PROPOSED ALTERNATIVE WASTE TECHNOLOGY FACILITY AT CHULLORA WASTE AND RECYCLING CENTRE

PART 3A APPLICATION FOR CONSENT

PRELIMINARY ENVIRONMENTAL ASSESSMENT

Report Prepared for

WSN Environmental Solutions

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EXECUTIVE SUMMARY

WSN Environmental Solutions (WSN) (the proponent) is seeking to have a proposal for the construction and operation of an Alternative Waste Technology (AWT) facility at the WSN Chullora Waste and Recycling Centre (WRC), assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The project has been declared a major project under Clause 6(1) of State Environmental Planning Policy (Major Projects) 2005 by the Director General of the Department of Planning.

Purpose

The increasing demand for sustainable waste management and efficient resource recovery services in the Sydney region has led to WSN proposing to upgrade the facilities currently operating at the Chullora WRC.

This Preliminary Environmental Assessment (PEA) and subsequent detailed Environmental Assessment (EA) will aim to provide sufficient detail to inform the Department of Planning (DoP), the Department of Environment and Climate Change (DECC) and other relevant authorities and stakeholders in their decision making in regards to the proposed development. Given the proximity of the proposed activity to residential areas, it is vital that appropriate and effective environmental impact mitigation measures be implemented in a manner consistent with state and local government policy.

Key Elements of Proposal

The key elements of the proposal include:

- the construction and operation of a new AWT facility for the treatment of 90,000 TPA of mixed waste using the ArrowBio technology (similar to that approved and near completion at WSN's Jack's Gully site in south-west Sydney) with a transfer capacity of 40,000 TPA. The facility will include a co-generation function converting biogas to electricity;
- ancillary AWT facility support structures e.g. loading areas, a bioscrubber, car and truck parking, signage and roadworks;
- modification to the existing Waste Transfer Station to accommodate the AWT Receival Hall;
- an increase in the Materials Recovery Facility (MRF) tonnage limit, and
- a capital value of approximately $50 million – generating 30-50 construction jobs over a 12 month period and 40 (full-time equivalent) operational positions.

The proposed AWT facility will utilise the unique hydro-biological processing of the ArrowBio system and will comprise the following three integrated processing units:

- AWT Receival Hall - a modification of the existing Waste Transfer Station (occupying approximately 3,000 m^2). The new building will combine current waste transfer and AWT-related waste receival functions;
- AWT Processing Building (containing trommels, shredder, hydrocrusher, water vats and eddy current and magnetic separators); and
- AWT Biological Plant (Tanks: four acidogenic tanks, two methanogenic reactors, a balance tank, a gas holder, chemical storage vessels and a flare unit).

The proposed AWT facility will also include two Electricity Generators (the methanogenic reactors will produce the biogas to fuel the electricity generators for the production of renewable energy to be sold to Energy Australia).

It is proposed that both the AWT Receival Hall and the AWT Processing Building will be fully enclosed and negatively pressured - with exhaust air vented through best practice bioscrubber or

other appropriate air filtration technology. It is also proposed that the Chullora WRC will operate 24 hours a day, seven days a week. This is consistent with the operational hours of surrounding industrial operations.

The proposed AWT will receive 130,000 TPA of waste and have a capacity to process 90,000 TPA and transfer out an additional 40,000 TPA. The Waste Transfer Station tonnage of 150,000 TPA will remain unchanged. It is also proposed that the MRF recyclable materials tonnage be increased from 50,000 TPA to 110,000 TPA in response to the increased supply of sorted recyclable materials.

This Chullora WRC proposal therefore seeks to increase the total site waste/resource tonnage from the current 200,000 TPA to 390,000 TPA.

Potential Environmental Impacts

The chief potential environmental impacts identified in regards to this development include:

- Operational Phase Odour and Air Pollutants; and
- Operational Phase Traffic.

The majority of the ArrowBio putrescible waste processing system is water-based and occurs in a submerged state, preventing malodorous emissions. Further to this, all operations will occur in an enclosed area and suitable ventilation filters will be installed to mitigate any remnant odour. Detailed odour and air quality modelling will be conducted as part of the preparation of the EA.

The existing road system was upgraded in 2000, to allow greater tonnage limits within the WRC, and this will significantly minimize any impacts associated with increased traffic flows. Detailed traffic modelling studies of all major intersections will be conducted to ascertain any likely traffic impacts and suggest mitigation measures.

Further environmental issues that have been identified and will be addressed as part of the EA (in accordance with Part 3A of the EP&A Act) including:

- Acoustics;
- Surface Water Management;
- Flora & Fauna;
- Waste Management;
- Heritage; and
- Visual Impact.

WSN will prepare a statement of commitments to describe how these issues will be managed through the design, construction and operation of the AWT facility and the Chullora WRC.

Given the nature of the technology and the industrialised nature and existing use of the site, it is not anticipated that the proposed development will cause any significant environmental impacts.

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Appendix A: Preliminary Environmental Risk Assessment

GLOSSARY AND ABBREVIATIONS

Amenity	Those features of an area that foster its use for various purposes.
Animal	Any animal, whether vertebrate or invertebrate, and at whatever stage of development.
ARI	Average Recurrence Interval
ASS	Acid Sulphate Soil(s)
AWT	Alternative Waste Technology
Biota	Living organisms.
Bird	Any bird that is native to, or is of a species that periodically or occasionally migrates to Australia, and includes the eggs and the young thereof and the skin, feathers or any other part.
BoM	Bureau of Meteorology
Catchment	The area draining to a site. It always relates to a particular location and may include the catchments of tributary streams as well as the main stream.
DCP	Development Control Plan
DEC	Department of Environment and Conservation (incorporating EPA, NPWS) (now DECC).
DECC	Department of Environment and Climate Change. This department incorporates the former DEC, DNR and some functions of NSW Fisheries.
DIPNR	Department of Infrastructure, Planning and Natural Resources (became Department of Planning and Department of Natural Resources, now DECC and DWE).
DISPLAN	Local Disaster Plan
DLWC	Department of Land and Water Conservation (Became DNR, now DECC and DWE).
DNR	Department of Natural Resources (Now DECC and DWE)
DoL	Department of Lands
DoP	Department of Planning (Previously DIPNR)
DWE	Department of Water and Energy (previously DEUS and DNR)
Ecosystem	A community of living organisms, together with the environment in which they live and with which they interact.
EIA	Environmental Impact Assessment. An assessment of the impact of a proposed activity.
EIS	Environmental Impact Statement
Endangered Fauna	Protected fauna of a species under Schedule 1 or 2 of the *Threatened Species Conservation Act*, 1995.
EPA	Environment Protection Authority (within DECC)
EP&A Act	*Environmental Planning and Assessment Act, 1979*
EPBC Act	*Environmental Protection and Biodiversity Conservation Act, 1999*.
ESD	Ecologically Sustainable Development. Development that does not interfere with the short and long-term well-being, health and viability of ecosystems.
Fauna	Any mammal, bird, reptile or protected amphibian.
Fish	All or any of the varieties of marine, estuarine or freshwater fishes (whether indigenous or not) and their young, fry and spawn and unless contrary intention be expressly state or the context otherwise requires, includes crustacean and oysters and all marine, estuarine and freshwater animal life.
GCC	Gosford City Council
Habitat	The places in which an organism lives and grows.
Invertebrate	Animal without a backbone.
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
LG Act	*Local Government Act, 1993*
LGA	Local Government Area
MRF	Materials Recycling Facility
NPWS	National Parks and Wildlife Services

NSW	New South Wales
NV Act	*Native Vegetation Act, 2003*
PAD	Potential Archaeological Deposit
PASS	Potential Acid Sulphate Soils
PoEO Act	*Protection of Environment Operations Act, 1997*
REP	Regional Environment Plan
Reptile	A snake, lizard, crocodile, tortoise, turtle or other member of the class reptilian (whether native, introduced or imported), and includes the eggs and the young thereof and the skin or any other part thereof.
RFI Act	*Rivers and Foreshores Improvement Act, 1948*
Riparian Vegetation	Vegetation growing along banks of rivers.
RTA	Roads and Traffic Authority
Runoff	That proportion of rainfall that drains off the lands surface.
Seawall	Wall built parallel to the shoreline to limit shoreline recession.
Sedimentation	The act or process of depositing sediment, especially by mechanical means of matter suspended in a liquid.
SEPP	State Environmental Planning Policy
TSC Act	*Threatened Species Conservation Act, 1995*
Vertebrate	Animal with a backbone.
WARR Act	*Waste Avoidance and Resource Recovery Act, 2001*
Water Quality	The suitability of the water for various purposes, as measured by the concentration or level of a wide variety of contaminants.
WRC	Waste and Recycling Centre

1. INTRODUCTION

1.1 Background

WSN Environmental Solutions (WSN) (the proponent) is proposing to upgrade its facilities, including constructing and operating an Alternative Waste Technology (AWT) facility on its existing Waste and Recycling Centre (WRC) at 19 Muir Road, Chullora (Lot 21, D.P 860283) (**Figure 1.1**, **Figure 1.2**, **Figure 1.3**).

The existing WSN Chullora WRC has been servicing the region since 1997 and represents one of the major WRCs within the Sydney Metropolitan Region. Over its operative lifespan several minor upgrades have been conducted on-site increasing the processing capacity and scope of the WRC in response to increasing demand.

The facilities currently operating on-site include:

- Materials Recovery Facility (MRF);
- Waste Transfer Station;
- Garden Organics Area;
- Community Recycling Centre;
- Glass Fines Processing Plant; and
- Several ancillary buildings and structures (*e.g*. weighbridges, workshops and administration buildings).

The Chullora WRC currently has approval for a total of 200,000 tonnes per annum (TPA) of waste.

The planned further urban consolidation of the inner-west and metropolitan areas (**Figure 1.2**) will ensure the demand for waste services continues to increase and reinforce the need for the Chullora WRC into the future. The increasing demand for waste services and limited land availability has led to WSN proposing to significantly upgrade the Chullora WRC with a best practice - sustainable waste recovery technology. This upgrade is inline with the increasing government and community push for sustainable waste outcomes.

The upgrading of the Chullora WRC will also allow convenient community, council and business access to waste services at low transport costs into the future.

1.2 Outline of the Proposal

WSN proposes to upgrade the current Chullora WRC site (**Section 2.1**). The upgrade will incorporate the existing key and ancillary facilities (previously approved via Bankstown City Council as well as the establishment of an AWT facility). The AWT will:

- process putrescible waste on-site;
- increase site handling capacity;
- decrease the amount of waste sent on to landfill by approximately 75%;
- generate renewable energy to feed back to the electricity grid; and
- produce more water (recyclable) than it uses.

The major elements of the proposed activity include:

- the construction and operation of a new AWT facility for the treatment of 90,000 TPA of mixed waste using the ArrowBio technology (similar to that approved and near completion at WSN's Jack's Gully site in south-west Sydney) with a transfer capacity of

40,000 TPA. The facility will include a co-generation function converting biogas to electricity;

- ancillary AWT facility support structures e.g. loading areas, a bioscrubber, car and truck parking, signage and roadworks;
- modification to the existing Waste Transfer Station to accommodate the AWT Receival Hall; and
- an increase in the Materials Recovery Facility (MRF) tonnage limit.

