

EIS 1461

AA068080

Salamander Bay Waste Transfer Station :environmental impact
statement for Port Stephens Council

NSW DEPT PRIMARY INDUSTRIES



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PLANNING

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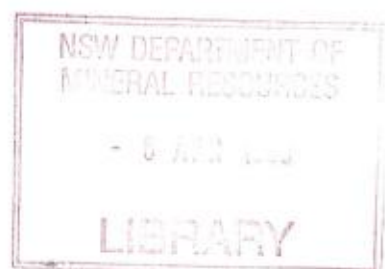
MITCHELL
ERM McCOTTER

SALAMANDER BAY
WASTE TRANSFER
STATION

*Environmental Impact
Statement*

For:
PORT STEPHENS COUNCIL

January 1999
58082EIS



EIS 1461

Report No. 58082EIS

This report was prepared in accordance with the scope of services set out in the contract between ERM Mitchell McCotter Pty Ltd ACN 002 773 248 (ERMMM) and the Client. To the best of our knowledge, the proposal presented herein accurately reflects the Client's intentions when the report was printed. However, the application of conditions of approval or impacts of unanticipated future events could modify the outcomes described in this document. In preparing the report, ERMMM used data, surveys, analyses, designs, plans and other information provided by the individuals and organisations referenced herein. While checks were undertaken to ensure that such materials were the correct and current versions of the materials provided, except as otherwise stated, ERMMM did not independently verify the accuracy or completeness of these information sources.

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ERM Mitchell McCotter Quality System

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EXECUTIVE SUMMARY

This environmental impact statement (EIS) has been prepared to accompany a development application by Port Stephens Council over Part Lot 145 DP 715013, Parish of Tomaree, County of Gloucester within the Port Stephens local government area. The land is freehold, owned by Port Stephens Council and is currently operated as a Class 1 solid waste landfill. It is bordered to the west by estuarine wetlands protected under SEPP 14, to the south by open forest and to the north by Salamander Industrial Estate. The site is zoned for open space 6(a) and the proposed waste transfer station is allowable with development consent under Port Stephens LEP 1987.

Port Stephens Council proposes to close and rehabilitate the existing landfill in order to provide a waste transfer station at Salamander Bay. The transfer station is an integral part of Port Stephens Council's waste minimisation strategy where they hope to achieve a reduction of 80 per cent of waste going to landfill by 2000 (compared to 1990 levels). The transfer station is required to accept waste from the expanding local population and the Salamander Bay site is well located. The existing landfill is near capacity and its closure will be environmentally beneficial.

The proposed waste transfer station is a designated development under Schedule 3 of the Environmental Planning and Assessment Regulations and therefore an EIS is required to support the development application. Relevant government and statutory authorities were consulted to ascertain their concerns and requirements to be addressed in the EIS. Discussions with relevant government authorities determined that the proposed transfer station at Salamander Bay is not integrated development. The key environmental issues identified early in the process were the close proximity of SEPP 14 wetland no. 766 and Cromartys Bay which contains significant oyster growing areas, potential odour from the site and traffic issues.

As required by the Environmental Planning and Assessment Regulations and the specification issued by the Department of Urban Affairs and Planning, the EIS describes the relevant aspects of Port Stephens LEP 1987, evaluates alternatives and provides justification for the development, discusses environmental management of operations, describes the existing environment and the potential impacts that the proposed waste transfer station may have on the environment.

The EIS will be circulated to a wide range of government agencies and placed on public exhibition to enable community participation in the decision making process. Council will assess all submissions it receives in response to the public exhibition of the EIS, prior to determining the development application.

The predicted key impacts on the natural and human environment are summarised as follows.

☐ Odour

It is anticipated that odour concentrations reaching residences will not cause greater nuisance than is currently occurring.

☐ Water Quality

All water generated from of the waste transfer station will be contained, screened and discharged to sewer with a trade waste agreement with Hunter Water Corporation.

The existing surface water system will be monitored by Council as part of the post-closure management of the landfill.

☐ Flora and Fauna

The proposed waste transfer station will not require the clearance or modification of any natural vegetation or habitats. The development is unlikely to significantly impact upon any species, population or ecological community currently listed on the Threatened Species Conservation Act.

☐ Noise

No operational noise impacts are predicted at the nearest residences.

☐ Roads and Traffic

The traffic impacts of the proposal would be negligible, as no noticeable changes would occur in traffic generation or distribution, in either the short or long term. The capacity of Soldiers Point Road would be unaffected, and the existing good level of service currently provided by the site access intersection would be maintained. There would be no impact on the Port Stephens Drive/Nelson Bay Road intersection.

☐ Visual

The visual environment will be minimally affected by the proposed construction of the waste transfer station as the building will only be visible from a few dwellings. Landscaping will assist in enhancing site views and screening.

□ Hazard and Offence

Assessment under State Environmental Planning Policy No. 33 indicates that the proposed Salamander Bay waste transfer station is not potentially hazardous.

□ Socio-economic

The socio-economic impacts on Salamander Bay are unlikely to be significant as the site is already established as a waste disposal facility. Development of the waste transfer station will generate construction employment and provide ongoing employment for landfill staff.

INTRODUCTION

This chapter describes the background to the project, the need for the waste transfer station and authority consultation undertaken.

1.1 BACKGROUND

Port Stephens Council (PSC) own and operate a Class 1 solid waste landfill with an area of 24.4 hectares on land described as Part Lot 145 DP 715013 Parish of Tomaree, County of Gloucester at Salamander Bay. The landfill was first licensed in 1968 and since that time has accepted a variety of solid and liquid wastes. In 1997, the landfill received approximately 22,340 tonnes of solid waste material. The location of the landfill is shown in *Figure 1.1*. The closest residential areas are situated along Soldiers Point Road to the south of the site.

In order to meet the requirements of the Waste Minimisation and Management Act 1995 (WMMA), Council is rationalising its waste disposal facilities and intend to use the recently approved Bedminster Bioconversion facility at Raymond Terrace as its main disposal facility. As part of the waste strategy, it is intended to close and rehabilitate the Salamander Bay landfill by June 1999 and construct a waste transfer station on the site. The proposed transfer station would receive, store and compact recyclable material before its transportation to either the Bedminster plant (currently under construction near Raymond Terrace) or to Solo Waste's Material Recovery Facility (MRF) at Gateshead within Lake Macquarie local government area (LGA).

ERM Mitchell McCotter was commissioned by Port Stephens Council to prepare a environmental impact statement (EIS) for the proposed waste transfer station at Salamander Bay. It should be noted that this report addresses the environmental impacts of the proposed waste transfer station and does not attempt to assess the impacts of the landfill.

1.2 PREVIOUS REPORTS

1.2.1 *Solid Waste Management Strategy (SKP, 1992)*

Sinclair Knight and Partners were commissioned by Port Stephens Council in 1992 to prepare a solid waste management strategy for the shire. Actions were formulated in relation to:

- ❑ efficient and effective solid waste collection, transport and disposal;
- ❑ adoption of alternative waste processing technologies;
- ❑ adoption of appropriate waste minimisation and recycling programs; and
- ❑ securing future waste disposal sites.

The strategy recognised that waste minimisation and recycling schemes were particularly important for Tilligerry and Tomaree Peninsulas due to their remoteness.

The waste strategy identified the present collection area for Salamander Bay Depot as all of the Tomaree Peninsula. Since the closure of the New Line Road waste disposal facility, waste has been brought to the site from the New Line Road collection area incorporating Raymond Terrace, Seaham and southern parts of the local government area (LGA).

The report recognised that the landfill produced a large quantity of diluted leachate due to the sand cover materials used on site. The need for an improved leachate management system was recognised given concern over the effect of the leachate on the downstream wetlands. The strategy recommended that the site be capped with a clay layer and that playing fields be the end use for the site.

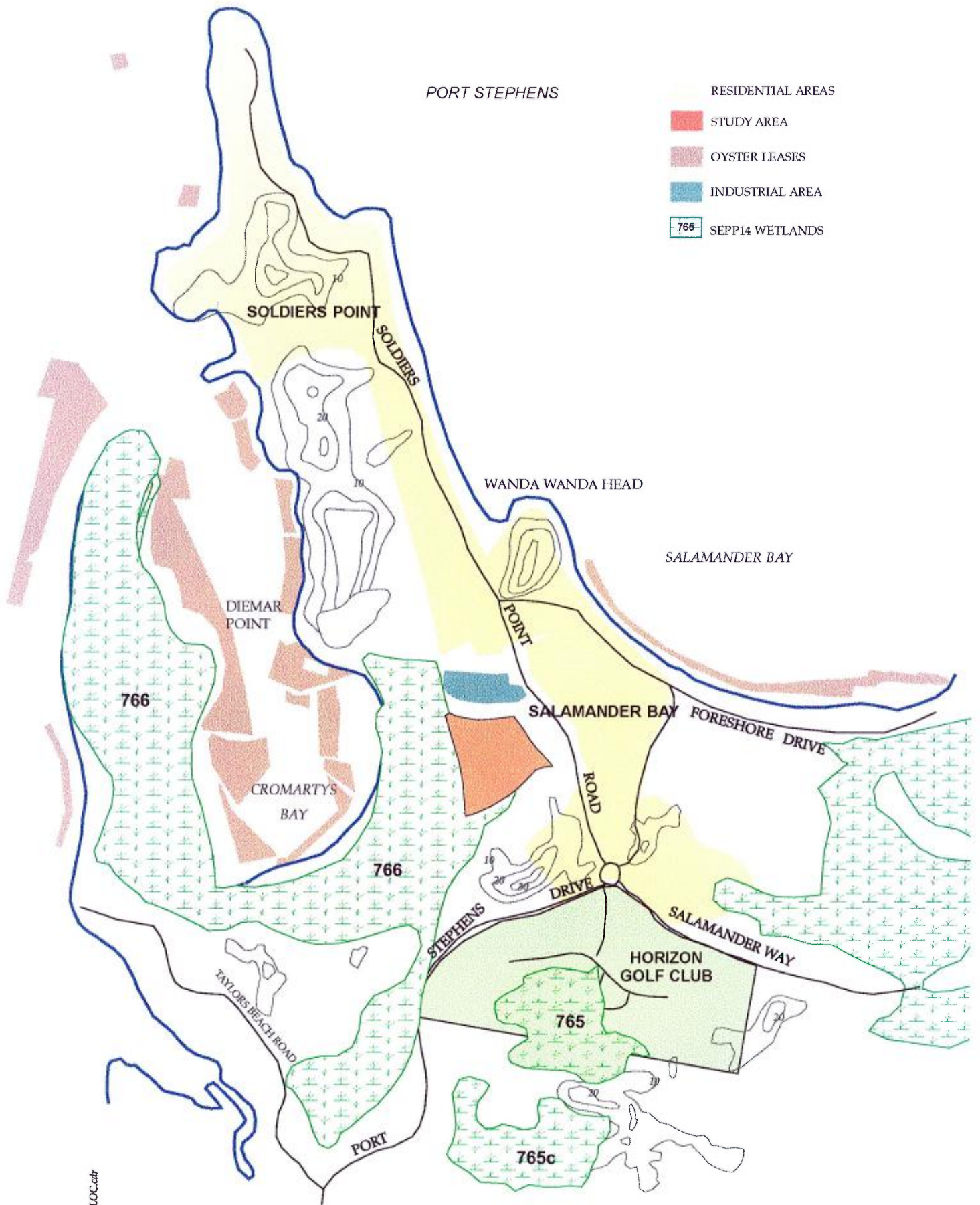
1.2.2 *LEMP (CMPS&F, 1997)*

A Landfill Environmental Management Plan (LEMP) was prepared for the site in December 1997 by CMPS&F. The LEMP was prepared to assist Council in obtaining a licence for the operation of the Salamander Bay Waste Depot (landfill) as a Class 1 solid waste landfill. The LEMP addressed the following aspects:

- ❑ a description of the existing site and landfilling operations;
- ❑ a description of management and rehabilitation options;
- ❑ the design and operation of the landfill;

PORT STEPHENS

- RESIDENTIAL AREAS
- STUDY AREA
- OYSTER LEASES
- INDUSTRIAL AREA
- 766 SEPP14 WETLANDS



SOURCE: 1:25,000 TOPO SERIES, KARUAIH, PORT STEPHENS, MORNA POINT AND WILLIAMTOWN SHEETS



Figure 1.1 LOCALITY PLAN



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- ❑ environmental management measures to be implemented on site;
- ❑ environmental monitoring to be undertaken;
- ❑ site rehabilitation and post closure management; and
- ❑ reporting.

The LEMP addresses the existing landfill on site. It has been used to provide background information for this EIS.

1.2.3 *Concept Design (GHD, 1998)*

GHD (1998) have prepared a concept design for the proposed waste transfer station which reviews the waste quantities and qualities expected to be received. The proposed transfer station has been designed accordingly. Most of the project description provided in *Chapter 4* of this document has been obtained from the concept design report.

1.3 AUTHORITY AND OTHER CONSULTATION

A number of government authorities, statutory bodies and community interest groups have been consulted during the preparation of this EIS. The organisations consulted were:

- ❑ Department of Urban Affairs and Planning;
- ❑ Environment Protection Authority;
- ❑ Department of Land and Water Conservation;
- ❑ Port Stephens Council;
- ❑ Roads and Traffic Authority;
- ❑ Hunter Waste Planning and Management Board;
- ❑ Hunter Water Corporation;
- ❑ Department of Mineral Resources;
- ❑ National Parks and Wildlife Service;

- ❑ NSW Fisheries;
- ❑ NSW Agriculture;
- ❑ Worimi Local Aboriginal Land Council;
- ❑ Maiangal Aboriginal Heritage Society; and
- ❑ Soldiers Point - Salamander Bay - Taylors Beach Precinct Committee.

A summary of the responses received is provided below with the full response reproduced in *Appendix A*.

i. Department of Urban Affairs and Planning

Department of Urban Affairs and Planning (DUAP) advised that under clause 55 of the Environmental Planning and Assessment Regulation 1994, the EIS should specifically address the key issues outlined below:

- ❑ the relevant aspects of Port Stephens LEP 1987;
- ❑ the impact of the proposal on nearby SEPP 14 wetland no 766; and
- ❑ the application of SEPP 33 in the event of the proposal being potentially offensive.

DUAP provided four attachments outlining statutory matters that must be included in any EIS and the type of information most likely to be relevant to the proposed development. Not all matters in the attachment 2, 3 and 4 may be appropriate for consideration; equally they are not exhaustive.

DUAP advised that Port Stephens Council should be consulted to incorporate any comments during the preparation of the EIS. The EIS should also address other issues that emerge from consultations with relevant local, State, Commonwealth government authorities, service providers and community groups.

ii. Environment Protection Authority;

The EPA advised that they have no specific guideline for the operation of Waste Transfer Stations. However, the EIS should identify and evaluate the potential impacts on air quality, water quality, waste management and noise associated with the processing or storage of raw materials of wastes on site. Reference should be made to the following:

□ Environmental Benefits

Transfer stations enable the efficient transportation of waste and subsequent reduction in air and noise pollution and allow for more centralised handling of waste recycling and disposal. These gains should be outlined in the document.

□ Site characteristics

A description of the physical characteristics of the site including previous land use practices, topography, drainage paths and soil characteristics and any changes in landform proposed should be included. It should be demonstrated that construction and operational activities will be consistent with the effectiveness of Council's Rehabilitation and Management Plan for the site.

The site should be assessed for actual and potential acid sulphate soils and where necessary a description given of the strategies to be used to control acid sulphate drainage using the methodology described in the publication Assessing and Managing Acid Sulphate Soil (EPA, 1995).

□ Water Quality Impacts

The EIS should identify the receiving waters and describe the likely impact on surface water and groundwater as a result of runoff or percolation from the site.

Transfer stations handling putrescible waste can generate a high-strength leachate that has the potential to pollute ground and surface waters, and can quickly turn anaerobic and generate odours. The waste should therefore be handled under cover within sealed hard-wearing areas, such as concrete with drains to collect all the leachate for disposal. Leachate is best disposed of to sewer or to an on-site sewage treatment plant (STP) after screening out the coarse material.

All trafficable areas used by waste vehicles should be sealed and cleaned of litter and sediment on a regular basis. Discharge from this area should be via a trash screen and a first-flush system to collect litter and sediment. Facilities should be provided for wheel and truck washing at the site.

The transfer trucks should be designed so that any leachate generated in transit is collected for appropriate drainage at the landfill or back at the transfer station.

□ Air Pollution

The main causes of air pollution at a transfer station are dust, litter, fire, odours from rotting waste or chemicals, and air toxics from industrial waste. The EIS should demonstrate that consideration will be given to these factors at the design stage.

Dust suppression should be considered over the waste unloading and handling areas. This usually consists of fine misting sprays (to which odour masking agents are added). The building should be enclosed to reduce dust dispersion, and ventilation air drawn out of the building should be passed through cyclones or plate separators to settle the dust before discharge.

Litter should be managed by enclosing the waste unloading and handling areas, and good housekeeping.

The facility should have the equipment and trained personnel to handle the outbreak of fire at the facility should it occur. The gatehouse should be separate from the unloading area, and if "hot" loads are discovered they should be promptly picked up and the build up of dust in the structure of the building (ie. purlins, rafters) kept to a minimum.

Odours are best managed by ensuring all wastes are promptly transferred to the transfer vehicles, and the pit or compactor totally emptied at the end of each day. Particularly odorous loads such as fish waste and viscera should not be unloaded but should go directly to the landfill.

Waste screening at the gatehouse and unloading areas should look for chemical wastes that may generate air toxics usually from the volatilisation of solvents or fumes from reacting wastes. Facility staff should have training on how to handle such an event.

Transfer trucks must be designed so that litter and dust are not emitted during transport.

☐ Waste Minimisation and Management

Recyclable wastes should not be mixed with waste for disposal and the facility should provide for the separate collection of these recyclable materials.

The operator of the facility should implement a system to record the source, type and amount of incoming wastes to allow for the tracking of unacceptable wastes or potentially recyclable wastes coming into the facility, and to determine if a licence from the EPA is required.

☐ Loss of Amenity and Hazards

Transfer stations can pose a threat to local amenity due to odour, dust, pests, vermin, litter and noise. The EIS should assess the impacts on nearby sensitive receptors and outline appropriate control measures to be implemented.

