls (as per the site establishment DA).

The main processing shed will contain:

- a concreted tipoff/inspection area;
- a flip-flow screen waste sorter (eg Finlay 883 flip flow screen or similar);
- an enclosed picking line with product bays, which will be 4 metres high and block walled; and
- waste/product stockpiles.

Processing within the shed is described in Section 2.4.

Diesel for plant and equipment used on the site will be stored in an external above-ground tank (approximately 30,000 L) located in accordance with the relevant Australian Standard/s. The tank will be within a bund with a capacity of 10% more than the tank's capacity. The tank and bund will be covered by a roof to prevent rain falling into the bund. The tank will be enclosed by colourbond (or similar) walls to prevent leaks in the site of the tank spraying outside of the bund.

Plant and vehicle diesel tanks will be filled from a bowser located next to the diesel tank. The filling area will also be bunded so that any fuel spilled during plant refuelling will be captured and will drain to an interceptor trap. There will be a diesel spill kit stored next to the bowser. This will be used in the case of a spill. Used absorbent material will be disposed at an appropriately licensed waste facility. Further details regarding the management of diesel on the site are provided in Table 7.1.

2.2.3 Site access

Sealed access and egress points, with dual entry and exit lanes located within a single crossover, will be created at the site's frontage on Anderson Road, as part of the site establishment works. This will not require modification to Anderson Road.

2.2.4 Site surfacing

The site's surface will be sealed, apart from the landscaped area at the front. All vehicle movement inside the site, as well as access and egress, will be strictly controlled. A surface water management system to mitigate the release of untreated stormwater runoff will be installed, with the site's surface graded towards the sediment control pit located in the north-east corner.

2.2.5 Car parking

Eight car parking spaces, including one designated space for persons with a disability, will be provided within the site, in the north-west corner. Car parking spaces will be dimensioned in accordance with the relevant standards.

It is noted that given the industrial nature and generous width of Anderson Road, there are generally no kerbside parking restrictions which apply in the vicinity of the site, including along the site frontage. A traffic management plan and vehicle turning ~~tamplates~~certification are provided ~~in Appendix X of~~ the TIA (refer to Appendix B).

2.2.6 Traffic

The site has been designed with separate access and egress points in order for all traffic to enter and exit the site in a forwards direction. Apart from the shed columns, waste store and two demountable buildings, traffic movement around the site will be largely unrestricted.

2.2.7 Landscaping

The verge between the site and Anderson Street will remain turfed and the existing street trees retained, with the exception of one small tree located within the proposed site access. The site's frontage will be landscaped to a high standard in accordance with landscape plans prepared by Greenland Design. Landscaping will comprise native species, with water gums set behind a garden bed wrapping around the site's frontage. Groundcover and shrubs will be planted around the visitor car parking spaces.

It is noted that landscaping for that part of the site identified as bushfire prone land will be in accordance with the *Planning for Bushfire Protection Guidelines* (Rural Fire Service (RFS) 2006).

~~2.2.4~~2.2.8 Site security

i Site establishment

Site establishment works will include landscaping of the site's frontage and installation of 2.1 m high metal palisade fence with automatic gates, also 2.1 m high.

ii Recycling and waste transfer facility

This SSDA seeks to increase the 3 m high colourbond perimeter fence along the southern boundary (extending approximately half way along the south-east boundary) to a height of 10 m, except where the shed walls abut the boundary. In these locations the existing 2 m high chain mesh fencing will be retained.

iii Signage

~~Approval for s~~Signage will ~~be sought under a separate DA and will~~ include a sign at the entrance to the site on Anderson Road with the name of the facility, opening hours and a telephone number for a phone that will be attended whenever the site is accepting waste or operating.

2.3 Waste materials, sources and quantities

2.3.1 Waste materials accepted

The waste recycling and transfer facility will accept 'Pre-classified general solid waste (non-putrescible)' as defined by EPA (2014a) (see Section 0). This will mainly consist of the following wastes:

- co-mingled and segregated construction and demolition waste, including tiles, bricks, concrete, glass, metal, wood, asphalt, gyprock and vegetation and uncontaminated soils;
- co-mingled and segregated commercial and industrial waste from factories and commercial premises such as paper/cardboard, cloth, plastics, rubber, wood, suitable slags, concrete and asphalt batching wastes and the like;
- excavated natural materials (ENMs) including virgin natural excavated material (VENM) such as sand and sandstone which are generated during bulk earthworks and road and infrastructure construction and repair;
- garden waste;
- wood waste;
- metals; and
- rail ballast and spoils.

No special hazardous restricted solid waste (including asbestos) will be accepted at the site.

2.3.2 Waste classification

Wastes accepted by the site will be classified according to the *Waste Classification Guidelines - Part 1: Classification of Waste* (EPA 2014a).

The following wastes will not be accepted:

- special waste (including clinical and related waste; asbestos waste; whole loads of waste tyres; or anything classified as special waste under an EPA gazettal notice) as defined in EPA (2014a) Step 1;
- liquid waste as defined in EPA (2014a) Step 2;
- wastes pre-classified as hazardous waste as defined in EPA (2014a) Step 3;
- general solid waste (putrescible) as defined in EPA (2014a) Step 3;
- waste possessing hazards as defined in EPA (2014a) Step 4; or
- waste that requires chemical assessment to determine its classification as defined in EPA (2014a) Step 5.

Waste that is pre-classified as General solid waste (non-putrescible) as listed in Table 2.1 will be accepted by the site.

Table 2.1 Pre-classified 'General solid waste (non-putrescible)' as defined by EPA (2014a)

The following wastes (other than special waste, liquid waste, hazardous waste, restricted solid waste or general solid waste (putrescible)) are pre-classified as 'general solid waste (non-putrescible)':

- glass, plastic, rubber, plasterboard, ceramics, bricks, concrete or metal;
- paper or cardboard;
- household waste from municipal clean-up that does not contain food waste;
- waste collected by, or on behalf of, local councils from street sweepings;
- grit, sediment, litter and gross pollutants collected in, and removed from, stormwater treatment devices and/or stormwater management systems, that has been dewatered so that they do not contain free liquids;
- grit and screenings from potable water and water reticulation plants that has been dewatered so that it does not contain free liquids;
- garden waste;
- wood waste;
- waste contaminated with lead (including lead paint waste) from residential premises or educational or child care institutions;
- containers, previously containing dangerous goods, from which residues have been removed by washing [The cleaning method must be as good as or better than the triple-rinsing method outlined in Appendix 2 of EPA (2014b)] or vacuuming;
- drained oil filters (mechanically crushed), rags and oil-absorbent materials that only contain non-volatile petroleum hydrocarbons and do not contain free liquids;
- drained motor oil containers that do not contain free liquids;
- non-putrescible vegetative waste from agriculture, silviculture or horticulture;
- building cavity dust waste removed from residential premises or educational or child care institutions, being waste that is packaged securely to prevent dust emissions and direct contact;

Table 2.1 Pre-classified 'General solid waste (non-putrescible)' as defined by EPA (2014a)

- synthetic fibre waste (from materials such as fibreglass, polyesters and other plastics) being waste that is packaged securely to prevent dust emissions, but excluding asbestos waste;
- virgin excavated natural material;
- building and demolition waste;
- asphalt waste (including asphalt resulting from road construction and waterproofing works);
- cured and uncured concrete waste from a batch plant;
- fully cured and set thermosetting polymers and fibre-reinforcing resins;
- fully cured and dried residues of resins, glues, paints, coatings and inks; and
- any mixture of the wastes referred to above.

In assessing whether waste has been pre-classified as general solid waste (non-putrescible), the following definitions apply:

Building and demolition waste means unsegregated material (other than material containing asbestos waste or liquid waste) that results from:

- the demolition, erection, construction, refurbishment or alteration of buildings other than:
  - chemical works;
  - mineral processing works;
  - container reconditioning works; and
  - waste treatment facilities.
- the construction, replacement, repair or alteration of infrastructure development such as roads, tunnels, sewage, water, electricity, telecommunications and airports;

and includes materials such as:

- bricks, concrete, paper, plastics, glass and metal; and
- timber, including unsegregated timber, that may contain timber treated with chemicals such as copper chrome arsenate (CCA), high temperature creosote (HTC), pigmented emulsified creosote (PEC) and light organic solvent preservative (LOSP).

but does not include excavated soil (for example, soil excavated to level off a site prior to construction or to enable foundations to be laid or infrastructure to be constructed).

Garden waste means waste that consists of branches, grass, leaves, plants, loppings, tree trunks, tree stumps and similar materials, and includes any mixture of those materials.

Virgin excavated natural material means natural material (such as clay, gravel, sand, soil or rock fines):

- that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities; and
- that does not contain sulfidic ores or soils, or any other waste.

and includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

Municipal waste consisting of household domestic recycling that is set aside for kerbside collection or delivered by the householder to the waste facility (eg glass, plastic, cardboard, paper, aluminium and steel).

Wood waste means sawdust, timber offcuts, wooden crates, wooden packaging, wooden pallets, wood shavings and similar materials, and includes any mixture of those materials, but does not include wood treated with chemicals such as CCA, HTC, PEC and LOSP.

2.3.3 Waste deliveries

The site will accept inert waste from councils, contractors and businesses and the general public. Accordingly, waste will be delivered to site by a variety of vehicles including:

- light vehicles such as cars with box trailers and utilities;
- single or dual axle heavy vehicles such as 'Daihatsus' and skip-bin trucks; and
- multiple axle combination heavy vehicles.

Vehicles will access the site from Anderson Road via Anzac Avenue, Narellan Road and Camden Valley Way. Narellan Road, Camden Valley Way and Anzac Avenue are major heavy vehicle routes. Anderson Road and Anzac Avenue are located wholly within the Smeaton Grange industrial area and are suitable for heavy vehicles. The vehicle movements associated with the proposed operations are described in Section 6.1 and Appendix D.

All vehicles delivering waste will be directed to the weighbridge where the load will be inspected for potential contaminants and classified. A ticket will be issued and the driver will be instructed where to deliver the waste within the site. The driver will then deliver the waste to the appropriate area where it will be tipped and will be closely inspected prior to the vehicle being directed back to the weighbridge area. Light vehicles will proceed to the designated 'hand unloading area' (refer to Appendix C) so that they can be safely unloaded by hand in a location that is away from trucks, heavy machinery etc. Vehicles will be re-weighed as they leave the site to determine the mass of the load delivered. Any rejected loads will be immediately reloaded for removal from the site and recorded in a 'rejected load' register.

All incoming waste will be inspected according to the incoming waste quality management plan (see Section 2.3.4) prior to being accepted.

2.3.4 Incoming waste quality plan

General waste (non-putrescible) can contain materials (eg hazardous materials, including asbestos) that are not pre-classified general solid waste (non-putrescible) as defined by EPA (2014a) (see Table 2.1). An incoming waste quality plan will be prepared in accordance with the NSW WorkCover *Management of Asbestos in Recycled Construction and Demolition Waste Guide* (NSW WorkCover 2010).

Incoming waste will be inspected in two stages:

1. a preliminary inspection of the incoming waste on the vehicle at the weighbridge; and
2. an inspection of the incoming waste after it is tipped off but before it is added to the appropriate feed stockpile. The customer will be required to wait until the waste has passed the inspection.

Any incoming waste loads that are suspected to contain contaminants (ie loads that contain wastes that are not listed in Table 2.1) will be rejected and the customer will be required to take the contaminated load out of the waste recycling and transfer facility immediately.

The plan will include:

- Prevention actions such as:
  - a ‘no asbestos’ clause in supplier contracts, advising suppliers that asbestos containing materials will not be accepted;
  - installing warning signage;
  - training workers on waste inspection and asbestos awareness and management; and
  - education programs at material source locations to minimise the risk of asbestos containing materials such as fibro entering the supply chain and being imported onto the premises.
- Contingency actions if potential asbestos containing materials are identified, including a rejected load register and reporting to the EPA.
- Empowering waste inspectors to reject loads considered ‘suspect’ or oderous.

Products produced for direct sale will be tested in accordance with requirements of the relevant resource recovery exemption.

2.4 Waste processing

Waste recycling and transfer facility processing will include the following steps:

1) Waste will be inspected prior to being accepted on site and any loads suspected to contain material that cannot be accepted by the site will be rejected (see Section2.3.4).

2) Wastes will generally be stored undercover in the main processing shed prior to processing. However, some segregated heavy materials (eg separated concrete, screen soils, VENM, ENM and and timber) will be stored in the bays along the southern boundary.

3) Waste processing will include sorting, screening and picking. There will be no shredding or crushing on site.

4) Waste deposited in the hand unloading area will be collected at the end of each day and taken to the main shed for processing.

5) Sorting will mostly occur within the main processing shed. A range of mobile plant (eg excavator, front-end loader) and a screening/picking line, will be used to handle and process the waste and products in the shed.

6) Some waste (less than 20%) will not able to be recycled onsite (referred to as ‘non-recyclable residues’). Non-recyclable residues will be stockpiled undercover prior being sent for further offsite recycling or disposal at an EPA licensed facility.

7) Recycled products generally will be dispatched by heavy vehicle for sale or further processing at another facility.

8) Non-recyclable residues will generally be dispatched to a licensed landfill by heavy vehicle.

2.5 Non-recyclable residue

Not all of the material delivered will be able to be separated to allow it to be recycled onsite. This material, or 'non-recyclable residue', will be less than 20% (by mass) of the waste delivered to the waste recycling and transfer facility for processing. The non-recyclable residue will be stockpiled under cover prior to removal for disposal at a landfill.

Figure 2.3 What really happens – from building site to recycled products

Waste accepted by the site will typically be in skips from building sites or from homes disposing of unwanted materials in a skip hired for the purpose. A typical journey from one of these skips to recycled products is described below.

Filling a skip

Photograph 2.1 Example of co-mingled construction waste and a typical skip bin truck

Builders generally hire skip bins during a construction or demolition project. These skips are used for disposing of a range of inert wastes (ie material that cannot be re-used or that does not require specific handling such as asbestos). For example, a builder undertaking an office refurbishment will dispose of waste from the demolition phase including concrete; bricks; tiles; plaster-board; glass; office partitions; plastic and metal pipes; timber, carpet and synthetic flooring; and plastic and cardboard packaging. Further waste from the construction phase will include excess concrete; wood and metal off-cuts; empty cement bags; cardboard; plastic packing straps and plastic film wrapping. Soil and vegetation could be excavated as part of the construction works for an extension or a new construction.

On many occasions, particularly on smaller construction sites, all of these materials are placed in the site skip bin. When full, the skip is picked up by the waste contractor and the co-mingled waste is generally delivered to a recycler or a landfill for disposal. With the development of this proposed waste recycling and transfer facility, this co-mingled waste can be processed into useful products.

Arrival at the waste recycling and transfer facility

Photograph 2.2 Examples of wastes accepted (left-to-right: segregated masonry, segregated timber and co-mingled pre-classified waste)

A skip truck (or other vehicle) entering the waste recycling and transfer facility site will first stop to remove the tarp covering the load. The vehicle will then proceed to the weighbridge area. Here, the full truck will be weighed and the waste will be inspected visually. If the waste contains material that cannot be accepted by the facility (eg asbestos sheeting or closed containers) the driver will be instructed to leave the facility with the load and a record is kept with the particulars of each rejected load. Otherwise, if the load is acceptable the driver will be issued with a docket and will be directed to where the waste is to be unloaded within the facility.

For example, in the case of a construction or demolition project, the skip will contain co-mingled waste. The driver will be issued with a docket stating this and will be directed to the appropriate feed stockpile location in the main processing shed.

Unloading the waste

The waste will be emptied onto clear hardstand adjacent the appropriate feed waste stockpile. The delivered waste will then be inspected while the truck waits. If the waste is accepted, it will be added to the appropriate stockpile. Otherwise, it will be reloaded onto the vehicle that delivered the waste and the driver will be instructed to leave the facility with the load.

Vehicles will leave the site via the wheel wash and weighbridge.

Waste processing

The waste processing will depend on its level of segregation when delivered.

The waste will first be sorted by an excavator using a grab to remove large non-recyclable components.

The co-mingled waste will then be loaded onto the flip-flow screen using an excavator. The flip-flow plant uses a series of conveyors, picking lines, fans and a vibrating screen to separate waste based on size and density. There will be two outputs from the flip-flow:

- rubble (coarse material) and mid-size material finds its way onto the -picking line; and

- <6 mm fines that will be dispatched (after testing and approval) as a natural soil substitute that replaces virgin top soils in a wide range of landscape applications.

The operation of a flip-flow is shown in the following clips:

- https://www.youtube.com/watch?v=e6d0MWFQCUw

- https://www.youtube.com/watch?v=JEu6e2L9A0U

- http://www.blue-group.com/en/recycling/fines-cleanup/

Waste fed onto the picking line will be sorted by hand. Workers standing along the picking line conveyor pick out material that is not suitable for export to a crushing facility.

These wastes will be further sorted as required eg metals will be sorted into ferrous and non-ferrous metals.

Products



Photograph 2.3 Examples of ready-to-use products (left-to-right: building aggregate, shredded timber and soil substitute)



Photograph 2.4 Example recycling feed products (left-to-right: paper/cardboard, plastic and mixed metals)

The wastes will be sorted into ready-to-use products and feeds for further recycling.

For example, the co-mingled waste the construction site skip bin would yield may include:

- Ready-to-use products, including:

    - building aggregates from the masonry following sorting, crushing and screening (these would be produced at a Benedict crushing facility at an alternative location);

    - mulches and soil substitutes from the screen; and

    - timber mulches from the timber following shredding at an alternative Benedict facility.

- Recycling feed products, eg:

    - clean, dry paper and cardboard from packaging;

    - ferrous and non-ferrous metals from pipes and office fittings; and

    - various plastics from packaging and fittings.

These products will be stored in bays. Masonry, soil or timber products will be stored outside while all other products will be stored within the shed.

Dispatch

Products like soil will be dispatched to retailers (eg construction and landscape suppliers); customers (eg local councils) requiring soils; or other Benedict sites for further processing. This will be by a combination of customer and contractor trucks. Non-recyclable residues will be delivered to a licensed landfill by contractor trucks.

2.6 Waste and product storage

It is proposed to accept up to 140,000 tpa of waste at the waste recycling and transfer facility. The proportions of each waste type are unknown and will be variable according to local waste demographics. Therefore, a number of conservative assumptions have been adopted for determining the potential impacts of the waste recycling and transfer facility, as described in Chapter 6.

There will be two primary stockpile types:

- waste feed stockpiles; and
- product stockpiles.

There may also be some intermediate stockpiles formed during processing. These will be located in the external bays along the southern boundary.

Table 2.2 Indicative stockpiles

Type[1]	Waste classification[2]	Stockpile location	Comments
Concrete, bricks and tiles Rail ballast and spoils Slags and concrete batching waste Recycled construction materials	Pre-classified general solid waste (non-putresible)	External bay	Maximum individual stockpile size[3]: 2,500 t, up to 5 m high
Wood	Pre-classified general solid waste (non-putresible)	External bay	Maximum individual stockpile size[3]: 300 t, up to 5 m high
Screened soil	EPA exempted after testing	External bay	Up to 2,000 t
Co-mingled waste	Pre-classified general solid waste (non-putresible)	Internal (in shed)	Up to 2,000 t
Green waste	Pre-classified general solid waste (non-putresible)	External bays	Maximum individual stockpile size[3]: 150 m^3 up to 3 m high

Notes: 1. Actual stockpile types will vary depending on the waste received.
2. EPA (2014b).
3. Multiple stockpiles may be required.

With the exception of segregated inert 'heavy' wastes, such as concrete, screened soil and wood and products derived from these materials, all wastes and products will be stored in bins or stockpiles in the shed, including:

- co-mingled wastes; and
- non-recyclable residues.

The inert 'heavy' wastes will be stored in external bays prior to quality testing and dispatch. It is noted that the materials for storage will be specifically designated for internal or external storage in order to ensure that environmental impacts, such as the possible release of leachate from paper when it gets wet, are avoided.

2.7 Plant and equipment

Indicative equipment to be used at the waste recycling and transfer facility is listed in Table 2.3. This information has been used in noise and air quality assessments. The actual equipment used may vary but Benedict Industries will ensure that noise and air quality compliance requirements are met.

Table 2.3 Indicative equipment and activities

Plant (or equivalent)[1]	Number	Typical activities
Equipment used across the site		
Front end loader (eg Volvo L150 or equivalent)	1	Unloading and loading trucks Moving waste and products
Trucks (customers)	4–5	Delivering waste and dispatching products Returning to/leaving the site
Equipment used in main shed		
13 t excavator	1	Sorting waste using a variety of excavator attachments Loading trucks
Screening plant inside shed	1	Sorting co-mingled waste
Picking line	1	Sorting co-mingled waste from screening plant

Note: 1. As modelled in the air quality assessment (Appendix E) and noise assessment (Appendix F).

2.8 Internal traffic

Traffic movements within the site are largely un-restricted with the entire site consisting of a hard sealed surface. Figure 3.1 of the TIA (Appendix D) shows the proposed arrangements for internal traffic circulation across the site. The public vehicle access area, providing access to the hand-unloading facility, will be delineated from the heavy vehicle area using road-pavement markings and appropriate signage.

Public pedestrian access is limited to the hand-unloading area only, which will be appropriately signed to ensure members of the public remain within this area at all times. Pedestrian access is also provided along the X boundary of the site, between the office/employee facilities and the main processing shed.

2.9 Workforce and hours of operation

The waste recycling and transfer facility will normally accept waste deliveries (from businesses and the public) and dispatch materials between 6 am and 10 pm Monday to Friday and between 6 am and 5 pm on Saturday. It will also normally accept deliveries from 8 am to 4 pm on Sunday, providing an additional day on which the public could deliver recyclable waste to the facility if there is sufficient demand.

This application seeks approval for the facility to accept (but not process) waste 24 hours per day on occasion, for example to accept waste from major infrastructure projects such as road and rail works that require waste disposal at night. It is anticipated that Council will be given 48 hour notice when waste will be delivered between 10 pm and 6 am (ie outside day-to-day operating hours). It is envisaged that this requirement could be enforced through the inclusion of a relevant condition on any consent granted.

Waste processing will normally only occur at the site from 7 am to 4 pm Monday to Saturday. These hours will be extended to 6 pm weekdays if demand is sufficient. There will be no processing on Sundays or public holidays.

The waste recycling and transfer facility is expected to be operated by approximately 8 employees. There are no contractors expected to work onsite except for maintenance and repair works.

2.10 Waste management

Putrescible waste generated by the operation of the waste recycling and transfer facility, such as rubbish from employee lunches and office waste, will be put in a 2 m^3 front-lift bin located next to the hand unloading area. Any recyclable waste will be deposited in a commercial recycling wheelie bin in the same location. Both bins will be emptied regularly by a private contractor.

2.11 Construction activities

Construction associated with the proposal will include installing the weighbridges and demountable office and extension of the boundary fence.

No significant ground excavation is anticipated although there may be very minor ground disturbance such as installing anchors for the demountable office as well as installation of footings for fencing.

An initial estimate indicates that the Capital Investment Value of the proposal is around $2,541,096.00 (refer Appendix J).

2.12 Development contributions

Consultation with the relevant Planning Officer at Camden Council (Jessica Mesiti) on 2 and 5 May 2016, confirmed that the S94 Contributions were addressed and paid as part of the wider subdivision application and that there is no further requirement in this respect.

3 Statutory framework

3.1 Introduction

This chapter provides an overview of the statutory framework relevant to the proposal including State and Commonwealth legislation, and State, regional and local plans and policies.

3.2 Environmental Planning and Assessment Act 1979

The EP&A Act defines the statutory framework for planning approval and environmental assessment in NSW. The EP&A Act is administered by the Minister for Planning, statutory authorities and local councils.

3.2.1 State significant development

The project is a SSD under the *State Environmental Planning Policy (State and Regional Development)* 2011 (SRD SEPP) (refer to Section 3.3.2ii). Division 4.1 of Part 4 of the EP&A Act relates to the assessment of SSD. Applications made under Division 4.1 are required by Section 89H to take into consideration the relevant matters referred to in Section 79C of the Act which include:

(a) the provisions of:

(i) any environmental planning instrument, and

(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and

(iii) any development control plan, and

(iiia) any planning agreement that has been entered into under Section 93F, or any draft planning agreement that a developer has offered to enter into under Section 93F, and

(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph), and

(v) any coastal zone management plan (within the meaning of the Coastal Protection Act 1979).

that apply to the land to which the development application relates,

(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,

(c) the suitability of the site for the development,

(d) any submissions made in accordance with this Act or the regulations,

(e) the public interest.

The above matters are considered below and throughout the EIS.

3.2.2 Designated development

Designated development, for the purposes of Section 77A of the EP&A Act, is defined in Schedule 3 of the EP&A Regulation. Schedule 3 of the EP&A Regulation includes particular waste management facilities or works described in Clause 32, including:

(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:

(a) that dispose (by landfilling, incinerating, storing, placing or other means) of solid or liquid waste:

- (i) that includes any substance classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste, or
- (ii) that comprises more than 100,000 tonnes of "clean fill" (such as soil, sand, gravel, bricks or other excavated or hard material) in a manner that, in the opinion of the consent authority, is likely to cause significant impacts on drainage or flooding, or
- (iii) that comprises more than 1,000 tonnes per year of sludge or effluent, or
- (iv) that comprises more than 200 tonnes per year of other waste material, or

(b) that sort, consolidate or temporarily store waste at transfer stations or materials recycling facilities for transfer to another site for final disposal, permanent storage, reprocessing, recycling, use or reuse and:

- (i) that handle substances classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste, or
- (ii) that have an intended handling capacity of more than 10,000 tonnes per year of waste containing food or livestock, agricultural or food processing industries waste or similar substances, or
- (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, or

(c) that purify, recover, reprocess or process more than 5,000 tonnes per year of solid or liquid organic materials, or

(d) that are located:

- (i) in or within 100 metres of a natural waterbody, wetland, coastal dune field or environmentally sensitive area, or
- (ii) in an area of high watertable, highly permeable soils, acid sulphate, sodic or saline soils, or
- (iii) within a drinking water catchment, or
- (iv) within a catchment of an estuary where the entrance to the sea is intermittently open, or
- (v) on a floodplain, or

(vi) within 500 metres of a residential zone or 250 metres of a dwelling not associated with the development and, in the opinion of the consent authority, having regard to topography and local meteorological conditions, are likely to significantly affect the amenity of the neighbourhood by reason of noise, visual impacts, air pollution (including odour, smoke, fumes or dust), vermin or traffic.

The proposal meets the definitions of designated development as it is (among other criteria) defined as 'Waste management facilities or works' that would 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' and would involve 'crushing, grinding or separating works' that 'have an intended processing capacity of more than 150 tonnes per day or 30,000 tonnes per year'.

Clause 79 of the EP&A Act details specific requirements for public participation that apply to an SSDA for designated development.

(1) Public exhibition and notification

As soon as practicable after a development application is made for consent to carry out designated development, the consent authority must:

(a) place the application and any accompanying information on public exhibition for a period of not less than 30 days (the submission period) commencing on the day after which notice of the application is first published as referred to in paragraph (d), and

(b) give written notice of the application in accordance with the regulations:

(i) to such persons as appear to it to own or occupy the land adjoining the land to which the development application relates, and

(ii) if practicable, to such other persons as appear to it to own or occupy land the use or enjoyment of which, in its opinion, may be detrimentally affected if the designated development is carried out, and

(iii) to such other persons as are required to be notified by the regulations, and

(c) cause notice of the application to be exhibited in accordance with the regulations on the land to which the application relates, and

(d) cause notice of the application to be published in accordance with the regulations in a newspaper circulating in the locality.

3.2.3 Integrated development

Integrated development is development that requires one or more of the approvals identified in Section 91 of the EP&A Act. The proposal is integrated development as it requires an environment protection licence (EPL) under the *Protection of the Environment Operations Act 1997* (POEO Act) (see Section 3.4.1). Although the proposal includes works within 40 m of a waterbody, under Section 89J of the EP&A Act, an activity approval (other than an aquifer interference approval) under Section 91 of the *Water Management Act* 2000 (WM Act) is not required for SSD that is authorised by a development consent (refer to Section 3.4.2).

Section 91A of the EP&A Act applies to the determination of an SSDA for integrated development.

...

(1) Before granting development consent to an application for consent to carry out the development, the consent authority must, in accordance with the regulations, obtain from each relevant approval body the general terms of any approval proposed to be granted by the approval body in relation to the development. Nothing in this Section requires the consent authority to obtain the general terms of any such approval if the consent authority determines to refuse to grant development consent.

(2) A consent granted by the consent authority must be consistent with the general terms of any approval proposed to be granted by the approval body in relation to the development and of which the consent authority is informed. For the purposes of this Part, the consent authority is taken to have power under this Act to impose any condition that the approval body could impose as a condition of its approval.

(3) If the approval body informs the consent authority that it will not grant an approval that is required in order for the development to be lawfully carried out, the consent authority must refuse consent to the application.

(4) If the approval body fails to inform the consent authority, in accordance with the regulations, whether or not it will grant the approval, or of the general terms of its approval:

(a) the consent authority may determine the development application, and

(b) if the consent authority determines the development application by granting consent:

(i) the approval body cannot refuse to grant approval to an application for approval in respect of the development, and

(ii) an approval granted by the approval body must not be inconsistent with the development consent, and

(iii) Section 93 applies to an approval so granted as if it were an approval the general terms of which had been provided to the consent authority,

despite any other Act or law.

(5) If a development application is determined, whether or not by the granting of development consent, the consent authority must notify all relevant approval bodies of the determination.

3.3 Relevant provisions

This Section gives consideration to the relevant provisions of the regulations and environmental planning instruments as required by Section 79C(1)(a) of the EP&A Act. No proposed instruments, planning agreements or coastal zone management plans are relevant to the project. Further, Clause 11 of the SRD SEPP (refer to Section 3.3.2 ii) states that development control plans do not apply to SSD and therefore, the Camden DCP 2011 has not been considered specifically.

3.3.1 NSW Environmental Planning and Assessment Regulation 2000

Part 6 of the EP&A Regulation details procedures relating to SSDAs. Schedule 2 of the EP&A Regulation relates to the preparation of EIS's and in particular, clauses 6 and 7 of this schedule prescribe the form and content of an EIS. The Schedule 2 requirements, and where they are addressed in this EIS, are set out in Table 3.1.

Table 3.1 Schedule 2 requirements for an EIS

Requirement	Where contained in the EIS
Name, address and professional qualifications of the person(s) who prepared the EIS	Certification page
Name and address of the responsible person (the applicant)	Certification page
Address of land	Section 1.3
Description of development	Chapter 2
Assessment of the environmental impact	Chapter 6
Declaration that the EIS has been prepared in accordance with this Schedule, contains all available information that is relevant to the environmental assessment of the development and that the information contained in the statement is neither false nor misleading	Certification page
Summary of the EIS	Executive summary
A statement of the objectives of the development	Section1.4.1
An analysis of feasible alternatives, having regard to its objectives, including the consequences of not carrying out the development	Section 1.4.3
A full description of the development	Chapter 2
A general description of the environment likely to be affected by the development	Section 1.3
The likely impact on the environment of the development	Chapter 6
A full description of the measures proposed to mitigate any adverse effects of the development	Chapter 6
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	Sections 3.2.2 and 3.2.3
A compilation of the measures proposed to mitigate any adverse effects of the development	Table 7.1
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	Section 1.4

3.3.2 Environmental planning instruments

i State Environmental Planning Policy (Infrastructure) 2007

Part 3, Division 23 of the *State Environmental Planning Policy (Infrastructure)* 2007 (the Infrastructure SEPP) relates to waste or resource management facilities. Under Clause 121, development for the purpose of waste or resource management facilities is permissible with consent in a prescribed zone. A prescribed zone includes land zoned IN1 General Industrial. The site is zoned IN1 General Industrial under the Camden LEP 2010. Therefore, the project is permissible with consent.

Schedule 3 of the Infrastructure SEPP details traffic generating development that is to be referred to the Roads and Traffic Authority (RTA) (now RMS) and includes recycling facilities of any size or capacity. Clause 104 of the Infrastructure SEPP requires the RMS to be notified of an application for traffic generating development.

Consultation with the RMS is outlined in Table 4.1.

ii State Environmental Planning Policy (State and Regional Development) 2011

The SRD SEPP, amongst other matters, defines certain development as SSD. Clause 8 of the SRD SEPP states:

> (1) Development is declared to be State significant development for the purposes of the [EP&A] Act if:
>
> (a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and
>
> (b) the development is specified in Schedule 1 or 2.

The project is permissible with consent by virtue of the Infrastructure SEPP.

Schedule 1 of the SRD SEPP defines a range of general SSDs, including waste and resource management facilities. Clause 23 Waste and resource management facilities includes the following:

> ...
>
> (2) Development for the purpose of waste or resource transfer stations in metropolitan areas of the Sydney region that handle more than 100,000 tonnes per year of waste.
>
> ...
>
> (3) Development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.

The project will handle up to 140,000 tpa of waste and is therefore development specified in Schedule 1.

The proposal meets both the requirements of clause 8 of the SRD SEPP and is therefore deemed to be SSD. Development consent for the project will be sought from the Minister for Planning.

Clause 11 of the SRD SEPP states in relation to the exclusion of application of development control plans:

> Development control plans (whether made before or after the commencement of this policy) do not apply to:
>
> (a) State significant development, or
>
> (b) development for which a relevant council is the consent authority under section 89D (2) of the Act.

The proposal has not therefore been assessed against the requirements of Camden DCP.

iii State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

Under SEPP 33 a preliminary hazard assessment (PHA) prepared in accordance with the current circulars or guidelines must be submitted with a SSDA for potentially hazardous or offensive development. The guideline *Applying SEPP 33* (DoP 2011a) includes a checklist and a risk screening procedure to determine whether a development is potentially hazardous or offensive.

An assessment against *Applying SEPP 33* found that the project is not potentially hazardous (see Section 5.4). Further, the project will not pose a significant risk to or have a significant adverse impact on human health, life, property or the biophysical environment (see Chapter 5). The project is not a potentially hazardous or offensive industry and therefore, a PHA is not required.

iv State Environmental Planning Policy No. 55 – Remediation of Land

A desktop study has been undertaken by EMM to determine whether or not the site is potentially contaminated under *State Environmental Planning Policy 55* (SEPP 55).

a. Development controls and planning policies

Planning certificates, obtained under section 149 of the EP&A Act, specify the development controls and planning policies that apply to the land, including contamination issues.

Planning Certificate ref.20160465 for the site, issued on 16 February 2016, was reviewed for contamination issues. There are no references to contamination issues or audits applicable to the site.

b. NSW EPA contaminated land: record of notices

The EPA's Contaminated Land Public Record register (under Section 58 of the *Contaminated Land Management Act* 1997 (CLM Act)) lists sites for which the EPA has issued regulatory notices under the CLM Act. The register includes the details of current and former regulatory notices issued.

A search of this register (undertaken on 24 March 2016) did not identify any reported contamination or any regulatory notices issued for suburbs of Smeaton Grange, Mount Annan, Currans Hill and Narellan in the Camden LGA.

c. NSW EPA contaminated land: sites notified

NSW EPA's register of contaminated sites notified to the EPA under Section 60 of the CLM Act, provides an indication of the management status of that particular site. Under Section 60 of the CLM Act, properties must be registered with EPA if there is reason to suspect the land is contaminated, and one or more of the notification triggers in the Duty to Report guidelines exist at the site. Upon receipt of a Section 60 notification, the EPA assesses the contamination status of the site to determine whether the contamination is significant enough to warrant regulation by the EPA.

A search of this public register, (dated 27 October 2015), for Smeaton Grange did not return any records of reported contamination or any regulatory notices. There were no notified sites in the suburbs of Mount Annan and Currans Hill that were within 5 km of the site.

Narellan had three listed sites, 2-3 km to the south-west of site: a former landfill, and two Caltex service stations. The service stations are under assessment and the landfill does not require regulation under the CLM Act. Groundwater flow from these notified sites is likely to the north, consistent with the topographic gradient. Therefore the potential for contamination migration via groundwater flow to Anderson Road is considered low, if groundwater contamination is even present.

d. NSW EPA: environmental protection licences

The NSW (POEO Act requires EPLs, issued by the EPA, to be held by owners or operators of premises where the activities being undertaken are potentially contaminating activities listed in Schedule 1 of the POEO Act. An EPL typically includes conditions that relate to pollution prevention, monitoring and reporting.

A search of the EPA's POEO public register (dated 3 July 2015) was undertaken for the Camden LGA, with focus on the suburbs of Smeaton Grange and Narellan and Mount Annan.

Endeavour Energy has a waste storage facility 800 m to the south south-west of site, where hazardous and restricted solid and liquid wastes are stored. Review of this facility indicates that the site is sealed with all waste storage contained indoors, meaning the potential for environmental contamination and subsequent off site migrations is low.

No other EPLs were listed within a 4 km radius of site listed.

e. Conclusion

State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55) provides for a statewide planning approach to the remediation of contaminated land. Under clause 7(1) of SEPP 55, prior to granting consent to the carrying out of any development on land, a consent authority is required to give consideration as to whether land is contaminated and, if the land is contaminated, whether the land is suitable for the purpose of the development or whether remediation is required.

Clause 6 of SEPP 55 states the following in relation to rezoning:

> (1) In preparing an environmental planning instrument, a planning authority is not to include in a particular zone (within the meaning of the instrument) any land specified in subclause (4) if the inclusion of the land in that zone would permit a change of use of the land, unless:
>
> (a) the planning authority has considered whether the land is contaminated, and
>
> (b) if the land is contaminated, the planning authority is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for all the purposes for which land in the zone concerned is permitted to be used, and
>
> (c) if the land requires remediation to be made suitable for any purpose for which land in that zone is permitted to be used, the planning authority is satisfied that the land will be so remediated before the land is used for that purpose.

Given that the site is located within a recently approved industrial subdivision and the land was formerly used for agricultural purposes, it is assumed that the land would have been rezoned and that such a planning proposal to rezone the land would have given due consideration to the requirements of clause 6. There is also no evidence of contamination at the site or immediate surrounds based on a review of the relevant EPA registers.

Further, a DA would also have been granted for subdivision of the land at which stage the requirements of clause 7 of SEPP 55, relating to contamination and remediation to be considered in determining development application, would have been met.

Therefore, by virtue of the rezoning and subdivision of land in which the site is contained, it is considered that if the land had been contaminated, sufficient remediation would have been undertaken to render it suitable for industrial purposes.

Notwithstanding, there will be minimal soil disturbance and no groundwater interaction during the construction of the waste recycling and transfer facility (refer to Section 2.9), and the majority of the site will be sealed during operation. Therefore there is very minimal potential for exacerbation of any potential soil contamination, associated with the construction phase only. The construction contractors will adhere to the procedures set out in Table 7.1 on finding potentially contaminated material.

Given this, the proposal is in accordance with the requirements of SEPP 55.

v Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River (No 2—1997)

The Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River (No 2—1997) (SREP 20) applies to land within Camden local government area (LGA). Part 2 of SREP 20 identifies the considerations, policies and strategies that are to be taken into consideration by the consent authority when determining an SSDA to which the plan applies. Further, Part 3 of SREP 20 identifies additional matters for consideration specific to the type of development. The matters for consideration for waste management facilities or works include:

> (a) Any potential for groundwater contamination.
>
> (b) The adequacy of the proposed leachate management system and surface water controls.
>
> (c) The long-term stability of the final landform and the adequacy of the site management plan.
>
> (d) If extraction of material is involved in the creation or other development of the waste management site, whether the extractive operation will have an adverse impact on the river system.

The above matters have been considered in Sections 0 and 6.5.4 of this EIS.

vi Camden Local Environmental Plan 2010

The site is zoned IN1 General Industrial under the LEP. Development for the purposes of a '*waste or resource transfer station*' and '*waste or resource management facility*' are permissible with consent within the IN1 zone. The project is consistent with the objectives of the IN1 zone which are:

- to provide a wide range of industrial and warehouse land uses;
- to encourage employment opportunities;
- to minimise any adverse effect of industry on other land uses;
- to support and protect industrial land for industrial uses;
- to enable other land uses that provide facilities or services to meet the day to day needs of workers in the area; and
- to enable non-industrial land uses that are compatible with and do not detract from the surrounding industrial and warehouse land uses.

The proposal's compliance with relevant standard and provisions of the LEP is detailed in Table 3.2. As previously noted, development control plans do not apply to SSD and therefore the Camden DCP 2011 has not been specifically considered.

Table 3.2 Camden Local Environmental Plan 2010 provisions

Provisions	Compliance
4.3 Height of Buildings	
The LEP specifies a maximum building height for the site at 11 m.	The project complies with this standard as shown in Appendix C.
4.4 Floor Space Ratio	
The LEP specifies a floor space ratio for the site of 1:1.	Yes
5.9 Preservation of trees	No trees are to be removed.
5.11 Bush fire hazard reduction	
Bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.	n/a
7.1 Flood planning	
(3) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development: (a) is compatible with the flood hazard of the land, and (b) is not likely to significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and (c) incorporates appropriate measures to manage risk to life from flood, and (d) is not likely to significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and (e) is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.	Flooding is not an issue for the site because the drainage channels in the subdivision have capacity to convey the 100 yr ARI flood flows with freeboard. The proposal does not introduce structures which will be sensitive to flood damage. The proposed development conforms to the Council and State Government flood management requirements.

3.4 Other State legislation

3.4.1 Protection of the Environment Operations Act 1997

The POEO Act is the principal NSW environmental protection legislation and is administered by the EPA. Section 48 of the POEO Act requires an EPL to undertake scheduled activities at a premise. Scheduled activities are defined in Schedule 1 of the POEO Act and include the following premise-based activities that apply to the project:

- resource recovery – having on site at any time more than 1,000 tonnes or processing more than 6,000 tonnes per year of general waste;
- waste processing (non-thermal treatment) – having on site at any time more than 1,000 tonnes or processing more than 6,000 tonnes per year of general waste; and
- waste storage – received from off-site and storing of more than 1,000 tonnes of waste at any time or more than 6,000 tonnes per year.

As the project involves scheduled activities it will require an EPL under the POEO Act. Under Section 89K of the EP&A Act, an EPL cannot be refused if it is necessary for carrying out SSD that is authorised by a development consent, and is to be substantially consistent with that development consent.

3.4.2 Water Management Act 2000

The WM Act regulates the use and interference with surface and groundwater in NSW where a water sharing plan has been implemented. Section 91(2) of the WM Act requires an activity approval for the carrying out of a controlled activity in, on or under waterfront land.

The project includes works within 40 m of a watercourse. Under Section 89J of the EP&A Act, an activity approval (other than an aquifer interference approval) under Section 91 of the WM Act is not required for SSD that is authorised by a development consent.

Notwithstanding, Department of Industry Water (DPI Water) have been provided with details of the proposal and will continue to be consulted (refer to Table 4.1).

3.4.3 Contaminated Land Management Act 1997

The NSW *Contaminated Land Management Act 1997* is administered by the EPA. It establishes a process where the significant contamination of land is investigated and, where appropriate, remediated.

The site is not identified as 'contaminated' under the Act (refer to Section 3.3.2iv).

3.4.4 Rural Fires Act 1997

The NSW *Rural Fires Act 1997* (RF Act) aims to prevent, mitigate, and suppress bush and other fires in local government areas of the State. Section 63(2) of the RF Act requires the owners of land to prevent the ignition and spread of bushfires on their land. Under Section 89J of the EP&A Act, a bush fire safety authority under Section 100B of the RF Act is not required for SSD that is authorised by a development consent.

The site is partially mapped as bushfire prone according to Camden Council mapping (Camden Council 2013). A bushfire risk assessment has been prepared for the project and is included as Appendix I. The recommended measures in the bushfire risk assessment are described in Section 6.8 and will ensure that the risk of bushfire ignition and spread will be as low as practically possible.

3.5 Commonwealth legislation

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), actions that may have a significant impact on a matter of national environmental significance (MNES) are 'controlled actions' and require approval from the Commonwealth. MNES include world heritage properties, wetlands of international importance, and listed threatened species and ecological communities.

The proposal will not have any significant impacts on any MNES and, accordingly, a referral to the Commonwealth Minister for the Environment has not been made.

4 Consultation

4.1 Consultation to date

The SEARs for the proposal (refer to Appendix B) require consultation with the following stakeholders:

- EPA;
- OEH;
- DPI;
- DPI Water;
- RMS; and
- the surrounding landowners and occupiers that are likely to be impacted by the proposal.

Consultation with all the above stakeholders has been undertaken for the proposal. The method and outcomes of the consultation are detailed in Table 4.1.

Table 4.1 Summary of consultation

Stakeholder	Consultation methods	Outcomes
Government agencies		
AGL	Consultation letter sent 2 February 2016 inviting input into the EIS.	No response received.
EPA	A summary of the proposal was sent to the EPA and they provided input into the preparation of the EIS through the SEARs. A letter was sent to EPA on 2 March 2016 inviting further input.	This EIS has been prepared in accordance with EPA comments included with the SEARs. No response to consultation letter was received.
OEH	A summary of the proposal was sent to the OEH and they provided input into the preparation of the EIS through the SEARs. Consultation letter sent on 2 March 2016 inviting further input.	OEH responded that they had no further inputs regarding the proposal.
DPI	A summary of the proposal was sent to the DPI and they provided input into the preparation of the EIS through the SEARs. A letter was sent to DPI Geological Survey of NSW (GSNSW) on 2 March 2016 inviting further input.	This EIS has been prepared in accordance with EPA comments included with the SEARs. The GSNSWteam of DPI responded by email on 7 March 2016 and has no concerns with the proposal as it has no impacts upon mineral or extractive resources, nor upon coal or petroleum production.
DPI Water	Consultation letter sent on 2 March 2016 inviting further input.	No response received.

Table 4.1 Summary of consultation

Stakeholder	Consultation methods	Outcomes
RMS	RMS were briefed and provided input into the preparation of the EIS through the SEARs. A summary of the proposal was sent to the RMS and they provided input into the preparation of the EIS through the SEARs.	This EIS has been prepared in accordance with RMS comments included with the SEARs. No response to consultation letter received.
Camden Council	Pre-DA meeting held 7 December 2015 .	Following the Pre-DA meeting, NCC issued preliminary planning advice and information for preparation of a DA (9 December 2015). The EIS has been prepared to address this advice.
Surrounding landowners/occupiers		
Coles Logistics (contact: Tony Glogowski)	Applicant's representative met with the contact at Coles Logistics on 22 March 2016 and briefed about the proposal.	No objection to the proposal.
Axis Building Group (contact: Clive Jacobsen)	Applicant's representative met with the contact at Axis Building Group on 22 March 2016 and briefed about the proposal.	No objection to the proposal.
3 Ashford Circuit, Currans Hill, NSW	Door knock by applicant's representatives on Saturday 23 April. Residents home.	Benedict information fact sheet supplied, resident offered no concerns.
11 Linton Road, Currans Hill, NSW	Door knock by applicant's representatives on Saturday 23 April. Residents home.	Benedict information fact sheet supplied, resident offered no concerns.
9 Linton Road, Currans Hill, NSW	Door knock by Benedict representatives. Residents not at home.	Benedict information fact sheet left at premise together with Ian Collier's business card.
7 Linton Road, Currans Hill, NSW	Door knock by Benedict representatives. Residents not at home.	Benedict information fact sheet left at premise together with Ian Collier's business card.
5 Linton Road, Currans Hill, NSW	Door knock by Benedict representatives. Residents not at home.	Benedict information fact sheet left at premise together with Ian Collier's business card.
3 Linton Road, Currans Hill, NSW	Door knock by Benedict representatives. Residents not at home.	Benedict information fact sheet left at premise together with Ian Collier's business card.
1 Linton Road, Currans Hill, NSW	Door knock by applicant's representatives on Saturday 23 April. Residents home.	Benedict information fact sheet supplied, resident offered no concerns.
20 Chapman Circuit, Currans Hill, NSW	Door knock by Benedict representatives. Residents not at home.	Benedict information fact sheet left at premise together with Ian Collier's business card.
18 Chapman Circuit, Currans Hill, NSW	Door knock by Benedict representatives. Residents not at home.	Benedict information fact sheet left at premise together with Ian Collier's business card.

Table 4.1 Summary of consultation

Stakeholder	Consultation methods	Outcomes
16 Chapman Circuit, Currans Hill, NSW	Door knock by applicant's representatives on Saturday 23 April. Residents home.	Benedict information fact sheet supplied, resident asked if the development was going to "be a tip". Ian Collier explained that no waste would be landfilled onsite but that the waste would be recycled. Materials such as soil, bricks & concrete, cardboard etc would be recycled for reuse. Resident said that was good and offered no further comments.
17 Chapman Circuit, Currans Hill, NSW	Door knock by Benedict representatives. Residents home.	Benedict information fact sheet supplied, resident offered no concerns.
79 Downes Cres, Currans Hill, NSW	Door knock by Benedict representatives. Residents home.	Benedict information fact sheet supplied, resident offered no concerns.

A copy of the fact sheet given to/left for local residents is provided in Appendix K. The twelve residences closest to the site have been consulted however, it is anticipated that as a minimum, the 22 residential receivers identified in the acoustic and air quality assessments will be contacted by a representative of the applicant as soon as the application is publically exhibited (including re-consultation of the 12 residences already consulted).

4.2 Proposed consultation

This EIS will be placed on public exhibition. Benedict will respond to any submissions regarding the proposal. This may also highlight the need to consult with any individuals or groups with a particular interest in the proposal.

The ongoing consultation is planned with the following:

- CC: regarding this EIS, development approval and subsequent consents;
- EPA: regarding an EPL;
- agencies providing comment on this EIS;
- one-on-one consultation regarding the EIS and upcoming activities at the site if requested by neighbours/adjoining occupiers; and
- utilities (water, sewerage and power) regarding reconnecting services to the site.

5 Hazards

5.1 Introduction

This chapter considers whether the proposal is a potentially hazardous or offensive development according to SEPP 33 and whether a PHA is required. It references *Applying SEPP 33* (DoP 2011a) and the *Hazardous Industry Planning Advisory Paper No 4: Risk Criteria for Land Use Safety Planning* guidelines (DoPc 2011).

5.2 Hazardous materials

5.2.1 *Applying SEPP 33* risk screening method

i Hazardous materials stored, processed or handled

Potentially hazardous or offensive development is defined by SEPP 33 as development which poses a significant risk to, or which would have a significant adverse impact on, human health, life, property or the biophysical environment, if it were to operate without employing any control measures. This includes developments for the handling, storing or processing of hazardous materials. A development is classified as a hazardous or offensive development if the thresholds in *Applying SEPP 33* — which compare the quantities of stored or used hazardous materials to the distance from publicly accessible areas — are exceeded. The hazardous materials classifications in the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (National Transport Commission 2007) (the Dangerous Goods Code) are used in *Applying SEPP 33*.

The hazardous materials that are proposed to be stored and used under the proposal are diesel, oils and grease. The storages, quantities and hazardous properties of the materials are provided in Table 5.1. These materials will be stored in a sealed shipping container with the exception of diesel which will be stored in a purpose built 30,000 L tank in accordance with Australian Standards.

No hazardous wastes will be accepted onto the site.

Table 5.1 Dangerous goods and other potentially hazardous materials to be stored onsite

Classification	Name	Storage conditions	Approximate quantity
Dangerous Goods			
Class 2.1 Flammable Gas	Battery terminal spray	Purpose built container, in enclosed storage room	0.4 L
	Hi press spray grease	Purpose built container, in enclosed storage room	0.4 L
	Acetylene	Three size G bottles (for 9.3 m^3 of gas at atmospheric pressure)	30 kg

Table 5.1 Dangerous goods and other potentially hazardous materials to be stored onsite

Classification	Name	Storage conditions	Approximate quantity
Class 2.2 Non-flammable, non toxic gas*	Oxygen	Five size G bottles (for 8.9 m^3 of gas at atmospheric pressure)	12 kg
	Contact cleaner aerosol	Purpose built container, in enclosed storage room	0.4 L
Class 3 Flammable Liquid PG II	Plumbers priming fluid	Purpose built container, in enclosed storage room	0.5 L
	Unleaded petrol	Purpose built container, in enclosed storage room	20 L
	Grip base	Purpose built container, in enclosed storage room	0.4 L
	Gasket sealant	Purpose built container, in enclosed storage room	0.05 L
	Quick dry enamel	Purpose built container, in enclosed storage room	3 L
Class 3 Flammable Liquid PG III	Hi-Tec heavy duty degreaser	Purpose built container, in enclosed storage room	20 L
Class 8 Corrosive substances PG III	Chemtech Heavy Duty Degreaser	Purpose built container, in enclosed storage room	20 L
Class 9 Miscellaneous dangerous substances PG III*	Diesel**	30,000 L metal tank kept in bunded and roofed storage container	30,000 L
Other hazardous materials			
	Flocculent	Purpose built plastic container	1,000 L
	Oils (engine, hydraulic, and diesel)	Purpose built containers, in enclosed storage room	840 L
	Penetrant spray	Aerosol container, in enclosed storage room	4 L
	Concentrated traffic film remover	Purpose built container, in enclosed storage room	20 L
	Lubricant	Purpose built container, in enclosed storage room	0.5 L
	Anti-bacterial soap	Purpose built container, in enclosed storage room	20 L
	Grease	Purpose built container, in enclosed storage room	15 kg
	Coolant	Purpose built container, in enclosed storage room	40 L

Notes: **Exempt from "Applying SEPP" risk screening test.*

***The Dangerous Goods Code states that diesel is not subject to the code as it is has a flash point of more than 60°C. The Work Practice Data Sheet provided by Chemwatch identifies Diesel as a Dangerous Good Glass 9.*

Based on the information provided in Table 5.1, a screening test against the thresholds in SEPP 33 for dangerous goods is provided in Table 5.2. All Class 3 PG II and III flammable liquids have been grouped together as Class 3 PG II which has a more stringent screening distance. The term 'sensitive' in the table refers to residential or other more sensitive land uses and 'other' applies to all other land uses (eg commercial or industrial).

The screening test determines that the hazardous materials are not potentially hazardous.

Table 5.2 *Applying SEPP 33* screening test

Dangerous goods classification	Total quantities	SEPP 33 screening threshold	Potentially hazardous
Class 2.1 (LPG only)	8 t*	10 t	No
Class 2.1 (liquefied excluding LPG)	30 kg	Greater than 500 kg at specified distance	No
Class 3 PG II	50 kg	Greater than 5 t at specified distance	No
Class 8 PG III	20 kg	50 t	No

*Notes: *Conversion used for LPG 1 L = 0.53 kg.*

ii Transport of hazardous materials

Applying SEPP 33 also sets threshold limits for the transportation of hazardous materials to and from a site.

The number of weekly and annual deliveries and the approximate quantities per load to the site are below the SEPP 33 transport screening thresholds as shown in Table 5.3.

Table 5.3 *Applying SEPP 33* transportation screening test

Hazardous materials	Deliveries		Quantities per load	Potentially hazardous
	Weekly (peak)	Annual		
Class 2.1 Flammable Gas	1	6	7.5 kL	No
Other hazardous materials	4	54	15 kL	No

5.2.2 Other risk factors

Applying SEPP 33 requires an assessment of other hazards/risk factors outside the scope of the risk screening method. An assessment of other types of hazards associated with the proposal is provided in Table 5.4.

Table 5.4 Other types of hazards

Type of hazard	Comments
Any incompatible materials (hazardous and non-hazardous materials)	No
Any wastes that could be hazardous	No. Wastes delivered to site will be inspected and will not be accepted if they contain hazardous materials (see Section 2.3.4).
The possible existence of dusts within confined areas	No
Types of activities the dangerous goods and otherwise hazardous materials are associated with (storage, processing, reaction, etc.)	Only as indicated in Table 5.1
Incompatible, reactive or unstable materials and process conditions that could lead to uncontrolled reaction or decomposition.	No
Storage or processing operations involving high (or extremely low) temperatures and/or pressure.	No
Details of known past incidents (and near misses) involving hazardous materials and processes in similar industries.	No known incidents involving hazardous materials/processed at recycling industries.

There are no other hazards/risk factors outside the scope of the risk screening method associated with the proposal.

5.2.3 Hazard management

A range of hazard control measures will be implemented during construction and operation of the proposal. Each of these will be appropriate for the hazard they are designed to control and will generally follow the *Hierarchy of Hazard Controls* (WorkCover NSW not dated):

- engineering controls:
  - design: components will be designed and constructed to comply with relevant standards; and
  - enclosure: components will be enclosed as appropriate. For example, tanks will be bunded.
- administrative controls:
  - operating procedures;
  - scheduled maintenance; and
  - training and reinforcing correct work procedures.

The storage and use of hazardous materials will be in accordance with the following Australian Standards:

- *Australian Standard 1940:2004 The Storage and Handling of Flammable and Combustible Liquids*; and
- *Australian Standard 1596:2008 The Storage and Handling of LP Gas.*

5.3 Potentially offensive industry

The air, noise, and water emissions from the proposal have been assessed to determine if it is classified as a potentially offensive industry.

5.3.1 Air quality

Ramboll Environ assessed potential air quality impacts (see Section 6.1 and Appendix E). The assessment found that the particulate emissions of PM_{10}, total suspended particulates (TSP) and dust deposition from the proposal will comply with the relevant criteria at sensitive receptors and will not lead to any unacceptable impacts on the amenity of the area.

5.3.2 Noise

EMM assessed potential noise impacts from the proposal (refer to Section 6.4 and Appendix F). The assessment concluded that noise modelling results predicted that operational noise emissions will not exceed the relevant criteria and will not lead to any unacceptable impacts on the amenity of the area.

It is likely that noise emission from proposed construction activity will be above the recommended noise management level at the assessment locations. Due to this, recommendations have been provided regarding work practices to be considered to minimise construction noise from the proposal.

5.3.3 Water

Surface water from the proposal will be managed by the proposed surface water management system (refer to Section 6.6.3 and Appendicies G and H). Any water released will have a suspended solids content of less than 50 mg/L. The proposal will not significantly increase runoff peak flows, discharge volume or the sediment load in runoff. Therefore, the proposal will not have a significant impact on flows or water quality in the receiving environment.

Project related ground excavations, including footings and an onsite detention/sedimentation basin/control device are expected to be less than 2 m deep (refer to Appendix G). These excavations are expected to be shallower than the depth to groundwater and therefore impacts to groundwater in the uppermost competent rock are not expected.

The site will be sealed and this will prevent any potential contamination from entering the groundwater.

5.3.4 Waste

Only inert pre-classified general solid waste (non-putrescible) will be accepted at the facility and no special, liquid, hazardous restricted solid or general solid waste (putrescible) wastes will be accepted at the site.

5.4 Conclusion: Is the proposal a potentially offensive industry?

An assessment of the storage and transport of hazardous materials against *Applying SEPP 33* determined that the proposal is not potentially hazardous.

The proposal will not result in unacceptable levels of pollution that will impact the amenity of the area. Therefore, the proposal is not a potentially offensive industry.

5.5 Other hazards

The following other hazards have been considered:

- Bushfire: the site is mapped as containing bushfire prone land (refer to Appendix I) A Section of the project will be on bushfire prone land and measures will be incorporated in the proposal to enable compliance with the objectives of *Planning for Bushfire Protection* (PBP). Specifically, an asset protection zone (APZ) will be provided and managed to enable fire fighter access, passage for evacuees and to reduce radiant heat at project buildings. The risk of the project initiating a bushfire will be minimised through the implementation of management measures.

- Flooding: flooding is not an issue for the site because the drainage channels in the subdivision have capacity to convey the 100 year ARI flood flows with freeboard. There is a constructed channel alongside the site which was designed, approved and constructed as part of the subdivision. The proposal does not introduce structures which will be sensitive to flood damages, other than the small offices. The proposed development conforms to the Council and State Government flood management requirements.

Camden Council’s engineer has confirmed (in an email from Jessica Mesiti (Planning Officer at Camden Council) dated 16 May 2016) that the proposed main processing shed is located above Council’s Flood Planning Level. They have also confirmed that the fence proposed along the boundary of the property is located above the 1% AEP flood level, which is in accordance with Section 4.9 of Council’s Flood Risk Management Policy. Therefore, the proposed development looks to be acceptable in relation to flooding.

- Sea level rise: sea level rise will not impact on built elements of the site which are at least 8 m above AHD.
- Mine subsidence area: the site is not located within a mine subsidence area.

6 Impact assessment

This chapter provides an assessment of the likely environmental impacts of the proposal as required by Section 79C(1b) of the EP&A Act. Further details of the existing environment, assessment methods, assessment criteria, predicted impacts and proposed management measures are provided in:

- Appendix D: traffic assessment;
- Appendix E: air quality assessment;
- Appendix F: noise assessment;
- Appendix G: water assessment;
- Appendix H: hydrogeology assessment; and
- Appendix I: bushfire assessment.

6.1 Traffic and transport

6.1.1 Traffic and transport assessment

A traffic and transport assessment has been prepared for the proposal by EMM (see Appendix D). The assessment considers the impacts of traffic generation by the proposal on existing and future traffic network. The assessment is based on average daily vehicle movements to and from the site, including: delivery of 140,000 tonnes of waste; dispatch of products and non-recyclable residues; employee and visitor vehicles; and vehicles associated with ancillary waste activities.

6.1.2 Traffic and transport impacts

The existing traffic volumes the intersections of Anderson Road/Camden Valley Way and Hartley Road/Narellan Road were surveyed on Friday 11 December 2015 and historic tube traffic counts undertaken by RMS were also used (Table 6.1). A SIDRA analysis of the intersections of Anderson Road/Camden Valley Way and Hartley Road/Narellan Road found that the intersections are currently operating at near capacity during peak hours (level of service E) (although Anderson Road/Camden Valley Way is level of service D in the morning peak hour).

Table 6.1 Summary of daily traffic volumes and increases with the recycling facility traffic

Road	Existing daily traffic (all vehicles)	Additional daily traffic (all vehicles)	Increase (%)	Existing daily traffic (heavy vehicles)	Additional daily traffic (heavy vehicles)	Increase (%)
Camden Valley Way (north of Anderson Road)	22,400	132	0.6%	1,120*	50	4.5%
Anderson Road (east of Camden Valley Way)	15,000	166	1.1%	1,230*	64	5.2%
Hartley Road (north of Narellan Road)	22,000	110	0.5%	2,490*	42	1.7%
Narellan Road (east of Hartley Road)	57,400	72	0.1%	5,100*	28	0.5%

For all waste receival, products/rejects dispatch, site employees, site visitors and maintenance vehicle traffic, the proposal will generate a daily average of approximately 276 daily vehicle movements (Table 6.1). This will comprise 170 light vehicle movements and 106 heavy vehicle movements. Construction generated traffic will be much lower than operational traffic with a maximum of 40 daily vehicle movements, comprising ten light vehicles and ten heavy vehicles.

Traffic increases on the local area roads as a result of the proposal will be of the order of +0.1% to +1.1%. These traffic increases will not generally be noticeable to existing road users. The corresponding increases in the daily heavy vehicle traffic movements will be approximately +0.5% to +5.2% which will also not generally be noticeable to existing road users or affect the future maintenance requirement for these roads.

As shown in tables 6.2 and 6.3, the increases in traffic due to the project will not impact the existing service levels of the intersections at Anderson Road/Camden Valley Way and the Hartley Road/Narellan Road.

Table 6.2 Camden Valley Way/Anderson Road intersection operations

Intersection	Peak hour	Existing 2015 base traffic			With project operations traffic		
		LoS	DOS	AVD	LoS	DOS	AVD
Camden Valley Way/Anderson Road	Morning peak hour (8.00 to 9.00 am)	D	0.830	46.4	D	0.842	46.5
Camden Valley Way/Anderson Road	Afternoon peak hour (3.45 to 4.45 pm)	E	0.980	61.0	E	0.987	61.0

Table 6.3 Narellan Road/Hartley Road intersection operations

Intersection	Peak hour	Existing 2015 base traffic			With project operations traffic		
		LoS	DOS	AVD	LoS	DOS	AVD
Narellan Road/Hartley Road	Morning peak hour (8.00 to 9.00 am)	E	0.974	60.8	E	0.974	61.3
Narellan Road/Hartley Road	Afternoon peak hour (3.30 to 4.30 pm)	E	1.000	60.5	E	1.000	60.6

The proposal-generated daily traffic increases will not require any additional road widening or reconstruction of either the Smeaton Grange industrial area roads or the adjoining major traffic routes via Camden Valley Way and Narellan Road.

The proposal will not have any impacts on parking, road safety and traffic management, public transport services, pedestrians or cyclists.

6.2 Air quality and greenhouse gases

An air quality and greenhouse gas assessment was prepared for the proposal by Ramboll Environ Australia Pty Limited (Ramboll Environ) (refer to Appendix E). The assessment considered the potential air quality impacts (including dust, odour and cumulative impacts) of the proposal during both construction and operations on nearby private properties (residential and industrial). Impacts were determined based on consideration of potential sensitive receivers (refer to Figure 6.1); prevailing meteorological conditions; existing sources of air emissions; potential air emissions during construction and operation; and the proposed control measures. A risk screening methods was adopted for construction dust impacts. Impacts to 22 representative receptors were assessed against the relevant NSW EPA ambient air quality criteria.

The air quality impact assessment was conducted based on indicative 24-hour operations at the proposed Recycling Facility. The developed 24-hour period operational emissions profile was repeated throughout the modelling period to combine likely daily emissions against potential atmospheric dispersion conditions that could be experienced. The assessment assumes that 140,000 tpa of waste will be accepted annually and the processing of this waste will be evenly distributed across the year during times the site is processing waste.

6.2.1 Air quality management measures

Management measures that will be implemented during construction and operation~~s~~ of the proposal to minimise air quality impacts ~~will~~ include:

- Construction:
  - record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
  - record any exceptional incidents that cause dust and/or air emissions, either on or off site, and the action taken to resolve the situation in the log book;
  - carry out regular site inspections, record inspection results, and make an inspection log available to the local authority when asked;

- impose a maximum-speed-limit of 20 km/h on all internal roads and work areas;
- minimise idling vehicles onsite, wherever practicable;
- ensure proper maintenance and tuning of all equipment engines;
- ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; and
- provide an adequate water supply on site for effective dust/particulate matter suppression/mitigation.

- Operations:
  - the entire site will be sealed except for the landscaped frontage;
  - water sprays will be used over any surfaces that have potential to generate unacceptable amounts of dust;
  - water sprays will be used on stockpiles and vehicle paths as well as the screening plant as required during opening hours;
  - a wheel wash in the weighbridge area will be used to clean truck tyres to prevent mud or sediment being carried to and deposited on the access road (and public roads);
  - potentially dust generating activities will be generally undertaken within the main shed;
  - no composting will be undertaken on the site; and
  - odorous materials will not be accepted on site.

Air quality management is described in ~~Table 6.4~~7.1.

6.2.2 Air quality impacts

The air quality assessment locations are shown in Figure 6.1. As shown in Table 6.4, the predicted incremental and cumulative particulate matter concentrations, dust deposition rates and odour concentrations generated by the proposal will be well below the corresponding NSW EPA criteria at the assessment locations.

The majority of material received under the proposal will be inert construction, demolition, commercial and industrial wastes. Therefore, the potential for odour emissions will be low. The most likely waste streams with odour potential are green waste, which create odours if allowed to compost. It is proposed to keep only minimal stocks of green waste as this ensures a high turnover of the material, thereby negating the possibility of green waste starting to compost.

Given the negligible air quality impacts predicted for the proposal, no air quality management measures additional to those described in Section 6.2.1 are warranted. Air quality management and any proposed monitoring measures are described in Table 7.1.

Table 6.4 Incremental and Cumulative Concentration and Deposition Results

Receptor ID	Incremental Concentration/Deposition due to Recycling Facility							Cumulative Concentration due to Recycling Facility + Background Air Quality				
	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Deposition	Odour	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$
	Annual Average	Maximum 24-hr	Annual Average	Maximum 24-hr	Annual Average	Annual Average	99^{th} Percentile 1-second	Annual Average	Maximum 24-hr	Annual Average	Maximum 24-hr	Annual Average
	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	g/m^2/month	OU	µg/m³	µg/m³[(b)]	µg/m³	µg/m³[(b)]	µg/m³
Criteria	NA	NA	NA	NA	NA	2	2	90	50	30	25[(a)]	8[(a)]
R1	0.2	0.8	<0.1	0.5	<0.1	<0.1	0.1	35.2	39.0	16.9	19.0	6.3
R2	0.2	0.7	<0.1	0.4	<0.1	<0.1	0.1	35.2	38.9	16.9	18.9	6.3
R3	0.2	0.9	<0.1	0.4	<0.1	<0.1	0.1	35.2	39.1	16.9	18.9	6.4
R4	0.2	1.3	<0.1	0.5	<0.1	<0.1	0.1	35.2	39.5	16.9	19.0	6.4
R5	0.2	1.1	<0.1	0.4	<0.1	<0.1	0.1	35.2	39.3	16.9	18.9	6.4
R6	0.2	0.8	<0.1	0.3	<0.1	<0.1	0.1	35.2	39.0	16.9	18.8	6.4
R7	0.2	0.5	<0.1	0.2	<0.1	<0.1	0.1	35.2	38.7	16.9	18.7	6.4
R8	0.2	0.5	<0.1	0.2	<0.1	<0.1	0.1	35.2	38.7	16.9	18.7	6.4
R9	0.2	0.5	<0.1	0.2	<0.1	<0.1	0.1	35.2	38.7	16.9	18.7	6.4
R10	0.2	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.2	38.4	16.9	18.6	6.4
R11	0.2	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.2	38.4	16.9	18.6	6.3
R12	0.2	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.2	38.4	16.9	18.6	6.3
R13	0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.9	18.6	6.3
R14	0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.9	18.6	6.3
R15	0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.9	18.6	6.3
R16	<0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.8	18.6	6.3
R17	<0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.8	18.6	6.3
R18	<0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.8	18.6	6.3

Table 6.4 Incremental and Cumulative Concentration and Deposition Results

Receptor ID	Incremental Concentration/Deposition due to Recycling Facility							Cumulative Concentration due to Recycling Facility + Background Air Quality				
	TSP	**PM_{10}**	**PM_{10}**	**$PM_{2.5}$**	**$PM_{2.5}$**	**Deposition**	**Odour**	**TSP**	**PM_{10}**	**PM_{10}**	**$PM_{2.5}$**	**$PM_{2.5}$**
	Annual Average	**Maximum 24-hr**	**Annual Average**	**Maximum 24-hr**	**Annual Average**	**Annual Average**	**99th Percentile 1-second**	**Annual Average**	**Maximum 24-hr**	**Annual Average**	**Maximum 24-hr**	**Annual Average**
	µg/m³	**µg/m³**	**µg/m³**	**µg/m³**	**µg/m³**	**g/m^2/month**	**OU**	**µg/m³**	**µg/m³(b)**	**µg/m³**	**µg/m³(b)**	**µg/m³**
Criteria	**NA**	**NA**	**NA**	**NA**	**NA**	**2**	**2**	**90**	**50**	**30**	**25(a)**	**8(a)**
R19	<0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.8	18.6	6.3
R20	<0.1	0.2	<0.1	0.1	<0.1	<0.1	<0.1	35.1	38.4	16.8	18.6	6.3
R21	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	35.1	38.3	16.8	18.6	6.3
R22	<0.1	0.2	<0.1	0.1	<0.1	<0.1	<0.1	35.0	38.4	16.8	18.6	6.3

Notes: *NA – Not applicable. Criteria are applicable to cumulative concentrations.*

a) The NEPM Reporting Standards for $PM_{2.5}$ are referenced for screening assessment purposes.

b) The maximum cumulative value is a sum of the maximum combined 24-hour average concentration from the Recycling Facility and the maximum baseline concentration.

EMM

Air quality and noise sensitive receiver locations

Smeaton Grange Recycling Facility
Environmental Impact Statement

Figure 6.1

6.3 Greenhouse gasses

A greenhouse gas quantification assessment was undertaken by Ramboll Environ. The estimation of greenhouse gas (GHG) emissions for the proposed waste recycling and transfer facility is based on the *National Greenhouse Accounts Factors* (NGAF) workbook (DoE 2015).

6.3.1 Greenhouse gasses management measures

Management measures that will be implemented during operations to minimise greenhouse gas emissions will include:

- on-site equipment will be regularly maintained and serviced to maximise fuel efficiency;
- vehicle kilometres travelled on site will be minimised; and
- energy efficiency will be progressively reviewed and implemented throughout the life of the facility.

6.3.2 Greenhouse gasses impacts

The annual Scope 1 emissions (direct emissions occurring within the boundary of a site or as a result of the site's activities) and Scope 3 emissions (indirect emissions that occur from upstream and downstream activities) at full production are shown in Table 6.5. These represent approximately 0.0004% of total GHG emissions for NSW and 0.0001% of total GHG emissions for Australia, based on the National Greenhouse Gas Inventory for 2013. This is not considered to be a significant environmental impact.

Table 6.5 Summary of estimated annual GHG emissions (tonnes CO2-e / annum)

Scope 1 emissions	Scope 2 emissions	Scope 3 emissions			
On-site Diesel	**Electricity**	**On-site Diesel**	**Electricity**	**Product Transport (Diesel)**	**Employee Travel**
563	193	43	29	501	412

Notes: GHG emissions are reported in tonnes of carbon dioxide equivalents (t CO2-e). Non-CO_2 gases are converted to CO_2-e by multiplying the quantity of the gas by its Global Warming Potential (GWP) – see Table 26 of the NGAF workbook.

6.4 Noise

6.4.1 Noise assessment

A noise impact assessment (NIA) was prepared by EMM (refer to Appendix F). The assessment was undertaken in accordance with the *Industrial Noise Policy, Interim Construction Noise Guideline* (ICNG) and *Road Noise Policy* (RNP). The assessment considered impacts to 22 representative assessment locations most likely to be affected by the proposal (refer Figure 6.1). The processing scenario for the assessment assumes that all plant and equipment is operating simultaneously to allow maximum noise levels to be predicted and, as such is considered to represent a worst-case scenario. It is noted that it will be rare for all equipment to be running simultaneously and that more than 140,000 tonnes of waste could be processed annually if all plant was used at full capacity.

Long-term unattended ambient noise monitoring was undertaken at one location in Currans Hill between 10 and 21 December 2015 to quantify the existing ambient acoustic environment (summarised in Table 6.6), with on-site observations made during deployment of the logger. Background noise levels derived from the long-term noise monitoring results were used to determine the relevant noise criteria for the proposal. Sound power levels for the plant to be used on the site were determined based on sound levels from similar equipment listed in EMM's noise emissions database. Noise levels at receivers were modelled using Brüel and Kjær Predictor noise modelling software.

Table 6.6 Summary of measured ambient noise levels

Location	RBL, dB			Ambient (L_{Aeq}) noise level, dB		
	Day	Evening	Night	Day	Evening	Night
L1. 20 Chapman Circuit, Currans Hill	36	35	31	52	53	46

6.4.2 Noise management measures

Management measures that will be implemented during construction and operation to minimise noise impacts will include:

- preparation of a construction noise management plan (CNMP) (to be included in the project Environmental Management Plan) prior to construction to ensure that all employees understand and take responsibility for noise control at site;
- properly maintaining plant to ensure rated noise emission levels are not exceeded;
- undertaking construction activities guided by AS2436-1981 *Guide to Noise Control on Construction, Maintenance and Demolition Sites*; and
- providing a contact telephone number which the public may use to seek information or make a complaint. A log of complaints should be maintained and actioned by the site superintendent in a responsive manner.

Universal work practices to minimise noise and vibration emissions include:

- regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration;
- regular identification of noisy activities and adoption of improvement techniques;
- avoiding the use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon residents;
- minimising the use of equipment that generates impulsive noise;
- minimising the movement of materials and plant and unnecessary metal-on-metal contact;
- minimising truck movements; and
- scheduling respite periods for intensive works.

Measures to minimise noise emissions from plant and equipment include:

- choosing quieter plant and equipment, including installing best-practice noise suppression equipment, based on the optimal power and size to most efficiently perform the required tasks;
- using temporary noise barriers (in the form of plywood hoarding or similar) to shield intensive construction noise activities from residences if required;
- operating plant and equipment in the quietest and most efficient manner; and
- regularly inspecting and maintaining plant and equipment to minimise noise and vibration level increases, to ensure that all noise and vibration reduction devices are operating effectively;
- plant with higher noise emissions will generally be located on the southern side of the site, inside the shed;
- a 10 metre high colourbond fence will be erected long the southern boundary and halfway along the south-eastern boundary (refer Figure 2.1);
- low-frequency reversing alarms ("growlers") will be used rather than the standard high frequency beepers;
- plant and equipment will be switched off when not in use;
- any vehicle queuing will be on site rather than on public roads as a second incoming weighbridge will be installed when required;
- material drop heights and materials dragging along the ground will be minimised;
- site contact details will be provided on a board at the front of the site;
- any noise-related complaints will be handled promptly; and
- a complaints register will be maintained.

Work~~ing~~ scheduling to minimise the impact of noise include:

- scheduling construction activities such that the concurrent operation of plant is limited;
- do not process (ie sorting and screening) between 10 pm and 6 am;
- scheduling activities to minimise impacts by undertaking all possible work during hours that will least adversely affect sensitive receivers and by avoiding conflicts with other scheduled events;
- scheduling work to coincide with non-sensitive periods;
- scheduling noisy activities to coincide with high levels of neighbourhood noise so that noise from the activities is partially masked and not as intrusive;
- planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from the sensitive receivers;

- optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours;
- designating, designing and maintaining access routes to the site to minimise impacts;
- include contract conditions that include penalties for non-compliance with reasonable instructions by the principal to minimise noise or arrange suitable scheduling; and
- conducting high vibration generating activities in continuous blocks, with appropriate respite periods as determined through consultation with potentially affected neighbours.

6.4.3 Noise impacts

i Construction

Construction noise levels are predicted to be above the noise-affected management level but remain below the highly noise affected level of 75 dB at all assessment locations considered. Given that the predictions assume equipment operating simultaneously and at the nearest locations within the site to the relevant residential dwellings, it is likely that actual construction noise levels would be less than those predicted for the majority of the time. Notwithstanding, mitigation measures are summarised in Table 7.1 to minimise construction noise impacts.

ii Operation

Operational noise levels have been assessed for the daytime/evening, morning shoulder and night time periods during calm and adverse weather conditions. It was conservatively assumed that all plant operates simultaneously for the proposed operations, thereby reflecting the worst-case scenario. As shown in Table 6.7, operational noise emission levels are predicted to meet the relevant criteria at all assessment locations for calm conditions during the daytime, evening, night and morning shoulder periods. During the presence of a temperature inversion during the night and morning shoulder periods, a minor exceedance of up to 1 dB is predicted to occur at one assessment location.

Further analysis of the unattended noise monitoring data revealed that ambient noise levels are generally increasing from 4 am Monday to Friday. On these days during the noise monitoring period, the L_{A90} descriptor was often above 40 dB before 6 am, ie the time the project would commence operations.

In addition to this, a 1–2 dB change in sound levels is deemed ‘typically indiscernible’ to the human ear. Thus, changes of 1–2 dB are unlikely to be perceivable to nearby residences.

With these factors taken into account, it is unlikely that project noise emissions during the night or morning shoulder periods would cause adverse impacts at the assessment locations.

Predicted operational noise contours for calm conditions during the daytime and adverse conditions (ie inversion) during the night-time are provided as an appendix in the attached NIA.

Table 6.7 Operational noise modelling results

Assessment locations	Predicted operational noise level, dB			Target noise level, dB
	Daytime/evening	Morning shoulder		
	Calm	Calm	Inversion	
R1	37	34	36	41 $L_{Aeq(15\text{-}min)}$ daytime 40 $L_{Aeq(15\text{-}min)}$ evening 39 $L_{eq(15\text{-}min)}$ morning shoulder
R2	38	35	36	
R3	38	35	37	
R4	39	36	37	
R5	39	36	38	
R6	39	36	37	
R7	40	37	38	
R8	39	36	38	
R9	40	37	38	
R10	40	37	38	
R11	39	37	38	
R12	39	37	38	
R13	39	37	38	
R14	40	37	39	
R15	40	38	39	
R16	40	37	39	
R17	39	36	38	
R18	38	35	38	
R19	38	35	37	
R20	37	35	37	
R21	37	34	37	
R22	40	37	**40**	

The loading and/or unloading of trucks during the morning shoulder period was assessed. Typical maximum noise events are likely to include impacts associated with loading activities. A typical impact L_{Amax} sound power level of 126 dB has been used to predict potential sleep disturbance impacts, which are summarised in Table 6.8.