Figure 1.1: Context of Project Location within the Greater Sydney Metropolitan Region
(Base Map Source: Google Maps©)

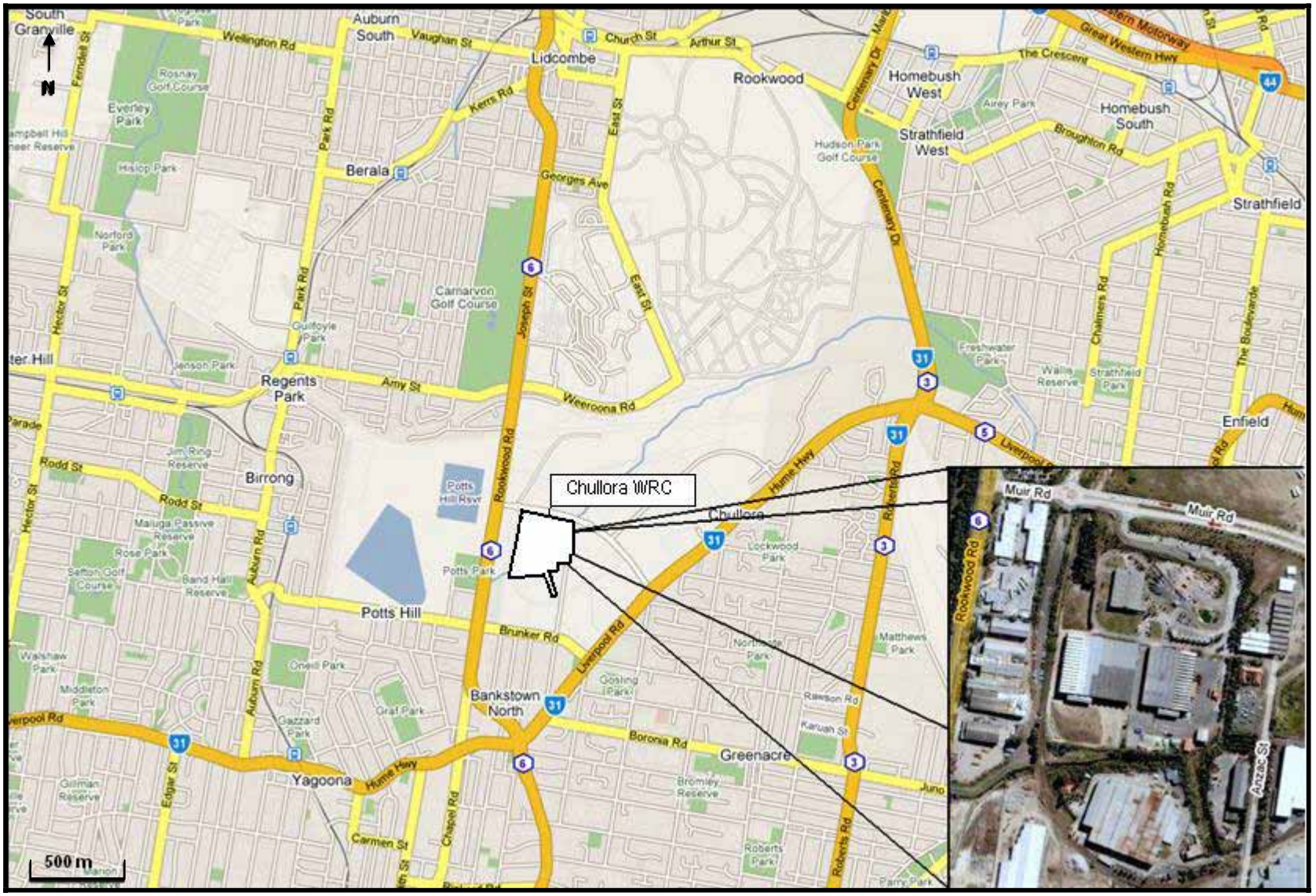

Figure 1.2: Site Locality Plan. *(Base Map Source: Google Maps©)*

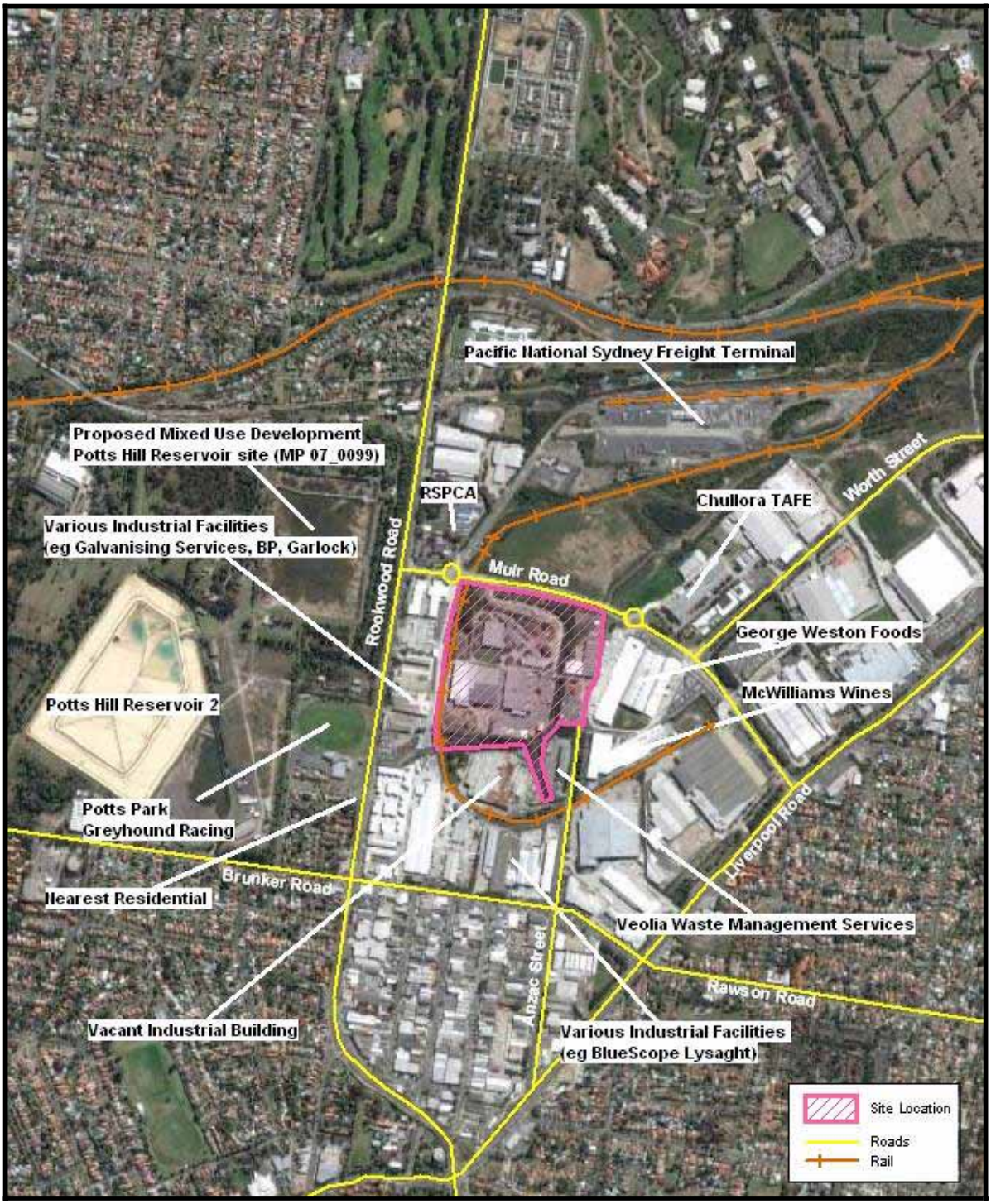

Figure 1.3: Chullora Waste and Recycling Centre and Chullora Technology Park
(Base Map Source: Google Maps©)

1.3 Need for the Project

Recent local government waste management tenders clearly confirm that there is a strong demand for an AWT facility servicing the inner-west and metropolitan Sydney. Local Councils are committed to providing sustainable waste management, significantly increasing resource recovery rates, and reducing associated greenhouse gas emissions.

The proposed AWT facility at Chullora WRC is a positive response to the demands of local government for sustainable waste management. The proposed development also advances the State Government waste minimisation strategies and targets. The proposed Chullora AWT facility will preserve local environmental amenity and enhance the economic development of the Chullora Technology Park.

In generating significant amounts of renewable energy, carbon credits and recyclable resources, the proposed development has the potential to advance the economic sustainability of the local government sector.

1.4 Statutory Framework

The process of assessment and approval of proposed developments within New South Wales is currently regulated by the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Environmental *Planning and Assessment Regulation 2000* (EP&A Regulation). Three categories of assessment are defined within the EP&A Act: Part 3A, Part 4, and Part 5. Part 3A provides for control of 'major infrastructure or other projects' that require development consent or other approval from the Minister for Planning. Part 4 provides for control of 'local development' that requires development consent from the local Council. Part 5 provides for control of 'activities' that do not require development consent or approval from the Minister for Planning.

The proposed works relate to the development of a new waste processing facility capable of processing greater than 75,000 tonnes of waste per year within the Sydney Metropolitan Region. Therefore the project is to be considered a major project by virtue of Clause 27 (3) of Schedule 1 of SEPP (Major Projects) 2005. Additionally, as the proposed AWT plant will produce biogas to be converted to electricity at a capital cost in excess of $30 million the project is also to be considered a major project by virtue of Clause 24 (a) of Schedule 1 of SEPP (Major Projects) 2005.

The Director General of the Department of Planning confirmed that the proposed upgrade to the Chullora Waste Treatment Centre, including construction and operation of an AWT facility, was to be considered a major project (27 February 2008). As a major project, the proposed works must be assessed under Part 3A of the EP&A Act.

1.5 Part 3A Process

There are three broad stages in the assessment of Major Projects under Part 3A of the EP&A Act:

- Preparation of the Environmental Assessment (EA);
- Exhibition and Consultations; and
- Assessment and Determination.

This PEA assists in the first of these stages: *Preparation of Environmental Assessment*. The PEA is designed to assist and inform the Department of Planning's Director-General in issuing requirements for a detailed EA. Once prepared, the EA would be submitted to the Director-General to determine whether the assessment is adequate to exhibit. Should it be deemed so, the proposal would enter Stage Two: *Exhibition and Consultations*. Comments and issues raised during this stage would be incorporated into the EA. Based on both these stages the Director-General will prepare an Environmental Assessment Report for the Minister who will asses and determine the viability of the project (Stage Three).

1.6 Purpose of this PEA

The purpose of this PEA is to describe the key elements of the proposed upgrade (including the AWT) at the Chullora WRC for which *Project Approval* is being sought and provide a preliminary assessment of potential environmental impacts. In line with the provisions of the EP&A Act, the information provided in this PEA is designed to assist with:

- The issuing of formal requirements from the Director-General and other government agencies for a future detailed EA (to be prepared as part of the application for Project Approval); and
- Providing the community and interested stakeholders with conceptual design information and the opportunity to contribute to the detailed design process.

Specific details of the proposed works will be submitted in a detailed project approval application following the receipt of the Director General's Requirements.

1.7 Overview of this PEA

This PEA addresses all relevant matters concerning the proposal. Key issues identified include:

- Air quality, Dust and Odour;
- Traffic;
- Noise and Acoustics;
- Surface water and groundwater management;
- Flora and Fauna;
- Waste Management;
- Heritage; and
- Visual Amenity.

In particular a planning meeting between the proponent and the DoP (13 November 2007) identified several key concerns in regards to the development of the Chullora WRC. These concerns included:

- the potential emission of odours and air pollutants from the putrescible waste processing of the AWT affecting neighbouring industries and local residents;
- noise and air emissions from the methane-gas electricity generator; and
- traffic impacts upon Muir Road, Rookwood Road, and the Hume Highway and associated intersections.

1.8 Overview of the Proponent

WSN Environmental Solutions (formerly Waste Service NSW) is the trading name for the Waste Recycling and Processing Corporation of New South Wales, a NSW State Government owned corporation. It operates Australia's largest waste management network, comprised of 12 waste recycling, processing and disposal facilities across NSW, primarily servicing the Sydney Metropolitan region. These facilities process 1.3 million tonnes of putrescible waste annually. The sites use a variety of waste recycling, treatment and disposal technologies. The AWT facility currently under construction at the Jacks Gully WRC represents the forefront of sustainable waste management and resource recovery.

As a state owned corporation, WSN was formed under the Waste Recycling and Processing Corporation Act 2001 (WRPC Act) and is responsible to the NSW Minister for the Environment.

The WRPC Act establishes six equally important objectives requiring WSN to:

- Be a successful business;
- Protect the environment by conducting its operations in an ecologically sustainable manner;
- Demonstrate a social responsibility towards regional development and decentralisation in the way in which it operates;
- Provide safe and reliable waste facilities;
- Provide efficient and responsible waste management services; and
- Minimise any adverse health and environmental impacts of its activities and services.

The proposed works are consistent with these objectives.

2. CURRENT OPERATIONS

2.1 Site Description

The site of the proposed activity is the existing WSN WRC at 19 Muir Road, Chullora (Lot 21, D.P 860283) (**Figure 2.1**). The proposed AWT facility (**Section 3.1**) will occupy approximately 12,300 m^2 in the northwest corner of the 15.2 ha WRC, adjacent to the current Waste Transfer Station.

Figure 2.1: Current Site Operations at Chullora WRC *(Base Map Source: Google Maps©)*

The suburb of Chullora is located near the geographic centre of greater Sydney. The Chullora WRC is one of the few WRCs within close proximity to many areas of Sydney and thus is attractive to both councils and private individuals seeking to reduce time and costs of waste transport.

