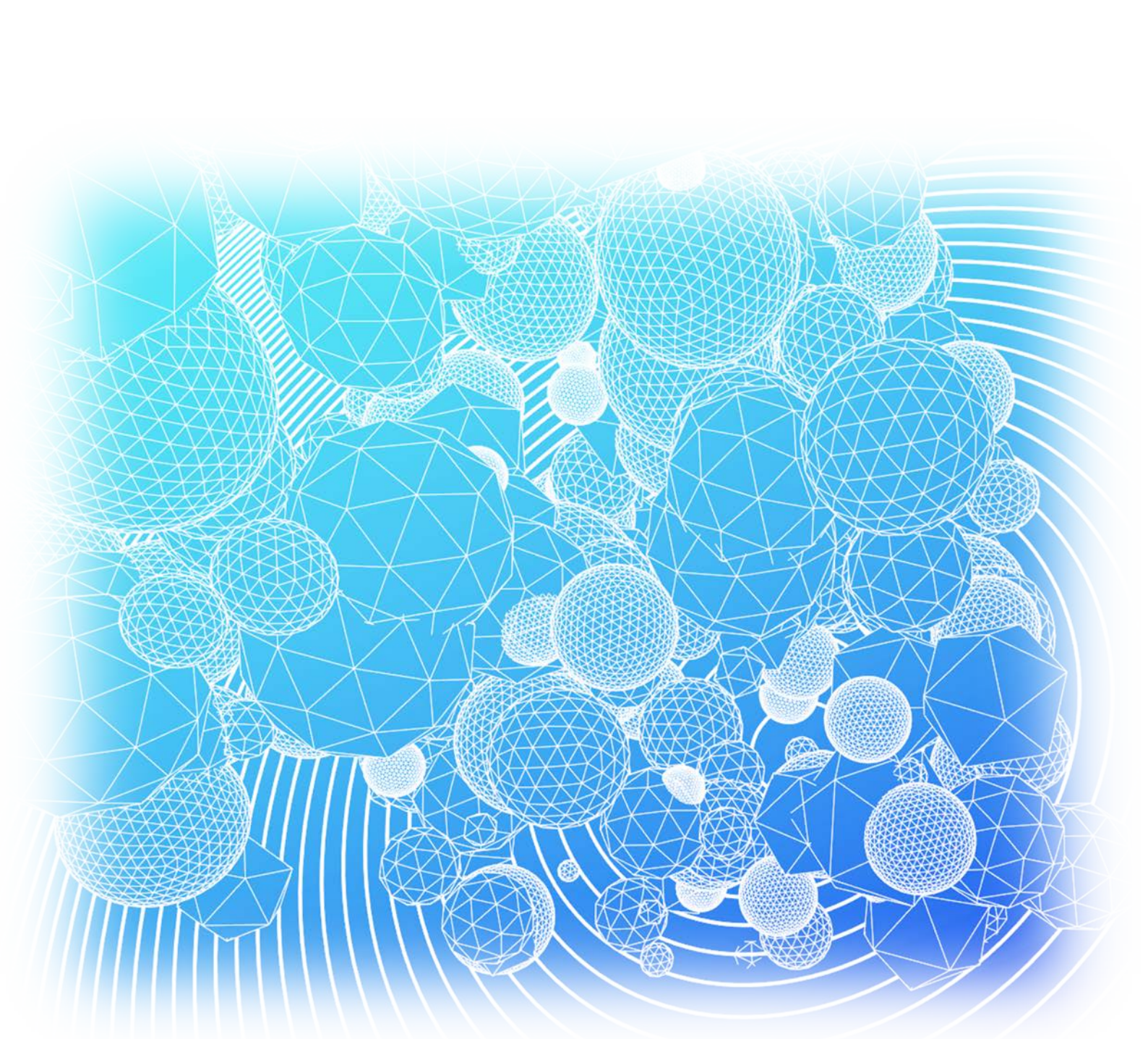


**Appendix L:**  
Health Impact Assessment

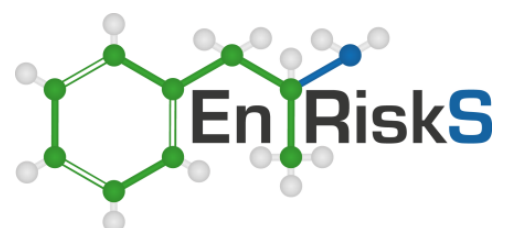
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# Materials Recovery Facility and Rail Freight Terminal: Health Impact Assessment

*Prepared for: Capital Recycling Solutions*

7 February 2018





## Document History and Status

<b>Report Reference</b>	F/18/CRS001
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## Limitations

Environmental Risk Sciences has prepared this report for the use of Purdon Planning Pty Ltd and Capital Recycling Solutions in accordance with the usual care and thoroughness of the consulting profession. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report.

It is prepared in accordance with the scope of work and for the purpose outlined in the Section 1 of this report.

The methodology adopted and sources of information used are outlined in this report. Environmental Risk Sciences has made no independent verification of this information beyond the agreed scope of works and assumes no responsibility for any inaccuracies or omissions. No indications were found that information contained in the reports provided for use in this assessment was false.

This report was prepared in December 2017 to January 2018 and is based on the information provided and reviewed at that time. Environmental Risk Sciences disclaims responsibility for any changes that may have occurred after this time.

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## Glossary of Terms

ACT	Australian Capital Territory
ANZECC	Australia and New Zealand Environment and Conservation Council
Detection limit	The lowest concentration of a chemical that can reliably be distinguished from a zero concentration.
Dose	The amount of a substance to which a person is exposed over some time period. Dose is a measurement of exposure. Dose is often expressed as milligram (amount) per kilogram (a measure of body weight) per day (a measure of time) when people eat or drink contaminated water, food, or soil. In general, the greater the dose, the greater the likelihood of an effect. An 'exposure dose' is how much of a substance is encountered in the environment. An 'absorbed dose' is the amount of a substance that actually got into the body through the eyes, skin, stomach, intestines, or lungs.
EPA	Environment Protection Authority
Exposure	Contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term [acute exposure], of intermediate duration, or long-term [chronic exposure].
Exposure assessment	The process of finding out how people come into contact with a hazardous substance, how often and for how long they are in contact with the substance, and how much of the substance they are in contact with.
Exposure pathway	The route a substance takes from its source (where it began) to its end point (where it ends), and how people can come into contact with (or get exposed) to it. An exposure pathway has five parts: a source of contamination (such as chemical leakage into the subsurface); an environmental media and transport mechanism (such as movement through groundwater); a point of exposure (such as a private well); a route of exposure (eating, drinking, breathing, or touching), and a receiver population (people potentially or actually exposed). When all five parts are present, the exposure pathway is termed a completed exposure pathway.
Guideline value	Guideline value is a concentration in soil, sediment, water, biota, air or noise (established by relevant regulatory authorities such as the NSW Environment Protection Authority or institutions such as the National Health and Medical Research Council (NHMRC), Australia and New Zealand Environment and Conservation Council (ANZECC) and World Health Organisation (WHO)), that is used to identify conditions below which no adverse effects, nuisance or indirect health effects are expected. The derivation of a guideline value utilises relevant studies on animals or humans and relevant factors to account for inter- and intra-species variations and uncertainty factors. Separate guidelines may be identified for protection of human health and the environment. Dependent on the source, guidelines will have different names, such as investigation level, trigger value, ambient guideline etc.
HIA	Health Impact Assessment
LOAEL	Lowest-observed-adverse-effect-level - The lowest tested dose of a substance that has been reported to cause harmful (adverse) health effects in people or animals.
LOR	Limit of Reporting
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NSW	New South Wales
OEH	Office of Environment and Heritage
Point of exposure	The place where someone can come into contact with a substance present in the environment [see exposure pathway].



Population	A group or number of people living within a specified area or sharing similar characteristics (such as occupation or age).
Risk	The probability that something will cause injury or harm.
Route of exposure	The way people come into contact with a hazardous substance. Three routes of exposure are breathing [inhalation], eating or drinking [ingestion], or contact with the skin [dermal contact]
Toxicity	The degree of danger posed by a substance to human, animal or plant life.
Toxicology	The study of the harmful effects of substances on humans or animals.
USEPA	United States Environmental Protection Agency
WHO	World Health Organisation

# Executive Summary

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## **Introduction**

The project, proposed by Capital Recycling Solutions Pty Ltd (CRS), involves the construction and operation of a Materials Recycling Facility (MRF), Rail Freight Terminal (RFT) and waste receipt station on Blocks 9 and 11 Section 8, 16 Ipswich Street, Fyshwick ACT (the 'site'). The site is zoned IZ2 Industrial Mixed Use under the Territory Plan and is located approximately 6 km south-east of Canberra CBD.

The proposed facility on the site will process 300 000 tonnes per annum of municipal solid, commercial and industrial waste and light fractions of construction and demolition waste that would normally be landfilled. Waste will be transported to the site via the existing waste collection network in the ACT. The facility aims to utilise advanced sorting and recycling streams to separate out and generate commercially reusable products for export. Other non-recyclable materials will be sent to landfill by rail.

As part of the development application process for this project is the need to conduct a Health Impact Assessment (HIA).

The overall objective of the HIA is to provide a structured assessment of the direct and indirect impacts associated with the proposed project on the health of the surrounding (local and regional) community. Outcomes of the HIA are used to determine recommendations to be implemented to minimise or mitigate identified negative impacts and maximise positive impacts.

## **Assessment Approach**

The HIA assessment has been conducted as a desktop assessment in accordance with national guidelines available from the Centre for Health Equity Training, Research and Evaluation (CHETRE) (Harris et al. 2007) and enHealth (2001). The HIA has been undertaken on the basis of the information provided in the Draft EIS and the specialist studies as outlined in **Table 1**.

The conduct of an HIA is intended to provide a structured, solution-focused and action-oriented approach to maximising the positive and minimising the negative health impacts of a proposed project. This HIA has therefore been conducted to identify and address potential social, economic and environmental impacts of the project on health and provide recommendations to enhance positive impacts and mitigate negative impacts.

## **Outcomes of the HIA**

The HIA has considered the operation of the proposed project and potential impacts to the health of the off-site community. The assessment has considered a range of issues that have the potential to affect the health of the community (either positive or negative), which relate to changes to noise, hazards (including fire, hazardous waste and bushfire risks), odour, traffic, visual landscape, pestilence, economic and social environment.