Table 6.8 Predicted maximum noise levels at residential assessment locations

Assessment locations	Predicted L_{Amax} noise level, dB		L_{Amax}, noise criterion, dB
	Calm	Inversion	
R1	52	54	46
R2	53	55	
R3	53	55	
R4	53	54	
R5	53	55	
R6	54	55	
R7	53	54	
R8	53	54	
R9	56	57	
R10	54	56	
R11	54	56	

Table 6.8 Predicted maximum noise levels at residential assessment locations

Assessment locations	Predicted L_{Amax} noise level, dB		L_{Amax}, noise criterion, dB
	Calm	Inversion	
R12	54	55	
R13	54	55	
R14	53	55	
R15	53	54	
R16	52	53	
R17	51	53	
R18	51	52	
R19	50	52	
R20	50	52	
R21	49	51	
R22	55	58	

Noise modelling predicts that the INP sleep disturbance screening criteria will not be met during calm and prevailing meteorological conditions. However, the RNP provides the following conclusion from the research on sleep disturbance:

> maximum internal noise levels below 50 to 55 dB(A) are unlikely to awaken people from sleep

It is widely accepted in the noise assessment profession that a facade including a partially open window will reduce external noise levels by 10 dB. The highest predicted external maximum noise level from site is 58 dB under adverse weather conditions. Therefore, internal noise will be below the above range provided by the RNP and the project is unlikely to disturb the sleep of nearby residences during the shoulder period.

An assessment of cumulative industrial noise from the proposal together with other industrial noise sources in the vicinity was also conducted. The project is not predicted to increase industrial noise levels above the relevant amenity criteria.

The proposal will result in additional traffic movements however the increase will be minor in comparison to existing traffic volumes and the overall increase in road traffic noise level at residences will be negligible.

6.5 Water

6.5.1 Water assessment

A water management report, including an erosion and sediment control plan and stormwater concept plan, has been prepared for the proposal by National Project Consultants Pty Limited (NPC) (refer to Appendix G).

The site will be graded so that all surface water will flow overland to the onsite detention/sedimentation basin/control device in the north eastern corner. As the site is completely bounded by a concrete kerb, water can only exit the site and enter the industrial precinct's stormwater scheme via the onsite detention/sedimentation basin/control device. The onsite detention/sedimentation basin/control device will cater for flows up to the 10 year ARI storm, as required by relevant council guidelines. Flows from more severe storms will flow overland to the onsite detention/sedimentation basin/control device. Water stored in the onsite detention/sedimentation basin/control device will be reused onsite for dust suppression purposes.

6.5.2 Management measures

Design features to prevent impacts to groundwater include:

- there will be no significant excavations within the site;
- a shed will be used to house the majority of the processing activities, preventing generation of runoff from these activities;
- the diesel storage tank will be bunded;
- surface water captured within the runoff management system will be used for dust suppression so that less mains water is required for this purpose;
- the site will be sealed to minimise the requirement for dust suppression using water;
- groundwater will not be used; and
- water will not be used in the product processing, other than for dust suppression.

Site runoff controls will include:

- the site surface will be sealed;
- a sediment trap will be properly maintained so that particulate matter is not discharged to the stormwater system;
- the proposed sedimentation basin in the north-eastern corner of the site;
- a flocculent will be used in the sedimentation basin if necessary;
- the site dust suppression system will preferentially draw from the onsite detention/sedimentation basin/control device first, keeping it nearly empty so as to provide the maximum first flush volume;
- flows from the final onsite detention/sedimentation basin/control device will be controlled to ensure that poor quality water is not discharged from site; and
- the weighbridges, office and amenities blocks will be connected to mains sewer and water.

These management measures and water quality monitoring are included in Table 7.1.

6.5.3 Surface water impacts

The average annual runoff volume from the site under existing conditions has been estimated at approximately 1847 m^3.

Average annual rainfall for the site is about 769 mm. The estimated volume of runoff available following the development of the site is about 3,697 m^3 per year. Water used for dust suppression will reduce runoff from the site by 76% (or about 1410 m^3 of runoff per year) and as such the average annual runoff volume from the site will be approximately 2287m^3.

Runoff water quliaty is controlled across the site in accordance with industry best practove guidelines know as the blue book. The blue book recommends a range of other sediment control measures which link to the sediment control basin. The sediment control basin is will be utilised to control the quality of runoff water leaving the site. Discharge from the site will be controlled by the outlet chamber and pipeline in the sedimentation device.

Water Sharing Plans consider that sedimentation basins are to be accounted in the maximum harvestable right on a site. A water licence can be required if basins extract more than 10% of the mean annual runoff from the property. These sharing plans are generally relevant to catchments supplying runoff to ephermal freshwater creeks which rely on runoff to maintain aquatic and riparian ecosystems and are not considered applicable to the proposal.

6.5.4 Groundwater impacts

A groundwater assessment was undertaken by EMM (refer to Appendix H). Ground excavations for the proposal, including footings and an onsite detention/sedimentation basin/control device are expected to be less than 2 m in depth .These excavations are expected to be shallower than the depth to groundwater in the shale, ie 3.2 m below ground level (BGL), and therefore impacts to groundwater in the uppermost competent rock are not expected.

The site will be sealed and this will prevent potential contamination from entering the groundwater. The reduction in potential groundwater recharge volume from the capture of runoff is considered negligible in the context of the catchment area.

6.6 Flooding

A small protion of the of the site, near north-east the Anderson Road frontage is subject to flooding and affected by Camden Council's flood planning level. It is not proposed to build on this part of the site. Plans of the proposed development have been reviewed by Camden Council and the Council are satisfied that the proposal complies with the relevant flood controls (refer Section 5.5). The water management report prepared for the proposal indicates that the proposed development conforms to the council and state government flood management requirements. Drainage channels in the subdivision have capcity to convey the 100 year ARI flood flow with freeboard.

6.7 Soils and contamination

In accordance with Section 3.3.2iv, due consideration of potential contamination of the site was required at both the rezoning and subdivision approvals phase. It is considered therefore that if the land had been contaminated, sufficient remediation would have been undertaken to render it useable for industrial purposes.

Notwithstanding, the majority of the site will be sealed and there will be minimal soil disturbance during the construction of the waste recycling and transfer facility. No significant ground excavation is required, with ground disturbance restricted anchors for the demountable office and fence foundations.

6.8 Bushfire

A bushfire hazard assessment (BHA) was prepared for the proposal by EMM (refer to Appendix I) in accordance with the NSW Rural Fire Service's *Planning for Bush Fire Protection Guideline* (RFS 2006) (PBP). It considers the bushfire hazard associated with the proposal and describes mitigation measures, in accordance with Appendix 4 of the PBP (submission requirements for SSDAs on bushfire prone land).

6.8.1 Bushfire management measures

- A solid fence will be constructed along the part of the south and the majority of the south-east boundary to provide noise shielding for nearby residential development. This fence will be between the site and the bushfire hazard vegetation and will provide some shielding of the diesel tank from radiant heat, ember attack and the spread of fire in the understorey if there is a fire in the vegetation;
- the diesel tank which will be installed in accordance with *Australian Standard 1940:2004 The Storage and Handling of Flammable and Combustible Liquids* and will be fully enclosed in a colourbond shed;
- sealed entry and exit driveways off Anderson Road will be constructed to accommodate vehicles over 15 tonnes such as fire fighting vehicles. They will have a minimum vertical clearance of 4 m to any overhead obstructions including branches;
- maintenance of the landscaping at the front of the site within the APZ as follows:
    - canopy cover will be kept at less than 15% of total surface area and will be kept at least 2 m from the roof line of a building;
    - garden beds and shrubs will not be located under trees and sited at least 10 m from any exposed windows or doors; and

- lower limbs of trees up to 2 m above the ground will be removed;

- water, gas and electricity services will be located and installed in a manner that reduces the potential for them to contribute to fire hazard;

- water for fire fighting will be provided to the project as follows:

  - existing fire hydrants in Anderson Road;

  - fire hydrants in the shed; and

  - extinguishers and fire hydrant at the office building.

- the following requirements from Chapter 4 of PBP will be applied to water infrastructure:

  - above ground pipes external to structures in the APZ will be metal including and up to taps; and

  - fire hydrants at buildings will be spaced, sized and pressured in accordance with Australian Standard 2419.1-2005 Fire Hydrant Installations – System Design, Installation and Commissioning.

- electricity and gas services will be located so they do not contribute to the risk of fire to a building. The following guidelines will be followed during detailed project design (from Chapter 4 of PBP):

  - it is preferable to place electrical transmission lines underground. However, If overhead electrical transmission lines are to be used, they will be installed and managed in accordance with Ausgrid (2010) *NS179 Vegetation Safety Clearances*;

  - *AS/NZS 1596:2008 The Storage and Handling of LP Gas* will be followed for bottled gas installation and maintenance. Metal piping will be used;

  - there will be a minimum 10 m distance between fixed gas cylinders and flammable materials and shielding will be placed on the hazard side of the cylinders; and

  - release valves on gas cylinders close to buildings will be directed away from the building and minimum 2 m from combustible material. Metal connections will be used.

6.8.2 Impacts of bushfire mitigation measures

A section of the proposed infrastructure/plant will be on bushfire prone land and measures which ensure that the proposal complies with the objectives of the PBP. Specifically, an APZ will be provided and managed to enable fire fighter access, passage for evacuees and to reduce radiant heat at proposed buildings. The risk of the proposal initiating a bushfire will be minimised through the implementation of management measures.

6.9 Visual

6.9.1 Introduction

This section provides an assessment of the potential visual impact of the proposal. It assesses the potential visual impacts of the proposed waste recycling and transfer facility on the amenity of the surrounding area as required by the Secretary's environmental assessment requirements (SEARs).

6.9.2 Visual character

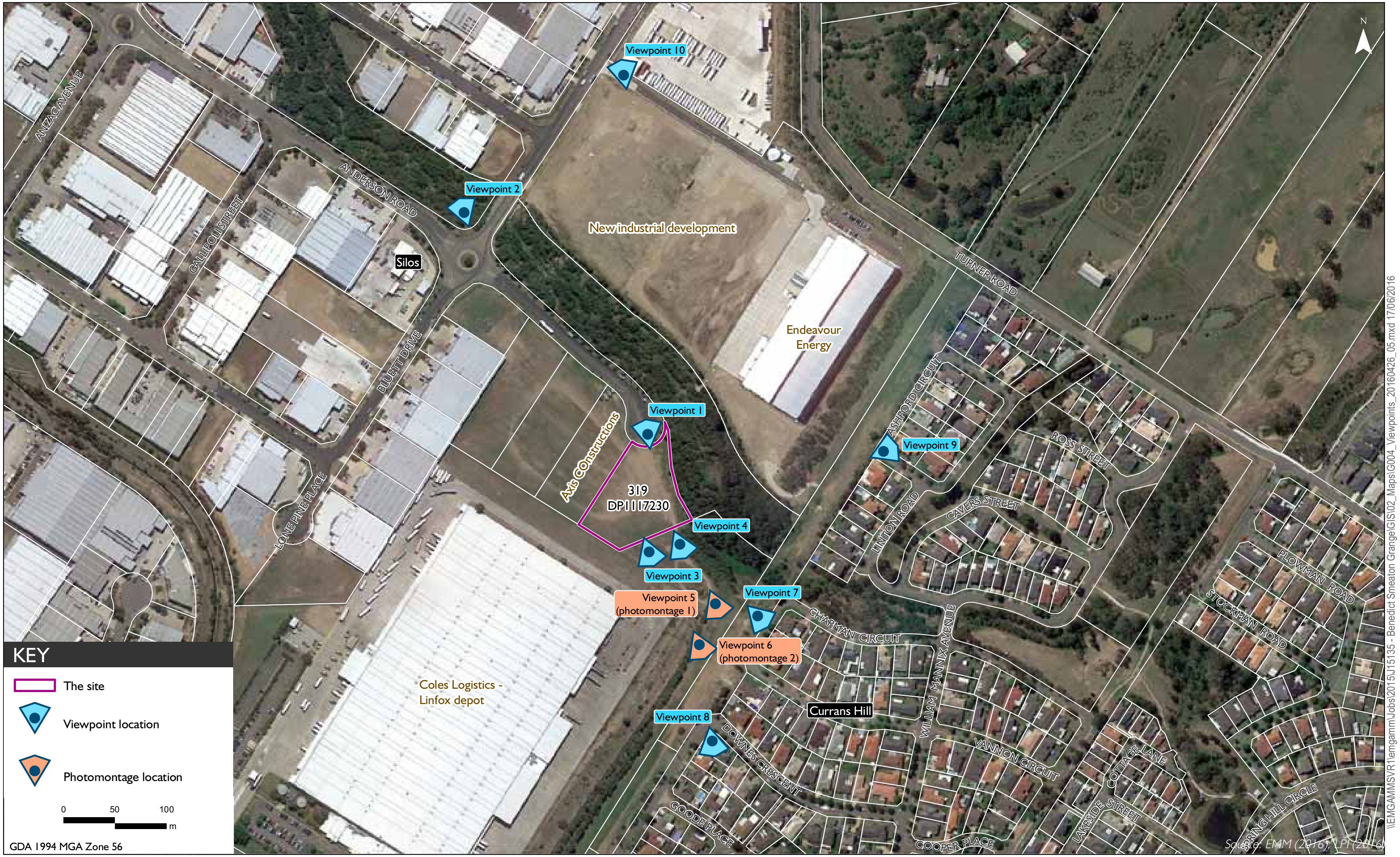
The visual character of the surrounding land to the north, south and west is predominantly industrial, as the site is located within the Smeaton Grange industrial estate. The dominant visual feature in the vicinity is large industrial buildings, including the Coles depot south-west of the site. There are two silos located on the southwest corner of Anderson Road and Bluett Street which are visually prominent due to their height.

The vegetated corridor running along the eastern side of Anderson Road provides a screen between land to the east and west of Anderson Road and form a break in the industrial landscape.

While the site itself is flat, there is a rise across the vacant land at the rear of the site, with a tree lined ridgeline that then slopes down again across a north-east to south-west electricity easement. The closest residential area is Currans Hill, located approximately 120 m from the site, on the far side of the easement.

6.9.3 Viewpoints

A series of viewpoints has been selected in order to assess the potential visual impacts of the proposal on the amenity of the area. These are provided in Photographs 3.1–3.10 and their locations are shown in Figure 6.2.



Location of viewpoints and photomontages

Smeaton Grange

Benedict Industries

Figure 6.2

EMM

Viewpoint 1 View into the site from Anderson Road

Viewpoint 2 View south-east to the site along Anderson Road

The site is visible from Anderson Road (Viewpoint 1), however from the west of the intersection with Bluett Street views become increasingly screened due to the vegetated corridor and other industrial development (Viewpoint 2).

The landscaping and a 2.1 m high colourbond fence and automated gates (included in the site establishment works) will enhance the visual appearance of the site from the public domain and limit views into the site, with clear internal views only possible when the gates are open. Elements of the site, including the upper section of the shed, will be visible above the front fence and gates. However, the bulk and scale of the building will be keeping with surrounding industrial development.

The external stockpiles, up to 5 m in height, will be located along the rear (southern) site boundary. The tops of these stockpiles may just be visible from Anderson Road prior to full establishment of landscaping. The external stockpiles will contain concrete (or similar) or wood and will be brown-grey when viewed from a distance. Any visual impacts of the stockpiles will be variable (as stockpiles will be constantly changing) and not significant.

Co-mingled and other waste stockpiles that may contain a range of colours will be located within the shed and significantly less visible from Anderson Road, if at all.

Viewpoint 3 **View north-west into the site from rise adjacent southern site boundary**

Viewpoint 4 **View looking north-west from midway up the informal road at the rear of the site**

Viewpoints 3 to 5 depict views into the site from the rise outside the southern boundary of the site. These views show that unobstructed views to the site are possible from the south and south-west. Further to east the view becomes further obstructed by vegetation so that by the western edge of the easement, views to the site are increasingly obscured.

Views of the southern boundary fence, shed walls and shed roof will be possible however the 10m high fence will mean that internal views will not be possible from these viewpoints. The south elevation will present a view that is in keeping with the Coles development adjacent the site.

Viewpoint 5 **View looking north-west towards the site**

Photomontage 1

Two photomontages have been prepared for the proposal, from Viewpoints 5 and 6. Photomontages were only produced for these two Viewpoints as the proposed development is not visible from Viewpoints 7 to 10 and the other viewpoints at the rear of the site provide a similar view to that provided in viewpoints 5 and 6.

Photomontage 1 demonstrates that the 10 m high fence and shed are visible from the south of the site, but only to the west of the easement. From Viewpoint 5, the view of the development is filtered by existing vegetation.

Viewpoint 6 **View north-west into the site from the Coles rear boundary**

Photomontage 2

Views of the site are possible from the eastern corner of the Coles site, as this viewpoint (Viewpoint 6) is elevated above the site. While this viewpoint is accessible by the public, it is not in close proximity to any public access way or to any dwellings and is most likely seldom accessed.

Photomontage 2 demonstrates that the proposal is similar in height and scale to surrounding industrial development, although it is noted that it does not extend as far to the southwest as development on the adjacent Coles site. The visual impact is lessened by the colour of the colourbond to be used for the fence and shed cladding.

Further, internal views of the site will be prevented by the rear wall and roof of the 10 m high shed (the maximum roof height is 11 m however this is along the internal northern side of the shed, and not on the boundary).

Viewpoint 7 **View north-west from eastern side of easement (adjacent residential development)**

Viewpoint 8 **View north-west from residence on corner of Downes Crescent, Currans Hill**

Currans Hill is the closest residential area to the site, located at least 120 m from the nearest point of the site. The topography of the area restricts views between the Smeaton Grange industrial estate and nearby residences. The site is relatively flat, with a rise in elevation at the rear of the site, across a vacant property at the rear (which forms part of the adjoining Coles lot). From the vegetated ridgeline, the land slopes gently downwards towards residential development on the far side of the easement.

Viewpoints 7 and 8 are from residential development in Currans Hill towards the site. As can be seen, any views to the site are restricted by vegetation and topography. It is anticipated that there will not be views of the proposal from the lower storeys or gardens of residential properties. Notwithstanding, if any views were possible from upper stores, they would be limited to the rear of the shed and boundary fence which are in keeping with the adjacent Coles development and other industrial development within the industrial estate.

Viewpoint 9 **View south-west to site from vegetation to the north of the vegetated corridor**

Viewpoint 9 provides a view looking south-west from the residential area on the corner of Ashford Circuit in Currans Hill to the easement. The vegetated corridor in the distance and new landscaping within the adjacent industrial site (to the west) prevent any views into the site.

Viewpoint 10 **View south to the site across vacant industrial land on far side of vegetated corridor**

A view south towards the site from undeveloped industrial land on the northern side of the vegetated corridor is shown in Viewpoint 10. The silos, located on the southwest corner of Anderson and Bluett Streets, can be seen to the right. Views to into the site are obscured by the vegetated corridor. Even if limited views into the site are possible from upper storeys of future industrial development, the proposal is in keeping with the industrial character of the area and any views would be distant and from within the industrial estate.

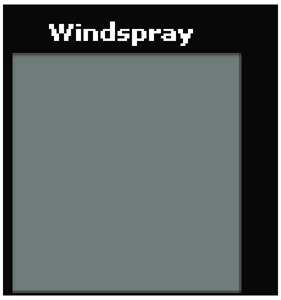
6.9.4 Management measures

Management measures that will be implemented during construction and operations to minimise visual impacts will include:

- the construction of a colourbond boundary fence, to a height of 10 m that will restrict any external views into the site. It is anticipated that the fence will have the appearance of a regular industrial building, such as the Coles to the south-west of the site;

- the colourbond fence will be coloured 'windspray'. A sample of the 'windspray' is provided in Figure 4.1. This colour has been specifically chosen as it is a non-reflective, natural colour that is used commonly throughout the Smeaton Grange industrial estate; and

- the site entrance on Anderson Road will be landscaped and the area will be kept tidy.



Source: *Colourbond roofing colour chart*

Figure 6.3 Colourbond colour sample

6.9.5 Visual impact assessment

The proposal is unlikely to have significant visual impacts given that it is located within an existing industrial estate and is consistent with the visual character of the area. External views of the colourbond shed and fence will be possible from some viewpoints however, no internal views of the site will be possible, except for from the Anderson Road site frontage if the gates are open. Further, except for the driveways and visitor parking, the entire frontage will be landscaped.

While some viewpoints will provide full and/or partial views of the proposed shed walls/fence, these comply with the maximum height requirements for the area, will be constructed in 'colour' Coulourbond (a non-reflective, natural colour) and are characteristic of other industrial developments nearby and within the broader Smeaton Grange industrial estate.

Therefore, no loss of visual amenity is expected as a result of the proposal.

6.10 Socio-economic

The recycling sector is economically important and unique as it provides resources or inputs to a range of industries without depleting natural resources. This constitutes a significant distinction between recycling and waste management activity, such as landfill disposal.

The direct socio-economic benefits of the proposal include the full time employment of eight persons in the waste recycling and transfer facility and potentially more for ancillary activities. These persons will be sourced from the local area, where possible, to help alleviate local unemployment.

In addition to the provision of employment, recycling can create a sense of civic pride and satisfaction felt through participation in recycling; and an improved natural resource base for future generations due to higher recycling uptake.

Other socio-economic benefits of industrial development of within the Smeaton Grange industrial estate include:

- stronger regional industrial activity; and
- utilisation of suitable industrial land and resources.

Social amenity impacts of the proposal, including noise, air quality, and visual impacts, are discussed in Chapter 6.

7 Statement of commitments

A site specific EMP, to be required as a condition of consent, will be prepared for the proposal that incorporates the site specific measures summarised in Table 7.1. All Benedict staff will be trained to understand and implement the EMP as it relates to the tasks that they are undertaking.

Table 7.1 Summary of mitigation measures to be included in the EMP

Key issue	Management measure
Air quality	Management measures that will be implemented during construction and operations to minimise air quality impacts will include: • Construction: – record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken; – record any exceptional incidents that cause dust and/or air emissions, either on or off site, and the action taken to resolve the situation in the log book; – carry out regular site inspections, record inspection results, and make an inspection log available to the local authority when asked; – impose a maximum-speed-limit of 20 km/h on all internal roads and work areas; – minimise idling vehicles onsite, wherever practicable; – ensure proper maintenance and tuning of all equipment engines; – ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; and – provide an adequate water supply on site for effective dust/particulate matter suppression/mitigation. • Operations: – all existing sealed areas must be maintained; – water sprays will be used over any other bare surfaces that have potential to generate unacceptable amounts of dust; – water sprays will be used at stockpiles, operational areas and the screening plant during material handling; – a wheel wash in the weighbridge area will be used to clean truck tyres to prevent mud or sediment being carried to and deposited on the access road (and public roads); – dust generating activities will be generally undertaken within the main shed; and – no composting will be undertaken on the site.
Greenhouse gases	Management measures that will be implemented during construction and operations to minimise greenhouse gas emissions will include: • on-site equipment will be regularly maintained and serviced to maximise fuel efficiency; • vehicle kilometres travelled on site will be minimised; and • energy efficiency will be progressively reviewed and implemented throughout the life of the facility.
Noise	Management measures that will be implemented during operation to minimise noise impacts will include: • no processing (ie sorting and screening) between 10 pm and 6 am; • choosing quieter plant and equipment, including installing best-practice noise suppression equipment, based on the optimal power and size to most efficiently perform the required tasks; • plant with high noise emissions will generally be located inside the shed; • plant and equipment will be regularly maintained and serviced; • low-frequency reversing alarms (“growlers”) will be used rather than the standard high frequency beepers;

Table 7.1 Summary of mitigation measures to be included in the EMP

Key issue	Management measure
	• a site layout has been adopted that minimises the need for mobile plant to reverse; • plant and equipment will be switched off when not in use; • any vehicle queuing will be on site rather than on public roads; • material drop heights will be minimised and dragging materials along the ground will be minimised; • site contact details will be provided on a board at the front of the site; • any noise-related complaints will be handled promptly; and • a complaints register will be maintained.
Visual	Management measures that will be implemented during construction and operations to minimise visual impacts will include: • this site will be colourbond fenced on the boundaries; and • the visual appearance of the site entrance on Anderson Road will be landscaped and kept tidy.
Water	Features to prevent impacts to groundwater include: • no significant excavations within the site; • existing sheds will be used to house the majority of the processing activities, preventing generation of runoff from these activities; • bunded fuels storage area; • sheds and the segregated heavy waste stockpiling and processing area will be outside of major overland flowpaths; • surface water captured within the runoff management system will be used for dust suppression so that mains water is not required for this purpose; • the majority of the site will be asphalt sealed to minimise the requirement for dust suppression using water (see Section 2.10.1); • groundwater will not be used; and • water will not be used in the product processing, other than for dust suppression. The site runoff controls will include: • a concrete perimeter kerb to keep runoff from entering and leaving the site; • an onsite detention/sedimentation basin/control device on site and remove sediment; and • flows from the sediment device will be controlled to ensure that poor quality water is not discharged from site.

Table 7.1 Summary of mitigation measures to be included in the EMP

Key issue	Management measure
Bushfire	In order to maintain APZs, the landscaping vegetation will be maintained as follows: • canopy cover will be kept at less than 15% of total surface area and will be kept at least 2 m from the roof line of a building; • garden beds and shrubs will not to be located under trees and sited at least 10 m from any exposed windows or doors; and • lower limbs of trees up to 2 m above the ground will be removed. Services including Water, gas and electricity services will be located and installed in a manner that reduces the potential for them to contribute to fire hazard. Water for fire fighting will be provided as follows: • existing fire hydrants in Anderson Road; • fire hydrants in the shed; • extinguishers and fire hydrant at the office building; and The following requirements from Chapter 4 of PBP will be applied to water infrastructure: • above ground pipes external to structures in the APZ will be metal including and up to taps; • pumps in the APZs will be shielded; and • Fire hydrants at buildings which will be spaced, sized and pressured in accordance with *Australian Standard 2419.1-2005 Fire Hydrant Installations – System Design, Installation and Commissioning*. In relation to the diesel tank: • the diesel tank which will be installed in accordance with *Australian Standard 1940:2004 The Storage and Handling of Flammable and Combustible Liquids* and will be fully enclosed in a colourbond shed.
Contamination	In the event of encountering suspected contaminated land, the area should be left undisturbed until a suitably qualified consultant can assess the area in question and provide appropriate mitigation measures identified if required.
Diesel spill	<u>Prevention</u> Overfilling of tanks will be prevented through gauging or monitoring of the tank's contents. Tanks, vents and fittings will be inspected regularly and valves will be regularly overhauled (at periods not exceeding 10 years). Hoses used for transfer of diesel, these will be regularly inspected. <u>Protection</u> The diesel tank will be self-bunded. The bund will be large enough to contain a spillage in accordance with the requirement of AS1940 para 5.8. The bund drain valve will be kept closed and locked except during supervised drainage, and a sign will be placed to display the need to keep the drain valve closed and locked. Provision will be made to quickly shut off the flow of liquid from the storage tank to a consuming device in an emergency. The shut off valve will comply with para 6.3.3 in AS1940, including resistance in a fire. Diesel pumps will be designed such that the discharge pressure cannot exceed design limit of pump or piping in the case of dead heading (shut-off at the pump discharge). An emergency shut-off device will be provided on each pump. There will be a diesel spill kit stored at the bowser. <u>Detection</u> Regular inspections by site personnel will be undertaken. Any liquid inside the bunded areas, such as rain water or any spilt liquid, will be removed following established procedures.

8 Conclusion and justification

8.1 Introduction

This chapter provides justification for the carrying out of the proposal against the principles of ecologically sustainable development (ESD). It also discusses the suitability of the site, any submissions made and whether the proposal is in the public interest as required by Section 79C(1)(c)–(e) of the EP&A Act.

Justification for the proposal based on biophysical, economic and social considerations is provided in Section 1.4.1.

8.2 Principles of ecologically sustainable development

The principles of ESD are defined in Clause 7(4) of Schedule 2 to the EP&A Regulation and include the following:

(a) the 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,

(b) inter-generational 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,

(c) conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

(d) improved valuation, pricing and incentive mechanisms, namely, that 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,

(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.

Consideration of the proposal against the four principles of ESD is given below.

8.2.1 The precautionary principle

Consideration of the precautionary principle requires two things. First, that the proponent properly assesses all potential impacts using plausible worst case assumptions and, either, avoids them in project planning or incorporates effective safeguards into the project design. Second, that the relevant authorities make a well-informed decision about the project based on a sound knowledge of the project's implications and impacts, including any limitations on the accuracy of impact predictions.

There are no "threats of serious or irreversible damage" from the proposal and the project's planning and design meets the first test above. The design and management measures incorporated as 'safeguards' are described in Chapters 2 and 6 this EIS. The Statement of Commitments (Chapter 7), summarises the key measures that will be implemented under the proposal to avoid, manage or mitigate predicted environmental impacts.

The second test will be satisfied by the comprehensive decision-making processes to be followed by the government, including the JRPP (or GSC depending on timing).

8.2.2 Inter-generational equity

The proposal will recycle waste materials that would otherwise be sent to lower order uses of landfill. The proposal will therefore extend the benefits provided by existing landfills for current and future generations. The recycled materials will largely be used in construction projects that will also benefit current and future generations.

8.2.3 Conservation of biological diversity and ecological integrity

The ecological integrity of the site is poor given its location within an existing industrial area on land that has previously been used for agricultural purposes. The site is devoid of vegetation other than grass and the proposal will not impact any threatened biodiversity on the site.

8.2.4 Improved valuation, pricing and incentive mechanisms

The proposal will use waste diverted from landfill to produce construction materials containing recycled material that have economic value. This will avoid the economic (and environmental) cost of disposing of the materials to landfill and, therefore, incorporates improved valuation, pricing and incentive mechanisms.

8.3 Suitability of the site

As described in Section 1.4, the site is considered suitable for the proposed activities given that it is within an industrial area, has existing site access and infrastructure. Suitable boundary treatment will screen the proposed operational activities. The proposal will secure and make use of an existing vacant industrial site.

8.4 Submissions made

The EIS for the proposal will be placed on public exhibition for a determined period of time. During this period, the public will be invited to provide submissions on the proposal. These submissions will be considered by CC and the determining authority in their determination of the proposal.

8.5 Public interest

The proposal is considered to be in the public's interest for the following reasons:

- the proposal provides a suitable use for an existing industrially zoned site;
- the proposal will provide socio-economic benefits through employment and stronger regional industrial activity;
- the materials received onsite will be recycled to minimise waste sent to landfill and to provide material suitable for construction projects and other purposes; and
- the proposal's environmental and social amenity impacts will be negligible with the implementation of the recommended mitigation and management measures.

8.6 Conclusion

There is currently only one other waste facility in a region which is experiencing unprecedented residential and commercial growth, in turn creating a significant demand for recycling services. The proposed waste recycling and transfer facility will accept waste from councils, businesses and the general public and would complement the activities of the Spring Farm ARRT, allowing additional waste generated in the region to be recycled, reducing the region's existing sole reliance on Spring Farm for waste transfer and recycling services. The waste recycling and transfer facility would therefore contribute to meeting the NSW Government's recycling strategies and targets.

The site is zoned IN1 General Industrial under the Camden LEP 2010 and the proposal is permissible with consent.

Benedict Recycling has entered into a JV agreement with the landowner to purchase the site with the sole purpose of developing a waste recycling and transfer facility. The site is ideally suited for the development of a waste recycling and transfer facility because it is: in an industrial area centrally located in the Narellan area; readily accessible to light and heavy vehicles; distant from residences; is devoid of vegetation, flat and ready to develop with services already in the industrial site. Development of the proposal will provide an ongoing economic and social benefit from a site that is only suitable to a small range of uses.

This EIS has been prepared in accordance with the SEARs, Clauses 71 and 72 of the EP&A Regulation and advice provided by CC following the pre-DA meeting. It describes the existing environment, the proposal, the legislative and policy context, proposed environmental management measures and the impacts of the project. Given the location and condition of the site, and the proposed environmental management measures incorporated, the proposed activities will only have minor environmental impacts.

It is therefore recommended that the proposed waste recycling and transfer facility is approved subject to the mitigation measures outlined in this EIS.

Abbreviations

APZ	Asset protection zone
ARI	Average recurrence interval
ARRT	Advanced Resource Recovery Park
CC	Camden Council
CP Act	*Coastal Protection Act 1979*
DA	Development application
DCP	Development Control Plan
DPE	Department of Planning and Environment
DPI	Department of Primary Industries
EIS	Environmental impact statement
EMM	EMM Consulting Pty Ltd
EP&A	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environment protection license
ESD	Ecologically sustainable development
GHG	Greenhouse gases
LEP	Local Environmental Plan
JV	Joint venture
LGA	Local government area
LOSP	Light organic solvent preservative
LPG	Liquid petroleum gas
mAHD	Australian Height Datum
MNES	Matter of national environmental significance
NSW	New South Wales
OEH	Office of Environment and Heritage
PAC	Planning assessment commission
PHA	Preliminary hazard analysis
POEO Act	*Protection of the Environment Operations Act 1997*
RDF	Refuse derived fuel
RMS	Roads and Maritime Services
RNP	Road Noise Policy
RTA	Roads and Traffic Authority
SEARs	Secretary's Environmental Assessment Requirements
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SSD	State Significant Development
TSP	Total suspended particulates
VNEM	Virgin natural excavated material
WMP	Waste Management Plan
WM Act	*Water Management Act 2000*

References

Camden Council 2013, Camden Council (bushfire) mapping.

Department of Environment (DoE, 2015), *National Greenhouse Accounts Factors* (NGAF) workbook.

Department of Planning (DoP) 2011a, *State Environmental Planning Policy No. 33 - Hazardous and Offensive Development and Applying SEPP 33*.

- 2011b, *Hazardous Industry Planning Advisory Paper No.6 - Guidelines for Hazard Analysis*.

- 2011c, Hazardous Industry Planning Advisory Paper No 4: Risk Criteria for Land Use Safety Planning guidelines.

Department of Planning and Infrastructure (DP&I) 2011, *Multi-level Risk Assessment*.

Environment Protection Authority (EPA) 2013, Waste Less, Recycle More: A Five-year $465.7 million Waste and Resource Recovery Initiative.

- 2014a, NSW Waste Avoidance and Resource Recovery Strategy 2014–21.

- 2014b, Waste Classification Guidelines Part 1: Classifying Waste.

.id 2011, The top 20 fastest growing suburbs in NSW, 2011-2021, viewed March 2016, *http://home.id.com.au/services/population-forecasting-safi/*)

National Transport Commission 2007, *Australian Code for the Transport of Dangerous Goods by Road and Rail.*

NSW Rural Fire Service 2006, *Planning for Bush Fire Protection Guideline.*

NSW WorkCover 2010, *Management of Asbestos in Recycled Construction and Demolition Waste Guide.*

WorkCover NSW not dated, *Hierarchy of Hazard Controls.*

Appendix A

Pre-Development Application meeting 136/2015 minutes, 9 December 2015

Camden Council
37 John Street, Camden NSW 2570 DX 25807
PO Box 183, Camden 2570 ABN: 31 117 341 764
Telephone: 02 4654 7777 Fax: 02 4654 7829
Email: mail@camden.nsw.gov.au

JMES

9 December 2015

CDA Architects
L2 60 Park Street
Sydney NSW 2000

Dear Jacob,

RE: Pre-Development Application Meeting 136/2015

PROPERTY: 52 Anderson Road, Smeaton Grange
LOT: 319 DP: 1117230

I refer to the above pre-development application meeting which was held on 7 December 2015. Council staff raise the following matters that should be addressed by the applicant and assessed as part of the state significant development application:

Proposed Development

1. Proposed recycling facility for non-putrescible waste

Zoning

The land is zoned IN1 – General Industrial pursuant to *Camden Local Environmental Plan 2010*. The proposed development is defined as a "general industry" which is permissible in the zone.

Town Planning Advice

1. The proposal must be assessed in detail against the following environmental planning instruments and development control plans:

- State Environmental Planning Policy (State and Regional Development) 2011;
- 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;
- Deemed State Environmental Planning Policy No. 20 – Hawkesbury-Nepean River;
- Camden Local Environmental Plan 2010; and,
- Camden Development Control Plan 2011.

2. The proposed works are located within 40m of a watercourse. A Controlled Activity Approval pursuant to section 91 of the *Water Management Act 2000* is required.

Therefore, this development is classed as Nominated Integrated Development and requires a referral to Department of Primary Industries Water for their general terms of approval.

3. The proposed development is Integrated Development as the scheduled activities require a licence pursuant to section 48 of the *Protection of the Environment Operations Act 1997*. A referral to the NSW Environment Protection Authority is required for their general terms of approval.

4. Council notes that the maximum building height for the site is 11m pursuant the Camden Local Environmental Plan 2010.

5. The front setback shall be 10 metres of which 5 metres must be utilised for landscaping in accordance with section D4.5.2 of the Camden Development Control Plan 2011.

6. The subject land is bushfire affected. A bushfire report is required to be prepared by a suitability qualified bushfire consultant which demonstrates consideration and management of bushfire in accordance with the NSW RFS publication ‘Planning for Bushfire Protection’ 2006.

7. The proximity to the riparian corridor and bushland raises bushfire risk and there is a requirement for an Asset Protection Zone (APZ).

8. Front fencing shall be designed to complement the development and form an important security role. The maximum height of all fencing is 2.1m. Fencing shall be in accordance with section D4.2.5 of the Camden Development Control Plan 2011.

9. The proposed use is located in close proximity to a residential zone (approximately 120m to the nearest resident). In that regard, an acoustic assessment of the proposal, prepared in accordance with Council’s Environmental Noise Policy, must be prepared.

10. The proponent shall also have regard to air quality and odour impacts projected from the proposed use.

11. Consideration should be given to the location of future signage for the development. Signage zones should be identified as part of the proposal with their overall placement and design integrated into the overall design.

<u>Traffic Advice</u>

1. A traffic and parking report that assesses the traffic impacts of the proposed parking for the proposal upon the surrounding road network must be prepared.

2. Queuing of vehicles within the cul-de-sac is not permitted. Consideration of the weighbridge location is required to avoid queuing and should be addressed within the traffic report.

3. Carparking is required to be located behind the building line.

Engineering Advice

1. A stormwater management report must be prepared. This report must demonstrate a satisfactory design for stormwater management, including quantity and quality control, in accordance with Council's Engineering Specifications.

2. Swept path diagrams must be prepared to account for the largest vehicle for service entry.

3. In accordance with Camden DCP 2011, D4.4 Parking and Access – *a maximum of one access driveway is permitted per lot frontage where the frontage is less than 60m.* Given the nature of the site frontage being a cul-de-sac head, the construction of two vehicle crossing may be considered.

4. Vehicle crossovers to be in accordance with Australian Standards AS2890 and Council's Engineering Design Specifications.

Waste Management

1. A construction and operational waste management plan (WMP) must be prepared. The WMP must address waste types, generation rates, storage, collection and disposal.

Should you have any enquiries in relation to this matter, please do not hesitate to contact the undersigned on (02) 4654 7777.

Yours sincerely,

J. Mesiti

Ms J Mesiti
Town Planner
(Development Branch)

Appendix B

Secretary's Environmental Assessment Requirements 16 December 2015

NSW GOVERNMENT | Planning & Environment

Contact: Kate Masters
Phone: (02) 9228 6321
Fax: (02) 9228 6466
Email: kate.masters@planning.nsw.gov.au

Mr Ernest Dupere
Benedict Recycling Pty Ltd
PO Box 431
Frenchs Forest NSW 1640

Dear Mr Dupere

State Significant Development – Secretary's Environmental Assessment Requirements Smeaton Grange Recycling Facility (SSD 7424)

Thank you for your request for Secretary's environmental assessment requirements (SEARs) dated 2 December 2015 for the preparation of an Environmental Impact Statement (EIS) for the above mentioned development proposal.

The attached SEARs have been prepared in consultation with the relevant government authorities (see **Attachment 2**) and are based on the information you have provided to date. The Department will forward comments from Camden City Council and the Department of Primary Industries under separate cover when they become available. Please note that the Secretary may alter these SEARs at any time and that you must consult further with the Secretary if you do not lodge a development application and EIS for the development within two years of the date of issue of these SEARs.

I wish to emphasise the importance of effective and genuine community consultation and the need for proposals to proactively respond to the community's concerns. Accordingly a comprehensive, detailed and genuine community consultation and engagement process must be undertaken during preparation of the EIS. This process must ensure that the community is both informed of the proposal and is actively engaged in issues of concern to it. Sufficient information must be provided to the community so that it has a good understanding of what is being proposed and of the potential impacts.

If your development is likely to have a significant impact on matters of National Environmental Significance, it will require an approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This approval would be in addition to any approvals required under NSW legislation and it is your responsibility to contact the Department of Environment to determine if an approval under the EPBC Act is required (http://www.environment.gov.au).

I would appreciate it if you would contact the Department at least two weeks before you propose to submit the development application and EIS for your development. This will enable the Department to:

- confirm the applicable fee (see Division 1AA, Part 15 of the *Environmental Planning and Assessment Regulation 2000*); and
- determine the number of copies (hard-copy and CD-ROM) of the EIS that will be required for reviewing purposes.

If you have any enquiries about these requirements, please contact Kate Masters, Planning Services at the Department on (02) 9228 6321 or via email at kate.masters@planning.nsw.gov.au

Yours sincerely

C. Ritchie 16/12/15.

Chris Ritchie
Director
Industry Assessments
as delegate of the Secretary

Secretary's Environmental Assessment Requirements

Section 78A(8A) of the *Environmental Planning and Assessment Act*
Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*

Application Number	SSD 7424
Development	Construction and operation of a resource recovery facility to process up to 140,000 tonnes per annum of non-putrescible waste including building and demolition waste, selected commercial and industrial waste, vegetation, virgin natural excavated material, rail ballast and spoil.
Location	52 Anderson Road, Smeaton Grange
Applicant	Benedict Recycling Pty Ltd
Date of Issue	December 2015
General Requirements	The Environmental Impact Statement (EIS) for the development must meet the form and content requirements in clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*. In addition, the EIS must include a: • detailed description of the development, including: – need for the proposed development; – justification for the proposed development; – likely staging of the development - including demolition, construction, and operational stage/s; – likely interactions between the development and existing, approved and proposed operations in the vicinity of the site; and – plans of any proposed building works. • demonstrate that the site is suitable for the proposed use in accordance with *State Environmental Planning Policy No 55 – Remediation of Land*; • consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments; • consideration of issues discussed in **Attachment 2** (public authority responses to key issues); • risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment; • detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: – a description of the existing environment, using sufficient baseline data; – an assessment of the potential impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes; – a description of the measures that would be implemented to avoid, minimise and if necessary, offset the potential impacts of the development, including proposals for adaptive management and/or contingency plans to manage any significant risks to the environment; and • a consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS. The EIS must also be accompanied by a report from a qualified quantity surveyor providing: • a detailed calculation of the capital investment value (as defined in clause 3 of the *Environmental Planning and Assessment Regulation 2000*) of the proposal, including details of all assumptions and components from which the CIV calculation is derived; • a close estimate of the jobs that will be created by the development

	during the construction and operational phases of the development; and • certification that the information provided is accurate at the date of preparation.
Key issues	The EIS must address the following specific matters: • **Waste Management** – including: – a description of the waste streams that would be accepted at the site including the maximum daily, weekly and annual throughputs and the maximum size for stockpiles; – a description of waste processing operations, including a description of the technology to be installed, resource outputs, and the quality control measures that would be implemented; – details of how waste would be stored and handled on site, and transported to and from the site including details of how the receipt of non-conforming waste would be dealt with; and – the measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021.* • **Traffic and Transport** – including: – details of all traffic types and volumes likely to be generated during construction and operation, including a description of haul routes; – an assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model; – detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian Standards; and – plans of any proposed road upgrades, infrastructure works or new roads required for the development. • **Air Quality and Odour** – including: – a quantitative assessment of the potential air quality, dust and odour impacts of the development in accordance with relevant Environment Protection Authority guidelines; – the details of buildings and air handling systems and strong justification for any material handling, processing or stockpiling external to a building; – a greenhouse gas assessment; and – details of proposed mitigation, management and monitoring measures. • **Noise and Vibration** – including: – a quantitative assessment of potential construction, operational and transport noise and vibration impacts in accordance with relevant Environment Protection Authority guidelines; and – details and justification of the proposed noise mitigation and monitoring measures. • **Soil & Water** – including: – a description of water and soil resources, topography, hydrology, watercourses and riparian lands on or nearby to the site; – a detailed site water balance, including identification of water requirements for the life of the project, measures that would be implemented to ensure an adequate and secure water supply is available for the proposal and a detailed description of the measures to minimise the water use at the site; – details of stormwater/wastewater/leachate management systems including the capacity of onsite detention systems, and measures to treat, reuse or dispose of water; – a description of erosion and sediment controls; – an assessment of potential impacts to soil and water resources, topography, drainage lines, watercourses and riparian lands on or nearby to the site; and – consideration of salinity, flooding and acid sulfate soil impacts.

	• **Hazards** – including: – a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development; and – should preliminary screening indicate that the project is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011). • **Visual** – including an assessment of the potential visual impacts of the project on the amenity of the surrounding area.
Plans and Documents	The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the *Environmental Planning and Assessment Regulation 2000*. These documents should be included as part of the EIS rather than as separate documents.
Consultation	During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and potentially affected landowners. In particular you must consult with: • Camden City Council; • Environmental Protection Authority; • Department of Primary Industries; • Roads and Maritime Services; and • nearby land owners and occupiers that may be affected by the proposal. The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.
Further consultation after 2 years	If you do not lodge an EIS for the development within 2 years of the issue date of these SEAR's, you must consult with the Secretary in relation to the requirements for lodgement.
References	The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. While not exhaustive, the following attachment contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this development.

ATTACHMENT 1

Technical and Policy Guidelines

The following guidelines may assist in the preparation of the Environmental Impact Statement. This list is not exhaustive and not all of these guidelines may be relevant to your proposal.

Many of these documents can be found on the following websites:
http://www.planning.nsw.gov.au
http://www.bookshop.nsw.gov.au
http://www.publications.gov.au

Policies, Guidelines & Plans	
Plans and Documents	
	The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the Environmental Planning and Assessment Regulation 2000. Provide these as part of the EIS rather than as separate documents. In addition, the EIS must include the following: 1. An existing site survey plan drawn at an appropriate scale illustrating: • the location of the land, boundary measurements, area (sq. m) and north point; • the existing levels of the land in relation to buildings and roads; • location and height of existing structures on the site; • location and height of adjacent buildings and private open space; and • all levels to be to Australian Height Datum (AHD). 2. A locality/context plan drawn at an appropriate scale should be submitted indicating: • watercourses including nearby rivers and creeks, and dams; • significant local features such as heritage items; • the location and uses of nearby buildings, shopping and employment areas, hospitals and schools; and • traffic and road patterns, pedestrian routes and public transport nodes. 3. An indication of the location of the site with respect to the relevant Land Zoning Map within the *Shoalhaven Local Environment Plan 2014*. 4. Drawings at an appropriate scale illustrating: • detailed plans, sections and elevations of the existing building, which clearly show all proposed internal and external alterations and additions.
Documents to be submitted	
	Documents to submit include: • 1 electronic copy of all the documents and plans for review prior to exhibition; and • other copies as determined by the Department once the development application is lodged.

Technical and Policy Guidelines

The following guidelines may assist in the preparation of the Environmental Impact Statement. This list is not exhaustive and not all of these guidelines may be relevant to your proposal.

Many of these documents can be found on the following websites:
http://www.planning.nsw.gov.au
http://www.bookshop.nsw.gov.au
http://www.publications.gov.au

Policies, Guidelines & Plans

Aspect	Policy /Methodology
Waste	
	Waste Avoidance and Resource Recovery Strategy 2010-2021 (EPA)
	The National Waste Policy: Less Waste More Resources 2009
	Waste Classification Guidelines (DECC)
	Environmental guidelines: Composting and Related Organics Processing Facilities (DEC)
	Environmental guidelines: Use and Disposal of Biosolid Products (NSW EPA)
	Composts, soil conditioners and mulches (Standards Australia, AS 4454)
Air Quality	
	Protection of the Environment Operations (Clean Air) Regulation 2010
	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC)
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC)
Odour	
	Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW (DEC)
	Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW (DEC)
Transport	
	Guide to Traffic Generating Development (RTA)
	Road Design Guide (RTA)
Noise	
	NSW Industrial Noise Policy (DECC)
	NSW Road Noise Policy (EPA, 2011)
	Environmental Criteria for Road Traffic Noise (NSW EPA)
	Interim Construction Noise Guideline (2009)
Soil and Water	
Soil	Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC & NHMRC)
	National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC)
	Draft Guidelines for the Assessment & Management of Groundwater Contamination (DECC)
	State Environmental Planning Policy No. 55 – Remediation of Land
	Managing Land Contamination – Planning Guidelines SEPP 55 – Remediation of Land (DOP)
	Acid Sulfate Soils Manual (Stone et al. 1998)
Surface Water	National Water Quality Management Strategy: Water quality management - an outline of the policies (ANZECC/ARMCANZ)
	NSW Guidelines for Controlled Activities on Waterfront Land (NOW, 2012)
	National Water Quality Management Strategy: Policies and principles - a reference document (ANZECC/ARMCANZ)

	National Water Quality Management Strategy: Implementation guidelines (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Australian Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ)
	Using the ANZECC Guideline and Water Quality Objectives in NSW (DEC)
	NSW State Rivers and Estuaries Policy(1993)
	State Water Management Outcomes Plan
	NSW Government Water Quality and River Flow Environmental Objectives (DECC)
	Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC)
	Managing Urban Stormwater: Soils & Construction (Landcom)
	Managing Urban Stormwater: Treatment Techniques (DECC)
	Managing Urban Stormwater: Source Control (DECC)
	Technical Guidelines: Bunding & Spill Management (DECC)
	NSW Floodplain Development Manual 2005
Groundwater	National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC)
	Australian Groundwater Modelling Guidelines (NWC, 2012)
	NSW State Groundwater Policy Framework Document (DLWC)
	NSW State Groundwater Quality Protection Policy (DLWC)
	NSW State Groundwater Dependent Ecosystems Policy (2002)
	NSW State Groundwater Quantity Management Policy (DLWC) Draft
	Guidelines for the Assessment and Management of Groundwater Contamination (DEC, 2007)
Hazards	
	State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
	Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (DUAP)
	Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis
Greenhouse Gas	
	The National Greenhouse and Energy Reporting (Measurement) Technical Guidelines (NGER Technical Guidelines)
	Guidelines for Energy Savings Action Plans (DEUS, 2005)
Visual	
	Control of Obtrusive Effects of Outdoor Lighting (Standards Australia, AS 4282)
	State Environmental Planning Policy No 64 - Advertising and Signage
Heritage	
	Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH, 2011)
	Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010)
	Draft Guidelines for Aboriginal Cultural Impact Assessment and Community Consultation (Department of Planning, 2005)
	Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW, 2010)

ATTACHMENT 2

Public Authority Responses to Request for Key Issues

Transport
Roads & Maritime Services

PCU063221

9 December 2015

Our Reference: SYD15/01557 (A11062593)
DPE Ref: SSD 7424

Team Leader
Industry Assessments
Department of Planning & Environment
GPO Box 39 SYDNEY NSW 2001

Attention: **David Mooney**

Dear Sir/Madam,

PROPOSED NON-PUTRESCIBLE WASTE RESOURCE RECOVERY FACILITY AT 52 ANDERSON ROAD, SMEATON GRANGE

Reference is made to the department's email dated 4 December 2015, regarding the abovementioned Application which was referred to Roads and Maritime Services (Roads and Maritime) to provide details of key issues and assessment requirements regarding the abovementioned development for inclusion in the Secretary's Environmental Assessment Requirements (SEARs).

Roads and Maritime has reviewed the submitted draft SEARs and has no further request for inclusion.

Should you have any further inquiries in relation to this matter, please do not hesitate to contact Saif Zaman on telephone 8849 2048 or by email at development.sydney@rms.nsw.gov.au

Yours sincerely,

Rachel Nicholson
A/Senior Land Use Planner
Network and Safety Section

NSW Department of Planning & Environment
GPO Box 39
SYDNEY NSW 2001

Attention: David Mooney

Notice Number	1536347
File Number	EF15/20592
Date	11-Dec-2015

Proposed Resource Recovery Facility

Lot 319 DP 1117230 - 52 Anderson Road, Smeaton Grange

I refer to your request for the Environment Protection Authority's (EPA) requirements for the environmental assessment (EA) in regard to the above proposal received by EPA on 4 December 2015.

The EPA has considered the details of the proposal as provided by the Department of Planning and Environment and has identified the information it requires to issue its general terms of approval in Attachment A. In summary, the EPA's key information requirements for the proposal include an adequate assessment of:

1. Baseline conditions that exist at the site of the proposed development;
2. Potential environmental impacts arising from the proposed development and its ongoing activities including air, odour, noise and water issues; and
3. Possible management and mitigation processes that will be implemented to protect the environment from these impacts.

In carrying out the assessment, the proponent should refer to the relevant guidelines as listed in Attachment B and any relevant industry codes of practice and best practice management guidelines.

Please note that this response does not cover biodiversity or Aboriginal cultural heritage issues, which are the responsibility of the Office of Environment and Heritage.

The Proponent should be made aware that any commitments made in the EA may be formalised as approval conditions and may also be placed as formal licence conditions.

The Proponent should be made aware that, consistent with provisions under Part 9.4 of the *Protection of the Environment Operations Act 1997* ("the Act") the EPA may require the provision of a financial assurance and/or assurances. The amount and form of the assurance(s) would be determined by the EPA and required as a condition of an Environment Protection Licence ("EPL").

In addition, as a requirement of an EPL, the EPA will require the Proponent to prepare, test and implement a Pollution Incident Response Management Plan and/or Plans in accordance with Section 153A of the Act.

Yours sincerely

....

Nick Feneley

Acting Unit Head

Waste & Resources - Waste Management

(by Delegation)

ATTACHMENT A: EIS REQUIREMENTS FOR

Proposed Resource Recovery Facility - LOT 319 DP1117230

52 Anderson Road, Smeaton Grange

How to use these requirements

The EPA requirements have been structured in accordance with the DIPNR EIS Guidelines, as follows. It is suggested that the EIS follow the same structure:

A. Executive summary

B. The proposal

C. The location

D. Identification and prioritisation of issues

E. The environmental issues

F. List of approvals and licences

G. Compilation of mitigation measures

H. Justification for the proposal

A Executive summary

The executive summary should include a brief discussion of the extent to which the proposal achieves identified environmental outcomes.

B The proposal

1. Objectives of the proposal

- The objectives of the proposal should be clearly stated and refer to:
  a) the size and type of the operation, the nature of the processes and the products, by-products and wastes produced
  b) a life cycle approach to the production, use or disposal of products
  c) the anticipated level of performance in meeting required environmental standards and cleaner production principles
  d) the staging and timing of the proposal and any plans for future expansion
  e) the proposal's relationship to any other industry or facility.

2. Description of the proposal

General

- Outline the production process including:
  a) the environmental "mass balance" for the process – quantify in-flow and out-flow of materials, any points of discharge to the environment and their respective destinations (sewer, stormwater, atmosphere, recycling, landfill etc)
  b) any life-cycle strategies for the products.
- Outline cleaner production actions, including:
  a) measures to minimise waste (typically through addressing source reduction)
  b) proposals for use or recycling of by-products
  c) proposed disposal methods for solid and liquid waste
  d) air management systems including all potential sources of air emissions, proposals to re-use or treat emissions, emission levels relative to relevant standards in regulations, discharge points
  e) water management system including all potential sources of water pollution, proposals for re-use, treatment etc, emission levels of any wastewater discharged, discharge points, summary of options explored to avoid a discharge, reduce its frequency or reduce its impacts, and rationale for selection of option to discharge.
  f) soil contamination treatment and prevention systems.
- Outline construction works including:
  a) actions to address any existing soil contamination
  b) any earthworks or site clearing; re-use and disposal of cleared material (including use of spoil on-site)
  c) construction timetable and staging; hours of construction; proposed construction methods
  d) environment protection measures, including noise mitigation measures, dust control measures and erosion and sediment control measures.

NSW EPA

Air

- Identify all sources of air emissions from the development.
  Note: emissions can be classed as either:
    - *point (eg emissions from stack or vent) or*
    - *fugitive (from wind erosion, leakages or spillages, associated with loading or unloading, conveyors, storage facilities, plant and yard operation, vehicle movements (dust from road, exhausts, loss from load), land clearing and construction works).*
- Provide details of the project that are essential for predicting and assessing air impacts including:
  a) the quantities and physio-chemical parameters (eg concentration, moisture content, bulk density, particle sizes etc) of materials to be used, transported, produced or stored
  b) an outline of procedures for handling, transport, production and storage
  c) the management of solid, liquid and gaseous waste streams with potential for significant air impacts.

Noise and vibration

- Identify all noise sources from the development (including both construction and operation phases). Detail all potentially noisy activities including ancillary activities such as transport of goods and raw materials.
- Specify the times of operation for all phases of the development and for all noise producing activities.
- For projects with a significant potential traffic noise impact provide details of road alignment (include gradients, road surface, topography, bridges, culverts etc), and land use along the proposed road and measurement locations – diagrams should be to a scale sufficient to delineate individual residential blocks.

Water

- Provide details of the project that are essential for predicting and assessing impacts to waters:
  a) including the quantity and physio-chemical properties of all potential water pollutants and the risks they pose to the environment and human health, including the risks they pose to Water Quality Objectives in the ambient waters (as defined on http://www.environment.nsw.gov.au/ieo/index.htm, using technical criteria derived from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZECC 2000)
  b) the management of discharges with potential for water impacts
  c) drainage works and associated infrastructure; land-forming and excavations; working capacity of structures; and water resource requirements of the proposal.
- Outline site layout, demonstrating efforts to avoid proximity to water resources (especially for activities with significant potential impacts eg effluent ponds) and showing potential areas of modification of contours, drainage etc.
- Outline how total water cycle considerations are to be addressed showing total water balances for the development (with the objective of minimising demands and impacts on water resources). Include water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.

Waste and chemicals

- Provide details of the quantity and type of both liquid waste and non-liquid waste generated, handled, processed or disposed of at the premises. Waste must be classified according to the EPA's *Waste Classification Guidelines (http://www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm).*
- Provide details of liquid waste and non-liquid waste management at the facility, including:
  a) the transportation, assessment and handling of waste arriving at or generated at the site
  b) any stockpiling of wastes or recovered materials at the site
  c) any waste processing related to the facility, including reuse, recycling, reprocessing (including composting) or treatment both on- and off-site
  d) the method for disposing of all wastes or recovered materials at the facility
  e) the emissions arising from the handling, storage, processing and reprocessing of waste at the facility
  f) the proposed controls for managing the environmental impacts of these activities.
- Provide details of spoil disposal with particular attention to:
  a) the quantity of spoil material likely to be generated
  b) proposed strategies for the handling, stockpiling, reuse/recycling and disposal of spoil
  c) the need to maximise reuse of spoil material in the construction industry
  d) identification of the history of spoil material and whether there is any likelihood of contaminated material, and if so, measures for the management of any contaminated material
  e) designation of transportation routes for transport of spoil.
- Provide details of procedures for the assessment, handling, storage, transport and disposal of all hazardous and dangerous materials used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.
- Provide details of the type and quantity of any chemical substances to be used or stored and describe arrangements for their safe use and storage.
- Reference should be made to the EPA's *Waste Classification Guidelines (http://www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm).*

ESD

- Demonstrate that the planning process and any subsequent development incorporates objectives and mechanisms for achieving ESD, including:
  a) an assessment of a range of options available for use of the resource, including the benefits of each option to future generations
  b) proper valuation and pricing of environmental resources
  c) identification of who will bear the environmental costs of the proposal.

3. Rehabilitation

- Outline considerations of site maintenance, and proposed plans for the final condition of the site (ensuring its suitability for future uses).

4. Consideration of alternatives and justification for the proposal

- Consider the environmental consequences of adopting alternatives, including alternative:
  a) sites and site layouts
  b) access modes and routes
  c) materials handling and production processes
  d) waste and water management
  e) impact mitigation measures
  f) energy sources
- Selection of the preferred option should be justified in terms of:
  a) ability to satisfy the objectives of the proposal
  b) relative environmental and other costs of each alternative
  c) acceptability of environmental impacts and contribution to identified environmental objectives
  d) acceptability of any environmental risks or uncertainties
  e) reliability of proposed environmental impact mitigation measures
  f) efficient use (including maximising re-use) of land, raw materials, energy and other resources.

C The location

1. General

- Provide an overview of the affected environment to place the proposal in its local and regional environmental context including:
  a) meteorological data (eg rainfall, temperature and evaporation, wind speed and direction)
  b) topography (landform element, slope type, gradient and length)
  c) surrounding land uses (potential synergies and conflicts)
  d) geomorphology (rates of landform change and current erosion and deposition processes)
  e) soil types and properties (including erodibility; engineering and structural properties; dispersibility; permeability; presence of acid sulfate soils and potential acid sulfate soils)
  f) ecological information (water system habitat, vegetation, fauna)
  g) availability of services and the accessibility of the site for passenger and freight transport.

2. Air

- Describe the topography and surrounding land uses. Provide details of the exact locations of dwellings, schools and hospitals. Where appropriate provide a perspective view of the study area such as the terrain file used in dispersion models.
- Describe surrounding buildings that may effect plume dispersion.
- Provide and analyse site representative data on following meteorological parameters:
  a) temperature and humidity
  b) rainfall, evaporation and cloud cover
  c) wind speed and direction
  d) atmospheric stability class

3. Noise and vibration

- Identify any noise sensitive locations likely to be affected by activities at the site, such as residential properties, schools, churches, and hospitals. Typically the location of any noise sensitive locations in relation to the site should be included on a map of the locality.
- Identify the land use zoning of the site and the immediate vicinity and the potentially affected areas.

4. Water

- Describe the catchment including proximity of the development to any waterways and provide an assessment of their sensitivity/significance from a public health, ecological and/or economic perspective. The Water Quality and River Flow Objectives on the website: http://www.environment.nsw.gov.au/ieo/index.htm should be used to identify the agreed environmental values and human uses for any affected waterways. This will help with the description of the local and regional area.

5. Soil Contamination Issues

- Provide details of site history – if earthworks are proposed, this needs to be considered with regard to possible soil contamination, for example if the site was previously a landfill site or if irrigation of effluent has occurred.

D Identification and prioritisation of issues / scoping of impact assessment

- Provide an overview of the methodology used to identify and prioritise issues. The methodology should take into account:
  a) relevant NSW government guidelines
  b) industry guidelines
  c) EISs for similar projects
  d) relevant research and reference material
  e) relevant preliminary studies or reports for the proposal
  f) consultation with stakeholders.
- Provide a summary of the outcomes of the process including:
  a) all issues identified including local, regional and global impacts (eg increased/ decreased greenhouse emissions)
  b) key issues which will require a full analysis (including comprehensive baseline assessment)
  c) issues not needing full analysis though they may be addressed in the mitigation strategy
  d) justification for the level of analysis proposed (the capacity of the proposal to give rise to high concentrations of pollution compared with the ambient environment or environmental outcomes is an important factor in setting the level of assessment).

E The environmental issues

1. General

- The potential impacts identified in the scoping study need to be assessed to determine their significance, particularly in terms of achieving environmental outcomes, and minimising environmental pollution.
- Identify gaps in information and data relevant to significant impacts of the proposal and any actions proposed to fill those information gaps so as to enable development of appropriate management and mitigation measures. This is in accordance with ESD requirements.

Describe baseline conditions

- Provide a description of existing environmental conditions for any potential impacts.

Assess impacts

- For any potential impacts relevant for the assessment of the proposal provide a detailed analysis of the impacts of the proposal on the environment including the cumulative impact of the proposal on the receiving environment especially where there are sensitive receivers.
- Describe the methodology used and assumptions made in undertaking this analysis (including any modelling or monitoring undertaken) and indicate the level of confidence in the predicted outcomes and the resilience of the environment to cope with the predicted impacts.
- The analysis should also make linkages between different areas of assessment where necessary to enable a full assessment of environmental impacts eg assessment of impacts on air quality will often need to draw on the analysis of traffic, health, social, soil and/or ecological systems impacts; etc.
- The assessment needs to consider impacts at all phases of the project cycle including: exploration (if relevant or significant), construction, routine operation, start-up operations, upset operations and decommissioning if relevant.
- The level of assessment should be commensurate with the risk to the environment.

Describe management and mitigation measures

- Describe any mitigation measures and management options proposed to prevent, control, abate or mitigate identified environmental impacts associated with the proposal and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.
- Proponents are expected to implement a 'reasonable level of performance' to minimise environmental impacts. The proponent must indicate how the proposal meets reasonable levels of performance. For example, reference technology based criteria if available, or identify good practice for this type of activity or development. A 'reasonable level of performance' involves adopting and implementing technology and management practices to achieve certain pollutant emissions levels in economically viable operations. Technology-based criteria evolve gradually over time as technologies and practices change.
- Use environmental impacts as key criteria in selecting between alternative sites, designs and technologies, and to avoid options having the highest environmental impacts.

- Outline any proposed approach (such as an Environmental Management Plan) that will demonstrate how commitments made in the EIS will be implemented. Areas that should be described include:

  a) operational procedures to manage environmental impacts
  b) monitoring procedures
  c) training programs
  d) community consultation
  e) complaint mechanisms including site contacts
  f) strategies to use monitoring information to improve performance
  g) strategies to achieve acceptable environmental impacts and to respond in event of exceedences.

4. Air

Describe baseline conditions

- Provide a description of existing air quality and meteorology, using existing information and site representative ambient monitoring data.

Assess impacts

- Identify all pollutants of concern and estimate emissions by quantity (and size for particles), source and discharge point.
- Estimate the resulting ground level concentrations of all pollutants. Where necessary (eg potentially significant impacts and complex terrain effects), use an appropriate dispersion model to estimate ambient pollutant concentrations. Discuss choice of model and parameters with the DECCW.
- Describe the effects and significance of pollutant concentration on the environment, human health, amenity and regional ambient air quality standards or goals.
- Describe the contribution that the development will make to regional and global pollution, particularly in sensitive locations.
- For potentially odorous emissions provide the emission rates in terms of odour units (determined by techniques compatible with EPA procedures). Use sampling and analysis techniques for individual or complex odours and for point or diffuse sources, as appropriate.
- Reference should be made to *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2001); *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (DEC, 2007); *Assessment and Management of Odour from Stationary Sources in NSW* (DEC, 2006); *Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006); Load Calculation Protocol for use by holders of NSW Environment Protection Licences when calculating Assessable Pollutant Loads* (DECC, 2009).

Describe management and mitigation measures

- Outline specifications of pollution control equipment (including manufacturer's performance guarantees where available) and management protocols for both point and fugitive emissions. Where possible, this should include cleaner production processes.

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5. Noise and vibration

Describe baseline conditions

- Determine the existing background (LA90) and ambient (LAeq) noise levels in accordance with the *NSW Industrial Noise Policy.*
- Determine the existing road traffic noise levels in accordance with the *NSW Environmental Criteria for Road Traffic Noise*, where road traffic noise impacts may occur.
- The noise impact assessment report should provide details of all monitoring of existing ambient noise levels including:
  a) details of equipment used for the measurements
  b) a brief description of where the equipment was positioned
  c) a statement justifying the choice of monitoring site, including the procedure used to choose the site, having regards to the definition of 'noise sensitive locations(s)' and 'most affected locations(s)' described in Section 3.1.2 of the *NSW Industrial Noise Policy*
  d) details of the exact location of the monitoring site and a description of land uses in surrounding areas
  e) a description of the dominant and background noise sources at the site
  f) day, evening and night assessment background levels for each day of the monitoring period
  g) the final Rating Background Level (RBL) value
  h) graphs of the measured noise levels for each day should be provided
  i) a record of periods of affected data (due to adverse weather and extraneous noise), methods used to exclude invalid data and a statement indicating the need for any re-monitoring under Step 1 in Section B1.3 of the *NSW Industrial Noise Policy*
  j) determination of LAeq noise levels from existing industry.

Assess impacts

- Determine the project specific noise levels for the site. For each identified potentially affected receiver, this should include:
  a) determination of the intrusive criterion for each identified potentially affected receiver
  b) selection and justification of the appropriate amenity category for each identified potentially affected receiver
  c) determination of the amenity criterion for each receiver
  d) determination of the appropriate sleep disturbance limit.
- Maximum noise levels during night-time period (10pm-7am) should be assessed to analyse possible affects on sleep. Where LA1(1min) noise levels from the site are less than 15 dB above the background LA90 noise level, sleep disturbance impacts are unlikely. Where this is not the case, further analysis is required. Additional guidance is provided in Appendix B of the *NSW Environmental Criteria for Road Traffic Noise.*

- Determine expected noise level and noise character (eg tonality, impulsiveness, vibration, etc) likely to be generated from noise sources during:
  a) site establishment
  b) construction
  c) operational phases
  d) transport including traffic noise generated by the proposal
  e) other services.

  Note: The noise impact assessment report should include noise source data for each source in 1/1 or 1/3 octave band frequencies including methods for references used to determine noise source levels. Noise source levels and characteristics can be sourced from direct measurement of similar activities or from literature (if full references are provided).

- Determine the noise levels likely to be received at the most sensitive locations (these may vary for different activities at each phase of the development). Potential impacts should be determined for any identified significant adverse meteorological conditions. Predicted noise levels under calm conditions may also aid in quantifying the extent of impact where this is not the most adverse condition.
- The noise impact assessment report should include:
  a) a plan showing the assumed location of each noise source for each prediction scenario
  b) a list of the number and type of noise sources used in each prediction scenario to simulate all potential significant operating conditions on the site
  c) any assumptions made in the predictions in terms of source heights, directivity effects, shielding from topography, buildings or barriers, etc
  d) methods used to predict noise impacts including identification of any noise models used. Where modelling approaches other than the use of the ENM or SoundPlan computer models are adopted, the approach should be appropriately justified and validated
  e) an assessment of appropriate weather conditions for the noise predictions including reference to any weather data used to justify the assumed conditions
  f) the predicted noise impacts from each noise source as well as the combined noise level for each prediction scenario under any identified significant adverse weather conditions as well as calm conditions where appropriate
  g) for developments where a significant level of noise impact is likely to occur, noise contours for the key prediction scenarios should be derived
  h) an assessment of the need to include modification factors as detailed in Section 4 of the *NSW Industrial Noise Policy*.
- Discuss the findings from the predictive modelling and, where relevant noise criteria have not been met, recommend additional mitigation measures.
- The noise impact assessment report should include details of any mitigation proposed including the attenuation that will be achieved and the revised noise impact predictions following mitigation.
- Where relevant noise/vibration criteria cannot be met after application of all feasible and cost effective mitigation measures the residual level of noise impact needs to be quantified by identifying:
  a) locations where the noise level exceeds the criteria and extent of exceedence
  b) numbers of people (or areas) affected
  c) times when criteria will be exceeded

d) likely impact on activities (speech, sleep, relaxation, listening, etc)

e) change on ambient conditions

f) the result of any community consultation or negotiated agreement.

- For the assessment of existing and future traffic noise, details of data for the road should be included such as assumed traffic volume; percentage heavy vehicles by time of day; and details of the calculation process. These details should be consistent with any traffic study carried out in the EIS.

Describe management and mitigation measures

- Determine the most appropriate noise mitigation measures and expected noise reduction including both noise controls and management of impacts for both construction and operational noise. This will include selecting quiet equipment and construction methods, noise barriers or acoustic screens, location of stockpiles, temporary offices, compounds and vehicle routes, scheduling of activities, etc.
- For traffic noise impacts, provide a description of the ameliorative measures considered (if required), reasons for inclusion or exclusion, and procedures for calculation of noise levels including ameliorative measures. Also include, where necessary, a discussion of any potential problems associated with the proposed ameliorative measures, such as overshadowing effects from barriers. Appropriate ameliorative measures may include:

a) use of alternative transportation modes, alternative routes, or other methods of avoiding the new road usage

b) control of traffic (eg: limiting times of access or speed limitations)

c) resurfacing of the road using a quiet surface

d) use of (additional) noise barriers or bunds

e) treatment of the façade to reduce internal noise levels buildings where the night-time criteria is a major concern

f) more stringent limits for noise emission from vehicles (i.e. using specially designed 'quite' trucks and/or trucks to use air bag suspension

g) driver education

h) appropriate truck routes

i) limit usage of exhaust breaks

j) use of premium muffles on trucks

k) reducing speed limits for trucks

l) ongoing community liaison and monitoring of complaints

m) phasing in the increased road use.

4. Water

Describe baseline conditions

- Describe existing surface and groundwater quality – an assessment needs to be undertaken for any water resource likely to be affected by the proposal and for all conditions (e.g. a wet weather sampling program is needed if runoff events may cause impacts).

  Note: Methods of sampling and analysis need to conform with an accepted standard (e.g. Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC 2004) *or be approved and analyses undertaken by accredited laboratories).*

- Provide site drainage details and surface runoff yield.
- State the ambient Water Quality and River Flow Objectives for the receiving waters. These refer to the community's agreed environmental values and human uses endorsed by the Government as goals for the ambient waters. These environmental values are published on the website: http://www.environment.nsw.gov.au/ieo/index.htm. The EIS should state the environmental values listed for the catchment and waterway type relevant to your proposal. NB: A consolidated and approved list of environmental values are not available for groundwater resources. Where groundwater may be affected the EIS should identify appropriate groundwater environmental values and justify the choice.
- State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC 2000 *Guidelines for Fresh and Marine Water Quality* (http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html) (Note that, as at 2004, the NSW Water Quality Objectives booklets and website contain technical criteria derived from the 1992 version of the ANZECC Guidelines. The Water Quality Objectives remain as Government Policy, reflecting the community's environmental values and long-term goals, but the technical criteria are replaced by the more recent ANZECC 2000 Guidelines). NB: While specific guidelines for groundwater are not available, the ANCECC 2000 Guidelines endorse the application of the trigger values and decision trees as a tool to assess risk to environmental values in groundwater.
- State any locally specific objectives, criteria or targets, which have been endorsed by the government e.g. the Healthy Rivers Commission Inquiries or the NSW Salinity Strategy (DLWC, 2000) (http://www.environment.nsw.gov.au/salinity/government/nswstrategy.htm).
- Where site specific studies are proposed to revise the trigger values supporting the ambient Water Quality and River Flow Objectives, and the results are to be used for regulatory purposes (e.g. to assess whether a licensed discharge impacts on water quality objectives), then prior agreement from the EPA on the approach and study design must be obtained.
- Describe the state of the receiving waters and relate this to the relevant Water Quality and River Flow Objectives (i.e. are Water Quality and River Flow Objectives being achieved?). Proponents are generally only expected to source available data and information. However, proponents of large or high risk developments may be required to collect some ambient water quality / river flow / groundwater data to enable a suitable level of impact assessment. Issues to include in the description of the receiving waters could include:

  a) lake or estuary flushing characteristics

  b) specific human uses (e.g. exact location of drinking water offtake)

  c) sensitive ecosystems or species conservation values

  d) a description of the condition of the local catchment e.g. erosion levels, soils, vegetation cover, etc

e) an outline of baseline groundwater information, including, but not restricted to, depth to watertable, flow direction and gradient, groundwater quality, reliance on groundwater by surrounding users and by the environment

f) historic river flow data where available for the catchment.

Assess impacts

- No proposal should breach clause 120 of the *Protection of the Environment Operations Act* 1997 (i.e. pollution of waters is prohibited unless undertaken in accordance with relevant regulations).
- Identify and estimate the quantity of all pollutants that may be introduced into the water cycle by source and discharge point including residual discharges after mitigation measures are implemented.
- Include a rationale, along with relevant calculations, supporting the prediction of the discharges.
- Describe the effects and significance of any pollutant loads on the receiving environment. This should include impacts of residual discharges through modelling, monitoring or both, depending on the scale of the proposal. Determine changes to hydrology (including drainage patterns, surface runoff yield, flow regimes, wetland hydrologic regimes and groundwater).
- Describe water quality impacts resulting from changes to hydrologic flow regimes (such as nutrient enrichment or turbidity resulting from changes in frequency and magnitude of stream flow).
- Identify any potential impacts on quality or quantity of groundwater describing their source.
- Identify potential impacts associated with geomorphological activities with potential to increase surface water and sediment runoff or to reduce surface runoff and sediment transport. Also consider possible impacts such as bed lowering, bank lowering, instream siltation, floodplain erosion and floodplain siltation.
- Identify impacts associated with the disturbance of acid sulfate soils and potential acid sulfate soils.
- Containment of spills and leaks shall be in accordance with the technical guidelines section 'Bunding and Spill Management' of the *Authorised Officers Manual* (EPA, 1995) (http://www.epa.nsw.gov.au/mao/bundingspill.htm) and the most recent versions of the Australian Standards referred to in the Guidelines. Containment should be designed for no-discharge.
- The significance of the impacts listed above should be predicted. When doing this it is important to predict the ambient water quality and river flow outcomes associated with the proposal and to demonstrate whether these are acceptable in terms of achieving protection of the Water Quality and River Flow Objectives. In particular the following questions should be answered:

  a) will the proposal protect Water Quality and River Flow Objectives where they are currently achieved in the ambient waters; and

  b) will the proposal contribute towards the achievement of Water Quality and River Flow Objectives over time, where they are not currently achieved in the ambient waters.

- Consult with the EPA as soon as possible if a mixing zone is proposed (a mixing zone could exist where effluent is discharged into a receiving water body, where the quality of the water being discharged does not immediately meet water quality objectives. The mixing zone could result in dilution, assimilation and decay of the effluent to allow water quality objectives to be met further downstream, at the edge of the mixing zone). The EPA will advise the proponent under what conditions a mixing zone will and will not be acceptable, as well as the information and modelling requirements for assessment.

  Note: The assessment of water quality impacts needs to be undertaken in a total catchment management context to provide a wide perspective on development impacts, in particular cumulative impacts.

- Where a licensed discharge is proposed, provide the rationale as to why it cannot be avoided through application of a reasonable level of performance, using available technology, management practice and industry guidelines.
- Where a licensed discharge is proposed, provide the rationale as to why it represents the best environmental outcome and what measures can be taken to reduce its environmental impact.
- Reference should be made to *Managing Urban Stormwater: Soils and Construction* (DECC, 2008), *Guidelines for Fresh and Marine Water Quality* ANZECC 2000), *Environmental Guidelines: Use of effluent by Irrigation* (DEC, 2004)>.

Describe management and mitigation measures

- Outline stormwater management to control pollutants at the source and contain them within the site. Also describe measures for maintaining and monitoring any stormwater controls.
- Outline erosion and sediment control measures directed at minimising disturbance of land, minimising water flow through the site and filtering, trapping or detaining sediment. Also include measures to maintain and monitor controls as well as rehabilitation strategies.
- Describe waste water treatment measures that are appropriate to the type and volume of waste water and are based on a hierarchy of avoiding generation of waste water; capturing all contaminated water (including stormwater) on the site; reusing/recycling waste water; and treating any unavoidable discharge from the site to meet specified water quality requirements.
- Outline pollution control measures relating to storage of materials, possibility of accidental spills (eg preparation of contingency plans), appropriate disposal methods, and generation of leachate.
- Describe hydrological impact mitigation measures including:
  a) site selection (avoiding sites prone to flooding and waterlogging, actively eroding or affected by deposition)
  b) minimising runoff
  c) minimising reductions or modifications to flow regimes
  d) avoiding modifications to groundwater.
- Describe groundwater impact mitigation measures including:
  a) site selection
  b) retention of native vegetation and revegetation
  c) artificial recharge
  d) providing surface storages with impervious linings
  e) monitoring program.
- Describe geomorphological impact mitigation measures including:
  a) site selection
  b) erosion and sediment controls
  c) minimising instream works
  d) treating existing accelerated erosion and deposition
  e) monitoring program.
- Any proposed monitoring should be undertaken in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW* (DEC 2004).

5. Soils and contamination

Describe baseline conditions

- Provide any details (in addition to those provided in the location description - Section C) that are needed to describe the existing situation in terms of soil types and properties and soil contamination.

Assess impacts

- Identify any likely impacts resulting from the construction or operation of the proposal, including the likelihood of:
  a) disturbing any existing contaminated soil
  b) contamination of soil by operation of the activity
  c) subsidence or instability
  d) soil erosion
  e) disturbing acid sulfate or potential acid sulfate soils.
- Reference should be made to *Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites* (OEH, 2011); *Contaminated Sites – Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report* (EPA, 2003).

Describe management and mitigation measures

- Describe and assess the effectiveness or adequacy of any soil management and mitigation measures during construction and operation of the proposal including:
  a) erosion and sediment control measures
  b) proposals for site remediation – see *Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning and Environment Protection Authority, 1998)
  c) proposals for the management of these soils – see *Assessing and Managing Acid Sulfate Soils,* Environment Protection Authority, 1995 (note that this is the only methodology accepted by the EPA).

6. Waste and chemicals

Describe baseline conditions

- Describe any existing waste or chemicals operations related to the proposal.

Assess impacts

- Assess the adequacy of proposed measures to minimise natural resource consumption and minimise impacts from the handling, transporting, storage, processing and reprocessing of waste and/or chemicals.
- Reference should be made to the EPA's *Waste Classification Guidelines*.

Describe management and mitigation measures

- Outline measures to minimise the consumption of natural resources.
- Outline measures to avoid the generation of waste and promote the re-use and recycling and reprocessing of any waste.
- Outline measures to support any approved regional or industry waste plans.

7. Cumulative impacts

- 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 or region.
- Identify infrastructure requirements flowing from the proposal (eg water and sewerage services, transport infrastructure upgrades).
- Assess likely impacts from such additional infrastructure and measures reasonably available to the proponent to contain such requirements or mitigate their impacts (eg travel demand management strategies).