The site is zoned under Bankstown City Council's Local Environment Plan 2001 (LEP 2001) as part of the Chullora Industrial Area (**Section 5.2.6**). The Site is bounded to the north by Muir Road and undeveloped industrially zoned land (owned by Pacific National) (**Figure 1.3**, **Figure 2.2**). To the east it shares a boundary with George Weston Foods (GWF) (**Figure 1.3**, **Figure 2.3**). A stormwater channel forms the southern site boundary and bisects the site - curving northeast - separating the Anzac Street storage and administration buildings, from the MRF, Garden Organics Area and other operational

facilities **(Figure 1.3, Figure 2.4)**. To the south of the channel are several industrial facilities (**Figure 1.3**, **Figure 2.5**). Immediately to the west of the site is a stretch of infrequently used rail track (**Figure 2.6**), beyond this is a steel galvanising plant (**Figure 1.3**, **Figure 2.7**), Rookwood Road, and the closest residences (approximately 300m from the site) (**Figure 1.3**).

Figure 2.2: Muir Road (north of the site), looking east.

Figure 2.3: George Weston Foods (east of the site)

Figure 2.4: Open Stormwater Channel.

Figure 2.5: Industrial facilities (south of the site).

Figure 2.6: Rail track (west of the site).

Figure 2.7: Steel Galvanising plant (west of the site).

2.2 Operating Facilities

The facilities that are currently operational on-site (**Figure 2.1**) include:

- the Materials Recovery Facility (MRF) (**Figure 2.8**),
- Garden Organics Area (**Figure 2.9**),
- Community Recycling Centre (**Figure 2.10**),
- Waste Transfer Station (**Figure 2.11**),
- Glass Fines Processing Plant, and
- several ancillary buildings and structures (*e.g.* weighbridges, workshops and offices).

These existing facilities will all remain operational during the construction phase. The Chullora WRC currently has approval to process 200,000 TPA of waste.

Figure 2.8: Materials Recovery Facility.

Figure 2.9: Garden Organics Area.

Figure 2.10: Community Recycling Centre (bottles, gas cylinders, metals, etc).

Figure 2.11: Waste Transfer Station.

2.2.1 Materials Recovery Facility (MRF)

The current MRF (**Figure 2.8**) has approval to receive and process 50,000 tonnes of recyclable waste per year from councils and private contractors. The MRF occupies the eastern half of the original Elcar Building (**Figure 2.1**).

2.2.2 Garden Organics Area

The Garden Organics Area (**Figure 2.9**) processes garden organic waste from residential and commercial properties. Only shredding and temporary storage of garden waste is allowed on-site. Organic material is transferred off-site to the Eastern Creek WRC for composting.

2.2.3 Community Recycling Centre

The Community Recycling Centre (**Figure 2.10**) acts as a receiving point for household and small business recyclables. Common items received include newspapers, plastic containers, and steel and aluminium cans. Items received at the Community Recycling Centre are reused, recycled, or transferred to the Waste Transfer Station.

2.2.4 Waste Transfer Station

The Waste Transfer Station (**Figure 2.11**) currently has approval to receive 150,000 TPA of predominantly commercial mixed (putrescible and non-putrescible) waste. Some sorting into recyclable and non-recyclable items occurs. A portion of the existing Waste Transfer Station will be modified to become the Receival Hall of the proposed AWT facility - increasing its utilisation and overall WRC operational efficiency (**Section 3.2**).

2.2.5 Glass Fines Processing Plant

The remnant Elcar Building has an enclosed Glass Fines Processing Plant capable of recovering metals and contaminants from glass waste. Glass fines are crushed and separated into differing sizes for a range of commercial uses. Feedstock is sourced from the MRF and WRC stockpiled glass.

2.2.6 Ancillary Infrastructure

To support the WRC operations and remain compliant with Council and State legislation there is significant ancillary infrastructure present on the site. Currently the eastern portion of the site (east of the open stormwater channel) (**Figure 2.1**) is occupied by a number of small buildings. These buildings act as WSN administration offices as well as being leased out for other companies to utilise (*e.g.* storage & light industrial). These buildings effectively act as a buffer area between the Chullora WRC operations and the adjacent George Weston Foods Limited (GWF) property. Also included within the buffer area is a 78-space car park, currently leased out to GWF. Parking is also available onsite for all WSN staff and visitors to the WRC.

To manage stormwater flows across the site an effective drainage system has been established. The major stormwater features on-site are the existing stormwater channel which follows the southern and eastern boundaries of the site and the water quality pond through which all captured stormwater passes for treatment and storage if required.

3. DETAILED PROJECT DESCRIPTION

3.1 Overview

As outlined in Section 1.2, the proposal involves the following elements:

- the construction and operation of a new Alternative Waste Technology (AWT) facility for the treatment of 90,000 TPA of mixed waste using the ArrowBio technology (similar to that approved and near completion at WSN's Jack's Gully site in south-west Sydney) with a transfer capacity of 40,000 TPA. The facility will include a co-generation function converting biogas to electricity;
- ancillary AWT facility support structures e.g. loading areas, a bioscrubber, car and truck parking, signage and roadworks;
- modification to the existing Waste Transfer Station to accommodate the AWT Receival Hall; and
- an increase in the Materials Recovery Facility (MRF) recyclable materials to 110,000 TPA.

On completion of the above works, the upgraded Chullora WRC will include:

- ArrowBio AWT Facility;
- Materials Recovery Facility;
- Garden Organics Area;
- Community Recycling Centre;
- Glass Fines Processing Plant; and
- Ancillary Infrastructure.

The currently existing facilities will all remain operational during the works to construct the AWT. Closure of the Waste Transfer Station will be required at certain times during construction to enable the AWT Receival Hall modifications to the building to proceed. The proposed location of the facility (isolated in the north-western corner) is such that construction works shall not greatly impact the operation of the currently existing facilities (**Section 2.2**). Alterations to vehicle access routes (particularly for the MRF) will be undertaken over several stages during construction; however, this will not prevent the operation of the facilities.

The proposed increase in MRF recyclable materials to 110,000 TPA is in response to the increased catchment area supply of sorted recyclable materials. To process this increased tonnage and remain commercially viable - the MRF requires upgrading with best practice resource recovery technology. The upgraded MRF will remain within the existing MRF (Elcar) building – no new building construction or extensions will be required.

It is proposed that the upgraded Chullora WRC will operate 24 hours a day seven days a week. This is consistent with the operational hours of surrounding industrial firms.

3.2 Construction and Operation of AWT

3.2.1 Overview

The proposed facility will occupy an area of approximately 12,300m^2 in the north-western corner of the 15.2 ha WRC site. The facility is shown in the context of the present site operations in **Figure 3.1** and in detail in **Figure 3.2**.

The proposed AWT facility will utilise the unique hydro-biological processing of the ArrowBio system and will comprise the following three integrated processing units:

- AWT Receival Hall - a modification of the existing Waste Transfer Station (occupying approximately 3,000 m^2). The new building will combine current waste transfer and AWT related waste receival functions;
- AWT Processing Building (containing trommels, shredder, hydrocrusher, water vats and eddy current and magnetic separators); and
- AWT Biological Plant (Tanks: four acidogenic tanks, two methanogenic reactors, a balance tank, a gas holder, chemical storage vessels and a flare unit).

The construction of the proposed AWT will require the removal of an existing glass fines stockpile north of the Elcar Building. In addition, ancillary support structures, a perimeter road, and access roads will be required.

The proposed AWT will receive 130,000 TPA of waste and have a capacity to process 90,000 TPA and transfer out an additional 40,000 TPA. The Transfer Station tonnage will remain unchanged. Including the MRF increase to 110,000 TPA – this application therefore seeks to increase Chullora WRC waste/resource tonnage from the current 200,000 TPA to 390,000 TPA.

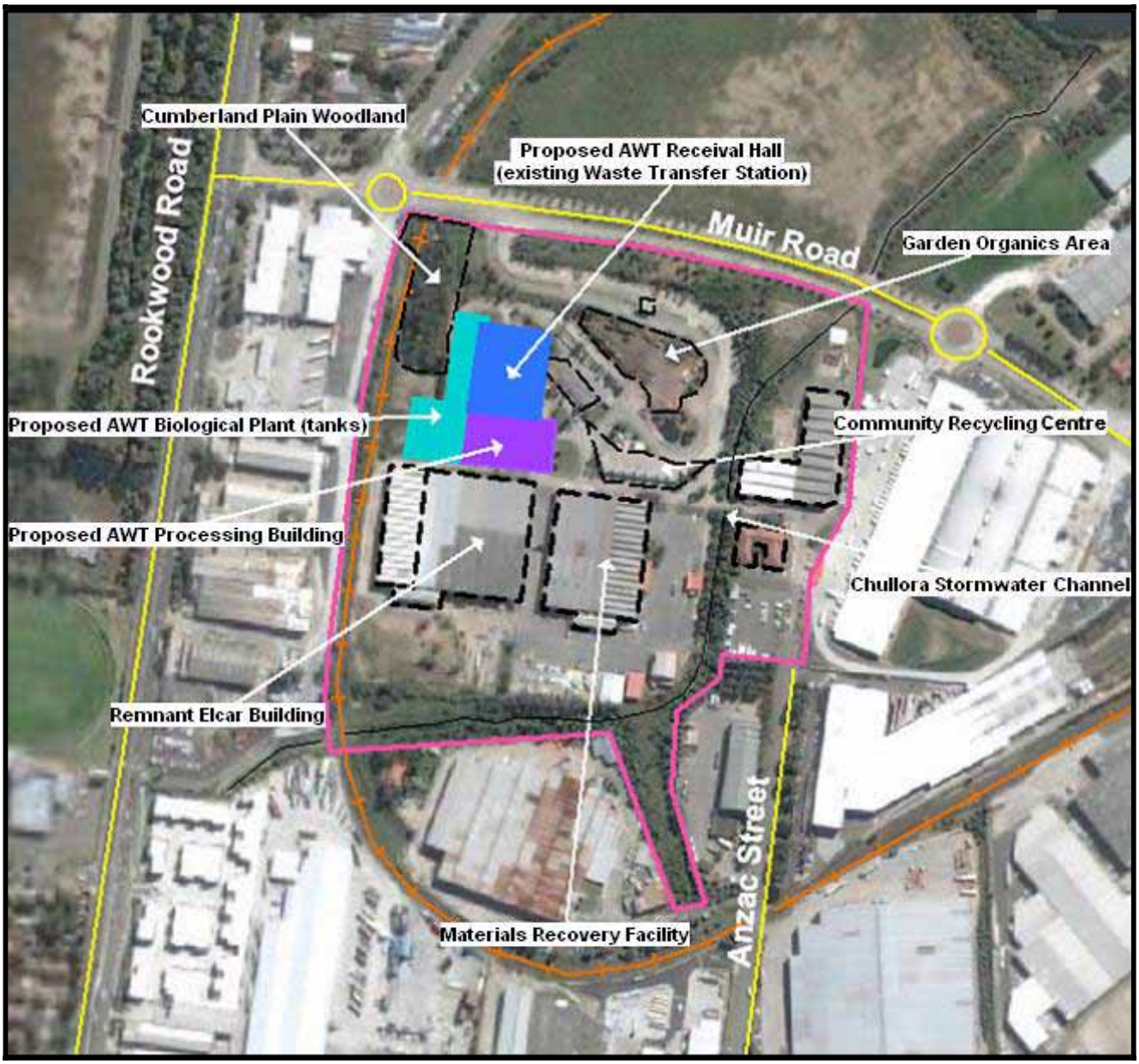

Figure 3.1: Proposed AWT location at Chullora WRC. *(Base Map Source: Google Maps©)*