Based on the assessment undertaken, the project is associated with some benefits to the community, particularly in relation to employment. Where negative impacts have been identified,



these are considered to be negligible in terms of community health due to the suggested and proposed process design, control, mitigation and management measures to be implemented. **Table ES-1** presents a summary of the HIA undertaken.

**Table ES-1 Summary of HIA Outcomes and Enhancement/Mitigation Measures**

Health Aspect/Issue	Reference in HIA	Impact Identified (positive or negative and significance)	Health Impacts	Types of measures that could be implemented to enhance positive impacts or mitigate negative impacts
Odour	Section 5	Negative but negligible	Annoyance, stress, anxiety at levels below defined health effects.	The odour assessment has outlined emissions control and mitigation measures that should be implemented.
Noise	Section 6	Negative but negligible	Sleep disturbance, annoyance, children's school performance and cardiovascular health.	The noise assessment has outlined mitigation measures required to ensure noise emissions comply with the relevant guidance. Post development monitoring to ensure mitigation measures are effective. Minimise truck movements during the 6am - 7am shoulder period.
Fire	Section 7	Negative but negligible	A major fire incident can result in loss of life, property damage or injury	The Bushfire assessment outline controls and mitigation measures required to ensure the safety of the facility under bushfire conditions. A number of suggestions have been made for onsite management of fires. A comprehensive plan for on-site management of fires is required.
Economic Environment	Section 8	Positive	Reduction in anxiety, stress and feelings of insecurity.	The identified positive outcomes in the local community can be enhanced by encouraging employment of people who live within the local community
Traffic	Section 8	Negative	Injury or death, stress and anxiety.	Ensure truck movements avoid the morning and afternoon peak traffic periods.
Pestilence	Section 8	Negative	Financial loss and possible injury, stress and anxiety.	Ongoing pest control program as part of the operational plan.
Discovery of hazardous waste		Negative	Possible injury if incorrectly disposed of	A comprehensive operational plan for the discovery and safe disposal of hazardous waste is required.
Social aspects of sustainable project	Section 8	Positive for some	Enhanced feelings of wellbeing	None identified.
Feelings of control over life decisions	Section 8	Negative if not managed with effective communications	Increased levels of anxiety and stress.	These health impacts relate to community perceptions and trust. It is therefore important that the positive impacts associated with the project are enhanced within the local community and community consultation is continued and uses a range of techniques that are tailored to the various sub-populations that have particular areas of concern or particular characteristics that make normal methods of communication less effective. It is important that an effective communication/ community consultation program is maintained throughout the construction, commissioning and operational phases of the project.



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## Section 1. Introduction

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### 1.1 Background

The project, proposed by Capital Recycling Solutions Pty Ltd (CRS), involves the construction and operation of a Materials Recycling Facility (MRF), Rail Freight Terminal (RFT) and waste receipt station on Blocks 9 and 11 Section 8, 16 Ipswich Street, Fyshwick ACT (the 'site'). The site is zoned IZ2 Industrial Mixed Use under the Territory Plan and is located approximately 6 km south-east of Canberra CBD (**Figures 1 & 2**).

The proposed facility will process 300 000 tonnes per annum of municipal solid, commercial and industrial waste and light fractions of construction and demolition waste that would normally be landfilled. Waste will be transported to the site via the existing waste collection network in the ACT. The facility aims to utilise advanced sorting and recycling streams to separate out and generate commercially reusable products for export. Other non-recyclable materials will be sent to landfill by rail.

Development approval is being sought for the facility development which includes (**Figure 3**):

- Weighbridges and weighbridge offices
- Material Recycling Facility building
- Rail Freight Terminal
- Office
- Car park and hard stand area.



**Figure 1: Site location**



Figure 2: Land use zoning around the project site



Figure 3: Proposed development seeking approval



Part of the development approval process is a need to conduct a Health Impact Assessment (HIA) to assess the health impacts on the surrounding community. The following requirements for have been made by the ACT Government:

- *Provide a formal Health Impact Assessment (HIA) that includes an analysis of the potential impacts on human health and any measures incorporated into the development to mitigate these impacts*
- *The HIA will investigate all positive and negative health implications including consultation with relevant stakeholders that may be impacted by the proposal*
- *Provide maps showing impacts on the surrounding sensitive receivers*
- *Detailed discussion of the potential social and economic impacts associated with the proposal*
- *Describe the suitability of the land for the type of proposal described in terms of socioeconomics and health*
- *Outline risk and mitigation measures relating to potential health impacts associated with harbouring vermin and pest animals*

Further ACT Health note that *the proposed development is located within proximity to residential and industrial mixed zones areas. ACT Health believes the conduct of a formal HIA would facilitate the appropriate avoidance or mitigation of any identified negative health impacts as well as the promotion of subsequent positive impacts.*

## **1.2 Objectives**

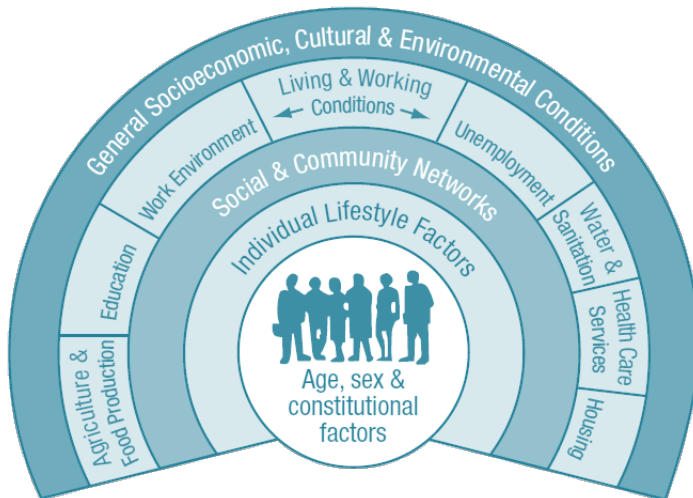
The overall objective of the HIA is to follow the requirement set by the ACT Government in terms of assessing and evaluating health impacts from the project as outlined above.

## **1.3 Approach and scope of works**

The HIA has been undertaken in accordance with the following guidance (and associated references as relevant):

- Harris, P., Harris-Roxas, B., Harris, E. & Kemp, L., Health Impact Assessment: A Practical Guide, Centre for Health Equity Training, Research and Evaluation (CHETRE). Part of the UNSW Research Centre for Primary Health Care and Equity. University of New South Wales, Sydney, 2007 (Harris 2007);
- enHealth, 2001. Health Impact Assessment Guidelines (enHealth 2001);
- enHealth, 2012. Environmental Health Risk Assessment: Guidelines for Assessing Human Health Risks from Environmental Hazards (enHealth 2012).

The above guidance requires the consideration of impacts that relate to a wider definition of health and well-being within the community. Health and health inequalities are affected by a wide range of factors, as illustrated below. These factors may be affected by a specific project in different ways. In some cases, the changes will result in negative impacts on health (and hence the HIA needs to determine what these impacts are and how they can be minimised) or positive impacts or benefits (and it is important that the HIA identify these and determine if these benefits can be enhanced).



**Figure 4: Wider determinants of health, as presented by Harris et al (2007)**

In accordance with this guidance the HIA has been undertaken as a desk-top assessment, based on information available (See **Section 1.5**). The HIA has evaluated positive and negative impacts, from the following key technical studies:

- Environmental Impact Statement (EIS)
- Community Stakeholder and Engagement Report
- Odour Assessment
- Noise Assessment
- Bush Fire Protection Assessment
- Scoping Application
- Traffic Assessment

## 1.4 Definitions

For the conduct of the HIA the following definitions are relevant and should be considered when reading this report.

### **Health:**

The World Health Organisation defines health as “a (dynamic) state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity”.

Hence the assessment of health should include both the traditional/medical definition that focuses on illness and disease as well as the more broad social definition that includes the general health and wellbeing of a population.

### **Health Hazard:**

These are aspects of the Project, or specific activities that present a hazard or source of negative risk to the health or well-being.

In relation to the HIA these hazards may be associated with specific aspects of the proposed development/construction or operational activities, incidents or circumstances that have the



potential to directly affect health. In addition, some activities may have a flow-on effect that results in some effect on health. Hence health hazards may be identified on the basis of the potential for both direct and indirect effects on health.

***Health Outcomes:***

These are the effects of the activity on health. These outcomes can be negative (such as injury, disease or disadvantage), or positive (such as good quality of life, physical and mental wellbeing, reduction in injury, diseases or disadvantage).

It is noted that where health effects are considered these are also associated with a time or duration with some effects being experienced for a short period of time (acute) and other for a long period of time (chronic). The terminology relevant to acute and chronic effects is most often applied to the assessment of negative/adverse effects as these are typically the focus of technical evaluations of various aspects of the project.

***Likelihood:***

This refers to how likely it is that an effect or health outcome will be experienced. It is often referred to as the probability of an impact occurring.

***Risk:***

This is the chance of something happening that will have an impact on objectives. In relation to the proposed project and the conduct of the HIA, the concept of risk more specifically relates to the chance that some aspect of the project will result in a reduction or improvement in the health and/or well-being of the local community. The assessment of risk has been undertaken primarily on a qualitative basis.

**Equity:**

Equity relates to the potential for the project to lead to impacts that are differentially distributed in the surrounding population. Population groups may be advantaged or disadvantaged based on age, gender, socioeconomic status, geographic location, cultural background, aboriginality, and current health status and existing disability.

**1.5 Technical reports**

In relation to the proposed project, and potential for impacts within the local community, this HIA has been developed on the basis of information provided within a wide range of specialist/technical reports prepared as part of the development application process. The following table presents a summary of the specialist/technical reports that have been used in the completion of the HIA. Note that other sources of information have also been utilised in this document, and these are referenced throughout the report.