F. List of approvals and licences

- Identify all approvals and licences required under environment protection legislation including details of all scheduled activities, types of ancillary activities and types of discharges (to air, land, water).

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G. Compilation of mitigation measures

- Outline how the proposal and its environmental protection measures would be implemented and managed in an integrated manner so as to demonstrate that the proposal is capable of complying with statutory obligations under EPA licences or approvals (eg outline of an environmental management plan).
- The mitigation strategy should include the environmental management and cleaner production principles which would be followed when planning, designing, establishing and operating the proposal. It should include two sections, one setting out the program for managing the proposal and the other outlining the monitoring program with a feedback loop to the management program.

H. Justification for the Proposal

- Reasons should be included which justify undertaking the proposal in the manner proposed, having regard to the potential environmental impacts.

ATTACHMENT B: GUIDANCE MATERIAL

Title	Web address
Relevant Legislation	
Contaminated Land Management Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+140+1997+cd+0+N
Environmentally Hazardous Chemicals Act 1985	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+14+1985+cd+0+N
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1979+cd+0+N
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1997+cd+0+N
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+2000+cd+0+N
Licensing	
Guide to Licensing	www.epa.nsw.gov.au/licensing/licenceguide.htm
Air Issues	
Air Quality	
Approved methods for modelling and assessment of air pollutants in NSW (2005)	http://www.epa.nsw.gov.au/resources/air/ammodelling05361.pdf
POEO (Clean Air) Regulation 2010	http://www.legislation.nsw.gov.au/maintop/view/inforce/subordleg+428+2010+cd+0+N
Noise and Vibration	
Interim Construction Noise Guideline (DECC, 2009)	http://www.epa.nsw.gov.au/noise/constructnoise.htm
Assessing Vibration: a technical guideline (DEC, 2006)	http://www.epa.nsw.gov.au/noise/vibrationguide.htm
Industrial Noise Policy Application Notes	http://www.epa.nsw.gov.au/noise/applicnotesindustnoise.htm
Environmental Criteria for Road Traffic Noise (EPA, 1999)	http://www.epa.nsw.gov.au/resources/noise/roadnoise.pdf
Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects (DECC, 2007)	http://www.epa.nsw.gov.au/noise/railinfranoise.htm
Environmental assessment requirements for rail traffic-generating developments	http://www.epa.nsw.gov.au/noise/railnoise.htm

Waste, Chemicals and Hazardous Materials and Radiation	
Waste	
Environmental Guidelines: Solid Waste Landfills (EPA, 1996)	http://www.epa.nsw.gov.au/resources/waste/envguidlns/solidlandfill.pdf
Waste Classification Guidelines (EPA, 2014)	http://www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm
Resource recovery exemption	http://www.epa.nsw.gov.au/waste/RRecoveryExemptions.htm
Chemicals subject to Chemical Control Orders	
Chemical Control Orders (regulated through the EHC Act)	http://www.epa.nsw.gov.au/pesticides/CCOs.htm
National Protocol - Approval/Licensing of Trials of Technologies for the Treatment/Disposal of Schedule X Wastes - July 1994	Available in libraries
National Protocol for Approval/Licensing of Commercial Scale Facilities for the Treatment/Disposal of Schedule X Wastes - July 1994	Available in libraries
Water and Soils	
Acid sulphate soils	
Coastal acid sulfate soils guidance material	http://www.environment.nsw.gov.au/acidsulfatesoil/
Acid Sulfate Soils Planning Maps	http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm
Contaminated Sites Assessment and Remediation	
Managing land contamination: Planning Guidelines – SEPP 55 Remediation of Land	http://www.planning.nsw.gov.au/assessingdev/pdf/gu_contam.pdf
Guidelines for Consultants Reporting on Contaminated Sites (EPA, 2000)	http://www.epa.nsw.gov.au/resources/clm/20110650consultantsglines.pdf
Guidelines for the NSW Site Auditor Scheme - 2nd edition (DEC, 2006)	http://www.epa.nsw.gov.au/resources/clm/auditorglines06121.pdf
Sampling Design Guidelines (EPA, 1995)	Available by request from EPA's Environment Line
National Environment Protection (Assessment of Site Contamination) Measure 1999 (or update)	http://www.scew.gov.au/nepms/assessment-site-contamination

Soils – general	
Managing land and soil	http://www.environment.nsw.gov.au/soils/landandsoil.htm
Managing urban stormwater for the protection of soils	http://www.environment.nsw.gov.au/stormwater/publications.htm
Landslide risk management guidelines	http://www.australiangeomechanics.org/resources/downloads/
Site Investigations for Urban Salinity (DLWC, 2002)	http://www.environment.nsw.gov.au/resources/salinity/booklet3siteinvestigationsforurbansalinity.pdf
Local Government Salinity Initiative Booklets	http://www.environment.nsw.gov.au/salinity/solutions/urban.htm
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html
Applying Goals for Ambient Water Quality Guidance for Operations Officers – Mixing Zones	Contact the EPA on 131555
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approvedmethods-water.pdf

Kate Masters

From:	David Mooney
Sent:	Wednesday, 9 December 2015 11:09 AM
To:	Kate Masters
Subject:	FW: Request for SEARS - Proposed Resource Recovery Facility, 52 Anderson Street, Smeaton Grange

fyi

David Mooney | **Team Leader**
Industry Assessments | Department of Planning and Environment
23-33 Bridge Street SYDNEY 2000 | GPO Box 39 SYDNEY 2001
t: 02 9228 2040 | e: david.mooney@planning.nsw.gov.au

From: Belinda Leo
Sent: Wednesday, 9 December 2015 11:07 AM
To: David Mooney
Subject: Request for SEARS - Proposed Resource Recovery Facility, 52 Anderson Street, Smeaton Grange

Dear Mr Mooney

Thank you for your email dated 4 December 2015 to the Office of Environment and Heritage (OEH) requesting Secretary's environmental assessment requirements for a proposed Resource Recovery Facility at 52 Anderson Street, Smeaton Grange.

After reviewing the relevant documents, OEH's Greater Sydney Planning Team has concluded that the matter does not contain biodiversity, natural hazards and Aboriginal Cultural Heritage issues that require a formal OEH response. We have no need to be further involved in the assessment of the project.

Kind regards
Belinda

Belinda Leo
Operations Officer, Greater Sydney Region
Regional Operations Group, Office of Environment and Heritage
Level 6, 10 Valentine Ave Parramatta (PO Box 644) NSW 2124
T: 9995 6820 W: www.environment.nsw.gov.au
Please note I do not work Thursday or Fridays

NSW GOVERNMENT | Department of Industry
Resources & Energy

15th December 2015

David Mooney
Team Leader – Industrial Assessments
Department of Planning and Environment
GPO Box 39
Sydney NSW 2001

Emailed: david.mooney@planning.nsw.gov.au

Your Reference: SSD 7424
Our Reference (TRIM): OUT15/35382

Dear Mr Mooney

Re:SEARs (SSD 7424) Resource Recovery Facility 52 Anderson Rd, Smeaton Grange

Thank you for the opportunity to provide advice on the above matter. This is a response from NSW Department of Industry – Geological Survey of New South Wales (GSNSW).

GSNSW requires the proponent to conduct an assessment as part of the EA, regarding the potential impacts of the project on any significant mineral resources, including:

- **Any operating mines, extractive industries or known mineral or petroleum resources.**
- **Exploration activities in the vicinity of the proposed development.**
- **Access for future exploration in the area.**

Petroleum Production Lease (PPL5) held by AGL Upstream Investments Pty Ltd exists over a broad regional area that includes the subject site. AGL should be consulted regarding the proposal, with a record of consultation included in the EIS.

The contact details for AGL (that GSNSW currently have on record) are as follows:
Contact - Andrew Parker (AGL Exploration Manager)
Phone - 0299212133
Email – andrew.parker@agl.com.au

GSNSW note Coal Authorisation (AUTH) 6 the held by the Secretary of the Department of Industry on behalf of the Crown exists over a broad regional area that includes the subject site. Identification of the title is to make the consent authority aware that there are other stakeholders with interests in the region.

Geoscience Information Services

The GSNSW has a range of online data available on line through the following website address:
http://www.resources.nsw.gov.au/geological/online-services

This site hosts a range of data to enable research into exploration, land use and general geoscience topics. Additionally, the location of exploration and mining titles in NSW may be accessed by the general public using the following online utilities:

1. **MinView** allows on-line interactive display and query of exploration tenement information and geoscience data. It allows spatial selection, display and download of geological coverages, mineral deposits and mine locations, geophysical survey boundaries, drillhole locations, historical and current exploration title boundaries and other spatial datasets of New South Wales. This online service is available at: http://www.resources.nsw.gov.au/geological/online-services/minview

2. **NSW Titles** enables the public to access and view frequently updated titles mapping information across NSW. This online service is available at: http://nswtitles.minerals.nsw.gov.au/nswtitles/

Queries regarding the above information, and future requests for advice in relation to this matter, should be directed to the GSNSW Land Use team at landuse.minerals@industry.nsw.gov.au.

Yours sincerely

Cressida Gilmore
Team Leader - Land Use

Appendix C

Plans of proposed waste transfer station

PROPOSED WASTE TRANSFER STATION
AT
52 ANDERSON ROAD SMEATON GRANGE

DRAWING LIST

REFERENCES

DRAWINGS TO BE READ IN CONJUNCTION WITH BUT NOT LIMITED TO ALL STORMWATER ENGINEERS, LANDSCAPE ARCHITECTS, AND OTHER ASSOCIATED PLANS & REPORTS

revision

A	02.02.16	ISSUED FOR GENERAL INFORMATION
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notes

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scale 1:500 @ A3

m 0 5 10

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date FEB 2016

drawn SS

project

PROPOSED WASTE TRANSFER STATION
52 ANDERSON ROAD
SMEATON GRANGE

drawing title

COVER SHEET

FOR DA APPROVAL

job no.		drawing no.	rev
J15306	DA	000	D

GROUND FLOOR PLAN

SCALE 1:500

REFERENCES

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project

PROPOSED WASTE TRANSFER STATION
52 ANDERSON ROAD
SMEATON GRANGE

drawing title

GROUND FLOOR PLAN

FOR DA APPROVAL

job no.		drawing no.	rev
J15306	DA	100	D

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date: APRIL 2013
drawn: SS

project

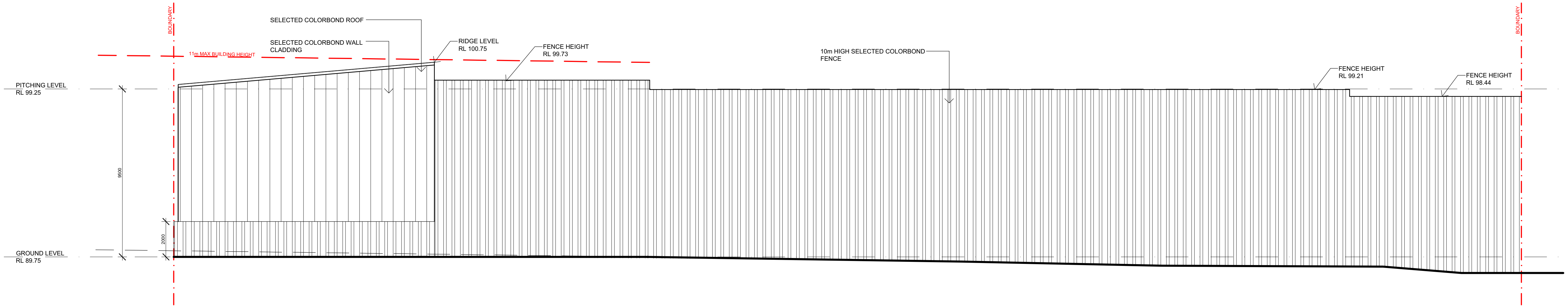
PROPOSED WASTE TRANSFER STATION
52 ANDERSON ROAD
SMEATON GRANGE

drawing title

ROOF PLAN

FOR DA APPROVAL

job no.		drawing no.	rev
J15306	DA	101	D



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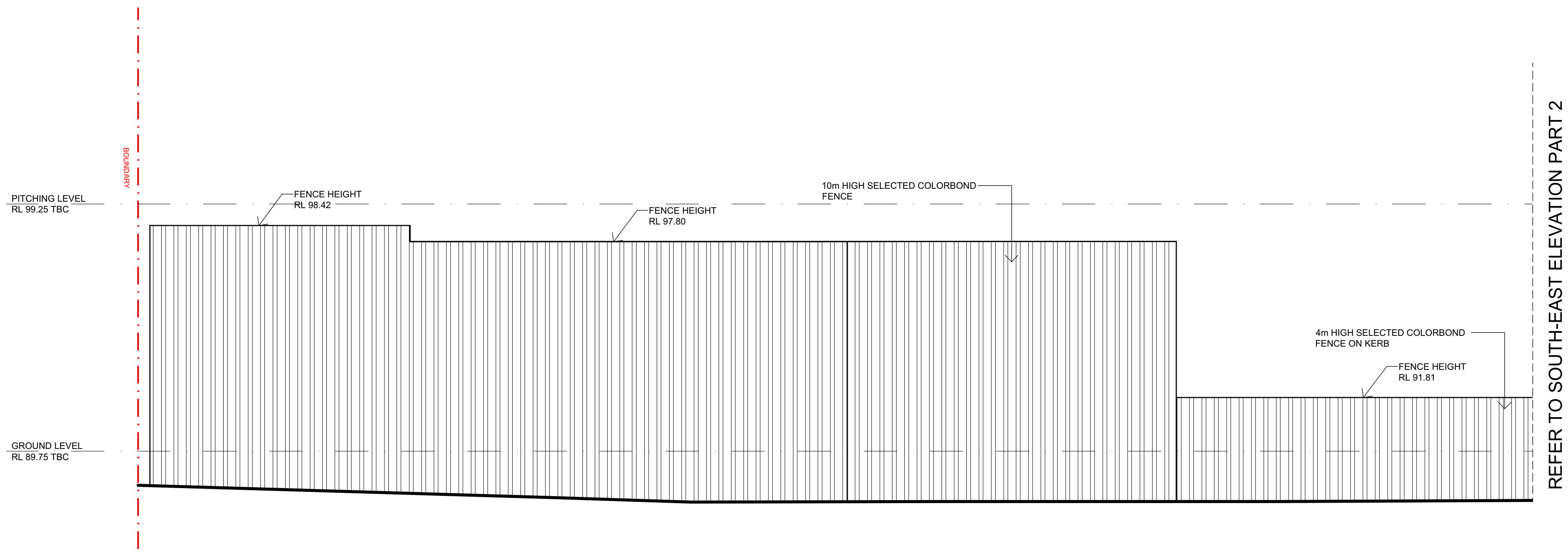

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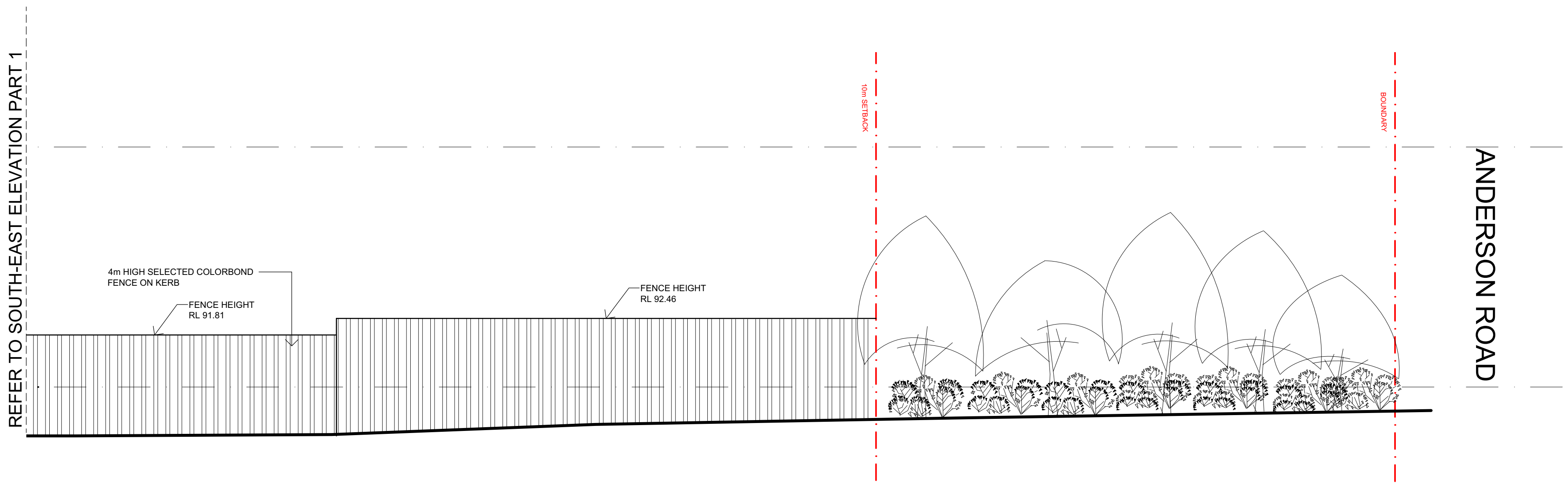

SOUTH-EAST ELEVATION (PART 2)

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drawn: SS

project

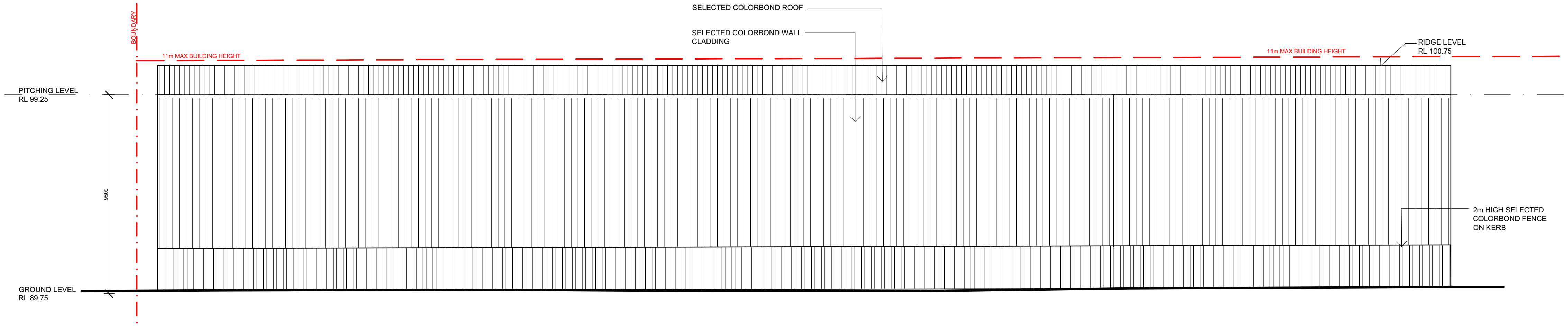
PROPOSED WASTE TRANSFER STATION
52 ANDERSON ROAD
SMEATON GRANGE

drawing title

ELEVATIONS 1

FOR DA APPROVAL

job no.		drawing no.	rev
J15306	DA	200	D



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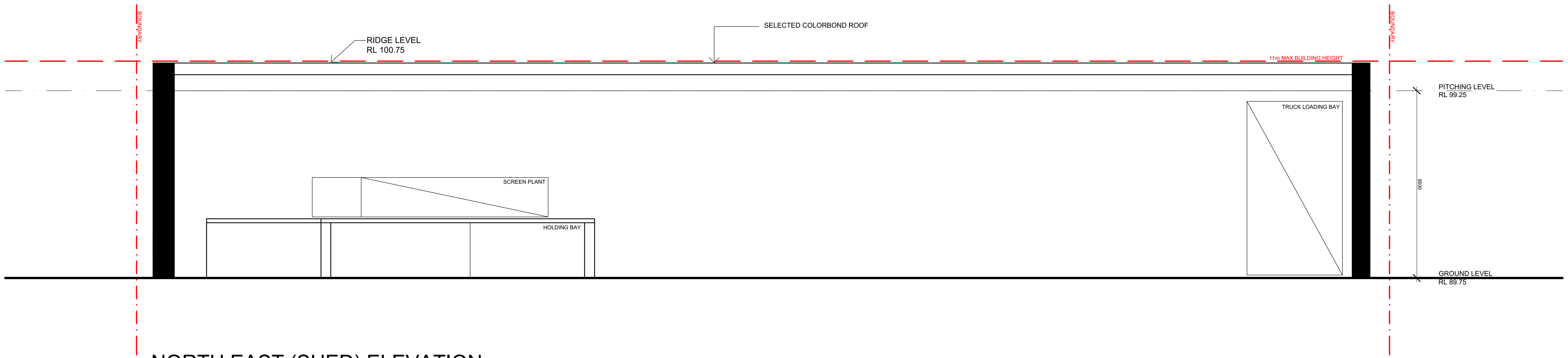

NORTH EAST (SHED) ELEVATION

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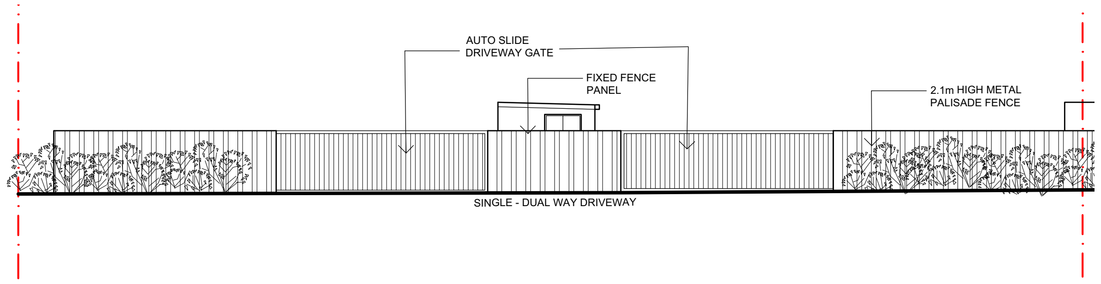

NORTH (STREET FRONT) ELEVATION

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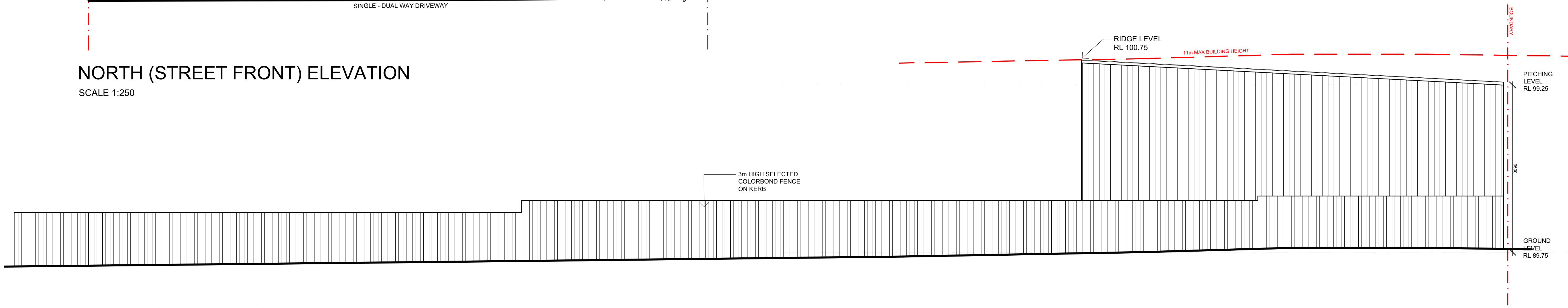

NORTH-WEST ELEVATION

SCALE 1:250

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PROPOSED WASTE TRANSFER STATION
52 ANDERSON ROAD
SMEATON GRANGE

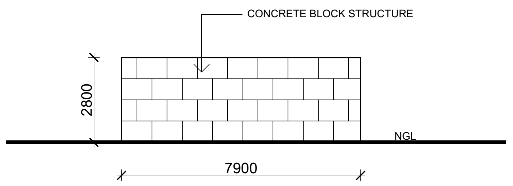
drawing title

ELEVATIONS 2

FOR DA APPROVAL

J15306 DA 201 D

job no. | drawing no. | rev



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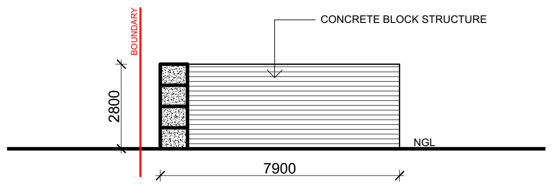

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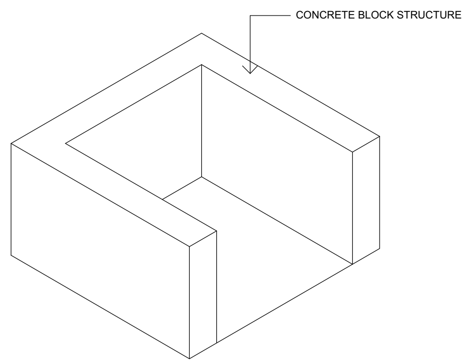

ISOMETRIC VIEW
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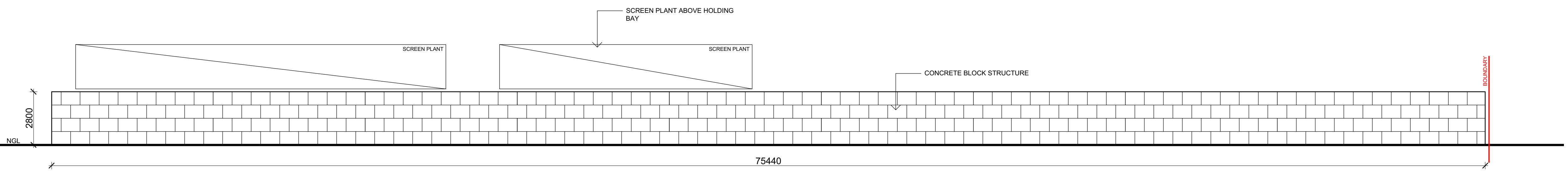

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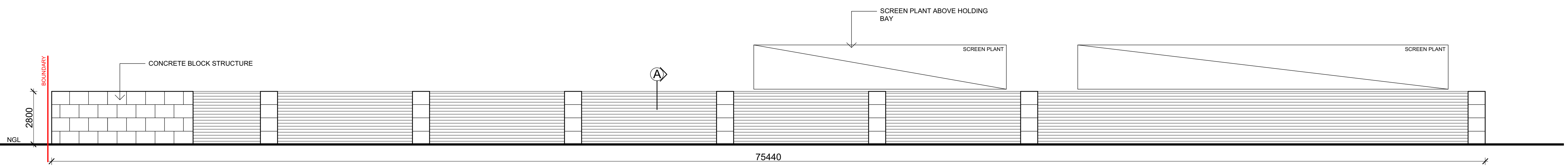

NORTH ELEVATION
SCALE 1:250

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project

PROPOSED WASTE TRANSFER STATION
52 ANDERSON ROAD
SMEATON GRANGE

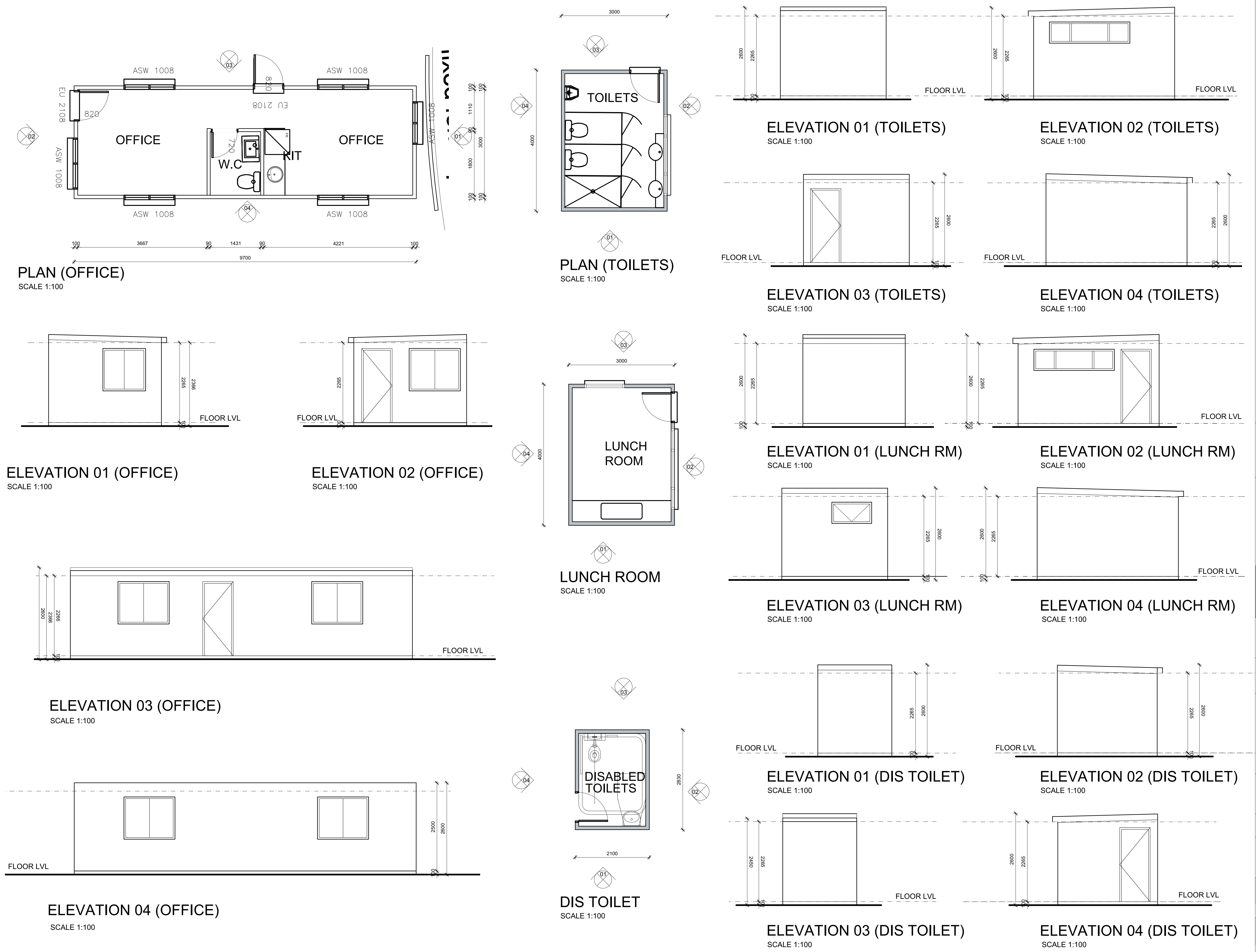
drawing title

DETAILS SHEET 1

FOR DA APPROVAL

J15306 DA 500 D

job no. drawing no. rev



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PROPOSED WASTE TRANSFER STATION
52 ANDERSON ROAD
SMEATON GRANGE

drawing title

DETAILS SHEET 2

FOR DA APPROVAL

J15306 DA 501 D

job no. drawing no. rev

Appendix D

Traffic assessment

Waste Recycling and Transfer Facility, Smeaton Grange

52 Anderson Road, Smeaton Grange | Traffic Impact Assessment

Prepared for Benedict Recycling Pty Ltd | 17 June 2016

Waste Recycling and Transfer Facility, Smeaton Grange

52 Anderson Road, Smeaton Grange | Traffic Impact Assessment

Prepared for Benedict Recycling Pty Ltd | 17 June 2016

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Waste Recycling and Transfer Facility, Smeaton Grange

Final

Report J15135RP1 | Prepared for Benedict Recycling Pty Ltd | 17 June 2016

Prepared by	**Tim Brooker**	Approved by	**Philip Towler**
Position	Senior Transport Planner	Position	Associate Director
Signature		Signature	
Date	17 June 2016	Date	17 June 2016

Document Control

Version	Date	Prepared by	Reviewed by
Final	30 March 2016	Tim Brooker	Philip Towler
Final V2	31 May 2016	Tim Brooker	Philip Towler
Final V3	17 June 2016	Tim Brooker	Philip Towler

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www.emmconsulting.com.au

Table of contents

Appendices

Tables

Figures

1 Introduction

1.1 Project background

The proposed Benedict recycling and waste transfer facility is to be located at 52 Anderson Road, Smeaton Grange, NSW, and is legally described as Lot 319 in DP 1117230. It is within the Smeaton Grange industrial estate and covers about 0.7 ha.

The proposal is a new development within an existing industrial subdivision on a site which is flat and largely devoid of vegetation. It is screened by mature trees around the north-eastern boundary, which adjoins a vegetated creek corridor.

The recycling and waste transfer facility would include the following components:

- a shed, constructed in colourbond, between approximately 45.67 m and 61.96 m in length, 24 m in width and 11 m high with a floor area of approximately 1,300 m2;
- a concrete slab for the shed;
- hard surfacing of the site in a material such as concrete or asphalt, with a perimeter curb;
- a surface water management system;
- landscaping;
- eight on-site parking spaces for staff, including one disabled space;
- connection to services;
- a weighbridge area with weighbridges;
- wheel washes for outbound vehicles;
- a demountable office;
- demountable amenities including lunch room and toilets;
- seven product bays, which will be four metres high and blockwalled;
- an enclosed, above ground bunded diesel storage tank (approximately 30,000 L);
- establishment of hand unloading area (to replace ‘waste storage area’ under site establishment DA);
- a sprinkling site irrigation system to minimise airborne dust;
- a flip-flow screen waste sorter (housed in main shed);
- an enclosed picking line inside the main shed that extends outside along a portion of the southern boundary;

- boundary fencing to a maximum height of 10 m on the south-eastern boundaries, 4 m along a portion of the eastern boundary, 3 m on the western boundary and 2 m at the rear and sides of the shed (see Figure 2.1);

- 2.1 m high metal palisade fence with automatic colourbond gates at the ingress and egress point;

- extension of the southern and part of the south-eastern side boundary fencing to a maximum height of 10 metres;

- waste/product stockpiles; and

- out-of-hours bin storage and waste truck parking.

1.2 Scope of this report

This traffic impact assessment (TIA) report has been prepared in accordance with the general requirements of the Road and Maritime Services (RMS) *Guide to Traffic Generating Developments* (RMS 2002) and addresses.

- the existing site access and traffic arrangements;

- existing traffic flows on major roads and at intersections in the locality;

- the proposed internal site traffic circulation and car parking;

- the forecast traffic generation from the proposal;

- effects of the proposal on the external road network and intersections; and

- effects of the proposal on traffic safety, public transport, pedestrian and cycling facilities.

The Department of Planning and Environment (DPE) Secretary's Environmental Assessment Requirements (SEARs) for the project specifically request the consideration and assessment of:

- details of all traffic types and volumes likely to be generated during construction and operation, including a description of haul routes;

- an assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model;

- detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian Standards; and

- plans of any proposed road upgrades, infrastructure works or new roads required for the development.

In correspondence to the DPE, RMS indicated they were satisfied with DPE's SEARs requirements and did not identify any additional items for consideration.

All the SEARs requirements have been addressed in this TIA.

2 Existing traffic conditions

2.1 Site location and land uses

The site is part of the large Smeaton Grange industrial estate which is located on the northern side of Narellan Road, the Camden Bypass and Smeaton Grange Road, between the intersections at Hartley Drive and Camden Valley Way, Figure 2.1. The Hartley Drive intersection on Narellan Road is located approximately 2.8 km west of the southern South Western Motorway interchange at Campbelltown.

The site access will utilise separate entry and exit driveways, leading directly off the cul-de-sac at the eastern end of Anderson Road. Anderson Road will not need to be modified for the proposal. Lockable gates will be installed at the site entry and exit driveways.

2.2 Road network and traffic volumes

The major road network in the vicinity of the project is shown in Figure 2.1 and consists of the following roads:

- Narellan Road is generally a six lane dual carriageway road with a wide median and additional turning lanes at all the major intersections. It provides the main access to most residential and employment areas of Camden Local Government Area (LGA) from the South Western Motorway at Campbelltown, which is approximately 55 km south-west of the Sydney CBD. Several sections of the route have recently been upgraded from four to six lanes traffic capacity. This provides additional capacity to accommodate traffic growth from new developments throughout Camden LGA.

- Camden Valley Way is generally a four lane dual carriageway road with a wide median and additional turning lanes at all the major intersections. It provides an alternative traffic route to and from the South Western and M7 Motorways from the north (via Bringelly Road) which can be used by traffic travelling to and from most parts of the Sydney Metropolitan region, as well as connecting the northern and southern parts of Camden LGA. The majority of the route has recently been upgraded from two to four lanes. This provides additional traffic capacity to accommodate traffic growth from new developments throughout Camden LGA.

- Hartley Road is a sub arterial type access road which provides access to both residential and industrial areas. It is also generally four lanes wide, with a tree lined or landscaped median barrier. It intersects with Narellan Road at Waterworth Drive, where the four way traffic signal controlled intersection has recently been reconstructed with additional traffic capacity (Figure 2.2). The route carries significant heavy vehicle traffic, between the Smeaton Grange Industrial Estate and Narellan Road, from where it is distributed mainly via the South Western Motorway to and from other urban areas of Sydney (to the north) and regional destinations to the south.

- Anderson Road is a local industrial area road which varies in width having a single carriageway cross section at the eastern end, which widens to a four lane dual carriageway on the sections closer to Camden Valley Way. Anderson Road provides the main access route to the Recycling Facility from Camden Valley Way, where it has traffic signals controlling the four way intersection with Sir Warwick Fairfax Drive (Figure 2.3). The intersection has recently been reconstructed to provide additional traffic capacity and has additional bus priority lanes in the northbound and southbound directions on Camden Valley Way.

Figure 2.1 Locality road network

Figure 2.2 Detailed plan of the recently reconstructed Narellan Road intersection

Figure 2.3 Detailed plan of the recently reconstructed Camden Valley Way intersection

The peak hour traffic movements at the intersections of Anderson Road/Camden Valley Way and Hartley Road/Narellan Road were surveyed on Friday 11 December 2015. The raw traffic count data for each location is included in Appendix A.

Historic tube traffic count data from the Roads and Maritime Services (RMS), formerly the Roads and Traffic Authority (RTA), was also reviewed at the available survey locations on the Narellan Road and Camden Valley Way routes. A summary of these counts, which record the historic growth in the average annual daily traffic (AADT) volumes in the Smeaton Grange locality, is provided in Table 2.1.

Table 2.1 Summary of AADT traffic volumes on Camden Valley Way and Narellan Road

RMS Location ref	Road and nearest cross street	1996	1999	2002	2005	2012	2015 (estimate)	% per annum traffic growth rate[1]
85.035	Narellan Road, east of Hartley Road	34,326	40,521	45,427	50,327	-	57,400	-
85.019	Camden Valley Way, south of Heath Road	16,820	19,428	21,023	20,820	21,500	22,400	+1.4%

Note: 1.The annual traffic growth rate is calculated for Camden Valley Way from 1996 to the most recent actual survey in 2012.

The current peak hourly traffic volumes on the road network and proportions of heavy vehicle traffic from the 11 December 2015 intersection traffic surveys are summarised in Table 2.2.

Table 2.2 Summary of December 2015 peak hour and heavy vehicle traffic surveys

Road	Direction	am peak hour 8.00 to 9.00 am typically			pm peak hour 3.45 to 4.45 pm typically		
		All traffic	Heavy vehicles	% Heavy	All traffic	Heavy vehicles	% Heavy
Camden Valley Way (north of Anderson Road)	N'bound	1,288	57	4.4%	1,145	28	2.4%
	S'bound	1.385	69	5.0%	1,748	30	1.7%
Anderson Road (east of Camden Valley Way)	E'bound	670	43	6.4%	657	19	2.9%
	W'bound	476	39	8.2%	630	15	2.4%
Hartley Road (north of Narellan Road)	N'bound	874	70	8.0%	750	51	6.8%
	S'bound	833	94	11.3%	1,124	59	5.2%
Narellan Road (east of Hartley Road)	E'bound	2,043	167	8.2%	2,444	100	4.1%
	W'bound	1,959	174	8.9%	2,486	102	4.1%

During the morning and afternoon peak traffic hours, the proportions of heavy vehicle traffic using Camden Valley Way are generally 5% or less, but at other times of the day, when there is less commuter traffic, the heavy vehicle percentages are higher.

On Narellan Road, Anderson Road and Hartley Road, the morning peak hour heavy vehicle traffic proportions are generally higher, between 6.4% and 11.3%, and reduce to between 2.4% and 6.8% during the afternoon peak hour. There are also higher proportions of heavy vehicle traffic using these routes at other times of the day when there is less commuter traffic.

2.3 Intersections

The current RMS 'intersection level of service' standards are summarised in Table 2.3.

Table 2.3 Intersection level of service standards

Level of Service	Average delay (seconds per vehicle)	Traffic signals, roundabout	Priority intersection ('Stop' and 'Give Way')
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity. At traffic signals, incidents will cause extensive delays. Roundabouts require other control mode	At capacity; requires other control mode
F	Greater than 71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing; requires other control mode

Source: (RTA 2002).

At the two Smeaton Grange industrial area access intersections, Anderson Road/Camden Valley Way and Hartley Road/Narellan Road, the modelled intersection details, including the length of the additional left and right turning traffic lanes are shown in Appendix B.

The detailed SIDRA analysis results are also in included in Appendix B and the base traffic situation results show the following intersection performance at the intersection of Anderson Road/Camden Valley Way.

- morning peak hour (8.00 to 9.00 am);
  - degree of saturation: 0.83;
  - average vehicle delay: 46.4 seconds; and
  - level of service: D.
- afternoon peak hour (3.45 to 4.45 pm);
  - degree of saturation: 0.98;
  - average vehicle delay: 61.0 seconds; and
  - level of service: E.

The intersection is currently operating with relatively high peak hour degrees of saturation (0.83 to 0.98) which correspond to significant traffic delays which affect the intersection levels of service. The intersection is currently working better (at level of service D) during the morning peak hour and is at level of service E during the afternoon peak hour.

The SIDRA analysis results for the existing base traffic situation at the intersection of Hartley Road/Narellan Road show the following intersection performance:

- morning peak hour (8.00 to 9.00 am);
  - degree of saturation: 0.97;
  - average vehicle delay: 60.8 seconds; and
  - level of service: E.
- afternoon peak hour (3.30 to 4.30 pm);
  - degree of saturation: 1.00;
  - average vehicle delay: 60.5 seconds; and
  - level of service: E.

This intersection is operating near capacity with relatively high peak hour degrees of saturation (0.97 and 1.00) which correspond to significant traffic delays affecting the intersection levels of service. The intersection is currently working at level of service E during both the morning and the afternoon traffic peak hours.

2.4 Existing industrial area traffic

The existing peak hourly volumes for the industrial precinct traffic which uses both Anderson Road and Hartley Road to reach their respective major road access intersections at Camden Valley Way and Narellan Road are shown in Table 2.2. The combined two way traffic volumes are:

- Anderson Road morning peak hour (8.00 to 9.00 am);
  - 1,146 vehicle movements (1,064 cars, 82 trucks); and
- Anderson Road afternoon peak hour (3.45 to 4.45 pm);
  - 1,287 vehicle movements (1,253 cars, 34 trucks).
- Hartley Road morning peak hour (8.00 to 9.00 am);
  - 1,707 vehicle movements (1,543 cars, 164 trucks); and
- Hartley Road afternoon peak hour (3.30 to 4.30 pm);
  - 1,874 vehicle movements (1,764 cars, 110 trucks).

The corresponding daily traffic volumes are approximately 15,000 daily vehicle movements using Anderson Road at Camden Valley Way and 22,000 daily vehicle movements using Hartley Road at Narellan Road including the surrounding residential area traffic.

2.5 Road safety and accident history

The recent accident history on the major roads (Camden Valley Way and Narellan Road) and the industrial area access routes (Anderson Road and Hartley Road) is believed to be good and will have been improved by the recent capacity upgrades for the major road routes in the Narellan area.

The road capacity upgrades will have included extensive road safety auditing at all stages of the design and construction process, which will have addressed existing and potential future road safety issues for the traffic using these routes, including the Smeaton Grange industrial area traffic using the major road network.

2.6 Car parking

The roads within the Smeaton Grange industrial area have generally been designed to permit on-street car parking, except for the busier sections of the two roads (Anderson Road and Hartley Road) which provide access to the major road network at Camden Valley Way and Narellan Road.

Most existing and future developments on sites within the Smeaton Grange industrial area will be expected to provide sufficient on-site car parking for their future site employees and visitors and there is currently only minimal use of existing on-street parking on the public roads within the industrial area.

2.7 Walking and cycling

The site is located within reasonable walking or cycling distance (up to one or five kilometres respectively) from many surrounding residential areas, including Currans Hill, Mount Annan, Narellan Vale and Narellan. A proportion of the future site employees and visitors could potentially walk or cycle to and from work at the site if they lived within reasonable proximity of the site.

2.8 Public transport access

The current public bus routes operating within the Narellan and Smeaton Grange areas, which are operated by Busabout, are shown in Figure 2.4.

Two bus routes (895 and 896) currently operate through the Smeaton Grange area during the peak morning and afternoon commuter times on weekdays which may be used by employees travelling to or from work at businesses in the area. There are between 5 and 6 bus trips daily in each direction on route 896 and between 10 and 11 bus trips daily in each direction on route 895 which operate through the Smeaton Grange industrial area.

These buses could potentially be used by any of the future site workforce living in the Camden, Narellan, Gregory Hills and Oran Park areas, to travel to and from work at Smeaton Grange.

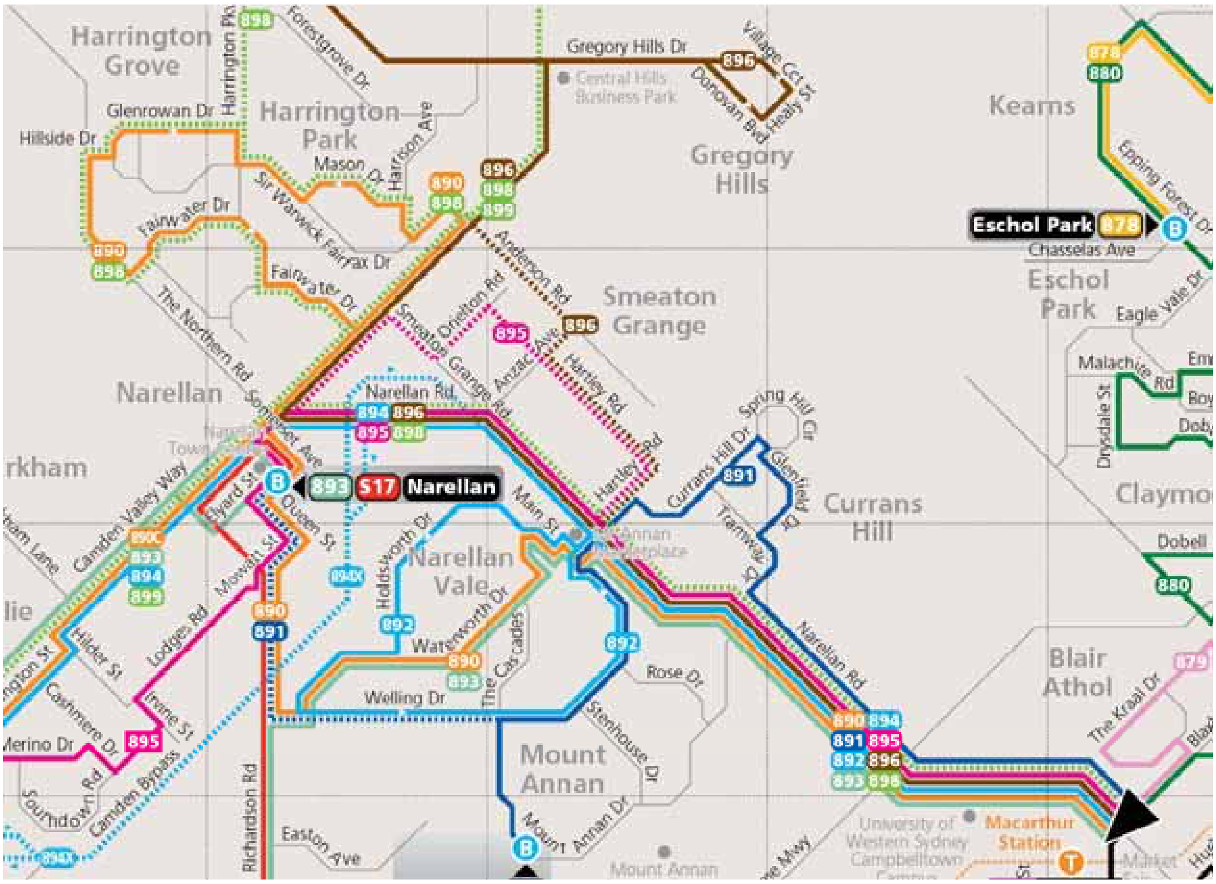


Figure 2.4 Bus routes map of the Narellan and Smeaton Grange areas

3 The proposal

3.1 Site layout and operations

The Recycling Facility is designed to accept a total of 140,000 tonnes per year of the following wastes:

- unsegregated and segregated building and demolition waste — soils, bricks, concrete, paper/cardboard, plastics, rubber, plasterboard, ceramics, glass, metal and timber, and the like;
- vegetation and uncontaminated soils;
- tiles, asphalt, suitable slags and concrete batching waste;
- excavated natural materials including virgin natural excavated material (VNEM) such as sand and sandstone which are generated during bulk earthworks and road and infrastructure repair; and
- rail ballast and spoils.

All waste received would be inspected prior to being accepted on site and any loads suspected to contain contaminants would be rejected. Waste would generally be stored undercover in the waste transfer holding shed prior to processing. However, some segregated heavy materials (eg concrete, timber and metal) would be stored on the hardstand area in dedicated bays.

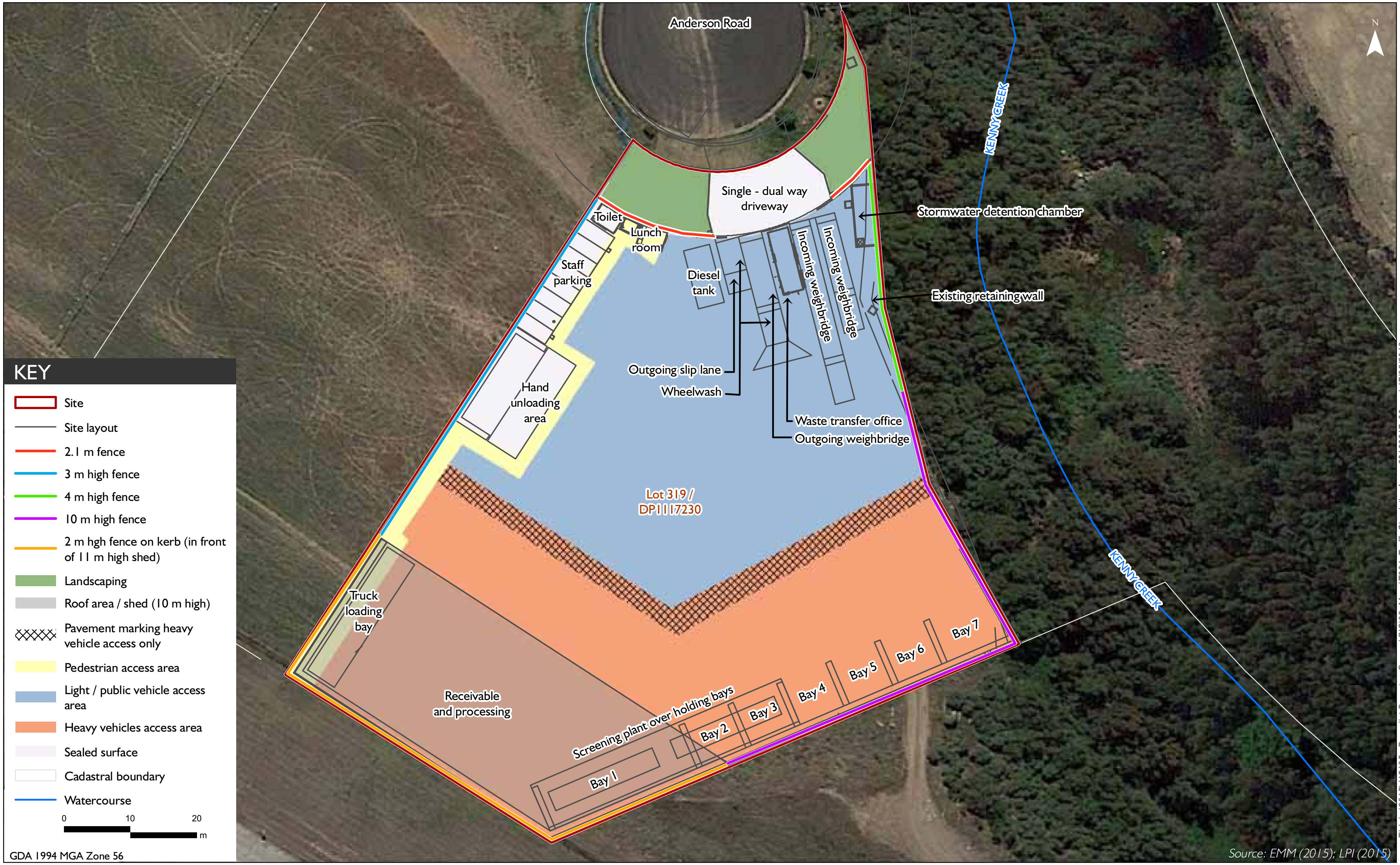
Waste sorting would generally occur within the waste transfer holding shed. A range of mobile plant (eg excavator and front-end loader) and a screening and picking line, would be used to handle and process the waste and products in the shed. Material processed in the shed would be stockpiled either in the shed, in the case of lightweight materials such as paper, or, in the case of inert 'heavy' materials such as timber, bricks and green waste, in the external bays prior to quality testing and dispatch. Segregated 'heavy' waste requiring further crushing or shredding (eg concrete, bricks or timber) would be sent to licensed recycling facilities able to process this waste.

The site would accept inert waste from businesses and the general public. No special liquid, hazardous, restricted solid waste or general solid waste (putrescible) would be accepted at the site. Waste would be delivered to site by a variety of vehicles including:

- light vehicles such as cars with box trailers and utilities;
- single axle heavy vehicles such as 'Daihatsu's' and skip-bin trucks; and
- multiple axle combination heavy vehicles such as 'truck and dogs'.

The primary site layout plan showing the locations of the site weighbridges, site offices, car parking and truck circulation areas is shown in Figure 3.1 and indicative swept paths are shown in Appendix C.

A large truck circulation area, approximately 40 metres in diameter will be provided within the centre of the site, which would permit the largest types of truck visiting the site (either a truck and dog trailer vehicle or a B-Double truck) to easily turn around within the site either before or after loading or unloading.



Proposed site layout showing traffic circulation area
Smeaton Grange Benedict Industries
Traffic Impact Assessment
Figure 3.1

EMM

3.2 Site traffic generation

The proposed facility operations would generate a combination of light and heavy vehicle traffic movements. Light vehicles are generally vehicles less than three tonnes and heavy vehicles are vehicles between three and 42 tonnes.

- An estimated 28,563 incoming waste deliveries are expected annually when the facility is operating at maximum capacity for 140,000 tonnes of material processed annually. Variations may occur in the amounts of waste received on any given day. However, there will be a daily average of 68 light vehicle loads and 36 heavy vehicle loads (104 vehicle loads in total) bringing waste material to the site. Consequently there will be on average 208 daily vehicle movements from this activity.

- Recycled products will be sold to customers throughout the Western Sydney region or will be transported to other Benedict Recycling sites for further processing. Some waste (less than 20% of the total amount received) which is not able to be recycled, would be stockpiled prior to be being sent to an EPA licensed facility for disposal. The dispatch of the site products and non-recyclable residues will generate about 4,675 truck loads annually by 33 tonne capacity truck and dog trailer vehicles. This will generate 17 loads daily (34 daily vehicle movements) when the facility is operating at maximum capacity.

The Recycling Facility will include off-street parking for trucks, employee cars and visitor light vehicles. The facility is expected to be operated by about 15 Benedict Recycling employees.

The site employee car and visitor traffic will generate approximately 17 light vehicle visits (34 vehicle movements) daily. For all waste receival, products/rejects dispatch, site employees, site visitors and maintenance vehicle traffic, there will be an overall total of about 276 daily vehicle movements generated, comprising 170 light vehicle movements and 106 heavy vehicle movements.

The total daily and peak hourly traffic movements generated by all site activities are summarised in Table 3.1 and Table 3.2. Approximately 50% of the total daily employee and site visitor car traffic movements are assumed to occur during either the morning or afternoon peak hours. These movements will generally travel in to the site (17 vehicle movements) during the morning peak hour and out from the site (17 vehicle movements) during the afternoon peak hour.

The other site traffic movements will be more uniformly distributed over the full working day, with approximately 10% of all the daily inbound and outbound site waste and recycled product traffic (14 light vehicle and 12 heavy vehicle traffic movements) occurring during the morning peak hour (8.00 to 9.00 am), and approximately 5% (6 light vehicle and 6 heavy vehicle traffic movements) occurring during the afternoon peak hour (3.30 to 4.30 pm).

Table 3.1 Summary of site generated daily traffic movements

Activity	Total daily traffic movements	Daily car and other light vehicle movements	Daily truck traffic movements
Site employees and visitors	34	34	0
Waste receivals	208	136	72
Recycled product and rejects	34	0	34
All site traffic	**276**	**170**	**106**

Table 3.2 Summary of site generated peak hourly traffic movements

Peak Hour	Inbound site hourly traffic movements[1]		Outbound site hourly traffic movements[1]		All site hourly traffic movements[1]	
(time of day)	Cars/other light vehicles	Trucks	Cars/other light vehicles	Trucks	Cars/other light vehicles	Trucks
Morning peak hour (8.00 to 9.00 am)	17 site employees/visitors +7 waste receivals	6 waste and product	7 waste receivals	6 waste and product	31	12
Afternoon peak hour (3.30 to 4.30 pm)	3 waste receivals	3 waste and product	17 site employees/visitors +3 waste receivals	3 waste and product	23	6

Notes: 1.The site car and truck traffic movements will both be distributed approximately 60%/40% to and from the Camden Valley Way and Narellan Road approach routes.

The site afternoon peak hourly traffic (29 vehicle movements) will be lower than during the morning (43 vehicle movements) because the site waste receival and product delivery traffic will normally be less intensive towards the end of the working day in comparison to during the mornings.

3.3 Haulage routes

For both the waste received and the products dispatched from the site, the traffic distribution to and from the site would be:

- Approximately 60% to and from Camden Valley Way via Anderson Road, then travelling either north or south on Camden Valley way from the Anderson Road intersection, and
- Approximately 40% to and from Narellan Road via Anderson Road, Anzac Avenue and Hartley Road, then travelling either east or west on Narellan Road from the Hartley Road intersection.

Waste material will be brought to the site and products dispatched via Anderson Road which connects directly to Camden Valley Way. There is also access via Anzac Avenue to Hartley Road which connects to Narellan Road. Camden Valley Way and Narellan Road are both major arterial traffic routes within the Sydney classified road network. Hartley Road, Anderson Road and Anzac Avenue are roads within the Industrial zone which are generally suitable for heavy vehicle use.

3.4 Proposed hours of operation

The Recycling Facility would generally accept deliveries (from businesses and the public) and dispatch materials between 6 am and 10 pm Monday to Friday and between 6 am and 5 pm on Saturday. It would also accept deliveries from 8 am to 4 pm on Sunday, providing an additional day on which the public could deliver recyclable waste to the facility.

On occasions, the facility could accept waste deliveries 24 hours per day to allow infrastructure projects operating on a similar basis (eg rail corridor works) and adjoining businesses, to deliver waste as it is generated.

Waste processing would only occur at the site from 7 am to 6 pm Monday to Saturday. There would be no processing on Sundays or public holidays.

3.5 Construction traffic generation

Project construction would require:

- hard surfacing of the site in a material such as concrete or asphalt, with a perimeter curb;
- construction of the water stormwater collection system with pipes leading to a concrete lined sediment settling and collection pit;
- shed construction;
- installing gates and fencing;
- erecting the waste transfer holding shed;
- constructing waste and product bays;
- installing weighbridges and demountable offices/amenities;
- marking traffic circulation and parking bays; and
- landscaping at the entrance.

Reticulated water and sewer are available to the site as well as electricity and telecommunications. Major service providers will be consulted with during the preparation of the EIS to confirm any specific capacity/connection requirements.

Construction would take 10 to 12 weeks. At the peak stage of construction there will be a potential maximum of 10 light vehicles and 10 heavy vehicles per day visiting the site during the 7.00 am to 6.00 pm daytime period. This will generate a potential maximum of 40 vehicle movements per day at the site during the peak stage of construction.

Construction light vehicle traffic will potentially generate up to 10 light vehicles arriving at the site during any one-hour morning peak period (eg 8.00 to 9.00 am) and a similar number departing from the site during any one hour afternoon peak period (eg 3.30 to 4.30 pm).

Construction heavy vehicle traffic will be potentially up to 3 trucks per hour arriving at and departing from the site during a one hour morning peak period (eg 8.00 am to 9.00 am). The remainder of the site construction related heavy vehicle traffic movements will generally be evenly distributed over the remainder of the working day, generating 1 truck per hour typically arriving at and departing from the site during most other periods of the working day.

4 Traffic impacts and mitigation measures

4.1 Traffic increases on the road network

4.1.1 Site construction traffic

The predicted site construction daily and peak hourly traffic movements which were summarised in Section 3.5 are as follows:

- 20 additional daily car traffic movements (10 inbound and 10 outbound) and 20 additional daily truck traffic movements (10 inbound and 10 outbound);
- 10 additional car traffic movements (all inbound) and 6 additional truck traffic movements (3 inbound and 3 outbound) during the construction morning peak hour; and
- 10 additional car traffic movements (all outbound) and 2 additional truck traffic movements (1 inbound and 1 outbound) during the construction afternoon peak hour.

The predicted site peak hourly construction traffic movements (12 to 16 hourly traffic movements) will be significantly lower than the corresponding hourly site operations traffic movements (29 to 43 hourly traffic movements) in Table 3.2. Detailed assessment of the predicted site construction stage traffic movements has not been undertaken as the potential site traffic impacts would be significantly lower than for the site operations stage which is assessed in Section 4.1.2 and Section 4.2.

4.1.2 Site operations traffic

The predicted local area daily traffic increases as a result of the recycling facility operations traffic on an average day with 276 daily vehicle movements, are summarised In Table 4.1.

Table 4.1 Summary of daily traffic volumes and increases with the recycling facility traffic

Road	Existing daily traffic (all vehicles)	Additional daily traffic (all vehicles)	Increase (%)	Existing daily traffic (heavy vehicles)	Additional daily traffic (heavy vehicles)	Increase (%)
Camden Valley Way (north of Anderson Road)	22,400	132	0.6%	1,120*	50	4.5%
Anderson Road (east of Camden Valley Way)	15,000	166	1.1%	1,230*	64	5.2%
Hartley Road (north of Narellan Road)	22,000	110	0.5%	2,490*	42	1.7%
Narellan Road (east of Hartley Road)	57,400	72	0.1%	5,100*	28	0.5%

*Notes: *Existing daily heavy vehicle traffic movements are calculated using the upper range of the surveyed am and pm peak hour proportions of heavy vehicle traffic in Table 2.2.*

The project generated traffic increases on the local area roads (Table 4.1) will be of the order of +0.1% to +1.1%. These traffic increases will not generally be noticeable to existing road users. The corresponding increases in the daily heavy vehicle traffic movements will be approximately +0.5% to +5.2% which will also not generally be noticeable to existing road users or affect the future maintenance requirement for these roads.

4.2 Traffic impacts at intersections

4.2.1 Site construction traffic

The additional site-generated peak hourly construction traffic movements at intersections have also not been assessed in detail as the potential impacts of the additional site traffic (+16 vehicle movements during the morning peak hour and +12 vehicle movements during the afternoon peak hour) would be significantly lower during construction than during project operations.

4.2.2 Site operations traffic

The additional site-generated peak hourly traffic movements at the Camden Valley Way/Anderson Road and Narellan Road/Hartley Road intersections have been assessed using SIDRA for the current (December 2015) surveyed intersection traffic volumes.

The impacts of the additional site traffic (+43 vehicle movements during the morning peak hour and +29 vehicle movements during the afternoon peak hour), when distributed between the two intersections in a 60%/40% ratio, are summarised in Table 4.2 and Table 4.3. Detailed results are provided in Appendix B.

Table 4.2 Camden Valley Way/Anderson Road intersection operations

Intersection	Peak hour	Existing 2015 base traffic			With project operations traffic		
		LoS	DOS	AVD	LoS	DOS	AVD
Camden Valley Way/Anderson Road	Morning peak hour (8.00 to 9.00 am)	D	0.830	46.4	D	0.842	46.5
Camden Valley Way/Anderson Road	Afternoon peak hour (3.45 to 4.45 pm)	E	0.980	61.0	E	0.987	61.0

Notes: LoS – Level of Service, DOS – Degree of Saturation, AVD – Average Vehicle Delay.

Table 4.3 Narellan Road/Hartley Road intersection operations

Intersection	Peak hour	Existing 2015 base traffic			With project operations traffic		
		LoS	DOS	AVD	LoS	DOS	AVD
Narellan Road/Hartley Road	Morning peak hour (8.00 to 9.00 am)	E	0.974	60.8	E	0.974	61.3
Narellan Road/Hartley Road	Afternoon peak hour (3.30 to 4.30 pm)	E	1.000	60.5	E	1.000	60.6

Notes: LoS – Level of Service, DOS – Degree of Saturation, AVD – Average Vehicle Delay.

The 2015 SIDRA results for the Camden Valley Way/Anderson Road intersection (Table 4.2) show that during the morning or afternoon peak hours there will be only minor change to the intersection operations. The average vehicle delays for all traffic at the intersection will increase from 46.4 seconds to 46.5 seconds in the morning peak hour and will remain at 61.0 seconds in the afternoon peak hour. The intersection levels of service will remain at 'D' and 'E' respectively.

The 2015 SIDRA results for the Narellan Road/Hartley Road intersection (Table 4.3) also show that during the morning or afternoon peak hours there will be only minor change to the intersection operations. The average vehicle delays for all traffic at the intersection will increase from 60.8 seconds to 61.3 seconds in the morning peak hour and will increase from 60.5 seconds to 60.6 seconds in the afternoon peak hour. The intersection levels of service will remain at 'E' and 'E' respectively.

4.3 Car and truck parking

A total of 12 car parking spaces will be provided at the site, eight adjacent to the northern boundary, within the site, for use by site employees and a further four car parking spaces located at a 90 degree angle to the site entry and exit driveways, for use by the site employees and visitors.

In the Camden Development Control Plan 2011 (Part B5), the car parking requirement for industrial sites is defined as 1 space per 70 m^2 of building gross floor area with minor additional requirements also applying for bicycle and motorcycle parking.

A formal assessment of the site car parking capacity in relation to the site building floor areas is not required, the proposed site provision of 12 car parking spaces will be adequate for the proposed maximum future number of site employees (15) plus the maximum likely number of visitors (two) who would be likely to be present at the site during normal weekday operations.

4.4 Impact on road safety and traffic management

The project will generate approximately 276 additional daily traffic movements, including 106 additional daily truck movements each day in the Smeaton Grange area. There are already high volumes of daily truck traffic operating on the major roads and industrial roads in the area, including Narellan Road, Camden Valley Way, Anderson Road and Hartley Road.

These roads have all been adequately constructed to accommodate heavy vehicle traffic and there would be no additional operational or traffic safety concerns for these roads as a result of the proposed additional truck traffic movements generated by the recycling facility.

4.5 Impact on public transport services, pedestrians and cyclists

The proposed site workforce of 15 employees is not anticipated to create a high demand for either pedestrian or cyclist access, to or from any of the nearby residential areas, such as Currans Hill.

The existing public transport access in the Smeaton Grange and Narellan areas, specifically the morning and afternoon peak period services on bus routes 895 and 896, provides adequate public transport access for the site for workforce travel to and from nearby residential areas such as Camden, Narellan, Gregory Hills and Oran Park.

5 Summary and conclusion

The traffic impact assessment has assessed the transport impacts of the proposed recycling facility at 52 Anderson Road, Smeaton Grange.

The proposed annual processing of 140,000 tonnes per annum of waste materials at the site, together with ancillary operations, will result in approximately 106 additional daily truck movements and 170 additional daily car/other light vehicle movements being generated on Anderson Road and the surrounding road network (276 additional daily traffic movements in total).

During construction, the proposal will potentially generate up to 10 employee cars and 10 truck deliveries on a typical weekday, resulting in an additional 40 daily traffic movements in total.

The operational traffic impacts of the proposal have been assessed for the maximum hourly traffic which will potentially occur from site employees and waste/recycling traffic during both the morning (8.00 to 9.00 am) and afternoon (3.30 to 4.30 pm typically) peak traffic hours on the surrounding road network. During these times the peak site traffic will potentially be:

- +43 vehicle movements per hour (31 by cars and 12 by trucks) during the morning peak hour; and
- +29 additional vehicle movements (23 by cars and 6 by trucks) during the afternoon peak hour.

Based on the likely waste delivery and product dispatch routes, it is anticipated that the additional site operations traffic movements will be distributed, approximately 60% and 40% to and from the west or the east via the Anderson Road/Camden Valley Way and the Hartley Road/Narellan Road intersections.

Beyond the immediate locality of Smeaton Grange, the future site traffic will be further distributed onto Camden Valley Way to the north and south, Narellan Road and the South western Motorway, such that the future project generated daily or peak hourly traffic volumes would be relatively minor on each of these routes.

The key findings of the project traffic impact assessment for the predicted additional daily and peak hour traffic movements are as follows:

- The additional daily traffic movements from the project will generate only minimal percentage traffic increases on the surrounding industrial area access roads (eg Anderson Road and Hartley Road) and will be accommodated with minimal changes to the existing traffic flows, traffic delays or road safety. The project generated daily traffic increases will not require any additional road widening or reconstruction of either the Smeaton Grange industrial area roads or the adjoining major traffic routes via Camden Valley Way and Narellan Road.
- The two major intersections which provide access from the Smeaton Grange industrial area to the surrounding major road network, at Anderson Road/Camden Valley Way and the Hartley Road/Narellan Road, are currently operating at peak hour traffic conditions with a level of service D or E during the morning peak hour traffic conditions (8.00 to 9.00 am) and a level of service E during the afternoon peak hour (3.30 to 4.30 pm typically).
- These intersection levels of service will not change with the site traffic generated during the project construction or operations stages. The intersection levels of service have been specifically re-assessed for the December 2015 surveyed traffic conditions with the proposed recycling facility peak hourly operations traffic movements.

- For the future project operations traffic under current (December 2015) traffic conditions, the actual increases in the corresponding average intersection traffic delays will be relatively minor at between 0 to +0.1 and 0 to +0.5 seconds per vehicle for the two peak hourly traffic periods considered at each intersection.

- The likely future site car parking demand from the site employees (15) and visitors (2) will be accommodated by the proposed 12 car parking spaces. These car parking areas are considered to be adequate for the anticipated demand. During the project construction phase, sufficient on site car parking will be provided for the anticipated peak project construction workforce parking demand (10 vehicles).

- The proposed internal site truck access and circulation paths will utilise the large (40 m diameter) central truck turning area within the site, which is separated from the site employee/visitor car parking area.

- The project is not anticipated to create any increased demand for public transport, pedestrian or cyclist access in the locality, due to the restricted access catchment for these travel modes currently and the relatively low future site employee and visitor numbers.

Based on the results of this TIA report, there will be no significant traffic impacts anticipated from proposal on either traffic capacity, traffic delays or road safety on the surrounding major road network, in comparison to the current (December 2015) base traffic conditions which have been surveyed for this traffic assessment.

References

Roads and Maritime Services (RMS) 2002, *Guide to Traffic Generating Developments.*

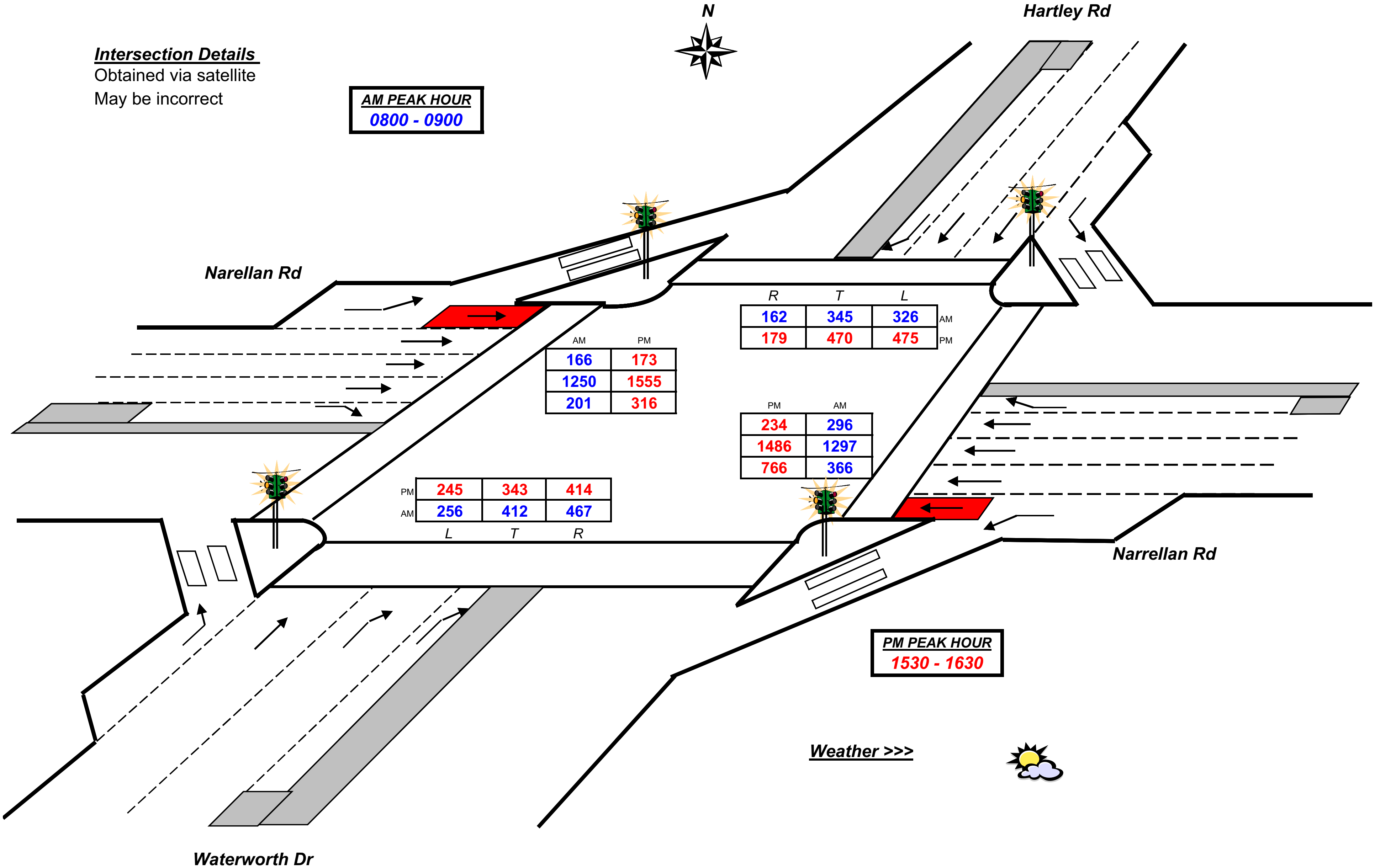
- 2014, *Review of Environmental Factors for Duplication of Tourle Street and Cormorant Road, Kooragang (Appendix J) Traffic Study*.