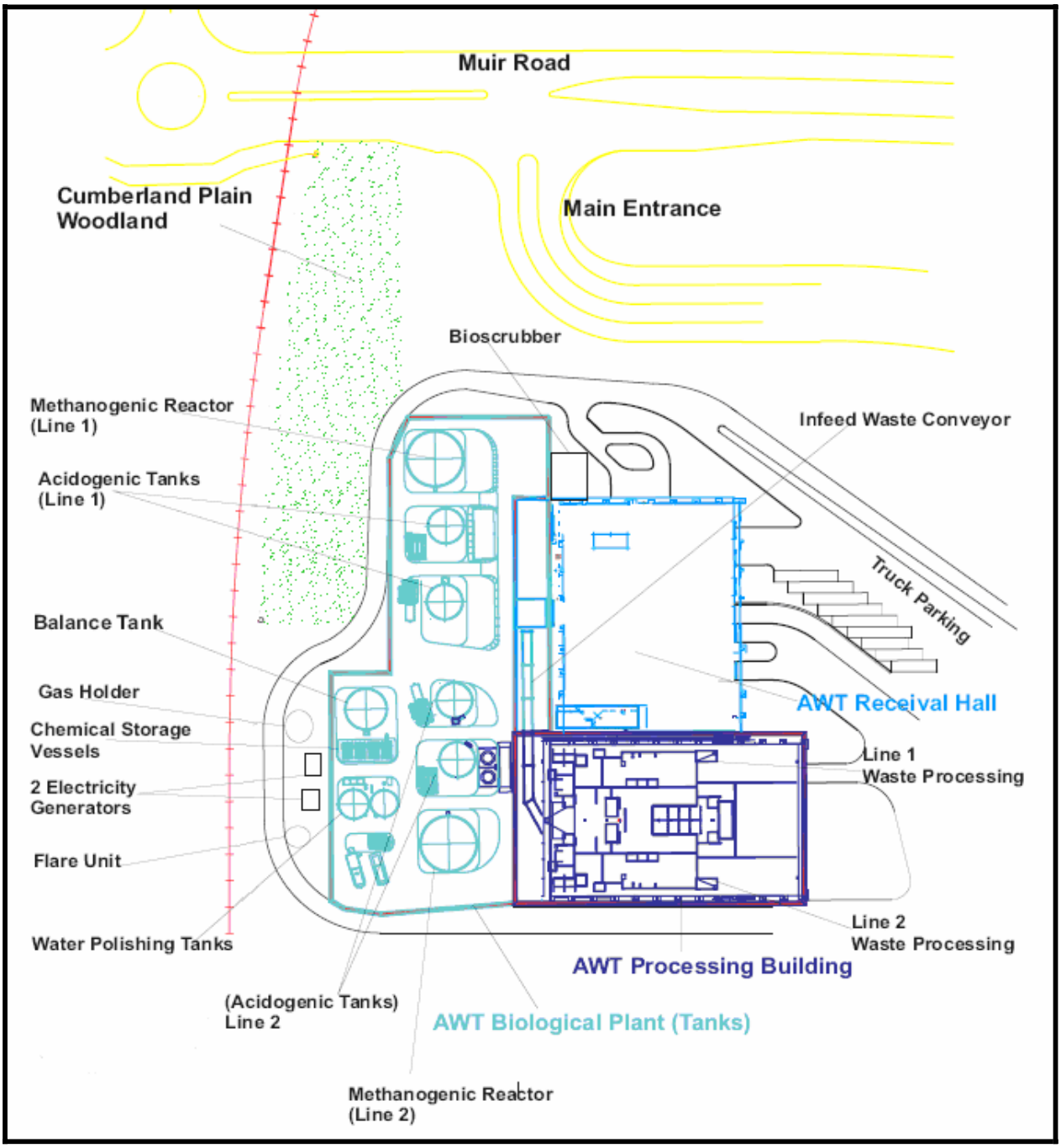

Figure 3.2: Detailed Layout of the Proposed Chullora AWT

The proposed AWT facility will also include two electricity generators (the methanogenic reactors will produce the biogas to fuel the electricity generators for the production of renewable energy to be sold to Energy Australia) (**Figure 3.2**).

It is proposed that both the AWT Receival Hall and the AWT Processing Building will be fully enclosed and negatively pressured - with exhaust air vented through best practice bioscrubber or other appropriate air filtration technology.

3.2.2 ArrowBio Technology – A Summary

The proposed AWT facility will utilise ArrowBio technology. ArrowBio technology represents a unique method to process municipal solid waste that would normally be sent to landfill. The processing of the waste is done through biological treatment, the product of which is

biogas (to be used for electricity generation), and nutrient rich sludge, which can be used commercially for composting (subject to gaining DECC approvals). Additionally, the process creates excess water that may be re-used on site. Currently, there is only one ArrowBio plant in operation in the world (Tel Aviv, Israel, **Figure 3.3**). Similar facilities have been commissioned for Jacks Gully (Sydney) (**Figure 3.4**), Falkirk (Scotland), and Mexico. The technology is recognised as sound, with the effectiveness primarily depending on the organic content of the putrescible municipal waste stream in question.

The ArrowBio process is based upon liquid waste treatment technology. By converting putrescible waste to an aqueous form, the waste can then be treated in a manner similar to that of many sewage and water treatment plants. The overall conceptual process is shown in **Figure 3.5**.

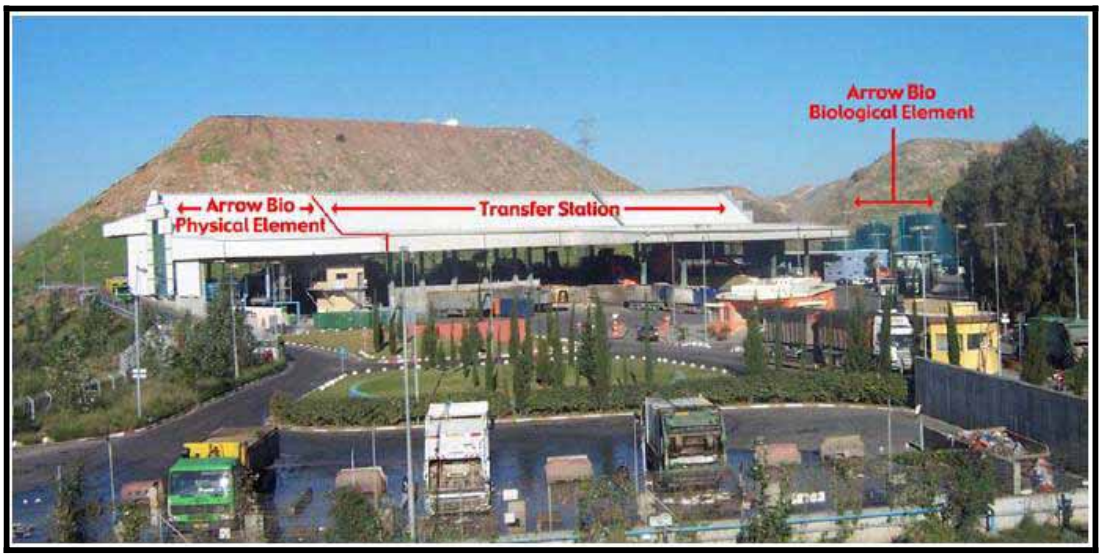

Figure 3.3: ArrowBio AWT Plant Tel Aviv, Israel.

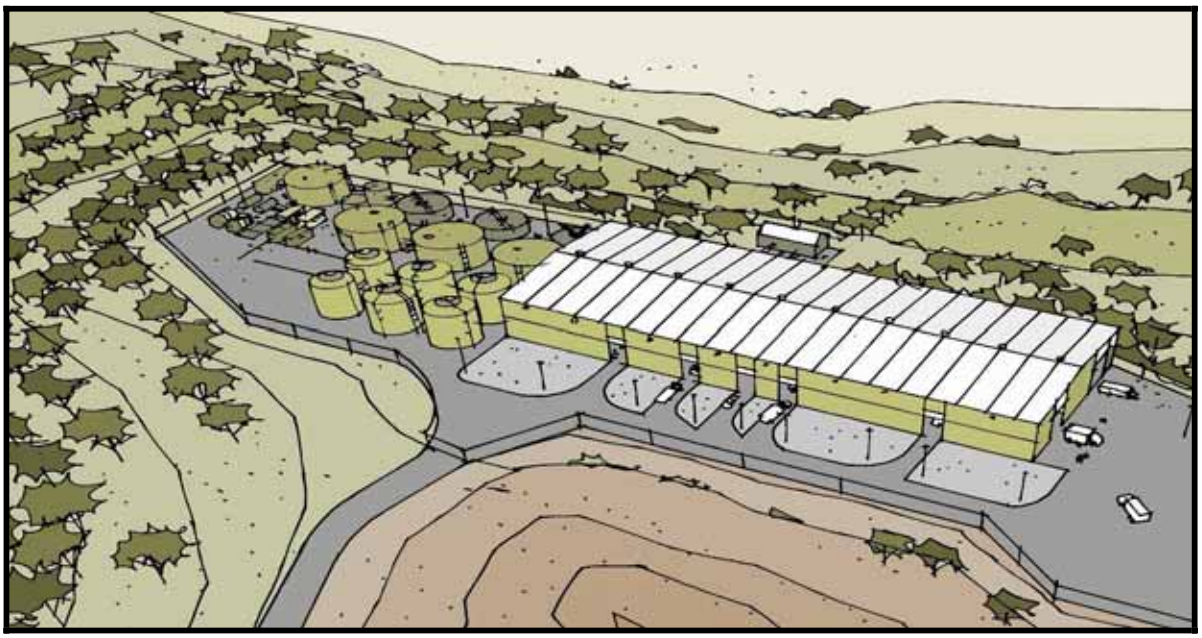

Figure 3.4: Artistic architectural view of Jacks Gully AWT Facility
(*Note: under construction at the time of this report*)

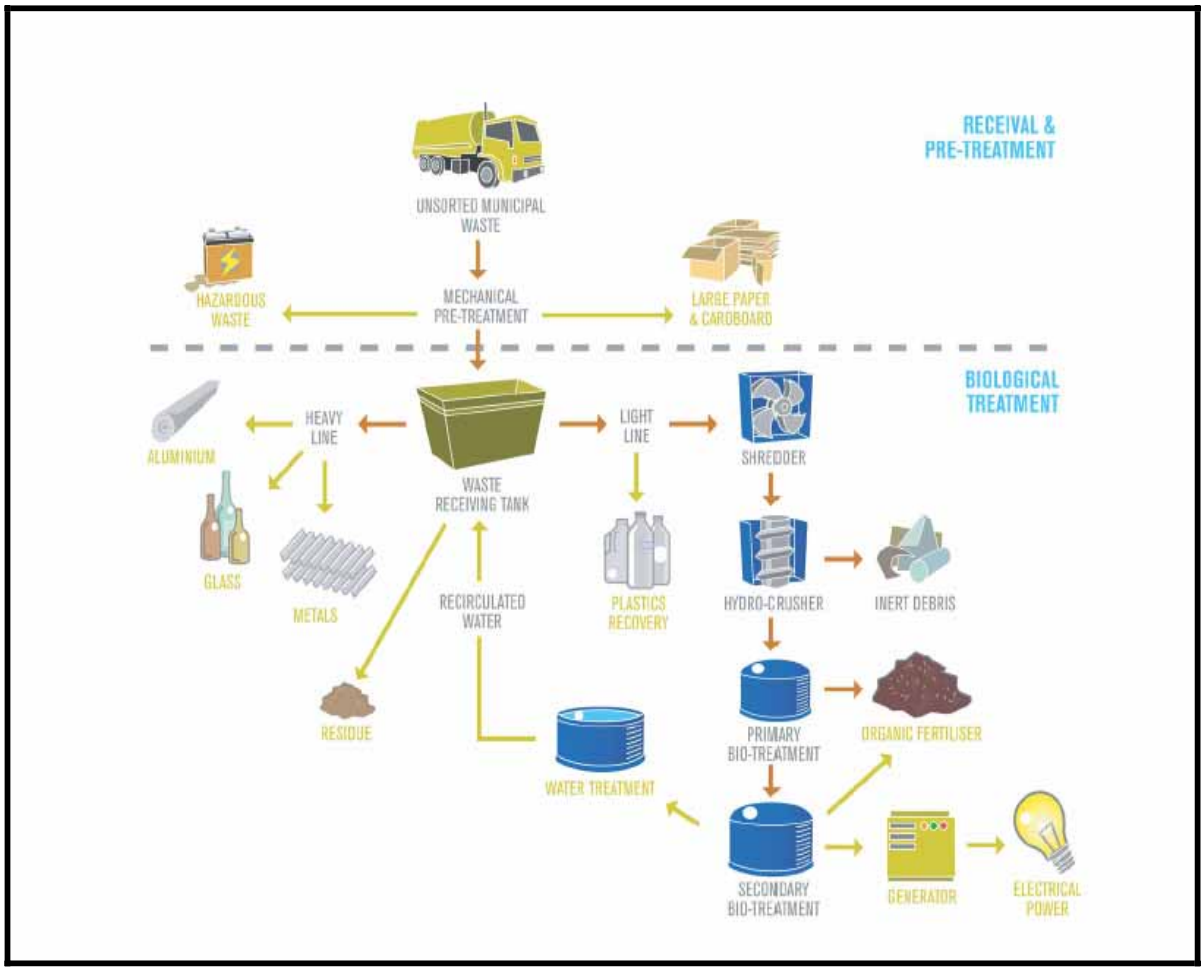

Figure 3.5: Conceptual Outline of the ArrowBio Process

The ArrowBio Plant will comprise three integrated processing units, utilising a combination of advanced MRF technologies and innovative biological processing techniques to maximise resource recovery.