**Table 1 Summary of available specialist/technical reports**

Report Title	Status/Date	Technical Areas Addressed in Report
Rudds, 2018. Noise Management Plan - Capital Recycling Solutions Materials Recycling Facility And Rail Freight Terminal Rudds Acoustics.	7 February 2018	Noise
The Odour Unit, 2017. Capital Recycling Solutions Materials Recovery Facility and Rail Freight Terminal Odour Impact Assessment. The Odour Unit Pty Ltd	January 2018	Odour
AECOM, 2017. Traffic and Transport Assessment, Block 9 and 11 – Section 8 Fyshwick ACT. AECOM	20 December 2017	Traffic
CRS, 2017 Advanced Waste Management for the ACT – Scoping Application. Capital Recycling Solutions	November 2017	Project description, economic impacts
Blackash 2017 Capital Recycling Solutions Waste Facility 16 Ipswich Street & Lithgow Street Fyshwick - Bushfire Risk Assessment and Management Plan. Blackash Bushfire Consulting	13 December 2017	Bushfire hazard
Purdon Planning 2018 Environmental Impact Statement, Capital Recycling Solutions, Block 9 + Block 11 Section 8. Purdon Planning	January 2018	Project description, Vermin control, hazardous waste handling, fire control, visual impact
Newgate, 2017 Environmental Impact Statement – Fyshwick Recycling and Rail Freight Proposal, Community and Stakeholder Engagement Report. Newgate Engage	November 2017	Community perceptions

## Section 2. Project Description

### 2.1 Site description and location

The site (Blocks 9 and 11 Section 8, 16 Ipswich Street, Fyshwick ACT) is located within the Industrial Mixed Use IZ2 zone of the Territory Plan of the Fyshwick industrial area. The site is approximately 6 km south east of Canberra CBD and borders the 'south shunt' rail corridor to its north east. (Figures 1 & 2).

The site is surrounded by commercial and industrial zoned land on all sides. These include a variety of retail stores, firewood yard and a scrap metal facility on Lithgow Street. The nearest residents are in Matina Street Narrabundah, approximately 630 metres to the south-west from the nearest boundary of the site. Although not zoned residential, the Canberra South Motor Park is located approximately 450 m to the south of the nearest boundary of the site **Figure 5**.



**Figure 5: Location of nearest residents (Purdon Planning 2018)**

When developed the site will be accessed using Ipswich and Lithgow Streets and via the 'south shunt' railway siding.

### 2.2 Project infrastructure and layout

The following structures and infrastructure are intended to be located on the site (refer to **Figure 3** for an artist's impression of the site):

- Weighbridges and weighbridge offices
- Material Recycling Facility building
- Rail Freight Terminal
- Office
- Car park and hard stand area.

### 2.3 Process

In this application CRS propose to process municipal solid waste, commercial and industrial and construction and demolition waste into recyclable and non-recyclable segments. The recyclable products will be exported offsite while the non-recyclable products will be sent to landfill.

Wastes will be delivered via a security controlled gateway from Lithgow Street. Vehicles will be weighed upon entry and then proceed into an outer negative pressurised building. Vehicles will unload and pass through a wheel wash after exiting the building and leave the site via a new signalised intersection at Ipswich Street. All waste will be immediately fed into the MRF after receipt (Figure 6).

The MRF separates and removes commercially recyclable materials such as paper, cardboard, certain plastics and metals. Inert and non-combustible materials such as glass, soil, aggregates are also separated out and exported from site. Plastics #1 (HDPE), #2 (PET) and #3 (PVC), metals, clean paper and other extracted recyclables are intended to be baled, containerised and ideally shipped via rail from the site for sale into the appropriate recycling commodities market.

Baling and packaging into containers of recyclable materials will be done onsite, inside the shed and will utilise the adjacent railway siding and train line to transport some of these materials interstate (CRS 2017).

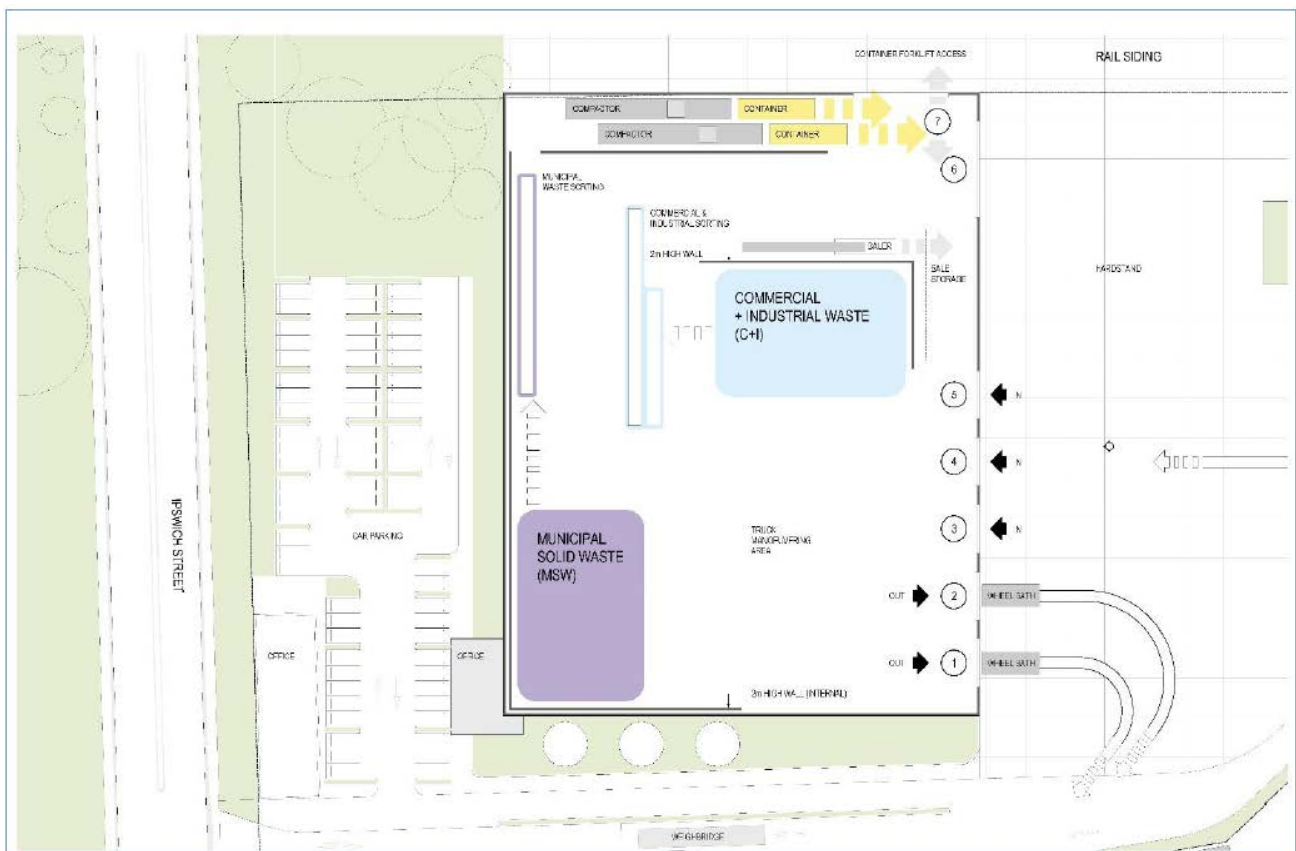


Figure 6 Proposed operational layout (CRS 2017)

## Section 3. Community Profile

This section provides an overview of the community potentially impacted by the proposed project. It is noted that the key focus of the assessment presented is the local community surrounding the site, not the workers who may be employed on the site.

The site is located in a mixed industrial area, surrounded by non-urban broad acre areas, with residential suburbs located to the west and south west of the site (refer to **Figure 1**). Although the non-urban broad acre areas may change to residential land use in the future, these areas are not closer to the proposed development than the current residential population at Narrabundah.

**Table 2** presents a summary of the populations who may live in suburbs adjacent to and surrounding the proposed site (based on 2016 Census and 2011 Socio-Economic data from the Australian Bureau of Statistics).

**Table 2 Summary of Populations Surrounding Proposed Project Site**

Indicator	Suburb or Statistical Area	ACT	Australia
	Narrabundah		
Total population	5960	403900	24051057
Population 0 - 4 years	6% (357)	6.7% (26795)	6.3% (1464779)
Population 5 - 19 years	17.6% (1047)	18.2% (72193)	18.5% (4321424)
Population 20 - 64 years	60.3% (3592)	62.5% (248448)	59.7% (13938913)
Population 65 years and over	15.9% (1285)	12.5% (49969)	15.8% (3676763)
Median age	41	35	38
Household size	2.3	2.6	
Unemployment	5.5%	4.7%	6.9%
Tertiary education	17.6%	26%	16.1%
SEIFA IRSAD	1094	1090	
SEIFA rank	10	10	
SEIFA IRSD	1076	1076	
SEIFA rank	9	10	
Indigenous	2.6%	1.6%	2.7%
Born overseas	35%	32%	33%
Speak other language at home	22%	24%	22%

SEIFA IRSAD = index of socioeconomic advantage and disadvantage, rank relates to rank in Australia that ranges from 1 = most disadvantaged to 10 = least disadvantaged

SEIFA IRSD = index of socioeconomic disadvantage, rank relates to rank in Australia that ranges from 1 = most disadvantaged to 10 = least disadvantaged

Shading relates to comparison against ACT: lower than:  greater than

[http://www.censusdata.abs.gov.au/census\\_services/getproduct/census/2016/quickstat/SSC80097?opendocument#employment](http://www.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC80097?opendocument#employment) (for Narrabundah ACT)

**Figure 6 Land Use Zoning Surrounding Site**

Based on the population data available and presented in **Table 2**, the community surrounding the site are slightly older than those seen in the ACT, however are representative of age distribution in Australia. The unemployment rate is also slightly higher than in the ACT, while being lower than the national average. The Narrabundah area also has a slightly higher indigenous and foreign born



population, and lower tertiary education than the ACT. However, the Narrabundah area has very little socioeconomic disadvantage when compared to the rest of Australia.

The health of the community is influenced by a complex range of interactive factors including age, socio-economic status, social capital, behaviours, beliefs and lifestyle, life experiences, country of origin, genetic predisposition and access to health and social care. The health indicators available and reviewed in this report generally reflect a wide range of these factors.

The population adjacent to the proposed site is relatively small (compared to that for the larger ACT area). Hence health data is not available that specifically relates to this population. However, it is assumed that the health of the local community is consistent with that reported in the larger ACT area. This expectation is based on the relatively similar make up of the Narrabundah population to the ACT population (**Table 2**) along with the lack of socioeconomic disadvantage.

**Table 3** presents a summary of the general population health considered relevant to the area. The table presents available information on health-related behaviours (i.e. key factors related to lifestyle and behaviours known to be of importance to health) and key indicators for the burden of disease within the community compared to NSW and Australia. The statistics presented have been obtained from ACT Health<sup>1</sup> and NSW Health<sup>2</sup>.