Appendix A

Intersection traffic survey data

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : EMGA
Job No/Name : 5898 NARELLAN Intersection Counts
Day/Date : Friday 11th December 2015



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : EMGA
Job No/Name : 5898 NARELLAN Intersection Counts
Day/Date : Friday 11th December 2015

Lights

Time Per	NORTH Hartley Rd			WEST Narellan Rd			SOUTH Waterworth Dr			EAST Narellan Rd			TOT
	L	T	R	L	T	R	L	T	R	L	T	R	
0600 - 0615	47	21	10	25	315	22	34	33	130	34	156	83	**910**
0615 - 0630	36	14	13	43	313	7	33	53	145	41	230	92	**1020**
0630 - 0645	64	16	11	33	430	11	28	59	172	52	245	72	**1193**
0645 - 0700	60	32	21	37	400	22	43	86	161	60	203	68	**1193**
0700 - 0715	39	27	12	24	373	22	26	71	164	80	266	55	**1159**
0715 - 0730	45	21	11	22	412	18	43	56	139	72	247	57	**1143**
0730 - 0745	58	30	21	35	352	22	56	94	142	51	234	68	**1163**
0745 - 0800	42	57	25	48	335	24	60	109	111	100	272	50	**1233**
0800 - 0815	58	91	29	58	290	35	46	132	132	81	263	64	**1279**
0815 - 0830	54	76	33	28	280	49	56	113	121	96	335	45	**1286**
0830 - 0845	72	83	41	31	300	48	63	82	106	95	303	66	**1290**
0845 - 0900	63	90	49	39	300	66	89	78	100	83	288	66	**1311**
Period End	**638**	**558**	**276**	**423**	**4100**	**346**	**577**	**966**	**1623**	**845**	**3042**	**786**	**14180**

Lights

Peak Time	NORTH Hartley Rd			WEST Narellan Rd			SOUTH Waterworth Dr			EAST Narellan Rd			TOT
	L	T	R	L	T	R	L	T	R	L	T	R	
0600 - 0700	207	83	55	138	1458	62	138	231	608	187	834	315	**4316**
0615 - 0715	199	89	57	137	1516	62	130	269	642	233	944	287	**4565**
0630 - 0730	208	96	55	116	1615	73	140	272	636	264	961	252	**4688**
0645 - 0745	202	110	65	118	1537	84	168	307	606	263	950	248	**4658**
0700 - 0800	184	135	69	129	1472	86	185	330	556	303	1019	230	**4698**
0715 - 0815	203	199	86	163	1389	99	205	391	524	304	1016	239	**4818**
0730 - 0830	212	254	108	169	1257	130	218	448	506	328	1104	227	**4961**
0745 - 0845	226	307	128	165	1205	156	225	436	470	372	1173	225	**5088**
0800 - 0900	247	340	152	156	1170	198	254	405	459	355	1189	241	**5166**
PEAK HOUR	**247**	**340**	**152**	**156**	**1170**	**198**	**254**	**405**	**459**	**355**	**1189**	**241**	**5166**

Heavies

Time Per	NORTH Hartley Rd			WEST Narellan Rd			SOUTH Waterworth Dr			EAST Narellan Rd			TOT
	L	T	R	L	T	R	L	T	R	L	T	R	
0600 - 0615	11	1	3	1	15	0	0	1	2	1	16	9	**60**
0615 - 0630	17	1	0	1	12	0	0	0	2	1	10	11	**55**
0630 - 0645	18	0	3	0	24	0	0	2	2	3	18	10	**80**
0645 - 0700	16	0	3	2	18	0	0	1	0	1	15	12	**68**
0700 - 0715	15	2	0	0	20	1	1	2	3	3	15	14	**76**
0715 - 0730	24	2	1	1	24	1	0	0	2	1	17	11	**84**
0730 - 0745	17	1	0	1	20	1	1	1	1	2	23	11	**79**
0745 - 0800	20	3	2	2	16	0	0	2	4	1	24	7	**81**
0800 - 0815	22	3	1	3	16	1	0	1	2	3	19	9	**80**
0815 - 0830	24	0	2	3	15	2	0	4	4	4	28	19	**105**
0830 - 0845	16	2	7	2	27	0	1	1	2	2	28	12	**100**
0845 - 0900	17	0	0	2	22	0	1	1	0	2	33	15	**93**
Period End	**217**	**15**	**22**	**18**	**229**	**6**	**4**	**16**	**24**	**24**	**246**	**140**	**961**

Heavies

Peak Per	NORTH Hartley Rd			WEST Narellan Rd			SOUTH Waterworth Dr			EAST Narellan Rd			TOT
	L	T	R	L	T	R	L	T	R	L	T	R	
0600 - 0700	62	2	9	4	69	0	0	4	6	6	59	42	**263**
0615 - 0715	66	3	6	3	74	1	1	5	7	8	58	47	**279**
0630 - 0730	73	4	7	3	86	2	1	5	7	8	65	47	**308**
0645 - 0745	72	5	4	4	82	3	2	4	6	7	70	48	**307**
0700 - 0800	76	8	3	4	80	3	2	5	10	7	79	43	**320**
0715 - 0815	83	9	4	7	76	3	1	4	9	7	83	38	**324**
0730 - 0830	83	7	5	9	67	4	1	8	11	10	94	46	**345**
0745 - 0845	82	8	12	10	74	3	1	8	12	10	99	47	**366**
0800 - 0900	79	5	10	10	80	3	2	7	8	11	108	55	**378**
PEAK HOUR	**79**	**5**	**10**	**8**	**80**	**3**	**2**	**7**	**8**	**11**	**108**	**55**	**378**

Combined

Time Per	NORTH Hartley Rd			WEST Narellan Rd			SOUTH Waterworth Dr			EAST Narellan Rd			TOT
	L	T	R	L	T	R	L	T	R	L	T	R	
0600 - 0615	58	22	13	26	330	22	34	34	132	35	172	92	**970**
0615 - 0630	53	15	13	44	325	7	33	53	147	42	240	103	**1075**
0630 - 0645	82	16	14	33	454	11	28	61	174	55	263	82	**1273**
0645 - 0700	76	32	24	39	418	22	43	87	161	61	218	80	**1261**
0700 - 0715	54	29	12	24	393	23	27	73	167	83	281	69	**1235**
0715 - 0730	69	23	12	23	436	19	43	56	141	73	264	68	**1227**
0730 - 0745	75	31	21	36	372	23	57	95	143	53	257	79	**1242**
0745 - 0800	62	60	27	50	351	24	60	111	115	101	296	57	**1314**
0800 - 0815	80	94	30	61	306	36	46	133	134	84	282	73	**1359**
0815 - 0830	78	76	35	31	295	51	56	117	125	100	363	64	**1391**
0830 - 0845	88	85	48	33	327	48	64	83	108	97	331	78	**1390**
0845 - 0900	80	90	49	41	322	66	90	79	100	85	321	81	**1404**
Period End	**855**	**573**	**298**	**441**	**4329**	**352**	**581**	**982**	**1647**	**869**	**3288**	**926**	**15141**

Combined

Peak Per	NORTH Hartley Rd			WEST Narellan Rd			SOUTH Waterworth Dr			EAST Narellan Rd			TOT
	L	T	R	L	T	R	L	T	R	L	T	R	
0600 - 0700	269	85	64	142	1527	62	138	235	614	193	893	357	**4579**
0615 - 0715	265	92	63	140	1590	63	131	274	649	241	1002	334	**4844**
0630 - 0730	281	100	62	119	1701	75	141	277	643	272	1026	299	**4996**
0645 - 0745	274	115	69	122	1619	87	170	311	612	270	1020	296	**4965**
0700 - 0800	260	143	72	133	1552	89	187	335	566	310	1098	273	**5018**
0715 - 0815	286	208	90	170	1465	102	206	395	533	311	1099	277	**5142**
0730 - 0830	295	261	113	178	1324	134	219	456	517	338	1198	273	**5306**
0745 - 0845	308	315	140	175	1279	159	226	444	482	382	1272	272	**5454**
0800 - 0900	326	345	162	166	1250	201	256	412	467	366	1297	296	**5544**
PEAK HOUR	**326**	**345**	**162**	**166**	**1250**	**201**	**256**	**412**	**467**	**366**	**1297**	**296**	**5544**

R.O.A.R DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : EMGA
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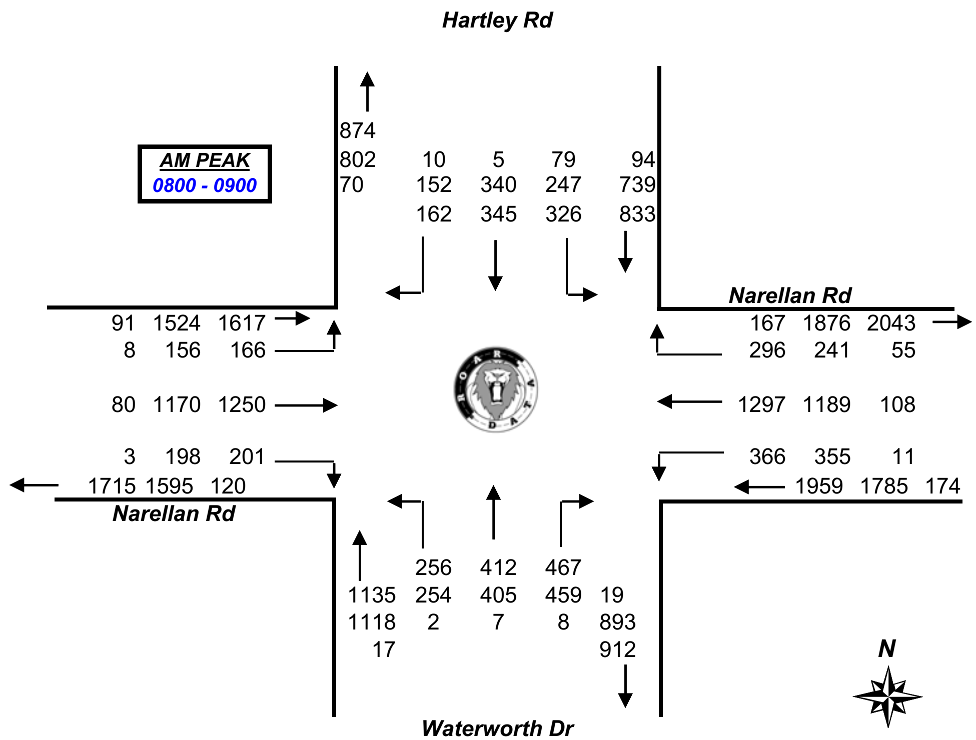
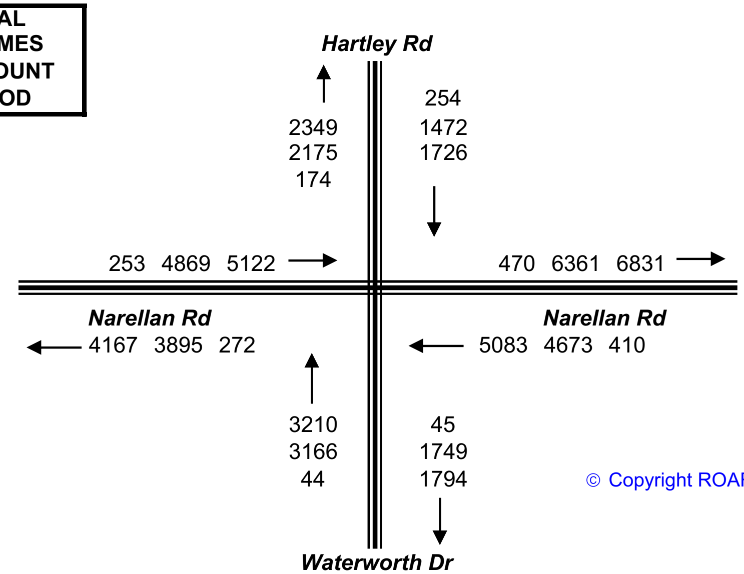
Day/Date : Friday 11th December 2015



Peds	NORTH	WEST	SOUTH	EAST	
	Hartley Rd	*Narellan Rd*	*Waterworth Dr*	*Narellan Rd*	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	**TOT**
0600 - 0615	0	0	0	0	**0**
0615 - 0630	0	0	1	0	**1**
0630 - 0645	0	0	0	0	**0**
0645 - 0700	0	1	0	0	**1**
0700 - 0715	0	0	0	0	**0**
0715 - 0730	0	0	0	0	**0**
0730 - 0745	0	0	0	0	**0**
0745 - 0800	1	3	0	1	**5**
0800 - 0815	0	1	0	0	**1**
0815 - 0830	0	5	0	0	**5**
0830 - 0845	0	0	0	1	**1**
0845 - 0900	1	1	0	0	**2**
Period End	**2**	**11**	**1**	**2**	**16**

TOTAL VOLUMES FOR COUNT PERIOD



Peds	NORTH	WEST	SOUTH	EAST	
	Hartley Rd	*Narellan Rd*	*Waterworth Dr*	*Narellan Rd*	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	**TOT**
0600 - 0700	0	1	1	0	**2**
0615 - 0715	0	1	1	0	**2**
0630 - 0730	0	1	0	0	**1**
0645 - 0745	0	1	0	0	**1**
0700 - 0800	1	3	0	1	**5**
0715 - 0815	1	4	0	1	**6**
0730 - 0830	1	9	0	1	**11**
0745 - 0845	1	9	0	2	**12**
0800 - 0900	1	7	0	1	**9**
PEAK HR	**1**	**7**	**0**	**1**	**9**

R.O.A.R. DATA

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Client : EMGA
Job No/Name : 5898 NARELLAN Intersection Counts
Day/Date : Friday 11th December 2015

Lights

	NORTH			WEST			SOUTH			EAST			
	Hartley Rd			*Narellan Rd*			*Waterworth Dr*			*Narellan Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1515	156	109	40	48	313	57	60	68	87	157	347	64	**1506**
1515 - 1530	93	111	36	42	401	103	61	88	103	153	281	64	**1536**
1530 - 1545	119	111	46	34	343	89	52	90	115	179	317	44	**1539**
1545 - 1600	89	122	31	56	396	80	62	85	91	195	390	41	**1638**
1600 - 1615	128	120	73	31	368	81	74	85	90	176	357	63	**1646**
1615 - 1630	89	111	26	47	410	66	57	75	106	208	366	48	**1609**
1630 - 1645	106	104	32	31	384	107	59	83	90	186	296	69	**1547**
1645 - 1700	101	114	36	35	357	93	48	66	112	180	318	51	**1511**
1700 - 1715	106	108	54	36	393	86	55	55	117	190	367	53	**1620**
1715 - 1730	61	130	35	39	388	89	47	83	115	198	348	42	**1575**
1730 - 1745	59	115	29	22	309	70	31	101	121	199	343	39	**1438**
1745 - 1800	47	111	19	25	312	101	71	76	103	182	376	44	**1467**
Period End	**1154**	**1366**	**457**	**446**	**4374**	**1022**	**677**	**955**	**1250**	**2203**	**4106**	**622**	**18632**

Lights

	NORTH			WEST			SOUTH			EAST			
	Hartley Rd			*Narellan Rd*			*Waterworth Dr*			*Narellan Rd*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1600	457	453	153	180	1453	329	235	331	396	684	1335	213	**6219**
1515 - 1615	429	464	186	163	1508	353	249	348	399	703	1345	212	**6359**
1530 - 1630	425	464	176	168	1517	316	245	335	402	758	1430	196	**6432**
1545 - 1645	412	457	162	165	1558	334	252	328	377	765	1409	221	**6440**
1600 - 1700	424	449	167	144	1519	347	238	309	398	750	1337	231	**6313**
1615 - 1715	402	437	148	149	1544	352	219	279	425	764	1347	221	**6287**
1630 - 1730	374	456	157	141	1522	375	209	287	434	754	1329	215	**6253**
1645 - 1745	327	467	154	132	1447	338	181	305	465	767	1376	185	**6144**
1700 - 1800	273	464	137	122	1402	346	204	315	456	769	1434	178	**6100**
PEAK HOUR	**425**	**464**	**176**	**168**	**1517**	**316**	**245**	**335**	**402**	**758**	**1430**	**196**	**6432**

Heavies

	NORTH			WEST			SOUTH			EAST			
	Hartley Rd			*Narellan Rd*			*Waterworth Dr*			*Narellan Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1515	16	1	1	3	19	1	1	3	1	3	18	10	**77**
1515 - 1530	9	1	0	1	18	0	1	0	2	3	21	8	**64**
1530 - 1545	12	1	1	2	12	0	0	1	1	1	18	8	**57**
1545 - 1600	6	0	0	1	12	0	0	3	3	3	16	8	**52**
1600 - 1615	15	3	1	1	7	0	0	3	5	2	11	11	**59**
1615 - 1630	17	2	1	1	7	0	0	1	3	2	11	11	**56**
1630 - 1645	9	0	1	3	5	0	0	0	4	2	11	9	**44**
1645 - 1700	13	0	2	5	5	1	0	1	3	3	11	10	**54**
1700 - 1715	10	0	1	0	8	0	1	0	2	1	17	7	**47**
1715 - 1730	6	0	3	1	3	0	0	2	1	2	11	9	**38**
1730 - 1745	6	1	0	1	4	0	0	0	3	1	5	8	**29**
1745 - 1800	10	0	0	1	6	0	0	1	1	2	11	8	**40**
Period End	**129**	**9**	**11**	**20**	**106**	**2**	**3**	**15**	**29**	**25**	**161**	**107**	**617**

Heavies

	NORTH			WEST			SOUTH			EAST			
	Hartley Rd			*Narellan Rd*			*Waterworth Dr*			*Narellan Rd*			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1600	43	3	2	7	61	1	2	7	7	10	73	34	**250**
1515 - 1615	42	5	2	5	49	0	1	7	11	9	66	35	**232**
1530 - 1630	50	6	3	5	38	0	0	8	12	8	56	38	**224**
1545 - 1645	47	5	3	6	31	0	0	7	15	9	49	39	**211**
1600 - 1700	54	5	5	10	24	1	0	5	15	9	44	41	**213**
1615 - 1715	49	2	5	9	25	1	1	2	12	8	50	37	**201**
1630 - 1730	38	0	7	9	21	1	1	3	10	8	50	35	**183**
1645 - 1745	35	1	6	7	20	1	1	3	9	7	44	34	**168**
1700 - 1800	32	1	4	3	21	0	1	3	7	6	44	32	**154**
PEAK HOUR	**50**	**6**	**3**	**5**	**38**	**0**	**0**	**8**	**12**	**8**	**56**	**38**	**224**

Combined

	NORTH			WEST			SOUTH			EAST			
	Hartley Rd			*Narellan Rd*			*Waterworth Dr*			*Narellan Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1515	172	110	41	51	332	58	61	71	88	160	365	74	**1583**
1515 - 1530	102	112	36	43	419	103	62	88	105	156	302	72	**1600**
1530 - 1545	131	112	47	36	355	89	52	91	116	180	335	52	**1596**
1545 - 1600	95	122	31	57	408	80	62	88	94	198	406	49	**1690**
1600 - 1615	143	123	74	32	375	81	74	88	95	178	368	74	**1705**
1615 - 1630	106	113	27	48	417	66	57	76	109	210	377	59	**1665**
1630 - 1645	115	104	33	34	389	107	59	83	94	188	307	78	**1591**
1645 - 1700	114	114	38	40	362	94	48	67	115	183	329	61	**1565**
1700 - 1715	116	108	55	36	401	86	56	55	119	191	384	60	**1667**
1715 - 1730	67	130	38	40	391	89	47	85	116	200	359	51	**1613**
1730 - 1745	65	116	29	23	313	70	31	101	124	200	348	47	**1467**
1745 - 1800	57	111	19	26	318	101	71	77	104	184	387	52	**1507**
Period End	**1283**	**1375**	**468**	**466**	**4480**	**1024**	**680**	**970**	**1279**	**2228**	**4267**	**729**	**19249**

Combined

	NORTH			WEST			SOUTH			EAST			
	Hartley Rd			*Narellan Rd*			*Waterworth Dr*			*Narellan Rd*			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1600	500	456	155	187	1514	330	237	338	403	694	1408	247	**6469**
1515 - 1615	471	469	188	168	1557	353	250	355	410	712	1411	247	**6591**
1530 - 1630	475	470	179	173	1555	316	245	343	414	766	1486	234	**6656**
1545 - 1645	459	462	165	171	1589	334	252	335	392	774	1458	260	**6651**
1600 - 1700	478	454	172	154	1543	348	238	314	413	759	1381	272	**6526**
1615 - 1715	451	439	153	158	1569	353	220	281	437	772	1397	258	**6488**
1630 - 1730	412	456	164	150	1543	376	210	290	444	762	1379	250	**6436**
1645 - 1745	362	468	160	139	1467	339	182	308	474	774	1420	219	**6312**
1700 - 1800	305	465	141	125	1423	346	205	318	463	775	1478	210	**6254**
PEAK HOUR	**475**	**470**	**179**	**173**	**1555**	**316**	**245**	**343**	**414**	**766**	**1486**	**234**	**6656**

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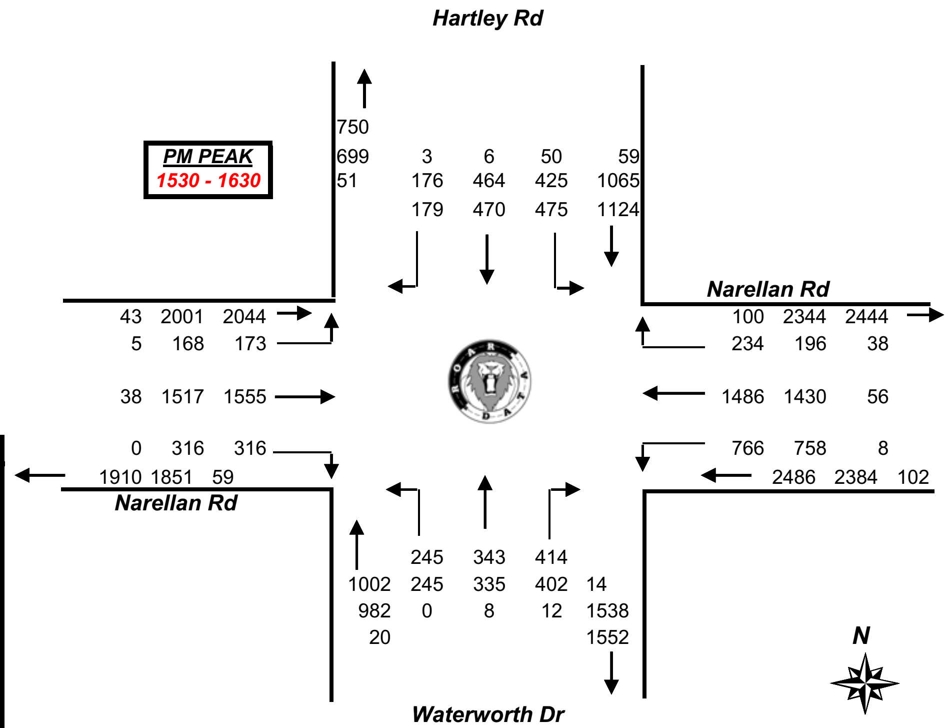
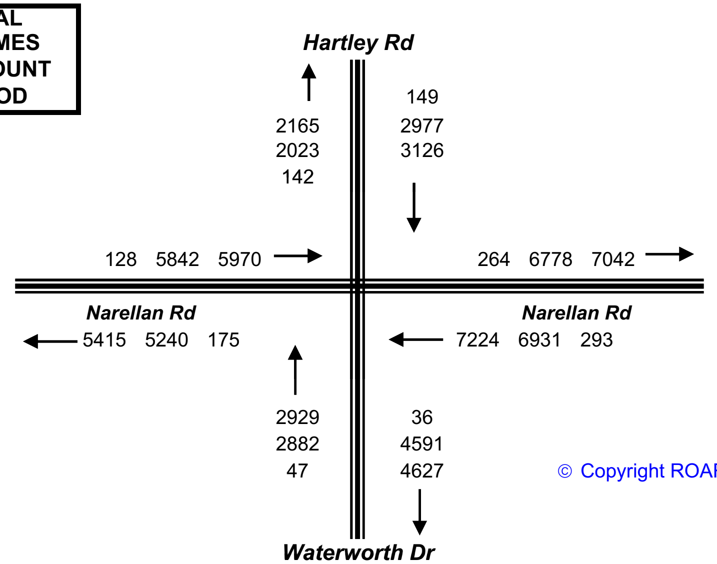


Peds	NORTH	WEST	SOUTH	EAST	
	Hartley Rd	Narellan Rd	Waterworth Dr	Narellan Rd	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1500 - 1515	0	0	0	0	**0**
1515 - 1530	1	0	0	1	**2**
1530 - 1545	0	0	0	0	**0**
1545 - 1600	0	0	0	0	**0**
1600 - 1615	0	0	0	0	**0**
1615 - 1630	0	0	0	0	**0**
1630 - 1645	0	1	0	1	**2**
1645 - 1700	0	2	1	0	**3**
1700 - 1715	0	1	0	0	**1**
1715 - 1730	1	1	0	0	**2**
1730 - 1745	1	0	0	0	**1**
1745 - 1800	0	0	0	0	**0**
Period End	**3**	**5**	**1**	**2**	**11**

TOTAL VOLUMES FOR COUNT PERIOD



Peds	NORTH	WEST	SOUTH	EAST	
	Hartley Rd	Narellan Rd	Waterworth Dr	Narellan Rd	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1500 - 1600	1	0	0	1	**2**
1515 - 1615	1	0	0	1	**2**
1530 - 1630	0	0	0	0	**0**
1545 - 1645	0	1	0	1	**2**
1600 - 1700	0	3	1	1	**5**
1615 - 1715	0	4	1	1	**6**
1630 - 1730	1	5	1	1	**8**
1645 - 1745	2	4	1	0	**7**
1700 - 1800	2	2	0	0	**4**

PEAK HR	**0**	**0**	**0**	**0**	**0**

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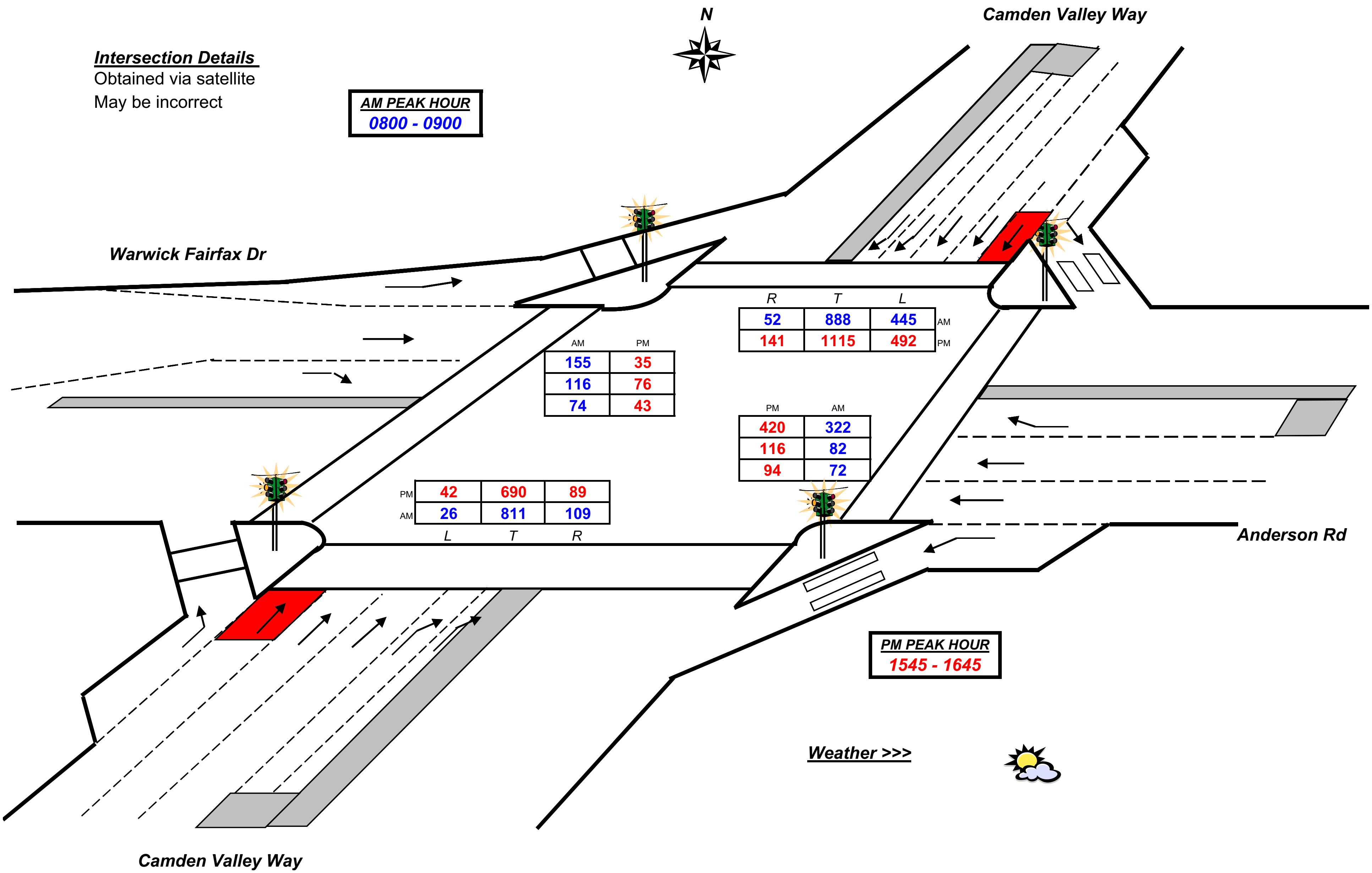

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Day/Date : Friday 11th December 2015

Lights	NORTH			WEST			SOUTH			EAST			
	Camden Valley			*Warwick Fairfax Dr*			*Camden Valley*			*Anderson Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0600 - 0615	41	68	1	12	17	3	3	65	10	2	2	32	**256**
0615 - 0630	68	90	2	15	22	4	2	171	18	8	2	55	**457**
0630 - 0645	72	104	5	28	18	9	5	224	27	14	5	86	**597**
0645 - 0700	95	113	3	19	27	3	6	146	19	10	3	68	**512**
0700 - 0715	73	119	5	37	26	6	4	190	20	9	6	73	**568**
0715 - 0730	59	86	5	25	12	6	3	162	11	14	6	68	**457**
0730 - 0745	83	109	7	28	39	5	7	201	23	14	14	62	**592**
0745 - 0800	117	159	6	42	22	12	4	189	21	10	8	70	**660**
0800 - 0815	125	185	11	38	35	26	5	209	37	26	7	88	**792**
0815 - 0830	95	190	10	42	24	8	8	233	25	10	21	55	**721**
0830 - 0845	79	184	15	31	25	19	6	163	17	9	28	57	**633**
0845 - 0900	115	293	14	42	31	21	6	191	19	22	23	91	**868**
Period End	**1022**	**1700**	**84**	**359**	**298**	**122**	**59**	**2144**	**247**	**148**	**125**	**805**	**7113**

Lights	NORTH			WEST			SOUTH			EAST			
	Camden Valley			*Warwick Fairfax Dr*			*Camden Valley*			*Anderson Rd*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0600 - 0700	276	375	11	74	84	19	16	606	74	34	12	241	**1822**
0615 - 0715	308	426	15	99	93	22	17	731	84	41	16	282	**2134**
0630 - 0730	299	422	18	109	83	24	18	722	77	47	20	295	**2134**
0645 - 0745	310	427	20	109	104	20	20	699	73	47	29	271	**2129**
0700 - 0800	332	473	23	132	99	29	18	742	75	47	34	273	**2277**
0715 - 0815	384	539	29	133	108	49	19	761	92	64	35	288	**2501**
0730 - 0830	420	643	34	150	120	51	24	832	106	60	50	275	**2765**
0745 - 0845	416	718	42	153	106	65	23	794	100	55	64	270	**2806**
0800 - 0900	414	852	50	153	115	74	25	796	98	67	79	291	**3014**
PEAK HOUR	**414**	**852**	**50**	**153**	**115**	**74**	**25**	**796**	**98**	**67**	**79**	**291**	**3014**

Heavies	NORTH			WEST			SOUTH			EAST			
	Camden Valley			*Warwick Fairfax Dr*			*Camden Valley*			*Anderson Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0600 - 0615	0	1	0	0	0	0	0	1	1	5	0	6	**14**
0615 - 0630	8	0	0	0	0	0	0	2	2	3	1	6	**22**
0630 - 0645	3	4	0	0	0	0	0	11	4	5	1	10	**38**
0645 - 0700	2	4	0	0	0	0	0	4	2	9	0	5	**26**
0700 - 0715	11	3	1	0	0	0	0	9	4	11	2	11	**52**
0715 - 0730	7	9	0	0	0	0	0	8	0	4	0	4	**32**
0730 - 0745	2	12	1	0	0	0	2	6	2	3	0	10	**38**
0745 - 0800	6	3	0	0	1	0	1	5	2	3	0	9	**30**
0800 - 0815	9	10	1	0	1	0	0	2	2	0	0	5	**30**
0815 - 0830	3	9	1	0	0	0	1	8	3	1	0	8	**34**
0830 - 0845	8	9	0	2	0	0	0	3	4	3	3	8	**40**
0845 - 0900	11	8	0	0	0	0	0	2	2	1	0	10	**34**
Period End	**70**	**72**	**4**	**2**	**2**	**0**	**4**	**61**	**28**	**48**	**7**	**92**	**390**

Heavies	NORTH			WEST			SOUTH			EAST			
	Camden Valley			*Warwick Fairfax Dr*			*Camden Valley*			*Anderson Rd*			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0600 - 0700	13	9	0	0	0	0	0	18	9	22	2	27	**100**
0615 - 0715	24	11	1	0	0	0	0	26	12	28	4	32	**138**
0630 - 0730	23	20	1	0	0	0	0	32	10	29	3	30	**148**
0645 - 0745	22	28	2	0	0	0	2	27	8	27	2	30	**148**
0700 - 0800	26	27	2	0	1	0	3	28	8	21	2	34	**152**
0715 - 0815	24	34	2	0	2	0	3	21	6	10	0	28	**130**
0730 - 0830	20	34	3	0	2	0	4	21	9	7	0	32	**132**
0745 - 0845	26	31	2	2	2	0	2	18	11	7	3	30	**134**
0800 - 0900	31	36	2	2	1	0	1	15	11	5	3	31	**138**
PEAK HOUR	**31**	**36**	**2**	**11**	**1**	**0**	**1**	**15**	**11**	**5**	**3**	**31**	**138**

Combined	NORTH			WEST			SOUTH			EAST			
	Camden Valley			*Warwick Fairfax Dr*			*Camden Valley*			*Anderson Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0600 - 0615	41	69	1	12	17	3	3	66	11	7	2	38	**270**
0615 - 0630	76	90	2	15	22	4	2	173	20	11	3	61	**479**
0630 - 0645	75	108	5	28	18	9	5	235	31	19	6	96	**635**
0645 - 0700	97	117	3	19	27	3	6	150	21	19	3	73	**538**
0700 - 0715	84	122	6	37	26	6	4	199	24	20	8	84	**620**
0715 - 0730	66	95	5	25	12	6	3	170	11	18	6	72	**489**
0730 - 0745	85	121	8	28	39	5	9	207	25	17	14	72	**630**
0745 - 0800	123	162	6	42	23	12	5	194	23	13	8	79	**690**
0800 - 0815	134	195	12	38	36	26	5	211	39	26	7	93	**822**
0815 - 0830	98	199	11	42	24	8	9	241	28	11	21	63	**755**
0830 - 0845	87	193	15	33	25	19	6	166	21	12	31	65	**673**
0845 - 0900	126	301	14	42	31	21	6	193	21	23	23	101	**902**
Period End	**1092**	**1772**	**88**	**361**	**300**	**122**	**63**	**2205**	**275**	**196**	**132**	**897**	**7503**

Combined	NORTH			WEST			SOUTH			EAST			
	Camden Valley			*Warwick Fairfax Dr*			*Camden Valley*			*Anderson Rd*			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0600 - 0700	289	384	11	74	84	19	16	624	83	56	14	268	**1922**
0615 - 0715	332	437	16	99	93	22	17	757	96	69	20	314	**2272**
0630 - 0730	322	442	19	109	83	24	18	754	87	76	23	325	**2282**
0645 - 0745	332	455	22	109	104	20	22	726	81	74	31	301	**2277**
0700 - 0800	358	500	25	132	100	29	21	770	83	68	36	307	**2429**
0715 - 0815	408	573	31	133	110	49	22	782	98	74	35	316	**2631**
0730 - 0830	440	677	37	150	122	51	28	853	115	67	50	307	**2897**
0745 - 0845	442	749	44	155	108	65	25	812	111	62	67	300	**2940**
0800 - 0900	445	888	52	155	116	74	26	811	109	72	82	322	**3152**
PEAK HOUR	**445**	**888**	**52**	**155**	**116**	**74**	**26**	**811**	**109**	**72**	**82**	**322**	**3152**

R.O.A.R DATA

Reliable, Original & Authentic Results

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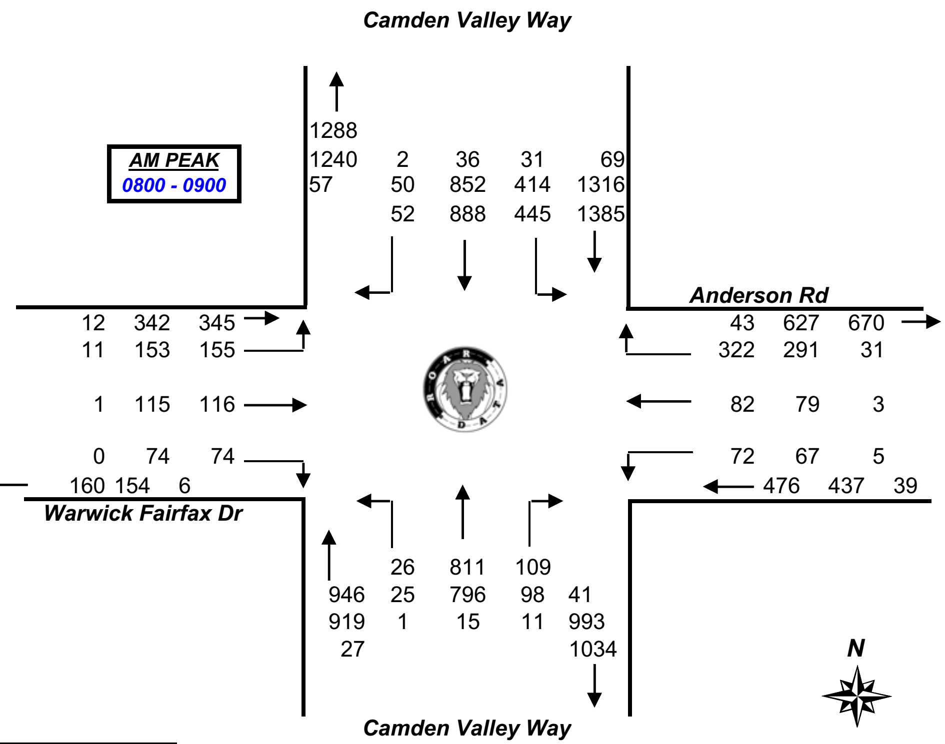
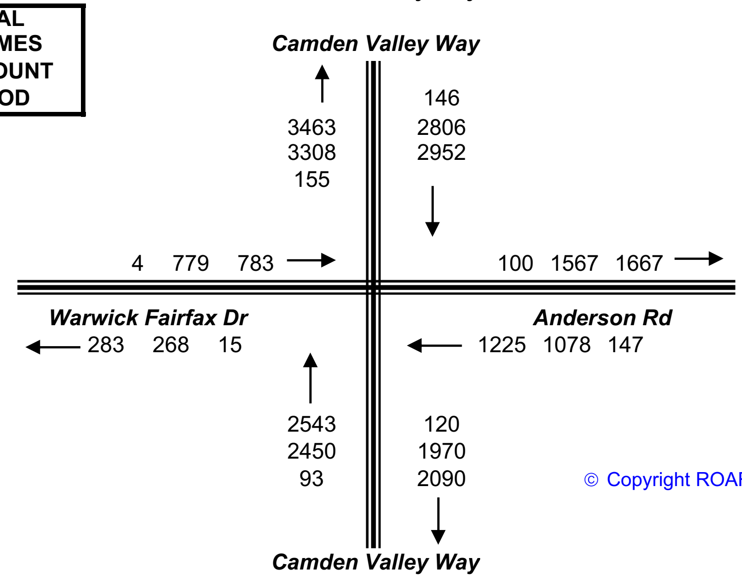
Client : EMGA
Job No/Name : 5898 NARELLAN Intersection Counts
Day/Date : Friday 11th December 2015



Peds	NORTH Way	WEST Warwick Fairfax Dr	SOUTH Way	EAST Anderson Rd	
Time Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
0600 - 0615	0	0	0	0	**0**
0615 - 0630	0	0	0	0	**0**
0630 - 0645	0	0	0	0	**0**
0645 - 0700	0	0	0	0	**0**
0700 - 0715	0	1	0	0	**1**
0715 - 0730	0	2	0	0	**2**
0730 - 0745	1	0	1	0	**2**
0745 - 0800	0	0	0	0	**0**
0800 - 0815	1	1	0	0	**2**
0815 - 0830	0	0	0	0	**0**
0830 - 0845	0	0	0	0	**0**
0845 - 0900	0	0	0	0	**0**
Period End	**2**	**4**	**1**	**0**	**7**

TOTAL VOLUMES FOR COUNT PERIOD



Peds	NORTH Way	WEST Warwick Fairfax Dr	SOUTH Way	EAST Anderson Rd	
Peak Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
0600 - 0700	0	0	0	0	**0**
0615 - 0715	0	1	0	0	**1**
0630 - 0730	0	3	0	0	**3**
0645 - 0745	1	3	1	0	**5**
0700 - 0800	1	3	1	0	**5**
0715 - 0815	2	3	1	0	**6**
0730 - 0830	2	1	1	0	**4**
0745 - 0845	1	1	0	0	**2**
0800 - 0900	1	1	0	0	**2**

PEAK HR	**1**	**1**	**0**	**0**	**2**

R.O.A.R. DATA

Reliable, Original & Authentic Results

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Client : EMGA
Job No/Name : 5898 NARELLAN Intersection Counts
Day/Date : Friday 11th December 2015

Lights

	NORTH Camden Valley			WEST Warwick Fairfax			SOUTH Camden Valley			EAST Anderson Rd			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1500 - 1515	86	228	25	21	14	20	13	169	14	32	14	135	**771**
1515 - 1530	87	213	18	4	12	16	10	180	25	30	16	98	**709**
1530 - 1545	82	206	19	6	13	6	14	198	32	20	23	88	**707**
1545 - 1600	112	302	44	8	18	14	9	135	28	22	36	91	**819**
1600 - 1615	147	303	36	12	19	13	3	180	22	24	34	111	**904**
1615 - 1630	110	241	27	9	22	11	13	156	14	21	22	100	**746**
1630 - 1645	111	251	34	5	16	4	15	207	19	27	24	103	**816**
1645 - 1700	109	252	33	15	20	19	17	169	23	22	23	95	**797**
1700 - 1715	85	202	22	1	17	12	13	122	15	48	48	121	**706**
1715 - 1730	120	248	46	14	25	5	17	162	18	33	34	91	**813**
1730 - 1745	88	247	42	18	22	3	11	145	16	16	30	70	**708**
1745 - 1800	138	270	34	17	9	19	7	186	15	20	27	96	**838**
Period End	**1275**	**2963**	**380**	**130**	**207**	**142**	**142**	**2009**	**241**	**315**	**331**	**1199**	**9334**

Lights

	NORTH Camden Valley			WEST Warwick Fairfax			SOUTH Camden Valley			EAST Anderson Rd			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1500 - 1600	367	949	106	39	57	56	46	682	99	104	89	412	**3006**
1515 - 1615	428	1024	117	30	62	49	36	693	107	96	109	388	**3139**
1530 - 1630	451	1052	126	35	72	44	39	669	96	87	115	390	**3176**
1545 - 1645	480	1097	141	34	75	42	40	678	83	94	116	405	**3285**
1600 - 1700	477	1047	130	41	77	47	48	712	78	94	103	409	**3263**
1615 - 1715	415	946	116	30	75	46	58	654	71	118	117	419	**3065**
1630 - 1730	425	953	135	35	78	40	62	660	75	130	129	410	**3132**
1645 - 1745	402	949	143	48	84	39	58	598	72	119	135	377	**3024**
1700 - 1800	431	967	144	50	73	39	48	615	64	117	139	378	**3065**
PEAK HOUR	**480**	**1097**	**141**	**34**	**75**	**42**	**40**	**678**	**83**	**94**	**116**	**405**	**3285**

Heavies

	NORTH Camden Valley			WEST Warwick Fairfax			SOUTH Camden Valley			EAST Anderson Rd			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1500 - 1515	3	5	0	0	0	0	0	3	0	3	0	10	**24**
1515 - 1530	4	4	0	0	0	0	1	3	0	2	0	2	**16**
1530 - 1545	2	5	0	0	0	1	0	1	1	0	0	2	**12**
1545 - 1600	3	3	0	0	1	1	1	1	1	0	0	1	**12**
1600 - 1615	2	4	0	1	0	0	1	4	2	0	0	2	**16**
1615 - 1630	3	5	0	0	0	0	0	5	1	0	0	3	**17**
1630 - 1645	4	6	0	0	0	0	0	2	2	0	0	9	**23**
1645 - 1700	2	4	0	0	0	0	1	4	2	2	0	4	**19**
1700 - 1715	2	8	0	0	0	0	2	2	3	0	0	6	**23**
1715 - 1730	2	3	0	0	0	0	2	2	2	0	0	3	**14**
1730 - 1745	1	0	0	0	0	0	1	1	1	0	0	1	**5**
1745 - 1800	3	2	0	0	0	1	1	4	1	0	0	2	**14**
Period End	**31**	**49**	**0**	**1**	**1**	**3**	**10**	**32**	**16**	**7**	**0**	**45**	**195**

Heavies

	NORTH Camden Valley			WEST Warwick Fairfax			SOUTH Camden Valley			EAST Anderson Rd			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1500 - 1600	12	17	0	0	1	2	2	8	2	5	0	15	**64**
1515 - 1615	11	16	0	1	1	2	3	9	4	2	0	7	**56**
1530 - 1630	10	17	0	1	1	2	2	11	5	0	0	8	**57**
1545 - 1645	12	18	0	1	1	1	2	12	6	0	0	15	**68**
1600 - 1700	11	19	0	1	0	0	2	15	7	2	0	18	**75**
1615 - 1715	11	23	0	0	0	0	3	13	8	2	0	22	**82**
1630 - 1730	10	21	0	0	0	0	5	10	9	2	0	22	**79**
1645 - 1745	7	15	0	0	0	0	6	9	8	2	0	14	**61**
1700 - 1800	8	13	0	0	0	1	6	9	7	0	0	12	**56**
PEAK HOUR	**12**	**18**	**0**	**1**	**1**	**1**	**2**	**12**	**6**	**0**	**0**	**15**	**68**

Combined

	NORTH Camden Valley			WEST Warwick Fairfax			SOUTH Camden Valley			EAST Anderson Rd			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1500 - 1515	89	233	25	21	14	20	13	172	14	35	14	145	**795**
1515 - 1530	91	217	18	4	12	16	11	183	25	32	16	100	**725**
1530 - 1545	84	211	19	6	13	7	14	199	33	20	23	90	**719**
1545 - 1600	115	305	44	8	19	15	10	136	29	22	36	92	**831**
1600 - 1615	149	307	36	13	19	13	4	184	24	24	34	113	**920**
1615 - 1630	113	246	27	9	22	11	13	161	15	21	22	103	**763**
1630 - 1645	115	257	34	5	16	4	15	209	21	27	24	112	**839**
1645 - 1700	111	256	33	15	20	19	18	173	25	24	23	99	**816**
1700 - 1715	87	210	22	1	17	12	15	124	18	48	48	127	**729**
1715 - 1730	122	251	46	14	25	5	19	164	20	33	34	94	**827**
1730 - 1745	89	247	42	18	22	3	12	146	17	16	30	71	**713**
1745 - 1800	141	272	34	17	9	20	8	190	16	20	27	98	**852**
Period End	**1306**	**3012**	**380**	**131**	**208**	**145**	**152**	**2041**	**257**	**322**	**331**	**1244**	**9529**

Combined

	NORTH Camden Valley			WEST Warwick Fairfax			SOUTH Camden Valley			EAST Anderson Rd			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1500 - 1600	379	966	106	39	58	58	48	690	101	109	89	427	**3070**
1515 - 1615	439	1040	117	31	63	51	39	702	111	98	109	395	**3195**
1530 - 1630	461	1069	126	36	73	46	41	680	101	87	115	398	**3233**
1545 - 1645	492	1115	141	35	76	43	42	690	89	94	116	420	**3353**
1600 - 1700	488	1066	130	42	77	47	50	727	85	96	103	427	**3338**
1615 - 1715	426	969	116	30	75	46	61	667	79	120	117	441	**3147**
1630 - 1730	435	974	135	35	78	40	67	670	84	132	129	432	**3211**
1645 - 1745	409	964	143	48	84	39	64	607	80	121	135	391	**3085**
1700 - 1800	439	980	144	50	73	40	54	624	71	117	139	390	**3121**
PEAK HOUR	**492**	**1115**	**141**	**35**	**76**	**43**	**42**	**690**	**89**	**94**	**116**	**420**	**3353**

R.O.A.R DATA

Reliable, Original & Authentic Results

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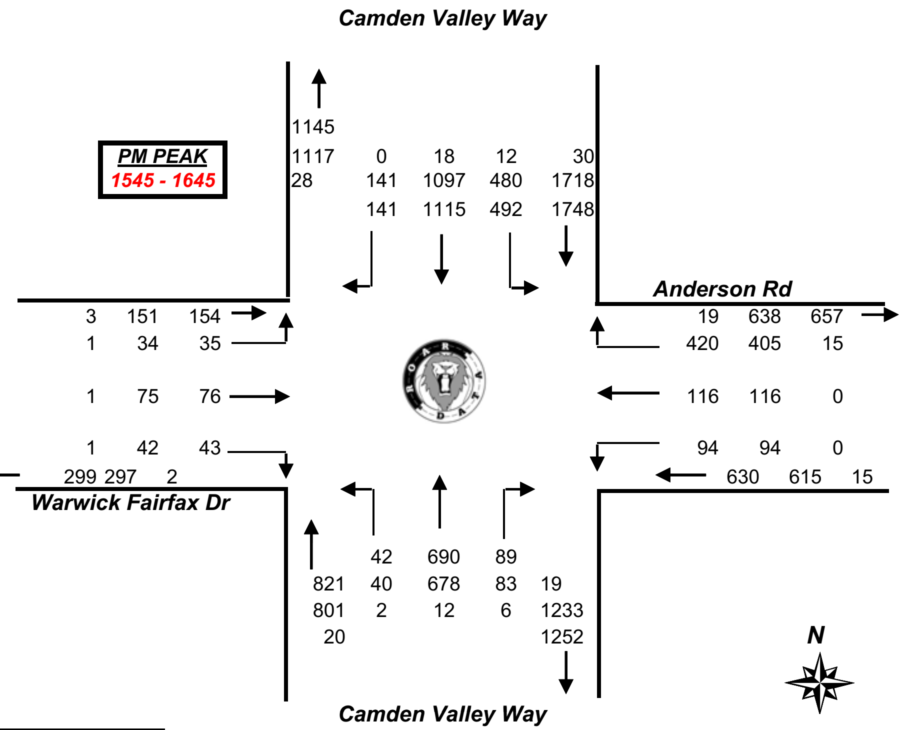
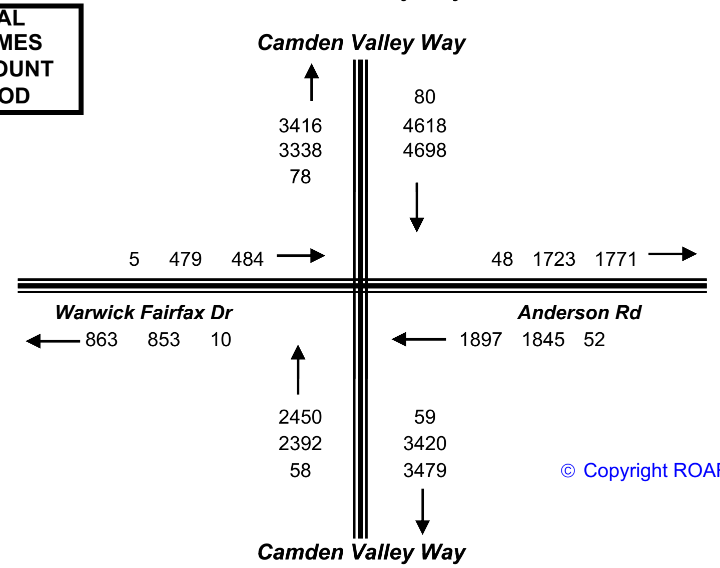
Client	: EMGA
Job No/Name	: 5898 NARELLAN Intersection Counts
Day/Date	: Friday 11th December 2015

PM PEAK
1545 - 1645



Peds	NORTH	WEST	SOUTH	EAST	
	Camden Valley	*Warwick Fairfax*	*Camden Valley*	*Anderson Rd*	
Time Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
1500 - 1515	0	0	0	0	**0**
1515 - 1530	0	0	0	0	**0**
1530 - 1545	0	0	0	0	**0**
1545 - 1600	1	2	0	1	**4**
1600 - 1615	0	0	0	0	**0**
1615 - 1630	0	0	0	0	**0**
1630 - 1645	0	0	0	0	**0**
1645 - 1700	0	0	0	0	**0**
1700 - 1715	0	0	0	0	**0**
1715 - 1730	1	1	1	0	**3**
1730 - 1745	0	0	0	0	**0**
1745 - 1800	0	0	0	0	**0**
Period End	**2**	**3**	**1**	**1**	**7**

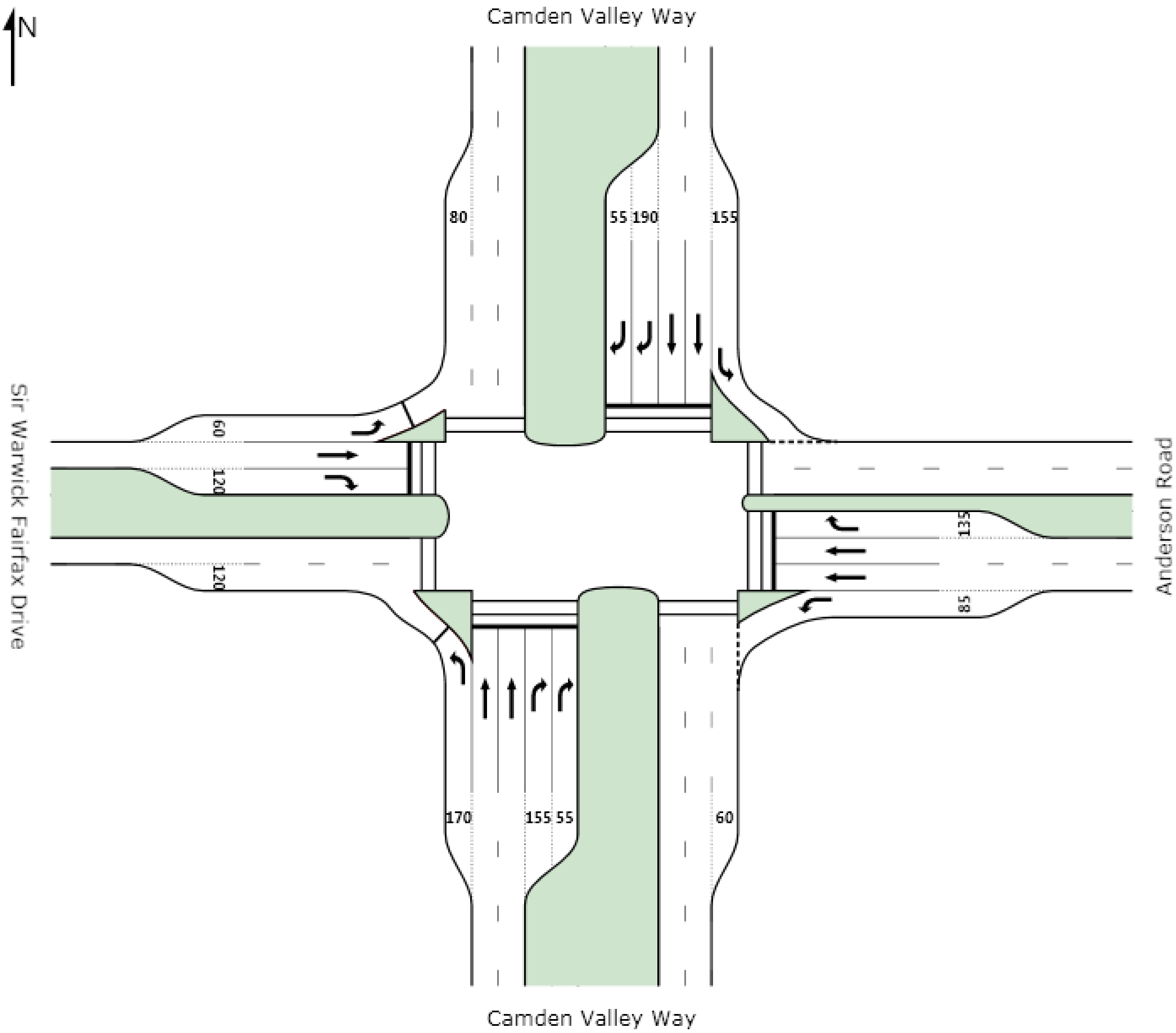
TOTAL VOLUMES FOR COUNT PERIOD



Peds	NORTH	WEST	SOUTH	EAST	
	Camden Valley	*Warwick Fairfax*	*Camden Valley*	*Anderson Rd*	
Peak Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
1500 - 1600	1	2	0	1	**4**
1515 - 1615	1	2	0	1	**4**
1530 - 1630	1	2	0	1	**4**
1545 - 1645	1	2	0	1	**4**
1600 - 1700	0	0	0	0	**0**
1615 - 1715	0	0	0	0	**0**
1630 - 1730	1	1	1	0	**3**
1645 - 1745	1	1	1	0	**3**
1700 - 1800	1	1	1	0	**3**
PEAK HR	**1**	**2**	**0**	**1**	**4**

Appendix B

SIDRA intersection analysis results



N
Camden Valley Way
80
55
190
155
Sir Warwick Fairfax Drive
60
120
120
Anderson Road
135
85
170
155
55
60
Camden Valley Way

PHASING SUMMARY

**Site: Camden Valley Way
Anderson Road Sir Warwick
Fairfax AM 2015**

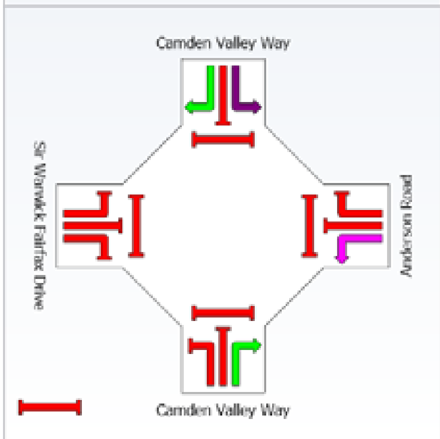
Four Way Traffic Signals
Signals - Fixed Time   Cycle Time = 135 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program
Sequence: Diamond 1 (phase reduction applied)
Input Sequence: A, A1, B, C, C1, D
Output Sequence: A, B, C, D

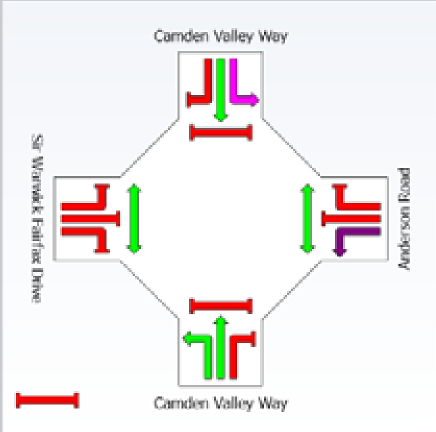
Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	6	40	32	33
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	12	46	38	39
Phase Split	9 %	34 %	28 %	29 %

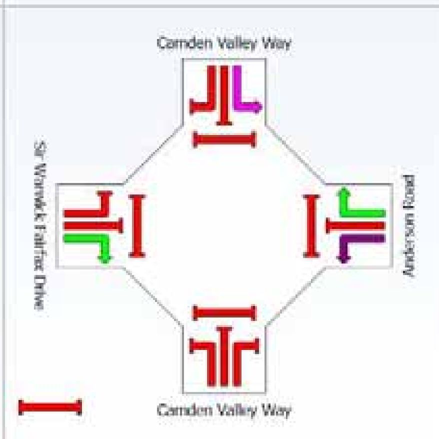
Phase A



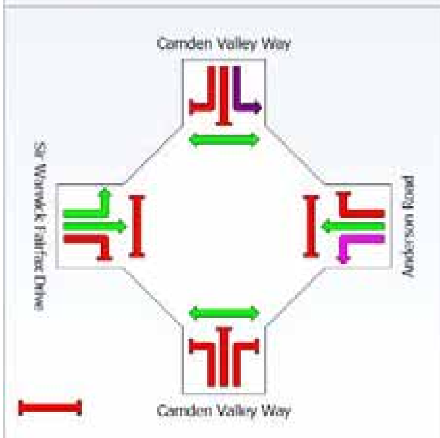
Phase B



Phase C

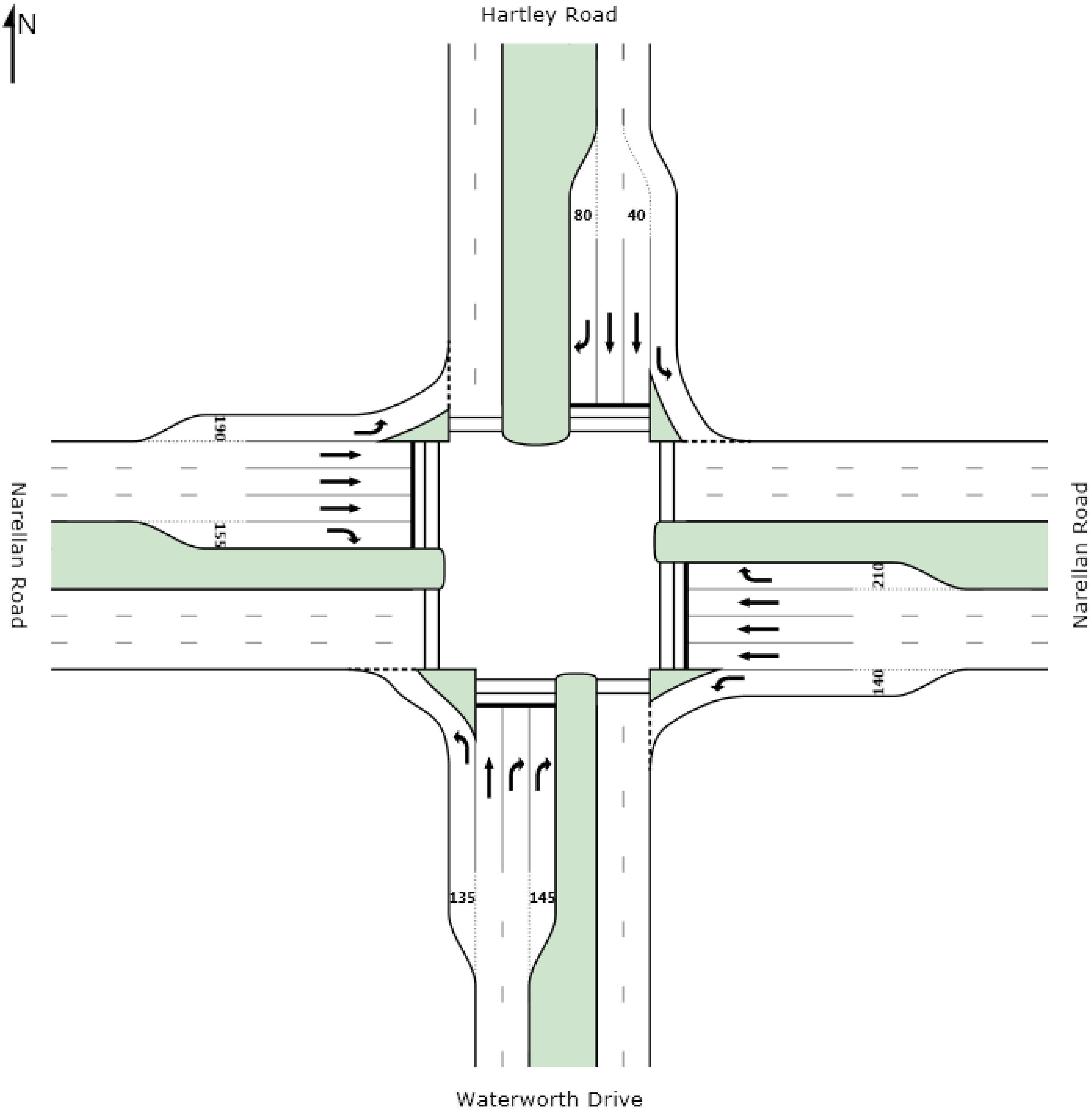


Phase D



Normal Movement	Permitted/Opposed
Slip-Lane Movement	Opposed Slip-Lane
Stopped Movement	Continuous Movement
Turn On Red	Undetected Movement
	Phase Transition Applied

SIDRA INTERSECTION


N
Hartley Road
80
40
190
155
Narellan Road
Narellan Road
210
140
135
145
Waterworth Drive

PHASING SUMMARY

Site: Narellan Road Hartley Road
2015 AM Peak

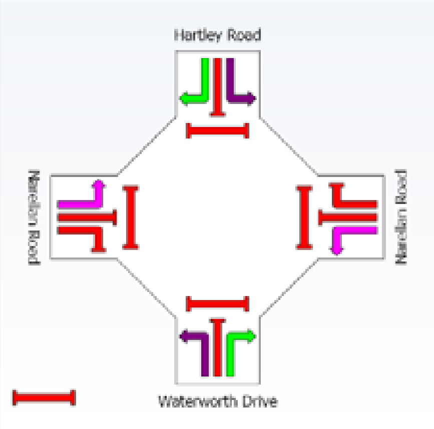
Four Way Traffic Signal Intersection
Signals - Fixed Time   Cycle Time = 130 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program
Sequence: Diamond 1 (phase reduction applied)
Input Sequence: A, A1, B, C, C1, D
Output Sequence: A, B, C, C1, D

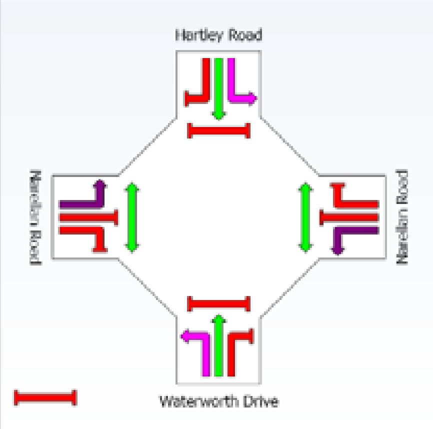
Phase Timing Results

Phase	A	B	C	C1	D
Green Time (sec)	18	30	19	1	32
Yellow Time (sec)	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2
Phase Time (sec)	24	36	25	7	38
Phase Split	18 %	28 %	19 %	5 %	29 %

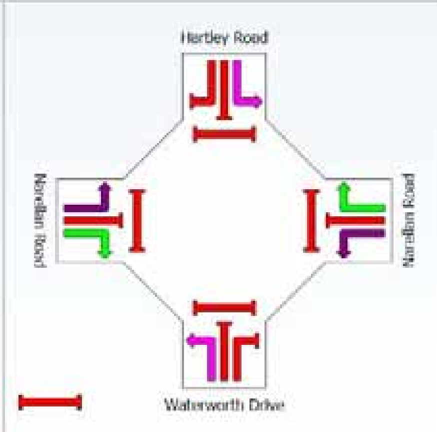
Phase A



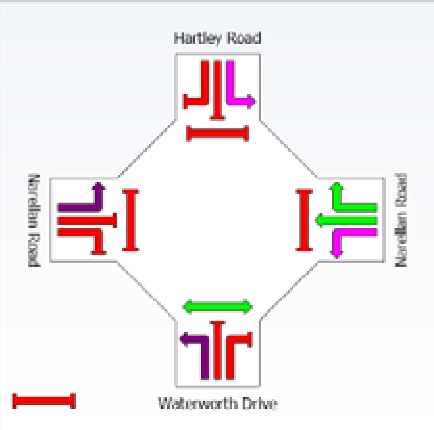
Phase B



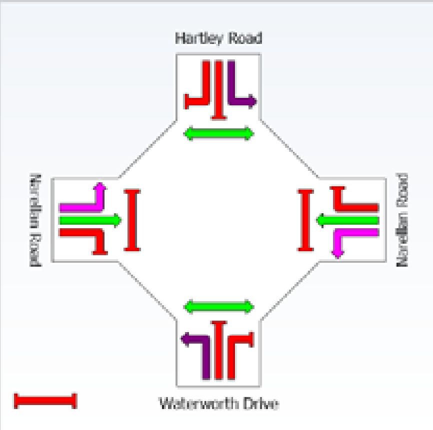
Phase C



Phase C1



Phase D



- Normal Movement
- Slip-Lane Movement
- Stopped Movement
- Turn On Red
- Permitted/Opposed
- Opposed Slip-Lane
- Continuous Movement
- Undetected Movement
- Phase Transition Applied

MOVEMENT SUMMARY

Site: Camden Valley Way Anderson Road Sir Warwick Fairfax AM 2015

Four Way Traffic Signals
Signals - Fixed Time Cycle Time = 135 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way											
1	L	27	3.8	0.051	42.7	LOS D	1.3	9.2	0.74	0.70	26.8
2	T	854	1.8	0.748	46.4	LOS D	25.5	181.2	0.97	0.85	25.3
3	R	115	10.1	0.745	84.1	LOS F	4.1	31.4	1.00	0.84	18.4
Approach		996	2.9	0.748	50.7	LOS D	25.5	181.2	0.97	0.85	24.3
East: Anderson Road											
4	L	76	6.9	0.136	14.7	LOS B	1.6	11.6	0.38	0.67	43.0
5	T	86	3.7	0.104	43.2	LOS D	2.5	17.7	0.81	0.64	26.0
6	R	339	9.6	0.823	66.0	LOS E	22.8	172.9	1.00	0.93	21.6
Approach		501	8.2	0.823	54.3	LOS D	22.8	172.9	0.87	0.84	24.1
North: Camden Valley Way											
7	L	468	7.0	0.363	9.3	LOS A	5.1	37.5	0.24	0.67	48.0
8	T	935	4.1	0.830	52.3	LOS D	30.5	221.2	1.00	0.95	23.7
9	R	55	3.8	0.391	78.8	LOS F	2.2	15.6	1.00	0.72	18.4
Approach		1458	5.0	0.830	39.5	LOS C	30.5	221.2	0.76	0.85	28.0
West: Sir Warwick Fairfax Drive											
10	L	173	6.7	0.748	56.8	LOS E	10.1	75.0	0.89	0.86	22.2
11	T	122	0.9	0.258	44.1	LOS D	6.5	45.5	0.85	0.69	24.1
12	R	78	0.0	0.177	50.3	LOS D	4.1	28.5	0.84	0.75	23.8
Approach		373	3.4	0.748	51.3	LOS D	10.1	75.0	0.86	0.78	23.1
All Vehicles		3327	4.7	0.830	46.4	LOS D	30.5	221.2	0.85	0.84	25.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	61.6	LOS F	0.2	0.2	0.96	0.96
P3	Across E approach	53	44.8	LOS E	0.2	0.2	0.81	0.81
P5	Across N approach	53	61.6	LOS F	0.2	0.2	0.96	0.96
P7	Across W approach	53	44.0	LOS E	0.2	0.2	0.81	0.81
All Pedestrians		212	53.0	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Camden Valley Way AM 2015 with Recycling site traffic

Four Way Traffic Signals
Signals - Fixed Time Cycle Time = 135 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way											
1	L	27	3.8	0.051	42.7	LOS D	1.3	9.2	0.74	0.70	26.8
2	T	854	1.8	0.748	46.4	LOS D	25.5	181.2	0.97	0.85	25.3
3	R	119	10.6	0.775	84.8	LOS F	4.3	32.9	1.00	0.86	18.3
Approach		1000	2.9	0.775	50.9	LOS D	25.5	181.2	0.97	0.85	24.2
East: Anderson Road											
4	L	78	8.1	0.141	14.7	LOS B	1.6	12.1	0.38	0.68	43.0
5	T	86	3.7	0.104	43.2	LOS D	2.5	17.7	0.81	0.64	26.0
6	R	345	10.4	0.842	67.9	LOS E	23.8	181.2	1.00	0.94	21.2
Approach		509	8.9	0.842	55.6	LOS D	23.8	181.2	0.87	0.85	23.8
North: Camden Valley Way											
7	L	483	7.4	0.376	9.3	LOS A	5.3	39.4	0.24	0.67	48.0
8	T	935	4.1	0.830	52.3	LOS D	30.5	221.2	1.00	0.95	23.7
9	R	55	3.8	0.391	78.8	LOS F	2.2	15.6	1.00	0.72	18.4
Approach		1473	5.1	0.830	39.2	LOS C	30.5	221.2	0.75	0.85	28.1
West: Sir Warwick Fairfax Drive											
10	L	173	6.7	0.748	56.8	LOS E	10.1	75.0	0.89	0.86	22.2
11	T	122	0.9	0.258	44.1	LOS D	6.5	45.5	0.85	0.69	24.1
12	R	78	0.0	0.177	50.3	LOS D	4.1	28.5	0.84	0.75	23.8
Approach		373	3.4	0.748	51.3	LOS D	10.1	75.0	0.86	0.78	23.1
All Vehicles		3355	4.9	0.842	46.5	LOS D	30.5	221.2	0.85	0.84	25.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	61.6	LOS F	0.2	0.2	0.96	0.96
P3	Across E approach	53	44.8	LOS E	0.2	0.2	0.81	0.81
P5	Across N approach	53	61.6	LOS F	0.2	0.2	0.96	0.96
P7	Across W approach	53	44.0	LOS E	0.2	0.2	0.81	0.81
All Pedestrians		212	53.0	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Camden Valley Way Anderson Road Sir Warwick Fairfax PM 2015

Four Way Traffic Signals
Signals - Fixed Time   Cycle Time = 145 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way											
1	L	44	4.8	0.087	47.4	LOS D	2.3	16.5	0.77	0.72	25.3
2	T	726	1.7	0.666	49.3	LOS D	22.6	160.7	0.94	0.82	24.5
3	R	94	6.7	0.639	87.8	LOS F	3.5	26.3	1.00	0.78	17.8
Approach		864	2.4	0.666	53.4	LOS D	22.6	160.7	0.94	0.81	23.6
East: Anderson Road											
4	L	99	0.0	0.199	18.2	LOS B	2.7	18.6	0.45	0.69	40.2
5	T	122	0.0	0.155	48.9	LOS D	3.9	27.0	0.84	0.67	24.3
6	R	442	3.6	0.957	65.0	LOS E	30.9	223.2	1.00	0.88	21.8
Approach		663	2.4	0.957	55.0	LOS D	30.9	223.2	0.89	0.81	23.9
North: Camden Valley Way											
7	L	518	2.4	0.378	8.8	LOS A	5.0	35.4	0.21	0.66	48.4
8	T	1174	1.6	0.980	91.9	LOS F	54.9	389.7	1.00	1.19	16.6
9	R	148	0.0	0.666	81.0	LOS F	6.2	43.6	1.00	0.79	18.1
Approach		1840	1.7	0.980	67.6	LOS E	54.9	389.7	0.78	1.01	20.5
West: Sir Warwick Fairfax Drive											
10	L	37	2.9	0.166	53.7	LOS D	2.0	14.6	0.82	0.71	22.9
11	T	80	1.3	0.182	48.2	LOS D	4.5	32.1	0.85	0.67	23.0
12	R	45	2.3	0.111	50.2	LOS D	2.4	17.3	0.80	0.72	23.8
Approach		162	1.9	0.182	50.0	LOS D	4.5	32.1	0.83	0.69	23.2
All Vehicles		3529	2.0	0.980	61.0	LOS E	54.9	389.7	0.84	0.91	21.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	66.6	LOS F	0.2	0.2	0.96	0.96
P3	Across E approach	53	45.6	LOS E	0.2	0.2	0.79	0.79
P5	Across N approach	53	66.6	LOS F	0.2	0.2	0.96	0.96
P7	Across W approach	53	48.0	LOS E	0.2	0.2	0.81	0.81
All Pedestrians		212	56.7	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Camden Valley Way PM 2015 with Recycling site traffic

Four Way Traffic Signals
Signals - Fixed Time   Cycle Time = 145 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way											
1	L	44	4.8	0.087	47.4	LOS D	2.3	16.5	0.77	0.72	25.3
2	T	726	1.7	0.666	49.3	LOS D	22.6	160.7	0.94	0.82	24.5
3	R	95	6.7	0.646	87.9	LOS F	3.6	26.6	1.00	0.78	17.8
Approach		865	2.4	0.666	53.4	LOS D	22.6	160.7	0.94	0.81	23.6
East: Anderson Road											
4	L	101	0.0	0.203	18.2	LOS B	2.7	19.1	0.45	0.70	40.1
5	T	122	0.0	0.155	48.9	LOS D	3.9	27.0	0.84	0.67	24.3
6	R	455	3.9	0.987	65.6	LOS E	32.2	232.7	1.00	0.88	21.7
Approach		678	2.6	0.987	55.5	LOS D	32.2	232.7	0.89	0.81	23.8
North: Camden Valley Way											
7	L	521	2.8	0.381	8.8	LOS A	5.0	35.9	0.21	0.66	48.4
8	T	1174	1.6	0.980	91.9	LOS F	54.9	389.7	1.00	1.19	16.6
9	R	148	0.0	0.666	81.0	LOS F	6.2	43.6	1.00	0.79	18.1
Approach		1843	1.8	0.980	67.5	LOS E	54.9	389.7	0.78	1.01	20.6
West: Sir Warwick Fairfax Drive											
10	L	37	2.9	0.166	53.7	LOS D	2.0	14.6	0.82	0.71	22.9
11	T	80	1.3	0.182	48.2	LOS D	4.5	32.1	0.85	0.67	23.0
12	R	45	2.3	0.111	50.2	LOS D	2.4	17.3	0.80	0.72	23.8
Approach		162	1.9	0.182	50.0	LOS D	4.5	32.1	0.83	0.69	23.2
All Vehicles		3548	2.1	0.987	61.0	LOS E	54.9	389.7	0.84	0.91	21.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	66.6	LOS F	0.2	0.2	0.96	0.96
P3	Across E approach	53	45.6	LOS E	0.2	0.2	0.79	0.79
P5	Across N approach	53	66.6	LOS F	0.2	0.2	0.96	0.96
P7	Across W approach	53	48.0	LOS E	0.2	0.2	0.81	0.81
All Pedestrians		212	56.7	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Narellan Road Hartley Road
2015 AM Peak

Four Way Traffic Signal Intersection
Signals - Fixed Time   Cycle Time = 130 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Waterworth Drive											
1	L	269	0.8	0.321	18.5	LOS B	8.2	57.5	0.54	0.72	35.9
2	T	434	1.7	0.974	88.6	LOS F	36.6	259.8	1.00	1.23	16.1
3	R	492	1.7	0.968	97.5	LOS F	20.1	143.1	1.00	1.16	15.8
Approach		1195	1.5	0.974	76.4	LOS F	36.6	259.8	0.90	1.09	18.2
East: Narellan Road											
4	L	385	3.0	0.384	14.1	LOS A	9.2	66.3	0.45	0.71	42.1
5	T	1365	8.3	0.820	49.6	LOS D	28.4	213.3	0.99	0.94	24.4
6	R	312	18.6	0.950	91.6	LOS F	25.1	204.1	1.00	1.08	17.3
Approach		2062	8.9	0.950	49.3	LOS D	28.4	213.3	0.89	0.92	24.7
North: Hartley Road											
7	L	343	24.2	0.411	27.9	LOS B	11.7	99.1	0.65	0.87	34.5
8	T	363	1.4	0.588	48.1	LOS D	14.9	105.3	0.92	0.77	24.5
9	R	171	6.2	0.692	67.7	LOS E	10.7	79.1	1.00	0.84	21.2
Approach		877	11.3	0.692	44.0	LOS D	14.9	105.3	0.83	0.82	26.8
West: Narellan Road											
10	L	173	4.9	0.204	24.6	LOS B	5.9	42.8	0.58	0.72	36.0
11	T	1316	6.4	0.952	79.0	LOS F	35.1	259.1	1.00	1.16	18.4
12	R	212	1.5	0.788	69.2	LOS E	13.9	98.2	1.00	0.90	20.1
Approach		1700	5.6	0.952	72.2	LOS F	35.1	259.1	0.96	1.09	19.6
All Vehicles		5834	6.8	0.974	60.8	LOS E	36.6	259.8	0.90	0.99	21.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	44.9	LOS E	0.2	0.2	0.83	0.83
P3	Across E approach	53	58.2	LOS E	0.2	0.2	0.95	0.95
P5	Across N approach	53	49.1	LOS E	0.2	0.2	0.87	0.87
P7	Across W approach	53	58.2	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		212	52.6	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Narellan Road Hartley Road 2015 AM Peak with Recycling Traffc

Four Way Traffic Signal Intersection
Signals - Fixed Time   Cycle Time = 130 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Waterworth Drive											
1	L	269	0.8	0.322	18.9	LOS B	8.3	58.2	0.55	0.72	35.6
2	T	434	1.7	0.974	88.6	LOS F	36.6	259.8	1.00	1.23	16.1
3	R	492	1.7	0.968	97.5	LOS F	20.1	143.1	1.00	1.16	15.8
Approach		1195	1.5	0.974	76.5	LOS F	36.6	259.8	0.90	1.09	18.2
East: Narellan Road											
4	L	385	3.0	0.384	14.1	LOS A	9.2	66.3	0.45	0.71	42.1
5	T	1365	8.3	0.820	49.6	LOS D	28.4	213.3	0.99	0.94	24.4
6	R	319	18.5	0.972	100.2	LOS F	27.1	219.9	1.00	1.11	16.2
Approach		2069	8.9	0.972	50.8	LOS D	28.4	219.9	0.89	0.92	24.3
North: Hartley Road											
7	L	346	24.3	0.415	28.0	LOS B	11.8	100.1	0.65	0.87	34.5
8	T	363	1.4	0.588	48.1	LOS D	14.9	105.3	0.92	0.77	24.5
9	R	173	6.7	0.704	68.1	LOS E	10.9	80.8	1.00	0.85	21.1
Approach		882	11.5	0.704	44.1	LOS D	14.9	105.3	0.83	0.83	26.8
West: Narellan Road											
10	L	178	5.3	0.211	24.7	LOS B	6.1	44.4	0.58	0.73	36.0
11	T	1316	6.4	0.952	79.0	LOS F	35.1	259.1	1.00	1.16	18.4
12	R	212	1.5	0.788	69.2	LOS E	13.9	98.2	1.00	0.90	20.1
Approach		1705	5.7	0.952	72.1	LOS F	35.1	259.1	0.96	1.09	19.6
All Vehicles		5852	6.8	0.974	61.3	LOS E	36.6	259.8	0.90	0.99	21.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	44.9	LOS E	0.2	0.2	0.83	0.83
P3	Across E approach	53	58.2	LOS E	0.2	0.2	0.95	0.95
P5	Across N approach	53	49.1	LOS E	0.2	0.2	0.87	0.87
P7	Across W approach	53	58.2	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		212	52.6	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Narellan Road Hartley Road
2015 PM Peak

Four Way Traffic Signal Intersection
Signals - Fixed Time   Cycle Time = 145 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Waterworth Drive											
1	L	258	0.0	0.339	23.1	LOS B	9.6	67.2	0.58	0.73	33.4
2	T	361	2.3	0.940	84.2	LOS F	30.6	218.8	1.00	1.13	16.6
3	R	436	2.9	0.914	90.3	LOS F	17.8	127.6	1.00	1.04	16.6
Approach		1055	2.0	0.940	71.8	LOS F	30.6	218.8	0.90	1.00	18.9
East: Narellan Road											
4	L	768	1.0	1.000[3]	33.2	LOS C	32.4	228.7	0.82	0.99	30.5
5	T	1603	3.8	0.885	60.6	LOS E	40.1	289.6	1.00	1.00	21.7
6	R	246	16.2	0.795	73.7	LOS F	17.7	141.3	1.00	0.90	20.1
Approach		2617	4.1	1.000	53.8	LOS D	40.1	289.6	0.95	0.99	23.4
North: Hartley Road											
7	L	500	10.5	0.561	32.3	LOS C	20.0	152.6	0.73	0.92	32.1
8	T	495	1.3	0.921	75.8	LOS F	29.2	206.6	0.97	1.00	18.4
9	R	188	1.7	0.784	78.1	LOS F	13.7	97.4	1.00	0.89	19.2
Approach		1183	5.2	0.921	57.8	LOS E	29.2	206.6	0.88	0.95	22.8
West: Narellan Road											
10	L	182	2.9	0.200	20.0	LOS B	5.6	40.2	0.49	0.71	38.9
11	T	1637	2.4	0.896	62.5	LOS E	41.7	297.8	1.00	1.01	21.3
12	R	333	0.0	0.962	100.1	LOS F	29.7	207.7	1.00	1.07	15.5
Approach		2152	2.1	0.962	64.7	LOS E	41.7	297.8	0.96	1.00	20.9
All Vehicles		7006	3.4	1.000	60.5	LOS E	41.7	297.8	0.93	0.99	21.8

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	46.4	LOS E	0.2	0.2	0.80	0.80
P3	Across E approach	53	66.6	LOS F	0.2	0.2	0.96	0.96
P5	Across N approach	53	44.8	LOS E	0.2	0.2	0.79	0.79
P7	Across W approach	53	66.6	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		212	56.1	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Narellan Road Hartley Road 2015 PM Peak with Recycling Traffic

Four Way Traffic Signal Intersection
Signals - Fixed Time Cycle Time = 145 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Waterworth Drive											
1	L	258	0.0	0.341	23.2	LOS B	9.6	67.5	0.58	0.73	33.4
2	T	361	2.3	0.940	84.2	LOS F	30.6	218.8	1.00	1.13	16.6
3	R	436	2.9	0.914	90.3	LOS F	17.8	127.6	1.00	1.04	16.6
Approach		1055	2.0	0.940	71.8	LOS F	30.6	218.8	0.90	1.00	18.9
East: Narellan Road											
4	L	768	1.0	1.000[3]	33.2	LOS C	32.4	228.7	0.82	0.99	30.5
5	T	1603	3.8	0.885	60.6	LOS E	40.1	289.6	1.00	1.00	21.7
6	R	248	16.5	0.803	74.3	LOS F	18.0	143.7	1.00	0.91	20.0
Approach		2619	4.1	1.000	53.9	LOS D	40.1	289.6	0.95	0.99	23.4
North: Hartley Road											
7	L	506	10.6	0.568	32.4	LOS C	20.2	154.6	0.73	0.93	32.1
8	T	495	1.3	0.921	75.8	LOS F	29.2	206.6	0.97	1.00	18.4
9	R	192	1.6	0.797	78.8	LOS F	14.0	99.7	1.00	0.90	19.1
Approach		1193	5.3	0.921	57.9	LOS E	29.2	206.6	0.88	0.95	22.8
West: Narellan Road											
10	L	182	2.9	0.201	20.0	LOS B	5.6	40.3	0.49	0.71	38.9
11	T	1637	2.4	0.896	62.5	LOS E	41.7	297.8	1.00	1.01	21.3
12	R	333	0.0	0.962	100.1	LOS F	29.7	207.7	1.00	1.07	15.5
Approach		2152	2.1	0.962	64.7	LOS E	41.7	297.8	0.96	1.00	20.9
All Vehicles		7018	3.4	1.000	60.6	LOS E	41.7	297.8	0.93	0.99	21.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	46.4	LOS E	0.2	0.2	0.80	0.80
P3	Across E approach	53	66.6	LOS F	0.2	0.2	0.96	0.96
P5	Across N approach	53	44.8	LOS E	0.2	0.2	0.79	0.79
P7	Across W approach	53	66.6	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		212	56.1	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Appendix C

Truck turning certification

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants
ACN 071 762 537 ABN 88 071 762 537

13 May 2016
Ref 16068

CD Architects
PO Box A102
SYDNEY SOUTH NSW 1235

Attn: Mr Jacob Yammine
jacob@cdarchitects.com.au

Dear Jacob,

TRUCK TURNING PATHS
52 ANDERSON ROAD, SMEATON GRANGE

As requested, I have reviewed the vehicular access arrangements proposed at the above location as indicated on the revised plan (copy attached).