Receival Hall

The municipal solid waste (MSW) is delivered into an enclosed Receival Hall by truck. Easily recoverable products, such as cardboard, are sorted by hand.

Processing Building

The balance of materials are sorted in the Processing Building via a trommel into larger and smaller fractions. Large fractions (*e.g.* concrete, furniture) are removed by mobile equipment and transferred to alternative facilities for recycling.

The remaining fractions are then shredded and passed into an aqueous solution (**Figure 3.6**). From this point forward the waste is constantly kept in a submerged state, preventing odour escape.

Figure 3.6: Hydro-Mechanical Sorting Systems in the Receival Hall at Tel Aviv

Once submerged, the shredded material separates out by the processes of buoyancy based on density. Inorganic materials will either generally rise to the surface (*e.g*. plastics), or fall to the bottom (*e.g*. glass fines). These materials are then extracted and transported to alternative facilities for further recycling.

This first processing stage ends with passing the suspension through eddy current and magnetic separators to further extract any Aluminium or Ferrous particles from the solution. This solution, consisting primarily of organic material, is hydro-crushed and then pumped into two bioreactors or fermentation tanks for acidogenic digestion (**Figure 3.7**).

Biological Plant

Once the solution is pumped to the first part of the biological plant (acidogenic digestion), naturally occurring micro-organisms start the fermentation process and transform the complex organic material into simpler compounds such as organic and fatty acids. This acidogenic fermentation process is an uninterrupted process, and the fermented liquid is transferred continuously to the methanogenic fermentation processing tanks.

Figure 3.7: AWT Bioreactors Controlling Fermentation.

The organic acid solution from the acidogenic stage is passed into a Methanogenic Reactor. A different type of micro-organism processes the organic material producing both a biogas (approximately 70% Methane and 30% Carbon Dioxide) and sediment (the final product; nutrient rich sludge). The passive anaerobic fermentation and gas capture systems will operate 24 hours per day. The process is designed to account for cases of system failure, ensuring that odour and noise levels will not exceed approved levels.

3.2.3 Water and Energy By-Products

The anaerobic fermentation process produces three valuable resources. The chief by-product of anaerobic fermentation is gas (predominantly methane). The biogas is collected in the upper part of the Methanogenic Reactor and can be transferred out of the system directly to energy generating units (*e.g.* electrical generators) (**Figure 3.8**). Alternatively, it can be stored for later usage as fuel in biogas vehicles. Energy produced through a generator could be used to power the site and/or sold-off to Energy Australia as an energy off-set. It would be expected that the site would produce approximately 2MW of energy per year.

Digested biomass from the Methanogenic Reactor is dewatered, and subsequently usable as an organic soil amendment (compost) as it is nutrient rich. Secondary processing of the biomass such as pelletisation is possible and would increase the potential market for the biomass.

Figure 3.8: AWT Gas Engines – Tel Aviv, Israel

Due to the nature of putrescible goods and the fermentation process, the system produces an excess of water. This excess water can either be re-used in the system (*e.g*. for the separation and shredding processes in the first stage) or treated and released to the sewer system or tankered off-site.

3.2.4 Overall AWT Outcomes

It is anticipated that the proposed Chullora AWT facility would divert approximately 75% of waste away from landfill, through best-practice recovery of recyclables and bioorganic treatment. This would prevent about 67,500 tonnes per year of waste (resources) being sent to landfill. This has significant environmental benefits including conservation of scarce landfill capacity. The facility will also avoid climate changing greenhouse gas impacts through total capture of biogas for renewable energy generation.

4. ALTERNATIVES AND JUSTIFICATION

4.1 Context – Landfill Capacity Constraints

The landfill capacity for putrescible waste in the Sydney Metropolitan Area is becoming increasingly limited relative to the amount of waste being produced by both residential and commercial operations. The need for conservation of this limited landfill capacity and increasing waste levies are driving waste technology innovation. The landfilling of putrescible waste and recyclables also results in significant greenhouse gas (GHG) generation - up to 8% of total state and national GHG emissions when the embodied energy contained within recyclables is considered (Lamb, 2007). The emission of these GHG's can only be reduced, but not completely eliminated, through the application of best practice landfill gas collection systems.

Sustainable alternative waste technologies, which are capable of achieving efficient resource and energy recovery and significant landfill diversion, are urgently required in order to achieve the goals of the 2006 Waste Avoidance and Resource Recovery (WARR) Strategy (DECC, 2006). This Strategy identifies such technologies as integral in achieving its aim of increasing recovery and re-use of materials from municipal waste streams from 26% in 2000 to 66% by 2014.

4.2 Alternative Waste Technologies – Current Status in NSW

There has been a rapid expansion in the technologies available for processing municipal waste streams, predominantly focusing on using Mechanical Biological Treatment (MBT) and thermal treatment.

Currently, the only such facilities within Sydney capable of treating putrescible waste are the Global Renewals Limited (in conjunction with WSN) Eastern Creek UR-3R plant (capable of processing 220,000 TPA), and the Earthpower facility at Camellia (capable of processing 76,650 TPA.

The UR-3R facility uses a four-stage treatment process - involving waste sorting, aerobic percolation, and additional anaerobic treatment producing biogas and composting to produce soil conditioner.

The Earthpower facility processes foodwaste and organic wastes using anaerobic digestion to produce renewable energy and fertiliser pellets.

Outside of Sydney there are a further four facilities operating AWT's:

- the Bedminster plants at Port Stephens, Perth (WA) and Cairns (QLD), and
- the Remondis plant at Port Macquarie.

The Bedminster plants are aerobic processes producing compost for broad-acre use and the Remondis plant processes green and food waste to produce quality compost for general use. Aerobic technologies are generally suitable for the treatment of garden organics and food waste; they do not capture GHG's or their renewable energy values.

4.3 The Benefits of ArrowBio Technology

The ArrowBio technology proposed for the AWT is a best practice (water based) MBT incorporating anaerobic digestion – converting waste into renewable energy, carbon credits, recovered recyclables and fertiliser. The technology has been proven to be comparatively efficient in regards to resource use, resource recovery, waste reduction,

landfill reduction, and environmental impacts, when compared to other emergent waste technologies (NYCDS, 2004).

The proposed AWT is primarily designed to process putrescible waste, and reduce the quantities sent to landfill (at least 75% reductions can be achieved depending on the type of waste (NYCDS, 2004)). In addition to this benefit, the final slurry produce of the system can be utilised (subject to gaining relevant approvals) as a rich organic fertiliser. This is of value as the demand for compost for both private and industrial vegetation rehabilitation is increasing. The gas-emissions, which the AWT produces, are fully harnessed and can be used as biogas for vehicles or electricity generation.

In comparison with other processing techniques the ArrowBio technology generates a small environmental footprint. Noise and odour emissions are minimised by having the receival and processing areas enclosed and under negative pressure. Ventilation through bioscrubbers (or other appropriate air filtration technology) further reduces the likelihood of odours leaving the site.

Similarly, the majority of the pre-fermentation process is completed in a submerged state. There is no odour associated with enclosed fermentation and the gas produced is specifically harvested for electricity production. Observations at the currently operating plant in Israel (described in **Section 3**) confirm these low noise and odour levels.

The range of benefits the project is anticipated to provide includes:

- maximum recovery of the major elements of the waste stream, thereby maximising energy and resource recovery;
- reductions in greenhouse gas emissions through the total capture and utilization of Biogas, and subsequent energy requirement reductions through green electricity;
- reductions in greenhouse gas by recycling of materials previously lost to landfill and emissions from landfilled organic material;
- reductions in landfill volumes and costs;
- the production of marketable compost from AWT sludge;
- containment of odour, noise and dust impacts by the enclosed nature of the facility, minimising impacts on surrounding businesses;
- development of a new industry and new employment opportunities within the Chullora Technology Park and suburban surrounds; and
- reductions in the environmental and economic costs of waste transport to distant waste receivers for putrescible waste.

4.4 AWT for Chullora WRC

The proposed AWT at Chullora WRC is of the same design as the facility at Jacks Gully WRC and will be capable of processing 90,000 TPA. Chullora WRC currently has approval to receive and transfer out municipal and dry waste, as well as garden organics and to process recyclables at the Materials Recovery Facility (MRF). Increasingly municipal waste is transferred either directly to WSN's landfill network or the UR-3R AWT at Eastern Creek. If this project proceeds it will permit best practice resource recovery and dramatic reductions in the transportation of waste to landfill. Centrally locating the AWT will generate significant environmental, economic and social benefits - including conserving limited landfill space and reducing the transportation of waste. The proposal is seen as advantageous to the on-going sustainable development of the region.

The proposed AWT site, within the Chullora WRC, is currently predominantly open space. This is considered an inefficient use of valuable industrial land. It would be optimal to utilise this potential area with facilities complementary to the existing site facilities and to achieve

the strategic aims of the relevant legislation and guidelines for waste management within NSW (*i.e.* WARR Act, Regulation, and Strategy).

The ArrowBio technology proposed for the AWT is an advanced technology and is seen to be in-line with Bankstown City Council's development vision for the Chullora Technology Park, within which the site is located. The installation of ArrowBio technology at Chullora WRC would complement the existing WRC facility by:

- increasing the capture of recyclable goods, normally lost to landfill;
- 100% capture of biogas for generating renewable energy;
- further expanding the scope and efficiency of the WRC - achieving a more sustainable waste management system for the region; and
- significantly upgrade the WRC's technological capacity to minimise the potential for environmental impacts on the surrounding industries.

If the proposed AWT facility did not proceed at Chullora WRC – putrescible waste would be transported by road to distant landfills – increasing road congestion, GHG generation and local government transport costs. A range of sustainable outcomes, including best practice resource and energy recovery, GHG capture and metropolitan landfill conservation, would not occur.

5. PLANNING CONSIDERATIONS AND LEGISLATIVE PROVISIONS

This section outlines the relevant statutory framework relevant to the proposed development of the Chullora WRC.

5.1 Commonwealth Legislation

Actions which are likely to have a significant impact on matters of National Environmental Significance, a significant impact on Commonwealth land or that require referral to the Commonwealth Minister of the Environment are required to be assessed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Matters of National Environmental Significance include:

- World Heritage Properties;
- Listed Migratory Species;
- Listed Threatened Species and Communities;
- Nuclear Actions;
- Wetlands of International importance; and
- Commonwealth Marine areas.

Given the current land usage and existing extent of native flora and fauna it is seen as unlikely that the proposed development would have a significant impact on any matters of National Environmental Significance. Similarly, the site is not expected to impact upon any Commonwealth Lands. The potential impact of the development on the identified threatened ecological community and flora is further discussed in **Section 7.6**. It is not expected that proposed development will need to be referred to the Commonwealth Minister for the Environment.

5.2 NSW State Legislation

5.2.1 Environmental Planning and Assessment Act 1979

The process of assessment and approval of proposed developments is regulated by the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Environmental *Planning and Assessment Regulation 2000* (EP&A Regulation). Three categories of assessment are defined within the EP&A Act: Part 3A, Part 4, and Part 5. Part 3A provides for control of 'major infrastructure or other projects' that require development consent or other approval from the Minister for Planning. Part 4 provides for control of 'local development' that requires development consent from the local Council. Part 5 provides for control of 'activities' that do not require development consent or approval from the Minister for Planning.

The proposed development of the Chullora WRC falls under the provisions of Part 3A of the EP&A Act.

5.2.2 Application of Part 3A to this Proposal

Part 3A of the EP&A Act establishes an assessment and approval regime for major infrastructure Projects within NSW. Part 3A applies to development that is declared to be a Part 3A "major project" project by either a State Environmental Planning Policy (SEPP) or Ministerial Order in the Government Gazette (Section 75B).

The proposed works relate to the development of a new waste processing facility capable of processing greater than 75,000 tonnes of waste per year within the Sydney Metropolitan Region. Therefore the project is to be considered a major project by virtue of Clause 27 (3) of Schedule 1 of SEPP (Major Projects) 2005. Additionally, as the proposed AWT plant will produce biogas to be converted to electricity at a capital cost in excess of $30 million the project is also to be considered a major project by virtue of Clause 24 (a) of Schedule 1 of SEPP (Major Projects) 2005.