□ Statutory Requirements

The EPA advised that if the transfer station received less than 30,000 tonnes per annum there is no requirement to be licensed under the Waste Minimisation and Management Act 1995, however the proponent will need to monitor the amount of waste received at the station and apply for a licence if this amount is exceeded. Therefore, accurate records will need to be kept of the amounts handled.

The proponent will need to determine if Pollution Control Approval (PCA) and/or Pollution Control Licence (PCL) is required for any of the works. If a PCA and/or PCL is required as well as development consent, the proposal will fall under the integrated development process with different obligations and timeframes to be met.

Towards the end of 1998, current pollution control legislation and major regulatory provisions of the Waste Minimisation and Management Act 1995 will be repealed and consolidated into the Protection of the Environment (Operations) Act 1997 (POEO Act). Until that time, the regulatory provisions of the WMMA and Pollution Control Act 1970 will apply.

iii. *Department of Land and Water Conservation*

DLWC provided information addressing a number of principle issues including:

a. Surface Water Management

The EIS should specify on-site management and potential risks to surface water management for the site. In particular, the EIS must address:

- current surface water status of the site, including location and flows of creeks and watercourses, and current water quality;
- flow directions and pathways downstream of the site, particularly if any flow is likely to be directed towards SEPP 14 wetland no 775a;
- the water management system of the proposal, including clean water diversions around the site, internal segregation of water, storages and any disposal mechanism which is required for on site contaminated water;
- the likelihood and type of contamination of water involved in the operation, and any treatment, storage or disposal problems which may eventuate;
- any particular leachate types which may be generated as a result of the proposed operation, and any remediation or amelioration which is required for leachate on site; and

- contingencies for spillages, leachate loss or contamination of watercourses downstream of the site, and a description of monitoring procedures for watercourses downstream of the site.

b. Groundwater

The EIS should provide a description of the groundwater hydraulics of the aquifer system(s) with supporting data. Requirements include providing details on the following:

- detailed geologic mapping to identify adverse geological conditions (eg fracture zones, out-of-slope bedding, fault zones or other geologic discontinuity's) and any proposed remedial measures;
- different aquifer systems present in the area including their extent and inter-relationship;
- physical and chemical characteristics of aquifers (permeability, storativity, aquifer chemistry);
- flow directions and rates of flow; and
- any connections to the surface water bodies or any dependent ecosystems.

The EIS should include details of any potential changes to the existing groundwater regime as a result of the development. Issues include:

- predicted volume of groundwater flow into the landfill over the lifetime of the station;
- changes in water levels and post landfill recovery;
- emplacements;
- waste management;
- methods to control groundwater contamination from leachate; and
- impacts of dewatering on short-term and long-term changes to groundwater features, related surface water bodies and any dependent ecosystems, existing and potential groundwater users in the area;
- details of any conceptual models used to make predictions.

Under Part V of the Water Act 1912, all proposed groundwater works including bores for the purpose of extraction, dewatering, testing or monitoring must be

licensed with DLWC prior to their installation. The EIS should include information regarding:

- ❑ locations and construction details of all proposed bores, including their purpose;
- ❑ if required, expected annual groundwater extractions from individual dewatering bores.

Any reports or documents on groundwater studies which are references in the EIS relating to the assessment of groundwater should be made available to DLWC for review.

c. Acid Sulphate Soils

DLWC advised that deposited NSW coastal soils that are within one metre sea level (AHD) have a high potential to be affected by acid sulphate soil (PASS) materials and the development site may be affected.

d. Erosion Control Specifications

The EIS should include a strategy to control erosion and sedimentation which includes at least the following:

- ❑ sequence and staging of development works;
- ❑ procedures for maintenance of erosion and sediment measures;
- ❑ location of critical areas (water bodies, drainage lines, unstable slopes, rock outcrops, hard cover areas, floodplains and wet areas);
- ❑ location and description of existing vegetation;
- ❑ location of all earthworks including roads, areas of cut and fill or land regrading;
- ❑ location and design criteria of erosion and sediment control structures;
- ❑ diversion of uncontaminated up-site runoff around the area to be disturbed;
- ❑ existing and final contours; and
- ❑ revegetation program.

e. Vegetation

The proponent should determine if the Native Vegetation Conservation Act (1997) is applicable to the proposal and if so apply to have vegetation cleared under permit.

f. Flooding Aspects

The principal objectives of the State Government's Flood Policy are to reduce the impact of flooding and flood liability on individual land owners and occupiers and to reduce private and public losses due to flooding. Under the Flood Policy, proponents of development in flood prone areas are required to demonstrate that local flooding will not be exacerbated as a result of their development and that development is designed in expectation of flooding.

The site is located adjacent to Cromartys Bay in wetlands and is subject to inundation. The area appears to be subject from:

- ☐ local catchment runoff;
- ☐ tidal inundation;
- ☐ elevated water levels in the Port Stephens Inlet as a result of major ocean storm events and wave runoff which could pump up water levels.

In preparing an EIS for the proposed waste transfer stations consideration should be given to the potential impact of the development on flood behaviour, and the impact of flooding on the development, in accordance with the principles set out in the Government's Floodplain Development Manual. As indicated in the Manual, the local council is responsible for setting the flood standard and development control conditions for the area.

iv. *Port Stephens Council*

It was understood that representatives of Port Stephens Council had been consulted during the preparation of the brief and that comments had been provided by the development services section of Council into the preparation of the brief prior to work on the EIS commencing. As such, no separate consultation letter was sent to Port Stephens Council to advise them of the proposed waste transfer station and to seek their requirements.

v. *Roads and Traffic Authority*

The RTA advised that Soldiers Point Road and Port Stephens Drive are both local roads and are the responsibility of Port Stephens Council. Therefore, Council should be approached with respect to conditions which may be applied on Soldiers Point Road and Port Stephens Drive.

The EIS should address the following issues:

- the potential noise impacts for residents along the haulage route of trucks, particularly along Nelson Bay Road. This should consider the number of trucks, their hours of operation and their frequency;
- the potential impacts on the operation of the roundabout at the junction of Port Stephens Drive and Nelson Bay Road;
- the EIS should include details of the proposed volume and type of vehicles likely to be generated by this development. Additionally, the EIS should present an assessment of the origin and destination of vehicles associated with the proposed waste transfer station.

The RTA advised that the proposal would be acceptable if the above information was addressed and that RTA reserves the right to comment after the EIS is submitted.

vi. *Hunter Waste Planning and Management Board*

The Board has advised that they have a 'suite of tools' that are utilised in assessing and preparing submissions. The tools relevant to this project are:

- conformance with and support of the objectives and aims of the Waste Minimisation and Management Act; and
- conformance with, and support of, programs contained within the Hunter Regional Waste Plan.

Reference should also be made to legislation and the contribution made to specific Regional Waste Plan Programs.

vii. *Hunter Water Corporation*

Hunter Water have advised the following:

- under Section 50 of the Hunter Water Board (Corporatisation) Act 1991 applications will be required to be lodged for the proposed waste transfer stations. The purpose of this application will be to investigate whether water and sewer infrastructure is available on the site, and if so, whether there is capacity within these systems. If the proposed development is deemed to place additional demand on these systems, a developer charge may be payable; and
- discharge of any leachate from the proposed sites must meet the requirements of the Trade Waste Policy and Management System. A major discharge Trade Waste permit application will be required to be completed stating the leachate quality, maximum daily and instantaneous flows.

viii. *Department of Mineral Resources*

The Department of Mineral Resources (DMR) have advised that there are no known extractive resources or mineral deposits of commercial interest affected by the proposed development. The DMR therefore has no objection to the proposal and has no further comment to make at this time.

ix. *National Parks and Wildlife Service;*

National Parks and Wildlife Service (NPWS) advised that they have statutory responsibilities for the protection and care of native flora, native fauna and Aboriginal sites and for the management of NPWS reserves. NPWS recommend that the matters referred to in their "*General Guidelines for Impact Assessment*" be addressed where appropriate for this project.

x. *NSW Fisheries;*

NSW Fisheries are concerned with the potential for contamination of the nearby waterways which contain extensive oyster cultivations and commercial and recreational fishing resources.

NSW Fisheries would prefer all leachate and runoff water be collected and treated on site with disposal to sewer. Major points raised were:

- the issue of water contamination, particularly in the Salamander Bay area should be addressed, with particular emphasis on the claims of leachate from the present landfill entering Cromartys Bay. Consequently to determine and assess the treatment of water from the site a comprehensive water quality monitoring programme should be put in place. This can used to assess current water quality and as a base for future monitoring of runoff quality. Of particular interest are the drains from the vicinity of the existing landfills and nearby bays; and
- transfer of waste should be in containers that are sealed to reduce the risk of spills of liquid waste between the stations and final repository for waste. If the waste is to be transferred wet, the liquid should be contained in a tank and be decanted at the final destination, not discharged on the road.

xi. *NSW Agriculture*

NSW Agriculture's concerns relate to impacts on agricultural production and associated resources such as land and water. In particular, NSW Agriculture advises that the report should include an assessment of whether the proposal will:

- cause a loss or alienation of agricultural land;
- have an adverse impact on rural landholders or surrounding agricultural activities;
- affect the long term productivity and fertility of agricultural land, such as through soil erosion, acidification, salinity, nutrient and chemical toxicity, weed proliferation or feral pests;
- adversely affect surface or groundwater quality; and
- threatened significant vegetation communities or faunal habitats such as remnant coastal vegetation and wetlands.

NSW Agriculture advised that although outside the declared *Phylloxera* quarantine areas, Port Stephens LGA adjoins the Hunter zone and important viticultural operations. As such it is critical that no material which may contain any form of plant material of the *Vitus* species is transferred outside of the LGA into restricted areas without a permit.

xii. *Worimi Local Aboriginal Land Council*

No response had been received at the time of writing.

xiii. *Maiangal Aboriginal Heritage Society*

No response had been received at the time of writing.

xiv. *Soldiers Point - Salamander Bay - Taylors Beach Precinct Committee.*

The Soldiers Point - Salamander Bay - Taylors Beach Precinct Committee wish to raise the following points for consideration in the EIS.

- The precinct committee is concerned about the number of truck movements per day along Soldiers Point Road to and from the proposed transfer stations. Recently, residents along that section of road petitioned Council in an endeavour to have a quieter road surface. Concern was also raised about traffic noise from laden vehicles.

The precinct committee suggests that access to the proposed transfer station be gained from the "old" Port Stephens Drive, with the only entrance to that section of road being from Port Stephens Drive.

- The precinct committee expressed concern about the aesthetic quality of the landfill and the entrance from Soldiers Point Road and proposed landscaping measures; and
- precinct members suggest that the present landfill areas be made into a special garden, which could be a tourist attraction and increase the value of the area.

1.4 REPORT STRUCTURE

This EIS has six chapters as follows:

- *Chapter 2* discusses the planning considerations for the project including the implications of the Waste Minimisation and Management Act 1995, the Hunter Regional Waste Plan and relevant EPA guidelines in relation to waste management;

- *Chapter 3* discusses the need for the project including alternative waste disposal options, the justification for this facility and consequences of not proceeding;
- *Chapter 4* details the project description including characterisation of waste types received, construction details, litter and vermin control, hours of operation, services and utilities, site layout, equipment used on site and environmental management measures;
- *Chapter 5* describes the existing environment at the site and describes the environmental impacts on both the human and physical environment including noise, odour and air quality, hazard, traffic, visual, flora and fauna, hydrology and surface water management; and
- *Chapter 6* provides a summary of mitigative measures. This chapter acts to provide a summary of the predicted environmental impacts of the proposed development.

PLANNING CONSIDERATIONS

2.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The project is a designated development under Schedule 3 of the EP&A Regulation. As such an EIS must be prepared and exhibited publicly. The consent authority must consider all relevant provisions of the EP&A Act and any submissions made by government bodies and members of the public.

Schedule 3 of the Environmental Planning and Assessment Regulation 1994 outlines designated developments. Waste management facilities or works that store, treat, purify or dispose of waste or sort, process, recover, use or reuse material from waste are designated development if they also satisfy any of the following requirements:

- 1) *dispose (by landfilling, incinerating, storing, placing or other means) of solid or liquid waste:*
 - a) *that includes any substances classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste; or*
 - b) *that comprises more than 100,000 tonnes of "clean fill" (such as soil, sand, gravel, bricks or other excavated or hard material) in a manner that, in the opinion of the consent authority, is likely to cause significant impacts on drainage or flooding; or*
 - c) *that comprises more than 1,000 tonnes per annum of sludge or effluent; or*
 - d) *that comprises more than 200 tonnes per annum of other waste material; or*
- 2) *sort, consolidate or temporarily store waste at transfer stations or materials recycling facilities for transfer to another site for final disposal, permanent storage, reprocessing, recycling, use or reuse and:*
 - a) *handle substances classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste; or*
 - b) *have an intended handling capacity of more than 10,000 tonnes per annum of waste containing food or livestock, agricultural or food processing industries waste or similar substances; or*

- c) *have an intended handling capacity of more than 30,000 tonnes per annum of waste such as glass, plastic, paper, wood, metal, rubber or building demolition material; or*
- 3) *purify, recover, reprocess or process more than 5,000 tonnes per annum of solid or liquid organic materials; or*
- 4) *are located:*
 - a) *in or within 100 metres of a natural waterbody, wetlands, coastal dune fields or an environmentally sensitive area;*
 - b) *in an area of high watertable, highly permeable soils, acid sulphate, sodic or saline soils; or*
 - c) *within a drinking water catchment; or*
 - d) *within a catchment of an estuary where the entrance to the sea is intermittently open; or*
 - e) *on a floodplain; or*
 - f) *within 500 metres of a residential zone or 250 metres of a dwelling not associated with the development and, in the opinion of the consent authority having regard to the topography and local meteorological conditions, are likely to significantly affect the amenity of the neighbourhood by reason of noise, visual impacts, air pollution (including odour, smoke, fumes or dust), vermin or traffic.*

The proposed waste transfer station is situated within 100 metres of a wetland and has an intended handling capacity of more than 30,000 tonnes per annum of waste such as glass, plastic, paper, wood, metal, rubber or building demolition material.

Therefore, the proposed waste transfer station is designated development and an EIS is required.

Preparation of an EIS is regulated by the EP&A Act and Regulation. Among these provisions is a requirement that the EIS address the matters set out in clause 51 of the Regulation and it is also necessary to consult with the Department of Urban Affairs and Planning to obtain the Director-General's requirements for the EIS. These are reproduced in Appendix A.

These requirements refers to recent amendments to the Environmental Planning and Assessment Act, 1979 and the implications for development applications lodged after 1 July, 1998. Integrated Development refers to proposals that require a

development application and at least one approval listed in Section 91 of the EP & A Act. Table 2.1 lists these approvals.

Table 2.1 INTEGRATED DEVELOPMENT APPROVALS CHECKLIST

Act	Approval	Act	Approval
Roads Act s138	Consent to: (a) erect a structure or carry out a work in, on or over a public road, or (b) dig up or disturb the surface of a public road, or (c) remove or interfere with a structure, work or tree on a public road, or (d) pump water into a public road from any land adjoining the road, or (e) connect a road (whether public or private) to a classified road	Pollution Control Act 1970 s17A (include 17C, 17D)	Licence in respect of one or more of the following: (a) scheduled premises or scheduled equipment within the meaning of the Clean Air Act 1961 (b) the pollution of waters within the meaning of the Clean Waters Act 1970 (c) A drain which discharges or is likely to be used for discharging any pollutants into any classified waters within the meaning of the Clean Waters Act 1970 (d) scheduled premises within the meaning of the Noise Control Act 1975
Water Act 1912 s.10	Licences to construct and use a work and to take and use water, if any, conserved or obtained by the work, and to dispose of the water for the use of occupiers of the land.	Pollution Control Act 1970 s.171	Pollution control approval from the Environment Protection Authority
Water Act 1912 s13A	Licence to construct a supply work and to take and use water obtained thereby	Fisheries Management Act 1994 s. 295	Permit to cut, remove, damage or destroy marine vegetation on public water, land, an aquaculture lease, or on the foreshore of any such land or lease
Water Act 1912 S18F	Permit to construct and use a work, and to take and use water, if any, conserved or obtained by the work, and to dispose of the water for the use of occupiers of land for any purpose other than irrigation.	Fisheries Management Act 1994 s.144	Aquaculture permit

Table 2.1 INTEGRATED DEVELOPMENT APPROVALS CHECKLIST

Act	Approval	Act	Approval
Water Act 1912 s20B	Authority to take water from a river or lake for the purposes of a joint water supply.	Fisheries Management Act 1994 s.201	Permit to carry out dredging or reclamation works in any waters
Water Act 1912 20CA	Authority to construct a supply work and to take and use water conserved or obtained thereby.	Heritage Act 1977 s.58	Approval in respect of the doing or carrying out of an act, matter or thing referred to in s57(1) of the Heritage Act 1977
Water Act 1912 s20L	Group licence under the <i>Water Act</i> 1912	Rivers and Foreshores Improvement Act 1948 Part 3A	Permit under Part 3A
Water Act 1912 s116	Licence to commence sinking a bore or to enlarge, deepen or alter a bore	Waste Minimisation and Management Act 1995 s.44	Licence to occupy a controlled waste facility
Water Act 1912 Part B	Approval to construct a controlled work	National Parks and Wildlife Act 1974 s.90	Consent to knowingly destroy, deface or damage or knowingly cause or permit the destruction or defacement of or damage to a relic or Aboriginal place.

Source: DUAP (1998)

The proposed development does not require any of the above additional approvals and as such is not 'integrated development'.

Although the proposed development is a waste transfer station, discussions with the Environment Protection Authority (EPA) have confirmed that that the proposed transfer station will not be a controlled waste facility pursuant to section 44 of the Waste Minimisation and Management Act 1995 until it received more than 30,000 tonnes of waste per year. The Waste Minimisation and Management Regulation 1996 defines various types of controlled waste facilities. For this development, the relevant clause is Part 2 Section 5 Clause 1(l) and it states:

"(l) waste facilities that store or transfer, or recover by way of separating or processing, over 30,000 tonnes of waste per year."

As the existing landfill facility is licensed as a controlled waste facility and the proposed waste transfer station is not predicted to receive more than 30,000 tonnes of waste per year until about 2018, the site would not be require licensing under the WMMA and as such is not integrated development.