I can confirm that the 12.5m wide driveway complies with the requirements of *Figure 3.1* of *AS2890.2 – 2002* for access driveway on a minor road catering for articulated vehicles.

Also attached is a *swept turning path* diagram confirming that a large 19m long articulated vehicle will be able to enter and exit the site whilst travelling in a forward direction at all times.

Please do not hesitate to contact me on telephone 9904 3224 should you have any enquiries.

Yours sincerely

Robert Varga
Director
Varga Traffic Planning Pty Ltd

Suite 6, 20 Young Street, Neutral Bay NSW 2089 - PO Box 1868, Neutral Bay NSW 2089
Ph: 9904 3224 - Fax: 9904 3228

GROUND FLOOR PLAN
SCALE 1:500

REFERENCES

DRAWINGS TO BE READ IN CONJUNCTION WITH BUT NOT LIMITED TO ALL STORMWATER ENGINEERS, LANDSCAPE ARCHITECTS, AND OTHER ASSOCIATED PLANS & REPORTS

revision

A	02.02.16	ISSUED FOR GENERAL INFORMATION
B	04.03.16	ISSUED FOR GENERAL INFORMATION
C	06.05.16	ISSUED FOR GENERAL INFORMATION

notes

All dimensions and setouts to be verified prior to commencement
DO NOT SCALE measurements off drawings
Figured dimensions to be used at all times
IF IN DOUBT - ASK
All omissions or discrepancies to be notified to the architect

scale 1:100 @ A3

Project Architect

CDARCHITECTS
Suite C1.10, 50-52 LYONS ROAD
DRUMMOYNE NSW 2047
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date APRIL 2013 | drawn MH

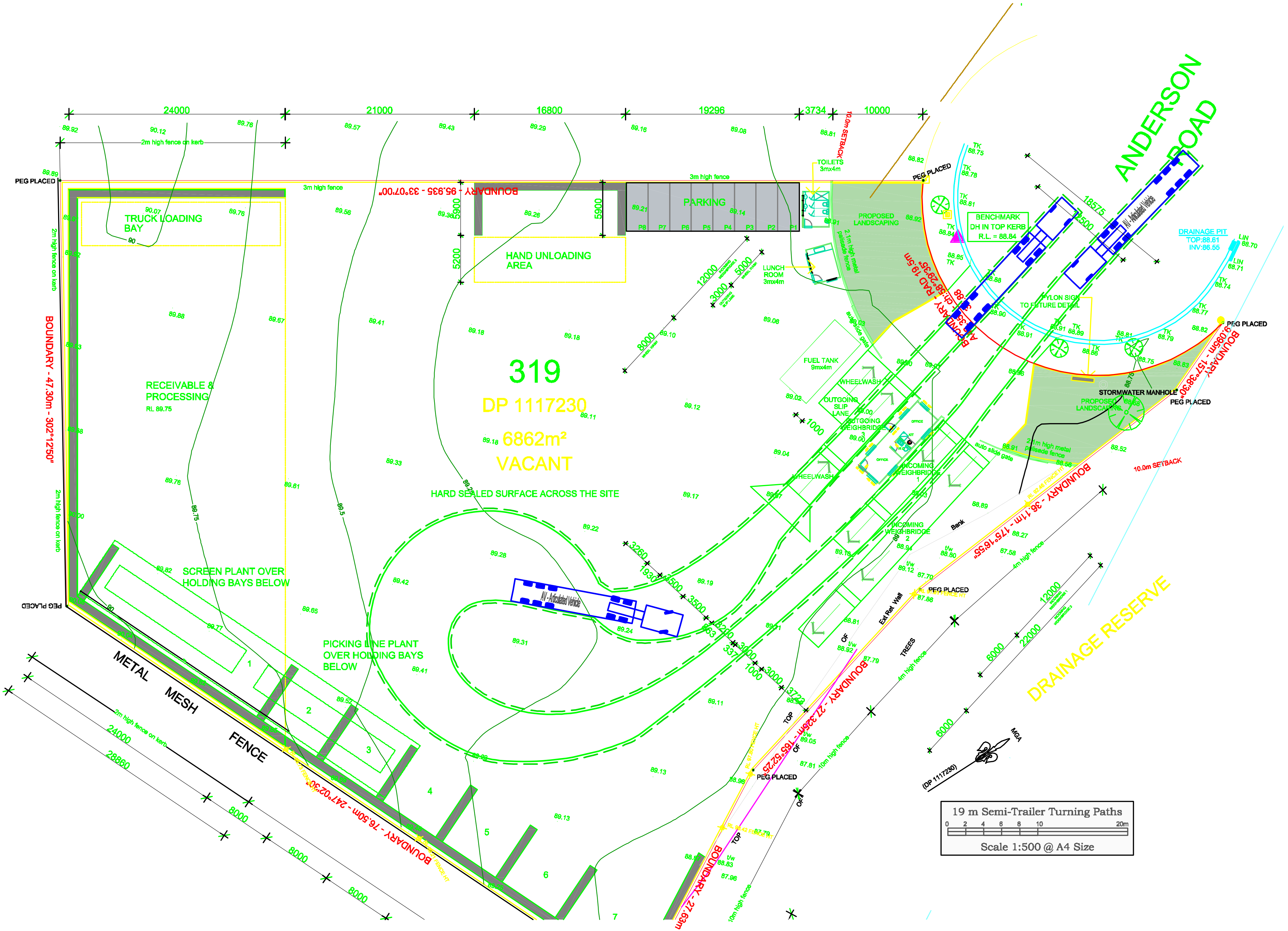
project
PROPOSED WASTE TRANSFER STATION
52 ANDERSON ROAD
SMEATON GRANGE

drawing title
GROUND FLOOR PLAN

FOR DA APPROVAL

J15306 DA 100 C

job no. | drawing no. | rev


ANDERSON ROAD
319
DP 1117230
6862m²
VACANT
HARD SEALED SURFACE ACROSS THE SITE
TRUCK LOADING BAY
RECEIVABLE & PROCESSING
RL 89.75
HAND UNLOADING AREA
PARKING
P8 P7 P6 P5 P4 P3 P2 P1
TOILETS 3mx4m
LUNCH ROOM 3mx4m
PROPOSED LANDSCAPING
BENCHMARK
DH IN TOP KERB
R.L. = 88.84
DRAINAGE PIT
TOP:88.61
INV:86.55
PYLON SIGN TO FUTURE DETAIL
FUEL TANK 9mx4m
WHEELWASH
OUTGOING SLIP LANE
OUTGOING WEIGHBRIDGE
INCOMING WEIGHBRIDGE 1
INCOMING WEIGHBRIDGE 2
OFFICE
STORMWATER MANHOLE
PEG PLACED
SCREEN PLANT OVER HOLDING BAYS BELOW
PICKING LINE PLANT OVER HOLDING BAYS BELOW
METAL MESH FENCE
2m high fence on kerb
3m high fence
4m high fence
10m high fence
2.1m high metal palisade fence
auto slide gate
10.0m SETBACK
BOUNDARY - 95.935 - 33°07'00"
BOUNDARY - 47.30m - 302°12'50"
BOUNDARY - 76.50m - 247°02'30"
BOUNDARY - 36.11m - 175°16'55"
BOUNDARY - 27.326m - 165°52'25"
AV - Articulated Vehicle
DRAINAGE RESERVE
(DP 1117230)
MGA
24000 21000 16800 19296 3734 10000
19 m Semi-Trailer Turning Paths
0 2 4 6 8 10 20m
Scale 1:500 @ A4 Size

SYDNEY
Ground floor, Suite 01, 20 Chandos Street
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Appendix E

Air quality assessment

Intended for
EMM Consulting Pty Ltd

Document type
Report

Date
June 2016

SMEATON GRANGE WASTE RECYCLING AND TRANSFER FACILITY
AIR QUALITY AND GREENHOUSE GAS ASSESSMENT

RAMBOLL ENVIRON

SMEATON GRANGE WASTE RECYCLING AND TRANSFER FACILITY
AIR QUALITY AND GREENHOUSE GAS ASSESSMENT

Version	Date	Made by	Checked by	Approved by	Signature
Final	17/06/2016	S. Fishwick	R. Kellaghan	S. Fishwick	

Ref AS121963

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Incremental Isopleth Plots

EXECUTIVE SUMMARY

Benedict Recycling Pty Ltd (Benedict Recycling) proposes to construct and operate a waste recycling and transfer facility at 52 Anderson Road, Smeaton Grange, NSW (the Recycling Facility). Ramboll Environ Australia Pty Ltd (Ramboll Environ) has been commissioned by EMM Consulting Pty Ltd (EMM) on behalf of Benedict Recycling to conduct an air quality and greenhouse assessment of the proposed Recycling Facility.

A qualitative assessment of construction dust impacts was undertaken. The results of this assessment identified that the risk of impacts from construction activities was low and could be effectively controlled through the implementation of a number of dust control mitigation measures.

Emissions of TSP, PM_{10}, $PM_{2.5}$ and odour were estimated for peak proposed operations associated with the Recycling Facility. Atmospheric dispersion modelling predictions of air pollution emissions for proposed operations were undertaken using the AERMOD dispersion model.

Existing air quality and meteorological conditions were analysed through a number of data resources, with particular weighting given to the Bureau of Meteorology Campbelltown (Mt Annan) and NSW Office of Environment and Heritage Campbelltown West monitoring stations.

The results of the dispersion modelling conducted indicated that the operation of the proposed Recycling Facility was unlikely to result in exceedances of the applicable NSW EPA assessment criteria for TSP, PM_{10} and dust deposition or the NEPM reporting goals for $PM_{2.5}$. Potential odour impacts from the Recycling Facility were conservatively assessed, with resultant predicted odour concentrations well below applicable impact assessment criterion.

A greenhouse gas quantification assessment was undertaken for the Recycling Facility. The annual Scope 1 and Scope 3 emissions at full production represent approximately 0.0004% of total GHG emissions for NSW and 0.0001% of total GHG emissions for Australia, based on the National Greenhouse Gas Inventory for 2013.

1. INTRODUCTION

Benedict Recycling Pty Ltd (Benedict Recycling) proposes to construct and operate a waste recycling and transfer facility at 52 Anderson Road, Smeaton Grange, NSW (the Recycling Facility). Ramboll Environ Australia Pty Ltd (Ramboll Environ) has been commissioned by EMM Consulting Pty Ltd (EMM) on behalf of Benedict Recycling to conduct an air quality and greenhouse gas assessment of the proposed Recycling Facility.

This report provides:

- characterisation of the existing environment, specifically the existing air quality, prevailing meteorology and regulatory context;
- review of potential emission sources and mitigation measures;
- calculation of annual particulate matter emissions from the proposed Recycling Facility;
- atmospheric dispersion modelling of emissions for proposed operations at Recycling Facility to predict potential air quality impacts at surrounding sensitive receptor locations; and
- quantification of greenhouse gas emissions from the peak operations of the Recycling Facility.

1.1 Study objectives

The objective of the study is to identify the potential air quality and greenhouse gas related impacts associated with the project, satisfy the Secretary's Environmental Assessment Requirements (SEARs) and to make recommendations for additional mitigation and management measures if required.

1.2 Secretary's Environmental Assessment Requirements

The SEARs for the project are as follows:

- **Air Quality and Odour** – including
  - a quantitative assessment of potential air quality, dust and odour impacts of the development in accordance with relevant Environment Protection Authority guidelines;
  - the details of buildings and air handling systems and strong justification for any material handling, processing or stockpiling external to a building;
  - A greenhouse gas assessment; and
  - details of proposed mitigation, management and monitoring measures.

The air quality requirements are specifically addressed in **Section 6, 7**, **8** and **9** of the report with earlier sections providing the baseline information and study methodology. The greenhouse gas requirements are specifically addressed in **Section 10** of the report.

The air quality assessment is guided by the NSW Environment Protection Authority (NSW EPA) Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales ("the Approved Methods for Modelling", (NSW EPA, 2005).

2. PROJECT DESCRIPTION AND LOCAL SETTING

2.1 Project Description

The Recycling Facility would import inert general solid waste (non-putrescible), such as construction and demolition wastes, and selected commercial and industrial wastes, for processing (e.g. screening and sorting) to produce saleable recycled materials. The recycled materials produced would include soils, metals and dry paper/cardboard. These products would meet recycled material specifications while recovering a range of materials that would otherwise be disposed to landfill.

The project setting and layout of the Recycling Facility are illustrated in **Figure 2-1** and **Figure 2-2** respectively.

No special, liquid, hazardous, restricted solid waste or general solid waste (putrescible) would be accepted at the Recycling Facility. All of the materials brought onto the site would be taken from the site as products or as rejects for disposal at an EPA licensed landfill. There would be no materials land-filled or otherwise disposed anywhere within the site as a result of this proposal.

2.1.1 State significant development application

This State Significant Development Application (SSDA) seeks consent for the following components:

- a shed, constructed in colourbond, between approximately 45.67 m and 61.96 m in length, 24 m in width and 11 m high with a floor area of approximately 1,300 m^2;
- a concrete slab for the shed;
- hard surfacing of the site in a material such as concrete or asphalt, with a perimeter curb;
- a surface water management system;
- landscaping;
- eight on-site parking spaces for staff, including one disabled space;
- connection to services;
- a weighbridge area with weighbridges;
- wheel washes for outbound vehicles;
- a demountable office;
- demountable amenities including lunch room and toilets;
- seven product bays, which will be four metres high and blockwalled;
- an enclosed, above ground bunded diesel storage tank (approximately 30,000 L);
- establishment of hand unloading area (to replace 'waste storage area' under site establishment DA);
- a sprinkling site irrigation system to minimise airborne dust;
- a flip-flow screen waste sorter (housed in main shed);
- an enclosed picking line inside the main shed that extends outside along a portion of the southern boundary;
- boundary fencing to a maximum height of 10 m on the south-eastern boundaries, 4 m along a portion of the eastern boundary, 3 m on the western boundary and 2 m at the rear and sides of the shed (see Figure 2.1);
- 2.1 m high metal palisade fence with automatic colourbond gates at the ingress and egress point;
- extension of the southern and part of the south-eastern side boundary fencing to a maximum height of 10 metres;
- waste/product stockpiles; and
- out-of-hours bin storage and waste truck parking.

2.1.2 Waste receival

Approval is sought for the Recycling Facility to accept a total of 140,000 tonnes per year of the following wastes:

- unsegregated and segregated building and demolition waste — soils, bricks, concrete, paper/cardboard, plastics, rubber, plasterboard, ceramics, glass, metal and timber, and the like;
- vegetation and uncontaminated soils;
- tiles, asphalt, suitable slags and concrete batching waste;
- excavated natural materials including virgin natural excavated material (VNEM) such as sand and sandstone which are generated during bulk earthworks and road and infrastructure repair; and
- rail ballast and spoils.

As described above, no special liquid, hazardous, restricted solid waste or general solid waste (putrescible) would be accepted at the site.

The site would accept inert waste from businesses and the general public. Accordingly, waste would be delivered to site by a variety of vehicles including:

- light vehicles such as cars with box trailers and utilities;
- single axle heavy vehicles such as 'Daihatsu's' and skip-bin trucks; and
- multiple axle combination heavy vehicles such as 'truck and dogs'.

About 28,500 waste deliveries are expected annually when the facility is operating at maximum capacity. This would be a daily average of about 68 deliveries by light vehicles (i.e. less than three tonnes) and about 36 deliveries by heavy vehicles (i.e. 3 tonnes to about 42 tonnes). However, variations around these averages are expected on any given day. While light vehicle are expected to make about 66% of deliveries, they would only deliver about 18% of the total tonnage received at the Recycling Facility.

Waste would be inspected prior to being accepted on site and any loads suspected to contain contaminants would be rejected.

Wastes would generally be stored undercover in the waste transfer holding shed prior to processing. However, some segregated heavy materials (eg concrete, timber and metal) would be stored on the hardstand.

2.1.3 Processing and dispatch

Waste processing would include sorting, picking, screening and stockpiling.

Sorting would generally occur within the waste transfer holding shed. A range of mobile plant (e.g. excavator and front-end loader) and a screening and picking line, would be used to handle and process the waste and products in the shed. Material processed in the shed would be stockpiled in the shed prior to quality testing and dispatch.

Segregated heavy waste requiring crushing or shredding (eg concrete, bricks or timber) would be sent to licensed recycling facilities able to process this waste.

Recycled products would generally be dispatched to customers, generally in the western Sydney region, by heavy vehicles.

Some waste (less than 20%) is not yet able to be easily recycled (referred to as non-recyclable residue). This would be stockpiled prior to be being sent to an EPA licensed facility for disposal.

Dispatch of products and rejects would require about 17 truck (generally truck and dog) trips daily when the Recycling Facility is operating at maximum capacity.

There would be an average of about 276 vehicle movements (ie 138 trips) daily, comprised of 170 light vehicle and 106 heavy vehicle movements for all site activities (waste receival, products/rejects dispatch, employees and maintenance).

The Recycling Facility would include parking for trucks, and employee and visitor light vehicles. Customer skip bins and skip-bin trucks would also be stored at the facility.

2.1.4 Operation hours and workforce

The Recycling Facility would generally accept deliveries (from businesses and the public) and dispatch materials between 6 am and 10 pm Monday to Friday and between 6 am and 5 pm on Saturday. It would also accept deliveries from 8 am to 4 pm on Sunday, providing an additional day on which the public could deliver recyclable waste to the facility. On occasions, the facility would accept waste deliveries 24 hours per day to allow infrastructure projects operating on a similar basis (e.g. rail corridor works) and adjoining businesses, to deliver waste as it is generated.

Waste processing would only occur at the site from 7 am to 6 pm Monday to Saturday. There would be no processing on Sundays or public holidays.

The Recycling Facility is expected to be operated by about eight full-time employees.

Figure 2-1: Site Location

Source: EMM (2016)

Figure 2-2: Proposed Site Layout

Source: EMM (2016)

2.2 Surrounding Landuse and Receptor Locations

The site is within the Smeaton Grange industrial precinct and covers 6,862 m^2. The site is flat (approximately 90 m Australian Height Datum (AHD)) and is largely covered by grass planted to stabilise the site.

The site is surrounded to the north, west and south by warehousing and other industrial operations. To the east of the Project Site is the residential suburb of Currans Hill. A number of residential receptors have been selected from the neighbouring area at which to assess air quality impacts from the proposed project. The selected receptor locations are presented in **Table 2-1** and illustrated in **Figure 2-3**.

Table 2-1 Sensitive Receptor Locations Surrounding the Project Site

Receptor ID	Location (m, MGA56S)		Elevation (m, AHD)
	Easting	Northing	
1	293824	6231032	97
2	293834	6231049	97
3	293842	6231062	97
4	293855	6231081	96
5	293877	6231114	96
6	293893	6231138	95
7	293905	6231165	94
8	293912	6231175	93
9	293920	6231187	93
10	293954	6231248	91
11	293964	6231265	91
12	293974	6231279	91
13	293983	6231293	91
14	293991	6231308	92
15	294000	6231322	92
16	294028	6231354	93
17	294038	6231373	93
18	294046	6231386	92
19	294054	6231402	92
20	294062	6231414	93
21	294072	6231426	93
22	294061	6231699	124

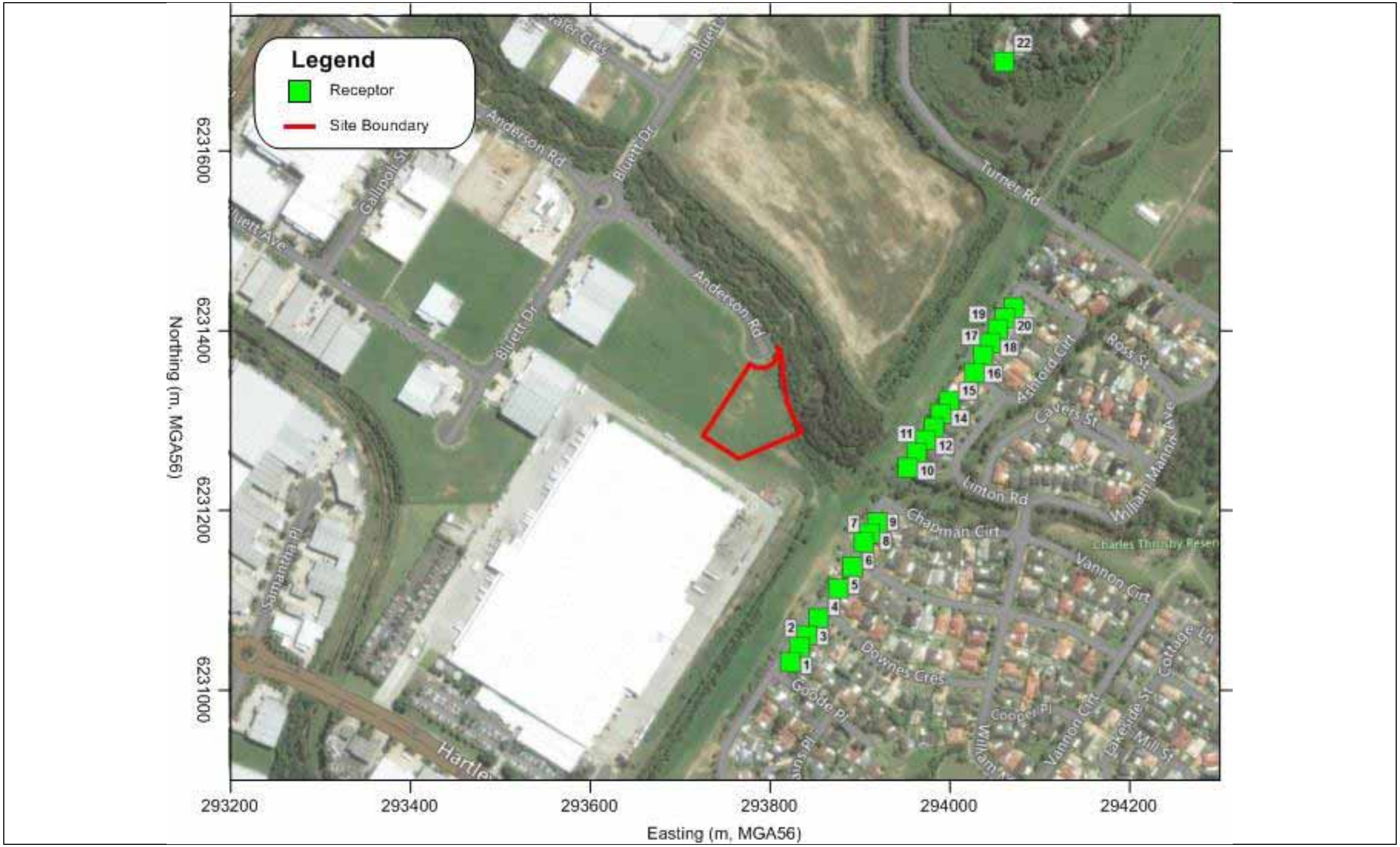


Figure 2-3: Surrounding Sensitive Receptor Locations

3. AIR QUALITY ASSESSMENT CRITERIA

The project must demonstrate compliance with the impact assessment criteria outlined in the Approved Methods for Modelling (EPA, 2005). The impact assessment criteria are designed to maintain ambient air quality that allows for the adequate protection of human health and well-being.

The Approved Methods for Modelling specifies that the impact assessment criteria for 'criteria pollutants[1]' are applied at the nearest existing or likely future off-site sensitive receptor and compared against the 100th percentile (i.e. the highest) dispersion modelling prediction. Both the incremental and cumulative impacts need to be presented, requiring consideration of existing ambient background concentrations for the criteria pollutants assessed.

For this assessment, focus has been given to the emissions of primary particulate matter (PM), including total suspended particulate matter (TSP) and particulate matter with an equivalent aerodynamic diameter of less than 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$). Dust deposition, as a result of the TSP emissions, is also assessed.

Relevant ambient air quality criteria applicable to the Recycling Facility are presented in this section. For proposed developments within NSW, ground level assessment criteria specified by the NSW EPA within the *Approved Methods for Modelling* are applicable. These assessment criteria are designed to maintain an ambient air quality that allows for adequate protection of human health and well-being.

3.1 Goals applicable to airborne particulate matter

Air quality limits for PM are typically given for various particle size metrics, including TSP, PM_{10} and $PM_{2.5}$. PM_{10} and $PM_{2.5}$ require specific consideration due to their health impact potential.

The impact assessment criteria for TSP and PM_{10} are prescribed in the Approved Methods for Modelling, however $PM_{2.5}$ is not included. Reference is therefore made to the $PM_{2.5}$ reporting standards issued by the National Environmental Protection Council (NEPC) (NEPC, 2003). The National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM) $PM_{2.5}$ reporting standards were first published as advisory goals in 2003 for the purpose of supporting the monitoring and evaluation of ambient $PM_{2.5}$ concentrations ahead of the setting ambient air quality standards for this pollutant. The AAQ NEPM was varied in December 2015 to adopt these 'advisory reporting standards' as formal standards for $PM_{2.5}$ (NEPC, 2015).

The air quality criteria applied for PM in this assessment are presented in **Table 3-1**.

[1] 'Criteria pollutants' is used to describe air pollutants that are commonly regulated and typically used as indicators for air quality. In the Approved Methods the criteria pollutants are TSP, PM_{10}, NO_2, SO_2, CO, ozone (O_3), deposition dust, hydrogen fluoride and lead.

Table 3-1 Impact assessment criteria for PM

Pollutant	Averaging Period	Concentration (µg/m³)	Reference
TSP	Annual	90	NSW EPA(1)(2)
PM_{10}	24 hours	50	NSW EPA(1)
	24 hours	50	NEPM(3)
	Annual	30	NSW EPA(1)
	Annual	25	NEPM(3)
$PM_{2.5}$	24 hours	25	NEPM(3)
	Annual	8	NEPM(3)

Note 1: NSW EPA, 2005 *Approved Methods for Modelling*

Note 2: NSW EPA impact assessment criterion based on the subsequently rescinded National Health and Medical Research Council (NHMRC) recommended goal

Note 3: NEPC, 2015, *National Environment Protection (Ambient Air Quality) Measure,* as amended

3.2 Dust deposition criteria

Nuisance dust deposition is regulated through the stipulation of maximum permissible dust deposition rates. The NSW EPA impact assessment goals for dust deposition are given in **Table 3-2** illustrating the allowable increment in dust deposition rates above ambient (background) dust deposition rates which would be acceptable so that dust nuisance could be avoided.

Table 3-2 Impact assessment criteria for dust deposition

Averaging Period	Maximum Increase in Deposited Dust Level	Maximum Total Deposited Dust Level
Annual	2 g/m^2/month	4 g/m^2/month

Source: Approved Methods for Modelling, EPA 2005

3.3 Criteria for Odour Mixtures

The odour performance criteria are expressed in terms of odour units. The detectability of an odour is defined as a sensory property that refers to the theoretical minimum concentration that produces an olfactory response or sensation. This point is called the odour threshold and defines one odour unit (OU). An odour criterion of less than 1 OU would theoretically result in no odour impact being experienced.

A concentration of 7 OU means that the sample requires a dilution with clean air 7 times to become odour free; thus an odour concentration expressed as 7 OU coincides with a dilution-to-threshold (D/T) ratio of 7, and 2 OU equates to a D/T ratio of 2 (and so on).

The NSW Technical Framework - Assessment and Management of Odour from Stationary Sources recommends that, as a design goal, no individual be exposed to ambient odour levels of greater than 7 OU (NSW DEC, 2006). Although the level at which an odour is perceived to be a nuisance can range from 2 OU to 10 OU, experience gained through odour assessments from proposed and existing facilities in NSW indicates that an odour performance goal of 7 OU is likely to represent the level below which "offensive" odours should not occur (for an individual with a 'standard sensitivity' to odours) (NSW DEC 2006).

Odour performance criteria are designed to take into account the range in sensitivities to odours within the community, and provide additional protection for individuals with a heightened response to odours, using a statistical approach which depends on the size of the affected population.

As the affected population size increases, the number of sensitive individuals is also likely to increase, which suggests that more stringent criteria are necessary in these situations. In addition, the potential for cumulative odour impacts in relatively sparsely populated areas can be more easily defined and assessed than in highly populated urban areas.

Where a number of the factors simultaneously contribute to making an odour "offensive", an odour goal of 2 OU at the nearest residence (existing or any likely future residences) is appropriate, which generally occurs for affected populations equal or above 2000 people. The EPA odour performance criteria are therefore based on considerations of risk of odour impact rather than on differences in odour acceptability between urban and rural areas.

Odour performance goals for various population densities are outlined in Table 7.5 of the Approved Methods for Modelling (EPA, 2005), and summarised in **Table 3-3**. They are expressed as the 99th percentile value, nose response time average (approximately one second).

For this assessment, an odour performance criteria of 2 OU is adopted.

Table 3-3 EPA odour performance criteria vs. population density

Population of Affected Community	Odour Performance Criteria (OU(1))
Urban area (> 2000)	2
500 – 2000	3
125 – 500	4
30 – 125	5
10-30	6
Single residence (< 2)	7

Source: Approved Methods for Modelling, EPA 2005

Note 1: Odour concentration over a nose response time averaging period (1 second), with permissible frequencies of occurrence at 99th percentile for Level 2 assessments

4. CLIMATE AND DISPERSION METEOROLOGY

Meteorological mechanisms govern the generation, dispersion, transformation and eventual removal of pollutants from the atmosphere. Emission generation rates are particularly dependent on wind energy and on the moisture budget, which is a function of rainfall and evaporation rates.

In the absence of onsite meteorological monitoring data, a combination of local area observational data and meteorological modelling techniques were used. Details regarding the meteorological modelling are presented in **Section 4.1**.

The following data were used in the meteorological analysis:

- 1-hour average meteorological data and historical climate data from the BoM Automatic Weather Station (AWS) at Campbelltown (Mt Annan) (Station Number 068257) and Camden Airport (Station Number 067108) located 4.8 km north and 11.3 km south-southwest of the Recycling Facility respectively.

4.1 Meteorological Modelling

Section 4.1 of DEC (2005) specifies that meteorological data representative of a site can be used in the absence of suitable on-site observations. Data should cover a period of at least one year with a percentage completeness of at least 90%. Site representative data can be obtained from either a nearby meteorological monitoring station or synthetically generated using the CSIRO prognostic meteorological model The Air Pollution Model (TAPM).

As stated, hourly average meteorological data from the BoM Campbelltown (Mt Annan) and Camden Airport AWS locations were obtained in the absence of onsite monitoring at the site. Data from the Campbelltown (Mt Annan) AWS was used as the primary resource, with observations from the Camden Airport AWS adopted only where data gaps exist (e.g. cloud observations only available at the Camden Airport AWS location).

To supplement these meteorological observation datasets, the CSIRO meteorological model TAPM was used to generate parameters not routinely measured, specifically the vertical temperature profile.

TAPM was configured and run in accordance with the Section 4.5 of the Approved Methods for Modelling, with the following refinements:

- Modelling to 300 m grid cell resolution (beyond 1 km resolution specified).
- Inclusion of high resolution (90 m) regional topography (improvement over default 250 m resolution data).

The TAPM vertical temperature profile for every hour was adjusted by first substituting the predicted 10 m above ground temperature with hourly recorded temperature at 10 m (sourced from the Campbelltown (Mt Annan) BoM AWS). The difference between the TAPM predicted temperature and the measured 10 m temperature was applied to the entire predicted vertical temperature profile. This modified vertical profile was used in combination with the ambient air temperature throughout the day to calculate convective mixing heights between sunrise and sunset.

4.2 Prevailing Wind Regime

A wind rose showing wind speed and direction data recorded at the Campbelltown (Mt Annan) BoM AWS is presented in **Figure 4-1**. The annual recorded wind pattern is dominated by southwesterly airflow. A less common northeasterly airflow is also experienced. The highest wind speeds recorded are most frequently experienced from the south to west quadrant. The average recorded wind speed for 2014 was 2.5 m/s, with a frequency of calm conditions (wind speeds less than 0.5 m/s) occurring in the order of 21% of the time.

Additional inter-annual, seasonal and diurnal wind roses for Campbelltown (Mt Annan) are provided in **Appendix 1**.

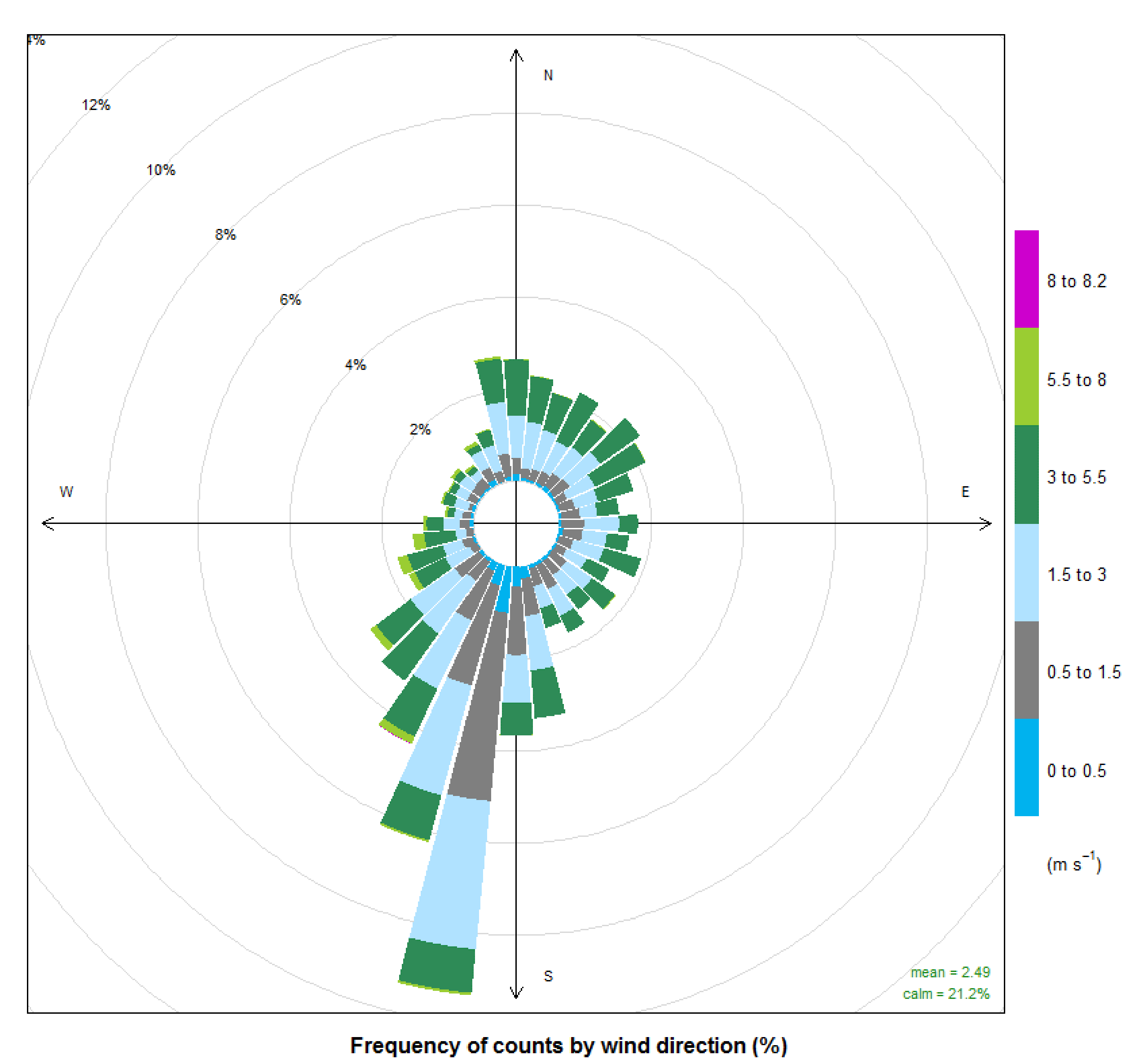


Figure 4-1: Annual Average Wind Rose – Campbelltown (Mt Annan) BoM AWS – 2014

Seasonal and diurnal (dividing the day into night and day) wind roses for the meteorological dataset are presented within **Appendix 1**.

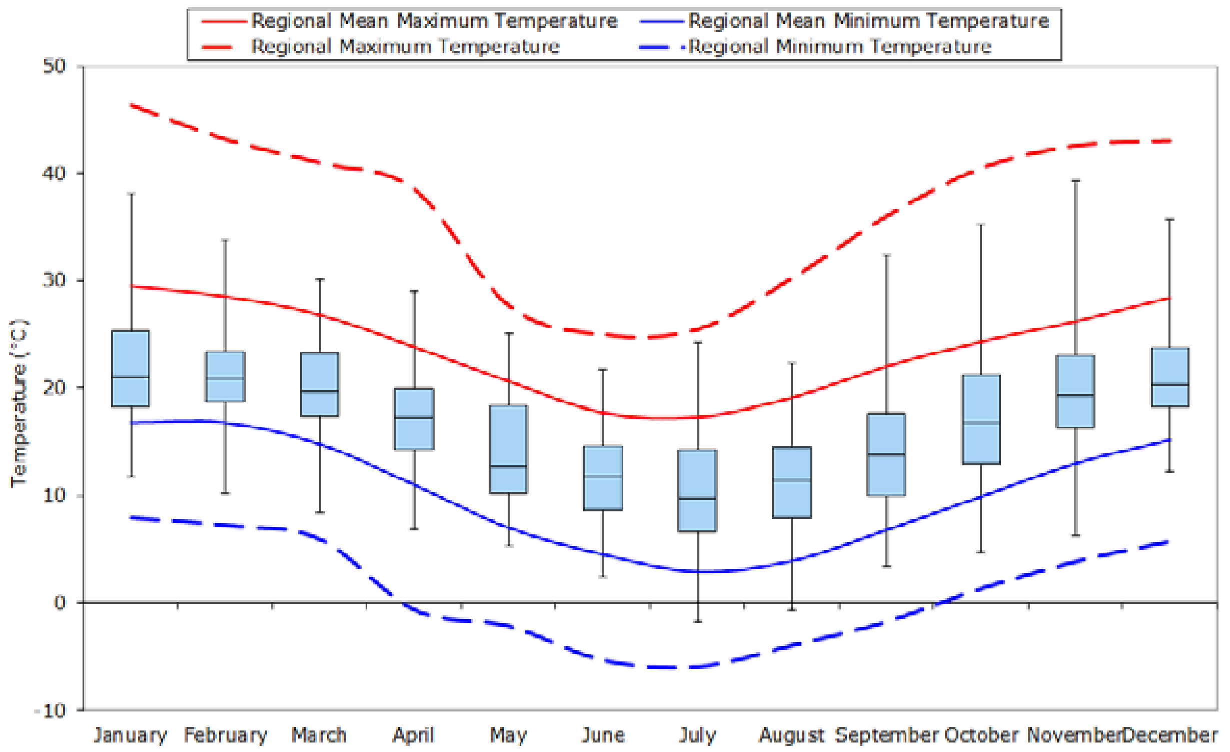
Seasonal variation in wind speed and direction is evident in the recorded data from the Campbelltown (Mt Annan) BoM AWS. The southwesterly airflow is evident in all seasons, with a particular dominance in autumn, winter and spring. The northeasterly airflow is most common in spring and summer. Wind speeds are typically lowest during the autumn months, with the lowest average wind speed and highest occurrence of calm conditions at this time. Wind speeds are highest during the spring and summer months.

Diurnal variation is notable in both recorded wind speed and direction. Wind speeds are higher during the daylight hours than at night. Daylight hours are experience a mixture of north to east and south to west quadrant flows. Night time hours experience a dominance of southwesterly air flow.

4.3 Ambient Temperature

Monthly mean minimum temperatures are in the range of 3°C to 17°C, with mean maxima of 17°C to 30°C, based on the long-term average record from the BoM Camden Airport climate station. Peaks occur during summer months with the highest temperatures typically being recorded between November and February. The lowest temperatures are usually experienced between June and August.

The 2014 Campbelltown (Mt Annan) BoM temperature dataset has been compared with long-term trends recorded at the Camden Airport BoM climate station to determine the representativeness of the dataset. **Figure 4-2** presents the monthly variation in recorded temperature during 2014 compared with the recorded station mean, minimum and maximum temperatures. There is good agreement between temperatures recorded during 2014 and the recorded historical trends, indicating that the dataset is representative of conditions likely to be experienced in the region.



Note: 2014 data from Campbelltown are illustrated by the 'box and whisker' indicators. Boxes indicate 25th, median and 75th percentile temperature values while upper and lower whiskers indicate maximum and minimum values. Maximum and minimum temperatures from long-term measurements at Camden Airport are depicted as line graphs.

Figure 4-2: Temperature Comparison between Campbelltown (Mt Annan) BoM 2014 dataset and Historical Averages (1943-2015) – Camden Airport BoM

4.4 Rainfall

Precipitation is important to air pollution studies since it impacts on dust generation potential and represents a removal mechanism for atmospheric pollutants.

Based on historical data recorded at Camden Airport, the area is characterised by moderate rainfall, with a mean annual rainfall of approximately 770mm, and an annual rainfall range between 450mm and 1,260mm. Rainfall is most pronounced in spring and summer, with lower rainfall during mid-winter to early spring. According to the long term records, an average of 112 rain days occur per year.

To provide a conservative (upper bound) estimate of the airborne particulate matter concentrations occurring due to the Recycling Facility, wet deposition (removal of particles from the air by rainfall) was excluded from the dispersion modelling simulations undertaken in this report.

4.5 Atmospheric Stability

Atmospheric stability refers to the degree of turbulence or mixing that occurs on the atmosphere and is a controlling factor in the rate of atmospheric dispersion of pollutants.

The Monin-Obukhov length (L) provides a measure of the stability of the surface layer (i.e. the layer above the ground in which vertical variation of heat and momentum flux is negligible; typically about 10 % of the mixing height). Negative L values correspond to unstable atmospheric conditions, while positive L values correspond to stable atmospheric conditions. Very large positive or negative L values correspond to neutral atmospheric conditions.

Figure 4-3 illustrates the seasonal variation of atmospheric stability derived from the Monin-Obukhov length calculated by AERMET for the Recycling Facility. The diurnal profile presented illustrates that atmospheric instability increases during daylight hours as convective energy increases, whereas stable atmospheric conditions prevail during the night-time. This profile indicates that the potential for atmospheric dispersion of emissions would be greatest during day time hours and lowest during evening through to early morning hours.

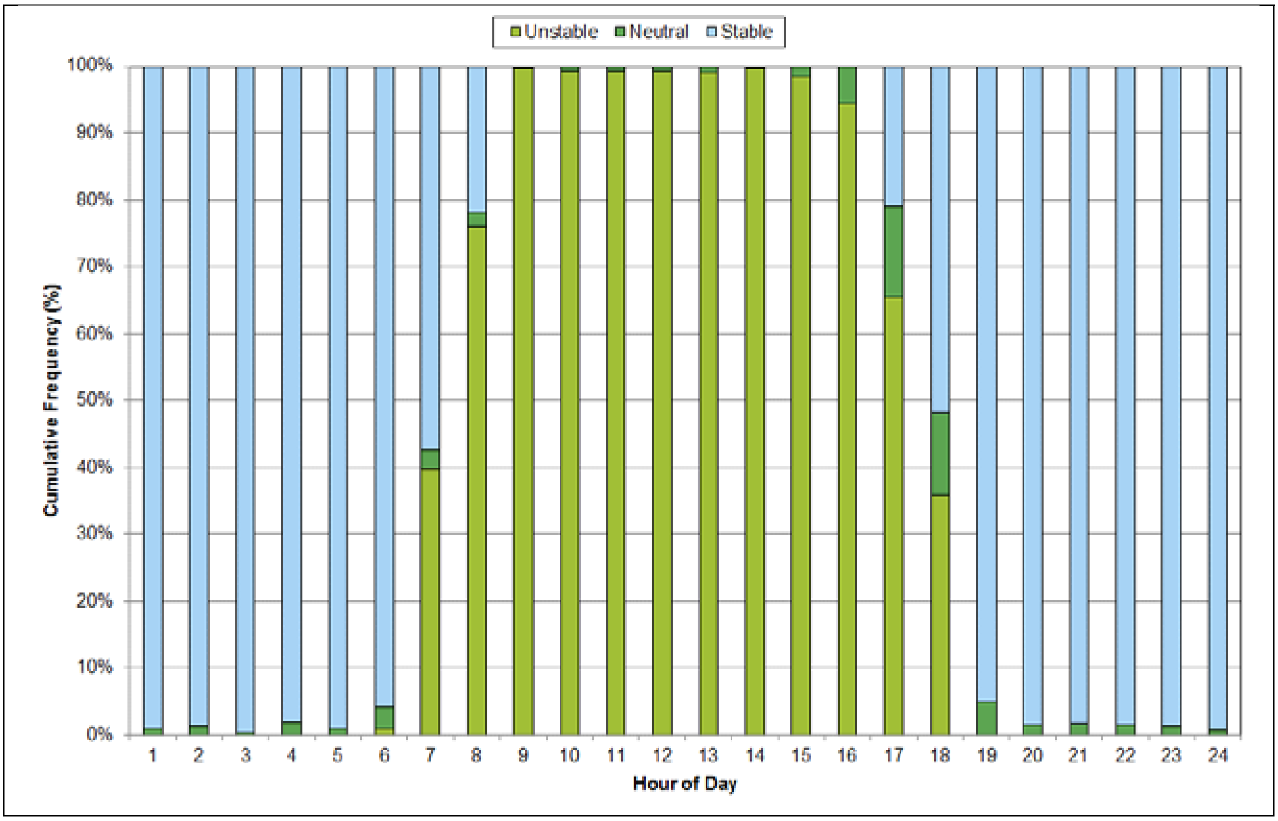
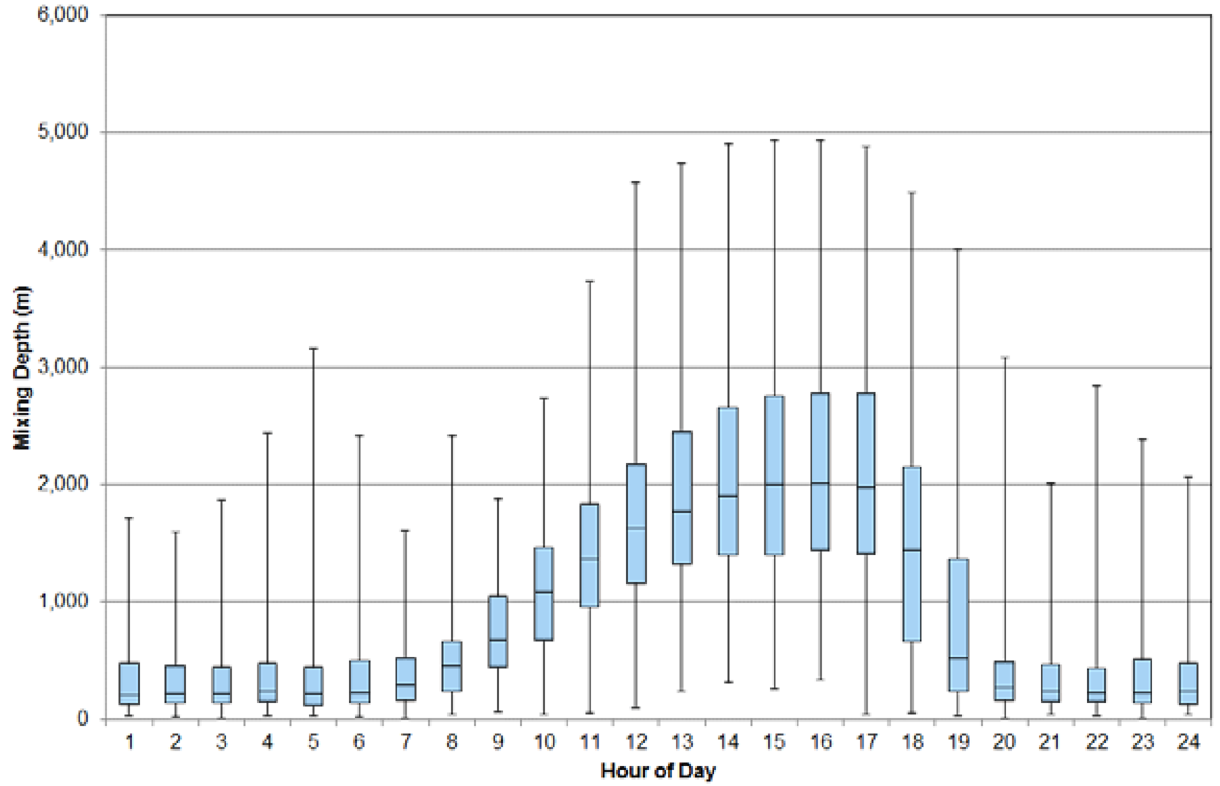


Figure 4-3: AERMET-Calculated Diurnal Variation in Atmospheric Stability– Recycling Facility 2014

4.6 Mixing Depth

Hourly-varying atmospheric boundary layer depths were generated for the Recycling Facility by AERMET, the meteorological processor for the AERMOD dispersion model (see **Section 8.1** for further information), using a combination of surface observations from the Campbelltown (Mt Annan) BoM AWS, sunrise and sunset times and adjusted TAPM-predicted upper air temperature profile.

The variation in average boundary layer depth by hour of the day for the Recycling Facility is illustrated in **Figure 4-4**. It can be seen that greater boundary layer depths are experienced during the day time hours, peaking in the mid to late afternoon. Higher day-time wind velocities and the onset of incoming solar radiation increases the amount of mechanical and convective turbulence in the atmosphere. As turbulence increases so too does the depth of the boundary layer, generally contributing to higher mixing depths and greater potential for atmospheric dispersion of pollutants.



Note: Boxes indicate 25th, Median and 75th percentile of AERMET-calculated mixing height data while upper and lower whiskers indicate maximum and minimum values.

Figure 4-4: AERMET-Calculated Diurnal Variation in Atmospheric Mixing Depth – Recycling Facility

5. EXISTING AIR QUALITY ENVIRONMENT

The quantification of cumulative air pollution concentrations and the assessment of compliance with ambient air quality limits necessitate the characterisation of baseline air quality. Given that particulate matter emissions represent the primary pollutant of concern generated by the proposed Recycling Facility, it is pertinent that existing sources and ambient air pollutant concentrations of these pollutants are considered.

5.1 Existing Local Sources of Atmospheric Emissions

The National Pollutant Inventory (NPI) database identifies 16 reporting sources of air pollution emissions in the surrounding 10km from the site. Of those, the industrial activities listed in **Table 5-1** are reported to contribute emissions of particulate matter to the local environment.

Table 5-1 Neighbouring air pollution emission sources – NPI database

Industry Name	Location	Activities
AGL Upstream Investments Pty Ltd	Menangle	Dehydration and compression of coal seam methane gas
Boral Bricks Pty Ltd	Bringelly	Clay brick manufacturing
CSR Building Products Limited	Ingleburn	Manufacture of glass fibre insulation.
CUB Pty Ltd	Campbelltown	Manufacturing and packaging cider
EDL LFG (NSW) Pty Ltd	Mount Annan	Electricity generation
Foamco Industries Pty Limited	Minto	Polyurethane foam manufacturing
Fulton Hogan Australia Pty Ltd	Minto	Hot mix asphalt manufacturing
Joe White Maltings Pty Ltd	Minto	Malting barley for production of malt
Unilever Australia Trading Limited	Minto	Ice cream manufacture (dairy processing)

In addition to the above operations, it is considered that the following sources contribute to particulate matter emissions in the vicinity of the proposed Recycling Facility:

- Dust entrainment and tyre and break wear due to vehicle movements along public roads;
- Petrol and diesel emission from vehicle movements along public roads;
- Wind generated dust from exposed areas within the surrounding region;
- Seasonal emissions from household wood burning fires;
- Sea salts contained in sea breezes.

More remote sources which contribute episodically to suspended particulates in the region include dust storms and bushfires. Whereas dust storms predominately contribute primary particulates from mechanical attrition, bushfires are a source of fine particulates including both primary particulates and secondary particulates formed by atmospheric gas to particle conversion processes.

5.2 Background PM_{10}

Particulate matter concentrations recorded by the NSW Office of Environment and Heritage (OEH) Campbelltown West station have been collected and analysed and are considered to be representative of ambient air quality conditions in the local environment in the absence of onsite air quality monitoring. The Campbelltown West air quality monitoring station is located at the Campbelltown TAFE, approximately 4 km southeast of the Recycling Facility.

The daily varying (24-hour average) PM_{10} concentrations recorded at the NSW OEH Campbelltown monitoring station during 2014 are illustrated in **Figure 5-1**. It can be seen that the recorded 24-hour average PM_{10} concentrations fluctuate throughout the period presented.

The maximum recorded 24-hour average PM_{10} concentration during 2014 at the Campbelltown West station was 49.4 µg/m^3 on 21 November 2014. As this concentration is approximately equivalent to the NSW EPA assessment criterion for 24-hour average PM_{10}, the hourly varying concentrations for that date were reviewed. Four consecutive elevated concentrations were recorded between 11am and 2pm on 21 November. Further investigation of concentrations at neighbouring NSW OEH monitoring stations did not detect such elevated concentrations at the same time. Consequently, the elevated concentrations are considered attributable to a localised source (e.g. grass cutting of surrounding land) and have been excluded from the data analysis.

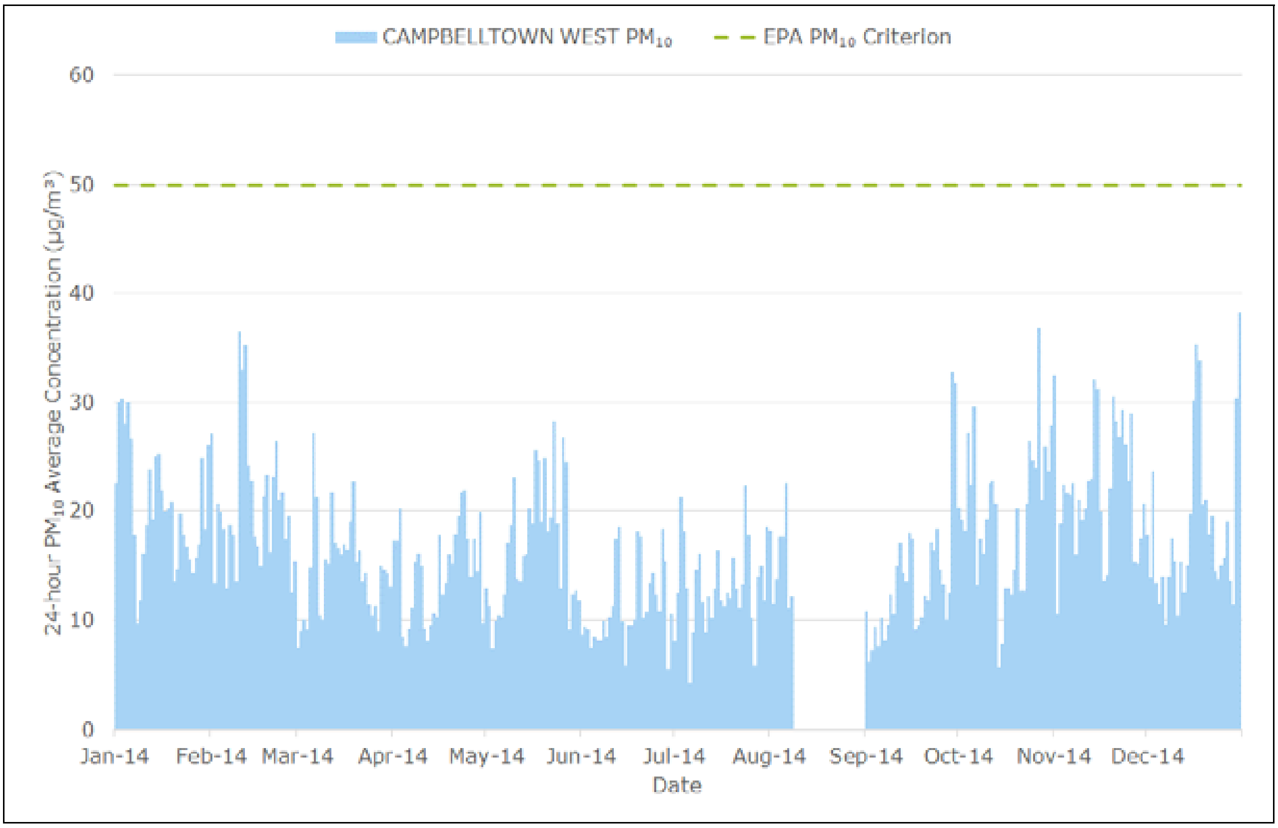


Figure 5-1: Time-series of 24-hour Average PM_{10} Concentrations recorded at OEH Campbelltown West – 2014

To assess the cumulative 24-hour average PM_{10} impacts of Recycling Facility emissions with ambient background PM_{10} concentrations, the maximum recorded concentration during 2014, 38.2 µg/m^3 on 31 December 2014, will be paired with the maximum predicted concentration at each receptor.

The annual average PM_{10} concentration to be adopted as background is 16.8 µg/m^3.

5.3 Background $PM_{2.5}$

The NSW OEH Campbelltown West monitoring station does not record concentrations of $PM_{2.5}$. The closest NSW OEH $PM_{2.5}$ monitoring station to the Recycling Facility is located at Camden, approximately 7 km west-southwest of the Recycling Facility. In the absence of $PM_{2.5}$ monitoring data at the Campbelltown West monitoring station, 24-hour average $PM_{2.5}$ concentrations recorded at Camden during 2014 will be adopted. A time series plot of 24-hour average $PM_{2.5}$ concentrations recorded at Camden during 2014 are illustrated in **Figure 5-2**.

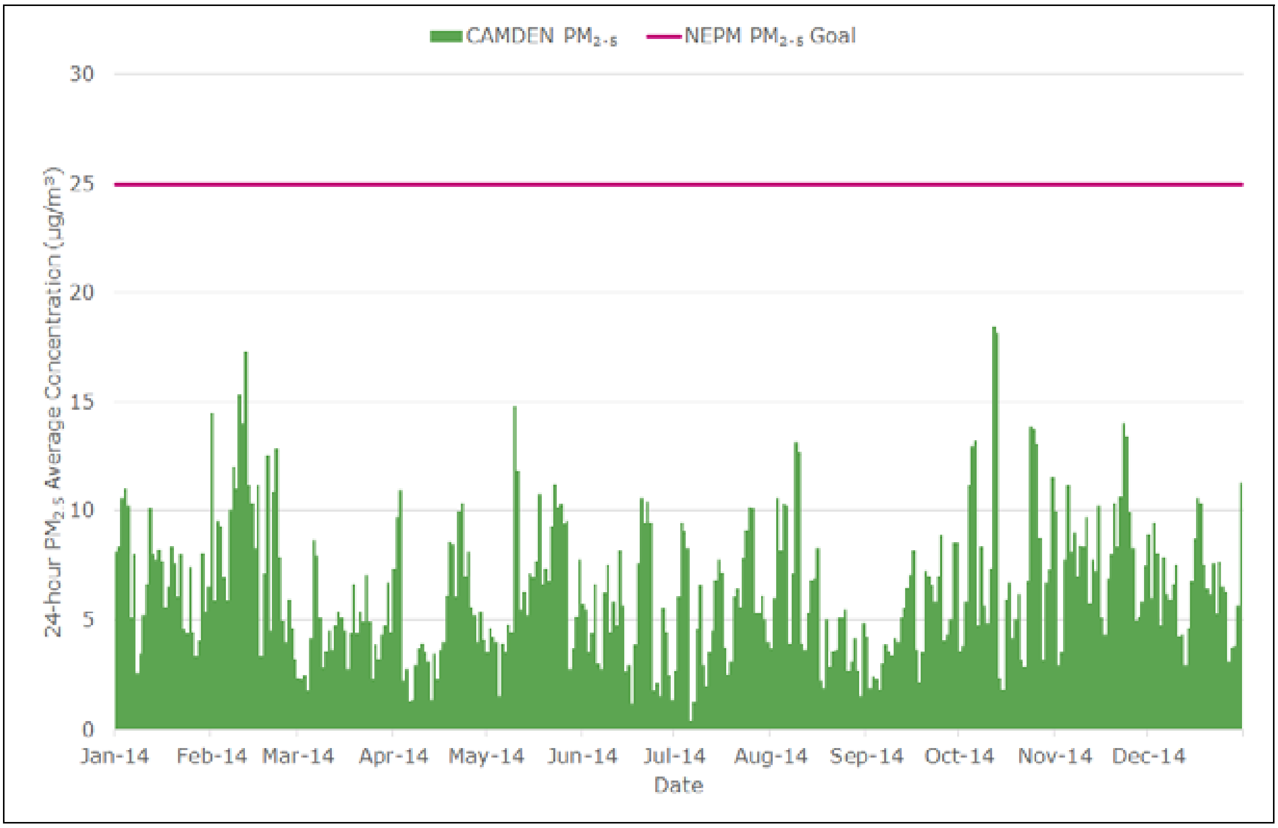


Figure 5-2: Time-series of 24-hour Average PM_{10} Concentrations recorded at OEH Camden – 2014

Maximum 24-hour average and annual average $PM_{2.5}$ concentrations for 2014 were 18.5 µg/m^3 and 6.3 µg/m^3 respectively.

5.4 Background TSP

Historically, the NSW OEH recorded concurrent 24-hour average TSP and PM_{10} concentrations on a one-in-six day sampling regime in the Sydney Metropolitan Region, with this monitoring discontinuing in 2004. NSW OEH quarterly air quality monitoring reports for 2003 and 2004 were reviewed for concurrent PM_{10} and TSP concentrations. This data highlighted that on average, the ratio of PM_{10} to TSP concentrations was approximately 0.48. In the absence of local TSP monitoring data, the PM_{10}/TSP relationship from the 2003-2004 NSW OEH monitoring reports has been applied to the Campbelltown West PM_{10} monitoring data. The annual average TSP concentration adopted as background is therefore 35 µg/m^3.

5.5 Background Dust Deposition

There is no dust deposition monitoring data available suitable to quantify baseline levels in the area surrounding the Recycling Facility. Modelling has therefore focussed on the incremental contribution from Recycling Facility operational emissions only. This is suitable for assessment against the NSW EPA incremental criterion of 2.0 g/m^2/month, expressed as an annual average.

6. CONSTRUCTION DUST IMPACT ASSESSMENT

In order to assess the air quality impact potential of the construction phase at the proposed Recycling Facility site, a qualitative impact assessment has been undertaken. While no specific methodology for such an assessment is available in Australia, the United Kingdom-based Institute of Air Quality Management (IAQM) has prepared the *Guidance on the Assessment of Dust from Demolition and Construction* (hereafter GADDC, IAQM 2014). The GADDC provides a progressive approach to assessing the particulate matter impact risk associated with construction and demolition projects.

The key steps to the GADDC approach to assessing air quality risks construction and demolition projects are as follows:

- **STEP 1** – screen requirement for a more detailed assessment based on proximity of surrounding receptors;
- **STEP 2** – assess the risk of dust impacts from demolition, earthworks, construction and truck movements and the sensitivity of surrounding receptors;
- **STEP 3** – determine the site-specific mitigation for each of the four potential activities in STEP 2;
- **STEP 4** – examine the residual effects and determine significance; and
- **STEP 5** – prepare dust assessment report.

It is noted that there will not be any demolition activities associated with the construction phase.

The following sections document the construction dust assessment, conducted in accordance with the GADDC.

6.1 STEP 1 – Screen the Need for a Detailed Assessment

Screening criteria for a detailed assessment is presented in Box 1 of Section 6 of the GADDC. The IAQM specify that if a human receptor is located within 350m of the boundary of a site, or within 50m of a route used by construction vehicles beyond 500m from site boundary, then a detailed construction dust assessment should be undertaken.

With the exception of receptor R22, all of the selected receptor locations listed in **Table 2-1** are located within 350m of the proposed Recycling Facility. Consequently, the proposed construction activities trigger the criteria to undertake a more detailed construction dust assessment.

6.2 STEP 2 – Assess the Risk of Dust Impacts

The GADDC identifies that the risk category for dust impacts from construction and demolition activities should be allocated based on the following factors:

- The scale and nature of works (STEP 2A); and
- The sensitivity of the area to dust impacts (STEP 2B).

These factors are then combined to determine the risk of impacts from the works (STEP 2C). The risk rating process is addressed in the following sections.

6.2.1 STEP 2A – Scale and Nature of Works

Section 7.2 of the GADDC requires that in allocating dust impact risk, the scale and nature of the following components are to be determined:

- Demolition;
- Earthworks;
- Construction; and
- Truck trackout to public roads.

The GADDC prescribes a range of criteria that classify the magnitude of each activity as either Large, Medium or Small. The GADDC notes that not all criteria need to be satisfied to meet a certain classification. For this assessment, where more than one magnitude rating could be applied, the highest magnitude classification has been selected for conservatism. Based on the proposed activities at site, the following magnitude ratings, and the rationale behind the classification, are applied:

- Demolition – **SMALL** – as the proposed Recycling Facility site has no existing structures, no demolition activities will occur;
- Earthworks – **MEDIUM** – total site area between 2,500m^2 and 10,000m^2 (approximately 6,800 m^2), potentially dusty soil type , only minor ground disturbances for footings of offices, sheds and fencing;
- Construction; – **SMALL** – total building volume approximately 14,300 m^3 , shed construction from colorbond sheeting, no onsite concrete batching;
- Truck trackout to public roads – **MEDIUM** – approximately 10 outbound truck movements in a single day, unpaved road length between 50m and 100m, potentially dusty surface material.

6.2.2 STEP 2B – Sensitivity of the Surrounding Environment

Section 7.3 of the GADDC details approach to categorise the sensitivity of the surrounding environment reviewing the following factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- Local ambient PM_{10} concentrations and likelihood of impact to human health; and
- Site specific factors to reduce wind-blown dust.

Based on the classification definitions presented within Section 7.3 of the GADDC, the following sensitivity ratings have been applied:

- Sensitivity of people to dust soiling effects - **HIGH**;
- Sensitivity of people to health effects of PM_{10} – **HIGH**; and
- Sensitivity of surrounding flora and fauna communities – **LOW**.

The above receptor sensitivity classifications are then combined with the number of receptors, background PM_{10} concentration (with regard to human health) and distance from source to classify the sensitivity of the surrounding environment. The specific influencing factors are as follows:

- The residential suburb of Currans Hill is located to the east of the proposed Recycling Facility. The surrounding environment is therefore within the ">100" category of the GADDC;
- Review of aerial imagery and cadastral data for the area identifies that there are approximately 20 residences within 200m and approximately 140 residences within within 350m of the proposed Recycling Facility boundary; and
- As detailed in **Section 5.2**, the annual mean PM_{10} concentration for the area is taken to be 16.8 µg/m^3.

After combining the above receptor sensitivity classifications with these influencing factors and comparing with the relevant rating tables in the GADDC (Table 2, Table 3 and Table 4), the sensitivity classification of the surrounding environment is as follows:

- Sensitivity of area to dust soiling effects on people and property - **LOW**;
- Sensitivity of area to human health effects – **LOW**;
- Sensitivity of area to ecological effects – **LOW.**

6.2.3 STEP 2C – Define the Risk of Dust Impacts

To determine the risk of impacts with no mitigation applied, Section 7.4 of the GADDC requires that the dust magnitude rating (**Section 6.2.1**) is combined with the sensitivity of the surrounding area (**Section 6.2.2**) for each of the four activity categories (demolition, earthworks, construction and truck trackout).

Table 6-1 presents the risk rating for the proposed bund construction activities.

Table 6-1 Dust Impact Risk Rating

Potential impact (sensitivity to impact)	**Construction activity (impact risk magnitude)**			
	Demolition (Small)	**Earthworks (Medium)**	**Construction (Small)**	**Truck trackout (Medium)**
Dust Soiling (Low)	Negligible	Low	Negligible	Low
Human Health (Low)	Negligible	Low	Negligible	Low
Ecological (Low)	Negligible	Low	Negligible	Low

It can be seen from the results presented in **Table 6-1** that uncontrolled dust emissions from the proposed construction activities at the site are negligible to low for all activity classifications.

The GADDC presents a range of recommended mitigation measures based on the risk rating derived from the dust impact risk assessment approach. These measures are listed in **Section 10.1**.

7. OPERATIONAL EMISSIONS ESTIMATION

Fugitive dust sources associated with the operation of the Recycling Facility were principally quantified through the application of emission estimation techniques (specifically the United States Environmental Protection Agency (US-EPA) AP-42 Chapter 13.2.4 – Aggregate Handling and Storage Piles (US-EPA 2006). Particulate matter emissions were quantified for each particle size fraction, with the TSP size fraction also used to provide an indication of dust deposition rates. Fine and course particulate matter (PM_{10} and $PM_{2.5}$) were estimated using ratios for the different particle size fractions available within the literature (principally the US-EPA AP-42).

7.1 Sources of Operational Emissions

Air emissions associated with the Recycling Facility would primarily comprise fugitive particulate matter releases. Potential sources of emission were identified as follows:

- Vehicle entrainment of particulate matter due to the haulage of material along the sealed roads in the Recycling Facility;
- Unloading of material to the raw material storage areas within the main shed and in the external yard;
- Screening plant operations within the main shed;
- Loading and transfer of screened material to stockpiles;
- Breaking and shredding of larger material in the external yard;
- Loading of product to truck for dispatch;
- Odour emissions from the storage of certain materials (assumed to be 100% green waste for this assessment);
- Diesel fuel combustion by on-site plant and equipment; and
- Wind erosion associated with stockpiled materials.

7.2 Emission Scenario

A single emissions scenario, focusing on peak Recycling Facility operations, has been assessed in this report to quantify maximum potential impacts in the surrounding environment. Construction emissions would be short term and minor relative to operational emissions and have therefore not been considered further in this assessment.

Details on the assumptions made for the operational scenario are listed within **Appendix 2**.

7.3 Emission Reduction Factors

Based on information provided by Benedict Recycling, the following emission reduction factors were applied to account for proposed controls at the Recycling Facility:

- Water spraying at stockpiles, screening plant and material handling - 50% reduction for water sprays (NPI, 2012).

It is noted that the Recycling Faclity will feature a roofed enclosure over primary materials unloading, screening operations and storage, while the perimeter of the site, excluding the street frontage boundary, will be marked by a 10m high colorbond steel fence. While this structures would assist with a reduction in emissions transport from site, no accounting for wind breaks has been included in the emission calculations. Consequently, the emission calculations and resultant dispersion modelling results should be viewed as conservatively high.

7.4 Particulate Matter Emissions

A summary of Recycling Facility-related emissions by source type is presented in **Table 7-1** and illustrated in **Figure 7-1**. Control measures proposed for implementation, as documented in **Section 7.3**, have been taken into account in the emission estimates.

Table 7-1 and **Figure 7-1** highlight that, for proposed operations, the most significant source of emissions are associated with screening activities in the main shed, truck movements on paved surfaces and diesel combustion emissions. Further details regarding emission estimation factors and assumptions are provided in **Appendix 2**.

Table 7-1 Calculated Annual TSP, PM_{10} and $PM_{2.5}$ Emissions

Emissions Source	Calculated Emissions (kg/annum) by Source		
	TSP	**PM_{10}**	**$PM_{2.5}$**
Material Delivery - Shed	301.9	58.0	14.0
Truck Unloading - Shed	210.0	77.0	11.6
Raw Material Handling - Shed	210.0	77.0	11.6
Screening - shed	875.0	301.0	55.7
Screened Material Handling - shed	105.0	38.5	5.8
Truck Unloading - Heavy Waste Yard	52.5	19.3	2.9
Raw Material Handling - Heavy Waste Yard	52.5	19.3	2.9
Shredding/Breaking - Heavy Waste Yard	47.3	21.0	3.9
Screened Material Handling - Heavy Waste Yard	26.3	9.6	1.4
Dispatch Truck Loading	105.0	38.5	5.8
Material Transportation from site	77.1	14.8	3.6
Wind Erosion - Exposed surfaces and stockpiles	21.3	10.6	1.6
Diesel Combustion	383.1	383.1	372.0
Total	**2,466.9**	**1,067.6**	**492.7**

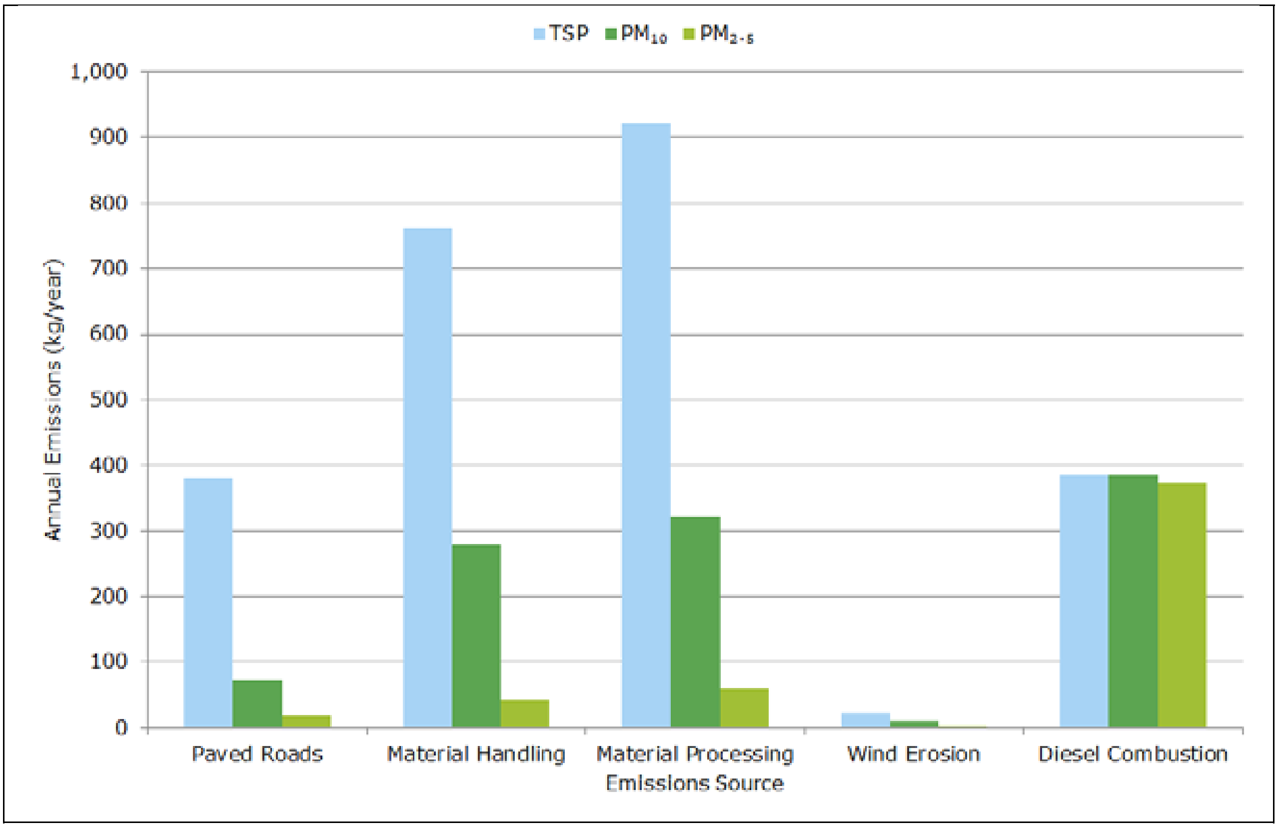


Figure 7-1: Comparison of Calculated Annual TSP, PM_{10} and $PM_{2.5}$ Emissions by Source Type

7.5 Odour Emissions

Given that that majority of material received by the proposed Recycling Facility would be inert building waste, the potential for odour emissions arising from the proposed operations would be low. Nevertheless, odour emissions have been quantified for this assessment for the waste streams with the highest odour potential, being green waste and glass material, although there will be no composting on site.

To quantify odour emission rates from the storage of odourous materials, a literature review of recent odour impact assessments involving green waste storage in NSW was undertaken. A summary of relevant odour emission rates are presented in **Table 7-2**. There were no data in the literature applicable to glass material.

Table 7-2 Odour Emission Rates – Green Waste Storage

Site	Specific Odour Emission Rate ($OU.m^3/m^2/second$)	Type	Reference
SITA Kemps Creek	0.134	Greenwaste area	Holmes Air Science, 2007
Spring Farm Advanced Resource Recovery Technology Facility	1.279	Greenwaste area	Pacific Environment, 2013
Veolia Camellia Recycling Facility	0.28	Dry Waste	CH2M Hill, 2013
Euchareena Road Resource Recovery	0.2	Green waste delivery bays	Heggies, 2009

It can be seen from the odour emissions rates presented in **Table 7-2** that a range of variability exists for green waste storage. The maximum odour emission rate presented in **Table 7-2**, 1.279$OU.m^3/m^2$/second, will be adopted in this assessment as a conservative assumption.

In order to quantify odour emissions, a green waste stockpile volume of up to 500m^3 and height 2m has been assumed. It is noted that while all odour generating materials would be stored and processed within the main shed, no control factors have been applied to emission calculations.

8. OPERATIONS ASSESSMENT METHODOLOGY

8.1 Dispersion Model Selection and Application

The atmospheric dispersion modelling completed within this assessment used the AMS/US-EPA regulatory model (AERMOD) (US-EPA, 2004). AERMOD is designed to handle a variety of pollutant source types, including surface and buoyant elevated sources, in a wide variety of settings such as rural and urban as well as flat and complex terrain.

Predicted concentrations were calculated for a regular Cartesian receptor grid covering a 2 km by 2 km computational domain centred over the proposed Recycling Facility, with a grid resolution of 50 m applied. Additionally, concentrations were predicted at the sensitive receptor locations listed in **Table 2-1**.

Simulations were undertaken for the 12 month period of 2014 using the AERMET-generated file based largely on the Campbelltown (Mt Annan) AWS meteorological monitoring dataset as input (see **Section 4** for description of input meteorology).

8.2 Modelling Scenarios

As identified in **Section 7.2**, a single emission scenario has been developed to estimate peak operational emissions of TSP, PM_{10} and $PM_{2.5}$ from the proposed Recycling Facility. The air dispersion modelling has predicted ground-level concentrations and deposition rates for this scenario.

8.3 Source and Emissions Data

The methodology and results of the emissions inventory developed for this study are presented in **Section 6** and **Appendix 2**. The spatial allocation of emissions was based on the layout of the proposed Recycling Facility presented in **Figure 2-2**. Material handling and wind erosion emissions were varied by wind speed, with higher emissions occurring during periods of higher wind speed.