Section 75M, Division 3 of Part 3A of the EP&A Act provides a process for the environmental assessment and approval of concept plans for projects where the Minister has authorized or required a proponent to submit a concept plan. No request for consideration of a concept approval will be submitted for this project.

The nature of the proposed works (waste management) and the relative proximity of residences (300m) is considered a significant factor in the assessment of the project. Subsequently, the level of detailed information required to provide a reliable assessment of the project (*i.e.* extensive monitoring and modelling) is considered beyond the scope of a concept plan. This has been decided in consultation with the Department Environment and Climate Change (DECC).

On receipt of the Director General's Requirements, in response to this Preliminary Environmental Assessment, a detailed project plan and Environmental Assessment will be submitted to the Department of Planning for assessment and approval.

5.2.3 Protection of Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) regulates pollution sources and waste disposal practices within NSW. Primarily, the POEO Act provides a licensing framework for all developments. The proposed development is considered scheduled development under Schedule 1 of the POEO Act and will require licensing. In order to ensure that the proposed development is consistent with waste management practices and conforms to the requirements of the POEO Act, this PEA shall be distributed to DECC for comment.

5.2.4 State Environmental Planning Policies

There are a number of State Environmental Planning Policies, which are likely to be relevant to the proposed works. The relevant SEPPs and their provisions are:

- SEPP (Major Projects) 2005: As outlined in Section 5.2.2 under the definitions of Schedule 1 the project has been declared as a major project.

- SEPP No. 33 – Potentially Hazardous or Offensive Developments: This policy aims to ensure that appropriate mitigation measures are employed to minimise the impacts of developments that are deemed 'hazardous' or 'offensive', and outlines matters to be considered by the Consent Authority when assessing hazardous and offensive development proposals. The proposed development is considered as potentially offensive because waste related activities could potentially impact on the surrounding locality, even after measures are taken to reduce or minimise the potential impacts.

- SEPP No. 55 – Remediation of Land: This policy aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. Previous works on the proposed site have discovered and remediated contaminated land. It is possible that further contaminated land may be uncovered during the works process.

- SEPP No.19 - Bushland in Urban Areas: This SEPP protects and preserves bushland within certain urban areas (zoned in particular manner), as part of the natural heritage or for recreational, educational and scientific purposes. Any development impacting native bushland areas must obtain consent from the relevant council. The proposed site has an area of native bushland, but is not zoned in a manner that triggers SEPP 19.

- SEPP (Infrastructure) 2007 - This policy aims to facilitate the effective delivery of infrastructure across the state. As the Chullora WRC is zoned General Industrial (Bankstown LEP 2001) - it constitutes a prescribed zone for 'resource recovery facilities' and the proposal is thus permitted with consent.

Other relevant SEPP, which was not seen to be applicable with regards to this project, are:

- SEPP No. 44 – Koala Habitat Protection: This policy aims to preserve known or likely Koala habitat to aid in the preservation of the species. Although containing small stands of native vegetation, the site does not contain any feed species. This SEPP does not apply to the site.

5.2.5 Regional Environmental Planning Policies

There are no Regional Environmental Planning Policies relevant to this proposal.

5.2.6 Local Environmental Plans

The site is subject to the planning provisions of the Bankstown Local Environment Plan (LEP) 2001. The Bankstown LEP aims to regulate development within the LGA in accordance with the local environment, demographic, amenity and sustainability goals. Under the LEP the site and surrounds fall within Zone 4(a) – General Industrial. The area immediately to the west of the site occupied by rail infrastructure is classified as Zone 5 – Special Uses (Railway), development of which is permissible with consent from Council where compliant with the requirements of the Transport Administration Act 1988.

Land within Zone 4(a) – General Industrial is designated such in order to promote development of primarily industrial services which are inappropriate in other zones, and limit the development of commercial business other than those which complement the industrial nature of the area. The developments are required to be designed such that they minimise any negative environmental and social effects.

The General Industrial area in which the proposed site falls has been further classified as land comprising the Chullora Technology Park under the Bankstown Development Control Plan 2005 (**Figure 5.1**). The objectives of the Technology Park are to:

- provide detailed controls and guidance for developers;
- encourage development that is appropriate for the site; and
- ensure items of natural and built heritage significance on the site are identified, recorded, and considered for possible retention.

Council wishes to encourage the development of technology rich and advanced industries within the area while preserving the following elements of the site:

- Vegetation: Any developments impacting areas of vegetation must be accompanied by a Plan of Management. The Plan of Management must justify any loss of significant vegetation, and describe any management practices aimed at retaining the existing vegetation.

- Heritage items: Any developments that propose to demolish or remove any structures or buildings from the site must be accompanied by advice from the Railway Heritage Committee.

- Drainage: Drainage systems on new developments must not increase the peak flows above pre-development conditions and ensure that gross pollutants do not leave the site and enter the Cooks River. Several conditions are detailed to help ensure this.

- Roads: Council accepts no responsibility for the funding of road works associated with the Chullora Technology Park or the maintenance of any private roads existing on a site.

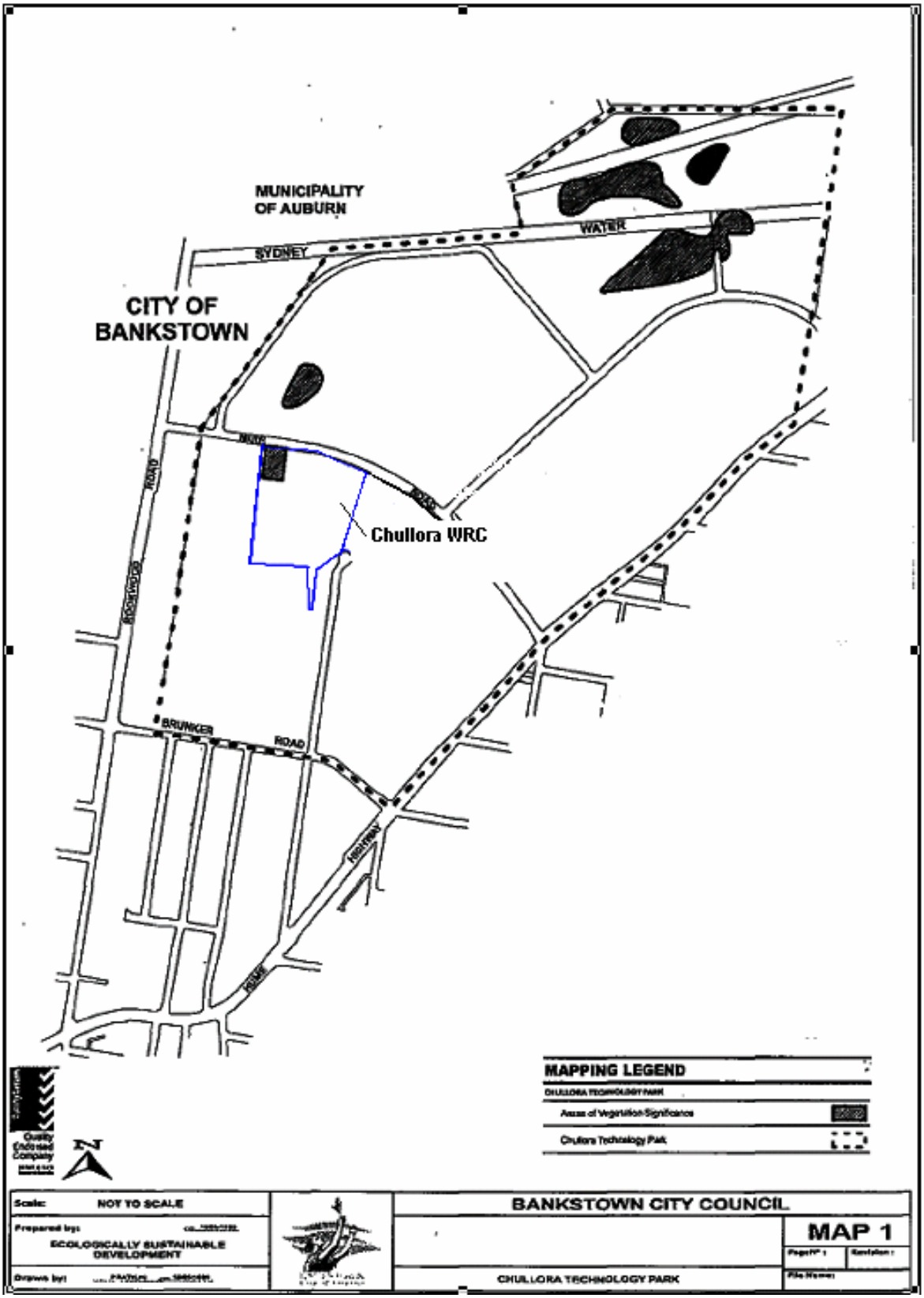

Figure 5.1: The Chullora Technology Park showing Chullora WRC.

6. COMMUNITY AND STAKEHOLDER ENGAGEMENT

Initial stakeholder and community engagement activities have commenced and further consultation is expected to shape the proposed development and the range of impact mitigation measures.

6.1 Bankstown City Council

Chullora WRC site redevelopment discussions have been held with Bankstown City Council senior planning officers (24 April 2007). Further dialogue will continue through the assessment process.

6.2 Statutory Authorities

Initial discussions were held with officers from the DoP (13 November 2007) and the DECC (18 October 2007) (Waste and Air Quality officers) in regards to the project and the assessment and approvals process.

DECC outlined the key issues that would need to be addressed in the EA. These included potential odour and noise impacts; many current AWT facilities experience such issues. It is important to note that the proposed process, the ArrowBio method, is significantly different to other AWT facilities (**Section 4.3**). Preliminary modelling undertaken by Holmes Air Sciences was discussed and indicates that even un-enclosed processing is unlikely to lead to odour impacts outside of the site boundary.

Issues identified by DECC included:

- typical buffer distances for putrescible waste processing are generally at least 0.9km (*c.f.* 300m in this case);
- methods of assessing the technology given that the technology is new and only one other plant is currently in operation. It was noted that the plant at Jacks Gully was approved by the DoP under Part 3A, will be commissioned in 2008;
- the need for strict odour and air quality controls (*e.g.* Bioscrubbers were suggested);
- the need to define contingency management measures to prevent impacts in the case of system failure;
- expansion of existing community consultation is required;
- the necessity to remove existing glass fines stockpile; and
- exploration of opportunities for biogas produced by the process to power WSN fleet vehicles and trucks, and provide energy to the electricity grid.

Other Government stakeholders which are proposed to be consulted during the preparation of the EA include:

- Department of Environment and Climate Change;
- Roads and Traffic Authority;
- Sydney Water Corporation;
- NSW Heritage Office;
- Railway Heritage Committee;
- Department of Water and Energy;
- Integral Energy;
- Department of Primary Industries, and
- Railcorp / ARTC (as required).

6.3 Business, Community and Non-Government Organisations

WSN has established a consultative committee for local businesses in the vicinity of the Chullora WRC, which also incorporates some NGOs and community members. In addition to receiving on-going feedback from members, WSN meets with active community groups concerned about the environmental impacts of the site. A 24-hour contact telephone line for the community to contact WSN has been established.

Further consultation with the local community and identifiable interest groups will be undertaken as the environmental assessment progresses. Key community members to be included in consultation include:

- George Weston Foods Limited located immediately east of the WSN Chullora site;
- McWilliams Wines to the south-east of the site;
- Pacific National located on the northern side of Muir Road;
- the range of commercial and industrial business to the south and west of the site;
- the Potts Park Greyhound Racing Club; and
- residences west of Rookwood Road.

Further consultation could take the form of:

- issue of two rounds of letters to residents and businesses outlining preliminary and, later, the detailed site design with the opportunity for feedback prior to release of the Draft EA for Public Exhibition;
- an open day at the site with a display to outline the proposed works; and
- receipt of delegations from any interested community groups.

A full discussion of the community engagement strategy will be provided as part of the detailed EA.

7. PRELIMINARY ENVIRONMENTAL ASSESSMENT

This section describes the potential environmental impacts identified with the proposed development at Chullora WRC. Where appropriate, a description of the methodology for assessing and addressing these matters to be undertaken later in the approvals process is provided.