An EIS acts as the main means of communication between a proponent and the consent authority, statutory authorities, interest groups and the general public. It quantifies and assesses the potential impacts and documents the benefits from a project. Of additional importance is that an EIS provides a permanent and public record of undertakings given by proponents on matters relating to the environment.

Once a development application and accompanying EIS are lodged with Council they are placed on exhibition for a minimum period of 30 days, although the exhibition period may be longer at the discretion of the consent authority which in this case is Port Stephens Council. Any person may inspect the documents and make a submission on the project during the exhibition period.

This EIS has been prepared in accordance with the requirements of the EP&A Act and Regulation. It also reflects the comments and requirements of Authorities who have a statutory responsibility for some aspect or consequence of the proposal. The certificate required by Clause 50 of the Regulation is included as *Appendix D*.

2.2 WASTE MINIMISATION AND MANAGEMENT ACT 1995

The *Waste Management and Minimisation Act, 1995* (WMMA) came into force in January 1996. The principles of the Act are:

- to achieve a 60 per cent reduction in the amount of waste disposed of in New South Wales by 2000 (based on 1990 disposal rates); and
- to set up a waste management hierarchy of avoidance, re-use, recycling and reprocessing, with disposal being the final option.

The Act has a number of objectives including:

- to ensure that the community, government and industry are involved in the development of State wide waste policy;
- minimising the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste through reuse and recycling;

- ❑ ensuring that the industry and the community shares the responsibility for minimising waste;
- ❑ to promote and ensure environmentally responsible transporting, reprocessing and handling of waste;
- ❑ regulation of waste facilities and waste activities; and
- ❑ to provide appropriate sanctions for unlawful waste disposal.

The WMMA establishes the *Waste Minimisation and Management Regulation* (WMMR) which addresses licensing requirements. The WMMA also outlines the requirement for the establishment of Waste Management Boards and the preparation of regional waste management strategies which are addressed in the following sections.

2.2.1 *Waste Minimisation and Management Regulation 1996*

The *Waste Minimisation and Management Regulation* took effect in November 1996 and introduces:

- ❑ a state-wide licensing system;
- ❑ standard requirements for certain operations that do not need to be licensed; and
- ❑ a waste contribution (waste disposal levy).

The waste regulations are a small component of a much larger scheme. They essentially deal with ensuring the responsible environmental management of wastes that cannot be avoided, creating opportunities for promoting reuse or reprocessing of these wastes through appropriate incentives and disincentives (EPA, 1996a).

Part 2 of the WMMR 1996 provides for the licensing of operations including:

- ❑ those who generate or store hazardous or industrial waste;
- ❑ transporters of hazardous or industrial waste or tyres;
- ❑ landfill sites; and
- ❑ facilities that treat process, reprocess or dispose of hazardous or industrial waste or facilities that store or dispose of tyres.

In accordance with the Regulation the proposed development will not require licensing by the Environment Protection Authority until it receives more than 30,000

tonnes of waste per year. At this stage, it is predicted that this will not occur until 2021.

2.2.2 Hunter Regional Waste Planning and Management Board

The Hunter Regional Waste Planning and Management Board has been formed as a result of the *Waste Minimisation and Management Act, 1995*. One of the main functions of Waste Boards is to prepare a waste management strategy for its region which takes into account the requirement for a 60 per cent reduction in waste to landfill (based on 1990 per capita data) by the year 2000.

The Hunter Regional Waste Planning and Management Board is comprised of the Councils of Lake Macquarie, Cessnock, Maitland, Port Stephens and Newcastle. A variety of recent legislation and guidelines are forcing a new approach to waste management. The most important of these in this context are the *Waste Minimisation and Management Regulations 1996*, the EPA's Solid Waste Landfill Guidelines, the EPA Non-liquid Waste Guidelines and the EPA's Draft Regional Waste Planning Guidelines, 1997.

Given the above legislative requirements and the changing nature of waste management in local government, the Hunter Regional Waste Planning and Management Board is studying existing waste generation and services and potential waste management options for the region. An economic, environmental and social assessment of these options will form the basis of a waste management strategy for the region. The Regional Waste Plan (HWPMB, 1998) has been recently completed following a period of public exhibition.

2.2.3 Regional Waste Management Plan

The *Waste Minimisation and Management Act 1995* (WMMA) states that a regional waste management plan must be prepared for approval by the Minister for the Environment within nine months of the constitution of a Waste Board. The waste management plan covers Lake Macquarie, Cessnock, Maitland, Port Stephens and Newcastle local government areas. These areas have a total population of approximately 450,000 and generate significant quantities of waste.

The primary aim of the Board is to formulate a waste management plan which will enable each participating Council to fulfil or exceed the objectives of the WMMA 1995, including in particular:

- integrated assessment and planning of waste management;
- efficient and cost-effective waste planning and management;

- incorporation of the State's policy on waste; and
- consistency with the principles of ecologically sustainable development.

A Draft Regional Waste Plan was released on 14 July, 1997 and was available for public comments throughout a public exhibition period during 1997. Comments were invited from residents, businesses and industry. The plan was finalised and released in 1998. The Regional Waste Plan (RWP) aims to guide the development of a sustainable waste management system in the region and ensure that the objectives of the WMMA are addressed.

The RWP aims to act as a detailed guide which the Board will use to move towards the State's 60 per cent reduction target. The plan includes:

- a summary of the guiding principles used to develop the RWP;
- a description of the nature and outcomes of community consultation conducted during development of the RWP;
- a summary of the roles and responsibilities of key stakeholders in the RWP;
- a four year strategic plan outlining programs for waste minimisation and management including costings;
- a summary of target waste reduction, costs and funding of the RWP; and
- a ten year strategic outline for the achievement of longer term waste management objectives for all waste in the region.

The core of the Plan is the four year strategic plan for the management and reduction of waste in the region. The strategic plan was developed using technical studies and consultation. For each program included in the four year strategic plan, costs have been estimated and the potential for waste reduction has been assessed in addition to assigning roles and responsibilities.

A ten year strategic outline is also detailed in the Plan. It describes programs that the Board is likely to pursue in the longer term. The Regional Waste Plan establishes reduction targets for waste streams that would be necessary to meet the State's 60 per cent reduction goal (HWPMB, 1998). The Plan recognises that all stakeholders will be required to take action if the overall objectives are to be achieved.

The proposed development is consistent with the overall objectives of the WMMA 1995. It will form an integral component of the Port Stephens Council's strategy for managing waste in the local government area. Council's strategy includes the separation of organic and inorganic waste through the provision of split bins to

householders. The proposed development will facilitate recycling, encourage the beneficial reuse of composted material, and help reduce the total volume of waste disposed of to landfill.

2.3 EPA GUIDELINES

The EPA has prepared guidelines dealing with solid waste landfilling, waste planning and hazardous waste assessment. These guidelines have been used extensively in the preparation of this EIS and the following sections summarise the guidelines contents.

2.3.1 EPA Environmental Guidelines: Solid Waste Landfills

The EPA *Environmental Guidelines for Solid Waste Landfills* (1996) focuses on the environmental management of landfills. The guidelines recognise the role landfilling plays in effectively treating and disposing of wastes which, in the present technological and economical environment, cannot feasibly be dealt with in any other way. The guidelines expressly support local government initiatives for more efficient and effective waste management (EPA, 1996a). A major objective of this proposal is to improve waste management in the Port Stephens LGA and as such is consistent with these guidelines.

The guidelines require occupiers of a landfill site to acknowledge the environmental issues associated with landfill operations: specifically water pollution, air pollution, land management and conservation, hazards and loss of amenity. The guidelines also require occupiers to recognise the environmental goals linked to these issues and consider a strategic approach to landfilling throughout the stages of site selection, design, monitoring, management and remediation.

An important component of the guidelines is the classification of landfill site as detailed in the following section.

i. Landfill Classifications

The EPA *Environmental Guidelines: Solid Waste Landfills* (1996a) explain that the types of waste received at a landfill determines the potential pollutants that can be generated and therefore the potential environmental risks associated with the landfill. Licensing requirements under the provisions of the *Waste Minimisation and Management Act* (1995) set down criteria for different classifications of waste. No wastes are proposed to be accepted for landfill at the Salamander Bay site following the opening of the waste transfer station.

The *Waste Minimisation and Management Regulation* (1996) established three categories of landfill. Each category is then further subdivided into classes:

a. Inert Waste Landfill

Inert waste landfill accepts only inert wastes. Two classes of inert waste landfill exist:

- Class 1 which accepts stabilised asbestos cement and physically, chemically or biologically fixed, treated or processed waste in accordance with any special requirements that may be set by the EPA; and
- Class 2 which accepts all inert wastes excluding stabilised asbestos cement, physically, chemically or biologically fixed, treated or processed waste.

b. Solid Waste Landfill

Solid waste landfills accept solid waste. Inert wastes may also be accepted in solid waste landfill, but hazardous wastes are excluded. Two classes of solid waste landfill exist:

- Class 1 which accepts all solid wastes including putrescible waste and other wastes approved by the EPA; and
- Class 2 which accepts all solid wastes excluding putrescible waste and other wastes approved by the EPA. Putrescible wastes are food or animal matter, or untreated or unstable biosolids.

c. Hazardous Waste Landfill

Hazardous waste landfills accept any wastes formally defined as hazardous or as specifically determined through any special requirements set out by the EPA.

ii. *Environmental Management of Landfills*

The guidelines detail the following five principal management techniques for landfilling:

- the selection of an appropriate site which has natural buffers and barriers to reduce environmental risk;
- the design and construction of the landfill and associate infrastructure to reduce environmental risk;

- ❑ monitoring and reporting of air, water, noise and waste associated with the landfill site;
- ❑ the effective site operations management of the landfill site in an environmentally acceptable manner; and
- ❑ remediation and post-closure management to minimise the impact of closed landfills and ensure beneficial use of the landfill site after closure.

iii. *Classification of Salamander Bay site*

The site is currently licensed as a Class 1 solid waste landfill as it accepts more than 5,000 tonnes per annum of solid waste.

Under Part 2 of the WMMR, the Salamander Bay site is not classified as a controlled waste facility requiring a licence, as outlined in *Section 2.1* of this report. It is anticipated that the proposed waste transfer station will receive 30,000 tonnes of waste per year only after 2018.

As the Salamander Bay site is already licensed by the EPA as a controlled waste facility and will not accept more than 30,000 tonnes of waste per year until 2018, the EPA advised that it is not necessary to apply for another licence until that time.

2.3.2 *Draft Guideline: Regional Waste Planning (1997)*

The *Draft Guidelines for Regional Waste Planning* (EPA 1997a) set out the guidelines for the development of regional waste planning and management boards in each of the waste management regions constituted in the *Waste Minimisation and Management Act, 1995*. The guidelines provide for the development of regional waste plans throughout NSW, which profile waste flows in the region and identify key strategies for waste reduction. Under the provisions of these guidelines, the Hunter Waste Planning and Management Board has developed a Regional Waste Management Plan for the Hunter Region. The waste plan is addressed in *Section 2.2.3* of this EIS.

The guidelines state that the regional plan should initiate action to reduce and manage wastes produced in the region over the short and long term. The long term goal of a 60 per cent reduction in the State's wastes disposed of to landfill by the year 2000 is identified as a goal of the plan.

The proposed waste transfer station at Salamander Bay satisfies the guidelines by providing an efficient and effective method of waste minimisation through recycling of products otherwise destined for landfill. Furthermore, wastes proposed to

be accepted at the facility are identified by the guidelines as priority targets in Section 1.3 of the Regional Waste Plan, specifically construction and demolition waste.

2.3.3 *Environmental Guidelines: Assessment, Classification and Management of Non-liquid Wastes (1997)*

The *Environmental Guidelines: Assessment, Classification and Management of Non-liquid Wastes* (EPA 1997b) (Non-liquid Waste Guidelines) replace the *Draft Hazardous Waste Definitions and Draft Environmental Guidelines: Solid Waste Assessment* (EPA 1996a). The more recent guidelines are designed to assist those who generate, store, transport, treat or dispose of waste, fulfil their obligations under the provisions of the WMMA. Obligations under WMMA are dependent on the classification of the waste involved in the operation. The Non-liquid Waste Guidelines provide the waste classification methodology and rules of management which apply to each class of waste.

The Non-liquid Waste Guidelines classify waste by its likelihood to undergo environmentally significant transformations which may result in the release of greenhouse gases or contaminated leachates. Contaminants of concern are nutrients and/or chemicals such as heavy metals and human-made chemicals that if allowed to contaminate soil, groundwater or surface water may result in harmful effects on the health of humans, animals, plants other living organisms.

Waste is classified by the guidelines in the following order, ranging from least harmful to the most harmful:

- Inert - least likely to undergo environmentally significant transformations and, therefore should not release significant quantities of greenhouse gases or contaminated leachates;
- Solid - can include putrescible waste, is likely to release higher quantities of greenhouse gases or contaminated leachates than inert wastes, and consequently needs to be managed with greater care;
- Industrial - may contain higher levels of greenhouse gases or contaminated leachates than solid wastes and consequently needs to be managed with more stringent environmental controls than solid waste; or
- Hazardous - contains greenhouse gases or leachates contaminated with nutrients and/or chemicals at levels high enough to require treatment which renders them safe before disposal.

Section 2 of the Non-liquid Waste Guidelines sets out the following licensing requirements of the WMMA:

- ❑ those who generate or store hazardous or industrial waste;
- ❑ transporters of hazardous or industrial waste or tyres;
- ❑ landfill sites; and
- ❑ facilities that treat, process, reprocess or dispose of hazardous or industrial waste.

According to these provisions, the Salamander Bay site will not require a licence as it is not proposed as a landfill site. Licence requirements of the facility as a landfill site are addressed with regard to the *Environmental Guidelines: Solid Waste Landfills* (EPA 1996c), in Section 4.2.1 of this EIS.

It is proposed to store demolition wastes at the Salamander Bay site. A licence is not required for this storage as demolition wastes are inert.

The Non-liquid Waste Guidelines requires all operators of waste facilities to maintain records of waste movements to ensure appropriate handling of classified wastes. The proposed Salamander Bay facility will adhere to these reporting requirements through recording of incoming loads at the weighbridge.

2.4 FISHERIES MANAGEMENT ACT 1994

The Fisheries Management Act 1994 as amended by the Fisheries Management Amendment 1997, has the following objectives in terms of the protection of threatened species and their habitats:

- (a) *to conserve biological diversity of fish and marine vegetation and promote ecologically sustainable development,*
- (b) *to prevent the extinction and promote the recovery of threatened species, populations and ecological communities of fish and marine vegetation,*
- (c) *to protect the critical habitat of those threatened species, populations and ecological communities that are endangered,*
- (d) *to eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities of fish and marine vegetation,*

- (e) *to ensure that the impact of any action affecting threatened species, populations and ecological communities of fish and marine vegetation is properly assessed,*
- (f) *to encourage the conservation of threatened species, populations and ecological communities of fish and marine vegetation by the adoption of measures involving co-operative management.*

Threatened marine and aquatic species listed under this Act are contained in Part 1 (Endangered species) or Part 4 (Species presumed extinct) of Schedule 4 or in Schedule 5 (Vulnerable species).

None of the species found in these Schedules or listed as a rare or threatened species in McDowell (1997), are considered likely to occur in the study area. The area does not comprise critical habitat as listed under Division 3.

Therefore, assessment of the impacts associated with the proposed waste transfer station construction and operation upon threatened species would not be significant as assessed under Division 6 and no species impact statement or application for a licence to harm threatened species is required.

2.5 THREATENED SPECIES CONSERVATION ACT 1995

Schedules 1 and 2 of the Threatened Species Conservation Act, 1995 list species, populations or ecological communities of native flora and fauna considered to be threatened in New South Wales. The status of threatened species, populations or ecological communities listed on Schedules 1 and 2 were determined by a Scientific Committee as either:

- ☐ Endangered (Schedule 1); or
- ☐ Vulnerable (Schedule 2).

If a proposal is in an area identified by the Threatened Species Conservation Act 1995 as critical habitat a species impact statement (SIS) is required to be prepared to assess the impacts of the proposal on the critical habitat of threatened species, populations and ecological communities. If the Director-General of NPWS assesses that the development will harm threatened species, populations or ecological communities, then a licence under section 92 of the Threatened Species Conservation Act 1995 may be required. The Director-General of NPWS may apply conditions to this licence.

Developments which are not in critical habitat are assessed by the eight part test of significance in section 6 of the Threatened Species Conservation Act 1995 and section 5A of the EP&A Act 1979.

An eight part test of significance for the Salamander Bay site is provided in *Section 5.7*.

2.6 NATIVE VEGETATION CONSERVATION ACT 1997

The Native Vegetation Conservation (NVC) Act 1997 repealed State Environmental Planning Policy 46 - Protection and Management of Native Vegetation (SEPP 46). The principle aim of the NVC Act is to streamline approvals and to regulate the clearing of native vegetation in New South Wales by making it subject to development consent. The legislation requires the assessment of proposals to clear native vegetation for the purpose of ensuring that native vegetation is protected and managed in the environmental, social and economic interests of the State (DLWC, 1997).

The objectives of the NVC Act are to:

- ❑ provide for the conservation and management of native vegetation on a regional basis;
- ❑ encourage and promote native vegetation management in the social, economic and environmental interests of the State;
- ❑ protect native vegetation of high conservation value;
- ❑ improve the condition of existing native vegetation;
- ❑ encourage the revegetation of land, and the rehabilitation of land, with appropriate native vegetation;
- ❑ prevent the inappropriate clearing of vegetation; and
- ❑ promote the significance of native vegetation, in accordance with the principles of ecologically sustainable development (ESD).

An assessment under the NVC Act 1997 is not required as the proposed development is designated and no clearing is required to establish the waste transfer station.

2.7 STATE ENVIRONMENTAL PLANNING POLICIES

2.7.1 SEPP 14

State Environmental Planning Policy No 14 - Coastal Wetlands (SEPP 14) was gazetted on 12 December, 1985 with the aim of ensuring that coastal wetlands are preserved and protected in the environmental and economic interests of the State (DUAP, 1996a).