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<sup>1</sup> <http://stats.health.act.gov.au/> and <http://www.health.act.gov.au/healthy-living/population-health>

<sup>2</sup> <http://www.healthstats.nsw.gov.au/>

**Table 3 Summary of Health Indicators/Data**

Health indicator/data	ACT	NSW/Australia
<b>Health behaviours</b>		
Adults adequate consumption of fruit (2013-2014)	58.4 female 46.1 male	53.9% for NSW
Children adequate consumption of fruit (2013-2014)	69.6% female 67.4% male	68.5% for NSW
Adults adequate consumption of vegetables (2013-2014)	12.3% female 6.5% male	7.4% for NSW
Children adequate consumption of vegetables (2013-2014)	4.4% female 4.8% male	8.1% for NSW
Adults risky alcohol drinking (2013-2014)	25.7% female 44% male	26.6% for NSW
Adults body weight (2014-2015)	39.1% overweight 23.9% obese	33.4% overweight NSW 18.9% obese NSW
Children body weight (2013-2014)	20.1% overweight 6.1% obese	20% overweight or obese NSW
Adults – adequate physical activity (2013-2014)	56%	42.9% for NSW
Daily smoking (2013-2014)	10%	11.5% for NSW 13% for Australia
Life expectancy (2014)	85.2 female 81.4 male	84.4 female for Australia 80.3 male for Australia
<b>Burden of disease</b>		
Mortality all causes (2012)	428.8* female 592.4* male	561.9* for NSW 467.1 female 675.1 male
Mortality – cardiovascular disease (2012)	141.4* #	165.6* for NSW
Mortality – respiratory disease (2012)	42* #	52.3* for NSW
Adults - prevalence of asthma (2011-2012)	10.2% #	10.1% for NSW
Children – prevalence of asthma (2011-2012)	11.1% #	15.4% for NSW

\* Rate per 100,000 population

# 2014 ACT CHO report

Shading relates to comparison against NSW and Australia:  lower than,  greater than

In general, the key indicators of health for the population in the ACT, when compared with the rates for NSW or Australia show:

- Lower levels of mortality from cardiovascular and respiratory disease
- Lower rates for child asthma
- Higher rates of overweight and obesity
- Higher rates of risky alcohol consumption in males
- Lower intake of vegetables by children
- Greater physical activity and life expectancy.

This data, along with data presented in **Table 2**, does not suggest the population in the areas surrounding the site are likely to be more susceptible to health-related impacts associated with the project, than any other population in NSW.

## Section 4. Community Consultation

A community consultation program has been undertaken as part of the EIS process, as outlined by Newgate (2017). Community consultation commenced in July 2017 and continued until late November 2017. It included the provision of information to residents, businesses, stakeholder and community groups, two-way interaction on a range of issues relating to the project, and community and stakeholder feedback (**Figure 7**).



**Figure 7 Community and stakeholder consultation process (modified from Newgate 2017)**



Specifically, engagement has been undertaken through the development of a website, establishment of a free call number and email, regular media articles, door knocking, letterbox drops and stakeholder and community meetings.

Key issues raised during the consultation period that related to community health (either directly or indirectly) for this proposal were as follows:

- Traffic congestion and safety
- Negative perceptions that may impact businesses and devalue house prices
- Job creation
- Health impact on children (400 children within 2 km of the proposed facility)
- Visual and noise impacts
- Odour impacts
- Fire at the facility

While not considered in this list, the most common health issue raised during the consultation process related to impacts from air emissions. These concerns were not connected to the current proposal, but rather to a waste to energy plant, and emissions from it. Any waste to energy plant would need to be assessed under a separate application and EIS process.

## Section 5. Health Impacts: Odour

### 5.1 Approach

This section presents a review of impacts on health associated with odour, relevant to the operation of the facility. The assessment presented has relied on the Odour Impact Assessment undertaken by The Odour Unit 2018.

### 5.2 Summary of the Odour Impact Assessment

#### 5.2.1 Odour assessment background

The Odour Impact Assessment provides an assessment of the odour impacts that may emanate from the proposed facility. The assessment is based on odour guidelines provided by the NSW Environment Protection Authority (NSW EPA), as there are no specific ACT guidelines. The NSW guidelines (Technical framework (and notes): assessment and management of odour from stationary sources in NSW) define actions and assessment criteria that should be met when proposing the development of a new facility **Table 4** lists these criteria, which are assessed in terms of odour units.

**Table 4 Odour Assessment Criteria (NSW DEC 2006)**

Population of Affected Community	Odour Assessment Criteria (OU odour units)
Rural 1 residence (i.e. approx. 2 people)	7
Rural ~10 people	6
Rural ~30 people	5
Rural ~125 people	4
Rural ~500 people	3
Urban >2000 people and/or schools/hospitals	2

Odour units are a theoretical measure of olfactory sensitivity, such that 1 odour unit (OU) is the theoretical minimum concentration that produces an olfactory response or sensation (also known as the 'odour threshold'). Not everyone has the same smell sensitivity, with only a few (sensitive) individuals being able to detect smells at this range.

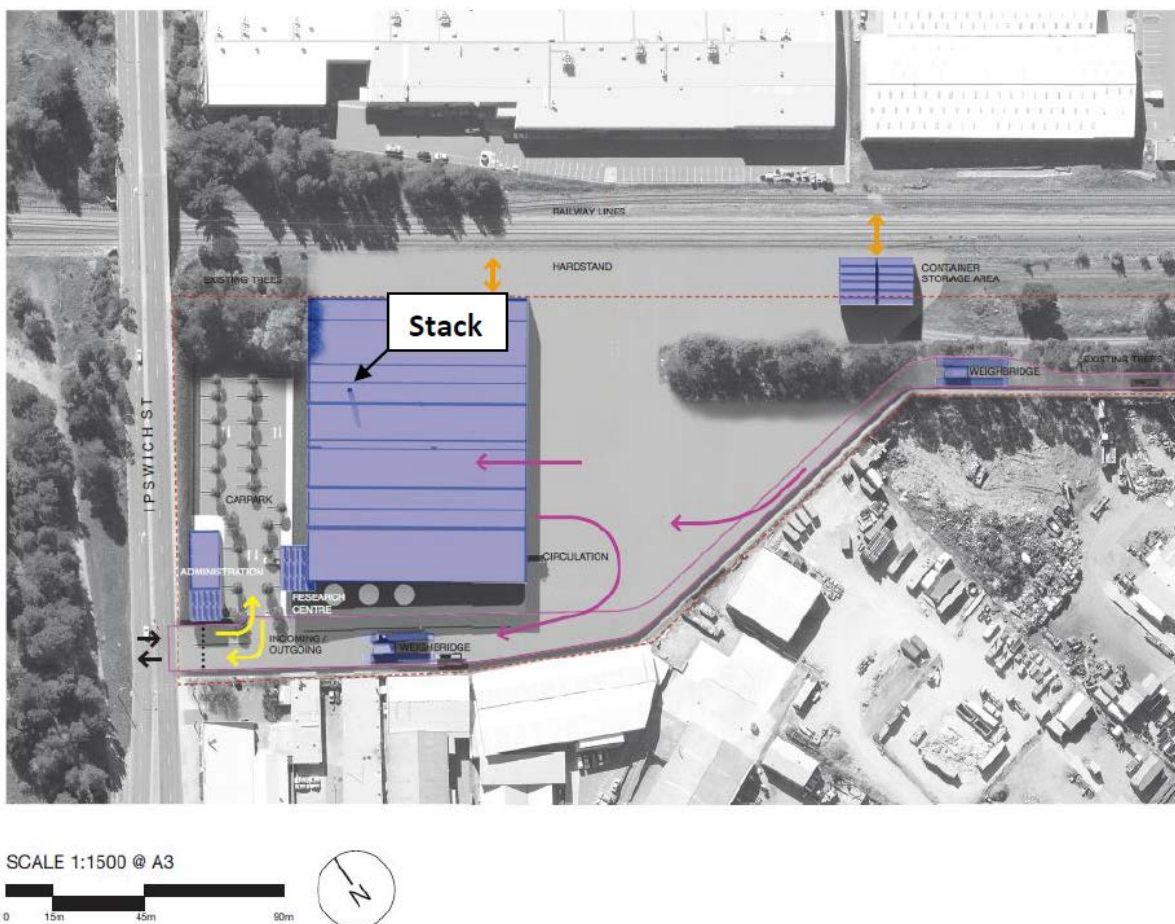
The NSW EPA consider an odour assessment as addressing an amenity issue rather than a strict health issue and advocate that a separate health risk assessment of odorous chemicals be undertaken to inform health risks. However, given that the WHO define health as *a (dynamic) state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity* an odour assessment addresses important quality of life issues.

Research undertaken by the NSW EPA found that odours in the range of 2 OU to 10 OU will be perceived as a nuisance, depending on a number of factors including odour quality, intensity and frequency, population sensitivity, and public expectation (NSW DEC 2006). Experience gained by the NSW EPA through odour assessments for proposed and existing facilities in NSW indicated that an odour performance criterion of 7 OU is not likely to represent an 'offensive' odour to an individual with 'standard sensitivity to odours. Above this level and individuals are more likely to develop adverse physiological and/or psychological health effects. Therefore, the NSW EPA recommends

that no individual be exposed to ambient odour levels greater than 7 OU. While setting a maximum odour exposure limit at 7 OU, the NSW EPA acknowledged that there are some ‘sensitive’ individuals within our community who may perceive an odour as a nuisance at lower levels. To adjust for the probability of these individuals being within an affected community, the NSW EPA have reduced the odour unit criteria based on population and / sensitive location, as specified in **Table 4**. The odour criteria should be measured against the 1 second highest or 99% highest concentration modelled. The 1 second concentration is used as it represents a nose response time to an odour.

### 5.2.2 Site assessment

The site is located in an industrial / urban area and as such an odour unit criterion of 2 OU was used in the assessment undertaken by The Odour Unit 2018. Odour will occur as waste is deposited, sorted and distributed on the site. These actions are proposed to occur solely within the main building which is planned to have an odour vent stack, fast action doorways and air exchange rate of 5 air changes per hour. Therefore, odour emissions from the site are expected to occur as a result of vent stack emissions from the main building and fugitively, as trucks move in and out of the main building where the building doors need to be opened and closed. **Figure 8** provides a site diagram of the main building with the proposed stack.