8.4 Presentation of Model Results

Dispersion simulations were undertaken to predict the concentrations of TSP, PM_{10} $PM_{2.5}$, odour and dust deposition. Incremental Recycling Facility-related concentrations and deposition rates occurring due to the proposed operations were modelled. Model results are expressed as the maximum predicted concentration for each averaging period at the selected assessment locations over the 2014 modelling period.

The results are presented in the following formats:

- Tabulated results of particulate matter concentrations and dust deposition rates at the selected assessment locations are presented and discussed in **Section 9**.
- Isopleth plots, illustrating spatial variations in Recycling Facility-related incremental TSP, PM_{10} and $PM_{2.5}$ concentrations and dust deposition rates are provided in **Appendix 3**. Isopleth plots of the maximum 24-hour average concentrations presented in **Appendix 3** do not represent the dispersion pattern on any individual day, but rather illustrate the maximum daily concentration that was predicted to occur at each model calculation point given the range of meteorological conditions occurring over the 2014 modelling period.

Odour impacts are expressed as a 99th percentile 1-second average (nose response) concentration for comparison with the EPA odour performance criterion of 2 OU. Predicted 1-hour average concentrations were converted to nose response averages using the peak-to-mean ratio of 2.3, as per Table 6.1 of the NSW EPA Approved Methods for Modelling.

9. DISPERSION MODELLING RESULTS

Incremental and cumulative TSP, PM_{10} and $PM_{2.5}$ concentrations and dust deposition rates predicted to occur under proposed Recycling Facility operations are presented in **Table 9-1** for each of the selected receptor locations.

Criteria applicable to the assessment of the predicted concentration are also presented in the tables. In the absence of air quality standards for $PM_{2.5}$, reference is made to the NEPM reporting standard for $PM_{2.5}$ to facilitate a screening assessment of predicted $PM_{2.5}$ concentrations.

Cumulative concentrations presented in these tables are the combination of the Recycling Facility-only increment and the adopted baseline air quality concentration (as per **Section 5**). In the case of maximum 24-hour average PM_{10} and $PM_{2.5}$ concentrations, the maximum predicted 24-hour average concentrations from Recycling Facility operations have been added to the maximum 24-hour average concentrations from local OEH monitoring stations. It is considered that this approach is conservative for assessing maximum cumulative impacts in the surrounding environment.

It can be seen from the results presented in **Table 9-1**, all pollutants and averaging periods are below the applicable NSW EPA assessment criterion and NEPM reporting goals at all neighbouring receptors.

Table 9-1 Incremental and Cumulative Concentration and Deposition Results

Receptor ID	Incremental Concentration/Deposition due to Recycling Facility							Cumulative Concentration due to Recycling Facility + Background Air Quality				
	TSP Annual Average µg/m³	PM_{10} Maximum 24-hr µg/m³	PM_{10} Annual Average µg/m³	$PM_{2.5}$ Maximum 24-hr µg/m³	$PM_{2.5}$ Annual Average µg/m³	Deposition Annual Average g/m²/month	Odour 99th Percentile 1-second OU	TSP Annual Average µg/m³	PM_{10} Maximum 24-hr µg/m³[(b)]	PM_{10} Annual Average µg/m³	$PM_{2.5}$ Maximum 24-hr µg/m³[(b)]	$PM_{2.5}$ Annual Average µg/m³
Criteria	**NA**	**NA**	**NA**	**NA**	**NA**	**2**	**2**	**90**	**50**	**30**	**25[(a)]**	**8[(a)]**
R1	0.2	0.8	<0.1	0.5	<0.1	<0.1	0.1	35.2	39.0	16.9	19.0	6.3
R2	0.2	0.7	<0.1	0.4	<0.1	<0.1	0.1	35.2	38.9	16.9	18.9	6.3
R3	0.2	0.9	<0.1	0.4	<0.1	<0.1	0.1	35.2	39.1	16.9	18.9	6.4
R4	0.2	1.3	<0.1	0.5	<0.1	<0.1	0.1	35.2	39.5	16.9	19.0	6.4
R5	0.2	1.1	<0.1	0.4	<0.1	<0.1	0.1	35.2	39.3	16.9	18.9	6.4
R6	0.2	0.8	<0.1	0.3	<0.1	<0.1	0.1	35.2	39.0	16.9	18.8	6.4
R7	0.2	0.5	<0.1	0.2	<0.1	<0.1	0.1	35.2	38.7	16.9	18.7	6.4
R8	0.2	0.5	<0.1	0.2	<0.1	<0.1	0.1	35.2	38.7	16.9	18.7	6.4
R9	0.2	0.5	<0.1	0.2	<0.1	<0.1	0.1	35.2	38.7	16.9	18.7	6.4
R10	0.2	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.2	38.4	16.9	18.6	6.4
R11	0.2	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.2	38.4	16.9	18.6	6.3
R12	0.2	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.2	38.4	16.9	18.6	6.3
R13	0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.9	18.6	6.3

Table 9-1 Incremental and Cumulative Concentration and Deposition Results

Receptor ID	Incremental Concentration/Deposition due to Recycling Facility							Cumulative Concentration due to Recycling Facility + Background Air Quality				
	TSP Annual Average $\mu g/m^3$	PM_{10} Maximum 24-hr $\mu g/m^3$	PM_{10} Annual Average $\mu g/m^3$	$PM_{2.5}$ Maximum 24-hr $\mu g/m^3$	$PM_{2.5}$ Annual Average $\mu g/m^3$	Deposition Annual Average $g/m^2/month$	Odour 99th Percentile 1-second OU	TSP Annual Average $\mu g/m^3$	PM_{10} Maximum 24-hr $\mu g/m^3$ (b)	PM_{10} Annual Average $\mu g/m^3$	$PM_{2.5}$ Maximum 24-hr $\mu g/m^3$ (b)	$PM_{2.5}$ Annual Average $\mu g/m^3$
Criteria	**NA**	**NA**	**NA**	**NA**	**NA**	**2**	**2**	**90**	**50**	**30**	**25(a)**	**8(a)**
R14	0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.9	18.6	6.3
R15	0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.9	18.6	6.3
R16	<0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.8	18.6	6.3
R17	<0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.8	18.6	6.3
R18	<0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.8	18.6	6.3
R19	<0.1	0.2	<0.1	0.1	<0.1	<0.1	0.1	35.1	38.4	16.8	18.6	6.3
R20	<0.1	0.2	<0.1	0.1	<0.1	<0.1	<0.1	35.1	38.4	16.8	18.6	6.3
R21	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	35.1	38.3	16.8	18.6	6.3
R22	<0.1	0.2	<0.1	0.1	<0.1	<0.1	<0.1	35.0	38.4	16.8	18.6	6.3

NA – Not applicable. Criteria are applicable to cumulative concentrations.

a) The NEPM Reporting Standards for $PM_{2.5}$ are referenced for screening assessment purposes.

b) The maximum cumulative value is a sum of the maximum combined 24-hour average concentration from the Recycling Facility and the maximum baseline concentration.

10. AIR QUALITY MITIGATION TECHNIQUES

10.1 Construction dust mitigation

The construction dust impact assessment completed in **Section 6** identified that proposed construction activities at the proposed Recycling Facility are low to negligible. To ensure that the impacts to the local environment are minimised, it is recommended that the following measures should be implemented.

The implementation of these measures would result in the Dust Impact Risk Rating for earthworks and truck movements (as described in **Section 6.2.3**) to reduce from **low** to **negligible**.

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Record any exceptional incidents that cause dust and/or air emissions, either on or off site, and the action taken to resolve the situation in the log book;
- Carry out regular site inspections, record inspection results, and make an inspection log available to the local authority when asked;
- Impose a maximum-speed-limit of 20 km/h on all internal roads and work areas;
- Minimise idling vehicles onsite, wherever practicable;
- Ensure proper maintenance and tuning of all equipment engines;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; and
- Provide an adequate water supply on site for effective dust/particulate matter suppression/mitigation.

10.2 Operational emissions mitigation

The modelling results show that there is unlikely to be an adverse impact associated with emissions from the Recycling Facility in the surrounding environment. The following management measures were integrated into the dispersion modelling process and will be implemented to minimise air quality impacts:

- entire site will be hardstand;
- all vehicle movements will be restricted to designated routes marked out by appropriate signage and fencing using sealed internal roads;
- water sprays will be used at stockpiles and screening plant and during material handling;
- a wheel wash in the weighbridge area will be used to clean truck tyres to prevent mud or sediment being carried to and deposited on public roads;
- particulate matter generating activities will be conducted within the main building where possible; and
- no composting will be undertaken on the site.

11. GREENHOUSE GAS ASSESSMENT

11.1 Introduction

The estimation of greenhouse gas (GHG) emissions for the proposed Recycling Facility is based on the National Greenhouse Accounts Factors (NGAF) workbook (DoE, 2015). The methodologies in the NGAF workbook follow a simplified approach, equivalent to the "Method 1" approach outlined in the National Greenhouse and Energy Reporting (Measurement) Technical Guidelines (DoE 2014). The Technical Guidelines are used for the purpose of reporting under the National Greenhouse and Energy Reporting Act 2007 (the NGER Act).

For accounting and reporting purposes, GHG emissions are defined as 'direct' and 'indirect' emissions. Direct emissions (also referred to as Scope 1 emissions) occur within the boundary of an organisation and as a result of that organisation's activities. Indirect emissions are generated as a consequence of an organisation's activities but are physically produced by the activities of another organisation (DoE, 2015). Indirect emissions are further defined as Scope 2 and Scope 3 emissions. Scope 2 emissions occur from the generation of the electricity purchased and consumed by an organisation. Scope 3 emissions occur from all other upstream and downstream activities, for example the downstream extraction and production of raw materials or the upstream use of products and services.

Scope 3 is an optional reporting category and should not be used to make comparisons between organisations (WBCSD, 2004), for example in benchmarking GHG intensity of products or services. Typically, only major sources of Scope 3 emissions are accounted and reported by organisations. Specific Scope 3 emission factors are provided in the NGAF workbook for the consumption of fossil fuels and purchased electricity, making it straightforward for these sources to be included in a GHG inventory, even though they are a relatively minor source.

11.2 Estimated emissions

The GHG emissions sources included in this assessment are presented in **Table 11-1** representing the most significant sources associated with the Project. Emission are estimated using the methodologies outlined in the NGAF workbook, using fuel energy contents and scope 1, 2 and 3 emission factors for diesel, gasoline and electricity generation in NSW.

Table 11-1: GHG emission sources

Scope 1	Scope 2	Scope 3
Direct emissions from fuel combustion (diesel) by onsite plant and equipment	Indirect emissions associated with the consumption of purchased electricity	Indirect upstream emissions from the extraction, production and transport of diesel fuel.
		Indirect upstream emissions from electricity lost in delivery in the transmission and distribution network.
		Indirect downstream emissions generated from off-site transportation of product
		Indirect emissions generated from employee travel

The adopted activity data for the emission estimates is presented in **Table 11-2**.

An estimate of diesel consumption from product transportation has been made based on the NSW average fuel consumption rate for articulated trucks of 56.9 L/ 100 km

(ABS, 2015[2]). An upper estimate of annual vehicle kilometres travelled (VKT) is based on a nominal return trip distance to market (50 km) and the number of trips per day (17).

An estimate of diesel consumption from employee travel is based on the NSW average fuel consumption rate for passenger vehicles of 10.7 L/ 100 km (ABS, 2015). An upper estimate of annual vehicle kilometres travelled (VKT) is based on a nominal commute distance of 30 km, 357 workdays per annum and 15 on-site employees.

Table 11-2: Estimated activity data for GHG emissions

Production (tonnes/annum)	On-site Diesel (kL/annum)	Electricity (kWh/annum)	Product Transport Diesel (kL/annum)	Employee Travel Fuel (kL/annum)
140,000	210	224,000	173	130

The estimated annual GHG emissions for each source is presented in **Table 11-3**. The annual Scope 1 and Scope 3 emissions at full production represent approximately 0.0004% of total GHG emissions for NSW and 0.0001% of total GHG emissions for Australia, based on the National Greenhouse Gas Inventory for 2013[3].

Table 11-3: Summary of estimated annual GHG emissions (tonnes CO_2-e / annum)

Scope 1 emissions	Scope 2 emissions	Scope 3 emissions			
On-site Diesel	Electricity	On-site Diesel	Electricity	Product Transport (Diesel)	Employee Travel
563	193	43	29	501	412
Note: GHG emissions are reported in tonnes of carbon dioxide equivalents (t CO2-e). Non-CO_2 gases are converted to CO_2-e by multiplying the quantity of the gas by its Global Warming Potential (GWP) – see Table 26 of the NGAF workbook.					

[2] http://www.abs.gov.au/ausstats/abs@.nsf/mf/9208.0

[3] http://ageis.climatechange.gov.au/

12. CONCLUSIONS

Ramboll Environ was commissioned by EMM to undertake an Air Quality Impact Assessment for the proposed Recycling Facility at Smeaton Grange on behalf of Benedict Recycling.

Construction emission impacts were assessed by a qualitative approach that allocates a dust impact risk rating for demolition, earthworks, construction and truck trackout emissions based on the likely magnitude of proposed activities, proximity of surrounding receptors and sensitivity of the surrounding environment to dust impacts.

The risk rating completed for the construction of the proposed Recycling Facility modification assigned a negligible to low risk rating for dust impacts from uncontrolled emissions from proposed activities. The implementation of a number of recommended dust mitigation and management measures will further reduce the risk rating of construction emission impacts on surrounding receptors.

Emissions of TSP, PM_{10}, $PM_{2.5}$ and odour were estimated for peak proposed operations associated with the Recycling Facility. Atmospheric dispersion modelling predictions of air pollution emissions for proposed operations were undertaken using the AERMOD dispersion model.

The results of the dispersion modelling conducted indicated that the operation of the proposed Recycling Facility was unlikely to result in exceedances of the applicable NSW EPA assessment criteria for TSP, PM_{10} and dust deposition or the NEPM Reporting Goals for $PM_{2.5}$. Potential odour impacts from the Recycling Facility were conservatively assessed, with resultant predicted odour concentrations well below applicable impact assessment criterion.

A greenhouse gas quantification assessment was undertaken for the Recycling Facility. The annual Scope 1 and Scope 3 emissions at full production represent approximately 0.0004% of total GHG emissions for NSW and 0.0001% of total GHG emissions for Australia, based on the National Greenhouse Gas Inventory for 2013.

13. REFERENCES

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14. GLOSSARY OF ACRONYMS AND SYMBOLS

Approved Methods	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW
AHD	Australian Height Datum
AWS	Automatic Weather Station
BoM	Bureau of Meteorology
Benedict Recycling	Benedict Recycling Pty Ltd
CO_2-e	Carbon dioxide equivalent
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DoE	Department of Environment
EIS	Environmental impact statement
EPA	Environmental Protection Authority
EMM	EMM Consulting Pty Limited
GADDC	Guidance on the Assessment of Dust from Demolition and Construction
IAQM	Institute of Air Quality Management
µg	Microgram (g x 10-6)
µm	Micrometre or micron (metre x 10-6)
m^3	Cubic metre
NGAF	National Greenhouse Accounts Factors
NPI	National Pollutant Inventory
OEH	NSW Office of Environment and Heritage
OU	Odour unit
PM_{10}	Particulate matter less than 10 microns in aerodynamic diameter
$PM_{2.5}$	Particulate matter less than 2.5 microns in aerodynamic diameter
Ramboll Environ	Ramboll Environ Australia Pty Ltd
SEARs	Secretary’s Environmental Assessment Requirements
SSDA	State Significant Development Application
TAPM	“The Air Pollution Model”
TSP	Total Suspended Particulates
The Recycling Facility	Proposed Smeaton Grange Recycling Facility
US-EPA	United States Environmental Protection Agency
VKT	Vehicle Kilometres Travelled

APPENDIX 1
WIND ROSES

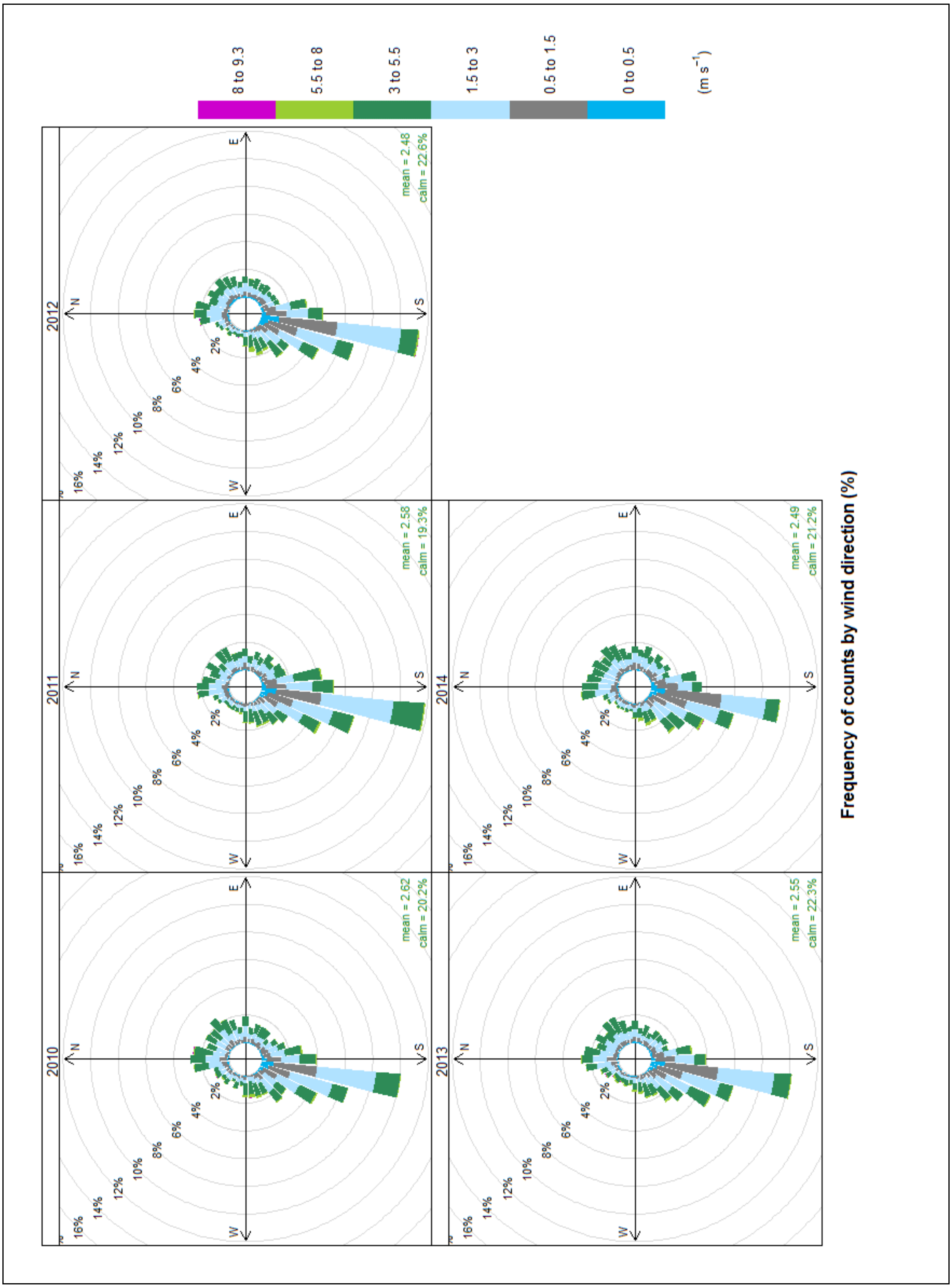

Figure A1.1 Annual Wind Roses – Campbelltown (Mt Annan) BoM AWS – 2010 - 2014

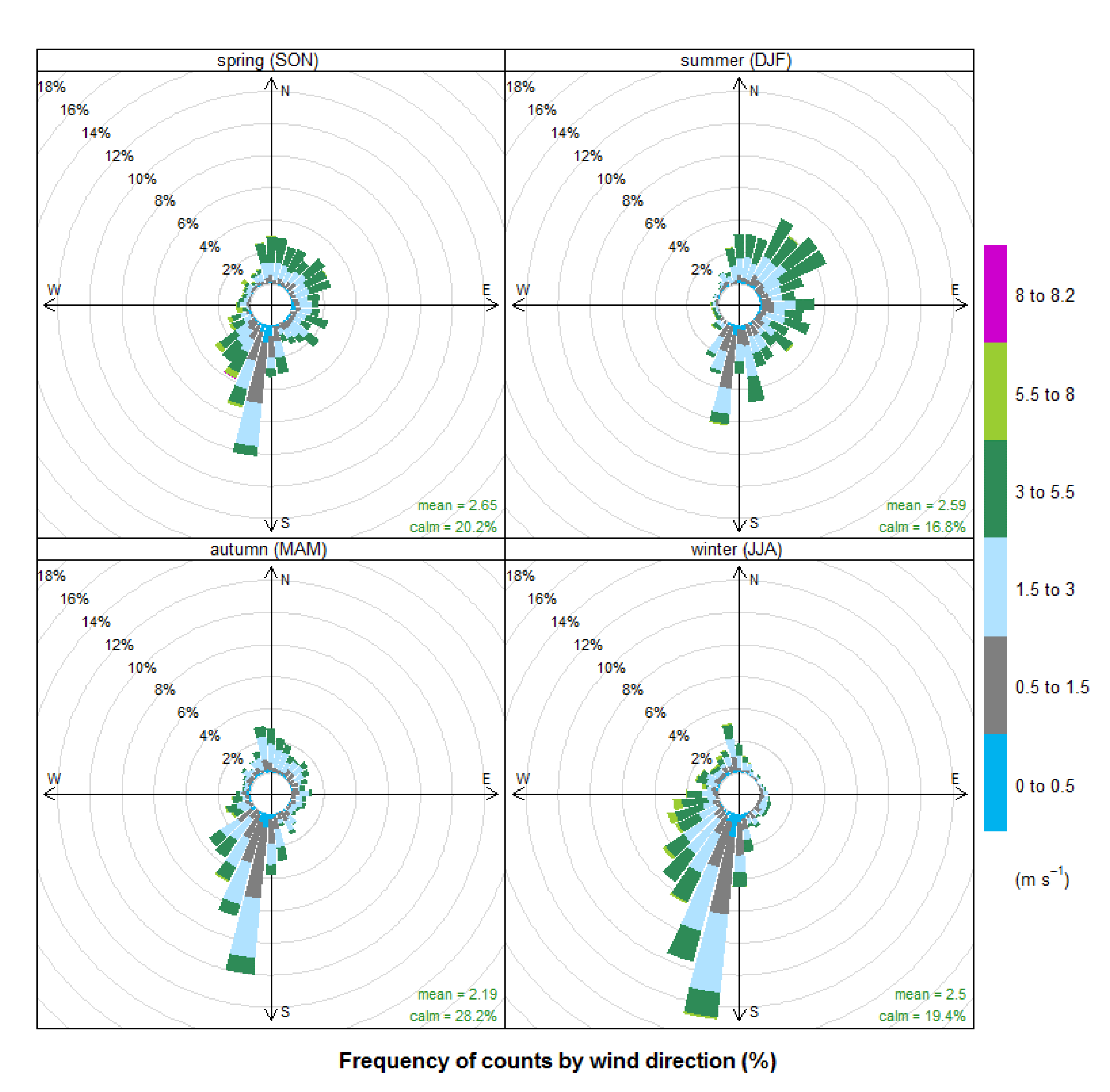

Figure A1.2 Seasonal Wind Roses – Campbelltown (Mt Annan) BoM AWS – 2014

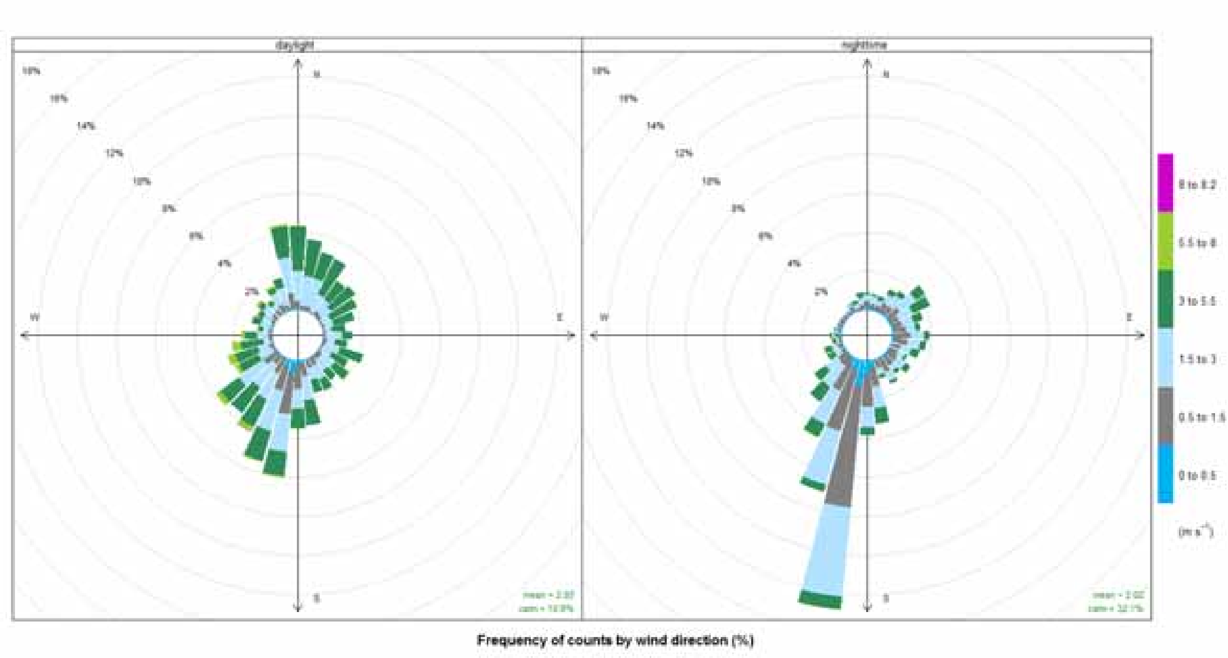

Figure A1.3 Diurnal Wind Roses – Campbelltown (Mt Annan) BoM AWS – 2014

APPENDIX 2
EMISSIONS INVENTORY

INTRODUCTION

Air emission sources associated with the Recycling Facility were identified and quantified through the application of accepted published emission estimation factors, collated from a combination of United States Environmental Protection Agency (US-EPA) AP-42 Air Pollutant Emission Factors and NPI emission estimation manuals, including the following:

- NPI Emission Estimation Technique Manual for Mining (NPI, 2012);
- AP-42 Chapter 13.2.4 – Aggregate Handling and Storage Piles (US-EPA 2006);
- AP-42 Chapter 11.19.2 – Crushed Stone Processing and Pulverized Mineral Processing (US-EPA 2006b); and
- AP-42 Chapter 13.2.1 – Paved Roads (US-EPA 2011).

Particulate matter releases were quantified for TSP, PM_{10} and $PM_{2.5}$ using ratios for that particle size fraction available within the literature (principally the US-EPA AP-42), as documented in subsequent sections.

Sources of Particulate Matter Emissions

Air emissions associated with the Recycling Facility would primarily comprise fugitive particulate matter releases. Potential sources of emission were identified as follows:

- Vehicle entrainment of particulate matter due to the haulage of material along the sealed roads in the Recycling Facility;
- Unloading of material to the raw material storage areas within the main shed and in the external yard;
- Screening plant operations within the main shed;
- Loading and transfer of screened material to stockpiles;
- Breaking and shredding of larger material in the external yard;
- Loading of product to truck for dispatch;
- Odour emissions from the storage of certain materials (assumed to be 100% green waste for this assessment);
- Diesel fuel combustion by on-site plant and equipment; and
- Wind erosion associated with stockpiled materials.

Operational Assumptions

To compile an emissions inventory for existing and proposed operations at the site, the following general assumptions were made:

- Material deliveries/dispatch activities occur between 6am and 10pm. Processing operations between 7am and 6pm. 51 operational weeks per year;
- Wind erosion area for stockpiled materials of 0.05 ha
- Assumed average truck weights (average of loaded and unloaded weights) of 30 t for all deliveries. Conservative as a large proportion of deliveries will be from lighter vehicles.
- Annual vehicle movements;
  - Incoming – 28,500;
  - Outgoing – 6,069.

Particulate Matter Emission Factors Applied

The emission factor equations applied within the assessment are documented in this subsection. **Table A2.1** lists the uncontrolled emission factors that were applied for the two emission scenarios, references the source of the listed factors and whether the factor is derived from a specific equation or a published default emission factor.

Table A2.1 Emission Estimation Factors Applied

Emission Source	TSP Emission Factor	PM_{10} Emission Factor	$PM_{2.5}$ Emission Factor	Emission Factor Unit	Source of Factor
Material Delivery - Shed	0.04237	0.00813	0.00197	kg/Vehicle KM Travelled	AP-42 13.2.1 - Paved Road Equation
Truck Unloading - Shed	0.00150	0.00055	0.00008	kg/tonne	USEPA AP-42 11.19.2 –Material Transfer Factor
Raw Material Handling - Shed	0.00150	0.00055	0.00008	kg/tonne	USEPA AP-42 11.19.2 –Material Transfer Factor
Screening - shed	0.01250	0.00430	0.00080	kg/tonne	USEPA AP-42 11.19.2 - Screening Factor
Screened material Handling - shed	0.00150	0.00055	0.00008	kg/tonne	USEPA AP-42 11.19.2 –Material Transfer Factor
Truck Unloading - Heavy Waste Yard	0.00150	0.00055	0.00008	kg/tonne	USEPA AP-42 11.19.2 –Material Transfer Factor
Raw Material Handling - Heavy Waste Yard	0.00150	0.00055	0.00008	kg/tonne	USEPA AP-42 11.19.2 –Material Transfer Factor
Shredding/Breaking - Heavy Waste Yard	0.00270	0.00120	0.00022	kg/tonne	USEPA AP-42 11.19.2 - Crushing Factor
Screened material Handling - Heavy Waste Yard	0.00150	0.00055	0.00008	kg/tonne	USEPA AP-42 11.19.2 –Material Transfer Factor
Dispatch Truck Loading	0.00150	0.00055	0.00008	kg/tonne	USEPA AP-42 11.19.2 –Material Transfer Factor
Material Transportation from site	0.04237	0.00813	0.00197	kg/Vehicle KM Travelled	AP-42 13.2.1 - Paved Road Equation
Wind Erosion - Exposed surfaces and stockpiles	850.0	425.0	63.8	kg/ha/year	AP-42 11.9 - Wind erosion of exposed areas factor

Details relating to the emission equations referenced in **Table A2.1** are presented in the following sections.

Paved Roads Equation

The emissions factors for paved roads, as documented within AP42 Chapter 13.2.2 -"Paved Roads" (US-EPA 2011), was applied as follows:

$E = k\,(sL)^{0.91}(W)^{1.02}$

Where:

E = Emissions Factor (g/VKT)

sL = road surface silt loading (g/m^2)

W = mean vehicle weight (tonnes)

k = constant of 1.5 for PM_{10}

Material parameters are listed in **Table A2.2**.

Diesel Calculations

Diesel combustion emissions of $PM_{2.5}$ are described in the tables below. It is assumed that 97% of PM_{10} emissions from diesel combustion is $PM_{2.5}$, emissions have been up-scaled accordingly.

Table A2.3 Likely Onsite Diesel Equipment and Fleet and $PM_{2.5}$ Emissions

Equipment	Number	Make (or similar)	Power Rating (kW)	Operating Hours	$PM_{2.5}$ Emission Factor (g/kWh) – USEPA Tier 2	NPI Load Factor	Annual Emissions (kg/year)
Front End Loader	1	Volvo L150	185	5865	0.0002	0.5	108.5
Excavator	1	Komatsu PC120	64	5865	0.0002	0.5	75.1
Screen	1	Finlay 883	72	3366	0.0004	1	96.9
Timber Shredder	1	Komptech Crambo 6000	429	841.5	0.0002	1	72.2

Emission Factor Source: NSW EPA (2014) Reducing Emissions from Non-road Diesel Engines. Prepared by ENVIRON Australia Pty Ltd.

Table A2.4 $PM_{2.5}$ Emissions – Trucks Moving Onsite

Equipment	PM Emission Factor (g/VKT) - 1996 ADR70/00	Annual VKT	Annual Emissions (kg/year)
Trucks moving on site	0.584	8,946	5.2

Emission Factor Source: NSW EPA (2012) Technical Report No. 7, Air Emissions Inventory for the Greater Metropolitan Region in New South Wales, 2008 Calendar Year,On-Road Mobile Emissions.

Table A2.5 $PM_{2.5}$ Emissions – Trucks Idling Onsite

Equipment	Trucks onsite at any hour	Emission Factor PM (g/hr) - USEPA	Hours per year	Annual Emissions (kg/year)
Trucks Idling on site	2	1.196	5,865	14.0

Emission Factor Source: NSW EPA (2012) Technical Report No. 7, Air Emissions Inventory for the Greater Metropolitan Region in New South Wales, 2008 Calendar Year, On-Road Mobile Emissions.

Recycling Facility Related Input Data

Material property inputs used in the emission equations presented in **Table A2.1** are detailed in **Table A2.2**. It is noted that minimal details relating to the material properties were available at the time of reporting. To compensate, values were adopted from the literature.

Table A2.2 Material Property Inputs for Emission Estimation Factors Applied

Material Properties	Units	Value	Source of Information
Moisture Content of material	%	2.1	AP42 13.2.4 default for stone quarrying and processing
Silt Loading of Paved Roads – Material Deliveries and Product Dispatch	g/m^2	0.6	Default baseline loading for roads with traffic <500 vehicles per day - US-EPA AP42 (2011)

Key operational details by process used in the emission calculations are listed in **Table A2.3**.

Table A2.3 Emission Estimation Activity Rates Applied for Emission Calculations

Process	Unit	Amount
Material Delivery - Shed	Annual VKT (km)	28,500
Truck Unloading - Shed	Tonnes of material	140,000
Raw Material Handling - Shed	Tonnes of material	140,000
Screening - shed	Tonnes of material	140,000
Screened material Handling - shed	Tonnes of material	140,000
Truck Unloading - Heavy Waste Yard	Tonnes of material	35,000
Raw Material Handling - Heavy Waste Yard	Tonnes of material	35,000
Shredding/Breaking - Heavy Waste Yard	Tonnes of material	35,000
Screened material Handling - Heavy Waste Yard	Tonnes of material	35,000
Dispatch Truck Loading	Tonnes of material	140,000
Material Transportation from site	Annual VKT (km)	6,069
Wind Erosion – Material storage area and stockpiles	Area (ha)	0.05

APPENDIX 3
INCREMENTAL ISOPLETH PLOTS

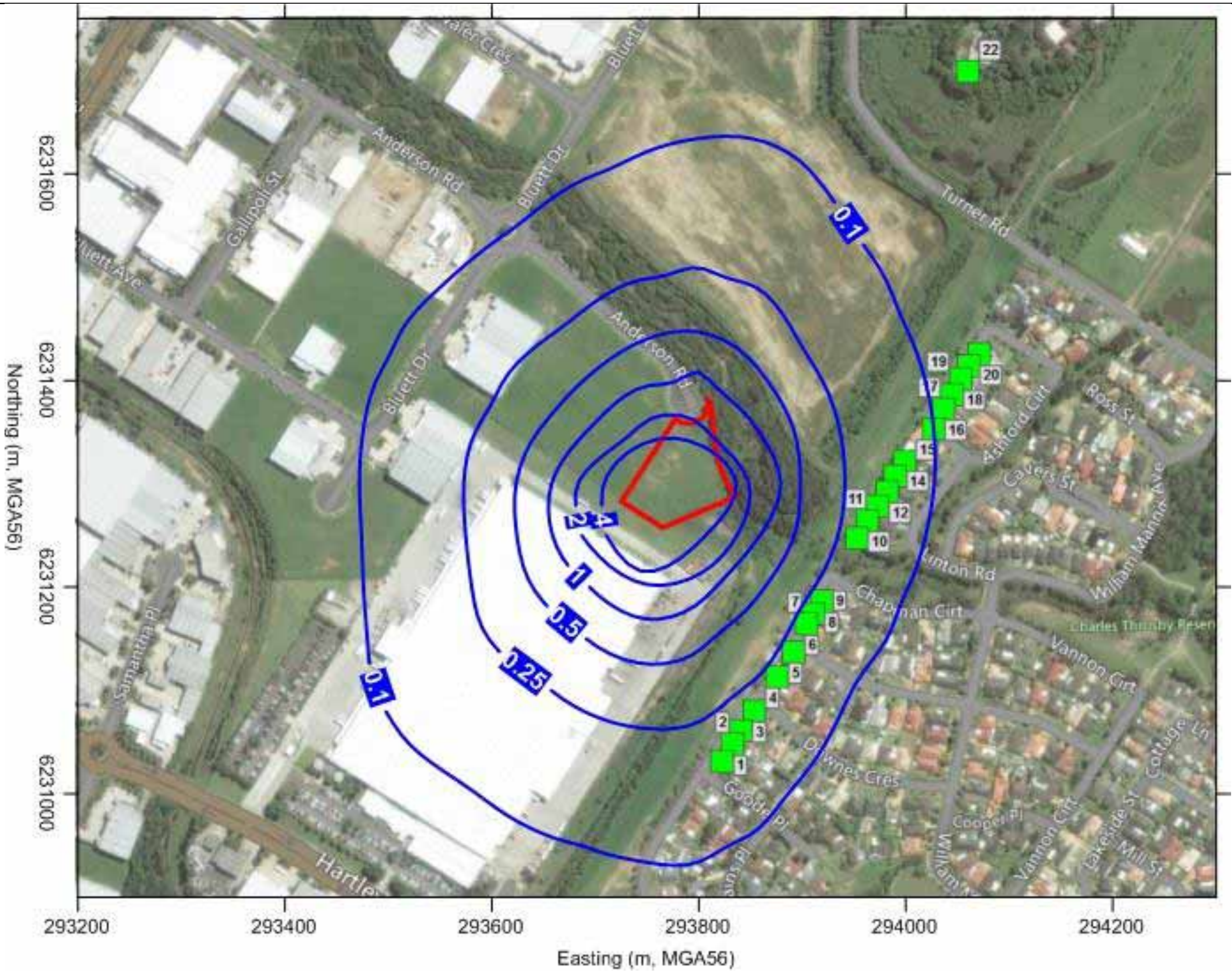

Figure A3.1 Predicted Incremental Annual Average TSP Concentrations (µg/m³)

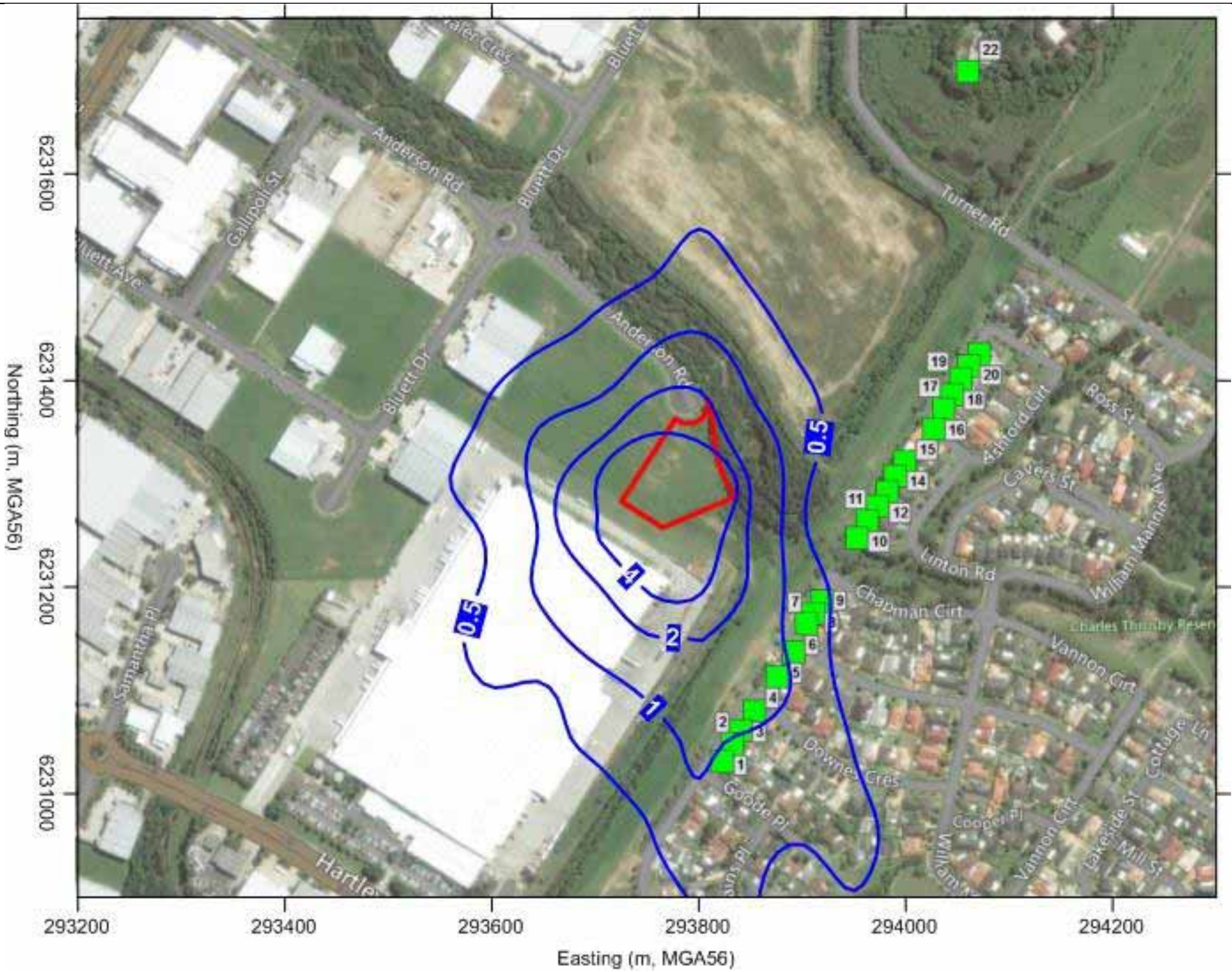

Figure A3.2 Predicted Incremental Maximum 24-hour Average PM_{10} Concentrations ($\mu g/m^3$)

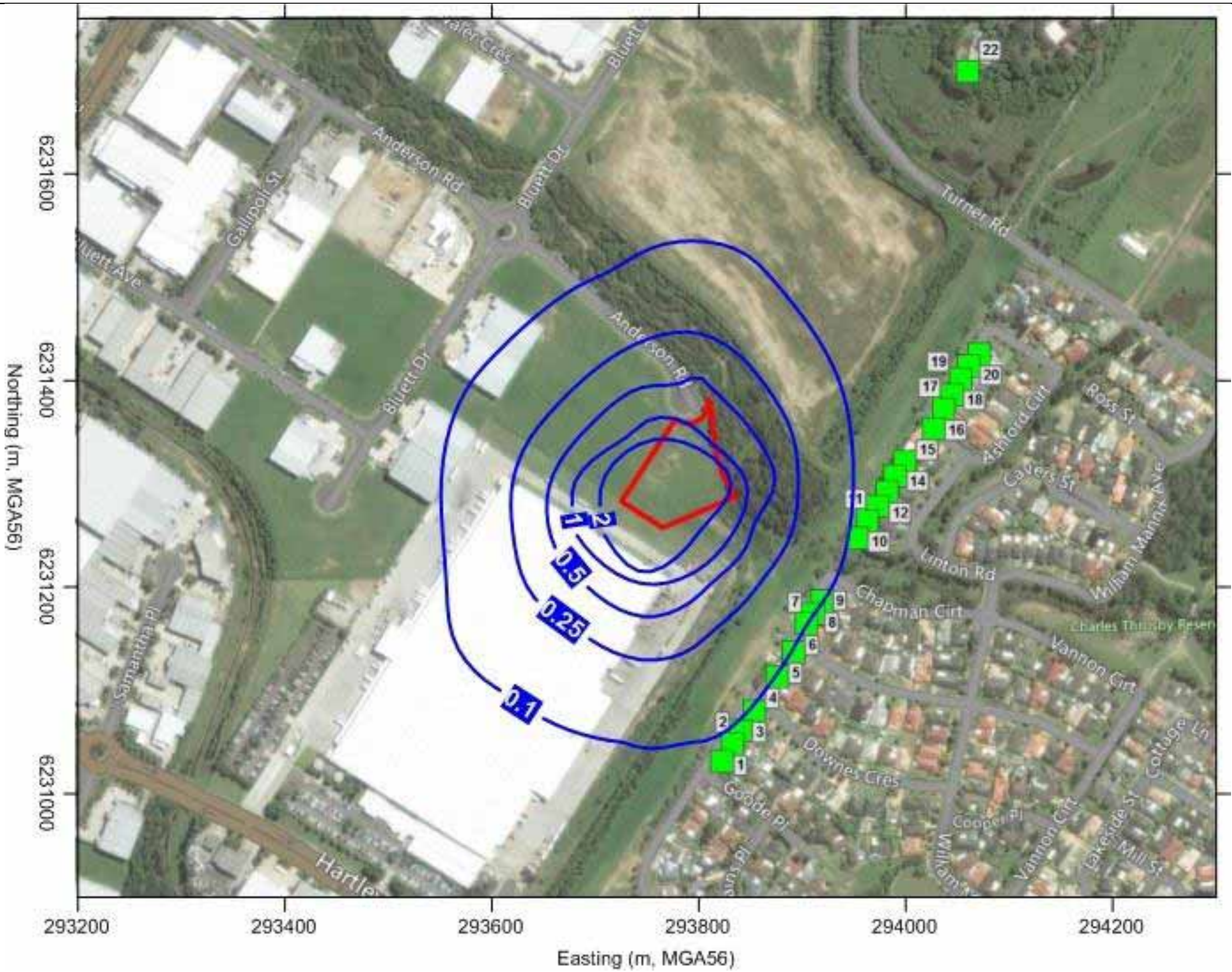

Figure A3.3 Predicted Incremental Annual Average PM_{10} Concentrations ($\mu g/m^3$)

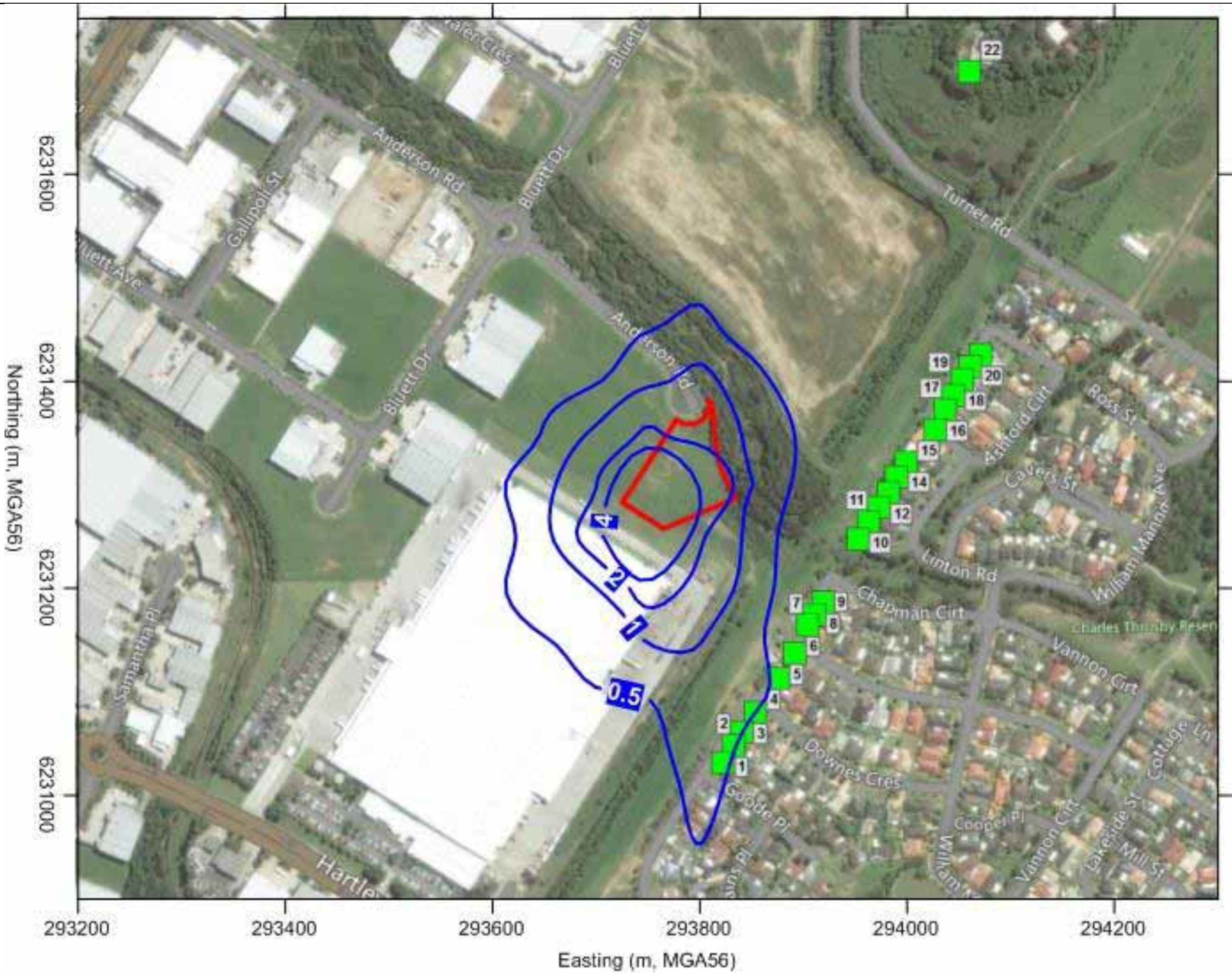

Figure A3.4 Predicted Incremental Maximum 24-hour Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)

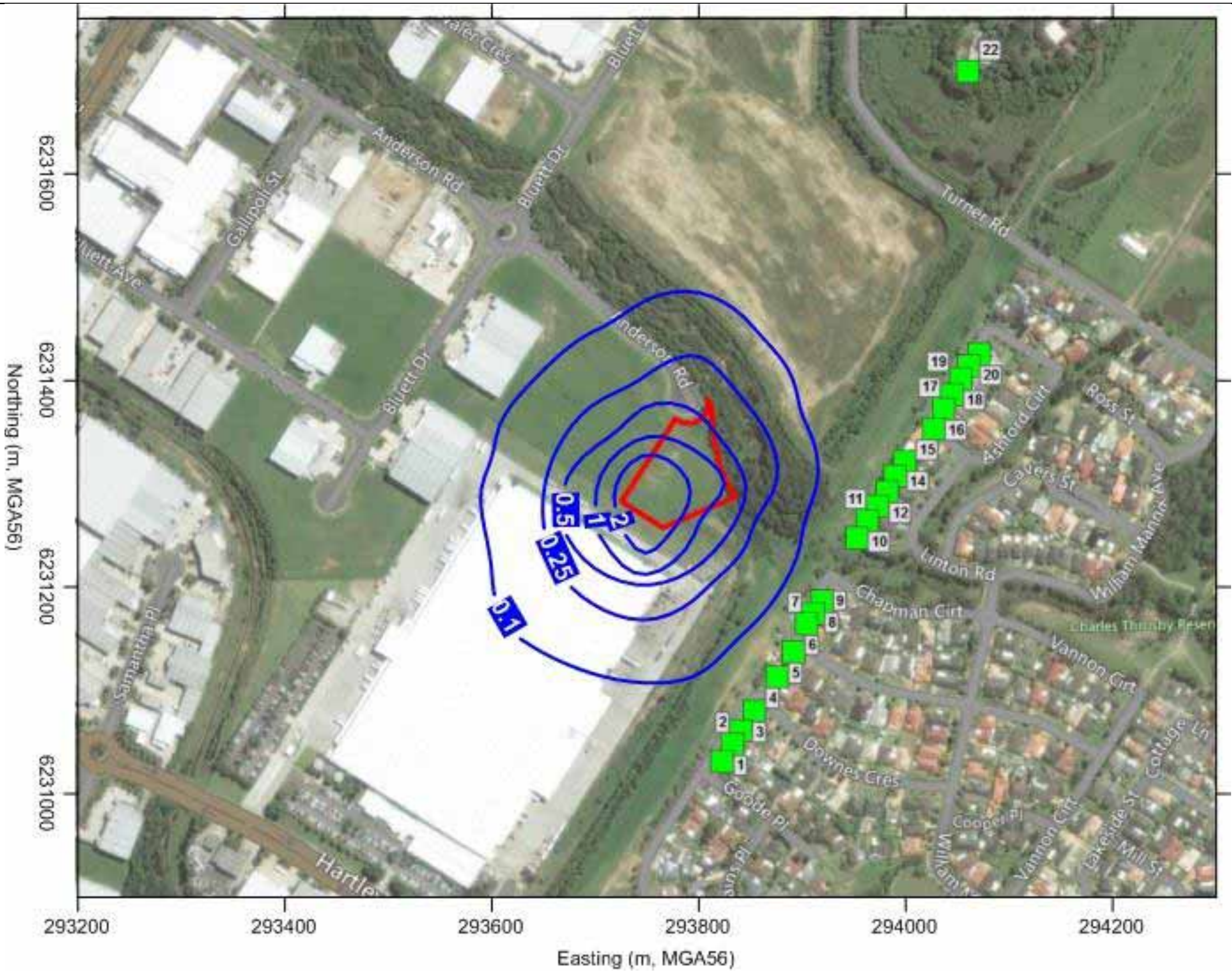

Figure A3.5 Predicted Incremental Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)

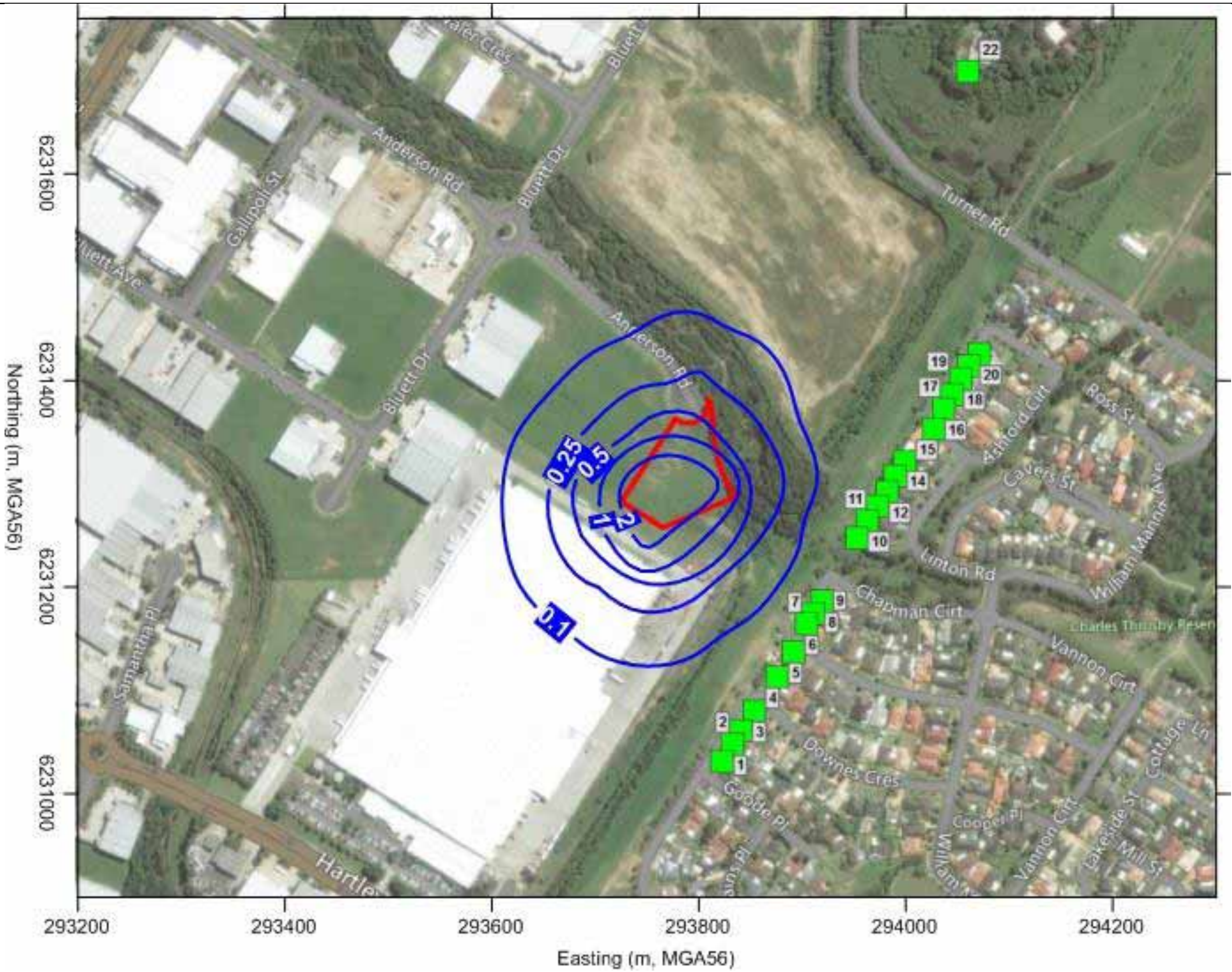

Figure A3.6 Predicted Incremental Annual Average Dust Deposition Levels (g/m²/month)

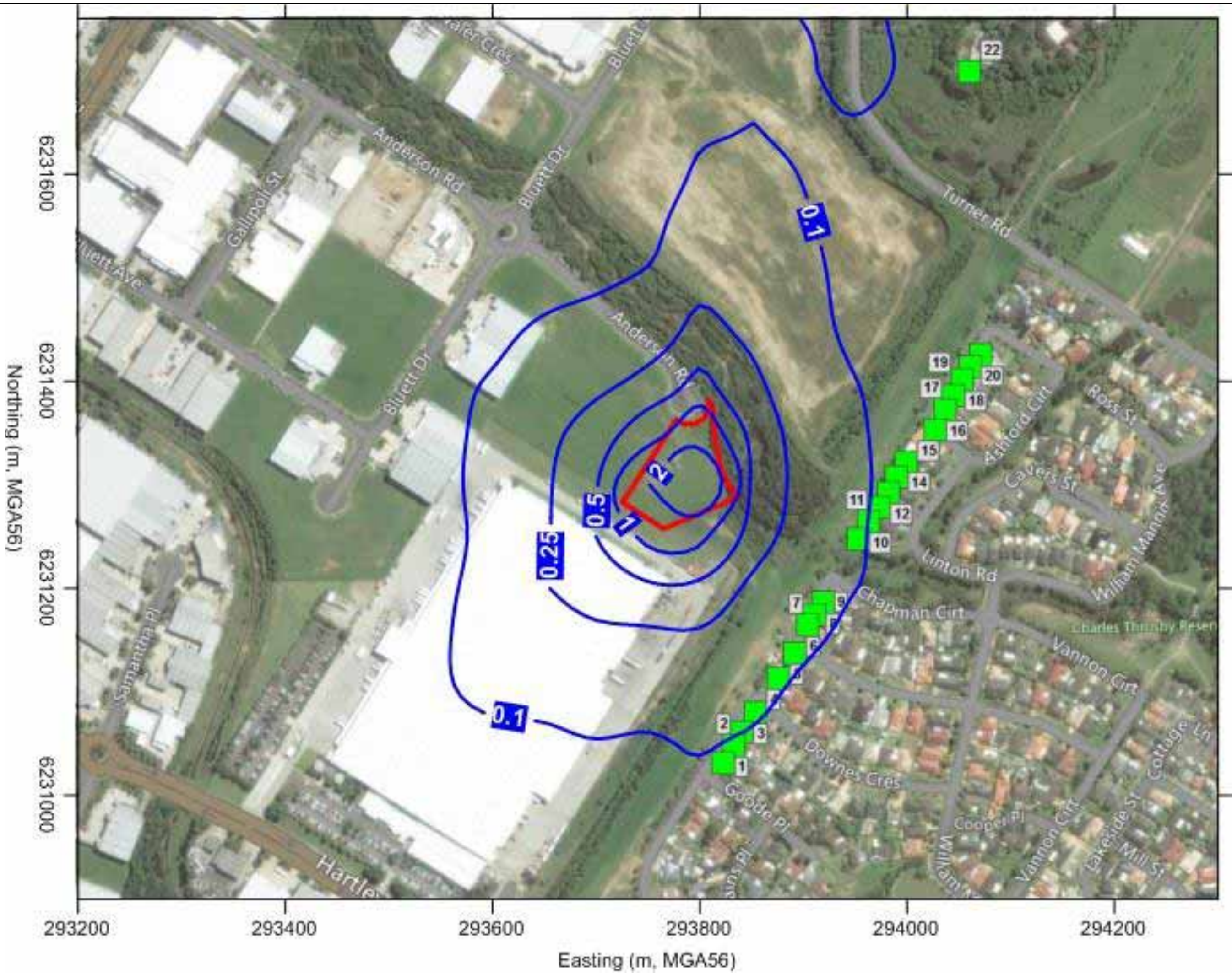

Figure A3.7 Predicted Incremental 99th Percentile 1-second Average Odour Concentrations (OU)

Appendix F

Noise assessment

Noise Impact Assessment

Waste Recycling and Transfer Facility | 52 Anderson Road, Smeaton Grange

Prepared for Benedict Recycling Pty Ltd | 17 June 2016

Noise Impact Assessment

Waste Recycling and Transfer Facility | 52 Anderson Road, Smeaton Grange

Prepared for Benedict Recycling Pty Ltd | 17 June 2016

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Noise Impact Assessment

Final

Report J15135RP1 | Prepared for Benedict Recycling Pty Ltd | 17 June 2016

Prepared by	**Katie Teyhan**	Approved by	**Najah Ishac**
Position	Associate Consultant	Position	Director
Signature		Signature	
Date	17 June 2016	Date	17 June 2016

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

Document Control

Version	Date	Prepared by	Reviewed by
Final	1 April 2016	Lucas Adamson / Katie Teyhan	Najah Ishac
Final V2	17 June 2016	Lucas Adamson / Katie Teyhan	Najah Ishac

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Figures

1 Introduction

EMM Consulting Pty Limited (EMM) has been commissioned by Benedict Recycling Pty Ltd (Benedict) to prepare a noise impact assessment (NIA) suitable to accompany a Development Application (DA) for the proposed Waste Recycling and Transfer Facility, Smeaton Grange (the Project).

The development is located at Lot 319 DP 1117230 (52 Anderson Road, Smeaton Grange), within the Camden City Council Local Government Area (LGA). The Project will include construction and operation of the following components:

- a waste transfer holding shed which would contain the majority of waste processing activities and some stockpiles;
- a segregated heavy waste (timber, brick/concrete and metal) and stockpiling area in bins also along the southern boundary;
- a yard, storage and parking area;
- a weighbridge area with three weighbridges, wheel-washes for the two outbound traffic lanes, demountable offices and amenities;
- a sprinkling site irrigation system to minimise airborne dust; and
- general use areas, including internal roads.

The entire site would be sealed (asphalt or concrete) with a perimeter curb.

This noise impact assessment supports a State significant development application (SSDA) for the project under Part 4, Division 4.1 of the *Environmental Planning and Assessment Act 1979*. The minister for Planning, or his delegate, is the consent authority for the application. The project will contribute to meeting the NSW Government's recycling strategies and targets.

Secretary's Environmental Assessment Requirements (SEARs) were issued by the Department of Planning and Environment (DPE) in January 2016 for the Project. The Environment Protection Authority (EPA) has also provided details of key issues requiring assessment for the Project. Table 1.1 provides the relevant assessment requirements and the section of the NIA report relevant to the specific requirement.

Table 1.1 Noise impact assessment requirements

Relevant authority and assessment requirement	Relevant section of NIA report
DPE	
Noise and vibration – including	
- a quantitative assessment of potential construction, operational and transport noise and vibration impacts in accordance with relevant Environmental Protection Authority guidelines; and	Refer entire NIA
- details and justification of the proposed noise mitigation and monitoring measures.	Chapter 9

Table 1.1 Noise impact assessment requirements

Relevant authority and assessment requirement	Relevant section of NIA report
EPA	
Describe baseline conditions	
Determine the existing background (L_{A90}) and ambient (L_{Aeq}) noise levels in accordance with the NSW Industrial Noise Policy.	Section 4.2
Determine the existing road traffic noise levels in accordance with the NSW Environmental Criteria for Road Traffic Noise, where road traffic noise impacts may occur.	Chapter 8
The noise impact assessment report should provide details of all monitoring of existing ambient noise levels.	Section 4.2
Assess impacts	
Determine the project specific noise levels for the site.	Chapter 5
Determine expected noise level and noise character (e.g. tonality, impulsiveness, vibration, etc) likely to be generated from noise sources during site establishment, construction, operational phases, transport and other services.	Chapters 6, 7, 8
Determine the noise levels likely to be received at the most sensitive locations (these may vary for different activities at each phase of the development). Potential impacts should be determined for any identified significant adverse meteorological conditions. Predicted noise levels under calm conditions may also aid in quantifying the extent of impact where this is not the most adverse condition.	Chapters 6, 7, 8
Discuss the findings from the predictive modelling and, where relevant noise criteria have not been met, recommend additional mitigation measures.	Chapters 6, 7, 9
The noise impact assessment report should include details of any mitigation proposed including the attenuation that will be achieved and the revised noise impact predictions following mitigation.	Chapter 9
Where relevant noise/vibration criteria cannot be met after application of all feasible and cost effective mitigation measures the residual level of noise impact needs to be quantified.	Chapters 6, 7, 8
For the assessment of existing and future traffic noise, details of data for the road should be included such as assumed traffic volume; percentage heavy vehicles by time of day; and details of the calculation process. These details should be consistent with any traffic study carried out in the EIS.	Chapter 8
Describe management and mitigation measures	
Determine the most appropriate noise mitigation measures and expected noise reduction including both noise controls and management of impacts for both construction and operational noise.	Chapter 9
For traffic noise impacts, provide a description of the ameliorative measures considered (if required), reasons for inclusion or exclusion, and procedures for calculation of noise levels including ameliorative measures. Also include, where necessary, a discussion of any potential problems associated with the proposed ameliorative measures, such as overshadowing effects from barriers.	Chapter 8

2 Glossary of acoustic terms

A number of technical terms are required for the discussion of noise and vibration. These are explained in Table 2.1.

Table 2.1 Glossary of acoustic terms

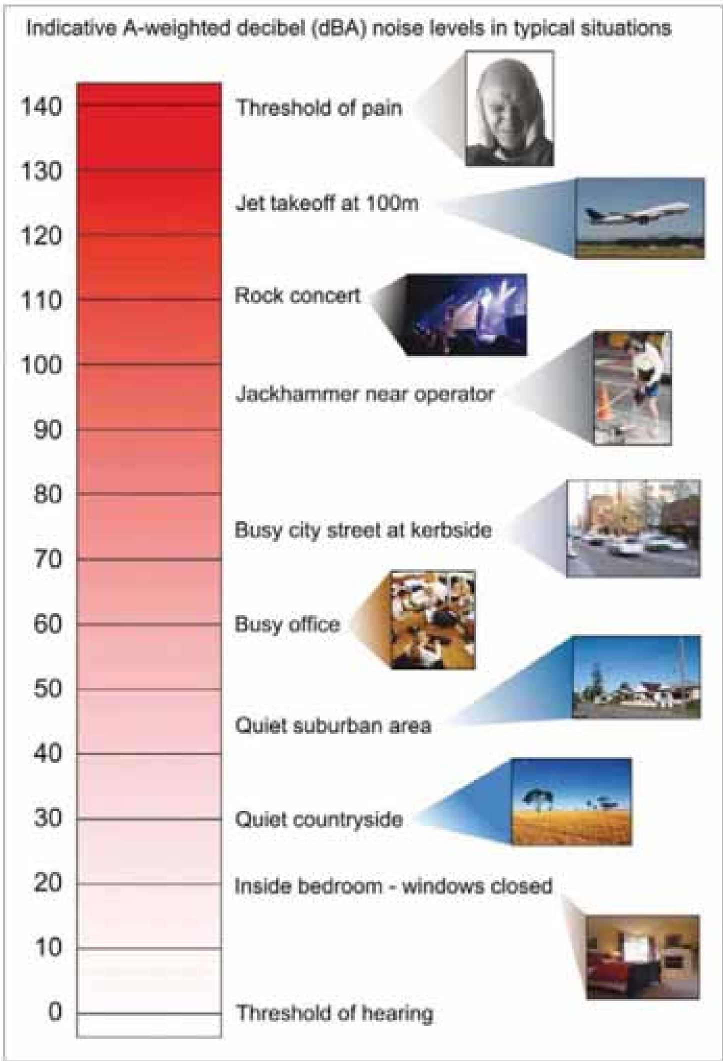
Term	Description
dB	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
L_{A1}	The 'A-weighted' noise level exceeded for 1% of a measurement period.
L_{A10}	A 'A-weighted' noise level which is exceeded 10% of the time. It is approximately equivalent to the average of maximum noise levels.
L_{A90}	Commonly referred to as the background noise, this is the 'A-weighted' level exceeded 90% of the time.
L_{Aeq}	It is the 'A-weighted' energy average noise from a source, and is the equivalent continuous sound pressure level over a given period. The $L_{eq,15min}$ descriptor refers to an L_{eq} noise level measured over a 15 minute period.
L_{Amax}	The 'A-weighted' maximum root mean squared sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single value background level representing each assessment period over the whole monitoring period.
Sound power level	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental property of the source and is independent of the surrounding environment.
Temperature inversion	A positive temperature gradient. A meteorological condition where atmospheric temperature increases with altitude.

It is useful to have an appreciation of decibels, the unit of noise measurement. Table 2.2 gives an indication as to what an average person perceives about changes in noise levels.

Table 2.2 Perceived change in noise

Change in sound level (dB)	Perceived change in noise
1–2	typically indiscernible
3	just perceptible
5	noticeable difference
10	twice (or half) as loud
15	large change
20	four times (or quarter) as loud

Examples of common noise levels are provided in Figure 2.1.



Source: Road Noise Policy (Department of Environment, Climate Change and Water (DECCW) 2011)

Figure 2.1 Common noise levels

3 Project and site description

3.1 Site operations and equipment

The project is located at 52 Anderson Road Smeaton Grange, legally described as Lot 301 DP 1117230 (see Figure 4.1). The indicative site layout is shown in Figure 3.1.

The state significant development application seeks consent for the following components:

- a shed, constructed in colourbond, between approximately 45.67 m and 61.96 m in length, 24 m in width and 11 m high with a floor area of approximately 1,300 m2;
- a concrete slab for the shed;
- hard surfacing of the site in a material such as concrete or asphalt, with a perimeter curb;
- a surface water management system;
- landscaping;
- eight on-site parking spaces for staff, including one disabled space;
- connection to services;
- a weighbridge area with weighbridges;
- wheel washes for outbound vehicles;
- a demountable office;
- demountable amenities including lunch room and toilets;
- seven product bays, which will be four metres high and blockwalled;
- an enclosed, above ground bunded diesel storage tank (approximately 30,000 L);
- establishment of hand unloading area (to replace ‘waste storage area’ under site establishment DA);
- a sprinkling site irrigation system to minimise airborne dust;
- a flip-flow screen waste sorter (housed in main shed);
- an enclosed picking line inside the main shed that extends outside along a portion of the southern boundary;
- boundary fencing to a maximum height of 10 m on the south-eastern boundaries, 4 m along a portion of the eastern boundary, 3 m on the western boundary and 2 m at the rear and sides of the shed (see Figure 2.1);
- 2.1 m high metal palisade fence with automatic colourbond gates at the ingress and egress point;

- extension of the southern and part of the south-eastern side boundary fencing to a maximum height of 10 metres;
- waste/product stockpiles; and
- out-of-hours bin storage and waste truck parking.

The project will import inert general solid waste (non-putrescible) such as construction and demolition wastes, and selected commercial and industrial wastes, for processing (eg screening and sorting) to produce saleable recycled materials. The recycled materials produced will include soils, metals and dry paper/cardboard. These products will meet recycled material specifications while recovering a range of materials that would otherwise be disposed to landfill.

No special, liquid, hazardous, restricted solid waste or general solid waste (putrescible), as defined in the NSW *Protection of the Environment Operations Act 1997* (POEO Act) and EPA (2014), would be accepted at the Recycling Facility. All of the materials brought onto the site will be taken from the site as products or as rejects for disposal at an EPA licensed landfill. There would be no materials land-filled or otherwise disposed of anywhere within the site as a result of this proposal.

The key elements of the project are summarised in Table 3.1.

Table 3.1 Key project elements

Project element	Project description
Maximum processing rate	140,000 tonnes of waste per annum
Site components	• a waste transfer holding shed which would contain the majority of waste processing activities and some stockpiles; • a segregated heavy waste (timber, brick/concrete and metal) and stockpiling area in bins also along the southern boundary; • a yard, storage and parking area; • a weighbridge area with three weighbridges, wheel-washes for the two outbound traffic lanes, demountable offices and amenities; • a sprinkling site irrigation system to minimise airborne dust; • general use areas, including internal roads; and • the entire site would be sealed (asphalt or concrete) with a permitter curb.
Hours of operation	Deliveries: • generally accepted 6 am and 10 pm Monday to Friday, 6 am and 5 pm Saturday, 8 am to 4 pm Sunday; and • accept (but not process) waste 24 hours per day on occasion. It is anticipated that Council will be given 48 hours notice when waste will be delivered between 10 pm and 6 am (ie outside day-to-day operating hours). Waste processing: • 7 am to 6 pm Monday to Saturday. • No processing on Sundays or public holidays.
Employment	15 full-time employees

Table 3.1 Key project element

Project element	Project description
Transport and access	Access will be via Anderson Road. There would be an average of about 276 vehicle movements (ie 138 trips) daily, comprised of 167 light vehicle and 109 heavy vehicle movements for all site activities (waste receival, products/rejects dispatch, employees and maintenance).

3.2 Site location and surroundings

The site is within the Smeaton Grange industrial precinct and covers 6,862 m^2. The site is flat (approximately 90 m Australian Height Datum (AHD)) and is largely covered by grass planted to stabilise the site. The site has been cleared and slightly filled and shaped with clay. There are trees just outside of the north-eastern boundary. The site is zoned IN1 General Industrial pursuant to the Camden Local Environmental Plan 2010 (Camden LEP).

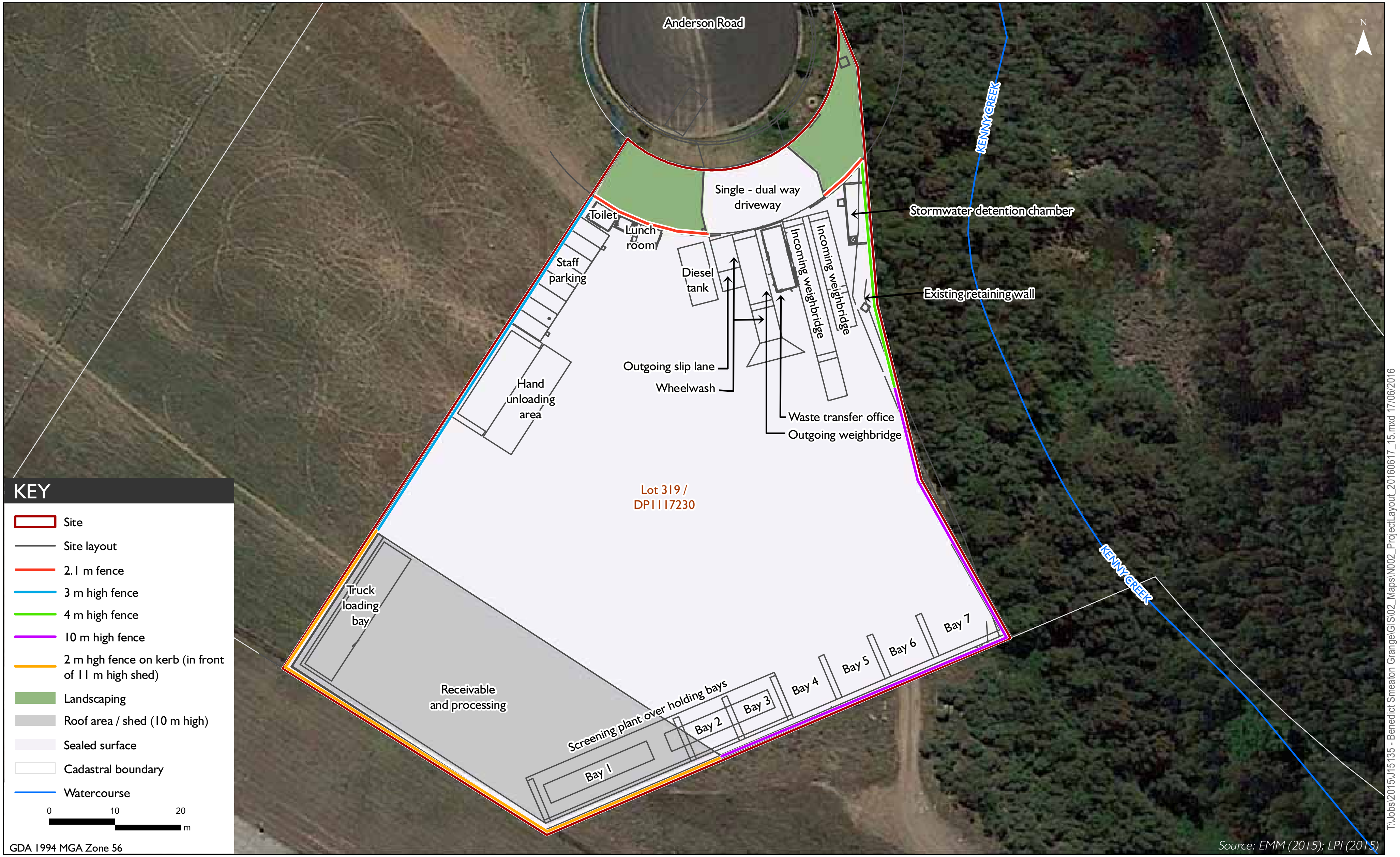
The site is at the end of a cul-de-sac (Anderson Road) which provides the only access to the site. There is an existing large industrial warehouse on the adjacent site to the south-west and a light industrial building to the north of the site. The nearest residences are approximately 120 m to the south-east on Linton Road and Chapman Circuit.

3.3 Key noise issues

The broad potential noise issues for the Project are as follows:

- noise associated with construction activity;
- noise associated with the main operations, which is expected to be dominated by on-site waste recycling within the main building;
- noise associated with the increased traffic to/from the site during operation; and
- cumulative noise from all existing and proposed industrial operations part of the larger development precinct.

The noise assessment focuses on these potential issues. Its preparation included noise measurements, derivation of suitable criteria in accordance with the Industrial Noise Policy (INP) (EPA 2000) and comparison of predicted noise emission levels at noise-sensitive receivers to appropriate noise criteria.



EMM

Site layout

Smeaton Grange waste transfer station

Noise Impact Assessment

Figure 3.1

4 Existing environment

4.1 Noise sensitive receivers

The assessment locations represent those most likely to be affected by the Project. Adherence with noise criteria at these locations would indicate that noise criteria will be met at other surrounding noise-sensitive locations. The nearest potentially affected noise sensitive receivers are residences located approximately 120 m south-east of the project site. Representative assessment locations considered in the noise assessment are shown in Figure 4.1.

4.2 Existing noise levels

A key element in assessing environmental noise impact from industry is to quantify the existing ambient acoustic environment, including any existing industrial noise where present.

The existing acoustic environment (ie ambient noise) was characterised by long-term unattended noise monitoring. This was supplemented by observations made on site during noise logger deployment and collection.

Long-term noise monitoring was completed by EMM at one location in Currans Hill from 10 to 21 December 2015 as described in Table 4.1. The long-term monitoring was complete using an ARL EL 316 Type 1 environmental noise logger (s/n 16-306-036).

Table 4.1 EMM noise logging details

Location	Approximate position with respect to the project site
L1. 20 Chapman Circuit, Currans Hill	120 metres to the south-east

The Rating Background Levels (RBL) and ambient $L_{Aeq,(period)}$ noise levels derived from EMM's long-term noise monitoring are summarised in Table 4.2. The daily noise data and charts are provided in Appendix A. The logging data was analysed in accordance with the INP, whereby data was excluded where rainfall and/or winds of greater than 5 m/s were recorded. This analysis was completed using weather data from the Bureau of Meteorology's Camden Airport Automatic Weather Station (Station ID 068192).

Table 4.2 Summary of measured ambient noise levels

Location	RBL, dB			Ambient (L_{Aeq}) noise level, dB		
	Day	Evening	Night	Day	Evening	Night
L1. 20 Chapman Circuit, Currans Hill	36	35	31	52	53	46

Note: 1. Day: 7 am to 6 pm Monday to Saturday; 8 am to 6 pm Sundays and public holidays; evening: 6 pm to 10 pm; night is the remaining periods.