A number of wetlands in coastal areas in New South Wales were identified and mapped. The policy makes the following developments designated, pursuant to Section 29 of the *Environmental Planning and Assessment Act 1979*:

- ❑ clearing of the land;
- ❑ constructing a levee on the land;
- ❑ draining the land; and
- ❑ filling the land.

Developments carried out on SEPP 14 wetlands require the concurrence of the Department of Urban Affairs and Planning in addition to consent from the consent authority.

SEPP 14 identifies Cromartys Bay, immediately to the west of the proposed development site, as SEPP 14 wetland No. 766. The boundary of this wetland in relation to the proposed development site is shown in *Figure 1.1*. The proposed waste transfer station will not be within SEPP 14 wetland no 766, although the existing landfill site adjoins the wetland area.

The Director of the Department of Urban and Affairs and Planning has referred to the *EIS Practice Guidelines for Landfilling* (DUAP, 1996b) and the *EIS Practice Guidelines for Composting and Related Facilities* (DUAP, 1996c). The *EIS Landfill Guidelines* outline a number of environmentally sensitive areas that should be avoided when selecting a site for a landfilling facility. It is recommended that sites in or within 250 metres of an area of significant environmental or conservation value including SEPP 14 wetlands be avoided.

The proposed waste transfer station site at Salamander Bay is not in the SEPP 14 wetland but is within 250 metres of the wetland boundary. These areas are usually avoided in order to avoid the risk of damaging areas of high environmental value (DUAP, 1996b). However, given the previously disturbed nature of the site and the existence of the existing landfill within this buffer zone, the site is considered appropriate for a waste transfer station. The construction of the waste transfer

station will allow the existing landfill on the site to be closed, thereby reducing the potential for impacts from the landfill operation on the SEPP 14 wetland.

2.7.2 SEPP 33

State Environmental Planning Policy No 33 - Hazardous and Offensive Development Applications establishes an approach to planning for and assessing proposals for new industrial development. The permissibility of an industrial proposal linked to its safety and pollution control performance. SEPP 33 applies to any proposals which fall under the policy's definition of "potentially hazardous industry" or "potentially offensive industry" (DUAP, 1994).

A full assessment of the proposed development in accordance with the requirements of SEPP 33 is provided in Section 5.11.

2.7.3 SEPP 44 - Koala Habitat Protection

State Environmental Planning Policy 44 - Koala Habitat Protection aims to:

'...encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas, to ensure permanent free-living populations over their present range and to reverse the current trend of population decline...' (DUAP 1994)

The practical effect of SEPP 44 is that in determination of a development application (DA), the consent authority must ensure that approval is not issued without prior investigation of *potential* and *core* koala habitat. With identification of *core* koala habitat a plan of management must accompany the DA before the consent authority approves the development application.

The policy applies to land in relation to which a DA has been made when the site has an area of more than one hectare. This policy applies to all local government areas within the known statewide distribution of the koala, including the Port Stephens local government area.

Potential koala habitat is defined as vegetation which incorporates a minimum of 15 per cent of tree species in the 'upper or lower strata of the tree component' listed in Schedule 2 of SEPP 44. The identification of *potential* koala habitat must be assessed by a person suitably qualified in tree identification (clause 7 (2)). If the subject land is not deemed to contain *potential* koala habitat, the consent authority may grant development consent. Identification of *potential* koala habitat requires further investigations to determine whether the site supports *core* koala habitat.

Core koala habitat is defined as

'...an area of land with a resident population of koalas, evidenced by attributes such as breeding females.. and recent sightings of and historical records of a Koala population...'

If the area does not support *core* koala habitat, under clause 8 of the policy the consent authority may determine the development application. If the site is determined to support *core* koala habitat, then a plan of management must be prepared and approved prior to granting development consent.

A SEPP 44 - Koala Habitat Assessment is provided as *Section 5.7.6* of this EIS.

2.7.4 SEPP 48

The aims of *State Environmental Planning Policy No 48 - Major Putrescible Landfill Sites* (SEPP 48) is to provide for the assessment and determination of proposals for major putrescible landfill sites. As it is not proposed to dispose of putrescible waste (defined by SEPP No. 48 as food or animal matter, or unstable or untreated biosolids) at the site or receive putrescible waste from more than one local government area, SEPP No. 48 does not apply to the proposed development.

2.8 REGIONAL AND LOCAL PLANNING

2.8.1 Hunter Regional Environmental Plan 1989

The principle regional environmental planning instrument applying to the Hunter region is the *Hunter Region Environmental Plan 1989* (DUAP 1989a) (HREP). The main aims of the HREP are to promote the balanced development of the Hunter Region, to encourage orderly and economic development and to bring about optimum use of land and other resources consistent with the needs and aspirations of the local community.

Part 7 of the HREP outlines environmental protection strategies and specifically addresses objectives concerning waste disposal. Clause 49 of the REP is reproduced as follows:

- (a) *to provide for safe and effective disposal of domestic, commercial and industrial wastes including toxic materials; and*

The transfer station has been designed to ensure that domestic, commercial and industrial wastes are disposed of in an

environmentally sensitive manner. Where possible material will be recycled or processed to produce compost to help minimise detrimental impacts on the environment. Wastewaters generated by the proposed transfer station will be disposed of to sewer in accordance with a trade waste permit from Hunter Water Corporation.

- (b) *to avoid the entry of harmful chemicals into the environment; and*

The proposed development incorporates a broad range of environmental controls to prevent the entry of harmful chemicals into the environment.

- (c) *to encourage the most efficient use of resources by recycling or alternative use as appropriate.*

The proposed development will facilitate the recycling and reuse of material which is currently landfilled. The waste transfer station is an integral part of Port Stephens Council's overall waste management strategy which aims to encourage the most efficient use of resources by recycling and composting.

Generally the requirements of the HREP are met by the proposed development. The impact of the proposed development on the environment is fully assessed in Chapter 5.

2.8.2 Hunter Regional Environmental Plan 1989 (Heritage)

The only other gazetted regional planning instrument which is relevant to the Port Stephens LGA is the *Regional Environmental Plan 1989 (Heritage)* (DUAP 1989b). The heritage plan specifies some 800 specific items which have heritage value worthy of community conservation and includes urban and rural dwellings, public and commercial buildings, archaeological remains, bridges, collieries and cemeteries which are classified as being of State, regional, or local significance. The heritage plan does not identify the site or any of the existing infrastructure at the Salamander Bay site and surrounding area as having heritage significance.

2.8.3 Port Stephens LEP 1987

The study area is zoned 6(a) (Public Recreation Zone) under the Port Stephens Local Environmental Plan 1987 (LEP 1987). This is the principle local environmental plan which governs land use within the Port Stephens local government area (LGA) and it came into force on the 11th December, 1987. Waste transfer stations are a

prohibited use in the 6(a) zone as they are not listed as permissible with Council's consent in the land use tables associated with the 6(a) zone.

Under Clause 9(3) of LEP 1987, Council cannot grant consent to the carrying out of development which is not consistent with the objectives of the zone. The objectives of the zone are to recognise and ensure that publicly owned land is developed for open space recreation, to encourage the development of open spaces which best satisfies community needs and to permit developments associated with or complementary to open space. The waste transfer station is considered complementary to the use of the land as open space.

Clause 28 of the LEP 1987 applies to land zoned 6(a) within the LGA. Clause 28(4) states:

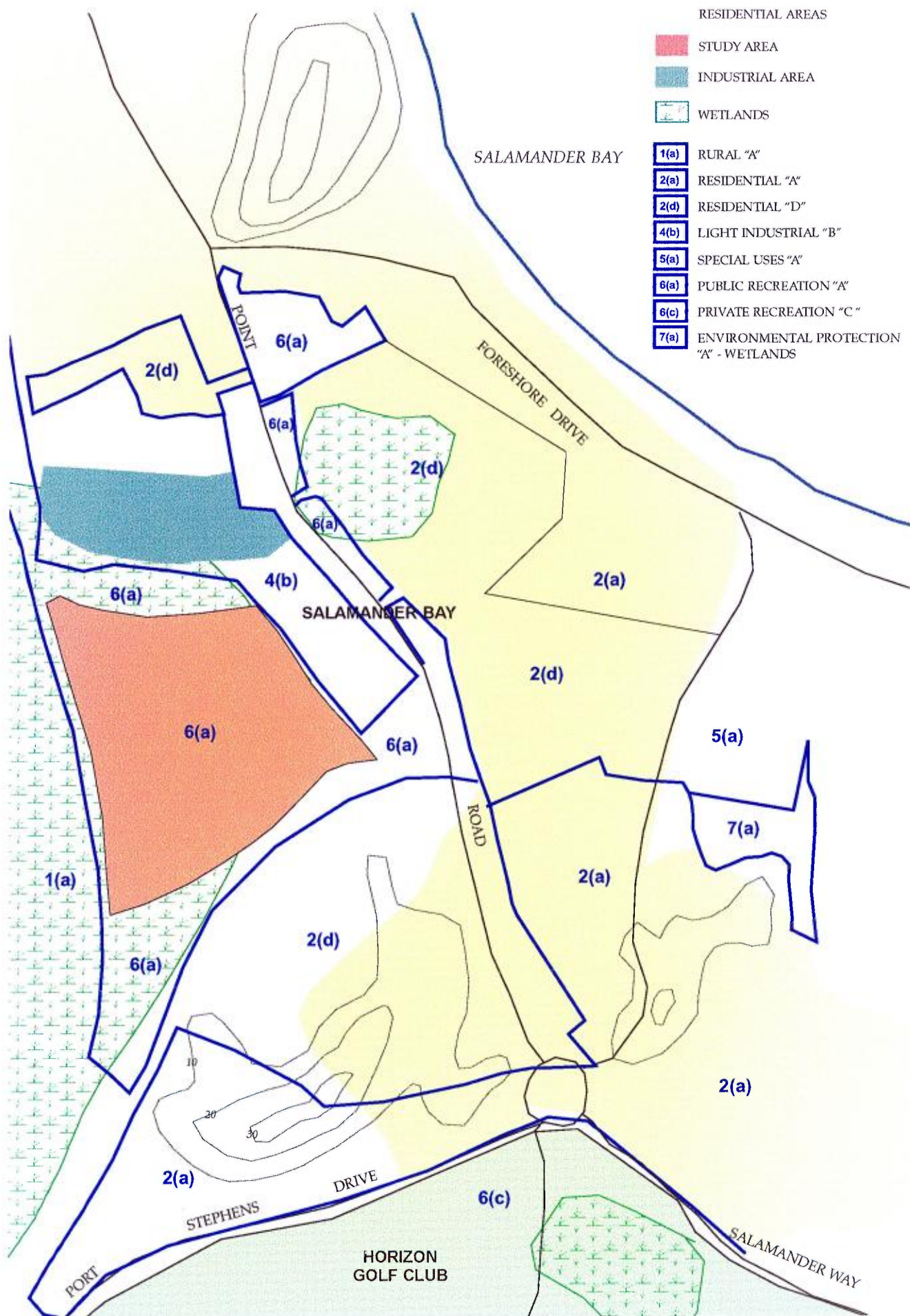
28(4). Land to which this clause applies may be developed for any purpose, with the consent of the Council, where the Council is satisfied that the carrying out of that development will not adversely affect the usefulness of the land for the purposes for which it has been zoned.

Therefore, the proposed Salamander Bay waste transfer station is permissible with Council's consent. Land zonings around the site are shown in *Figure 2.1*.

2.8.4 Other approvals

As the site is already licensed by the EPA as a class 1 solid waste landfill and the transfer station will not receive more than 30,000 tonnes of waste within the first 20 years of its operation, no additional licence is required from the EPA under the WMMA or WMMR.

The EPA have also advised that no pollution control approval or licence would be required and that the site would not be scheduled premises under either the Clean Air Act or the Clean Waters Act.



SOURCE: PORT STEPHENS LEP 1996

58082FG21SBZON.cdr

Figure 2.1 ZONING



0 250m

JUSTIFICATION AND ALTERNATIVES

3.1 NEED FOR THE PROJECT

The Waste Minimisation and Management Act 1995 (WMMA) encourages the development of waste management strategies of avoidance, re-use, recycling and reprocessing, with disposal as the least preferred management option. The Act also provides a goal of a 60 per cent reduction (based on 1990 levels) of waste to landfill by the year 2000.

The proposed waste transfer station will enable recyclable material to be transferred to a processing site and assist in reducing the amount of waste to landfill. The proposal is therefore consistent with the aims of the WMMA.

The Hunter Regional Waste Plan (HRWP) (Hunter Waste Planning and Management Board, 1998) documents waste reduction programs for the achievement of sustainable regional waste management. The HRWP reports that up to 31.6 per cent of waste in the domestic waste stream within and outside of the Hunter waste management region is made up of potentially recyclable material. A percentage breakdown of the domestic waste stream is summarised in *Table 3.1*.

Table 3.1 PERCENTAGE BREAKDOWN OF DOMESTIC WASTE (1996)

Component of domestic waste	Percentage of total domestic waste
Food waste	21.5 %
Garden waste	29.1 %
Potentially recyclable material (including glass, plastic, paper, etc)	31.6 %
Non-recyclable waste	17.8 %

Notes: 1. Source: HRWP, 1997.

In 1996, approximately nine per cent of waste received at Council operated waste management facilities within the region was diverted from landfill. Comparison of this recycling rate with the percentage of potentially recyclable material given in *Table 3.1*, demonstrates the need for an effective domestic recycling service.

The rate of domestic recycling has increased with the implementation of kerbside recycling and it is expected that this rate will continue to increase, providing additional recyclable material to be transferred and diverted from landfill.

An intensive education campaign in Port Stephens LGA focused on the value of recycling and use of Council's recycling programs. This education campaign and the kerbside collection service provided by Council has resulted in a high usage rate.

All these factors contribute to a reduction in waste to landfill and assist in Council achieving waste reduction targets.

The HRWP identifies markets for recyclable materials. Prices have fluctuated in the past due to the instability of markets, however, the provision of a stable supply of recyclables, with predictable quantities and qualities will assist in stabilising the market (HRWP, 1997). Development of the recyclable materials market is necessary to achieve effective resource recovery in the Hunter Region, and is identified by the HRWP (1997) as an option for future waste management in the HWMR. To achieve the 60 per cent reduction in waste and encourage resource recovery as required by the WMMA, it is essential that the supply of recyclables is predictable and stable. The proposed transfer station is an integral part of Port Stephens waste management strategy.

The proposed waste transfer station will provide the infrastructure to allow a constant, relatively consistent quality and quantity of recyclables to the markets. Port Stephens LGA comprises approximately ten per cent of the population of the lower Hunter and the proposed waste transfer station will contribute to the operation and expansion of successful recovery of resources in the lower Hunter region.

3.2 EXISTING WASTE MANAGEMENT IN PORT STEPHENS LGA

A report dealing with the characterisation of waste in the Port Stephens LGA was prepared by Sinclair Knight and Partners in 1992, and the majority of data presented in this section has been sourced from that report.

There are three sources of solid waste generated in Port Stephens LGA. These are:

- domestic waste generated in private dwellings. This has varying levels of toxicity but very little is classed as hazardous (estimated at 0.2 per cent of the waste stream in EPA Domestic Garbage Breakdown, 1996). It is collected and disposed of by Council;

- commercial waste produced by shops, offices, hotels, restaurants and hospitals. The majority of this waste is solid and most is collected by private contractors; and
- industrial waste produced from industrial processes such as manufacturing, factories, and refineries. Most solid wastes are inert and collected by private contractors. There is normally a larger hazardous waste component in industrial waste than in domestic waste. Industrial toxic or hazardous wastes are either recycled, transported to private secure landfills or transported to the Waste Management Authority for disposal in Sydney (Sinclair Knight, 1992).

The methods of waste collection and transport are as follows:

- municipal wastes are collected on a weekly basis. Mobile bins which are split to provide disposal of recyclable materials (paper, glass, plastic, aluminium, and steel) as well as other domestic waste are emptied using a one-person-per-truck operation. There is also a quarterly clean-up service for excess domestic refuse;
- small vehicle waste - private delivery of domestic waste to landfill depot;
- non-hazardous wastes collected from commercial/industrial sites by private contractors; and
- special wastes including inert hardfill wastes, trees, derelict cars, and rubber tyres (Sinclair Knight, 1992).

In 1992, there were three waste disposal depots: Raymond Terrace, Lemon Tree Passage, and Salamander Bay. *Table 3.2* shows the proportions of the various kinds of wastes delivered to depots in the Port Stephens LGA in a one week survey (Sinclair Knight, 1992).

Table 3.2 SURVEY OF WASTES - PORT STEPHENS LGA

Type of Waste	Percentage
Household	28
Commercial	18
Garden Waste	16
Other (trees, builders rubble etc)	38
Total	100

Source: Sinclair Knight (1992)

A large proportion of these wastes will be able to be handled by the proposed facility.

3.3 ALTERNATIVE WASTE DISPOSAL OPTIONS

A report prepared on behalf of Port Stephens Council by Sinclair Knight and Partners in 1992 and updated in 1996, examined alternative waste disposal facilities and methods in the Port Stephens LGA. The alternatives to the proposed co-composting system investigated included:

- ❑ traditional landfill disposal of unsorted waste;
- ❑ landfill disposal of non-recyclable waste;
- ❑ resource recovery using physical and chemical methods to recover materials of value from the mixed waste stream;
- ❑ incineration;
- ❑ collection and reuse of recyclables;
- ❑ pulverisation to reduce landfill requirements;
- ❑ shredding to reduce landfill requirements;
- ❑ baling to reduce landfill requirements;
- ❑ pyrolysis which breaks down waste by heating;
- ❑ neutralysis which combines domestic and liquid wastes with clay to produce light weight aggregate for use in the building industry; and
- ❑ advanced techniques currently being researched including hydrolysis, hydrogenation, wet oxidation and anaerobic digestion were not considered viable due to the early stage of development.

The 1992 report recommended that Council secure the former Boral quarry site for future landfill and that a kerbside recycling program be established. The kerbside recycling program was implemented in 1997 throughout the LGA. This same report detailed the predicted life of existing landfills at the current rates of filling and at a reduced rate accounting for a waste reduction of 0.5 kilograms per person per day over a 12 month period. These predictions are reproduced in *Table 3.3*.