**Figure 8 Main building and source of odour (The Odour Unit 2018)**

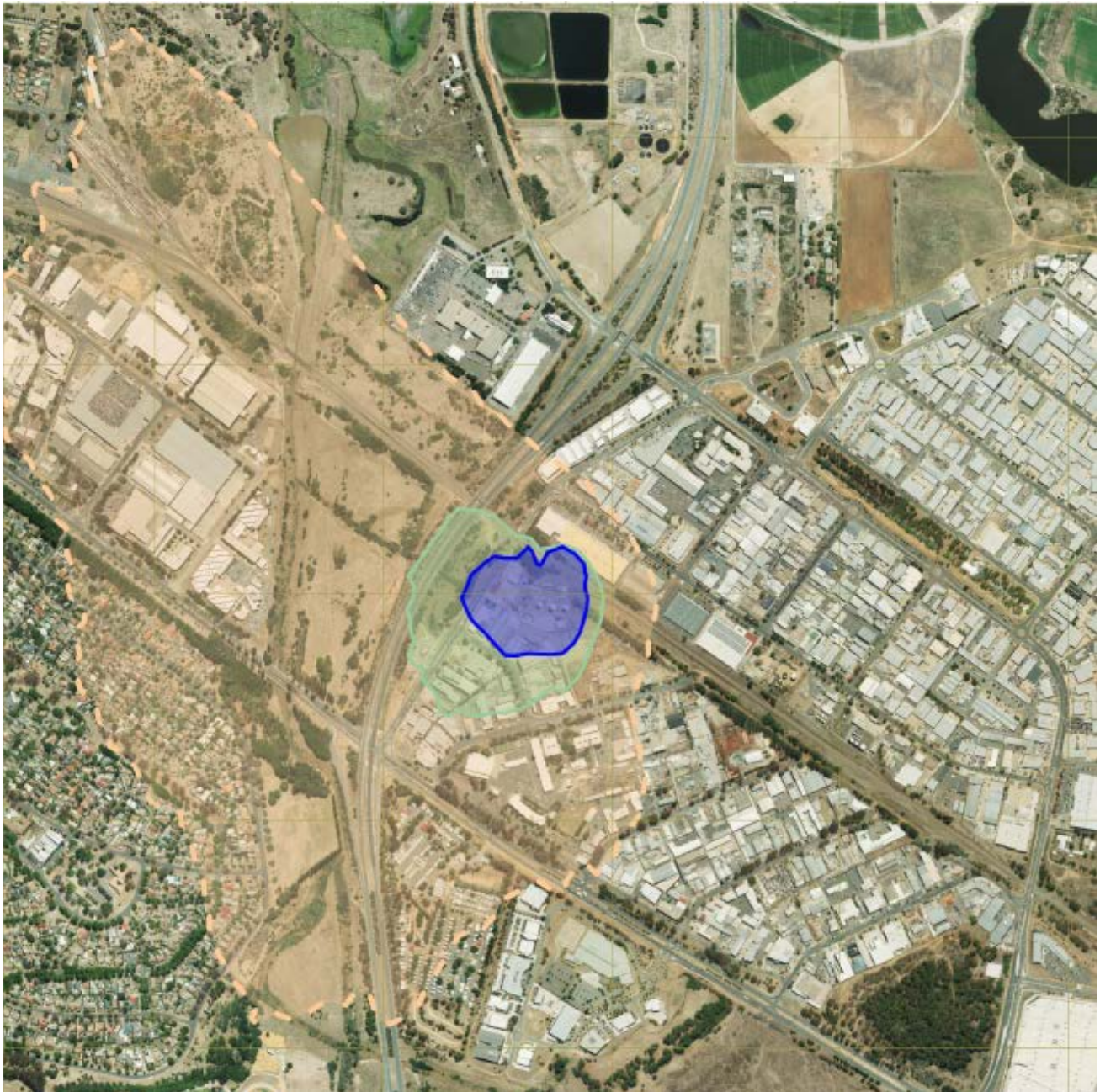
The Odour Unit modelled three potential odour impact scenarios. These were:

- Scenario A – “benchmark design” predicted stack emissions and 5% fugitive emissions from truck movements in and out of the building,
- Scenario B – “sensitivity test” predicted stack emissions and 10% fugitive emissions from truck movements in and out of the building, and
- A theoretical sensitivity analysis of uncontrolled odour emissions from the site.

Odour concentrations were based on likely rubbish composition and its associated odour emission factors. It was conservatively assumed that the site operated 7 day a week with processing of the waste between the hours of 6am – 10 pm. For scenario A & B it was also assumed that:

- The rubbish tipping area was fully enclosed with the building under negative pressure and air extracted through the discharge stack,
- Air exchange of the building of at least 5 exchanges per hour,
- A design airflow of 410 000m<sup>3</sup>/h,
- The stack would be located 21 m above ground level and discharge at a velocity of 20m/s, and
- Trucks would enter and exit through fast-action doorways.

**Figure 9** provides the modelled results indicating the impacted area where odour units of 2 or greater are predicted. The blue area represents Scenario A and is predominately impacting on site. The green area encompassing the blue area represents Scenario B and is found to impact some commercial and industrial sites predominantly in the south west. The orange area predicts the odour emissions with no control technology, the impacts intruding into the residential area of Narrabundah to the south west.



**Figure 9 Predicted odour impacts (The Odour Unit 2018)**

The odour assessment predicts no odour impacts for the residential community provided the control measures are in place. Depending on the effectiveness of these control measures, surrounding commercial and industrial enterprises may experience some odour issues.

### **5.3 Particle emissions**

The odour assessment considered particle emissions in a qualitative manner. Based on professional judgement the assessment concluded that the generation of particles at a concentration to cause dust problems outside the facility was most unlikely.

## 5.4 Outcomes of odour impact assessment

Impacts associated with odour emissions	
<b>Benefits</b>	There are no benefits to the off-site community in relation to odour emissions of this type.
<b>Impacts</b>	Based on the odour assessment completed for the proposed project (The Odour Unit 2018), provided appropriate mitigation measures are followed nuisance odours will not impact the surrounding residential community but may be noticed by surrounding industrial and commercial neighbours.
<b>Mitigation</b>	<p>The Odour Unit 2018 use several mitigation assumptions in their model. If these assumptions are not met, the predicted impacts will be worse. The mitigation assumptions include:</p> <ul style="list-style-type: none"> <li>■ The rubbish tipping area being fully enclosed with the building under negative pressure and air extracted through the discharge stack,</li> <li>■ Air exchange of the building of at least 5 exchanges per hour,</li> <li>■ A design airflow of 410 000m<sup>3</sup>/h,</li> <li>■ The stack located 21 m above ground level and have a discharge velocity of 20m/s, and</li> <li>■ Trucks entering and existing through fast-action doorways.</li> </ul> <p>Any odour complaints should be followed up with potential odour suppression or further mitigation measures.</p>

## Section 6. Health Impacts: Noise

### 6.1 Approach

This section presents a review and further assessment of impacts on health associated with noise, relevant to the operation of the facility. The assessment presented has relied on the Rudds (2018) Noise Management Plan.

The site is located within a IZ2 Industrial mixed zone and surrounded by commercial and industrial zoned land on all sides. Specifically, to the south east of the site is a scrap metal recycling facility and concrete batching plant, to the south west is parkland and industrial and warehousing facilities, while to the north of the railway easement are commercial buildings including a Harvey Norman retail outlet, Herzog Steel Manufacturing and other industrial warehouses. The site is in ACT Noise Zone A (land in an industrial zone).

### 6.2 Summary of Noise Management Plan

The Noise Management Plan provided an assessment of operational, construction and road traffic noise impacts based on the ACT Industrial Zones Development Code, the ACT Environment Protection Regulation (2005), Part 3 Noise and the repealed ACT Planning Authority Noise Management Guidelines (1996). From these guidelines the consultants determined the following acceptable noise criteria (**Table 5**).

**Table 5** Determined noise criteria for the proposed facility

Impact / Location	Units		
	(6am–8pm) L <sub>10</sub> dBA	(8pm –10pm) L <sub>10</sub> dBA	(All other times) L <sub>10</sub> dBA
<b>Construction</b>			
All site boundaries	Exempt*	65	55
<b>Operational</b>	<b>Daytime L<sub>10</sub> dBA</b>	<b>Night time L<sub>10</sub> dBA</b>	
All site boundaries	65	55	
<b>Road Traffic</b>	<b>(18 hour) L<sub>10</sub> dBA</b>	<b>(1 hour) L<sub>10</sub> dBA</b>	
Residential and community facilities	63		
Private open space	58		
Pedestrian plaza		69	
Commercial facilities	75		

\*All relevant noise reduction measures mentioned in AS 2436, as in force from time to time, must be implemented.

#### 6.2.1 Background

The existing noise environment includes significant existing road traffic and industrial noise sources. The surrounding roads receive a high proportion of heavy vehicles and high through traffic volumes, and the existing industry include concrete batching and metal recycling.

Short and long term noise monitoring was undertaken. Short term (minutes) monitoring was undertaken on 13 November 2017 at 4 sites, 2 boundary sites and 2 sites near residential receptors. The boundary site monitoring was undertaken on the eastern and western boundaries, with the eastern monitoring dominated by industrial noise and the western monitoring by road traffic noise. The two off-site monitoring were placed to the south between the Canberra South Motor Park and the Monaro Highway and Matina Street Narrabundah and the Monaro Highway. These sites were chosen to represent receptor exposure to noise from trucks entering and existing the Monaro Highway. Traffic noise was dominant at both sites, but less so at the Matina Street site.

Long term monitoring was undertaken between the Canberra South Motor Park and the Monaro Highway (**Figure 10**) from 17 November 2017 to 23 November 2017.



**Figure 10** Long term noise monitoring location (Rudds 2018)

For the seven days of monitoring the average of the monitoring results were a  $L_{10(18 \text{ hour})}$  of 60 dBA, a daytime  $Leq_{(1 \text{ hour})}$  of 63 dBA and a night time  $Leq_{(1 \text{ hour})}$  of 62 dBA.

### 6.2.2 Construction noise

No assessment of potential construction noise was provided in Rudds 2018. It is noted that from 6am – 8 pm the site is exempt from meeting noise criteria provided all relevant noise reduction

measures mentioned in AS 2436 are implemented. Therefore, it is important that construction only takes place during these hours and all noise reduction measures are implemented to minimise any impact.

### 6.2.3 Operational noise

Operational noise was estimated based on a daytime operation of receiving waste (via truck movements and associated activities) and train loading and unloading activities. From 6am – 7am truck movements were modelled while from 10pm – 6am no site operations were expected to occur, and therefore no modelling was undertaken for this period. Typical noise levels for equipment predicted to be on or entering the site were used in the model.