Several industrial developments currently operate in the area surrounding the Project site.

Observations during noise logger deployment identified the acoustic environment to be typical of a suburban area with natural noise sources (birds and insects), domestic pets (dog barks), occasional local car movements, very distant traffic noise and occasional truck movements (slight engine noise and reversing alarms) from warehousing operations to the west.

EMM

Air quality and noise monitoring and assessment locations

Smeaton Grange Recycling Facility
Noise Impact Assessment

Figure 4.1

EMM's observations confirm that the existing industrial noise was highly likely to be less than the Acceptable Noise Level (ANL) minus 6 dB for all assessment periods.

4.3 Meteorology

Noise propagation over large distances can be significantly affected by the prevailing weather conditions. Such influences are not significant at small distances as is the case in the subject proposal. Nonetheless these have been considered in this noise assessment.

Of most relevance are source to receiver winds, the presence of temperature inversions and drainage flow effects, as these conditions can enhance received noise levels. To account for these phenomena, the INP specifies meteorological analysis procedures to determine the prevalent weather conditions that enhance noise propagation in a particular area, with a view to determining whether they can be described as a 'feature' of the project area.

4.3.1 Wind

Wind has the potential to increase noise impacts at a receiver when it is light and stable, and blows from the direction of the noise source. As the wind strength increases, the noise produced by the wind usually obscures noise from most industrial and transport sources.

The prevailing wind directions in the area have been determined in accordance with Section 5 of the INP. The INP requires that winds of speeds up to 3 m/s with an occurrence greater than 30% of the time during any period (day, evening or night) in any season be assessed.

4.3.2 Analysis of prevailing winds in the area

The prevailing winds analysis considered weather data over a one year period (2015). The analysis determined that winds from the south-east are a feature of the area. These prevailing winds would have the effect of reducing noise from the site to the closest residences. Therefore, only calm weather conditions are relevant and have been modelled.

4.3.3 Temperature inversions

Temperature inversions, when they occur, have the ability to increase noise levels by focusing sound waves. Temperature inversions generally occur during the night-time and early morning periods during the winter months. A temperature inversion needs to occur for approximately 30% of the total night-time period during winter, or approximately two nights per week, for it to be a significant characteristic of the area and require consideration according to the INP.

The frequency of temperature inversions was determined based on sigma-theta data obtained from the Bureau of Meteorology's Camden Airport weather station. Analysis of the data found that F or G stability class (temperature inversions) may occur for greater than 30% of the night-time period and, as such, has been considered in the prediction and assessment of noise emissions for the night and morning shoulder periods.

4.3.4 Drainage winds

The INP states that a default wind drainage value should be applied where sources are at a higher altitude than the assessment location with no intervening topography. All assessment locations are at a similar or higher elevation than the subject site. Therefore, drainage winds have not been adopted in this assessment.

4.3.5 Modelled meteorological conditions

The relevant site specific meteorological conditions adopted based on the meteorological data analysis are presented in Table 4.3.

Table 4.3 Weather conditions considered in noise modelling

Assessment period	Meteorological condition	Air temperature	Relative humidity	Wind speed	Temperature gradient
Day/Evening	Calm	20°C	70%	0 m/s	D class
Night/Morning Shoulder	Calm	10°C	90%	0 m/s	D class
	Temperature inversion	10°C	90%	0 m/s	F class

5 Noise criteria

5.1 Operational noise

Industrial sites in NSW, including recycling facilities, are regulated by the local council, DPE and/or the EPA and usually have a licence and/or approval conditions stipulating noise limits. These limits are normally derived from operational noise criteria applied at assessment locations. They are based on INP guidelines (EPA 2000) or noise levels that can be achieved at a specific site following the application of all reasonable and feasible noise mitigation.

The INP guidelines for assessing industrial facilities have been used for this assessment. With respect to the criteria, the guidelines state:

> They are not mandatory, and an application for a noise producing development is not determined purely on the basis of compliance or otherwise with the noise criteria. Numerous other factors need to be taken into account in the determination. These factors include economic consequences, other environmental effects and the social worth of the development.

Assessment criteria depend on the existing amenity of areas potentially affected by a proposed development. Noise assessment criteria for industry are based on the following objectives:

- protection of the community from excessive intrusive noise; and
- preservation of amenity for specific land uses.

To ensure these objectives are met, the EPA provides two separate criteria: intrusiveness criteria and amenity criteria. A fundamental difference between the intrusiveness and the amenity criteria is the period they relate to:

- intrusiveness criteria — apply over 15 minutes in any period (day, evening or night); and
- amenity criteria — apply to the entire assessment period (day, evening or night).

5.1.1 Intrusiveness

The intrusiveness criteria require that $L_{Aeq(15\text{-}min)}$ noise levels from the project during the relevant operational periods (ie day, evening and morning shoulder) do not exceed the RBL by more than 5 dB.

The adopted RBL was derived from EMM's long-term noise monitoring at one location in Currans Hill. This location was identified to be the potentially worst affected residential receiver and was seen to accurately quantify the existing ambient acoustic environment, including any existing industrial noise. The RBL and corresponding intrusive criteria for the project are given in Table 5.1.

Table 5.1 Intrusive noise criteria

Location	Period[1]	Adopted RBL, dB(A)	Intrusive criteria dB(A), $L_{eq(15\text{-}min)}$
L1. 20 Chapman Circuit, Currans Hill	Morning shoulder	34	39[2]
	Day	36	41
	Evening	35	40
	Night	31	36

Note: 1. Day: 7 am to 6 pm Monday to Saturday; 8 am to 6 pm Sundays and public holidays; Evening: 6 pm to 10 pm; Night: 10 pm to 7 am Monday to Saturday, 10 pm to 8 am Sundays and public holidays; Morning shoulder: 6 am to 7 am.

2. The RBL adopted for the morning shoulder period has been taken as the midpoint of the RBLs determined for day and night-time periods in accordance with the INP Application Notes.

5.1.2 Amenity

The assessment of amenity is based on noise criteria specific to the land use. The criteria relate only to industrial noise and exclude road or rail noise. Where the measured existing industrial noise approaches recommended amenity criteria, it needs to be demonstrated that noise levels from new industry will not contribute to existing industrial noise.

Residential assessment locations potentially affected by the project have been categorised in the INP suburban amenity category. The corresponding recommended amenity criteria for the project are given in Table 5.2.

Table 5.2 Amenity criteria

Assessment location	Indicative area	Time period	Recommended noise level dB(A), $L_{eq,(period)}$	
			Acceptable	Maximum
All residential areas	Suburban	Day	55	60
		Evening	45	50
		Night	40	45

5.1.3 Project specific noise level

The project-specific noise level (PSNL) is the more stringent of the calculated intrusive or amenity criteria. The PSNL for the morning shoulder, daytime and evening periods are indicated in bold in Table 5.3.

Table 5.3 Project specific noise levels

Location	Period[1]	Intrusive criteria dB(A), $L_{eq(15\text{-}min)}$	Amenity criteria dB(A), $L_{eq,(period)}$
L1. 20 Chapman Circuit, Currans Hill	Morning shoulder	**39**	48
	Day	**41**	55
	Evening	**40**	45
	Night	**36**	40

Note: 1. Day: 7 am to 6 pm Monday to Saturday; 8 am to 6 pm Sundays and public holidays; evening: 6 pm to 10 pm; morning shoulder: 6 am to 7 am.

5.2 Construction noise and vibration

5.2.1 Construction noise

The construction phase of the Project is estimated to be 10 to 12 weeks duration. However, there are no significant excavation activities proposed (refer Section 3.3) and no construction activity will occur at night.

The NSW DECC Interim Construction Noise Guidelines (ICNG) (DECC 2009) provides guidance for the assessment and management of noise from construction works.

The ICNG suggests the following time restriction for construction activities where the noise is audible at residential premises:

- Monday to Friday 7.00 am to 6.00 pm;
- Saturday 8.00 am to 1.00 pm; and
- no construction work is to take place on Sundays or public holidays.

Table 5.4 is an extract from the ICNG and provides noise management levels for residential receivers for both recommended standard construction hours and outside of these periods. These time restrictions are the primary management tool of the ICNG.

Table 5.4 ICNG residential criteria

Time of day	Management level $L_{Aeq, 15min}$	How to apply
Recommended standard hours: Monday to Friday 7:00 am to 6:00 pm Saturday 8:00 am to 1:00 pm No work on Sundays or public holidays	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 LAeq (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	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 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; and if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Table 5.4 ICNG residential criteria

Time of day	Management level $L_{Aeq,\ 15min}$	How to apply
Outside recommended standard hours	Noise affected RBL + 5dB	• 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 above the noise affected level, the proponent should negotiate with the community.

In summary, the ICNG noise level goals at residences for activities during the standard hours are 10 dB above the existing background levels. For activities outside of the recommended standard hours, the noise levels should be no more than 5 dB above the existing background levels.

Table 5.5 presents ICNG noise management levels for commercial and industrial receivers.

Table 5.5 ICNG noise management levels at commercial and industrial land uses

Land use	Management level, $L_{Aeq(15\text{-}min)}$
Industrial premises	External noise level 75 dB (when in use)
Offices, retail outlets	External noise level 70 dB (when in use)

Source: ICNG (DECC 2009).

The construction noise management levels (NMLs) for this assessment have been developed using the noise monitoring data provided in Section 4 and in accordance with the ICNG.

Table 5.6 Construction noise management levels

Receiver	Period	Representative RBL, dB	NML, $L_{Aeq,15min}$, dB
Residences (nearest potentially affected)	Day	36	46 (noise affected) 75 (highly noise affected)
	Evening	35	N/A
	Night	31	N/A
Offices, retail outlets	When in use	N/A	70
Neighbouring industrial premises	When in use	N/A	75

Notes: 1. N/A = not applicable since construction activity is not proposed to occur during these periods.

2. Based on measured RBL at long-term noise monitoring location at 20 Chapman circuit, Currans Hill.

5.2.2 Construction vibration

Environmental Noise Management – Assessing Vibration: a Technical Guideline (DEC 2006) is based on potential vibration impacts of the project have been assessed, with reference to the guidelines contained in *BS 6472 – 2008, Evaluation of Human Exposure to Vibration in Buildings (1–80Hz).*

The guideline presents preferred and maximum vibration values for use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques. At vibration values below the preferred values, there is a low probability of adverse comment or disturbance to building occupants. Where all feasible and reasonable mitigation measures have been applied and vibration values are still beyond the maximum value, it is recommended the operator negotiate directly with the affected community.

The Guideline defines three vibration types and provides direction for assessing and evaluating the applicable criteria. Table 2.1 of the Guideline provides examples of the three vibration types and has been reproduced in Table 5.7.

Table 5.7 Examples of types of vibration (from Table 2.1 of the Guideline)

Continuous vibration	Impulsive vibration	Intermittent vibration
Machinery, steady road traffic, continuous construction activity (such as tunnel boring machinery).	Infrequent: Activities that create up to 3 distinct vibration events in an assessment period, eg occasional dropping of heavy equipment, occasional loading and unloading. Blasting is assessed using ANZECC (1990).	Trains, intermittent nearby construction activity, passing heavy vehicles, forging machines, impact pile driving, jack hammers. Where the number of vibration events in an assessment period is three or fewer these would be assessed against impulsive vibration criteria.

i Continuous and impulsive vibration

Appendix C of the Guideline outlines acceptable criteria for human exposure to continuous and impulsive vibration (1–80 Hz). The criteria are dependent on both the time of activity (usually daytime or night-time) and the occupied place being assessed. Table 5.8 reproduces the preferred and maximum criteria relating to measured peak velocity.

Table 5.8 Criteria for exposure to continuous and impulsive vibration

Place	Time	Peak Velocity	
		Preferred	Maximum
Continuous vibration			
Critical working Areas (eg hospital operating theatres, precision laboratories)	Day or night-time	0.14	0.28
Residences	Daytime	0.28	0.56
	Night-time	0.20	0.40
Offices	Day or night-time	0.56	1.1
Workshops	Day or night-time	1.1	2.2
Impulsive vibration			
Critical working Areas (eg hospital operating theatres, precision laboratories)	Day or night-time	0.14	0.28
Residences	Daytime	8.6	17.0
	Night-time	2.8	5.6
Offices	Day or night-time	18.0	36.0
Workshops	Day or night-time	18.0	36.0

Notes: 1. RMS velocity (mm/s) and vibration velocity value (dB re 10^{-9} mm/s).

2. Values given for most critical frequency >8 Hz assuming sinusoidal motion.

ii Intermittent vibration

Intermittent vibration (as defined in Section 2.1 of the guideline) is assessed using the vibration dose concept which relates to vibration magnitude and exposure time.

Intermittent vibration is representative of activities such as impact hammering, rolling or general excavation work (such as an excavator tracking).

Section 2.4 of the Guideline provides acceptable values for intermittent vibration in terms of vibration dose values (VDV) which requires the measurement of the overall weighted RMS (root mean square) acceleration levels over the frequency to calculate VDV range 1 Hz to 80 Hz. The following formula (refer *section 2.4.1* of the guideline) was used:

$$VDV = \left[\int_0^T a^4(t)dt \right]^{0.25}$$

Where *VDV* is the vibration dose value in $m/s^{1.75}$, *a(t)* is the frequency-weighted RMS of acceleration in m/s^2 and *T* is the total period in a day (in seconds) during which vibration may occur.

The Acceptable VDV for intermittent vibration are reproduced in Table 5.9.

Table 5.9 Acceptable vibration dose values (VDV) for intermittent vibration

Location	Daytime		Night-time	
	Preferred value, $m/s^{1.75}$	Maximum value, $m/s^{1.75}$	Preferred value, $m/s^{1.75}$	Maximum value, $m/s^{1.75}$
Critical Areas	0.10	0.20	0.10	0.20
Residences	0.20	0.4	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

Notes: 1. Daytime is 7 am to 10 pm and night-time is 10 pm to 7 am.

2. These criteria are indicative only, and there may be a need to assess intermittent values against continuous or impulsive criteria for critical areas.

There is a low probability of adverse comment or disturbance to building occupants at vibration values below the preferred values. Adverse comment or complaints may be expected if vibration values approach the maximum values. The Guideline states that activities should be designed to meet the preferred values where an area is not already exposed to vibration.

iii Structural vibration

Most commonly specified "safe" structural vibration limits are designed to minimise the risk of threshold or cosmetic surface cracks, and are set well below the levels that have potential to cause damage to the main structure.

In terms of the most recent relevant vibration damage criteria, Australian Standard AS 2187.2—2006 *Explosives* - Storage *and Use* - *Use of Explosives* recommends the frequency dependent guideline values and assessment methods given in BS 7385 Part 2-1993 *Evaluation and measurement for vibration in buildings Part 2* be used as they are "applicable to Australian conditions".

The standard sets guide values for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated. These levels are judged to give a minimum risk of vibration induced damage, where minimal risk for a named effect is usually taken as a 95% probability of no effect.

Sources of vibration that are considered in the standard include demolition, blasting (carried out during mineral extraction or construction excavation), piling, ground treatments (eg compaction), construction equipment, tunnelling, road and rail traffic and industrial machinery.

The recommended limits (guide values) for transient vibration to ensure minimal risk of cosmetic damage to residential and industrial buildings are presented numerically in Table 5.10 and graphically in Figure 5.1.

Table 5.10 Transient vibration guide values - minimal risk of cosmetic damage

Line	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	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

The standard states that the guide values in Table 5.10 relate predominantly to transient vibration which does not give rise to resonant responses in structures and low-rise buildings.

Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table 5.10 may need to be reduced by up to 50%.

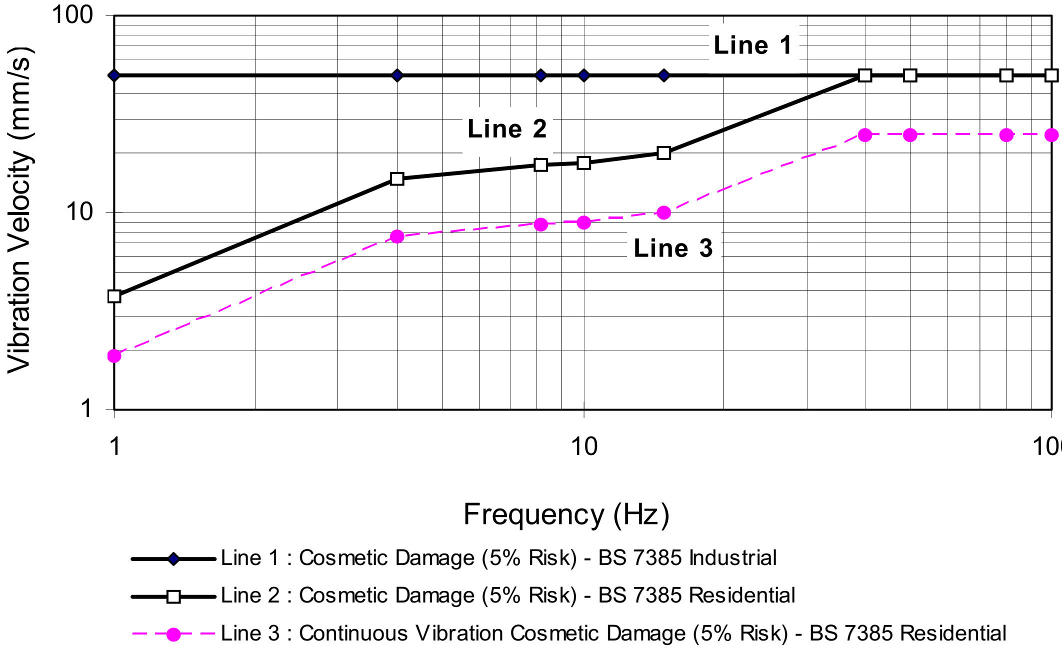


Figure 5.1 Graph of transient vibration guide vales for cosmetic damage

Sheet piling activities (for example) are considered to have the potential to cause dynamic loading in some structures (eg residences) and it may therefore be appropriate to reduce the transient values by 50%.

In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the guide values for building types corresponding to Line 2 are reduced. Below a frequency of 4 Hz where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard goes on to state that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 5.10, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the guide values in Table 5.10 should not be reduced for fatigue considerations.

In order to assess the likelihood of cosmetic damage due to vibration, AS2187 specifies that vibration measurements should be undertaken at the base of the building and the highest of the orthogonal vibration components (transverse, longitudinal and vertical directions) should be compared with the criteria curves presented in Table 5.10.

It is noteworthy that extra to the guide values nominated in Table 5.10, the standard states that:

> Some data suggests that the probability of damage tends towards zero at 12.5 mm/s peak component particle velocity. This is not inconsistent with an extensive review of the case history information available in the UK.

Also that:

> A building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive.

iv Ground-borne noise

Ground-borne noise is noise generated by vibration transmitted through the ground into a structure. The ICNG provides guidance on the assessment of ground-borne noise and relevant internal noise levels for the evening and night-time periods above which management actions should be implemented.

It is understood that vibration-generating events, such as vibratory rolling and compacting, would occur during the daytime only. As such, ground-borne noise impacts are not expected at the nearest residences.

5.3 Sleep disturbance criteria

The project will typically operate during the morning shoulder from 6 am to 7 am, which falls in the defined night-time period and, on occasion, deliveries may occur during the night-time period. Therefore assessment of sleep disturbance is required in accordance with the INP and associated application notes.

The operational criteria described in Section 5.1, which consider the average noise emission of a source over 15 minutes, are appropriate for assessing noise from steady-state sources, such as engine noise from mobile plant and other pit equipment. However impact noise from sources such as a front end loader (FEL) loading trucks is intermittent (rather than continuous) and needs to be assessed using the L_1 or L_{max} noise metrics when determining the potential for sleep disturbance.

The INP Application Notes (last updated June 2013) recognise that the current sleep disturbance criteria is not ideal. The assessment of potential sleep disturbance is complex and poorly understood and the EPA believes that there is insufficient information to determine a suitable alternative criteria.

In the interim, the INP guideline suggests that the $L_{A1(1min)}$ level of 15 dB above the RBL is a suitable screening criteria for sleep disturbance for the night-time period. Guidance regarding potential for sleep disturbance is also provided in the NSW *Road Noise Policy* (RNP) (EPA 2011). The RNP calls upon a number of studies that have been conducted into the effect of maximum noise levels on sleep. The RNP acknowledges that, at the current level of understanding, it is not possible to establish absolute noise level criteria that would correlate to an acceptable level of sleep disturbance. However, the RNP provides the following conclusions from the research on sleep disturbance:

- maximum internal noise levels below 50 to 55 dBA are unlikely to awaken people from sleep; and
- one or two noise events per night, with maximum internal noise levels of 65 to 70 dBA, are not likely to affect health and wellbeing significantly.

It is commonly accepted by acoustic practitioners and regulatory bodies that a facade including a partially open window will reduce external noise levels by 10 dB. Therefore, external L_{Amax} noise levels in the order of 60 to 65 dB calculated at the facade of a residence are unlikely to cause sleep disturbance affects.

If noise levels over the screening criteria are identified, then additional analysis should consider factors such as:

- how often the events would occur;
- the time the events would occur (between 10 pm and 7 am); and
- whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods).

Table 5.11 provides the sleep disturbance criteria for the residential assessment locations.

Table 5.11 Sleep disturbance criteria – residential assessment locations

Assessment location	Adopted RBL, dB[1]	Sleep disturbance criteria dB, L_{Amax}
L1. 20 Chapman Circuit, Currans Hill	31	46

Notes: 1.Night-time RBL adopted.

5.4 Road traffic noise criteria

The principle guidance for assessing the impact of road traffic noise is the RNP. The site is accessible from Anderson Road via Camden Valley Way and also from Anderson Road via Anzac Avenue and Smeaton Grange Road. Camden Valley Way and Smeaton Grange Road are both major heavy vehicle routes. Anderson Road and Anzac Avenue are both within the IN1 General Industrial zone and are suitable for heavy vehicles. As per the definitions in Table 2 of the RNP, Narellan Road and Camden Valley Way are classified as freeway/arterial roads, Hartley road is classified as sub-arterial and Anderson road is classified as a local road.

Table 5.12 presents the road noise assessment criteria reproduced from Table 3 of the RNP.

Table 5.12 Road traffic noise assessment criteria for residential land uses

Road category	Type of project/development	Assessment criteria, dB(A)	
		Day (7 am to 10 pm)	**Night (10 pm to 7 am)**
Freeway/arterial/sub-arterial roads	Existing residences affected by additional traffic on existing freeway/arterial/sub-arterial roads generated by land use developments.	$L_{eq(15\text{-}hr)}$ 60 (external)	$L_{eq(9\text{-}hr)}$ 55 (external)

Source: EPA (2011).

The RNP states that where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to 2 dB.

5.4.1 Relative increase criteria

In addition to meeting the assessment criteria, any significant increase in total traffic noise at assessment locations must be considered. Assessment locations experiencing increases in total traffic noise levels above those presented in Table 5.13 should be considered for noise mitigation.

Table 5.13 Relative increase criteria for residential land uses

Road category	Type of project/development	Total traffic noise level increase, dB(A)	
		Day (7 am to 10 pm)	**Night (10 pm to 7 am)**
Freeway/arterial/sub-arterial roads and transitways	New road corridor/redevelopment of existing road/land use development with the potential to generate additional traffic on existing road.	Existing traffic $L_{eq(15\text{-}hr)}$ +12 dB (external)	Existing traffic $L_{eq(9\text{-}hr)}$ +12 dB (external)

6 Operational noise assessment

6.1 Noise modelling method

This section presents the methods and assumptions used to model noise emissions from operation of the project.

Noise modelling was based on three-dimensional digitised ground contours of the surrounding land. Noise predictions were carried out using Brüel and Kjær Predictor Version 10.10 noise prediction software. 'Predictor' calculates total noise levels at assessment locations from the concurrent operation of multiple noise sources. The model has considered factors such as:

- the lateral and vertical location of plant;
- source to assessment location distances;
- ground effects;
- atmospheric absorption;
- topography of the project site and surrounding area; and
- applicable meteorological conditions (refer to Section 4.3).

Plant and equipment was modelled at locations and heights representing maximum likely activity during operations using representative equipment sound power levels and quantities provided in Table 6.1. The sound power levels adopted have been taken from an EMM database of similar equipment. Noise modelling has conservatively assumed that all plant and equipment operates simultaneously and, as such, is considered to represent a worst-case operational scenario. While this may occur at times, the use of individual plant generally will be intermittent during operations. The reduced sound power level of the front end loader (to account for the increased sensitivity to noise emissions during the morning shoulder period) has been applied during the morning shoulder only. For the purpose of noise predictions it has been assumed that the sound power of the front end loader would not be reduced during the daytime.

Table 6.1 Operational plant and equipment sound power levels

Plant and equipment	Typical activities	Location	Assumed utilisation	Quantity	Lw, $L_{Aeq(15\text{-}min)}$, dB
Main operations (daytime/evening)					
Excavator	Sorting waste using a variety of excavator attachments Loading feed to processing plant Loading trucks	Inside main building	100%	1	104
Heavies sorter (Screen)	Sorting co-mingled waste	Inside main building	100%	1	101
Picking line	Sorting / moving co-mingled waste	Inside main building	100%	1	88

Table 6.1 Operational plant and equipment sound power levels

Plant and equipment	Typical activities	Location	Assumed utilisation	Quantity	Lw, $L_{Aeq(15\text{-}min)}$, dB
Front-end loader (FEL)	Loading trucks Moving waste products	Outside in main yard adjacent to ground bins	100%	1	108
Road truck	Delivering waste and dispatching products, returning to/leaving the site	Delivery/dispatch route	70%	2	105
Idling road trucks	Standing at weighbridge	Weighbridge	100%	2	90
Transporting product only (morning shoulder)					
Road truck	Delivering waste and dispatching products, returning to/leaving the site	Delivery/dispatch route	70%	1	105
Front end loader[1]	Loading trucks	Outside in main yard adjacent to ground bins	100%	1	105
Deliveries only (night)					
Road truck	Delivering waste returning to/leaving the site	Delivery/dispatch route	70%	1	105

Note: *1. Given the increased sensitivity to noise emissions during the morning shoulder period, it has been assumed for the purpose of operational noise modelling that the sound power level of the front end loader would be reduced. This could be readily achieved via the installation of noise attenuation kit and operator-training with regard to quiet work practices.*

A noise barrier was also included in the noise model. The location and indicative heights assumed in the noise model are shown in Figure 3.1.

Noise modelling was completed for daytime/evening, night and morning shoulder periods for the meteorological scenarios presented in Table 4.4.

6.2 Noise modelling results and discussion

Predicted Project noise emission levels at the assessment locations shown in Figure 4.1 are provided in Table 6.2. Noise emissions predicted to be above the relevant project specific noise level are indicated in bold text. Predicted operational noise contours for calm conditions during the daytime and adverse conditions (ie inversion) during the night-time are provided in Appendix B.

Table 6.2 Operational noise modelling results

Assessment locations	Predicted operational noise level, dB				
	Daytime/evening	Night		Morning shoulder	
	Calm	Calm	Inversion	Calm	Inversion
R1	37	31	33	34	36
R2	38	32	34	35	36
R3	38	32	34	35	37
R4	39	33	34	36	37
R5	39	33	34	36	38
R6	39	33	34	36	37

Table 6.2 Operational noise modelling results

Assessment locations	Predicted operational noise level, dB				
	Daytime/evening	Night		Morning shoulder	
	Calm	Calm	Inversion	Calm	Inversion
R7	40	34	35	37	38
R8	39	33	34	36	38
R9	40	33	35	37	38
R10	40	34	35	37	38
R11	39	33	35	37	38
R12	39	33	35	37	38
R13	39	33	35	37	38
R14	40	33	35	37	39
R15	40	34	35	38	39
R16	40	33	35	37	39
R17	39	32	34	36	38
R18	38	32	34	35	38
R19	38	31	33	35	37
R20	37	31	33	35	37
R21	37	31	33	34	37
R22	40	35	**37**	37	**40**
Target noise level, dB	41/40	36	36	39	39

Operational noise emission levels are predicted to meet the relevant PSNLs at all assessment locations for calm conditions during the daytime, evening, night and morning shoulder periods. During the presence of a temperature inversion during the night and morning shoulder periods, a minor exceedance of up to 1 dB is predicted to occur at one assessment location.

Further analysis of the unattended noise monitoring data (presented graphically in Appendix A) revealed that ambient noise levels are generally increasing from 4 am Monday to Friday. On these days during the noise monitoring period, the L_{A90} descriptor was often above 40 dB before 6 am, ie the time the project would commence operations.

In addition to this, as noted in Table 2.2, a 1–2 dB change in sound levels is deemed 'typically indiscernible' to the human ear. Thus, changes of 1–2 dB are unlikely to be perceivable to nearby residences.

With these factors taken into account, it is unlikely that project noise emissions during the night or morning shoulder periods would cause adverse impacts at the assessment locations.

6.3 Sleep disturbance assessment

The loading and/or unloading of trucks during the night and morning shoulder periods has been assessed. Typical maximum noise events are likely to include impacts associated with loading/unloading activities. A typical impact L_{Amax} sound power level of 126 dB has been used to predict potential sleep disturbance impacts (Table 6.3).

Table 6.3 Predicted maximum noise levels at residential assessment locations

Assessment locations	Predicted L_{Amax} noise level, dB		L_{Amax}, noise criterion, dB
	Calm	Inversion	
R1	52	54	46 L_{Amax}
R2	53	55	
R3	53	55	
R4	53	54	
R5	53	55	
R6	54	55	
R7	53	54	
R8	53	54	
R9	56	57	
R10	54	56	
R11	54	56	
R12	54	55	
R13	54	55	
R14	53	55	
R15	53	54	
R16	52	53	
R17	51	53	
R18	51	52	
R19	50	52	
R20	50	52	
R21	49	51	
R22	55	58	

Noise modelling predicts that the INP sleep disturbance screening criteria will not be met during calm and prevailing meteorological conditions. However, the RNP provides the following conclusion from the research on sleep disturbance:

> maximum internal noise levels below 50 to 55 dB(A) are unlikely to awaken people from sleep

It is commonly accepted by acoustic practitioners and regulatory bodies that a facade including a partially open window will reduce external noise levels by 10 dB. Therefore, external noise levels in the order of 60 to 65 dB calculated at the facade of a residence are unlikely to cause sleep disturbance affects.

The highest predicted external maximum noise level from site is 58 dB under adverse weather conditions. Hence, it is unlikely that night-time operations from the project will cause sleep-disturbance at any of the assessment locations. Nonetheless, work practices during the morning shoulder period will be appropriately managed to minimise such impact sounds.

6.4 Cumulative noise assessment

Potential cumulative noise impacts from existing and successive developments are considered by the INP procedures by ensuring that the appropriate noise criteria are established with a view to maintaining acceptable noise *amenity* levels. Therefore, the cumulative impact of the Project with existing industrial noise sources has been assessed in the determination of the acceptable amenity levels at the assessment locations.

Based on experience with similar sites, amenity noise levels from such sites are typically 3 dB below the intrusive noise level. On this basis, the highest predicted daytime amenity level at any residential assessment location is up to 39 dB. This is greater than 10 dB below the acceptable amenity level for a suburban receiver type and thus is predicted to not have the effect of increasing industrial noise above the relevant criteria.

7 Construction noise and vibration assessment

7.1 Construction noise

Noise from proposed construction activities on site were predicted at the assessment locations.

Simultaneous operation of two delivery/haul trucks, two concrete trucks, one crane, one scraper and one excavator (30 tonne) were used to represent typical construction activities and are considered to represent an acoustically worst-case 15-minute period during standard construction hours.

Representative sound power levels associated with these equipment used in noise modelling are summarised in Table 7.1.

Table 7.1 Representative equipment sound power levels

Equipment	$L_{Aeq(15\text{-}min)}$ Sound Power Level, dB
Dump Truck	103
Concrete truck	113
Scraper	104
Excavator	104
Crane	106

It has been assumed that construction activity would generally take place during standard construction hours. Activities outside standard construction hours may be permitted where there is a safety requirement or emergency work needs to be undertaken or where it can be demonstrated that construction activity will not cause noise impact at nearby residences.

Indicative construction noise emission predictions for the project are provided in Table 7.2.

Table 7.2 Predicted construction noise

Assessment locations	Indicative construction noise level $L_{Aeq\,(15\,min)}$, dB	Construction noise management level, dB
	Standard construction hours	Standard construction hours
R1	48	46 $L_{Aeq(15\,min)}$ (noise affected)
R2	49	75 $L_{Aeq(15\,min)}$ (highly noise affected)
R3	50	
R4	53	
R5	57	
R6	56	
R7	59	
R8	59	
R9	56	
R10	60	
R11	60	
R12	59	
R13	59	
R14	59	

Table 7.2 Predicted construction noise

Assessment locations	Indicative construction noise level $L_{Aeq (15 min)}$, dB	Construction noise management level, dB
	Standard construction hours	Standard construction hours
R15	58	
R16	55	
R17	50	
R18	49	
R19	49	
R20	49	
R21	47	
R22	48	

Predictions in Table 7.2 indicate that construction noise levels are likely to be above the noise-affected management level but remain below the highly noise affected level of 75 dB at all assessment locations considered. Given that the predictions assume equipment operating simultaneously and at the nearest locations within the site to the relevant residential dwellings, it is likely that actual construction noise levels would be less than those predicted for the majority of the time. Notwithstanding, recommendations are provided in Section 9 with the aim of minimising construction noise impacts from the project.

7.2 Construction vibration

It is not yet known exactly what methods and/or vibration generating equipment will be utilised for the project. As a guide, safe working distances for typical items of vibration intensive plant are listed in Table 7.3. The safe working distances are quoted for both “Cosmetic Damage” (refer British Standard BS 7385) and “Human Comfort” (refer British Standard BS 6472-1).

Table 7.3 Recommended safe working distances for vibration intensive plant

Plant item	Rating/description	Safe working distance	
		Cosmetic damage (BS 7385)	Human response (BS 6472)
Vibratory Roller	<50 kN (typically 1–2 tonnes)	5 m	15 to 20 m
	<100 kN (typically 2–4 tonnes)	6 m	20 m
	<200 kN (typically 4–6 tonnes)	12 m	40 m
	<300 kN (typically 7–13 tonnes)	15 m	100 m
	>300 kN (typically 13–18 tonnes)	20 m	100 m
	>300 kN (>18 tonnes)	25 m	100 m
Small hydraulic hammer	(300 kg - 5 to 12 tonne excavator)	2 m	7 m
Medium hydraulic hammer	(900 kg - 12 to 18 tonne excavator)	7 m	23 m
Large hydraulic hammer	(1,600 kg - 18 to 34 tonne excavator)	22 m	73 m
Vibratory pile driver	Sheet piles	2 m to 20 m	20 m
Pile boring	≤800 mm	2 m (nominal)	N/A
Jackhammer	Hand held	1 m (nominal)	Avoid contact with structure

Source: Transport Infrastructure Development Corporation Construction’s Construction Noise Strategy (Rail Projects), November 2007.
Plant items shown are indicative to illustrate safe working distances, not all plant items will be used.

The safe working distances presented in Table 7.3 are indicative and will vary depending on the particular item of plant and local geotechnical conditions. They apply to cosmetic damage of typical buildings under typical geotechnical conditions.

In relation to human comfort response, the safe working distances in Table 7.3 relate to continuous vibration and apply to residential receivers. For most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels, occurring over shorter periods are allowed, as discussed in BS 6472-1.

The nearest industrial building is located approximately 40 m south from the southern property boundary. The nearest residences are located approximately 120 m from the nearest point on the eastern property boundary.

It is difficult at this stage to predict the level of vibration that may occur at nearby structures and therefore in the first instance the guide values presented in Table 7.3 should be followed. It is possible that some vibratory activities will occur within close distance of nearby structures and therefore management of vibration levels will be required. Recommendations in this regard are provided in Section 9.

8 Road traffic noise assessment

The nearest residences potentially affected by an increase in road traffic volumes as a result of the project are located in Hartley Road. The *Smeaton Grange Traffic Impact Assessment* (EMM 2016) states that the predicted total traffic volume increase as a result of vehicles associated with operation of the project is up to +0.5% on Hartley Road with an associated increase in heavy vehicles of 1.7%.

Traffic generated by the Project will not generate any noticeable increase in road traffic average noise levels at the nearest residential locations. This increase in traffic volume would lead to a negligible increase (<0.5 dB) in road traffic noise. Therefore, the impact of road traffic noise associated with the project is predicted to be negligible and within the 2 dB allowable increase for land use developments as described in the RNP (DECCW 2011).

9 Noise management

9.1 Construction noise and vibration

As described in Section 7, it is likely that noise levels will be above the relevant noise goals at times during construction. It is also possible that vibration levels generated at the project site could be above the relevant human comfort criteria outside of the site.

There are several mitigation measures that may be employed to reduce noise impacts. These include:

- scheduling construction activities such that the concurrent operation of plant is limited;
- preparation of a construction noise management plan (CNMP) (to be included in the project Environmental Management Plan) prior to construction to ensure that all employees understand and take responsibility for noise control at site. The CNMP should include, as a minimum, the following components:
  - identification of nearby residences and sensitive land uses (as described in this noise impact assessment);
  - description of proposed hours of work and what work will be undertaken;
  - description of what work practices will be applied to minimise noise in particular for out of standard construction hours works;
  - description of complaints handling process;
  - description of noise and/or vibration monitoring that is required; and
  - notification process for nearby properties;
- properly maintaining plant to ensure rated noise emission levels are not exceeded;
- undertaking construction activities guided by AS2436-1981 *Guide to Noise Control on Construction, Maintenance and Demolition Sites*; and
- providing a contact telephone number which the public may use to seek information or make a complaint. A log of complaints should be maintained and actioned by the site superintendent in a responsive manner.

9.2 Adoption of general noise and vibration management practices

AS 2436-2010 Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites sets out numerous practical recommendations to assist in mitigating construction noise emissions. Examples of measures that could be implemented on the subject project are listed below.

9.2.1 Universal work practices

Universal work practices to minimise noise and vibration emissions include:

- regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration;
- regular identification of noisy activities and adoption of improvement techniques;
- avoiding the use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon residents;
- minimising the use of equipment that generates impulsive noise;
- minimising the movement of materials and plant and unnecessary metal-on-metal contact;
- minimising truck movements; and
- scheduling respite periods for intensive works.

9.2.2 Plant and equipment

Measures to minimise noise emissions from plant and equipment include:

- choosing quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks;
- using temporary noise barriers (in the form of plywood hoarding or similar) to shield intensive construction noise activities from residences;
- operating plant and equipment in the quietest and most efficient manner; and
- regularly inspecting and maintaining plant and equipment to minimise noise and vibration level increases, to ensure that all noise and vibration reduction devices are operating effectively.

9.2.3 Work scheduling

Work scheduling to minimise the impact of noise include:

- scheduling activities to minimise impacts by undertaking all possible work during hours that will least adversely affect sensitive receivers and by avoiding conflicts with other scheduled events;
- scheduling work to coincide with non-sensitive periods;
- scheduling noisy activities to coincide with high levels of neighbourhood noise so that noise from the activities is partially masked and not as intrusive;
- planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from the sensitive receivers;
- optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours;

- designating, designing and maintaining access routes to the site to minimise impacts;
- include contract conditions that include penalties for non-compliance with reasonable instructions by the principal to minimise noise or arrange suitable scheduling; and
- conducting high vibration generating activities in continuous blocks, with appropriate respite periods as determined through consultation with potentially affected neighbours.

10 Conclusion

EMM has prepared a NIA to accompany a SSDA for the proposed Waste Recycling and Transfer Facility, Smeaton Grange. This noise assessment has been prepared in accordance with the methodology outlined in the INP and associated Application Notes, as well as other relevant guidelines and standards.

Project specific noise levels (noise criteria) have been established based on the results of ambient noise monitoring and methodology provided in the INP.

Operational noise levels have been assessed for the daytime/evening, night and morning shoulder periods during calm and adverse weather conditions. It was conservatively assumed that all plant operates simultaneously for the proposed operations. Operational noise emission levels are predicted to meet the relevant criteria at all assessed locations during calm conditions. During the presence of a temperature inversion during the night and morning shoulder periods, a minor exceedance of up to 1 dB is predicted to occur at one assessment location. It is noted that this increase in noise levels would be indiscernible to the human ear. Further, ambient noise levels in the area are generally increasing from 4 am, being typically above 40 dB from 6am onwards. With these factors taken into account, it is unlikely that project noise emissions during the night or morning shoulder periods would cause adverse impacts at the assessment locations.

Sleep disturbance from operation of the Project during the morning shoulder period has been assessed. Internal maximum noise level events are predicted to be below those likely to wake residents.

An assessment of cumulative industrial noise from the project together with other industrial noise sources in the vicinity was also conducted. The project is not predicted to increase industrial noise levels above the relevant amenity criteria.

A quantitative approach has been taken regarding the assessment of construction noise from the project. It is likely that noise emission from proposed construction activity will be above the recommended noise management level at the assessment locations. Due to this, recommendations have been provided regarding work practices to be considered to minimise construction noise from the Project.

The Project will result in additional traffic movements. However the increase will be minor in comparison to existing traffic volumes and the overall increase in road traffic noise level from this project at residences will be negligible.

References

Australian Standard AS 1055-1997, *Acoustics - Description and Measurement of Environmental Noise*.

Australian Standard AS 2436-2010, *Guide to Noise Control on Construction, Maintenance and Demolition Sites.*

EMM Consulting Pty Ltd 2016, *Smeaton Grange Traffic Impact Assessment*.

NSW Department of Environment and Climate Change 2009, *Interim Construction Noise Guideline.*

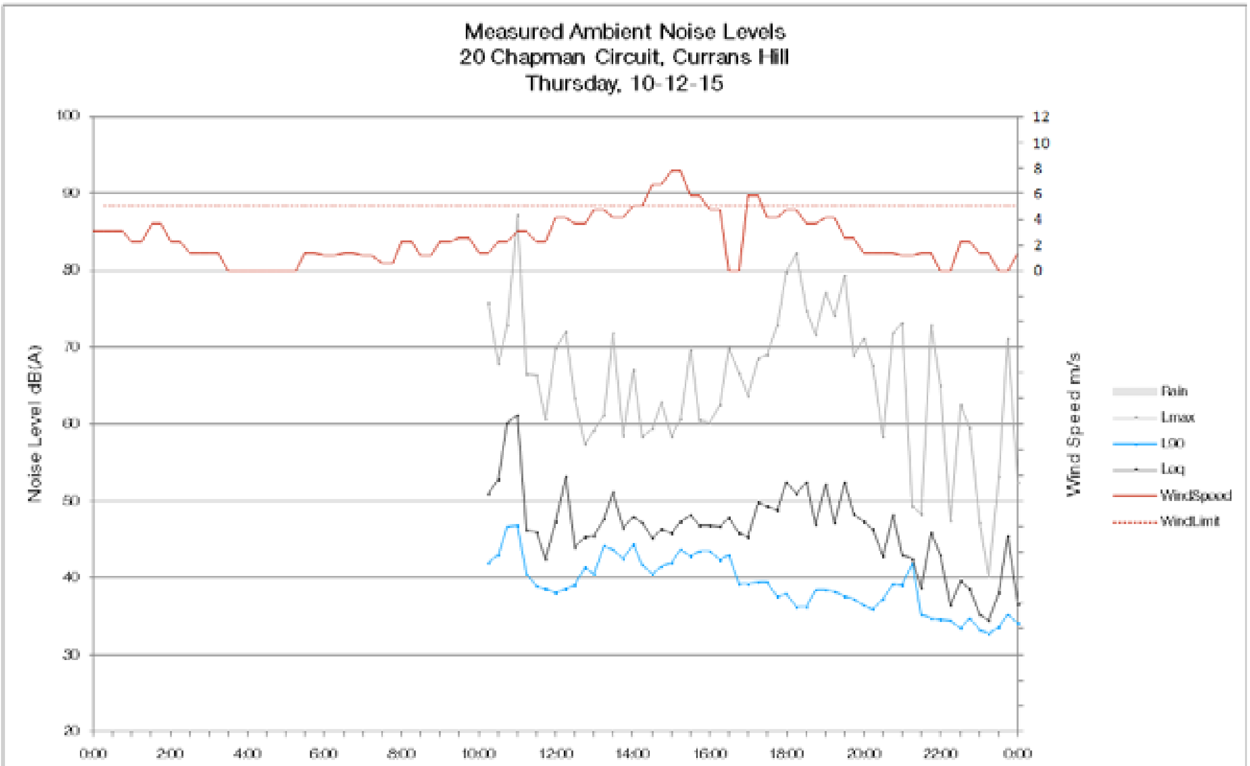
NSW Department of Environment and Conservation 2006, *Assessing Vibration: A Technical Guideline.*

NSW Department of Environment, Climate Change and Water 2011, *Road Noise Policy*.

NSW Environmental Protection Authority 2000, *Industrial Noise Policy.*

Appendix A

Daily unattended monitoring results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Thursday, 10-12-15
Noise Level dB(A)
Wind Speed m/s
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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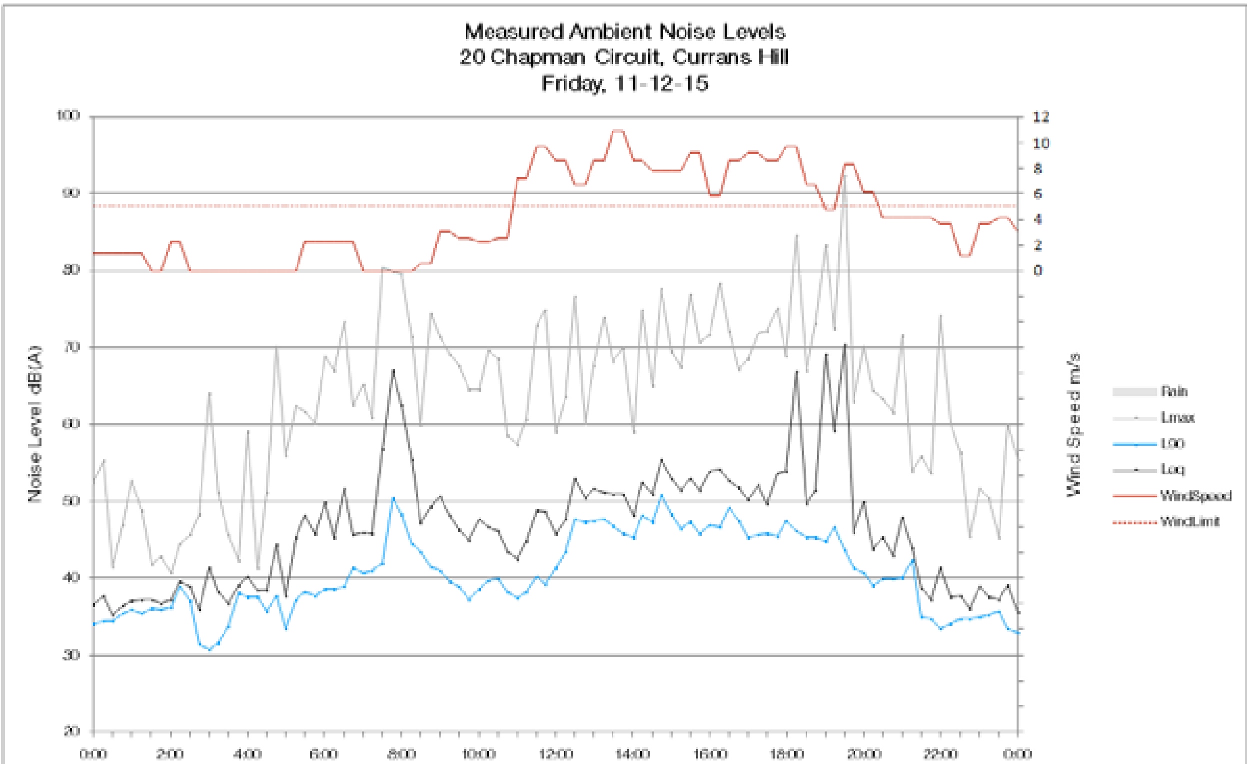
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L90
Leq
WindSpeed
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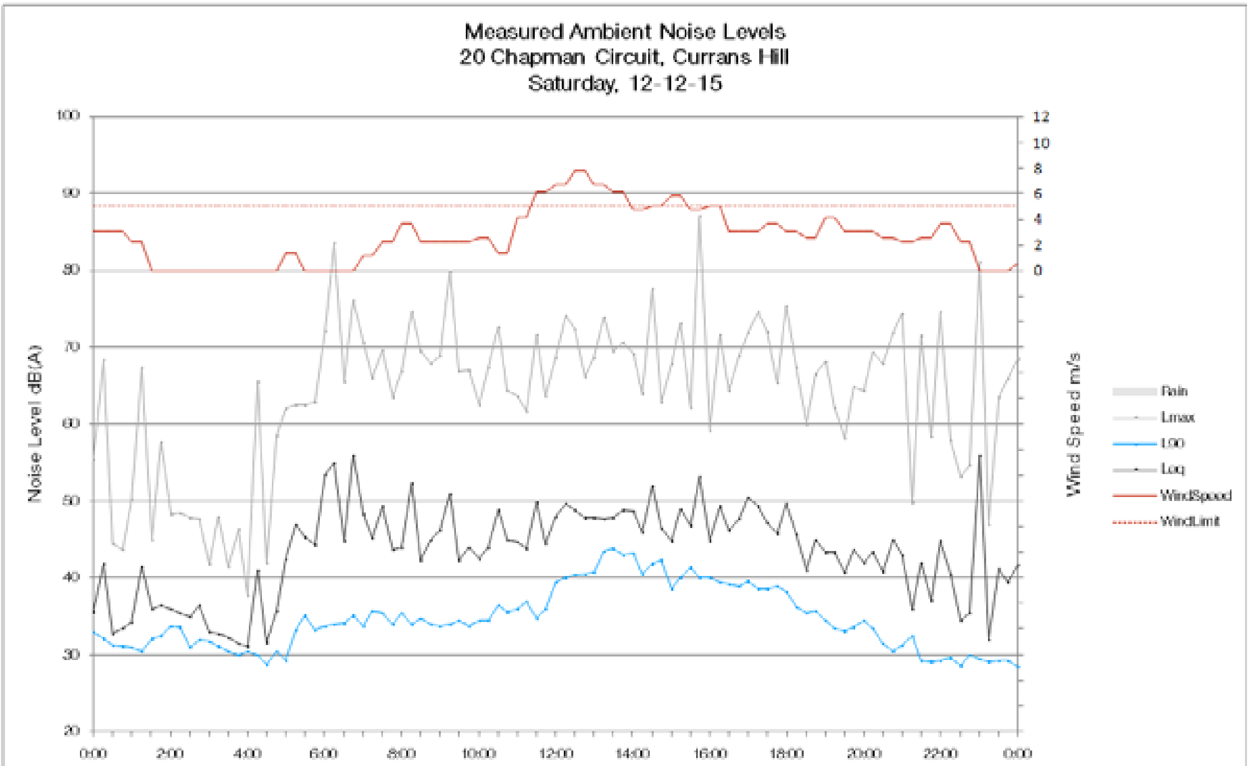
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Wind Speed m/s
Rain
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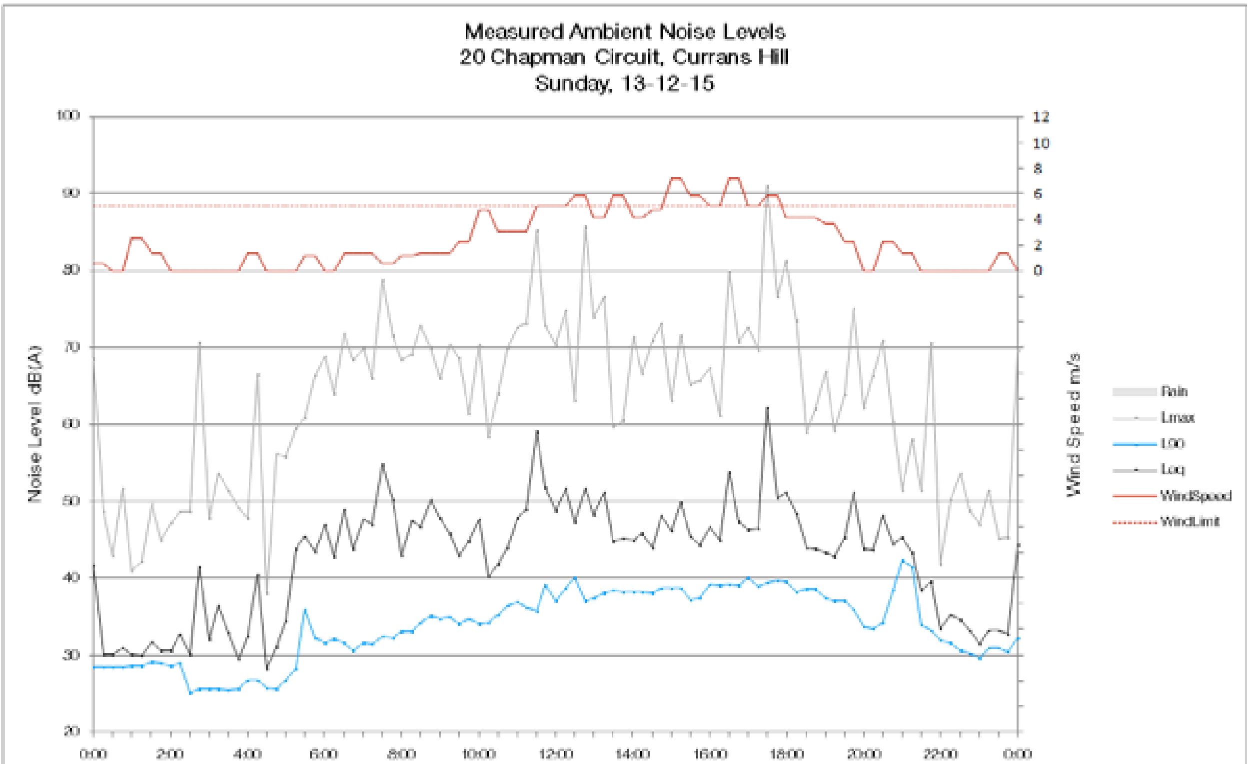
L90
Leq
WindSpeed
WindLimit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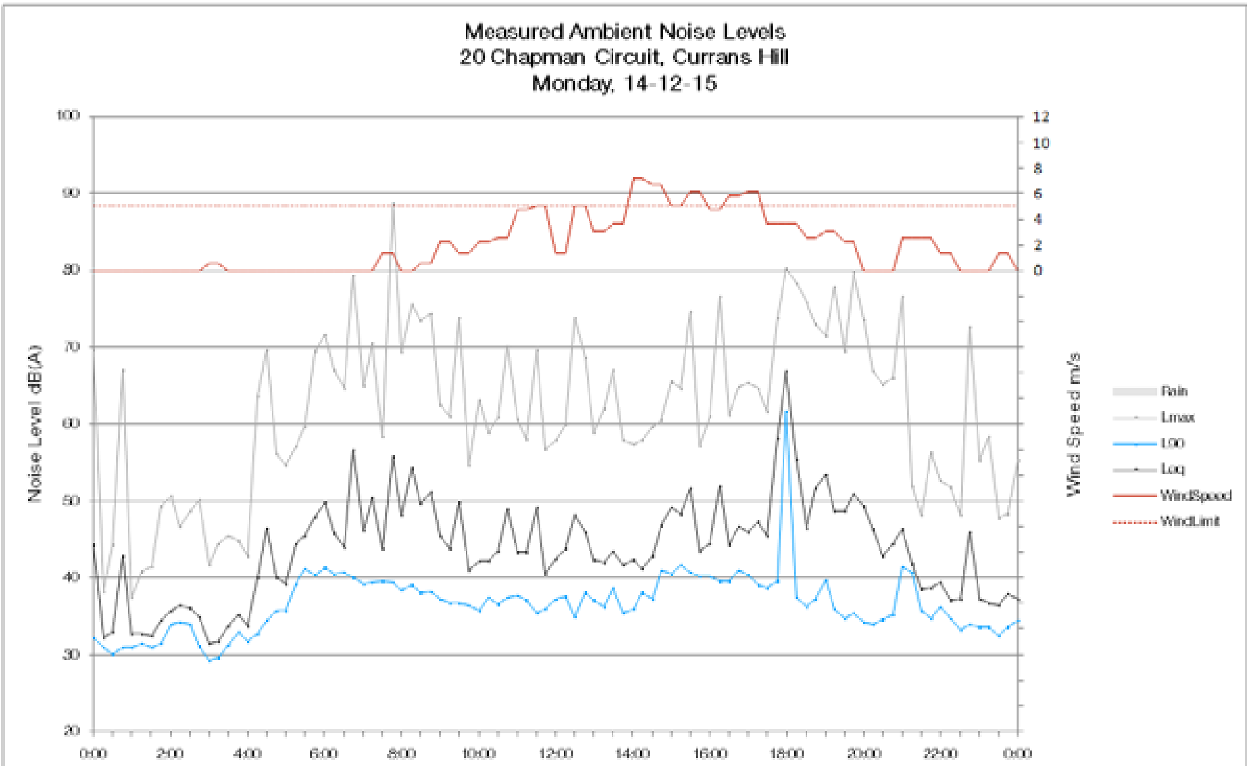
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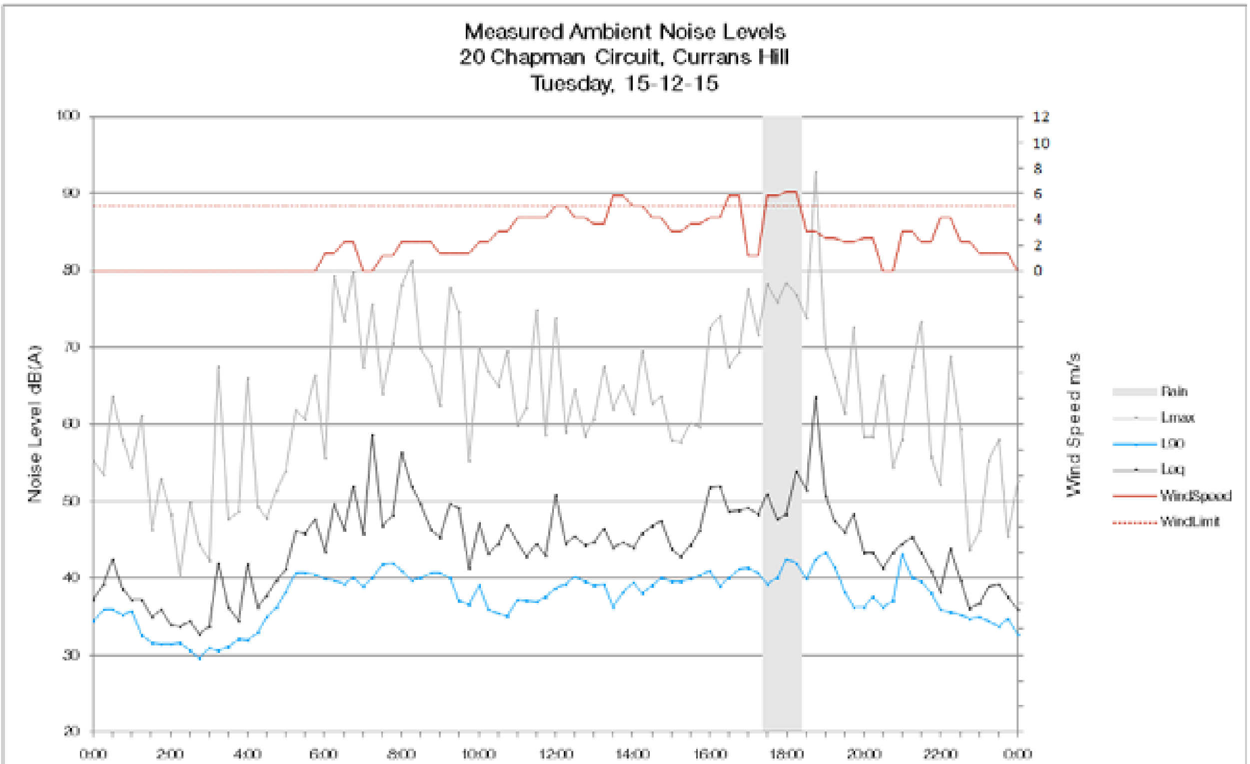
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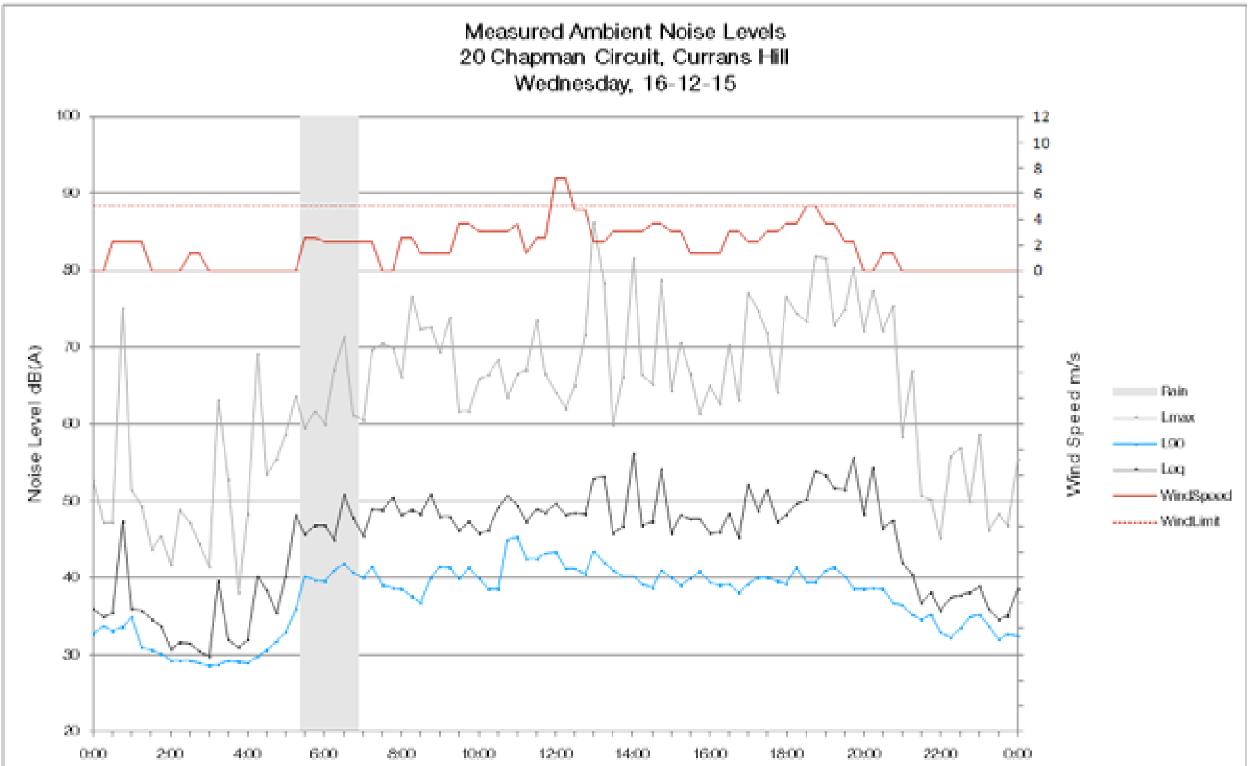
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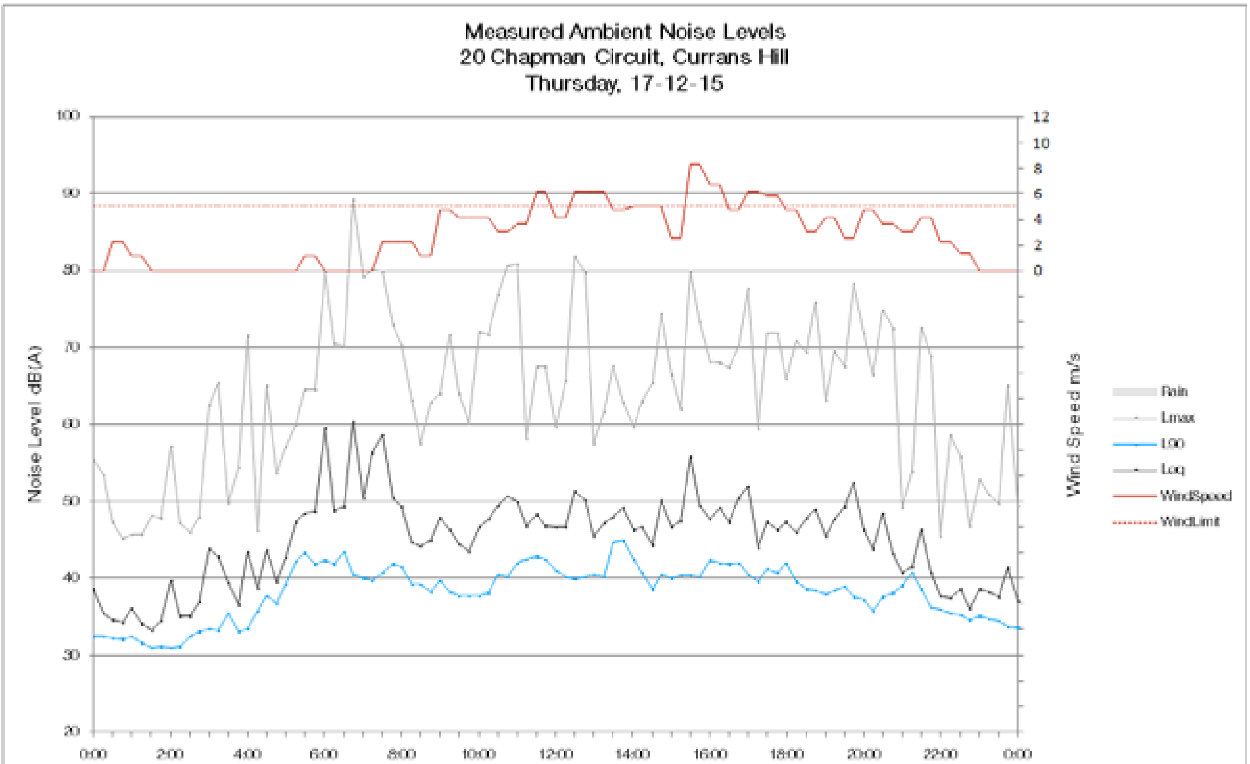
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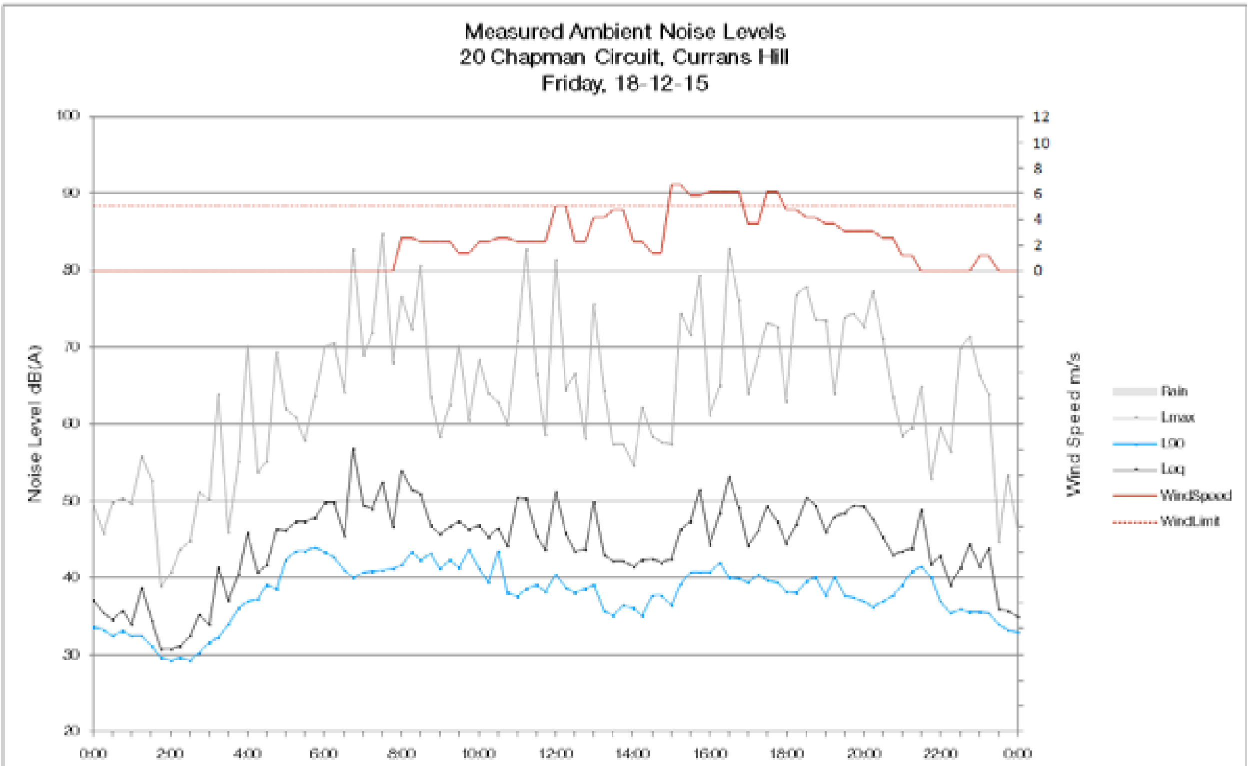
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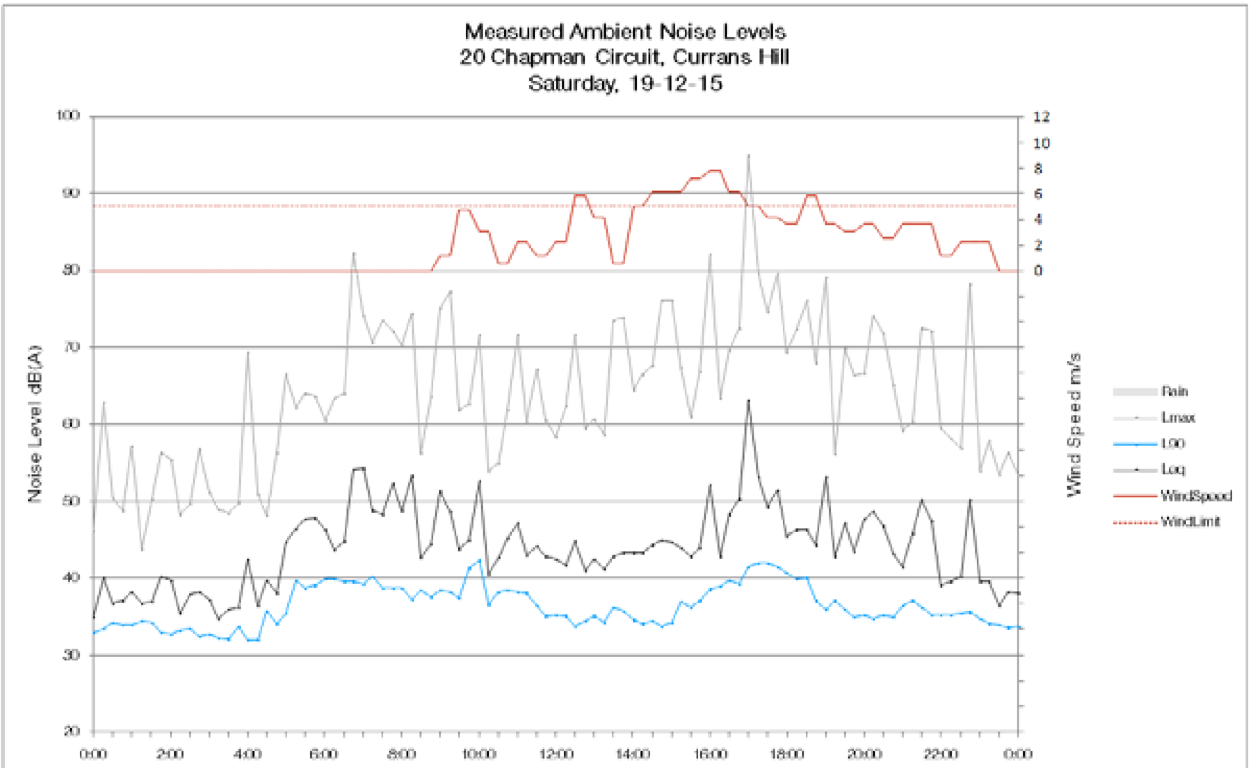
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Saturday, 19-12-15
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Lmax
L90
Leq
WindSpeed
WindLimit
0:00 2:00 4:00 6:00 8:00 10:00 12:00 14:00 16:00 18:00 20:00 22:00 0:00

Appendix B

Noise contours

Predicted operational noise contours – Day Calm $L_{Aeq(15\text{-}min)}$

Smeaton Grange Recycling Facility

Noise Impact Assessment

Figure B.1

Predicted operational noise contours – Night Inversion $L_{Aeq(15\text{-min})}$

Smeaton Grange Recycling Facility
Noise Impact Assessment

Figure B.2

EMM

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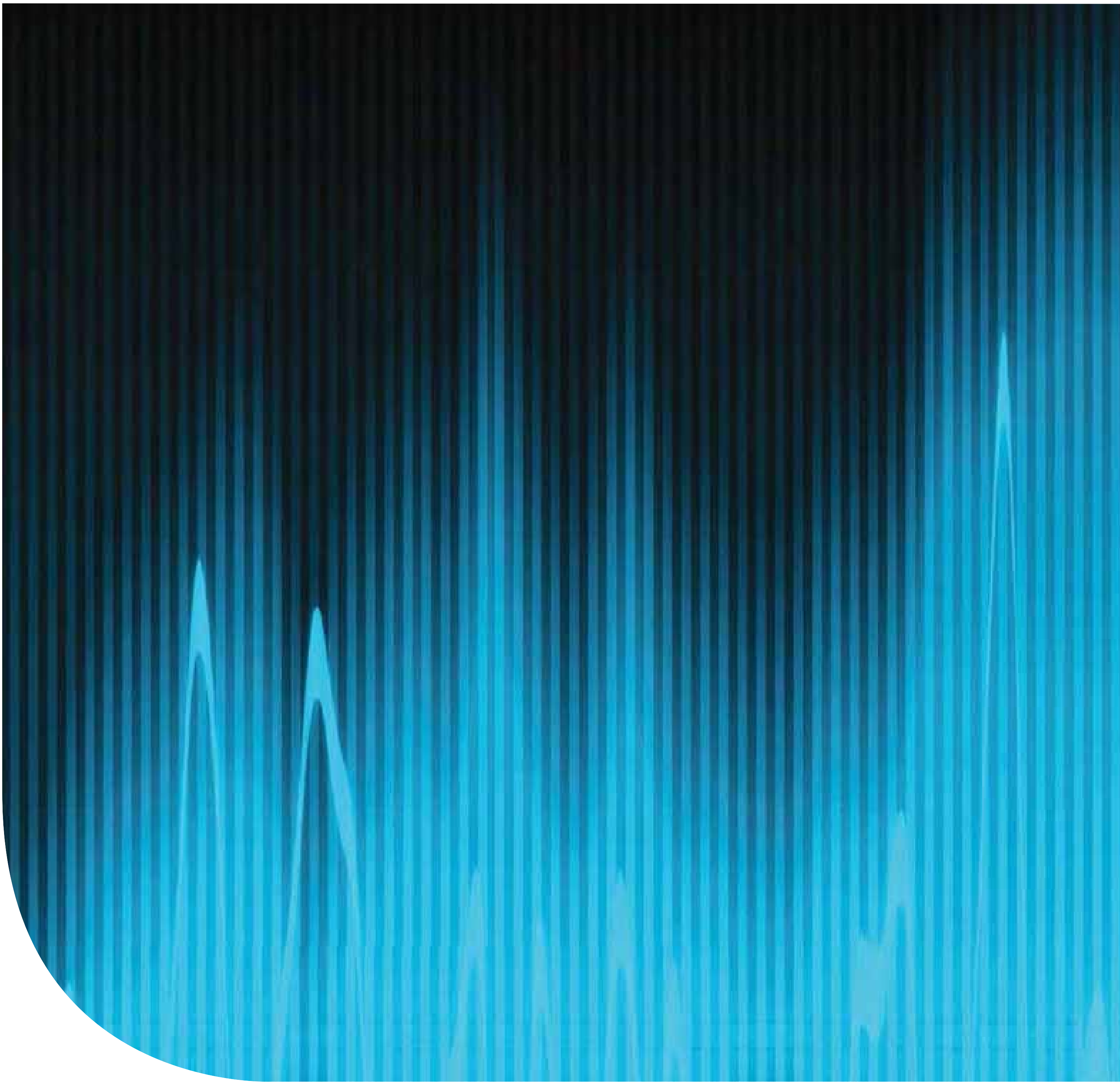
T 02 4927 0506   F 02 4926 1312

BRISBANE
Level 4, Suite 01, 87 Wickham Terrace
Spring Hill, Queensland, 4000
T 07 3839 1800   F 07 3839 1866



www.emmconsulting.com.au

Appendix G

Water assessment

PROPOSED RECYCLING FACILITY
52 ANDERSON ROAD, SMEATON GRANGE

ENVIRONMENTAL IMPACT STATEMENT

WATER MANAGEMENT REPORT

JUNE 2016

Prepared by:

Mark Tooker
National Project Consultants Pty Ltd
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1. Introduction

Benedict Recycling Pty Ltd proposes to construct and operate a recycling facility on an industrial lot at 52 Anderson Road, Smeaton Grange.

This report deals with the water management issues and has been prepared by Mark Tooker of NPC to support a State Significant Development Application (SSDA) for the project.

2. Site Description

The site is a 6862m^2 lot at 52 Anderson Road, Smeaton Grange (refer Figure 1). Its legal description is Lot 301 DP1117230.

The site is located within an industrial subdivision. It has a relatively flat slope falling approximately 1m from its western boundary to the north eastern corner of the site (refer Figure 2). There is a constructed drainage reserve along the eastern boundary of the site.

Anderson Road has a stormwater pipe drainage system with a kerb inlet pit located adjacent to the north eastern corner of the site.

The average annual rainfall in the area is 769mm (at Camden Airport).

3. Proposed Development

The project will import general solid waste (non-putresible) such as construction and demolition wastes and selected commercial and industrial wastes, for processing (e.g – screening and sorting) to produce saleable recycled materials and materials for further offsite processing. The recycled materials produced will include soils, metals and dry paper/cardboard. These products will meet recycled material specifications while recovering a range of materials that would otherwise be disposed to landfill.

No special liquid, hazardous, restricted solid waste or general solid waste (putrescible), as defined in the NSW Protection of the Environment Operations Act (POEO Act) 1997 and EPA (2014) would be accepted at the Recycling Facility. All of the materials brought onto the site will be taken from the site as products or as rejects for disposal at an EPA licensed landfill. There would be no materials land-filled or otherwise disposed of anywhere within the site as a result of this proposal.

The development will consist of a waste transfer holding shed along the south western boundary (refer Figure 2). This shed will be roofed and have an area of approximately 1294m2.

Material holding bays will be located on the north western and south eastern boundaries with staff parking of the north western corner of the site. Weighbridges and wheel washes will be located at the site entrance. There will be 10m landscaped setback from the front boundary.

The site surface will be fully bitumen sealed other than for the landscaped area at the entrance. The open paved area other than for the shed, office/amenity buildings and landscaped areas will be approximately 5094m^2.

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There will be a concrete kerb along the south western, southern and eastern boundaries. Runoff on the open paved area will run overland and be directed by the kerbs to a concrete lined sediment settling and collection basin. Gravelled filled bags will be located at the base of the kerbs at regular intervals to collect suspended sediment from the runoff on route to the sediment basin. This stormwater system is presented on the stormwater drainage concept plan at Figure 4. The activities on the site do not suit a pipe drainage system as the pipts and pipes would readily fill with sediment and course debris. Water stored in the sediment basin will be reused for dust supression on the site.

The concrete kerb and material holding bays will ensure runoff from the open paved area was directed to the sediment settling and collection basin. This basin will drain via pipe to the street kerb inlet pit near the north eastern corner of the site.

During construction of the facility, an erosion and sediment control plan strategy will be implemented to control the extent of sediment in runoff from the site (refer Figure 3).

4. Risk Assessment

4.1 Site Description

4.1.1 Operation Phase

The site area will be graded to the north eastern corner of the site.

The runoff will flow overland to the sediment basin in the north eastern corner. The concept stormwater plan is presented in Figure 4. The water stored in the sediment basin will be reused onsite for dust suppresion purposes.

The DCP notes that no detention storage is required in the Smeaton Grange industrial area.