Table 3.3 PREDICTED LIFE OF EXISTING LANDFILLS

Landfill site	Existing fill rate		Waste reduction fill rate	
	Year	Life (years)	Year	Life (years)
Salamander Bay	2012	15	2016	19
Lemon Tree Passage	2000	3	2003	6
New Line Road	1994	6	1995	-

Source: Sinclair Knight and Partners, 1992

The predicted life of the recently-closed New Line Road landfill has passed and the depot is still in use because an additional lift has been added to the facility thereby increasing the total available space. The data in Table 3.3 indicates that only limited landfill capacity is available at two of the three existing landfills within the Port Stephens LGA.

A report prepared by Port Stephens Council in 1996 assessed the economic viability of landfilling at other sites including Newcastle Council's Summerhill site and Maitland Council's Mount Vincent landfill and noted that to use these facilities a waste transfer station would be required to be built at Raymond Terrace, Salamander Bay and Lemon Tree Passage. In addition additional transport costs would be involved in transferring waste to the landfills.

3.4 SITE SELECTION

3.4.1 Putrescible Waste

The 1992 *Solid Waste Disposal Strategy* (Sinclair Knight & Partners, 1992) prepared for Port Stephens Council identified and investigated the various potential landfill locations available within the LGA. The following sites were included in this investigation:

- the existing landfill sites at New Line Road, Salamander Bay, and Lemon Tree Passage;
- the closed depots at Karuah and Williams River;
- the New Line Road site where the co-composting plant is under construction;
- Medowie quarry;
- Wallaroo, Old Swan Bay Road;

- ❑ Swan Bay, Swan Bay Road;
- ❑ Cromartys Bay, Soldiers Point Road;
- ❑ Marsh Road, Bobs Farm;
- ❑ Bobs Farm, Nelson Bay Road;
- ❑ Bucketts Way; and
- ❑ Fullerton Cove.

These sites were assessed with regard to operating and development costs, environmental constraints, proximity to dwellings and available void size. Environmental constraints excluded several sites from further consideration. The Boral quarry site on New Line Road was considered the preferred landfill site (Sinclair Knight and Partners, 1992). The same report concluded that the Medowie Quarry site would be suitable for non-putrescible waste only.

In 1996 Sinclair Knight and Partners reviewed the 1992 report and found that some of the potential landfill sites investigated initially were no longer available due to rezonings and encroaching residential development. It was concluded that although the number of potential sites had been reduced, landfill stands alone as the only waste disposal method that can deal with all materials in the waste stream.

Generally putrescible waste landfills and transfer stations are located away from residences to reduce the potential detrimental impact on amenity caused by noise, traffic and odour.

The overall strategy that has emerged is:

- ❑ to close the three landfill sites remaining - Raymond Terrace, Salamander Bay and Lemon Tree Passage;
- ❑ to establish a co-composting plant at the former Boral quarry on New Line Road, Raymond Terrace; and
- ❑ to establish waste transfer stations at both Salamander Bay and Lemon Tree Passage to receive waste, store it temporarily before transporting it to either the New Line Road site or a recycling facility outside Port Stephens LGA.

The Salamander Bay proposed waste transfer station will be situated on an already extensively disturbed site and is considered advantageous due to the relatively low environmental impact expected. In addition, environmental impacts from the

existing landfill on the site will diminish over time as a post closure management system is implemented and the site is rehabilitated.

3.4.2 *Alternative Site Uses*

An alternative use of the site is the do nothing approach and leave the site in its current state. In the long term this is not considered desirable due to the highly disturbed nature of the area. The existing landfill activities at the site has limited the potential for alternative development due to its degraded state. Considerable rehabilitation would therefore be required to enable other uses. The proposed development is considered appropriate as it will facilitate rehabilitation and potentially enable other land uses in the long term.

Alternatively, the entire site could be developed as playing fields. The current proposal allows the establishment of a 135 by 185 metre playing field oriented east-west. Considering the proximity of the site to the Tomaree Sporting Complex and the Salamander Oval, one playing field is considered appropriate at the Salamander Bay site.

3.5 JUSTIFICATION FOR THE PROJECT

The existing waste facility at Salamander Bay is nearing capacity and an alternative waste disposal site will soon be required. It is proposed to transport putrescible waste to the already approved co-composting plant at New Line Road, Raymond Terrace. Putrescible material will no longer be disposed of to landfill and will be reprocessed to produce valuable compost.

The proposed waste transfer station is a key component of the Port Stephens Council strategy for managing wastes in the local government area. It will greatly assist Council in meeting its obligations under the Waste Minimisation and Management Act, 1995 which requires all local authorities to reduce waste volumes to landfills by at least 60 per cent by the year 2000.

The site is located at Salamander Bay which is the centre of a major population centre within the LGA. The site has been extensively disturbed by existing landfilling which will be progressively rehabilitated with and converted to playing fields which will lead to a long term improvement in the environmental conditions on the site. It will also provide a recreational facility for residents of Tomaree Peninsula.

The proposed waste transfer station is part of Council's overall waste management strategy which was based on economic, environmental and long term resource sustainability issues.

3.6 CONSEQUENCES OF NOT PROCEEDING

The proposed waste transfer station will have significant environmental benefits for the Salamander Bay site. The existing landfill will close following the construction and commencement of operations at the proposed waste transfer station. As landfilling commenced on the site in 1968, the site is not designed to meet current environmental standards. However, the proposed waste transfer station has been designed to comply with current stringent standards, will be fully enclosed and wastewater will be pumped to the sewer with a trade waste permit from Hunter Water Corporation.

If the project does not proceed at the Salamander Bay site, Council will still have to meet the Waste Minimisation and Management Act 1995 target of a 60 per cent reduction in waste to landfill by the year 2000 (from 1990 levels). This will mean that recyclable material generated by the Tomaree Peninsula area will have to be transported further resulting in increased pressure on the road network.

If the proposed waste transfer station does not proceed, the life of the Salamander Bay landfill itself may need to be extended in order to provide a waste disposal facility on the Tomaree Peninsula. As a result, the significant environmental benefits of the proposed waste transfer station and landfill closure would not be achieved in the same timeframe.

Chapter 4

PROJECT DESCRIPTION

This chapter describes the project including quantities and qualities of waste expected to be received, operating hours, site layout and infrastructure and transport to and from the site.

4.1 PROJECT OVERVIEW

Port Stephens Council recognise that some of their existing landfill sites including the Salamander Bay Waste Disposal Facility have a limited lifespan and approval for alternative methods of waste disposal need to be sought.

Port Stephens has a population of approximately 55,000 and is one of the fastest growing local government areas in the State. The introduction of the Waste Minimisation and Management Act 1995 requires Councils to reduce the amount of waste being landfilled by 60 per cent by the year 2000. Port Stephens Council have set themselves the ambitious target of an 80 per cent reduction of waste to landfill by the year 2000.

In order to achieve this target, Council have entered an agreement to use a recently approved co-composting plant at Raymond Terrace.

Details of the concept design outlined in this chapter have all been sourced from the GHD (1998) report titled Salamander Bay Waste Transfer Station - Concept Design, prepared in September 1998 for Port Stephens Council.

The final land use on the site will include the proposed waste transfer station. It may also include bulky goods and green waste recycling areas, Council works depot, stormwater ponds and active and passive recreational areas.

The transfer station will accept waste from municipal services, commercial services and residential drop offs. It will accept both recyclable and waste materials. Suitable waste will be hauled to the Bedminster plant. Other materials will be hauled to Solo Waste's Materials Recovery Facility (MRF) at Gateshead.

4.2 WASTE QUALITY AND QUANTITY

The waste transfer station has been designed to receive an estimated 35,742 tonnes per annum by the year 2021. This figure was estimated using the 1997 figure of

22,340 tonnes and assuming that waste quantity will increase by 2.5 per cent per annum. Table 4.1 details the quantities of waste received during 1997 and projections for 2021.

Table 4.1 CHARACTERISATION OF WASTE, 1997 AND 2021

Month	Municipal Waste	Collection Recyclables	Domestic Waste	Green Waste	C & I Waste	C & D Waste	Total (1997)	Estimate (2021)
Jan 97	1090	136	179	106	902	0	2413	3860
Feb 97	884	111	131	83	800	29	2037	3259
Mar 97	811	101	109	123	818	6	1967	3147
Apr 97	863	108	157	46	523	8	1705	2729
May 97	811	101	109	123	818	6	1967	3147
Jun 97	764	96	81	96	398	4	1438	2301
Jul 97	496	62	103	153	608	6	1429	2286
Aug 97	474	59	103	146	758	6	1546	2474
Sep 97	735	92	96	139	824	0	1887	3019
Oct 97	582	73	129	140	944	4	1872	2995
Nov 97	528	66	135	162	789	35	1715	2743
Dec 97	1012	127	123	190	895	17	2364	3782
Total	9050	1132	1455	1507	9077	121	22340	35742

Source: GHD (1998)

Note: All figures in tonnes

The waste transfer station will be fully enclosed and will provide separate collection and unloading areas for:

- ☐ municipal solid waste (MSW);
- ☐ plastic containers;
- ☐ newsprint;
- ☐ mulch/green waste;
- ☐ car bodies/scrap metals;
- ☐ car tyres;
- ☐ car batteries;

- dead animals; and
- white goods.

The Salamander Bay waste transfer station will receive old car bodies and animal carcasses from other waste catchments as well as its own.

4.3 SITE LAYOUT AND INFRASTRUCTURE

The waste transfer station will be divided into two levels to provide access for large vehicles (maximum 50 cubic metre containers) on the lower level approximately three metres below the upper level. The upper level is where both commercial and private deliverers will be able to unload their waste onto a tipping floor. The floor plan of the proposed transfer station is shown in *Figure 4.1* an artists impression is included as *Figure 4.2*.

The commercial delivery area has been designed to provide enough space for collection trucks to unload the materials and will be at the north and north-eastern side of the transfer station close to four bays accommodating 50 cubic metre transfer containers. This area will be delineated from the private delivery area (south-western side of station) by the through traffic route.

The lower level will consist of a delivery area with enough space for collection trucks to tip their loads next to bays accommodating 50 cubic metre transfer containers. There are currently two bays at the west end of the proposed transfer station which accommodate containers for recyclables (paper & cardboard, plastics).

Different waste types will be received in different areas as follows.

i. Municipal Solid Waste

Municipal solid waste (MSW) will be received in an enclosed built on a concrete slab. The structure would be 30 x 30 metres and have a height of seven metres. The two bays present on site as part of a temporary transfer station will be assigned for MSW and building and demolition waste. Four bays on the western side of the enclosed shed will receive MSW from private delivers while the two skips on the eastern side will receive MSW delivered by commercial vehicles (see *Figure 4.1* and *Table 4.2*).

ii. *Recyclables*

Recyclables will be collected in two 50 cubic metre containers within two bays adjacent to the north-west side of the building. Recyclables will either be tipped onto the concrete floor next to the bays or directly into the containers.

Alternatively, containers for recyclables (R1 and R2) and part of the unloading area could be covered with a canvas roof with a height of seven metres. This roof would need to be designed to consider the prevailing westerly winds in the area.

iii. *Building and Demolition Waste*

An area suitable for receiving building and demolition waste (B&D) from both commercial and private deliverers will be adjacent to the northern side of the main building. Quantities of B&D are expected to be very small in comparison to MSW and other wastes. One of the containers presently used as part of the existing temporary transfer station will be used for the storage of B&D waste.

iv. *Car Batteries and White Goods*

Car batteries and white goods will be stored in sheds (12 x 6 metres, 3.5 metres high) which will be enclosed by a 2.1 metre high fence.

v. *Green Waste and Other Waste*

A second area (70 x 70 metres) will be assigned for disposal and storage of:

- green waste (22 x 23 metres);
- car bodies, car tyres and metal scrap (C7 M, 22 x 30 metres);
- car batteries (BAT); and
- white goods (WG).

This area is shown in *Figure 4.1*.

4.4 OPERATIONS

The transfer station has been designed to accept waste from waste contractors, collection vehicles and private delivery. After crossing a weighbridge (maximum

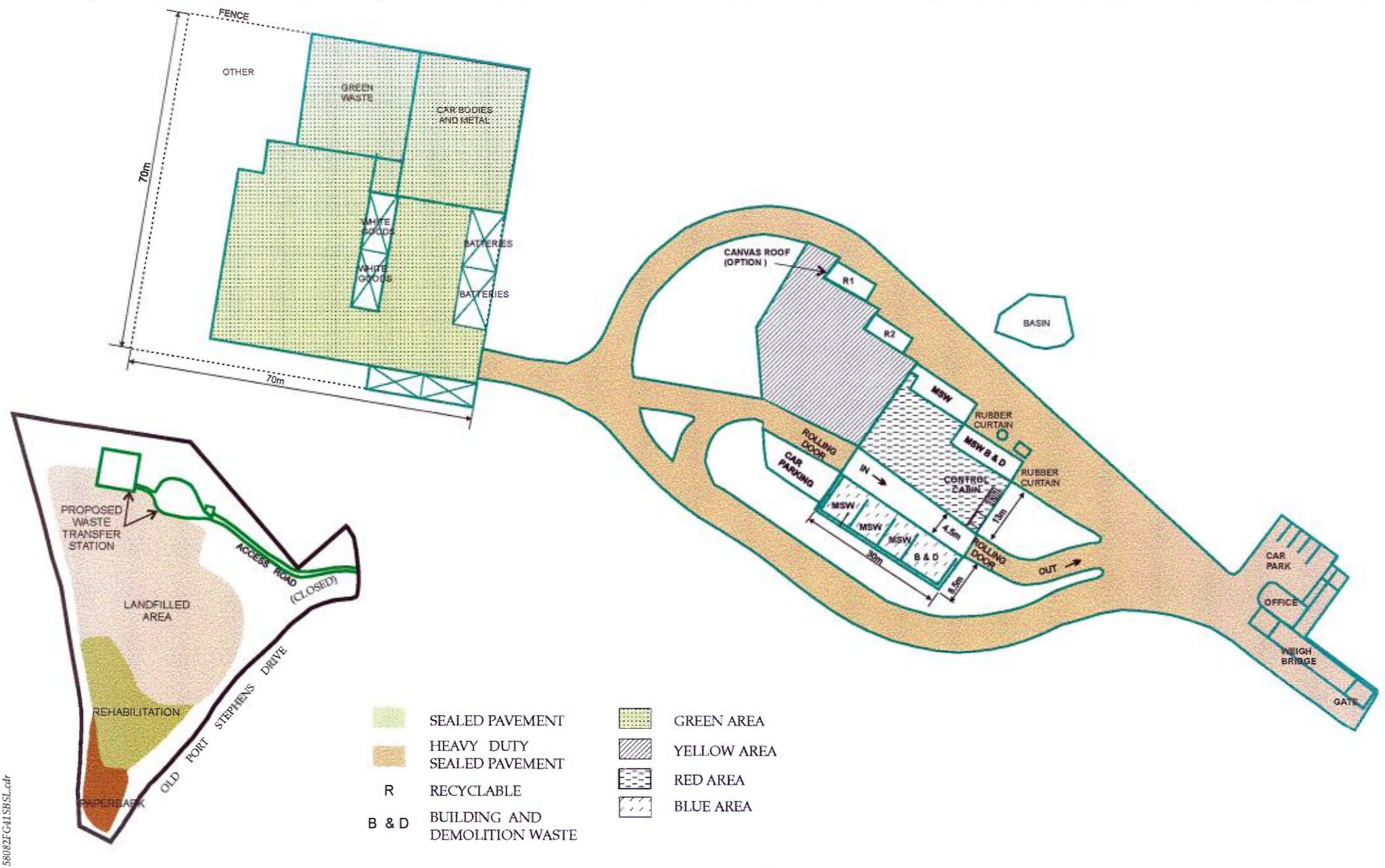
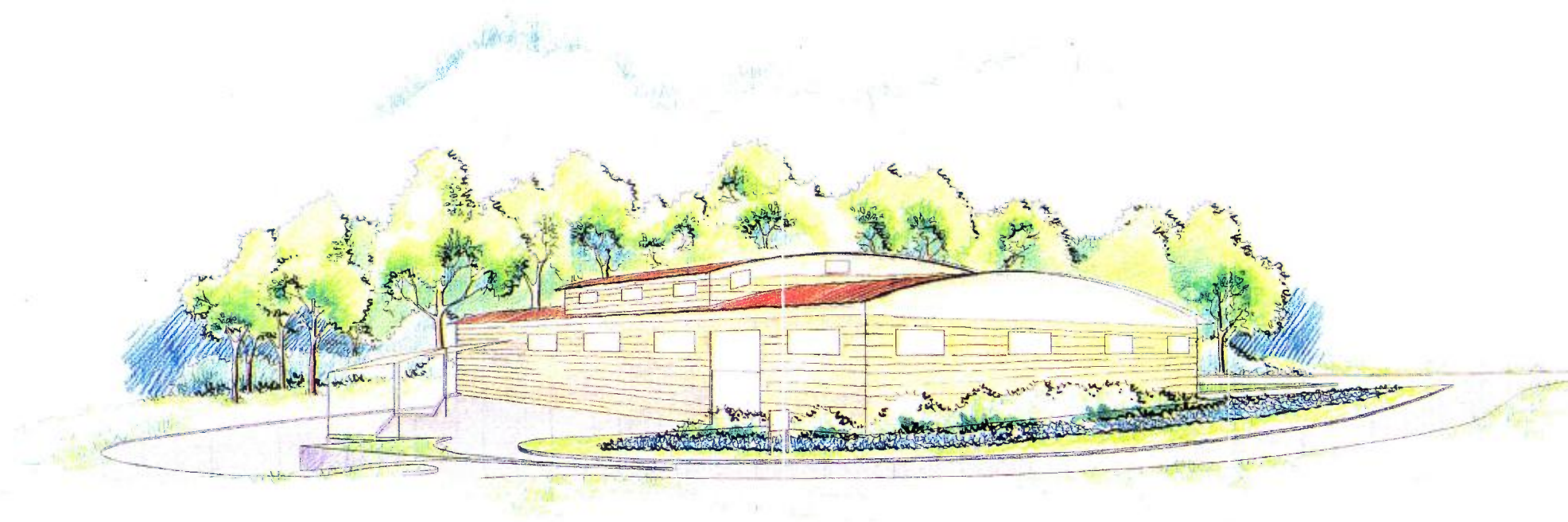


Figure 4.1 SITE LAYOUT



NOT TO SCALE



SOURCE: PORT STEPHENS COUNCIL.