7.1 Site Characteristics

The WSN Chullora WRC (**Figure 1.3**) occupies 15.2ha in the upper region of the Cooks River Catchment. The site is situated on Wianamatta shale, typical of the Blacktown Soil Landscape Group (Chapman and Murphy, 1989). The Wianamatta shales comprise claystone with fine to medium grained sandstones. A natural layer of medium density brown clay overlies the shale. Some parts of the site were previously filled and levelled using ash, associated with the former use of the site as railway workshops (Perram & Partners, 2000). Site contamination investigations prior to the initial development of the site revealed localised contamination from railway use, generally limited to the top 0.3 metres of the soil (ERM, 1996). Further investigations were carried out during demolition of railway structures and the site was satisfactorily remediated during redevelopment.

The site experiences an average of 870 mm of rainfall per year, with a seasonal maximum of 103mm in February and seasonal minimum of 44.3mm in July. The average maximum temperature experienced at the site peaks in January (28°C) and is lowest in July (17.2°C) (BoM, 2007). The winds experienced at the site are generally from the west and south-south-east in the morning, shifting and strengthening to easterlies in the afternoon (Perram & Partners, 2000).

The proposed site is located within the Chullora Technology Park. Other industrial companies adjacent to the site include the GWF property (**Figure 2.3**), McWilliam's Wines (**Figure 7.1**) a steel galvanising plant (**Figure 2.7**), and a waste transfer station (**Figure 7.2**). The closest existing residences are within 300m to the southwest, on the western side of Rookwood Road (Yagoona) (**Figure 1.3**).

Figure 7.1: Neighbour to the southeast – McWilliams Wines

Figure 7.2: Neighbour to the south – Veolia Greenacre Waste Transfer Station.

Given this existing environment and the proposed works, the key environmental issues identified relate to:

- Air Quality, Dust and Odour;
- Traffic;
- Surface Water Management;
- Acoustics;
- Flora & Fauna;
- Waste Management;
- Heritage; and
- Visual Impact.

Previous developments of the site led to the production of several Environmental Impact Statements (ERM, 1994; ERM, 1996; Perram & Partners, 2000), which addressed each of these issues for the current operations. As the direct impact of the proposed development is predominantly limited to one section of the site, several of the studies conducted for these previous developments are expected to provide sufficient data to not require further re-assessment. However, the AWT potentially presents new issues, which will require monitoring and control measures.

7.2 Air Quality, Dust and Odour

It is expected that air quality may be impacted through dust and odour. Steps will be taken to mitigate any impacts on air quality to comply with required dust and odour levels.

7.2.1 Odour

The proximity of the site to both residences and sensitive industrial receivers (particularly the GWF and McWilliam's Wines properties) highlights odour as a significant issue. No odour studies were conducted for the current operations (assessment was made on comparison to studies done at similar facilities (Perram & Partners, 2000)). An existing potential odour source is the Garden Organics Area. This is mitigated by having a 48-hour turnover of material and no composting on-site. This policy will be maintained. Odours from the MRF, Glass Fines Processing Plant, Community Recycling Centre, and delivery trucks are not considered likely to migrate off-site.

It is recognised that the proposed AWT represents a different odour source and requires further modelling. Preliminary modeling by Holmes Air Sciences indicates that in an exposed situation (*i.e*. assuming no enclosure of the source), AWT odours do not have the potential to move across the WRC boundary. Although similar plants are currently not operational within Australia, preventing direct comparison, modelling commissioned for the WSN Jacks Gully ArrowBio plant (GHD, 2006) indicated that, with appropriate control measures in place, the odour output of such a system is minimal.

In general, the ArrowBio process is considered a low odour technology, largely due to the waste being immersed in water soon after entering the plant (**Section 3.2.2**).

Mitigation measures to further reduce odours include:

- completely enclosing all aspects of the AWT (including truck delivery and unloading);
- operating the ArrowBio plant under negative air pressure;
- filtering exhaust air through an appropriate odour reduction system (such as a bioscrubber) to absorb any potential odours;
- refusing to accept particularly odorous waste;
- daily clearing and washing of the push pits, plant and delivery floors; and
- providing a masking agent for addition to cleaning/washing sprays, if needed.

It is recognised that as the technology is relatively unknown and untested in Australia, the locating of a putrescible waste processing station within close proximity to residences is of concern. Holmes Air Sciences will be commissioned to conduct detailed monitoring and modelling, based upon predicted outputs and environmental conditions to allow for appropriate controls to be adopted.

7.2.2 Dust

It is not expected that dust impacts would be significant during operation of the proposed AWT facility. Primarily, this is due to the emptying of all truckloads within an enclosed building. All roads on-site will be sealed to prevent vehicle-based erosion. The Garden Organics Area represents the greatest potential dust source (*e.g*. shredding). Management of stockpile size and regular wetting of surfaces will minimize any potential dust pollution. The Garden Organics Area has not received any complaints in regards to dust since it was commissioned. The MRF has also not received any dust related complaints since it commenced operations in 1997.

During the demolition/construction phase of the proposed facility dust emissions may increase. While the total dust generated at the site is likely to increase during this initial earthworks stage it is expected they would be well below the EPA Guidelines. Appropriate erosion and sediment controls will be implemented during the construction phase to minimize any potential impacts of dust generation on adjacent residents and businesses.

7.3 Traffic

The Chullora WRC currently receives approximately 148,000 vehicles per year. The site is accessed primarily through Muir Road (all vehicles which enter from Muir Road must pass over a weigh-bridge). A secondary access is available through Anzac Street (primarily used by staff). Muir Road is a four lane, east-west street joining Rookwood Road with the Hume Highway.

The previous development of the MRF and associated EIS (ERM, 1996) led to the construction of a two-lane roundabout to the east of the site entrance (**Figure 2.1**). This roundabout (coupled with a 75m right-hand turning bay) allows access to the site from Muir Road in both directions, and egress is via left turn only. Further analysis of this entrance/exit arrangement (Perram & Partners, 2000) indicated that the four major intersections along Muir Road (including the linkages with Rookwood Road and the Hume Highway) were operating relatively efficiently.

The AWT facility and the MRF upgrade are expected to increase the number of trucks entering and exiting the site. A comprehensive Traffic Assessment will be commissioned as part of the EA and will detail the exact number of additional trucks generated by the proposed AWT facility and MRF upgrade. It is expected that, given the current efficiency of the road system and the length of the right-hand turning bay, the proposed development would not significantly deteriorate the traffic flows in the area. Detailed traffic flow modelling is required to certify that no significant impact would be produced.

Currently there is parking available on Muir Road. It is probable that the traffic study would recommend that parking availability be removed, at least for the westbound lanes. It should also be noted that Council does not accept responsibility for the funding of any road works within the Chullora Technology Park.

7.4 Surface-Water and Ground-Water Management

The Chullora WRC is in the upper catchment of the Cooks River. Stormwater run-off from the site enters an open channel, which borders the site to the south and proceeds north along the eastern boundary (**Figure 2.1**). The channel captures run-off from the residential area to the southwest and the majority of the Chullora Technology Park. The nature of the channel varies from an open concrete-lined channel, to a hybrid channel (the channel bed and lower banks manipulated to resemble a natural creek) (**Figure 7.3**), to a closed channel passing under Muir Road. ERM (1996) states that site is located above the 100 year ARI event level. Some minor flooding has historically occurred in the south-west corner of the site. Modelling would be conducted for the EA to understand flood risks on the site and surrounds.

The site currently maintains a stormwater detention basin and adjacent first-flush basin (**Figure 7.4**) capable of receiving all site run-off in a 100 year rainfall event. It is not anticipated that the proposed development will significantly alter the site stormwater flows. The current drainage system will be altered to accommodate the proposed structures and operations. Modeling will need to be conducted to determine whether alterations to the size and capacity of the detention and first-flush basin are required.

Figure 7.3: View of transition between concrete channel and hybrid stormwater channel installed upstream of the Chullora WRC.

Figure 7.4: Oblique aerial view of existing first-flush and stormwater detention basins.

During construction an appropriate sediment and erosion control plan will be implemented. The enclosure of facilities where possible will limit litter and macro pollutants from entering the stormwater system.

It is unlikely that the proposal will have any impact upon groundwater as all operations will be conducted within hard-stand enclosed areas and the majority of the site (*e.g.* roads and carparks) are impervious.

As the ArrowBio system actually produces a net gain of water (**Section 3.2.3**), there may be the option of treating the water for further use on or off-site.

7.5 Acoustics

As the proposed works are close to established commercial, industrial, and residential areas, there is potential for noise and vibration impacts during both construction and operation. The industrial nature of the area and traffic flow along Muir and Rookwood Road contribute to existing background ambient noise levels.

During construction, noise would be generated from the construction/demolition site and the movement of trucks and equipment on and off-site. Maintenance of construction plant and equipment and restricting construction hours will minimize the short-term impacts of construction noise. During operation, noise and vibration would be generated by the passage and unloading/loading of trucks, the operation of AWT plant and equipment. The 24 hour operation of the AWT will produce a continuous noise source.

The most recent noise monitoring and study for the site was undertaken by Atkins Acoustics for the 2000 Environmental Impact Statement (Perram & Partners, 2000). The study revealed that the noise levels satisfied the amenity criterion for both the residential and industrial receptors under all modelled conditions. However, the intrusive criterion was only seen to be satisfied for residential receptors for most conditions and the industrial receptor criterion for intrusive noise was exceeded in four of the five modelled scenarios. Atkins Acoustics identified the main noise sources associated with these non-compliances as the reject chute and bin and the glass discharge chutes at the MRF.

The proposed works will require new modelling to be undertaken, utilising known sound power levels generated from similar facilities (*e.g*. WSN's Eastern Creek and Jacks Gully facilities. The noise modelling will incorporate all likely noise sources on site. Given the proposed enclosed nature of the AWT (and the MRF), it will be possible to establish effective noise controls to ensure compliance to DECC required noise levels (EPA, 2000). It is likely that noise output will remain similar to current WRC operational noise levels.

Traffic noise will also be modelled to account for predicted increased transport levels. The area is highly industrial and there already exists a significant ambient road noise from Muir and Rookwood Roads.

7.6 Flora and Fauna

The majority of the site is developed or cleared land. There are three broad stands of vegetation on the site (**Figure 2.1**). The stands along the southern and eastern portions of the site, bordering the hybrid stormwater channel (**Figure 7.3**) are largely populated with landscaped and invasive species (*e.g.* Silky Oak (*Grevillia robusta*), *Casuarinaceae*, *Pittosporum spp*., *Acacia spp*.). The majority of trees within these stands are relatively juvenile in nature.

The vegetated area in the north-west of the site was identified in the original site EIS (ERM Mitchell McCotter 1994) as containing several Downy Wattle (*Acacia pubescens*) trees. The Downy Wattle is listed as vulnerable under the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 and Threatened Species Conservation (TSC) Act 1995. Further to this, Eco Logical conducted a vegetative study of the Bankstown LGA (Eco Logical, 2002) and identified this stand as remnant Cumberland Plain Woodland (CPW). CPW is listed as an Endangered Ecological Community under the EPBC Act 1999 and TSC Act 1995. This area is currently fenced off from the rest of the site.

It is considered unlikely that the proposed works will significantly impact any of the flora stands on the site due to the localized nature of the works. The works will be conducted on areas of open space, either hard-stand or grassed areas with little vegetation. The existing glass-fines stockpile to the north of the Elcar Building currently has some minimal grass, shrub and tree cover present which will need to be removed, however this is not considered significant habitat. Streetscape, semi-mature *Casuarina* trees may also be required to be removed to accommodate the works. This is also considered unlikely to affect any native species and will be offset with further plantings on completion of the works and in other areas of the site. Given the proximity to the stand of CPW protective fencing will be established to prevent dust and debris from affecting the stand.

There is little fauna present on site. There are known rabbit, rat and general vermin problems associated with the site. The predicted minimal flora impact suggests that it is unlikely any terrestrial or avian fauna will be negatively affected by the proposed works.

7.7 Waste Management

It is likely that the proposal would generate a number of waste streams and utilise a variety of materials during construction. General building waste (*e.g*. timber, masonry, scrap metal, packaging materials and plastics) is likely to be generated. The construction phase of the works would require the development of a waste management plan to ensure efficient resource recovery and minimise environmental impacts.

In operation, the AWT Facility residue wastes will be transported directly to landfills. The "stabilised sludge" will also be disposed of to a suitably licensed landfill until potentially gaining DECC approval for use as a compost material.

The proposed AWT facility has been purposely designed to produce a minimal environmental footprint (*e.g*. enclosed areas, capture and re-use of biogas, efficient recovery of recyclables). The nature of the site is such that appropriate disposal methods for most wastes are readily available. Appropriate approvals procedures for the handling and disposal of hazardous goods will be employed if required.