Daytime noise levels were not found to be compliant with the relevant noise criteria, while at the southern boundary noise from 6am – 7am was not compliant with the relevant criteria. To reduce the predicted level of noise Rudds 2018 recommended a boundary fence (acoustic barrier) along the southern boundary of a height no less than 2.7m and equipment silencing kits on the container handlers. These interventions were predicted to bring all noise impacts into compliance except for the noise generated from 6am - 7am.

### 6.2.4 Traffic noise

Traffic noise was modelled based on predictions in AECOM 2017 of up to 230 inbound heavy vehicle movements per day. Modelled impacts were undertaken at the estimated nearest residential premises (Canberra South Motor Park and Matina Street, Narrabundah) and nearest commercial properties. Modelled noise levels complied with relevant criteria.

## 6.3 Health impacts associated with noise

Environmental noise has been identified (I-INCE 2011; WHO 2011) as a growing concern in urban areas because it has negative effects on quality of life and well-being and it has the potential for causing harmful physiological health effects. With increasingly urbanised societies impacts of noise on communities have the potential to increase over time.

Deciding on the most effective noise management options in a specific situation is not just a matter of defining noise control actions to achieve the lowest noise levels or meeting arbitrarily chosen criteria for exposure to noise. The goal should be designed to achieve the best available compromise between the benefits to society of reduced exposure to community noise versus the costs and technical feasibility of achieving the desired exposure levels given the project. On the one hand, there are the rights of the community to enjoy an acceptably quiet and healthy environment. On the other hand there are the needs of the society for new or upgraded facilities, industries, roads, recreation opportunities etc, all of which typically produce more community noise (I-INCE 2011; WHO 2011).

Sound is a natural phenomenon that only becomes noise when it has some undesirable effect on people or animals. Unlike chemical pollution, noise energy does not accumulate either in the body or in the environment but it can have both short-term and long-term adverse effects on people. These health effects include (WHO 1999, 2011):

- Sleep disturbance (sleep fragmentation that can affect psychomotor performance, memory consolidation, creativity, risk-taking behaviour and risk of accidents)

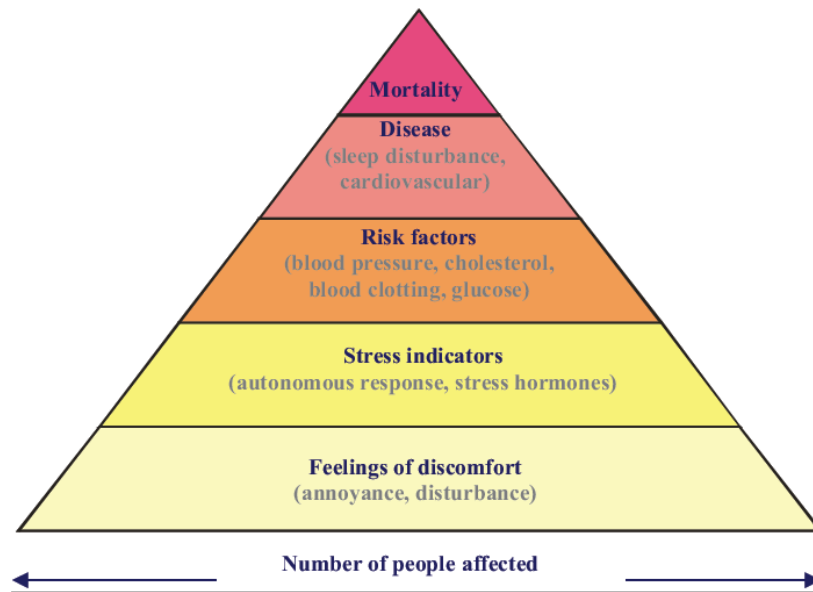


- Annoyance
- Hearing impairment
- Interference with speech and other daily activities
- Children's school performance (through effects on memory and concentration)
- Cardiovascular health.

Other effects for which evidence of health impacts exists, but for which the evidence is weaker, include:

- Effects on mental health (usually in the form of exacerbation of existing issues for vulnerable populations rather than direct effects)
- Tinnitus (which can also result in sleep disturbance, anxiety, depression, communication and listening problems, frustration, irritability, inability to work, reduced efficiency and a restricted participation in social life)
- Cognitive impairment in children (including deficits in long term memory and reading comprehension)
- Some evidence of indirect effects such as impacts on the immune system.

Within a community the severity of the health effects of exposure to noise and the number of people who may be affected are schematically illustrated in **Figure 11**.



**Figure 11 Schematic of severity of health effects of exposure to noise and the number of people affected (WHO 2011)**

Often, annoyance is the major consideration because it reflects the community’s dislike of noise and their concerns about the full range of potential negative effects, and it affects the greatest number of people in the population.

There are many possible reasons for noise annoyance in different situations. Noise can interfere with communication or other desired activities. Noise can contribute to sleep disturbance, which can obviously be very annoying and has the potential to lead to long-term health effects. Sometimes noise is just perceived as being inappropriate in a particular setting without there being any objectively measurable effect at all. In this respect, the context in which sound becomes noise can be more important than the sound level itself.

Different individuals have different sensitivities to types of noise and this reflects differences in expectations and attitudes more than it reflects any differences in underlying auditory physiology. A noise level that is perceived as reasonable by one person in one context (for example in their kitchen when preparing a meal) may be considered completely unacceptable by that same person in another context (for example in their bedroom when they are trying to sleep). In this case the annoyance relates, in part, to the intrusion from the noise. Similarly, a noise level, which is considered to be completely unacceptable by one person, may be of little consequence to another even if they are in essentially the same room. In this case, the annoyance depends almost entirely on the personal preferences, lifestyles and attitudes of the listeners concerned.

It is against this background that regulators in various communities have established sound level criteria above which noise is deemed to be unacceptable and below which it is deemed to be acceptable. Any assessment of noise impacts needs to consider the relevant criteria established for a new or existing (or upgraded) facility or activity. Where there are impacts in excess of these guidelines, an assessment of noise mitigation is required to be undertaken.

In relation to this project, potential noise impacts have been assessed against criteria that have been established on the basis of the relationship between noise and health impacts. The basis for the development of the ACT noise criteria is not available, however, the noise criteria outlined in the ACT *Environmental Protection Regulation 2005* are consistent with, and sometimes lower than those presented in the NSW Industrial Noise Policy (NSW EPA 2000). The NSW policy is based on the health effects of noise outlined in the reviews published by the following organisations:

- World Health Organisation – *Guidelines on Community Noise – Health effects of noise* (WHO 1999)
- World Health Organisation – *Night Noise Guidelines for Europe* (WHO 2009)
- International Institute of Noise Control Engineering – *Guidelines for Community Noise Impact Assessment and Mitigation* (I-INCE 2011)
- Environmental Health Council of Australia – *The health effects of environmental noise – other than hearing loss* (enHealth 2004).

Except for the morning shoulder period during operation, the proposed project can be designed and operated to comply with the ACT noise policies, provided appropriate mitigation measures are followed. Therefore, adverse health impacts from noise are unlikely.

#### 6.4 Outcomes of health impact assessment

Health impacts associated with noise emissions	
<b>Benefits</b>	There are no benefits to the off-site community in relation to noise emissions
<b>Impacts</b>	Based on the noise management plan completed for the proposed project (Rudds 2018), provided appropriate mitigation measures are followed adverse health impacts relevant to exposures to noise generated from the operation of the facility that may occur within the off-site community is unlikely.
<b>Mitigation</b>	<p>Rudds 2018 outline several mitigation measures that should be implemented into the design including:</p> <ul style="list-style-type: none"> <li>■ All relevant noise reduction measures mentioned in AS 2436 for construction noise are undertaken;</li> <li>■ A boundary fence (acoustic barrier) along the southern boundary of a height no less than 2.7m;</li> <li>■ Equipment silencing kits on the container handlers.</li> </ul> <p>Further,</p> <ul style="list-style-type: none"> <li>■ Undertaking of a post development noise study 6 months after final commissioning and annually for 2 years of operation. Part of this should include monitoring at the southern boundary during the shoulder period (6am – 7am), to determine if the guideline is exceeded as predicted. If so, further noise mitigation strategies should be considered including minimising truck movements during shoulder period.</li> </ul>

## Section 7. Health impact assessment: Fires

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### 7.1 Approach

Fire risk to the site may be from external sources such as bushfire or internally through processes like spontaneous combustion. In both cases an adequate fire response strategy is required.

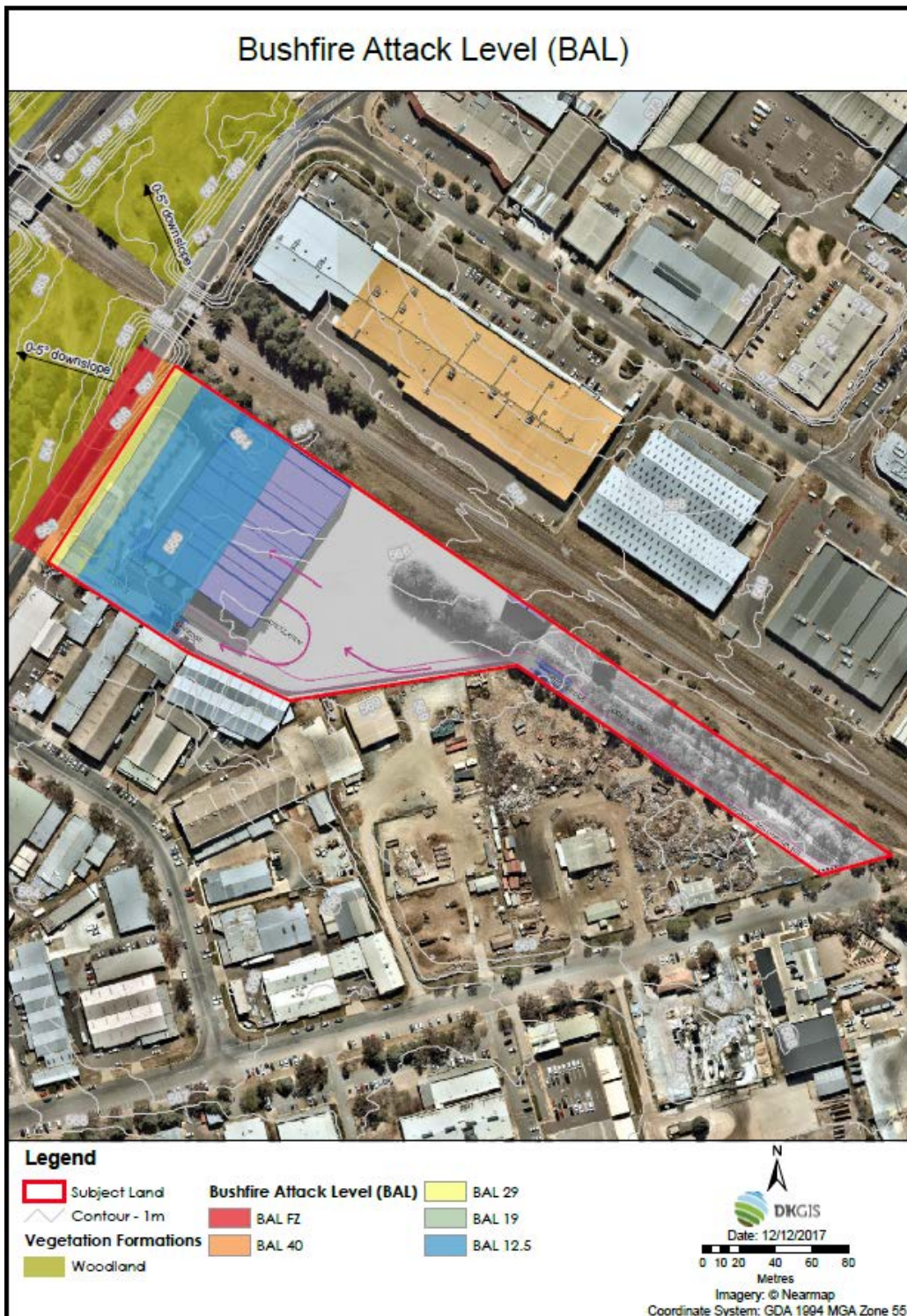
Bushfire risks related to the operation of the proposed facility have been assessed in the Bushfire Risk Assessment and Management Plan by Backash (2017), while internal fire issues have been highlighted in the Environmental Impact Statement by Purdon Planning. The health impacts associated with fire risks as assessed in this chapter have been drawn from these reports.