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Figure 4.2 ARTIST'S IMPRESSION

range 60 tonnes), all vehicles will enter the station from the northern side through a 4.5 metre high roller door.

Signs indicating the types of wastes accepted will be prominently displayed for drivers to read before entering the weighbridge. The types of wastes accepted at this site are detailed in *Section 4.2*. Liquid and hazardous wastes and waste unable to be classified by the weighbridge operator will be rejected and the vehicle will be denied access.

The station will be divided into two levels to provide access for large vehicles (maximum 50 cubic metre containers) on the lower level. The lower level will be three metres below the upper level where both commercial and private deliverers will be able to unload their waste onto a tipping floor.

Deliverers will be directed to the relevant bay or to the tipping floor where they will unload their delivery.

If material is temporarily stored on the tipping floor, a wheel loader will push MSW and recyclables into the appropriate containers within the bays. A second area (70 x 70 metres) would be assigned for disposal and storage of green waste (22 x 23 metres), car bodies, tyres and scrap metal (22 x 30 metres), car batteries and white goods.

The drainage system will conform with relevant Australian Standards. Any runoff from the site will be collected and treated through a screen and grease trap prior to discharge. Runoff will be isolated from the waste skips.

4.5 PLANT AND EQUIPMENT

Council have advised that the equipment used permanently on site is:

- ❑ one Caterpillar 953B crawler/loader; and
- ❑ one Volvo BML-90C compactor.

In addition, vehicles movements on site in an average month includes 369 commercial vehicles (ie. trucks one tonne or more) per month and 1263 private vehicles (cars, station wagons, utes, trailers up to one tonne) per month.

It is likely that a bobcat or small front end loader (FEL) will be used within the enclosed shed with the crawler/loader being used to transport green waste.

4.6 OPERATING TIMES

The waste transfer station will be open to waste collection vehicles between 7:30am and 4:30pm on weekdays. The station will be open to the public on Mondays, Wednesdays and Fridays between 7:30am and 3:30pm and Sundays between 9:00am and 3:00pm.

This maintains the existing opening hours as the landfill site is currently open to the public from 7:30am to 3:30 pm on Monday, Wednesday and Friday and 9:00 am to 3:00pm on Sundays.

4.7 TRANSPORT AND TRAFFIC CONTROL

Traffic entering, leaving and manoeuvring within the transfer station will follow clear directions. Adequate traffic handling procedures will be in place for drivers to follow.

Large signs will be displayed directing vehicles to disposal areas. It is expected that letter coded signage will be use in order to:

- give unambiguous directions to non-regular drivers who are not familiar with the site;
- divert MSW deliveries to a different part of the transfer station (MSW 1 to MSW 3) thus enabling a smooth traffic flow during peak hours; and
- increase safety on site.

The signage codes suggested in the concept design (GHD, 1998) are outlined in *Table 4.2*.

Table 4.2 PROPOSED LETTER CODING FOR DELIVERIES

Type of Waste	Private/Commercial	Colour code	Letter Code
municipal solid waste (MSW)	P	blue	MSW 1
			MSW 2
municipal solid waste (MSW)	C	red	MSW 1
			MSW 2
			MSW 3
building and demolition waste	P	blue	B&D
	C	red	B&D
recyclables 1 (paper & cardboard)	P	yellow	R1
	C	yellow	R1
recyclables 2 (plastics)	P	yellow	R2
	C	yellow	R2
green waste	P	green	GW
	C	green	GW
car bodies and scrap metal	P	green	C&M
	C	green	C&M
tyres	P	green	T
	C	green	T
car batteries	P	green	BAT
	C	green	BAT
white goods	P	green	WG
	C	green	WG

Source: GHD (1998)

The areas for different colour codings are indicated on *Figure 4.1*.

Most access roads within the site will be sealed, seven metres in width with a 3.5 metre passing lane in each direction at the weighbridge and will generally follow the existing road lay out. The main transfer station has been designed to allow one way traffic flow with turning paths designed for 19 metre long semi trailers. The minimum width is five metres. The access road to the undercover dumping area has been designed for use by a garbage truck.

Provision has been made to upgrade the pavement to be suitable for heavy vehicles for the main access road and for a pavement suitable for light vehicles to be used on other roads.

The access way to the recycling area is six metres wide and two way. It is not expected that heavy vehicles will use this access way. The layout of the area allows for vehicles to reverse to the dumping area, then drive out.

A carpark for permanent staff and public will be provided on site. Parking space will accommodate four cars next to the office building, with space for an additional three cars on the northern western side of the building opposite the recyclables storage area.

4.8 EMISSIONS AND SAFETY

In order to reduce dust emissions during the loading and unloading of waste material, a spray system will be installed under the roof above the commercial delivery area. Operation would be via a manually opening valve as required by transfer station personnel.

There will be no forced ventilation inside the building. Gate openings and openings at container bays will be sufficient for natural ventilation throughout the building.

The following provisions will be put in place to reduce odour emission from the site:

- MSW bay will be enclosed as part of the building structure. Access to the MSW bay will be possible from the south-east. A sequence of flexible rubber strips covering the opening from the top to 3 metres above the lower level will reduce air flow through this section;
- all putrescible wastes will be removed from the site by the end of the day.

An elevated cabin and accessible stairs will be located at the south-eastern end of the inside of the buildings to enable personnel to supervise deliveries and direct traffic during times of peak flow.

For safety reasons, all throughways will be kept free and marked clearly.

4.9 UTILITIES

Electricity, water and sewer systems will need to be connected to the site.

Electricity supply is required to power the following items:

- internal transfer station area lighting;
- general light and power;
- security lighting;
- electric roller doors;
- communication equipment;
- gatehouse; and
- weighbridge.

There is an existing water service to the site. However, this would require amplification. The new recyclables area would be serviced by extending the existing water service 120 metres from the existing transfer area and installing fire hose reels and standpipes in the new transfer area.

The site is currently unsewered. It is proposed to connect to the sewer to service the existing transfer and recyclables area as well as the administration area. Wash down water from the transfer area would be directed to sewer via a coarse bar screen and grease trap. Wastewater from this area and the amenities block would gravitate to a small package sewage pumping station (SPS) which would pump via a small diameter rising main to the existing sewer service in the road reserve.

4.10 ENVIRONMENTAL MANAGEMENT

4.10.1 Water Management

The waste transfer station has been designed such that all runoff is captured and pollutants including litter are removed. The general design aims for water to be captured from paved areas and directed towards a central water quality pond.

The water will be captured using a system of open table drains and pipes. Generally, open drains will be parallel to the roads. Table drains are expected to be no more than one metre wide and 0.25 metres deep and should be sized for a 5 year average recurrence interval (ARI) storm. Clean water will be diverted around the site via a jute-lined catch drain.

A detention basin and litter collection pit will be located in the eastern corner of the site. Access roads around the transfer station will be kerbed with pits located at set

intervals along the kerbs. Trench drains will replace pits in areas where litter may be a problem such that the pavement is graded away from the kerb and towards the trench drain. Pipes with a minimum size of 375 millimetres will link the pits and trench drains to the proposed detention basin.

GHD (1998) have designed the detention basis in accordance with the NSW Housing guidelines for a 5 year average recurrence interval (ARI) 1 hour storm. The volume of the calculated basin is 65 cubic metres with dimension of 10 x 15 metres and a depth of 0.6 to 0.7 metres. The base will be lined with 300 millimetres of clay.

4.10.2 Litter

A two metre litter proof fence will be erected around the site boundary to ensure that litter does not leave the site.

4.10.3 Sediment and Erosion Control

Sediment and erosion control measures will be installed prior to construction commencing on site. Such measures may include sediment/silt fences, and practices such as minimising the amount of disturbance in bare areas. Following completion of construction works on site, erosion control measures will be removed and the area will be landscaped. Other areas on the site will be turfed.

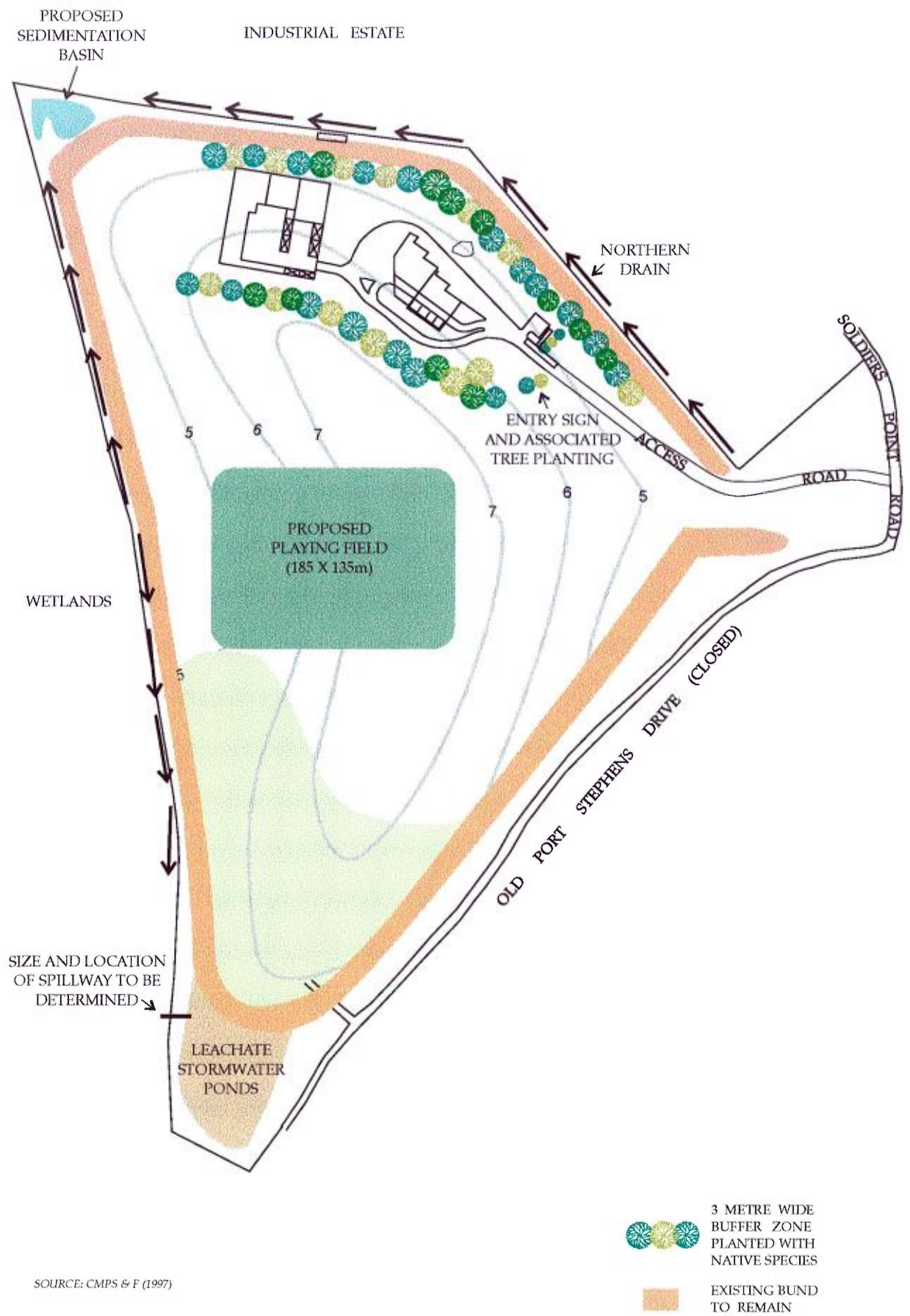
4.10.4 Landscaping

Mulched three metre buffer zones will be planted with tubestock native trees and shrubs to reduce the visual impact to the north and south of the transfer station. Tree planting will also be undertaken near the carpark and entry sign. A wetland turf species will be used to line the detention basin and ensure a grass cover is maintained at all times.

Figure 4.3 shows the proposed landscaping features to be incorporated as part of the design of the proposed waste transfer station.

4.11 POST CLOSURE MANAGEMENT

Information on post closure management has been sourced from the LEMP (CMPS&F, 1997). This EIS does not seek to address the environmental impacts of the existing landfill.



SOURCE: CMPS & F (1997)

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Figure 4.3 LANDSCAPING AND FINAL LANDFORM



0 80m

The final landform of the site was designed to provide adequate grading for site drainage. This grading will allow for drainage from the balance of the site excluding the proposed waste transfer station.

The landfill will be capped with an impervious layer which will minimise the infiltration of rainwater and contain the waste to prevent the effects of windblown litter, dust and odour.

4.11.1 Environmental Management

CMPS&F (1997) state that ongoing management of the site would be undertaken following closure of the site for landfilling. This will primarily consist of monitoring of the site and identifying any maintenance action required.

Council will ensure that any monitoring wells, stormwater controls, gas collection or venting system and reporting practices are maintained.

No waste materials received as part of the waste transfer station will be disposed of at the site after the landfill operations cease.

4.11.2 Maintenance

Regular maintenance of the final landform and landscaping will be undertaken. This will comprise:

- monitoring of stormwater ponds and drains and undertaking repairs where necessary;
- filling of any cracks that may occur in the final cover layer;
- filling of depressions created by settlement of landfilled waste (to ensure shedding of surface water runoff);
- replacement of vegetation to maintain vegetation density; and
- repairing erosion scours.

These activities would continue until the landfill has been stabilised.

ENVIRONMENTAL ASSESSMENT

5.1 SITE CHARACTERISTICS

5.1.1 *Description*

The existing landfill is owned and operated by Council. It has a site area of approximately 24.4 hectares and is located on land described as Part Lot 145 DP 715013, Parish of Tomaree, County of Gloucester.

CMPS&F (1997) note that the area consists generally consists of undulating wind blown sands separated by broad, flay low-lying areas of marshy grounds and wetlands. A broad, flat wetland occupies the entire western boundary of the site and separates the landfill area from Cromartys Bay, approximately 350 metres west of the landfill. Most of the landfill is between 2 and 3 metres above the elevation of the adjacent wetlands.

The general area consists of aeolian sand deposits separated by broad, flat low-lying marshes and wetlands. There is a large sand dune to the south-east of the site which has been rehabilitated following sand mining.

5.1.2 *Surrounding Land Use*

The site adjoins Soldiers Point Road on the Tomaree Peninsula. The site is situated on a smaller peninsula separating Salamander Bay in the east and Cromartys Bay in the west. Residences are located along Soldiers Point Road with a large sand dune separating the site from a residential area approximately 200 metres to the east of the site. Additional residences are located on the opposite side of Salamander Way with a light industrial subdivision to the north and north-east of the site.

SEPP 14 wetland No 766 adjoins the site immediately to the west and south-west. This wetland drains directly into Cromartys Bay, an important fishery and oyster growing area.

The area immediately across Soldiers Point Road had been earmarked for residential development, but this may not proceed due to ecological constraints.

5.2 CLIMATE

The Salamander Bay area experiences a warm temperate climate. Temperature, rainfall, humidity and wind data has been obtained from the Bureau of Meteorology's Williamstown weather station, the nearest official station to the site providing long-term, continuous meteorological records. Temperature is based on 1951 to 1991 data, and rainfall is based on 1942 to 1991 data.

5.2.1 Temperature and Humidity

Mean minimum and maximum monthly temperatures are shown in *Table 5.1*. Mean temperature ranges from a minimum of 6.2 degrees Celsius in July to a maximum of 27.7 degrees Celsius in January.

Mean monthly relative humidity is also provided in *Table 5.1*, and ranges from 57.5 per cent to 70 per cent.

Table 5.1 MEAN MONTHLY TEMPERATURE AND RELATIVE HUMIDITY

Mean Minimum Temperature (degrees Celsius)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
17.9	18.0	16.3	13.3	10.0	7.9	6.2	6.8	8.9	12.0	14.2	16.4
Mean Maximum Temperature (degrees Celsius)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
27.7	27.2	26.2	23.6	20.1	17.5	16.8	19.3	20.9	23.3	25.3	27.2
Relative Humidity (per cent)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
64.5	68.0	67.0	67.0	69.0	70.0	65.5	61.5	57.5	58.5	58.0	60.5

Source: Bureau of Meteorology

5.2.2 Rainfall

Average monthly rainfall and number of raindays is shown in *Table 3.2*. Average annual rainfall is 1124 millimetres, with 137 mean number of raindays per year. The period of highest rainfall is from January to June.

Table 5.2 RAINFALL

Monthly Rainfall (millimetres)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
109	116	120	103	107	121	69	82	58	81	75	83
Mean Number of Raindays											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	12	12	11	12	13	10	11	10	12	11	11

Source: Bureau of Meteorology

5.2.3 Wind Speed and Direction

Wind speed and direction data for representative seasons of the year is shown in Figure 5.1a to 5.1d.

The wind roses show that during summer, the predominant wind direction is from the east and south-east, with stronger winds during the afternoon. In autumn and winter months, morning breezes are predominantly from the west and north-west, with south and south-east breezes increasing in the afternoons. In winter, stronger winds generally blow from the west to north-west.

It should be noted that the above data came from a meteorological station approximately 24 kilometres west-south-west of the site. Particular coastal conditions, such as afternoon sea breezes, would still occur at the proposed site as both the site and meteorological station are approximately the same distance from the coast.