The runoff water quality, given the extensive use of sediments on the site, is best controlled by the measures required by the applicable State Government body, EPA. This is a risk based approach as proposed in the industry best management practice guidelines known as the Blue Book. The Blue Book recommends a range of source control measures for runoff water quality linked to a sediment basin at the outlet. The sediment basin will be a concrete lined structure or equivalent which will store runoff from a 2 day 75 percentile rainfall on the site (13.6mm) and allow sediment to settle over two days. If necessary, the basin will be dosed with a flocculant to assist sediment settling and to allow pump out of water to reinstate the storage volume in the basin two days after significant rainfall. Excess water pumped from the basin will have a total suspended solids (TSS) concentration less than 50mg/L. This TSS concentration limit will not apply (as specified by the Blue Book) to overflows from the basin in storms which exceed the adopted design rainfall for the site and basin. The sediment collecting in the base of the basin will be removed each week using equipment that will be used for the material handling on the site.

The sizing of the basin is detailed in Appendix A.

The outflows from the basin will be piped to the kerb inlet pit in the cul de sac at the head of Anderson Road adjacent to the north eastern corner of the site.

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The subject lot is located within a planned subdivision which has dedicated drainage channels to cater for the 100 yr ARI flows throughout the subdivision.

4.1.2 Construction Phase

The sediment basin will be constructed in the initial works on the site. Additional erosion and sediment control measures will be implemented to minimise the extent of sediment in runoff during construction on the site.

These proposed measures are presented in the Erosion and Sediment Control Plan (ESCP) at Figure 3. The same operational measures for the basin as detailed in Section 4.1.1 will be implemented during the construction phase.

4.2 Site Water Balance

The potable water for the site will be supplied from the water mains in Anderson Street and sewage from the amenities will be discharged to the sewer.

The site water balance has been calculated based on existing and developed scenarios. Details are provided in Appendix B.

The average annual runoff volume from the site under existing conditions has been estimated at approximately 1847m^3.

In the developed scenario, the extent of increase in runoff from the site will be reduced by capturing some of the runoff in the sediment basin and reusing it for dust suppression on the site. The estimated average annual runoff in the developed case (without reuse) will be approximately 3697m^3, The estimated average annual reuse volume for dust suppression will be approximately 1410m3 reducing the average annual runoff volume to 2287m3. This resuse will reduce the average increase in runoff volume from the site from 100% to only 24%. This is a significant reduction in volumes and benefit for the drainage system downstream.

The capturing of roof runoff will not provide sufficient water to cover the dust suppression water requirements. It is estimated that on average, up to 210m3 of town water supply will be used each year for dust suppression. The reuse of site runoff provides 87% of the water required for dust suppression. This provides a significant benefit in reducing the demand on the water supply in terms of volume available and the water reticulation available capacity.

4.3 Flooding

Flooding is not an issue for the site because the drainage channels in the subdivision have capacity to convey the 100 yr ARI flood flows with freeboard. The proposed development onsite does not introduce structures, other than for the small offices, which will be sensitive to flood damages.

The proposed development conforms to the Council and State Government flood management requirements.

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4.4 Acid Sulphate Soils

The site is not included in the Office of Heritage and Environment Acid Sulphate Soils Risk Maps because there is no underlying potential for this risk in the Camden area.

4.5 Salinity

The then Department of Infrastructure Planning and Natural Resources prepared a Salinity Potential Map for Western Sydney in 2002. This map indicates that the Recycling Facility site has a "Moderate Low Salinity Potential" (refer Figure 5). This classification means that salinity processes may occur on the site. There is no evidence of soil salinity on the site. This issue will have been dealt with at the sub division construction stage in order to provide a lot which complied with the salinity guidelines. Prior to commencement of construction of the recycling facilities, sediment samples from the site will be tested and if necessary, mitigation measures as recommended in the Camden Growth Centres DCP Salinity Management Strategy will be implemented to address any salinity issues.

4.6 Watercourses and Riparian Areas

The site is located within a planned industrial estate which has allocated space outside the lots for drainage and riparian corridors. The proposed development therefore will not adversely impact on watercourses or riparian corridors. The reuse of runoff for dust suppression will significantly reduce any increase in the volume of runoff from the site.

The Council's DCP does not require any onsite detention of runoff on the site and as such, the watercourses and drainage corridors have been designed to be stable for the developed condition on the lot. The sediment basin will provide a detention function which will further add in minimising potential impacts of runoff on the watercourses and riparian areas.

4.7 Groundwater

The proposed structures onsite will typically be constructed on strip footings or on isolated concrete piers. The strip footings will be shallow footings less than 2m deep which will not cause any significant impact on the groundwater flows or quality. Any isolated pier footings likewise will not form any significant barrier to groundwater flows.

The entire site, other than for the proposed landscaped area, will be paved and hence will not allow any significant transport of pollutants from the site surface into the groundwater.

The proposed development, therefore will not have any significant adverse impacts on groundwater flows or quality.

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5 Summary of Mitigation Measures for the Proposed Development

The mitigation measures proposed to minimize the impact of the proposed works on the water related aspects of the environment are:

- A runoff erosion and sediment control strategy to manage runoff which conforms to State Government authority best practice guidelines in the Blue Book;
- specific runoff sediment traps along the flow path to remove sediment and debris at the source;
- a sediment basin on site to trap runoff and remove sediment;
- reuse runoff from the sediment basin for dust suppression on the site;
- use of a large holding shed to house materials for transfer and equipment to prevent runoff generated from these activities;
- connection to the sewerage system for onsite personnel amenities;
- location of sheds and processing area outside of major overland flow paths;
- no use of groundwater; and
- no use of water in the product processing.

6. Conclusions

The proposed processing facility and mitigation measures have been formulated to minimise the impact on water related aspects of the site and downstream watercourses and riparian areas. As such, the proposed development will not have a significant adverse impact on:-

- stormwater runoff;
- groundwater;
- wastewater disposal;
- potable water demand;
- runoff volume and water quality
- flooding;
- acid sulphate soils;
- salinity; and
- watercourses and riparian areas.

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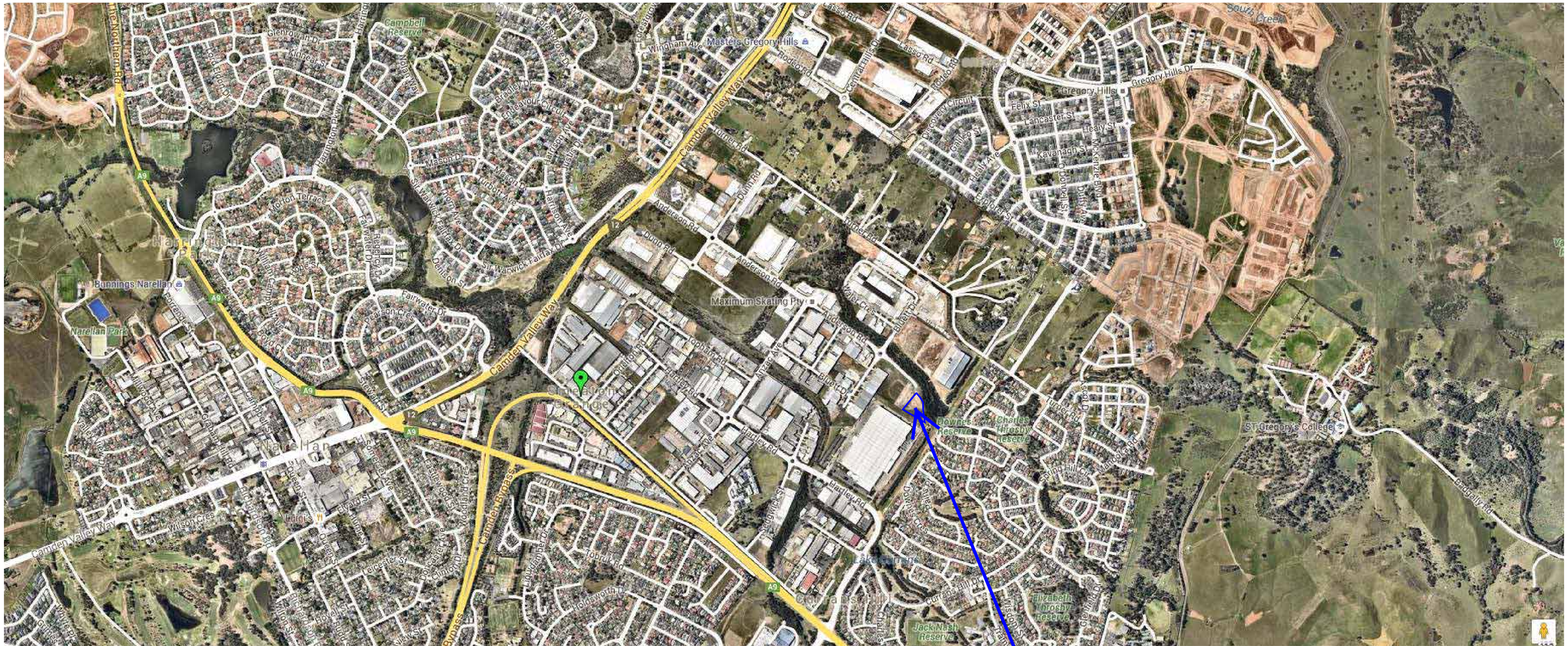
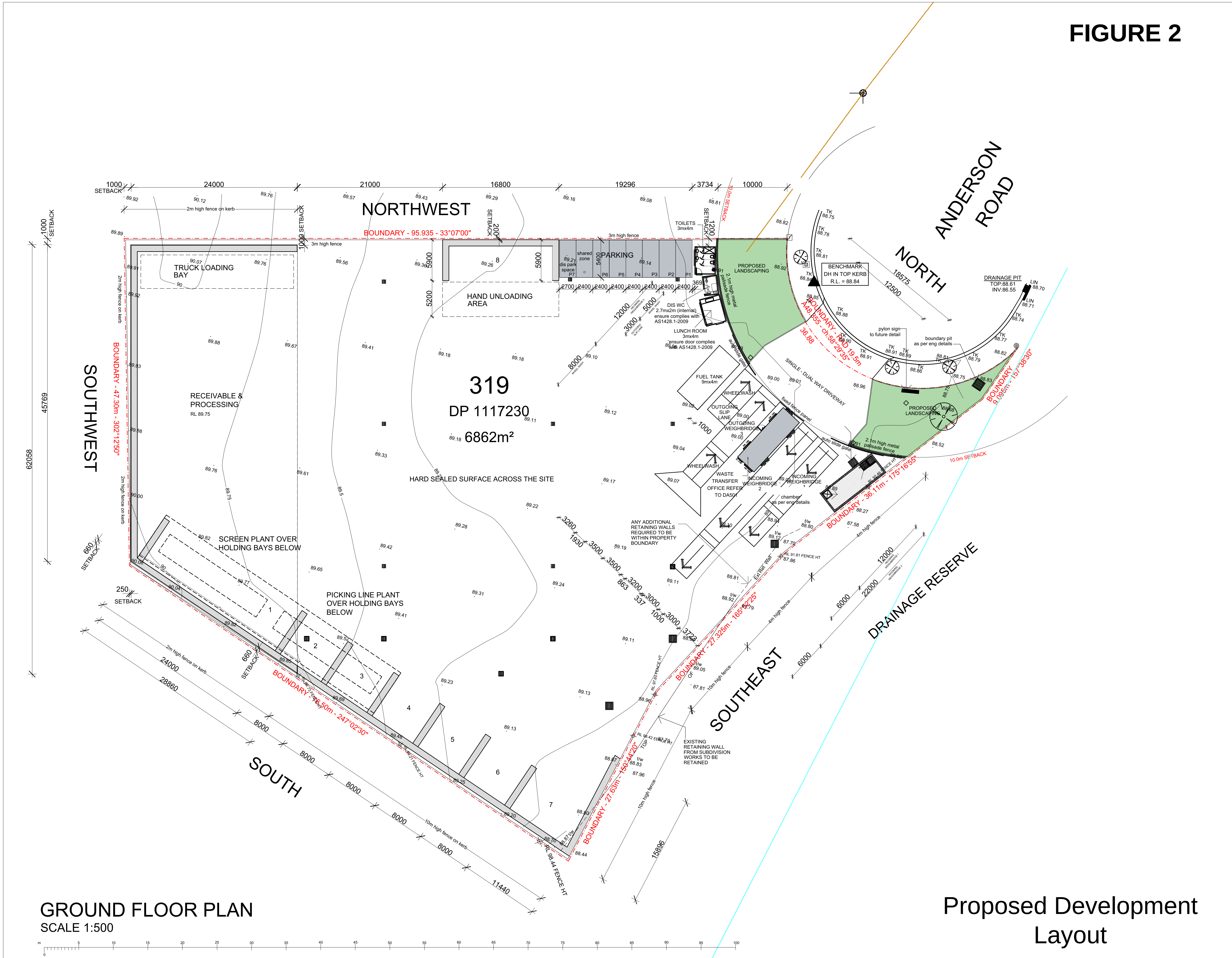
FIGURE 1



Subject site

Locality Plan

FIGURE 2



GROUND FLOOR PLAN
SCALE 1:500

Proposed Development Layout

REFERENCES
DRAWINGS TO BE READ IN CONJUNCTION WITH BUT NOT LIMITED TO ALL STORMWATER ENGINEERS, LANDSCAPE ARCHITECTS, AND OTHER ASSOCIATED PLANS & REPORTS

revision

A	02.02.16	ISSUED FOR GENERAL INFORMATION
B	04.03.16	ISSUED FOR GENERAL INFORMATION
C	06.05.16	ISSUED FOR GENERAL INFORMATION
D	23.05.16	ISSUED FOR GENERAL INFORMATION

notes
All dimensions and setouts to be verified prior to commencement
DO NOT SCALE measurements off drawings
Figured dimensions to be used at all times
IF IN DOUBT - ASK
All omissions or discrepancies to be notified to the architect

scale 1:100 @ A3

Project Architect
CDARCHITECTS

L2 - 60 PARK STREET
SYDNEY NSW 2000
P: 02 9267 2000
W: www.chaninedesign.com.au

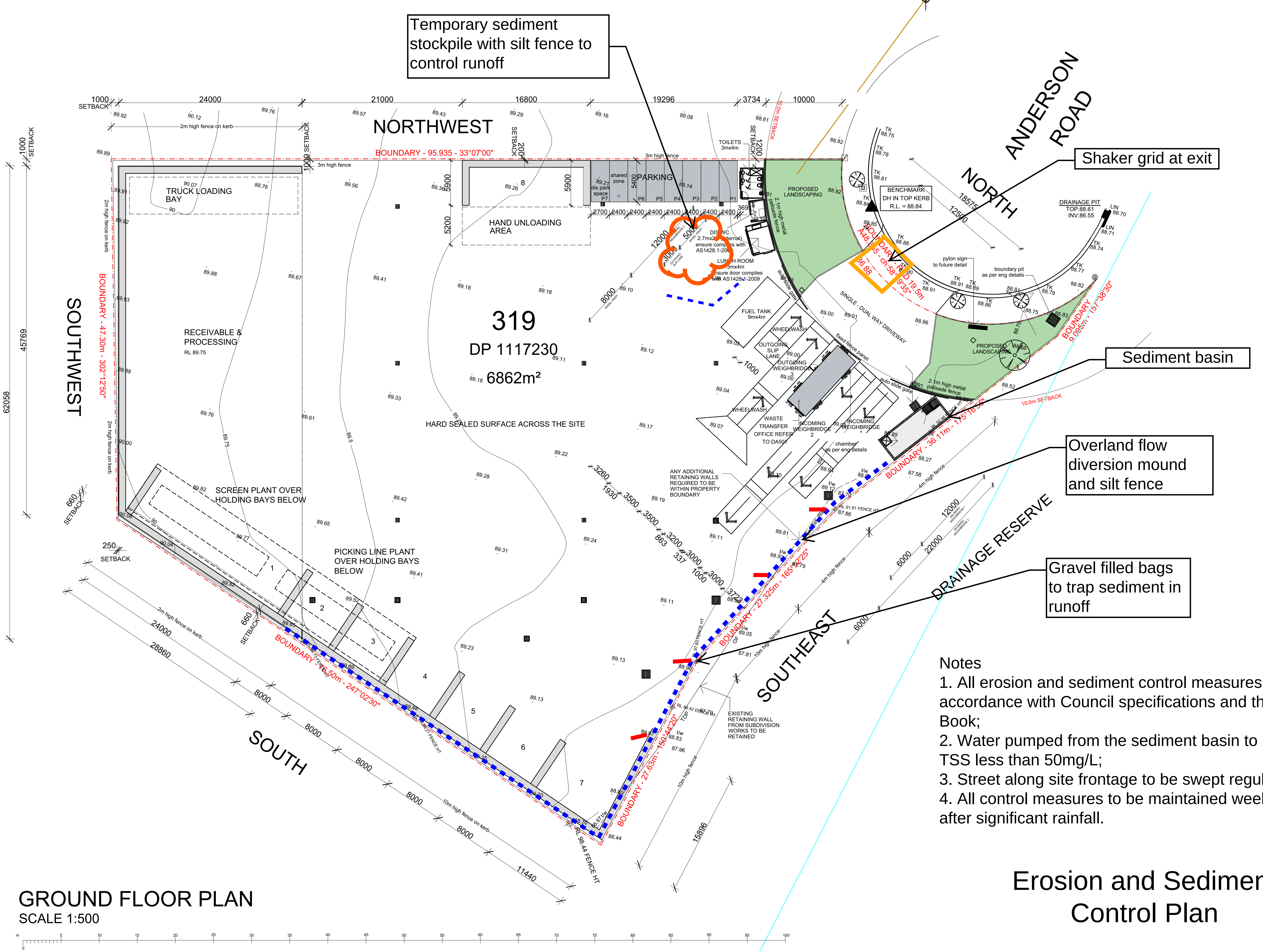
date APRIL 2013 | drawn SS

project
PROPOSED WASTE TRANSFER STATION
52 ANDERSON ROAD
SMEATON GRANGE

drawing title
GROUND FLOOR PLAN

FOR DA APPROVAL
J15306 DA 100 D
job no. drawing no. rev

FIGURE 3



Notes

1. All erosion and sediment control measures to be in accordance with Council specifications and the Blue Book;
2. Water pumped from the sediment basin to have TSS less than 50mg/L;
3. Street along site frontage to be swept regularly;
4. All control measures to be maintained weekly and after significant rainfall.

GROUND FLOOR PLAN

SCALE 1:500

Erosion and Sediment Control Plan

REFERENCES

DRAWINGS TO BE READ IN CONJUNCTION WITH BUT NOT LIMITED TO ALL STORMWATER ENGINEERS, LANDSCAPE ARCHITECTS, AND OTHER ASSOCIATED PLANS & REPORTS

revision

A	02.02.16	ISSUED FOR GENERAL INFORMATION
B	04.03.16	ISSUED FOR GENERAL INFORMATION
C	06.05.16	ISSUED FOR GENERAL INFORMATION
D	23.05.16	ISSUED FOR GENERAL INFORMATION

notes

All dimensions and setouts to be verified prior to commencement
DO NOT SCALE measurements off drawings
Figured dimensions to be used at all times
IF IN DOUBT - ASK
All omissions or discrepancies to be notified to the architect

scale 1:100 @ A3

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date APRIL 2013 drawn SS

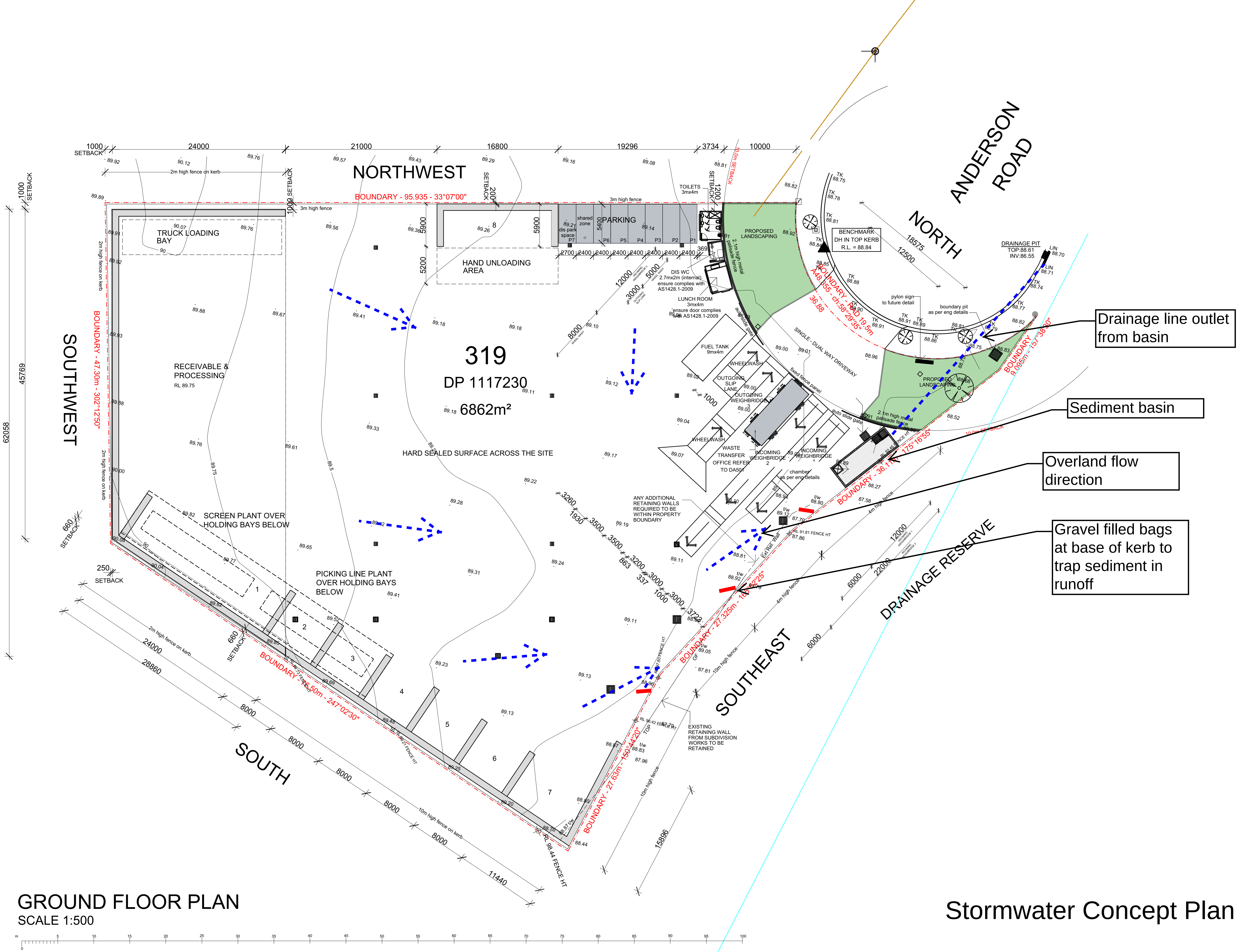
project
PROPOSED WASTE TRANSFER STATION
52 ANDERSON ROAD
SMEATON GRANGE

drawing title
GROUND FLOOR PLAN

FOR DA APPROVAL

job no. J15306 DA drawing no. 100 rev D

FIGURE 4



REFERENCES

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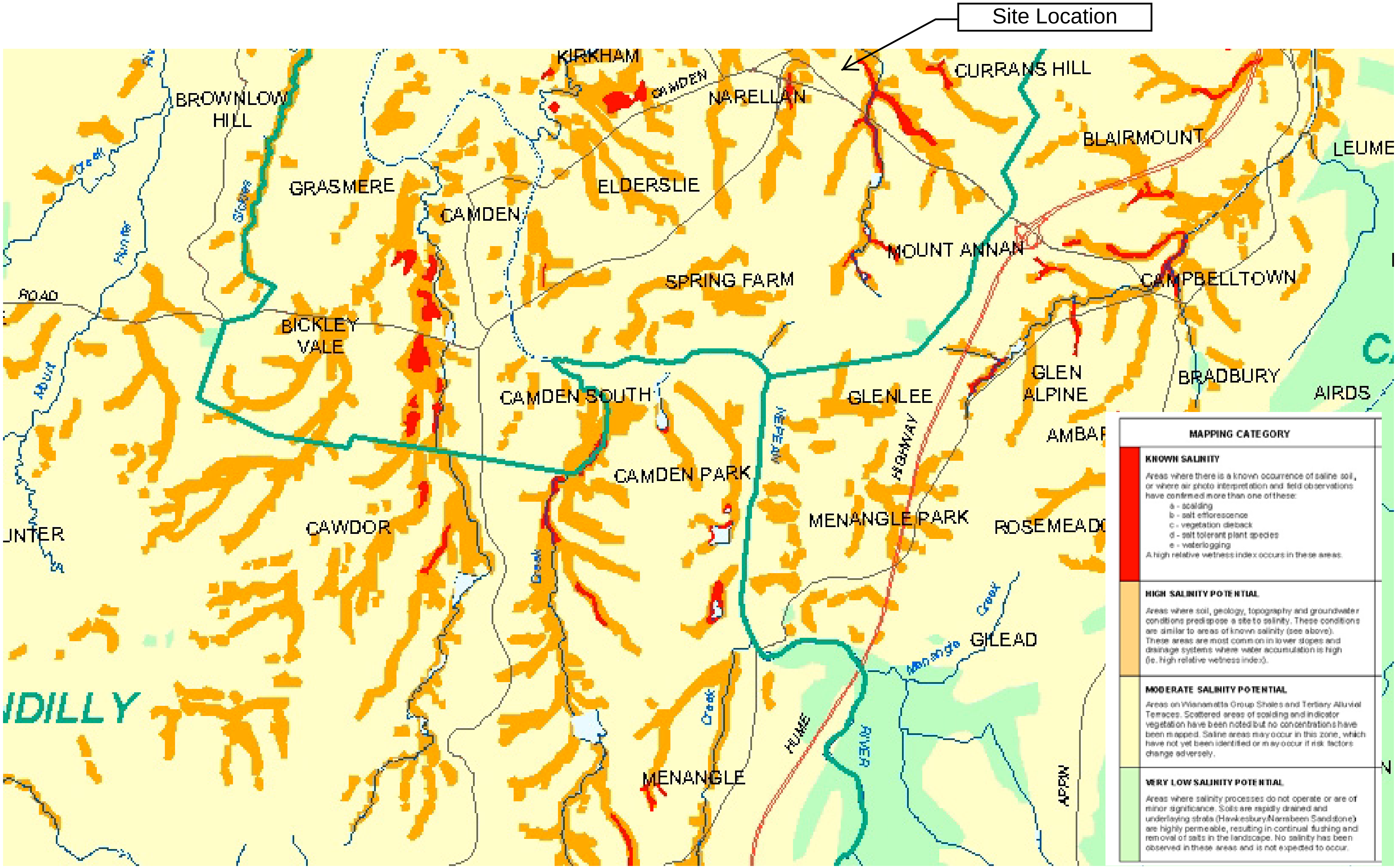
drawing title
GROUND FLOOR PLAN

FOR DA APPROVAL

J15306 DA 100 D

job no. drawing no. rev

FIGURE 5



Salinity Potential Map for
Western Sydney - Camden Area

APPENDIX A

Runoff Water Management
Sediment Basin Sizing

Blue Book

Settling Volume = 10 x Cv x A x R where:

Cv = volumetric runoff coefficient = 0.69

A = area of disturbed surface in hectares = 0.6862 ha

R = 2 day total rainfall depth which is not exceeded 75% of storms = 13.6mm

Setting Volume = 10 x 0.69 x 0.6862 x 13.6 = 64.4m^3

Storage Volume = $\frac{\text{settling volume x 0.5}}{\text{8 weeks}}$

= on basis that basin sediment is cleared at the end of each week

= 4m^3

Total Sediment Basin Volume = 68.4m^3

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APPENDIX B
Site Annual Water Balance

1. Assumptions

Mean Annual Rainfall	769mm
Mean Number of Rainy Days	47 days
Mean Number of Dry Days	318 days
Volumetric Runoff Coefficient	
- existing	0.35
- developed	0.69
Traffic Areas requiring dust suppression	$5094m^2$
Total Site Area	$6862m^2$
Roof Area	$1348m^2$
Paved Runoff Area	$5094m^2$
Landscaped Area	$420m^2$
Dust Suppression Water Application Rates	$= 1L/m^2$/dry day
Average Annual Dust Suppression Water Usage	$5094 \times 1 \times 318 = 1620m^3$

2. Existing Conditions

Site Area	$= 6862m^2$
Volumetric Runoff Coefficient	= 0.35
Annual Rainfall	= 769mm
Runoff Volume	$= 6862 \times 0.35 \times 0.769 = 1847m^3$

3. Developed Conditions

a. Roof Area = $1348m^2$
Volumetric Runoff Coefficient = 0.85
Reuse Volume = $1348 \times 0.85 \times 0.769 = 881m^3$

b. Paved Area = $5094m^2$
Volumetric Runoff Coefficient = 0.69
Runoff Volume = $5094 \times 0.69 \times 0.769 = 2703\ m^3$

c. Runoff captured in sediment basin for each event= (5094+1348m2)x0.69x0.0136m =60m3

Average annual number of wet days = 47
Potential average annual number of two day rainfall = 23.5
Runoff volume reused from basin for dust suppression = 23.5x60 = 1410m3

d. Landscaped Area = $420m^2$
Volumetric Runoff Coefficient = 0.35
Runoff Volume = $113m^3$

e. Net Average Annual Runoff Volume = $2703 + 113 + 881 - 1410 = 2287m^3$

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4. Average Annual Dust Suppression Water Supply

Volume of Water Required	= 1620m^3
Volume available from sediment basin	= 1410m^3
Volume to be supplied from town water supply	= 210m^3

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Appendix H

Hydrogeology assessment

Memorandum

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9 March 2016

Subject **Hydrogeology – Proposed Recycling Facility, 52 Anderson Road Smeaton Grange**

1 Introduction

Benedict Recycling Pty Ltd (Benedict Recycling) proposes to construct and operate a recycling facility at 52 Anderson Road, Smeaton Grange. An overview of hydrogeological conditions in the vicinity of the proposed recycling facility, from published data sources, is provided in this memorandum.

2 Geology

The site is located in the centre of the geologic Permo-Triassic Sydney Basin. The basal layers of the Sydney Basin are Permian aged sedimentary rocks that include coal measures. Overlying the Permian rocks are Triassic sedimentary rocks, namely the Hawkesbury Sandstone and the Wianamatta Shale Group.

The Wianamatta Group, Liverpool Sub Group, comprising shale with some sandstone beds outcrops at the site, although east of the site at Campbelltown the shale has been eroded and Hawkesbury Sandstone, a quartz rich lithic sandstone outcrops (Wollongong 1:250,000 Geological Series Sheet, 1966). In the vicinity of the site Quaternary alluvium is identified adjacent to surface water features, and is likely associated with a drainage feature at the northern site boundary. The thickness of the shale fluctuates and is a maximum 50 m thick, while the Hawkesbury Sandstone is approximately 100 m thick at the site vicinity.

3 Hydrogeology

The Hawkesbury Sandstone is the main groundwater bearing unit in the region, though groundwater is also present in other geological units. The Wianamatta Group Shale unit has low permeability and act as an aquitard to downward vertical flow (Ross 2014). Groundwater within the shales is generally brackish to saline and bores are generally very low yielding. Groundwater within the Hawkesbury Sandstone in this area is generally fresh with yields ranging from low to high (McKibbin and Smith 2000).

Reference to the Department of Primary Industries Water (DPI Water) online groundwater database indicates that in a two kilometre radius from the site there are eight monitoring bores and two private bores, used for stock and domestic, and irrigation. The private bores intersect an unknown unconsolidated unit (18.9 m in depth) and the deeper Hawkesbury Sandstone (110 m in depth). All monitoring bores intersect the upper shale and are less than 11 m in depth, with the exception of one monitoring bore which intersects alluvium and is 5 m in depth.

The shallow shale monitoring bores have a slightly brackish salinity, with a range of electrical conductivity measurements between 1,080 µS/cm and 4,063 µS/cm. The depth to groundwater in these bores is between 3.2 and 7.7 m below ground level (BGL). The alluvium monitoring bore had a fresh electrical conductivity (416 µS/cm) and a shallower depth to groundwater (1 m BGL). The groundwater flow direction is expected to follow a muted reflection of topography, and is therefore to the north-west towards a tributary of the Nepean River.

3.1 Groundwater dependent ecosystems

There are no listed high priority groundwater dependent ecosystems in the vicinity of the site in the applicable water sharing plan, *Greater Metropolitan Region Groundwater Sources 2011.* There are also no groundwater dependent ecosystems in the online Bureau of Meteorology Atlas of Groundwater Dependent Ecosystems. Industrial activity and cleared lands are in the vicinity of the site, and there is no evidence of remnant vegetation.

4 Potential project impacts

Project related ground excavations, including strip footings and a sediment basin are expected to be less than 2 m in depth (npc 2016). These excavations are expected to be shallower than the depth to groundwater in the shale (ie 3.2 m BGL) and therefore impacts to groundwater in the uppermost competent rock are not expected.

Care will need to be taken to ensure excavations into alluvium material are avoided as groundwater could be encountered. This is considered a practical request given the geotechnical properties of unconsolidated material and the need to avoid potential dewatering.

In addition the site will be paved and this will prevent potential contamination from entering the groundwater. The reduction in potential groundwater recharge volume from the capture of runoff is considered negligible in the context of the catchment area; the site area is 6,862 m^2, which is 0.005% of the Georges River Basin.

References

Bureau of Meteorology Atlas of Groundwater Dependent Ecosystems (8 March 2016):

http://www.bom.gov.au/water/groundwater/gde/map.shtml

Department of Primary Industries Water (DPI Water) online groundwater database (8 March 2016): http://allwaterdata.water.nsw.gov.au/water.stm

npc 2016 *Proposed Recycling Facility, 52 Anderson Road Smeaton Grange, Environmental Impact Statement, Water Management Report*, March 2016

NSW Departments of Mines, Sydney 1966 Wollongong 1:250,000 Geological Series Sheet, Second edition

McKibbin D & Smith PC (2000) 'Sandstone Hydrogeology of the Sydney Region', 15th Australian Geological Convention: Sandstone City – Sydney's Dimension Stone and other Sandstone Geomaterials, Monograph No. 5, G.H. McNally & B.J. Franklin (eds), EEHSG Geological Society of Australia

Ross J. R. 2014 Groundwater Resource Potential of the Triassic Sandstone of the Southern Sydney Basin: an Improved Understanding. Australian Journal of Earth Sciences 2014, **61**: 463-474

Appendix I

Bushfire assessment

Waste transfer station

Smeaton Grange | Bushfire hazard assessment

Prepared for Benedict Recycling Pty Ltd | 30 March 2016

Waste transfer station

Smeaton Grange | Bushfire hazard assessment

Prepared for Benedict Recycling Pty Ltd | 30 March 2016

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Waste transfer station

Final

Report J15135RP1 | Prepared for Benedict Recycling Pty Ltd | 30 March 2016

Prepared by	**Mark Roberts**	Approved by	**Philip Towler**
Position	Senior Environmental Consultant	Position	Associate Director
Signature		Signature	
Date	30 March 2016	Date	30 March 2016

Document Control

Version	Date	Prepared by	Reviewed by
V1	30 March 2016	Mark Roberts	Philip Towler

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Table of contents

Figures

Abbreviations

APZ	Asset protection zone
BCA	Building code of Australia
BHA	Bushfire hazard assessment
DA	Development application
DCP	Development control plan
EIS	Environmental impact statement
EMM	EMM Consulting Pty Limited
FDI	Fire danger index
IPA	Inner protection area
LEP	Local environmental plan
LGA	Local government area
OPA	Outer protection area
PBP	Planning for bushfire protection
SEARs	Secretary's Environmental Assessment Requirements

1 Introduction

This bushfire hazard assessment (BHA) has been prepared by EMM Consulting Pty Ltd (EMM) for Benedict Recycling Pty Ltd's proposed waste transfer station (the project) at 52 Anderson Road, Smeaton Grange (the site). A BHA is required as part of the land is bushfire prone according to Camden Council bushfire prone land mapping (Camden Council 2013).

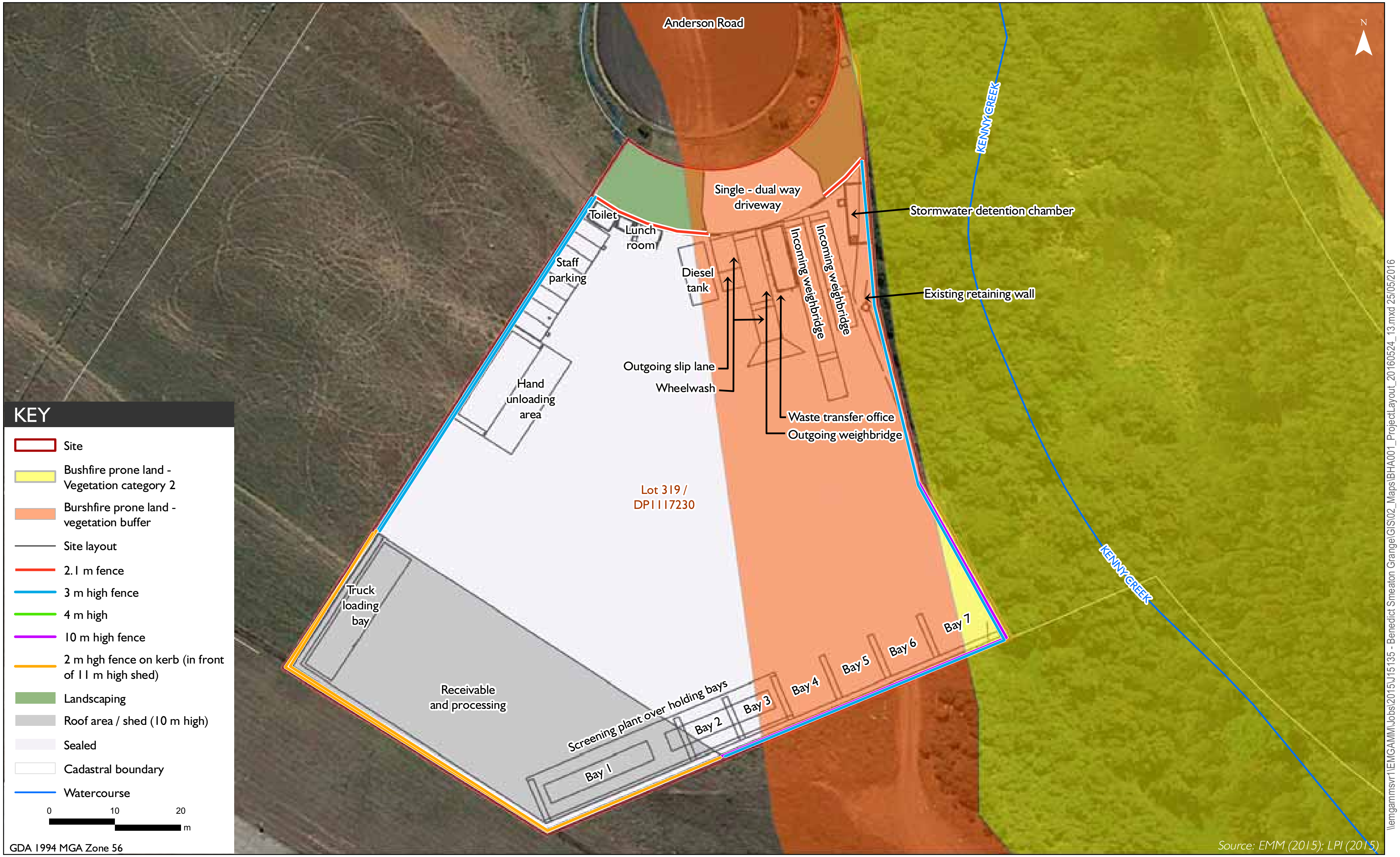
This BHA has been prepared in accordance with the NSW Rural Fire Service's *Planning for Bush Fire Protection Guideline* (RFS 2006) (PBP). It considers the bushfire hazard associated with the project and describes mitigation measures, in accordance with Appendix 4 of the PBP (Submission requirements for DAs on bushfire prone land).

1.1 Project overview

The project will comprise construction and operation of a waste transfer station at the site (Lot 319 DP 1117230), which has an area of 6,862 m^2. It will accept inert general solid waste (non-putrescible) such as construction and demolition waste, and selected commercial and industrial wastes. The wastes will be screened and sorted to produce saleable products such as soils, metals and cardboard.

The project will comprise (Figure 1.1):

- a weighbridge area with weighbridges, wheel washes for outbound vehicles;
- a demountable office;
- seven product bays, which will be 4 m high and blockwalled;
- diesel tank (approximately 30,000 L) which will be installed in accordance with *Australian Standard 1940:2004 The Storage and Handling of Flammable and Combustible Liquids* and will be fully enclosed in a colourbond shed;
- a sprinkling site irrigation system to minimise airborne dust;
- a flip-flow screen waste sorter (housed in main shed);
- an enclosed picking line inside the main shed that extends outside along a portion of the southern boundary;
- extension of the side boundary fencing to a maximum height of 10 m;
- waste/product stockpiles; and
- out-of-hours bin storage and waste truck parking.



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Project layout
Bushfire hazard assessment
Smeaton Grange waste transfer station
Figure 1.1

1.2 Development application and bushfire assessment statutory requirements

Section 89C of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) states that a development may be declared a state significant development under an environmental planning instrument. Clause 8 of State Environmental Planning Policy (State and Regional Development) 2011 declares certain types of developments to be state significant if they are listed in schedules 1 or 2, with the project qualifying as it will be a waste transfer station which handles over 10,000 tonnes per year.

An application for state significant development must be accompanied by an environmental impact statement (EIS). This BHA is appended to the EIS to enable the Minister for Planning to consider bushfire risks at the site.

Section 79BA of the EP&A Act requires developments on bushfire prone land to conform to the specifications in PBP.

Section 63(2) of the NSW *Rural Fires Act 1997* requires the owners of land to prevent the ignition and spread of bushfires on their land. The implementation of the recommended measures in this bushfire assessment will ensure that the risk of bushfire ignition and spread will be as low as practically possible.

The Camden Development Control Plan 2011 (DCP) requires proponents of developments on bushfire prone land to assess bushfire risks in accordance with PBP. It also prohibits the construction of habitable and storage buildings in APZs. As described in Section 3.1, the office building will be in the APZ, which is prohibited by the DCP. However, as described above, the project will be determined by the Minister for Planning, who may give consideration to, but is not bound by, the DCP.

1.3 Objective and scope

1.3.1 Objective

The project is categorised in Section 1.1 of the PBP as 'other development', that is, development which is not an 'integrated development' such as residential/rural residential subdivision or special fire protection purposes. 'Other development' is required to satisfy the aim and objectives of the PBP.

The aim of the PBP is to:

> To use the NSW development assessment system to provide for the protection of human life (including fire-fighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, onsite amenity and protection of the environment (RFS, 2006).

The objectives of the PBP are as follows (RFS, 2006):

- afford occupants of any building adequate protection from exposure to a bushfire;
- provide for a defendable space to be located around buildings;
- provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- ensure that safe operational access and egress for emergency service personnel and residents is available;

- provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the APZ; and
- ensure that utility services are adequate to meet needs of firefighters (and other assisting in bushfire fighting).

2 Existing environment

This section determines if project buildings will be on bushfire prone land and describes vegetation and slope within 100 m of proposed buildings, as required by Appendix 4.1 of the PBP.

2.1 Bushfire prone land

There is Category 2 bushfire prone vegetation adjacent to the south-eastern boundary of the site (Figure 2.1), with the corresponding 30 m vegetation buffer extending into the site along that boundary (Camden Council 2013). Category 2 bushfire prone vegetation usually represents lower risk vegetation types or areas, such as rainforest, managed land or vegetation which is surrounded by development where ignitions can be detected quickly.

As described below, the vegetation is dry sclerophyll forest (shrub understorey), which is usually a higher risk vegetation type. However, a lower risk has likely been assigned to this vegetation by Council as it is managed (it is an area of revegetation) and it is adjacent to heavily developed industrial and commercial sites.

2.2 Vegetation

Dr David Keith compiled broad scale native vegetation classifications and maps between 2001 and 2004 for NSW (the Keith formations) (Keith 2004). The PBP uses the Keith formations to classify bushfire hazard vegetation (the PBP classifications). The site was inspected on 13 January 2016, with the vegetation classified in accordance with the key in Keith (2004). There is an approximately 20 m wide strip of *Eucalyptus sp.* dominant dry sclerophyll forest (shrub understorey) adjacent to the site boundary and an approximately 10 m wide strip of *Casuarina sp.* dominated forested wetlands along Kenny Creek. In areas where there are two or more vegetation types, the PBP states that the vegetation type providing the greatest bushfire hazard should be considered as predominant. Therefore, the dry sclerophyll forest (shrub understorey) is taken to represent the greatest bushfire hazard.

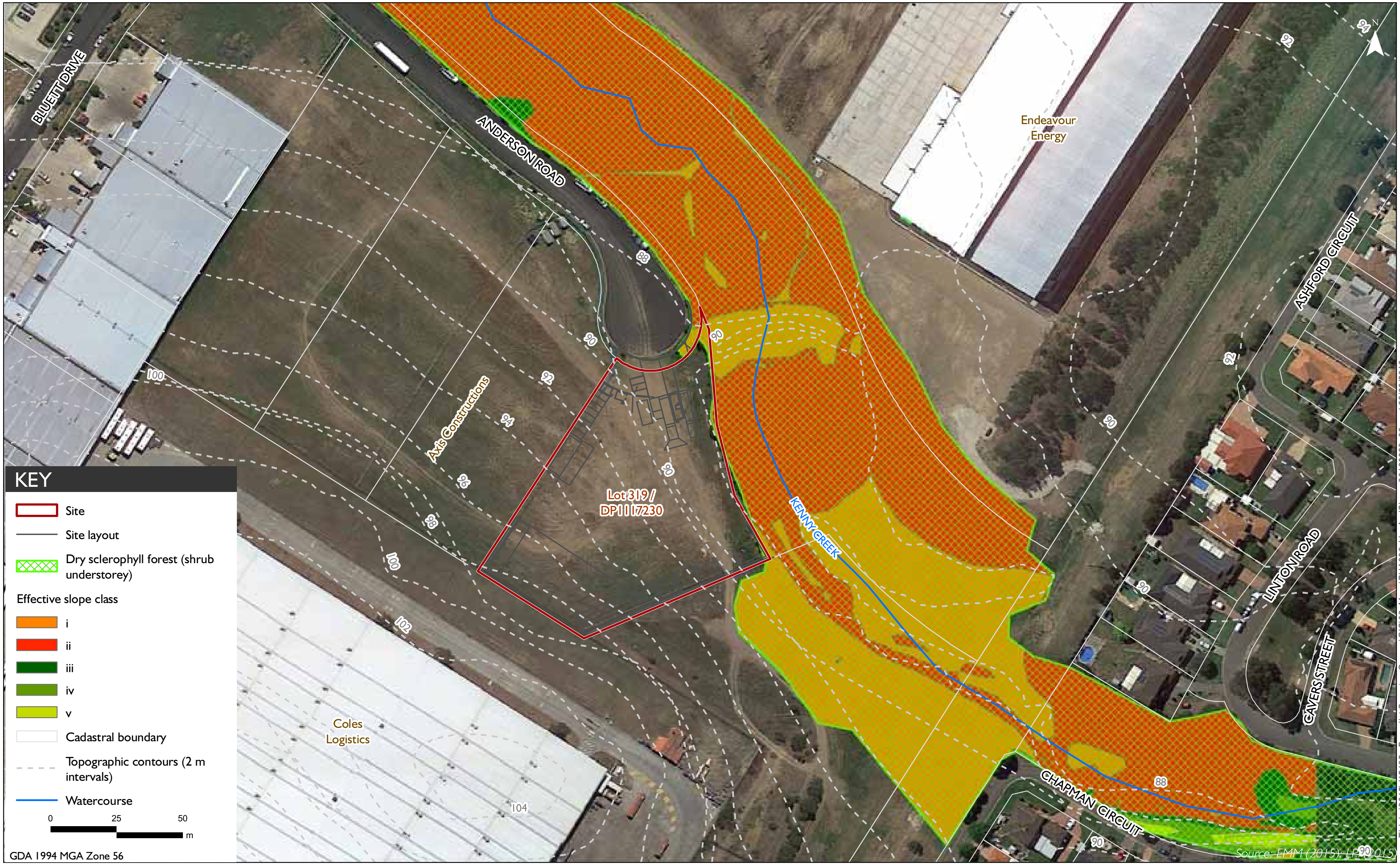
The PBP classification, distance and direction of native vegetation within 100 m of project buildings on bushfire prone land are shown on Figure 2.1.

2.3 Slope

Slope is an important contributor to a bushfire's rate of spread. A bushfire will spread quicker up a steep slope compared to a gradual slope or flat land. Slopes are classified according to the PBP, and are combined with vegetation classes in an area to determine appropriate APZs (see Section 3.1). The slope over a distance of 100 m from the site boundary was determined using a digital terrain model (2 m height resolution). The slopes were classified according to the PBP:

- All upslope vegetation (considered 0°);
- >0 to 5° downslope vegetation;
- >5 to 10° downslope vegetation;
- >10 to 15° downslope vegetation; and
- >15 to 18° downslope vegetation.

Project buildings on bushfire prone land will be constructed on flat areas. There are slope classes i and ii along the shallow vegetated banks of Kenny Creek (Figure 2.1).



Vegetation and slope within 100 m of site

Bushfire hazard assessment

Smeaton Grange waste transfer station

Figure 2.1

3 Bushfire prevention and protection

This section identifies APZs, including appropriate widths, maintenance requirements and specifications for service and access provision as provided in Chapter 4 of the PBP.

3.1 Asset protection zones

The PBP does not provide APZ specifications for 'other development', including industrial buildings. However, such development is required to comply with the objectives of the PBP, including provision of buffers between buildings and bushfire prone vegetation. Appendix 2 of the PBP (see Section 1.2) provides a procedure for determining APZs for habitable buildings, which has been adopted in this bushfire assessment.

An APZ is the distance that buildings are set back from vegetation that represents a bushfire hazard (see Appendix 2 of the PBP). APZs are provided for the following reasons:

- to provide sufficient separation from buildings for safe fire fighting;
- to reduce radiant heat at buildings;
- to reduce the influence of convection driven winds;
- to reduce the threat of ember attack on buildings; and
- to allow for dispersal of smoke.

APZs are divided into an 'inner protection area' (IPA) and an 'outer protection area' (OPA) where there is adjacent forest vegetation. The IPA provides a defendable space and reduces heat intensities near buildings. The OPA helps reduce the length of flames, the speed of fire advance and the likelihood of fire spread by 'crowning'.

APZs are determined by referring to tables A2.5 and A2.7 (for forest vegetation) in PBP, which compare predominant fire hazard vegetation formations, highest slope classes near subject buildings and fire weather at a site. The fire weather or 'fire danger index' (FDI) for Camden Local Government Area is 100 (Table A2.3 in the PBP).

The resulting APZs for the project are (Figure 3.1):

- slope class i: 20 m; and
- slope class ii: 25 m.

The APZs have not been divided into IPAs or OPAs as they will not comprise any vegetation, other than the landscaping at the front of the site (refer to Section 3.1.1).

The APZs will comprise sealed surfaces and managed landscaping vegetation, part of the diesel tank and the office building.

The diesel tank will be partially in the APZ. However, it will be enclosed in a colourbond shed which will shield it from radiant heat if there is a fire in the bushfire prone vegetation.

The office building will be occupied during facility opening hours. The facade will be constructed of non-combustible materials and an exit will be provided on the non-hazard side (north-west) of the building so that personnel can quickly evacuate to the muster point if a fire is approaching.

3.1.1 Maintenance of APZs

The landscaping vegetation in the APZ will be maintained as an IPA on an ongoing basis, that is, in a manner that prevents accumulation of fine flammable debris on the ground so that fuel quantities are reduced, thus lessening flame heights and potential crowning. General maintenance guidelines are described in Appendix 2 of the PBP.

The landscaping vegetation will be maintained as follows:

- canopy cover will be kept at less than 15% of total surface area and will be kept at least 2 m from the roof line of a building;
- garden beds and shrubs will not to be located under trees and sited at least 10 m from any exposed windows or doors; and
- lower limbs of trees up to 2 m above the ground will be removed.

3.2 Services

Water, gas and electricity services will be located and installed in a manner that reduces the potential for them to contribute to fire hazard. Detailed design has not taken place for the project. However, the specifications given below will be incorporated into the detailed project design.

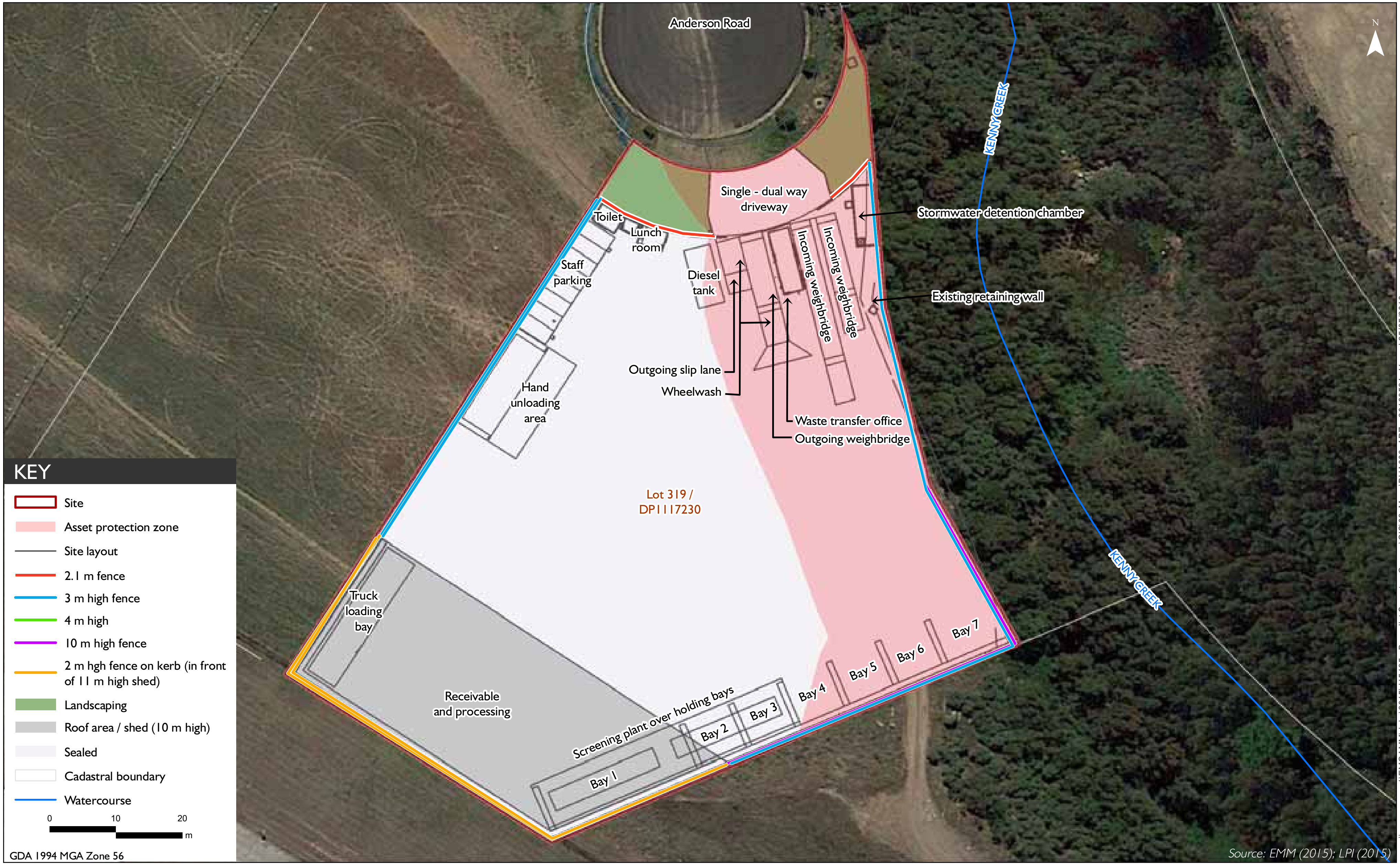
3.2.1 Water

The availability of water is a critical determinant of the survival of life and property during a bushfire. Water for fire fighting will be provided to the project as follows:

- existing fire hydrants in Anderson Road; and
- extinguishers and fire hydrant at the office building.

The following requirements from Chapter 4 of PBP will be applied to water infrastructure:

- above ground pipes external to structures in the APZ will be metal including and up to taps; and
- fire hydrants at buildings will be spaced, sized and pressured in accordance with *Australian Standard 2419.1-2005 Fire Hydrant Installations – System Design, Installation and Commissioning*.



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Asset protection zone

Smeaton Grange Benedict Industries
Bushfire Hazard Assessment
Figure 3.1

3.2.2 Electricity and gas

Electricity and gas services will be located so they do not contribute to the risk of fire to a building. The following guidelines will be followed during detailed project design (from Chapter 4 of PBP):

- it is preferable to place electrical transmission lines underground. However, If overhead electrical transmission lines are to be used, they will be installed and managed in accordance with Ausgrid (2010) *NS179 Vegetation Safety Clearances*;
- *AS/NZS 1596:2008 The Storage and Handling of LP Gas* will be followed for bottled gas installation and maintenance. Metal piping will be used;
- there will be minimum 10 m distance between fixed gas cylinders and flammable materials and shielding will be placed on the hazard side of the cylinders; and
- release valves on gas cylinders close to buildings will be directed away from the building and minimum 2 m from combustible material. Metal connections will be used.

3.3 Access

The project will be accessed and exited via sealed entry and exit driveways off Anderson Road, which will be constructed to accommodate vehicles over 15 tonnes such as fire fighting vehicles. They will have a minimum vertical clearance of 4 m to any overhead obstructions including branches.

3.4 Mitigating feature

Appendix 4.1 requires a BHA to describe features that may mitigate the impact of a high intensity bushfire on a proposed development. As described in Section 1.1, a solid 10 m high fence will be constructed along the south-east boundary and along part of the north-east boundary to provide noise shielding for nearby residential development.

This fence will be between the project and the bushfire hazard vegetation and will provide some shielding of the office building from radiant heat, ember attack and the spread of fire in the understorey if there is a fire in the vegetation.

3.5 Environmental impacts of mitigation measures

Appendix 4.1 requires a BHA to describe environmental impacts from the implementation of bushfire protection measures. Provision of the above measures will not have an environmental impact as built elements and the APZ will be at an existing cleared area. Therefore, no vegetation clearing will be required to implement the measures.

4 Bushfire construction levels

Section A4.1 of the PBP requires an assessment of whether specific buildings are capable of complying with the bushfire construction levels described in *Australian Standard 3959 – 2009 Construction of Buildings in Bushfire Prone Areas* (AS 3959 – 2009). The specific buildings are classified by the *Building Code of Australia* (BCA 2013) as class 1, 2, 3 and 4 buildings; and some class 9 and 10 buildings.

The office building does not correlate to the above BCA classes and therefore does not have bushfire construction levels specified in AS 3959 – 2009. Notwithstanding, the PBP requires that such buildings comply with the general bushfire construction requirements in section 3 of AS 3959 – 2009. The office building will be constructed to comply with these requirements.

5 Conclusion

A section of the project will be on bushfire prone land and this assessment describes measures to enable the project to comply with the objectives of the PBP. Specifically, an APZ will be provided and managed to enable fire fighter access, passage for evacuees and to reduce radiant heat at project buildings. The risk of the project initiating a bushfire will be minimised through the implementation of management measures.

References

Australian Building Codes Board 2013 *Building Code of Australia* (BCA). Australian Government.

Australian Standard 3959 – 2009 Construction of Buildings in Bushfire Prone Areas (AS 3959 – 2009).

Camden Council 2013 *Camden Council Bushfire Prone Land – Map 4*.

Keith, D 2004 *Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT*. NSW Department of Environment and Conservation.

NSW Rural Fire Service (RFS) 2006 *Planning for Bushfire Protection*. NSW Government.

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Appendix J

Quantity Surveyor's report and Capital Investment Value estimate

#
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29 March 2016

Benedict Industries

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Attention – Verity Blair

Dear Sirs,

52 Anderson Road, Smeaton Grange, Use and Development SSDA

Please find enclosed cost estimate summaries for the above.

The total submitted figure of $2,795,205 is inclusive of fees and GST but exclusive of contingencies.

In addition it should be noted that:

1) Capital Investment Value in accordance with PS 10-008 dated 10 May 2010. This total is $2,541,096.

Please refer to notes accompanying the cost summary for further clarification of the works.

We trust this is sufficient for the completion of the DA submission.

Yours faithfully,

Alan Jenkins

Alan Jenkins AAIQS#

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# #

52 ANDERSON ROAD SMEATON GRANGE

BENEDICT

ORDER OF COST SUMMARY USE & DEVELOPMENT SSDA 23-Mar-16

The estimate for the proposed works are based on industry recognised prices and the estimated costs have been prepared having regard to the matters set out in Clause 255 of the Environmental Planning and Assessment Regulation 2000

Item	Quantity	Rate	$
Use and Development			$240,810
Plant & Equipment			$2,123,000
Total for Construction Works as at March 2016			$2,363,810
Design Fees	5.00%		$118,191
Project Management Fees	2.50%		$59,095
			$2,541,096
GST	10%		$254,110
Total incl Fees and GST as at March 2016			***$2,795,205***

Notes
Rates above include allowances for prelims and margin.
Contingencies are excluded
Internal fitout including retail tenancy, office equipment, etc are excluded
Works forming part of the separate Site Establishment DA are excluded
Figures are based on competitive lump sum tenders
Land costs, legal fees and holding charges are excluded
Scheme as per CDA Architects drawings dated March 2016
Works outside the site boundary are excluded

52 Anderson Road, Smeaton Grange

Benedict

Cost Summary 22-Mar-16

This estimate summary is prepared for the Use & Development SSDA submission only

A separate DA submission is being made for for Site Establishment DA which includes the building works for the site

Item	Quantity	Rate	$
Builders works for weighbridges, wheel washer etc	168 m2	$25.00	$4,200.00
Footings etc as required for demountable office incl connection to services etc	35 m2	$300.00	$10,500.00
Product bays comprising block walls, footings etc as required	350 m2	$100.00	$35,000.00
Bunded deisel storage tank (30,000 litres) including enclosure & assoc builders work	Item		$40,000.00
Picking line enclosure	Item		$10,000.00
Extend boundary fencing to 10m as noted	595 m2	$150.00	$99,700.00
Connecting plant and equipment to site services	Item		$10,000.00
			$209,400.00
Preliminaries	15%		$31,410.00
Total (excl GST)			$240,810.00

52 Anderson Road, Smeaton Grange

Benedict

Cost Summary 22-Mar-16

This estimate summary is prepared for the Use & Development SSDA submission only
A separate DA submission is being made for for Site Establishment DA
which includes the building of the site

Plant and equipment (as advised Benedict Ind)			
Front end loader	Item		$380,000
13t excavator	Item		$170,000
Weighbridges	Item		$255,000
Weighbridge office	Item		$68,000
Processing plant	Item		$720,000
Wheelwashes	Item		$60,000
Irrigation for dust suppression	Item		$30,000
Flip flow screen waste sorter	Item		$440,000
Total			$2,123,000

RIC-QS Pty Ltd
(Residential Industrial Commercial Quantity Surveyors)
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sam@ricqs.com.au

12th May 2016

Roussakis Holdings Pty Ltd
C/o - CDArchitects
PO BOX 10,
BARDWELL PARK NSW 2207

Attention: Jacob Yammine (info@cdarchitects.com.au)

PROJECT ADDRESS: **52 Anderson Road, Smeaton Grange**

PROJECT DESCRIPTION: **Proposed warehouse factory facility including concrete Access stand, parking facility and associated external works**

COUNCIL: **CAMPBELLTOWN COUNCIL**

Dear Jacob,

Further to your instructions, please find enclosed our indicative estimate of probable cost in the amount of **$2,164,643** (incl. Professional fees & GST) for the development situated in the Campbelltown Council jurisdiction.

Due to the level of documentation we have had to make the following assumptions in the preparation of our estimate.

ALLOWANCES & ASSUMPTIONS INCLUDED:

1. Demolition and general site clearance.
2. Bulk and detailed excavation in materials OTR.
3. All services connections and associated works.
4. Allowance for placing cables underground.
5. Allowance for landscaping over site and irrigation system.
6. Standard quality finishes and fitments.
7. Builder's preliminaries and margin.
8. Professional fees in the order of 2%.

ALLOWANCES & ASSUMPTIONS EXCLUDED:

1. Rock excavation.
2. Shoring or anchoring.
3. Grey water management.
4. Services Amplification.
5. Contingency. We recommend a contingency of 5% be allowed over the entire project.
6. Council contributions, authority fees, bank fees and charges, marketing, leasing and selling costs.

Documentation Reviewed:

We have prepared our estimate based on the following documentation.

- Architectural Drawings. Job No 15306, Drwing No DA100,101 Rev B. Dated March 2016 as prepared by CD Architects.

Disclaimer:

We advise that this estimate is indicative and may vary due to council conditions under the final council approval. Upon receipt of the approval and the council conditions approval any additional documentation or information we reserve the right to review our estimate.

This report is for use by the party to whom it is addressed and for no other purposes. No responsibility is taken for any third party who may use or rely on the whole or any part of this report.

If you have any queries or wish to discuss the matter further please do not hesitate to contact this office.

Yours faithfully

Sam Francis

Director (7467M A.I.Q.S)
RIC-QS Pty. Ltd.
(Residential, Industrial & Commercial – Quantity Surveyors)

tel/fax. 02 8739 2259 email. info@ricqs.com.au web. www.ricqs.com.au
add. Suite 6, 41-45 Rickard Road, Bankstown NSW 2200

160331 Smeaton Grange - Summary

Job Name : 160331 SMEATON GRANG

Client's Name: Emmanuel Roussakis

Job Description

Warehouse/Factory Facility including conrete access stand, parking facility and associated external works

Trd No.	Trade Description	Trade Qty	Trade Unit	Trade Rate	Sub Total	Mark Up %	Trade Total
1	NOTES						
2	GROUND FLOOR	1,268	m2	760.09	963,801		963,801
3	ROOF	1,354	m2	264.48	358,100		358,100
4	EXTERNAL WORKS	5,488	m2	98.16	538,690		538,690
5	DEMOLITION	6,868	m2	10.00	68,680		68,680
6	Subtotal						*1,929,271*
7	PROFESSIONAL FEES	1	It	38,586.00	38,586		38,586
8	Subtotal						*1,967,857*
9	GST ALLOWANCE	1	It	196,786.00	196,786		196,786
	GFA: 1,268 m2.				**2,164,643**		**2,164,643**

Final Total : $ **2,164,643**

160331 Smeaton Grange - Trade Breakup

Job Name :	160331 SMEATON GRANG		**Job Description**
Client's Name:	Emmanuel Roussakis		Warehouse/Factory Facility including conrete access stand, parking facility and associated external works

Item No.	Item Description	Quantity	Unit	Rate	Amount
Trade : 1	***NOTES***				
	DRAWINGS & OTHER DOCUMENTATION REVIEWED				
1	This indicative square metre estimate was prepared by applying functional rates against indicative areas from the following drawings and documentation:		Note		
2	Architectural Drawings Job No, J15306, Drawing No DA 100,101. Rev B, dated by March 2016 as prepared by CD Architects				
3					
	ALLOWANCES & ASSUMPTIONS INCLUDED				
4	Demolition and general site clearance.				
5	Bulk and detailed excavation in materials OTR.				
6	All services connections and associated works.				
7	Allowance for placing cables underground.				
8	Allowance for landscaping over site and irrigation system.				
9	Standard quality finishes and fitments.				
10	Builder's preliminaries and margin 15%.				
11	Professional fees of 2% .				
12	Any cost increases associated with the 10% GST.				
13					
	ALLOWANCES & ASSUMPTIONS EXCLUDED				
14	Rock excavation.				
15	Site remediation and decontamination.				
16	Allowance for shoring.				
17	Allowance for lift services.				
18	Grey water management.				
19	Allowance for Electrical, Gas, Hydraulic, Water, Stormwater & Sewer services amplification.				
20	Escalation in costs and union enterprise bargaining costs.				
21	Council contributions, design fees, authority fees, bank fees and charges, marketing, leasing and selling costs.				
22					

160331 Smeaton Grange - Trade Breakup

Job Name : 160331 SMEATON GRANG

Client's Name: Emmanuel Roussakis

Job Description

Warehouse/Factory Facility including conrete access stand, parking facility and associated external works

Item No.	Item Description	Quantity	Unit	Rate	Amount
Trade : 1	***NOTES***				*(Continued)*
	RICQS DISCLAIMER				
23	This report is provided for construction finance purposes and is for use by the party to whom it is addressed only. No responsibility is taken for any third party who may use or rely on the whole or any part of this report.				
24	All quantities measured in this estimate are approximate only.				
25	Quantities or rates in this report are not to form part of any future building contract.				
26	Our costs exclude GST.				
27	This estimate and or rates provided will expire after a period of 3 months based on current market conditions				
			NOTES	**Total :**	
Trade : 2	***GROUND FLOOR***				
1	Shed areas :[1212 m2]	1,212.00	m2	750.00	909,000.00
2	Lunch room areas :[13 m2]	13.00	m2	900.00	11,700.00
3	Wet areas :[13 m2]	13.00	m2	1,100.00	14,300.00
4	Waste storage areas	30.00	m2	900.00	27,000.00
5	Stairs area to facilities(non-UCA)	2.00	m2	900.00	1,800.00
			GROUND FLOOR	**Total :**	**963,800.00**
Trade : 3	***ROOF***				
1	Roof areas	1,326.00	m2	250.00	331,500.00
2					
3	Concrete roof area to waste storage	28.00	m2	950.00	26,600.00
			ROOF	**Total :**	**358,100.00**
Trade : 4	***EXTERNAL WORKS***				
1	Concrete areas	4,923.00	m2	100.00	492,300.00
2					
3	Driveway areas	148.00	m2	100.00	14,800.00
4					

160331 Smeaton Grange - Trade Breakup

Job Name : 160331 SMEATON GRANG

Client's Name: Emmanuel Roussakis

Job Description

Warehouse/Factory Facility including conrete access stand, parking facility and associated external works

Item No.	Item Description	Quantity	Unit	Rate	Amount
Trade : 4	***EXTERNAL WORKS***				*(Continued)*
5	Staff parking areas	105.00	m2	150.00	15,750.00
6	Visitor parking areas	54.00	m2	150.00	8,100.00
7					
8	Landscape areas	258.00	m2	30.00	7,740.00
		EXTERNAL WORKS	**Total :**		**538,690.00**
Trade : 5	***DEMOLITION***				
1	Structure		No		
2	Site Clearance	6,868.00	m2	10.00	68,680.00
		DEMOLITION	**Total :**		**68,680.00**
Trade : 6	***Subtotal***				
		Subtotal	**Total :**		
Trade : 7	***PROFESSIONAL FEES***				
1	Professional fees (say 2%)	0.02	%	1,929,271.00	38,585.42
2		1.00	Item		
		PROFESSIONAL FEES	**Total :**		**38,585.42**
Trade : 8	***Subtotal***				
		Subtotal	**Total :**		
Trade : 9	***GST ALLOWANCE***				
1	Allowance for Goods & Services Tax overall	0.10	%	1,967,857.00	196,785.70
2		1.00	Item		
		GST ALLOWANCE	**Total :**		**196,785.70**

Appendix K

Consultation factsheet

SMEATON GRANGE WASTE RECYCLING AND TRANSFER FACILITY FACTSHEET

52 Anderson Road, Smeaton Grange

Overview

Benedict Recycling proposes to develop a waste recycling and transfer facility at 52 Anderson Street, Smeaton Grange.

The surrounding area is experiencing rapid residential and industrial growth, which is creating significant demand for mixed waste recycling services. There are currently no mixed waste recycling facilities in the region except for the Spring Farm Advanced Resource Recovery Park, (formerly Jacks Gully Landfill), which accepts commercial and industrial and construction and demolition wastes but acts primarily as a transfer station. The proposed facility would accept waste from businesses and the general public and would complement the activities of the Spring Farm facility by allowing additional waste generated in the Narellan region to be recycled.

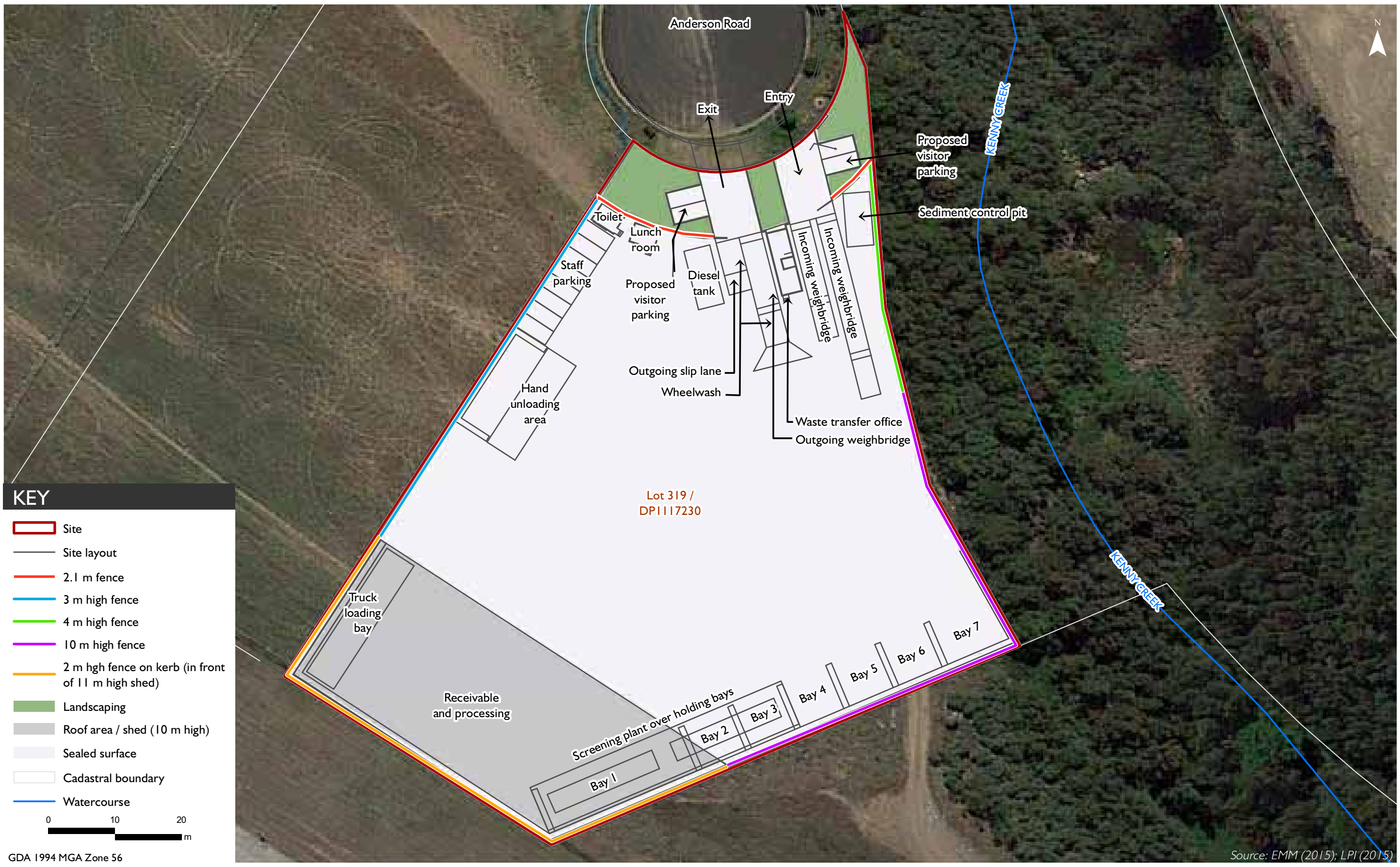
The site is ideally suited for the development of a recycling facility because it is in an industrial area centrally located in Smeaton Grange and readily accessible to light and heavy vehicles. Development of the proposal would provide an ongoing economic and social benefit from a vacant site that is zoned for industrial uses.

Proposed recycling facility site

The site is approximately 6,862 m2 (Figure 1), flat and devoid of vegetation other than grass.

Land immediately to the south-west is developed with a large transport depot operated by Coles Logistics, while land to the west and north (on the far side of the vegetated creek corridor) is developed, or being developed, for industrial uses with large industrial sheds which have been approved and are either built or under construction.

The nearest residential properties are on the far side of an easement (vacant land), in Currans Hill, at least 150 m south-west of the site. The site is mostly obscured from these properties by a vegetated ridgeline and separated by vacant land between the site and closest residences.



west boundary of the site which would prevent any views into the site from residential properties.

The EIS visual impact assessment found that the proposal would be unlikely to have significant visual impacts given that it is located within an existing industrial estate, is consistent with the visual character of the area and there would be very limited external views to site activities.

Air quality

The site's surface would be completely sealed, apart from the proposed landscaping in the front setback. The majority of material received under the proposal would be solid construction and demolition waste. No liquid, hazardous or putrescible waste would be accepted into the facility and captured rainfall runoff would be used for water sprays over any other operational areas that have potential to generate unacceptable amounts of dust. Therefore, the potential for dust or odour emissions from the facility is low. Air quality modelling for the EIS indicated that all air quality criteria (dust and odours) will be met offsite (ie no impacts at nearby residential properties).

Noise

Operational noise emission levels are predicted to meet the relevant criteria for calm conditions (ie when noise impacts would be most noticeable) during the daytime, evening, night and morning shoulder periods.

An assessment of cumulative industrial noise from the proposal together with other industrial noise sources in the vicinity predicts that the project will not increase industrial noise levels above the relevant amenity criteria.

The proposal would result in additional traffic movements however the increase would be minor in comparison to existing traffic volumes and the overall increase in road traffic noise level at residences will be negligible.

Traffic

At full production, the recycling facility would generate an average of 106 truck movements daily and 170 light vehicle movements. (ie 276 daily traffic movements in total). Waste material would be brought to the site and products dispatched via Anderson Road which connects directly to Camden Valley Way. There is also access via Anzac Avenue to Hartley Road which connects to Narellan Road. Camden Valley Way and Narellan Road are both major arterial traffic routes within the Sydney classified road network. Hartley Road, Anderson Road and Anzac Avenue are roads within the Industrial zone which are generally suitable for heavy vehicle use.

The EIS traffic impact assessment found that the proposal would not have any impacts on parking, road safety, intersection levels, public transport services, pedestrians or cyclists.

Water

The site would be sealed with a material such as concrete or asphalt to ensure that there is no disturbance of existing soils on the site. In addition, the site will be completely bounded by a concrete kerb and a stormwater scheme implemented that will allow captured water to be used for dust misting when necessary.

Site layout and activities

The recycling facility layout is shown in Figure 2. The facility would import inert pre-classified general solid waste (non-putrescible), such as construction and demolition wastes, and selected commercial and industrial wastes, for processing to produce saleable recycled materials. No special, liquid, hazardous, restricted solid waste or general solid waste (putrescible) would be accepted at the facility.

Processing would include sorting, screening and picking but would not include crushing or shredding (which generates more noise than the proposed processing).

Products would include soils that would be ready for use and segregated recycled materials that would be sent to other recycling facilities for further processing, eg ferrous and nonferrous metals, dry paper/cardboard, timber, masonry and plastics. The facility would have a processing capacity of 140,000 tonnes of material per annum.

Operating hours and workforce

The facility would accept waste deliveries and dispatch materials:

- Monday to Friday: 6 am–10 pm
- Saturday: 6 am–5 pm
- Sunday: 8 am–4 pm

Waste processing at the facility would occur Monday to Saturday between 7 am and 4 pm. No waste processing would occur on Sundays.

At times, waste is generated by major infrastructure projects that requires disposal at night, particularly from road and rail works. Therefore, there may be occasions where the facility would accept, but not process, waste for 24 hours per day to allow these important projects to proceed. It is anticipated that Council will be given 48 hour notice when waste will be delivered between 10 pm and 6 am (ie outside day-to-day operating hours).

The recycling facility is expected to be operated by approximately 8 employees.

Environmental Impact Statement

An environmental impact statement (EIS) has been prepared to accompany a development application (DA) for the proposal under Part 4 of the NSW Environmental Planning and Assessment Act 1979. The consent authority for the DA is the Minister for Planning and the determining authority is anticipated to be the Planning Assessment Commission (PAC).

The EIS addresses the relevant environmental planning requirements and requirements of relevant NSW government agencies, including the Secretary's Environmental Assessment Requirements issued by the Department of Planning and Environment for the project. The EIS will be placed on public exhibition shortly. Key findings of the EIS are summarised below.

Visual impacts

There will be no external views to activities on the site, apart from the entry gates on Anderson Street. It is proposed to provide substantial fencing along the south-

Ecology

The site has been cleared and capped with clay and is devoid of vegetation other than grass. No threatened species have been recorded on the industrial site and there are no anticipated impacts on flora and fauna due to the facility.

Heritage

The site has been heavily modified (cleared, graded and capped with clay) and the potential for extant archaeological sites is extremely low. Therefore, there are no predicted impacts on any Aboriginal or historic heritage items.

Questions?

For any questions and comments that you might have, please ring Benedict Recycling's Ernest Dupere on **0407 282 444**.

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EMM

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