### 7.2 Overview of bushfire assessment

The site is not located within a Bushfire Prone Area, however a Bushfire Prone Area is adjacent to the site (**Figure 12**). Blackash 2017 has considered risks to the plant from a bushfire using a hazard approach based on nearby vegetation and slope of the land. The vegetation formations (bushfire fuels) and the topography (effective slope) combine to create the bushfire threat that may affect bushfire behaviour at the site and which determine planning and building responses such as Asset Protection Zones. The vegetation and topography are then combined with a Fire Danger Index which is based on local weather conditions to develop a Bushfire Attack Level (BAL) as designated in the Australian Standard for Construction of Buildings in Bushfire Prone Areas (AS3959). Blackash 2017 determined that for the build elements within the site, a BAL of 12.5 was calculated, this being the lowest construction level in AS3959 (**Figure 13**). Also they identified that the site had adequate access for firefighting and fire management purposes. However, the assessment did identify the need for an Asset Protection Zone near the site boundary, water supply for fire fighting in accordance with AS2419 and a bushfire maintenance plan and fire emergency procedures. Further, as the plant may suffer from ember attack from a bushfire, the plant should provide ember protection to the onsite assets.



**Figure 12** Defined bushfire prone areas around the site



**Figure 13 Calculated on-site Bushfire Attack Levels**

### 7.3 Internal Fire

Spontaneous combustion of waste is a recognised on-site risk. A series of mitigation measures have been identified for implementation to alleviate this risk. They include:

- Load acceptance protocols which would include initially spreading and inspecting every load that is tipped for any smouldering elements or igniting substances. Any risks would be isolated and removed. Loads that are problematic or generate fire risk would not be accepted
- Processing of waste expeditiously to eliminate the time necessary to create spontaneous combustion. It is noted that the facility will only contain several days' worth of recyclable material.
- Waste residues to be compacted into sealed ISO containers – the design of which eliminates oxygen flow and therefore limits fire risk.

Further, a range of hazard related infrastructure and equipment has been proposed for the site including:

- Use of the existing firefighting system network that was designed for fuel storage tanks
- Back to base fixed smoke and fire alarm systems within the MRF building
- Thermal cameras (portable and fixed) to monitor stockpile and bale temperatures. These cameras can be accessed from the office and weighbridges
- Fire warning systems and fire exits as part of the fire response management plan
- Fixed fire hose, water and foam sprinkler locations with employee induction training
- Fixed zoned sprinkler system in roof over the stockpiles and bale storage areas.
- Machinery sprinklers where appropriate
- Fire vehicle access from both Lithgow and Ipswich streets.

## 7.4 Outcomes of health impact assessment

Health impacts associated with bushfires	
<b>Benefits</b>	There are no benefits to the off-site community in relation to fires
<b>Impacts</b>	Based on the assessments undertaken and where the plant incorporates all the proposed and recommended control measures, there are no predicted significant health impacts for the off-site community that may occur from fire impacting the buildings on the site
<b>Mitigation</b>	<p>The site will require a comprehensive strategy for addressing fire related issues as part of its operational plan.</p> <p>Blackash 2017 has provided a number of recommendations to ensure any offsite bushfire activity does not lead to on-site impacts. These include:</p> <ul style="list-style-type: none"> <li>■ An Asset Protection Zone near the site boundary,</li> <li>■ Water supply for firefighting in accordance with AS2419,</li> <li>■ A bushfire maintenance plan and fire emergency procedures,</li> <li>■ On-site ember protection system, and</li> <li>■ Maintain a design that allows adequate access for firefighting and fire management purposes.</li> </ul> <p>Further, Purdon Planning 2018 have identified several operational and on-site infrastructure measures including:</p> <ul style="list-style-type: none"> <li>■ Load acceptance protocols</li> <li>■ Sealed containers</li> <li>■ back to base fixed smoke and fire alarm systems</li> <li>■ portable and fixed thermal cameras</li> <li>■ fire warning systems and fire exits</li> <li>■ fixed fire hoses</li> <li>■ water and foam sprinklers</li> <li>■ fixed zoned sprinkler system, and</li> <li>■ machinery sprinklers</li> </ul>

## **Section 8. Health impact assessment: Economics, transport, pestilence, hazardous waste, community and social aspects**

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### **8.1 Approach**

Health impacts associated with other aspects of the proposed project, including economics, transport, pestilence, community and social aspects have been addressed in this section. The assessment presented has relied on the *Advanced Waste Management for the ACT – Scoping Application* by CRS, the *Environmental Impact Statement* by Purdon Planning and the *Draft Traffic and Transport Assessment* undertaken by AECOM. The assessment has been undertaken as a qualitative evaluation, to identify benefits and impacts associated with the project.

### **8.2 Overview and assessment of issues**

#### **Economics**

The construction value of the project is estimated to be \$50 million of which a significant proportion will flow into the local economy.

The proposed project will result in employment opportunities of more than 48 full time jobs and at least 10 part time jobs.

The most significant health outcomes in the community are expected to be benefits associated with job creation. While there is evidence to support that finding employment has health benefits, most studies are related to the negative impacts of unemployment. It would seem reasonable that if unemployment has a range of negative effects then finding employment would have positive effects. Health outcomes from unemployment include increases in the risk of illness and premature death and there are impacts on a range of mental health issues (anxiety, stress etc.) and social aspects of life (lower self-esteem, feelings of insecurity etc.). Finding employment is expected to be associated with improvements in these aspects of health and wellbeing.

These improvements in health and wellbeing can be enhanced by encouraging local employment at the facility.

#### **Transport**

The traffic and transport assessment report has identified 230 additional truck movements in the surrounding area per day. Access to the site will be predominately via trucks turning from Ipswich St into Wiluna St and then into Lithgow St where the site entrance is located. Departing vehicles will leave via a driveway exit from the site onto Ipswich St. It is proposed to establish a set of traffic lights (signals) at this exit point onto Ipswich St to provide additional road and pedestrian safety.

The additional 230 truck movements per day is estimated to be approximately 5% of the total number of heavy vehicle movements in the area. For the AM peak period it was estimated that the total traffic movements going through both Newcastle Street and Canberra Avenue was in excess of 3000 vehicles, with the proposal to add an extra 14 vehicles during this period.

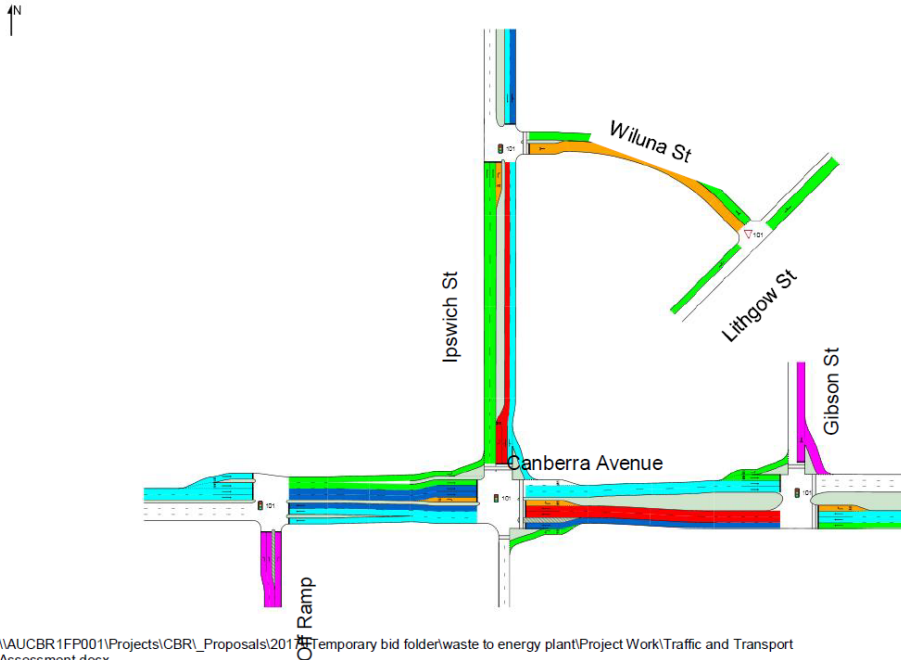


Modelling of how the traffic movements will impact local traffic operations was undertaken for the morning and afternoon peak times (**Figures 14 & 15**). The modelling has identified the roads surround the site are likely to suffer from traffic congestion issues during morning and afternoon peak times. Increased traffic congestion has the potential to decrease road safety and increase levels of stress and anxiety in the community.