5.3 ODOUR

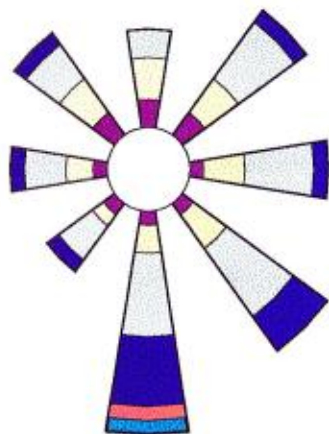
5.3.1 Introduction to Odour

i. The Nature of Odour

Odour nuisance is subject to human response and the best currently available method of assessing it is to use people as the measurement device. Direct measurement of the concentrations of chemical components does not provide sufficient information to enable a determination of nuisance to be made. Human response is determined by factors including the following:

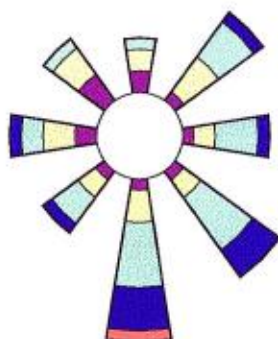
- human perception of the unpleasantness of odours is highly subjective;

Windrose for January
9 AM
North



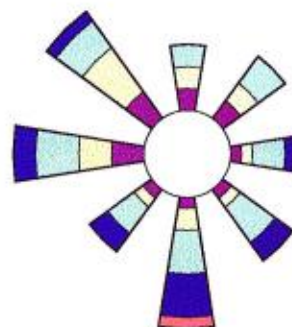
South

Windrose for February
9 AM
North



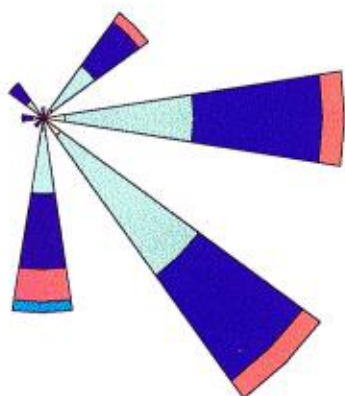
South

Windrose for March
9 AM
North



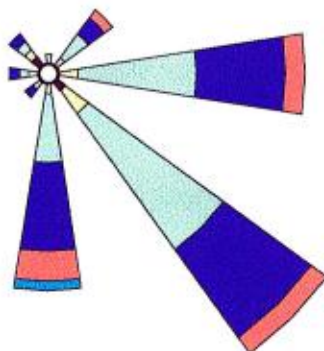
South

Windrose for January
3 PM
North



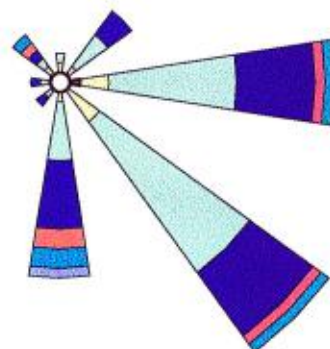
South

Windrose for February
3 PM
North



South

Windrose for March
3 PM
North



South



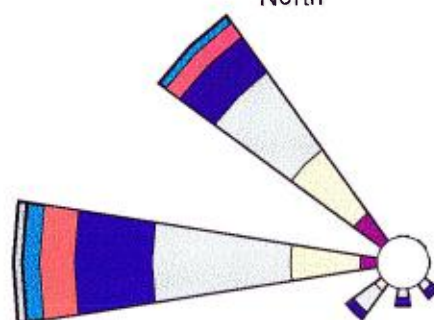
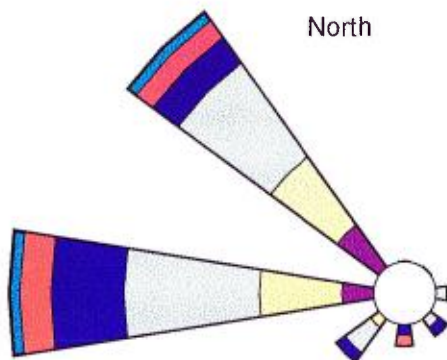
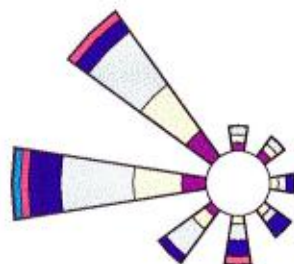
The segments of each arm represent the seven wind speed classes, with increasing windspeed from the centre outwards. The length of each arm represents the proportion of the total wind that blew from that direction.

The radius of the circle in the middle represents the proportion of calm conditions.

Windrose for April
9 AM
North

Windrose for May
9 AM
North

Windrose for June
9 AM
North



South

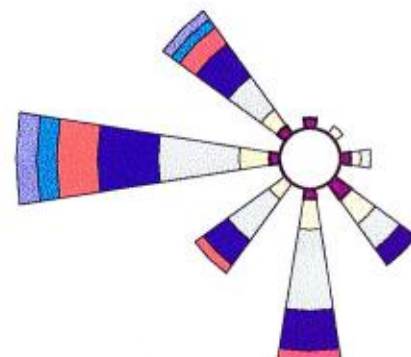
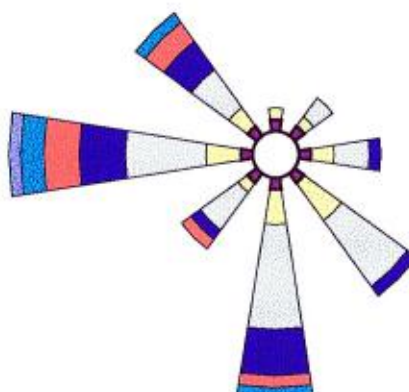
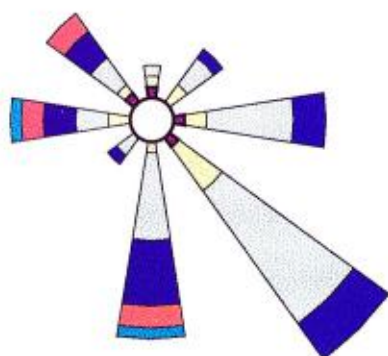
South

South

Windrose for April
3 PM
North

Windrose for May
3 PM
North

Windrose for June
3 PM
North



South

South

South

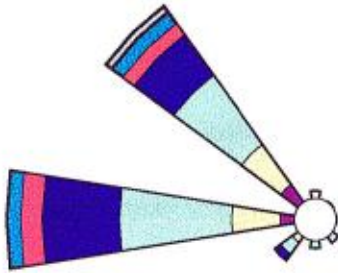


The segments of each arm represent the seven wind speed classes, with increasing windspeed from the centre outwards. The length of each arm represents the proportion of the total wind that blew from that direction.

The radius of the circle in the middle represents the proportion of calm conditions.

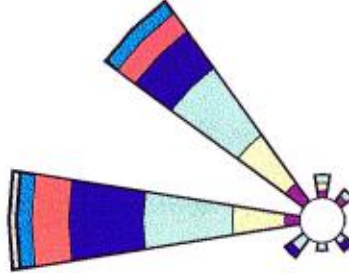
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Windrose for July
9 AM
North



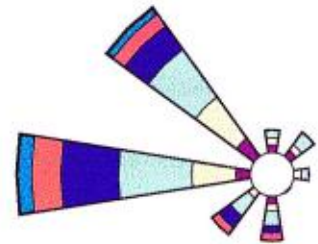
South

Windrose for August
9 AM
North



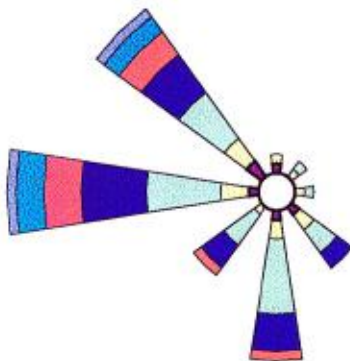
South

Windrose for September
9 AM
North



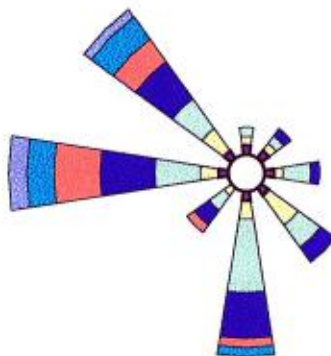
South

Windrose for July
3 PM
North



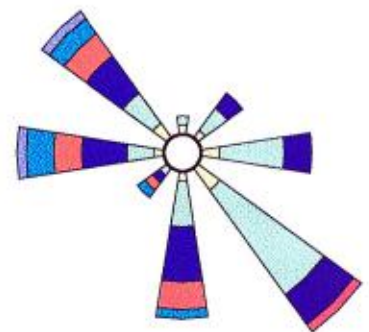
South

Windrose for August
3 PM
North



South

Windrose for September
3 PM
North



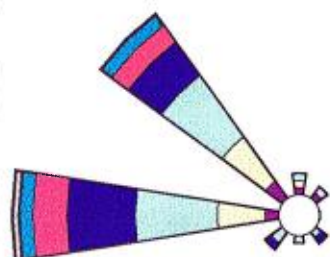
South



The segments of each arm represent the seven wind speed classes, with increasing windspeed from the centre outwards. The length of each arm represents the proportion of the total wind that blew from that direction.

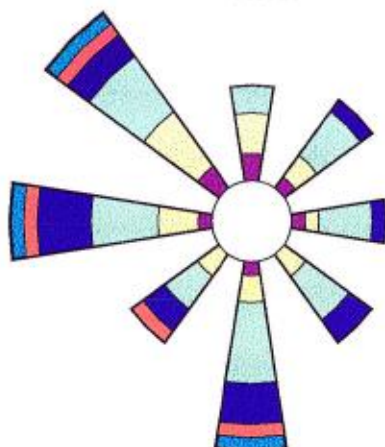
The radius of the circle in the middle represents the proportion of calm conditions.

Windrose for October
9 AM
North



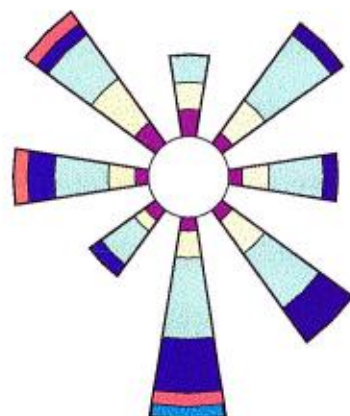
South

Windrose for November
9 AM
North



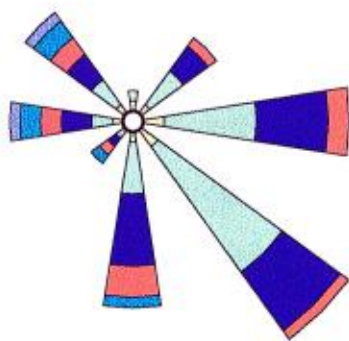
South

Windrose for December
9 AM
North



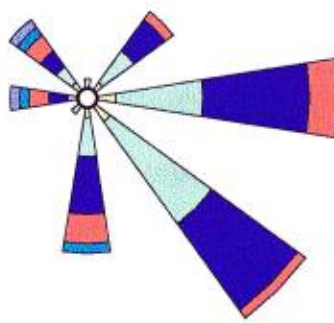
South

Windrose for October
3 PM
North



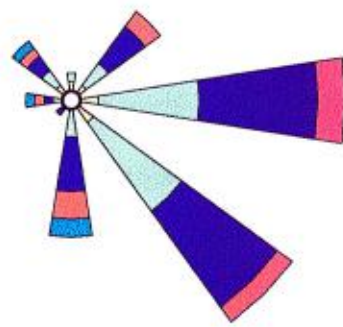
South

Windrose for November
3 PM
North



South

Windrose for December
3 PM
North



South



The segments of each arm represent the seven wind speed classes, with increasing windspeed from the centre outwards. The length of each arm represents the proportion of the total wind that blew from that direction.

The radius of the circle in the middle represents the proportion of calm conditions.

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- the perceived intensity of an odour rapidly decreases after initial exposure;
- when multiple sources are being assessed, the interaction of odours with different chemical compounds can complicate the analysis. Interaction of different waste composting odours is not likely to result in an odour nuisance that is greater than the sum of the individual sources; and
- annoyance due to odours can be caused by exposure to short-term peak concentrations of approximately three minutes and detection can occur from one second exposures.

ii. Terminology

The measurement of odour concentration by diluting a sample and delivering it to a panel of people is called dynamic olfactometry.

Odour concentration is measured in odour units that are related to human ability to detect and characterise odour. The units OU_{50D} are defined as the number of dilutions with odour-free air required to reduce the concentration such that 50% of a panel of people can just *detect* the odour. This is equivalent to the minimum concentration of that odour at which it is detected.

For example, if the sample had to be diluted with fresh air at a ratio of 1:150 (1 part sample to 150 parts fresh air by volume) for the panel to just detect the odour, then the concentration of an odour sample is said to be 150 OU_{50D} . The higher the number of odour units, the more intense the odour.

The average person can detect an odour of strength 1 OU_{50D} . To allow the human nose to characterise and recognise an odour, a concentration of at least 3 OU_{50D} could be required, depending on the character of the odour.

iii. Emission of Odours

In order to carry out an assessment it is necessary to take samples at or near the source where concentrations are high. Odour concentrations are then determined using dynamic olfactometry.

Having established the odour concentration, it is necessary to calculate the odour emission rates by multiplying by the volumetric flow rate of odorous air at the time of sampling.

iv. *Odour Criteria*

There is currently no clear consensus in Australia relating to the criteria that should be adopted for determining odour nuisance. Although consistent sampling, assessment and dispersion modelling techniques for odour analysis are being developed, a wide range of odour criteria is used.

Section 15A of the New South Wales Clean Air Act (1974) requires that no odour be detectable beyond the boundary of *scheduled premises*. For new, *non-scheduled premises* the design criterion accepted by NSW EPA is 2 OU_{50D} occurring 99.5% of 3-minute peaks. It should be noted that, although the transfer station will be new, its commission will coincide with the capping of the landfill. The waste generating the odour will still have the same constituents. Theoretically, this criterion would be applied at the boundary of the site and adequate buffer distances would be required within the site boundary. In many circumstances, buffer zones outside the site boundary are acceptable. In such cases, it is appropriate to consider the odour concentrations at the nearest sensitive receptors.

As this is a qualitative assessment of the potential for nuisance, the focus is on sensitive receptors rather than odour concentrations at the site boundary.

5.3.2 *Baseline Environment*

i. *The Site*

The site is located on a peninsula protruding into Port Stephens, separating Salamander Bay on the eastern side from Cromartys Bay on the western side. The transfer station is to be constructed on the north-eastern end of the existing landfill which occupies an area of 24.4 hectares.

ii. *Topography and Meteorology*

The peninsula consists of undulating sand dunes and wetlands protruding in a north-north west direction into Port Stephens. The site is below 10 m AHD but elevated 2 - 3 metres above the adjacent wetland. 600 metres to the north is Wanda Wanda Head, a steep hill peaking at more than 30 metres AHD. To the east are undulating sand dunes between 0 and 10 metres AHD and 650 metres to the north-east is Salamander Bay. 600 metres to the south is a steep sand dune peaking at more than 30 metres AHD. To the west is a wetland and Cromartys Bay.

Meteorological data from Williamtown Airport have been compiled into the wind roses shown in *Figures 5.1a to 5.1d*. These give an indication of regional airflow. For dispersion of odour from ground level sources, the low wind speed periods are most

critical. Over summer, mornings have a high incidence of calm conditions with no particularly dominant wind direction. The summer afternoon sea breeze brings light winds from the south to south-east. The gentle morning winds flowing down the river valleys are known as drainage flows. In winter, these dominate from the north to north-west. Afternoon breezes blow from the west or south.

The local topography of the peninsula and Port Stephens are likely to shift the sea breeze around to the east and the drainage flows around to the west.

Overall, the majority of low winds are likely to flow from either the east or the west.

iii. Existing Environment

a. Odour Sources

The only known sources of odour in the area are the existing landfill and decaying vegetation in the wetland west of the site. Nearby industrial facilities include a concrete batching plant, warehouses and motor vehicle wreckers. No odorous industry is known to operate on the peninsula.

b. Sensitive Receptors

Residential areas near the transfer station site are:

- ❑ a residential area commencing approximately 360 metres north of the site;
- ❑ a residential area approximately 450 metres north-east;
- ❑ a residential area and retirement village approximately 270 metres to the east and south-east; and
- ❑ a residential area approximately 360 metres to the south.

Light industrial facilities are along the eastern and northern boundary. While these are not as sensitive as residential areas, higher concentrations of odour may still cause nuisance to workers.

c. Odour Environment

It is expected that odour from the existing landfill is noticed by people in the industrial facilities and may, during occasional calm meteorological conditions, be detected by people in the residential areas to the east, south-east and south. It is understood that the Council has received no complaints regarding odour from the landfill.

Odour from the wetland would be of a similar nature to that from the landfill and may combine to increase odour concentrations in residential areas.

iv. Projected Baseline

a. Odour Sources

The existing landfill will close as part of the development. Some management techniques during its remaining life will reduce odour generated after it is capped including:

- ❑ filling from the high end first thus reducing surface water entrapment;
- ❑ not depositing waste in standing water; and
- ❑ depositing waste in thin layers to maximise compaction.

Council is also investigating the feasibility of a landfill gas extraction system to reduce the amount of methane venting through the soil.

It is not anticipated that any new odour sources will be introduced to the area in the foreseeable future. If odorous industries were planned, they would be subject to the assessment and approval processes. Thus the remaining odour sources will be the wetland and odour from the capped landfill.

b. Sensitive Receptors

It is believed that future residential growth will be limited to the area to the south. To the west is a wetland which is unsuitable for development and the area east across Soldiers Point Road is of high habitat value and thus also unsuitable for development.

Part of the proposal is to cap the existing landfill and use it for recreational purposes such as a playing field. Thus the transfer station will be located adjacent to these facilities. As this facility will be a maintained public infrastructure, it is considered to have some sensitivity to nuisance arising from odour.

Thus sensitive receptors will include users of the future recreational facilities, as well as residents of the existing residential area to the east and south-east.

c. Odour Environment

With the capping of the landfill, the residential areas have only a slight potential for experiencing odour nuisance from the landfill and the wetland. Some odorous

compounds will be released from the landfill after it is capped, and are likely to be detected by recreational users of the site. If a gas extraction system is installed and the landfill is managed effectively prior to its closure, odour would be unlikely to cause nuisance in the residential areas.

5.3.3 *Project Assessment*

i. Project Details

The transfer station will accept waste from municipal collection services, commercial services, and private dropoff including both recyclable and waste materials. Recyclables will be hauled to a materials recovery facility and compostable materials to the Raymond Terrace Composting Centre.

The approximate mass of waste likely to generate odours, projected to 2021, is:

- ❑ 14,500 tonnes of municipal solid waste (MSW) including animal carcasses;
- ❑ 2,300 tonnes of domestic waste; and
- ❑ 2,400 tonnes mulch / green waste.

The MSW and domestic waste will be received in enclosed bays within the building with commercial vehicles emptying into 50 cubic metre transfer containers on the northern side of the building. Private vehicles will empty into bays on the southern side. The transfer containers are located on a lower level and removed via openings. Rubber strips to restrict airflow will cover the upper half of these openings, from 3 metres above the ground.