The proposed MRF upgrade will significantly increase regional resource recovery of recyclable materials – strengthening recycled materials markets, conserving landfill capacity, capturing embodied energy and reducing GHG impacts.

7.8 Heritage

The previous EIS documents (ERM, 1994; ERM, 1996; Perram and Partners, 2000) indicate that, other than the historic rail-yards and track, there have been no recorded heritage (indigenous or non-indigenous) items identified on the site or within its immediate surrounds. The site has been greatly disturbed, reshaped and sealed both in its use as a railway workshop and its current occupation. It is considered unlikely that any heritage items would be uncovered during the works. However; advice from the Railway Heritage Committee will be sought during the preparation of the EA.

Should any items suspected as being of historic value (greater than 50 yeas age for non-indigenous relics) be discovered in the course of the works, operations shall cease and the advice of a qualified archaeologist be sought before works resume.

An Aboriginal Heritage Information Management System (AHIMS) database search will be requested to confirm that no known items of aboriginal heritage occur within the site locality.

7.9 Visual Impact

It considered unlikely that the proposed works will impact upon the visual amenity of the area. The site is surrounded by similar industrial properties to the west, south, and east (**Figure 1.3**). Some aspects of the site are currently visible from Muir Road, however vegetative screening effectively protects the northern façade of the site. The proposed AWT buildings will adjoin the existing Waste Transfer Station and will be designed to fit in with the current architectural design and are unlikely to be readily visible from Muir Road due to the recessed nature of the site in comparison to its northern and western surrounds. The existing Cumberland Plain Woodland stand will shield the proposed bioreactor cells and limit any visual impact.

The visual impact of the proposed AWT and ancillary structures are consistent with the goals of Council in regards to the Chullora Technology Park.

Some negative visual impact may affect residences to the west of Rookwood Road during construction, however these effects will be short-term impacts only.

8. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

A preliminary environmental risk assessment was undertaken of the project specific construction and operation risks, particularly associated with the establishment of an ArrowBio AWT in the context of the overall Chullora WRC operations. Risks were identified based on the existing location, practices, proposed developments, and an understanding of ArrowBio technology. The preliminary environmental assessment (**Section 7**) provides further context to the risk assessment.

The risk assessment was based on an index formed from the perceived likelihood of an occurrence, and the subsequent consequence of that occurrence. Both likelihood and consequence were measured on a scale of 1 – 5 (improbable/negligible – frequent/catastrophic). A subsequent index was developed and all identified risks classified as belonging to either Low, Moderate or High risk categories (**Table 8.1**). This is a conservative index, emphasising the number of Moderate and High risks identified.

Table 8.1: Environmental Risk Assessment Matrix

Likelihood	Consequence				
	Insignificant	**Minor**	**Moderate**	**Major**	**Catastrophic**
Improbable	Low	Low	Low	Moderate	Moderate
Remote	Low	Low	Low	Moderate	High
Occasional	Low	Moderate	Moderate	High	High
Probable	Moderate	Moderate	Moderate	High	High
Frequent	Moderate	High	High	High	High

The results of the risk assessment are shown in **Appendix A**. The majority of risks identified are seen to be of a Low or Moderate nature. The only High risks identified involved the injury or loss of human life. The increased traffic flows and work schedules during both construction and operation of the proposed facility will increase the likelihood of accidents occurring. The installation of clear and visible warnings, street signs and lighting, will minimize risks.

The potential risk of odour impacts resulting from a putrescible waste processing facility in close proximity to residential areas was not seen to be a High risk when coupled with comprehensive environmental management facilities. This is largely due to both the technology involved in the process and measures incorporated into site design. The submergence of all waste under water, almost immediately after truck delivery, greatly limits the potential for odour emissions. The completely enclosed (including truck entrance/exits), negatively pressured facility provides significant opportunities for air filtration prior to odours leaving the building. An odour complaints register will be maintained, and Bio-scrubbers (or other appropriate air filtration technology) may be installed to mitigate any odour impacts.

The highly industrial nature of the Chullora Technology Park significantly limits the risks associated with noise and visual amenity as a result of AWT facility installation. Conversely, the industrial nature of the region increases the risks associated with traffic congestion. The most recent traffic surveys indicate the surrounding roads have potential to carry further levels without increasing congestion. It is not expected that the AWT facility will significantly impact traffic levels. However, should congestion increase, scheduling of waste vehicle delivery and utilisation of the Anzac Street entrance may be used to minimize the risk of congestion.

By conducting waste processing in an enclosed building and in a submerged state there is a reduction in the risks of litter, faced by the currently operating facilities at the site.

Similarly, the green technology utilised in the ArrowBio process results in a Low risk in regards to energy usage and greenhouse gas emissions.

9. ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Ecologically Sustainable Development is founded upon four basic principles to ensure that proposed developments minimise their ecological footprints:

- the precautionary principle;
- inter-generational equality;
- conservation of Biological Diversity; and
- improved valuation, pricing, and incentive mechanisms.

The proposed Chullora AWT is seen to be compliant with these four guiding principles. The nature of the technology is such that it is not seen to present a threat to the existing or future environment. The unique ArrowBio process is such that large reductions in the amount of waste sent to landfill will be achieved, reducing the waste storage burden of future generations.

The technology will deliver best practice resource recovery rates – effectively recovering the embodied energy of recyclables and thus reducing greenhouse gas impacts. It is expected that between 50-75% of the green energy produced on-site would be exported to the local power grid, saving more than 20,000 tonnes of greenhouse gases being produced at NSW power stations each year (GHD, 2006). The on-site production of electricity and water will conserve usage of resources from other limited and environmentally damaging sources. By providing local solutions to waste transportation problems, economic and sustainable outcomes to waste disposal issues are provided.

10. CONCLUSION

With appropriate management and environmental mitigation measures integrated into the design, the proposal is considered unlikely to have any significant environmental impacts, although further studies in regards to air quality, noise, stormwater run-off, and traffic will be commissioned. Should contaminated land or heritage Items be uncovered during the works, further studies will need to be undertaken at this stage. The level of environmental impact will be minimal primarily due to:

- the nature and design of the ArrowBio technology; and
- the existing modified and industrial nature of the site.

The project is seen to provide many on-going benefits for the site, environment, and local communities. It fulfils an increasing demand for regional waste services and resource recovery facilities. The social benefit is likely to extend to the provision of employment options during both construction and operation. In terms of the environment the ArrowBio technology both reduces the volume of waste sent to landfill and produces both re-usable water and green electricity.

The increased traffic flows, odour issues, and noise, will require in-depth monitoring and mitigation measures to confirm the findings of this PEA.

The construction phase of the project is likely to produce many impacts typically associated with construction sites. The adoption of an adequate environmental management plan will adequately resolve these issues. It is considered that the proposed development conforms with all legislative requirements of both State and Council authorities.

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APPENDIX A

Preliminary Environmental Risk Assessment

Preliminary Environmental Risk Assessment - Proposed Facility Upgrade at Chullora (including new AWT)

Environmental Impact	Process/Activity	Potential Impacts from AWT	Risk	Comments and Mitigation Actions
Odour and Air Quality	Overall AWT Operation	Unexpectedly high odour emissions from AWT operations impacting residences and businesses	**MODERATE**	Installation of advanced air filtration technologies limit the risk of odour emissions. The majority of waste processing is conducted in an aqueous environment negation odour risk
	Receival Hall - System Malfunction/Failure	System malfunction/failure resulting in increased odour emission	**LOW**	The receival hall is entirely enclosed and under negative pressure. Should waste processing systems in the hall malfunction, all effects are expected to be localised
	AWT Processing Building - System Malfunction/Failure	System malfunction/failure resulting in increased odour emission	**LOW**	The processing building is entirely enclosed and under negative pressure. Should waste processing systems in the hall fail all effects will be localised
	AWT Biological Tanks - System Malfunction/Failure	System malfunction/failure resulting in increased odour emission	**LOW**	The biological tanks are entirely enclosed and under negative pressure. Should waste processing systems in the hall fail all effects will be localised
	Malfunction/Failure of Bioscrubbers	System malfunction/failure resulting in increased odour emission and decreased air quality	**LOW**	The enclosure of all systems and liquid processing of waste limit the extent to which odours can leave the property.
Traffic	Construction Traffic	Pedestrian incident associated with construction traffic	**HIGH**	A detailed construction traffic management plan will be established.
	Operational Traffic	Pedestrian incident associated with waste delivery traffic	**HIGH**	Detailed and visible signing of road changes and speed limits will be provided
		Waste spillage during transport	**MODERATE**	The current measures taken to minimise spillage risk will be adopted by all vehicles entering/leaving the site
		Traffic accident resulting from changed transport routes	**MODERATE**	Detailed and visible signing of road changes and speed limits will be provided
	Traffic Congestion	Congestion along Muir Road resulting from increased traffic flows	**MODERATE**	Scheduling of vehicles to avoid peak congestion times and areas can be introduced.

Environmental Impact	Process/Activity	Potential Impacts from AWT	Risk	Comments and Mitigation Actions
Traffic	Traffic Congestion	Congestion along Rookwood Road resulting from increased traffic flows	**LOW**	Scheduling of vehicles to avoid peak congestion times and areas can be introduced.
		Congestion along the Hume Highway resulting from increased traffic flows	**MODERATE**	Scheduling of vehicles to avoid peak congestion times and areas can be introduced.
Noise	Construction of AWT	Exceedance of acceptable noise limits during construction, particularly at sensitive receivers	**LOW**	Effective noise barriers can be established. The location of the works and nature of the area diminish the likelihood of noise levels exceeding guideline levels.
	Operation of AWT	Exceedance of acceptable noise limits during operation, particularly at sensitive receivers	**MODERATE**	Effective noise barriers can be established. The location of the works and nature of the area diminish the likelihood of noise levels exceeding guideline levels.
	Electricity Generator operation	Electricity generators produce excessive noise	**MODERATE**	Effective noise barriers can be established. The location of the works and nature of the area diminish the likelihood of noise levels exceeding acceptable levels.
	Operational traffic	Higher volumes of vehicle passage than expected increasing noise levels	**LOW**	Scheduling of vehicles to avoid peak traffic times and areas can be introduced.
Water	Water usage within the AWT	Escape of water used by the AWT into the stormwater system	**MODERATE**	The site contains a water quality pond capable of capturing any such flows
Flooding	Significant rain and flood events.	Floodwaters entering the AWT	**LOW**	The elevation of the site and enclosed nature of the building make flooding unlikely
Heritage	Construction of AWT	Inadvertent damage to the historic railway and Elcar building	**MODERATE**	Para-webbing will be established along the Elcar building and Railway boundary to minimise accident risk.
Visual Amenity	Lighting resulting from 24 hour operation of AWT	Light disturbance (including night lighting, security lighting and traffic lighting during operation)	**LOW**	Location of site and nature of surrounding areas will prevent night lighting impacting residential areas
	Construction of AWT	Disturbance to Visual amenity during construction	**MODERATE**	There will be some short-term impact. The industrial nature of the area will minimise this impact
	Operation of AWT	Disturbance to Visual amenity during operation	**LOW**	Protective vegetative screening will negate any potential risk

Environmental Impact	Process/Activity	Potential Impacts from AWT	Risk	Comments and Mitigation Actions
Energy Use	Operation of AWT	Higher usage of electricity sources than expected	**LOW**	It is expected the site will produce surplus, "green", energy. Any net energy deficit will be minimal.
Climate Change	Operation of AWT	AWT system malfunction/failure leading to emission of greenhouse gases	**LOW**	Gas levels produced would be relatively minimal at any one time. Regular safety checks would be established to minimise risk.
Flora and Fauna	Construction of AWT	Inadvertent damage to the Cumberland Plain Woodland stand	**MODERATE**	Para-webbing will be established along the Cumberland Plain Woodland boundary to minimise accident risk.
	Operation of AWT	Fauna and Flora species affected by waste pollution and contamination	**LOW**	The enclosed nature of the proposed works will limit external impact. Regular litter inspections and removals will be undertaken.
Health	Operation/system failure of AWT	Illness of employees resulting from exposure to harmful materials	**MODERATE**	Appropriate safety gear and training will be provided to all employees.
Fire Hazard	Operation/system failure of AWT	Fire hazard - particularly given the presence of gas on-site	**MODERATE**	Employee training and regular plant and equipment inspections will minimise fire hazard.