**LANE LEVEL OF SERVICE**

Lane Level of Service for Network Sites  
 Network: N101 [AM Network]  
 New Network  
 Network Cycle Time = 130 seconds (Network Cycle Time - User-Given)

Colour code based on Level of Service  
 LOS A LOS B LOS C LOS D LOS E LOS F



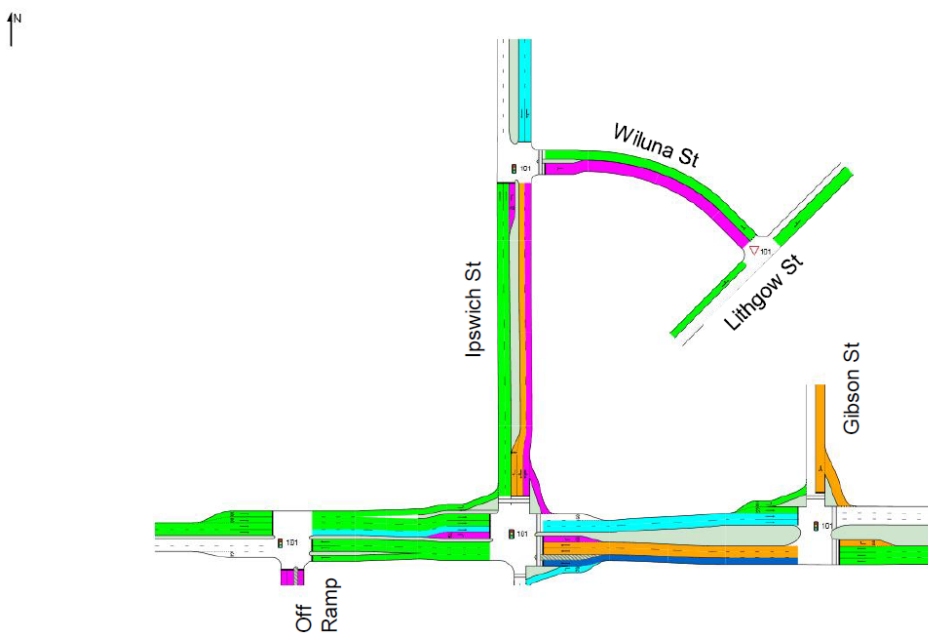
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**Figure 14 Peak lane Level of Service (Morning Peak)**  
 Scale is from LOS A (free flowing) to LOS F (heavy congestion)

**LANE LEVEL OF SERVICE**

Lane Level of Service for Network Sites  
 Network: N101 [PM Network]  
 New Network  
 Network Cycle Time = 100 seconds (Network Cycle Time - User-Given)

Colour code based on Level of Service  
 LOS A LOS B LOS C LOS D LOS E LOS F



**Figure 15 Peak lane Level of Service (Afternoon Peak)**  
 Scale is from LOS A (free flowing) to LOS F (heavy congestion)

## **Pestilence**

The creation of a habitat that encourages the establishment and reproduction of vermin and pest animals such as rats/mice, cockroaches and an array of bird species can have amenity, anxiety and financial impacts on the surrounding community. The eradication of site produced vermin by the local community will lead to financial loss and potential environmental and health impacts if undertaken incorrectly.

The MRF facility is to be located within a fully enclosed, sealed negative-pressure environment with fast closing doors, limiting the ability for bird species to become established. It is anticipated that waste will be processed in an expedient manner minimising the amount of waste stored on site and therefore limiting the attraction to pest animals. No waste will be stored outside the MRF building unless it is containerised in waterproof shipping containers.

A comprehensive and ongoing pest control program will be undertaken at the site which will be a key action in the site's operational plan.

## **Discovery and disposal of hazardous waste**

It is inevitable that during operations the discovery of hazardous waste will occur. Hazardous waste includes smoke alarms, medications, batteries (household, car, phone, laptop and rechargeable), light bulbs, paints, flammable liquids, containers with toxic and chemical residues, asbestos, copper chrome arsenate timber and so forth. The incorrect handling and disposal of such waste can lead to inappropriate human exposures. A comprehensive operational plan for the discovery and correct disposal of such waste will minimise these exposures.

## **Community and Social**

There are a range of benefits the overall project offers to the community, specifically:

- A high diversion of waste from landfill which has flow on benefits of reduced generation of greenhouse gases and landfill leachate
- Recycling of metals, plastics, paper and other waste products
- educating and encouraging reduce, reuse and recycling by the community

These aspects offer benefits to the community by improving the sustainability of the use of products and fuels. For some individuals, sustainability is an important factor in community wellbeing and for these individuals the project has the potential to enhance feelings of wellbeing which may be linked with a reduced risk of mental health issues.

Changes to the amenity of a street or suburb can negatively impact a sense of belonging and identity of its residents and consequently their community cohesion. The project is to be located in an existing industrial area characterised by a variety of retail stores, woodfire yard and a scrap metal facility. It is intended that the development have modern designed buildings that are in keeping with the surrounding structures in the Fyshwick area. The project will ensure all feedstock will be received, stored and processed in an enclosed area or building so these materials will not be visible. All the waste activities and receipt doors have been designed to be internally facing (east) thereby screening them acoustically and visually from the direction of residences, and surrounding properties as far as practicable.



Community issues may also arise for particular developments as a result of feelings of control, or lack of control, over decisions. This can result in increased levels of stress and anxiety particularly where there are perceptions that a particular development may affect the wellbeing and amenity of the community. These issues relate to perceived risks, rather than actual risks for this project and can be mitigated through the maintenance of community consultation throughout the construction, commissioning and operation of the facility.

As outlined in **Sections 5 to 7** there are no impacts on the off-site community in relation to changes in odour, noise or bushfire risk that would adversely affect the health of the off-site community, both existing and in areas of potential future residential development provided appropriate migration measures are undertaken. Hence there are no equity issues that require further consideration in relation to the distribution of health-related impacts in the off-site areas.



## Section 9. Summary of HIA Outcomes

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Based on the evaluations presented in **Section 5 to 8**, a range of impacts and outcomes (both positive and negative) have been assessed in relation to health impacts. These, along with measures that could be implemented to enhance or mitigate the identified health impacts, are summarised in **Table 6**.

**Table 6 Summary of HIA Outcomes and Enhancement/Mitigation Measures**

Health Aspect/Issue	Reference in HIA	Impact Identified (positive or negative and significance)	Health Impacts	Types of measures that could be implemented to enhance positive impacts or mitigate negative impacts
Odour	Section 5	Negative but negligible	Annoyance, stress, anxiety at levels below defined health effects.	The odour assessment has outlined emissions control and mitigation measures that should be implemented.
Noise	Section 6	Negative but negligible	Sleep disturbance, annoyance, children's school performance and cardiovascular health.	The noise assessment has outlined mitigation measures required to ensure noise emissions comply with the relevant guidance. Post development monitoring to ensure mitigation measures are effective. Minimise truck movements during the 6am - 7am shoulder period.
Fire	Section 7	Negative but negligible	A major fire incident can result in loss of life, property damage or injury	The Bushfire assessment outline controls and mitigation measures required to ensure the safety of the facility under bushfire conditions. A number of suggestions have been made for onsite management of fires. A comprehensive plan for on-site management of fires is required.
Economic Environment	Section 8	Positive	Reduction in anxiety, stress and feelings of insecurity.	The identified positive outcomes in the local community can be enhanced by encouraging employment of people who live within the local community
Traffic	Section 8	Negative	Injury or death, stress and anxiety.	Ensure truck movements avoid the morning and afternoon peak traffic periods.
Pestilence	Section 8	Negative	Financial loss and possible injury, stress and anxiety.	Ongoing pest control program as part of the operational plan.
Discovery of hazardous waste		Negative	Possible injury if incorrectly disposed of	A comprehensive operational plan for the discovery and safe disposal of hazardous waste is required.
Social aspects of sustainable project	Section 8	Positive for some	Enhanced feelings of wellbeing	None identified.
Feelings of control over life decisions	Section 8	Negative if not managed with effective communications	Increased levels of anxiety and stress.	These health impacts relate to community perceptions and trust. It is therefore important that the positive impacts associated with the project are enhanced within the local community and community consultation is continued and uses a range of techniques that are tailored to the various sub-populations that have particular areas of concern or particular characteristics that make normal methods of communication less effective. It is important that an effective communication/ community consultation program is maintained throughout the construction, commissioning and operational phases of the project.



## Section 10. References

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Australian Bureau of Statistics, 2011. Selected characteristics retrieved from QuickStats, TableBuilder and DataPacks. [www.abs.gov.au](http://www.abs.gov.au). Accessed December 2016.

enHealth 2001, *Health Impact Assessment Guidelines*, Commonwealth Department of Health and Aged Care.

enHealth 2004, *The health effects of environmental noise – other than hearing loss*, enHealth Council, Department of Health and Ageing.

enHealth 2012, *Environmental Health Risk Assessment, Guidelines for assessing human health risks from environmental hazards*, Commonwealth of Australia, Canberra.  
<[http://www.health.gov.au/internet/main/publishing.nsf/content/804F8795BABFB1C7CA256F1900045479/\\$File/DoHA-EHRA-120910.pdf](http://www.health.gov.au/internet/main/publishing.nsf/content/804F8795BABFB1C7CA256F1900045479/$File/DoHA-EHRA-120910.pdf)>.

Harris, P, Harris-Roxas, B., Harris, E. & Kemp, L. 2007, *Health Impact Assessment: A Practical Guide*, Centre for Health Equity Training, Research and Evaluation (CHETRE). Part of the UNSW Research Centre for Primary Health Care and Equity. University of New South Wales.

I-INCE 2011, *Guidelines for Community Noise Impact Assessment and Mitigation, I-INCE Publication Number: 11-1*, International Institute of Noise Control Engineering (I-INCE) Technical Study Group on Community Noise: Environmental Noise Impact Assessment and Mitigation.

NSW DEC 2006, *Assessment and management of odour from stationary sources in NSW*, NSW Department of Environment and Conservation.  
<<http://www.epa.nsw.gov.au/resources/air/20060440framework.pdf>>.

NSW EPA 2000, *NSW Industrial Noise Policy*, NSW Environment Protection Authority.  
<<http://epa.nsw.gov.au/noise/industrial.htm>>.

WHO 1999, *Guidelines for Community Noise*, World Health Organisation, Geneva.

WHO 2009, *Night Noise Guidelines for Europe*, World Health Organisation Regional Office for Europe.

WHO 2011, *Burden of disease from environmental noise, Quantification of healthy life years lost in Europe*, World Health Organisation and JRC European Commission.