All putrescible waste (other than green waste) will be removed from the site by the end of the working day.

According to Council's Landfill Environmental Management Plan, the odorous waste categories that will not be received at the existing landfill for its remaining life include material containing sulphide and industrial waste from:

- ❑ tanning or leather processing plant;
- ❑ petroleum or petrochemical plant;
- ❑ chemical plant;
- ❑ paint manufacturing plant;
- ❑ metal treatment plant;

- ❑ vegetable oil or mineral oil plant; and
- ❑ pharmaceutical manufacturing plant.

It is assumed that these materials will not be accepted at the transfer station.

The prime gaseous emissions from organic decomposition that can cause offensive odours are volatile organic compounds (VOCs). These compounds are liberated during decomposition while the waste is within receiving bays. VOCs include the following gases:

- ❑ acetone;
- ❑ carbon disulphide;
- ❑ 2-butanone;
- ❑ toluene;
- ❑ 2-hexanol;
- ❑ styrene;
- ❑ m & p xylenes; and
- ❑ 1,4-dichlorobenzene.

ii. *Estimation of Emission Rates*

The height restriction in the MSW bay opening will reduce the air flow rate through and increase odour concentrations within the bay. It will also increase the retention time of air within the bay which may slightly reduce the total odour emission rates from the bay. However this reduction is not likely to be significant.

The waste will be stored within a smaller area than at the landfill, which may lead to higher initial concentrations of odour. However, there will also be less exposure of the material to air which, over the short period that the waste will be stored there, will tend to reduce odour.

The material will be transferred off-site within the time frame that it would currently be covered. The emission rates per volume of material are therefore likely to be similar. However, Council predicts an increase in waste volume by a factor of 1.6 for the year 2021.

Odour emissions measured from uncovered food scraps at a landfill in Victoria were 0.128 OU/m²/s (ESA 1991). Other odour emissions measured from fresh, uncovered MSW were 0.10 OU/m²/s (Woodward Clyde 1997). This is approximately equivalent to 0.75 OU/m³/s. The maximum volume of MSW that the site could take at any time would be around 100 m³ of commercial delivery and 100 m³ of private delivery. Actual volumes predicted in the concept design do not exceed these amounts. Assuming the worst case of 200 m³, the odour emission rate would be approximately 150 OU/s.

iii. Odour Dispersion

Ambient concentrations are ideally estimated using a computer-based model to quantify the dispersion of the odour. However, to be meaningful, this requires continuous wind monitoring within a few kilometres of the site and hourly estimations of atmospheric stability, inversion height and temperature within approximately 20 kilometres. It also requires measured or accurately predicted odour emission rates.

For this assessment, twice-daily wind data was available at Williamstown airport. Other meteorological data was not available. In addition, worst case emission rates were assumed.

Therefore a qualitative assessment of the nuisance caused by worst case estimates of ambient concentrations has been performed. This is based on experience with dispersion modelling, the effect of topography and the potential dispersion of odour concentrations over the distance to the receptors.

Light wind conditions are expected to be predominantly from the east and west. Therefore, odour may potentially reach the residential areas to the east during light wind conditions and reach residences to the south, east and north under calm conditions.

iv. Ambient Concentrations

The odour emissions from the transfer station are likely to be of similar magnitude to those released from the large area of the landfill after it is capped.

Similar case studies and modelling predictions on other projects suggest that 3 minute odour concentrations would be sufficiently low at residences to the south and north that the 1 OU criteria would not be exceeded more than 1 per cent of the time. However, there is some potential for odour to be higher at residences to the east, which may occasionally be subjected to concentrations of odour sufficient to

cause nuisance to more sensitive individuals. However, odour concentrations are likely to be lower than the existing concentrations.

In the industrial area and at the recreational facility, it is likely that odour would be detectable and probably recognisable more than 1 per cent of the time particularly if combined with emissions from the capped landfill. This combination may therefore cause nuisance to workers and recreational users. As the recreational users will be on top of the capped landfill, nuisance may be slightly worse than nuisance from the existing landfill operation.

5.3.4 Recommendations

It is anticipated that odour concentrations reaching residences will not cause greater nuisance than is currently occurring. However, in the projected baseline case without the transfer station and with the landfill capped, odour concentrations, and hence the potential for nuisance, would be less. In addition, concentrations in the industrial and future recreational area may be sufficient in combination with odours from the transfer station to cause nuisance.

Council has proposed in the concept design that waste having the potential to generate odour will not be stored on site overnight. Odorous chemicals should not be accepted at the station. It is also recommended that commercial fish waste and viscera should not be accepted.

As the key residential area to the east is located slightly higher than the site, ventilation through a stack is not likely to be effective in dispersing odour. It is therefore desirable that ambient odour concentrations be reduced by the installation of a gas extraction system in the capped landfill. Alternately, the situation should be monitored using periodic odour surveys of local residents to determine odour nuisance levels.

If any complaints are received during the operation of the transfer station, details of the event should be kept in a complaints register. If validated complaints re-occur, an odour survey should be conducted and odour emission measurements carried out according to the Australian Standard for Odour Measurement currently being drafted and due for completion in 1999.

5.4 SOILS AND GEOLOGY

5.4.1 Soils

The Department of Land and Water Conservation (Soil Conservation Service of NSW) soil landscape map for Port Stephens shows that the study area is situated within predominantly estuarine and aeolian landscape types. The soils landscape map describes two landscape units, namely Fullerton Cove and Shoal Bay landscape variant. These landscape units consist of several different soil types which are positioned within the unit area according to topography. Details of each of the soil landscapes are provided below in *Table 5.3*.

Table 5.3 SOILS

Landscape Unit	Landform	Geology	General Soil Description	Soil Erosion
Fullerton Cove (fc)	tidal flats with local relief of , 3m on Holocene estuarine sediments	Holocene sediments - silt, clay and estuarine sediments with common shell layers	saturated saline organic mud	mostly slight, but extreme under concentrated channelised flows
Shoal Bay landscape variant (sbc)	poorly drained Pleistocene sand sheets	Pleistocene aeolian sand sheets and low dunes of quartz sand.	deep well drained podzols	foundation hazard high, waterlogging frequent

Source: 1. Matthei (1995)
2. Kovac and Lawrie (1991)

Investigations undertaken during the preparation of the LEMP (CMPS&F, 1997) indicate that the whole site is underlain by sandy sediments. However, the site of the proposed waste transfer station has been filled as part of the landfill operations and capped with clay materials meaning that the waste transfer station will not be constructed directly on sandy sediments.

In 1994, Coffey Partners installed eight monitoring wells across the site. The logs from the bores found three types of sediments:

- fill - silty or clayey sand, fine to medium grained, grey, dark grey and brown, Some clay fill was encountered. Thickness of fill varied from 1.0 to 1.8 metres;
- aeolian sands - wind-blown sands, fine to medium grained sand with little or no fines, coloured grey through brown to orange, On the south-eastern side of the site these were in excess of five metres deep; and

- alluvium/estuarine deposits - interbedded sand silty sand, clayey sand and organic clay. Sands were fine to medium grained, clays of high plasticity, containing organic fibres and an odour of decomposing organic matter, The clays were wet beyond their plastic limit. No clays were encountered on the south-eastern side of the site.

5.4.2 Acid Sulphate Soils

The Port Stephens Acid sulphate soil risk map (Soil Conservation Service of NSW, 1995) was reviewed to determine the occurrence of acid sulphate soils or potential acid sulphate soils in the vicinity of the proposed waste transfer station. The Salamander Bay site is situated on an area which is mapped as disturbed terrain due to the extent of filling undertaken on the site. However, the site is surrounded by sediments identified as having a low and high probability of occurrence of acid sulphate material within the soil profile.

Areas with low probability of occurrence of acid sulphate soil material are generally found in areas where the environment of deposition has generally not been suitable for the formation of acid sulphate soil materials and soil materials are often Pleistocene in age. Acid sulphate soil materials if present are sporadic and may be buried by alluvium or windblown sediments.

Areas with a high probability of occurrence of acid sulphate soil materials are generally found in areas where the environment of deposition has been suitable for the formation of acid sulphate soil materials. Acid sulphate soil material are widespread or sporadic and may be buried by alluvium or windblown sediments.

The existing Salamander Bay waste disposal facility is bordered to the north by sediments described as Wa1(p) (low probability within one metre of ground surface), to the west by Wa2(p) (low probability between one and three metres below the ground surface), to the south and south-east by Wd4(p) (low probability greater than three metres below the ground surface) and Wa2(p) (low probability between one and three metres below the ground surface) and to the west by Eu1 (high probability within one metre of the ground surface) where *W* means the landform process is aeolian, *E* means the landform process is estuarine, *a* means the landform element is a sand plain and *d* means the landform element is a dune. The *1* means ground surface elevations is between one and two metres, *2* means ground surface elevation is between two and four metres and *4* means ground surface elevation is greater than four metres and (*p*) means the sediments are Pleistocene in age.

Overall, the likelihood of acid sulphate soil material being present during the construction and operation of the waste transfer station is minimal due to the amount of filling that has occurred on the site and the proposal to site the waste

transfer station on an area that has been previously filled. However, surrounding areas, particularly to the west would have a high probability of occurrence of acid sulphate soil material.

5.4.3 Geology

Information contained in the LEMP (CMPS&F, 1997) indicates that the site is underlain at depth by Nerong Volcanics. The surrounding wetlands and aeolian sands are Quaternary in age. The Carboniferous Nerong Volcanics consist of volcanics, agglomerate, conglomerate, sandstone and siltstone.

5.5 HYDROLOGY

CMPS & F (1997) report that there are two large, shallow leachate/surface water ponds located at the southern end of the site. A barrier separating them into a primary and overflow ponds had been overtopped and the ponds were at risk of overflowing into the wetlands.

Approximately 300 metres of a drainage channel on the western side of the site, adjacent to the wetlands, drains south to the leachate ponds. It was noted that surface runoff sheet flows directly into the wetlands. This occurs from only a small proportion of the site as the majority of the site is graded to drain away from the wetlands.

A drainage channel traverses the northern side of the site between the landfill and adjoining light industry. This drainage channel continues though to the wetlands and Cromartys Bay. The channel collects runoff from the industrial area, from residential areas north of the industrial area and across Salamander Way and potential leachate from the landfill. It is expected that a large portion of this channel is subject to tidal fluctuations. The location of this drainage channel and drainage patterns on the site are shown in *Figure 4.3*.

There is no drain on the eastern side of the site. There is a depression between the landfill and a paved road which collects stormwater from Soldiers Point Road in addition to potential leachate from the landfill and drains to the leachate ponds.

Unmanaged surface water consisting of large shallow puddles in low-lying and overgrown areas occurs on the site. This may be contributed to by a number of influences including the importing of clay soil as cover material and the change in the underlying geology from sand to estuarine clays.

The Department of Land and Water Conservation (DLWC) have advised that the site is subject to flooding from tidal inundation. The one in one hundred year flood height for the site is 2.05 metres AHD. This level would be high enough for water to enter the western drain and leachate ponds. The resulting floodwaters on site would be of poor quality and of sufficient volume to dilute the leachate to a low concentration. This is considered unsatisfactory, therefore, some form of flood control to prevent tidal inundation on the site is recommended.

5.5.1 Surface Water Quality

CMPS&F (1997) report that surface water monitoring commenced on site in February 1988 and continued until January 1996. Results for lead, nitrate, copper, iron, pH, cadmium, biochemical oxygen demand (BOD) and chemical oxygen demand (COD) periodically exceed both the ANZECC Protection of Aquatic Ecosystems Marine (PAEM) guidelines and guidelines in Schedule 2 of the Clean Waters Act.

Overall, water contained in the leachate pond and adjoining western channel is not of suitable quality for discharge into the wetland. CMPS&F (1997) recommended that samples be collected in the northern drainage channel to confirm water quality and sources of potential contaminants. Samples should be collected upstream and downstream of the landfill site and under varying conditions of rainfall, flow and tide.

5.5.2 Impacts

The waste transfer station itself will not contribute waste water to the existing water management system on site. All water generated as part of the waste transfer station will be contained, screened and discharged to sewer with a trade waste agreement with Hunter Water Corporation.

The existing surface water system will be monitored by Council as part of the post-closure management of the site detailed in *Section 4.11*.

5.6 HYDROGEOLOGY

Coffey Partners installed eight monitoring wells on the site in 1994. In 1997, CMPS&F found that six monitoring wells remained. Indications from borehole logs suggests that groundwater in the zone underlain by sand is non-saline and generally moves from east to west. Sands on the site are well-drained with recharge occurring quickly due to high infiltration and little surface runoff. Conditions vary in the wetland where organic clays, muds and silts underlie the surface. Conditions are

saturated due to the tidal influence and groundwater is saline. There is little groundwater movement in this zone due to low permeability and lack of relief. In January 1994 when the monitoring wells were installed, groundwater was encountered between 0 and 1.0 metre below the natural surface. Table 5.4 summarises the groundwater elevations encountered by CMPS&F (1997).

Table 5.4 GROUNDWATER ELEVATIONS

Bore no	TOC bore elevation (m)	groundwater depth (metres below casing)	groundwater elevation (metres) *
S2	98.16	2.67	95.49
S3	96.37	0.72	95.65
S4	96.44	1.42	95.02
S5	96.67	1.01	95.66
S6	96.96	1.94	95.02
S8	100.00	3.51	96.49

Source: CMPS&F (1997)

Notes 1. * = Elevation with respect to S8 top of casing nominal reference elevation of 100 metres.

5.6.1 Groundwater Quality

Groundwater quality has been measured by Coffey Partners in August 1994 and January 1995 and by CMPS&F in 1997. CMPS&F (1997) provide a summary of groundwater quality. They note that conductivity and dissolved solids were significantly higher in the down gradient bores and conclude that this may represent contamination from the landfill. However, it could be the result of saline deposits associated with the wetlands or tidal influence. Coffey Partners found high levels of nitrate, ammonia and TKN (total Kehlajl Nitrogen) in subsequent monitoring. Bores with elevated ammonia and organic nitrogen concentrations were generally those established in the organic rich estuarine muds. Bores in aeolian sands were not affected by these parameters. Natural sources of nitrogen associated with estuarine muds makes it difficult to assess contamination on the basis of nitrogen alone. Higher pH results were observed in down gradient bores by Coffey Partners consistent with marine water.

In general, CMPS&F (1997) reported that water analysis indicated that bores S2, S5 and S4 and to a lesser extent S3 and S6 are affected by water with a similar chemical composition to the leachate pond sample. These bores are also affected by marine influences from the estuarine clays encountered in the wetlands and therefore the extent to which leachate impacts these bores is difficult to assess.

5.7 FLORA AND FAUNA

5.7.1 Study Area and Environs

The existing landfill site is largely cleared of native vegetation. Scattered trees occur along the perimeter fence and in the drainage lines on the southern boundary. The majority of the site is currently utilised for landfill or is grassland. The proposed waste transfer station is located within the existing landfill operation area and covers approximately one quarter of the total landfill site. The waste transfer station is proposed to be constructed on filled, cleared land.

Natural vegetation in the Salamander Bay area is characterised by a system of wetlands and forested areas extending from the shore of Salamander Bay towards Cromartys Bay and Taylors Beach in the west and towards Anna Bay and the Newcastle Bight areas on the southern side of the Tomaree Peninsula. Forested areas are largely dry sclerophyll forest on elevated dunes dominated by rusty gum (*Angophora costata*) and blackbutts (*Eucalyptus pilularis*) with sclerophyllous shrub understorey.

To the west and south-west of the landfill site is an estuarine wetland designated as SEPP 14 wetland 766. This wetland has been identified as a wetland of high ecological and cultural value (SWC, 1988). The high ecological value is based on its proximity to oyster growing areas in Cromartys Bay and high cultural value based on its combined high ecological value and moderate to high usage and/or accessibility rating allowing for scientific studies, education opportunities and bird watching (SWC, 1988).

5.7.2 Study Objectives

Flora and fauna investigations were undertaken for the site of the proposed waste transfer station, the existing landfill site and immediate environs. The primary objectives of the flora and fauna survey were to:

- describe the vegetation communities in accordance with the classification system of Specht *et al.* (1995);
- identify fauna habitats elements;
- compile a list of flora and fauna species identifying any threatened species as listed in Schedules 1 and 2 of the Threatened Species Conservation Act, 1995; and
- assess the impacts of the proposed waste transfer station and whether the development is likely to have a significant impact on the environment of

threatened species, populations and ecological communities through consideration of section 5A of the Environmental Planning and Assessment Act, 1979 as amended by the Threatened Species Conservation Act, 1995.

5.7.3 *Survey Methodology*

The flora and fauna survey was undertaken over one day in September 1998. Survey methodology to assess the flora and fauna of the site and environs are described below.

i. *Flora Assessment*

The flora survey involved field verification of the location of each plant community and a general description of the community using qualitative field observations. Vascular plant species were recorded during foot traverses across each vegetation community. Any threatened flora species would be identified and where required, sent to the National Herbarium for verification.

Vegetation communities are classified based on the structural characteristics of Specht *et al.* (1995). The conservation status of flora species was derived from Briggs and Leigh (1995) and Schedules 1 and 2 of the Threatened Species Conservation Act, 1995. The conservation status of vegetation communities was assessed based on their condition, occurrence of threatened flora, and assessment of the distribution of the community on a local, regional and statewide distribution.

ii. *Fauna Survey*

Sampling for threatened and protected fauna involved direct and indirect techniques. Survey methodology was of a reconnaissance nature based on identification of fauna habitats, opportunistic sightings, searches for indirect evidence of the presence of species (scats, tracks, scratch marks), surveys for nocturnally active animals including spotlighting, searches for amphibians in drainage lines, grassy soaks and wetland habitats, and/or identification of audible calls.

The survey data was supplemented with a literature review of species likely to occur from database searches and a review of previous studies undertaken in the local area.

5.7.4 Proposed Waste Transfer Station

i. Vegetation Communities and Fauna Habitats

The proposed development site is within an existing landfill operation. The development site itself is largely devoid of vegetation and has no habitat value for protected and threatened flora and fauna species. Where there is vegetation cover this is dominated by introduced grasses and weed species such as kikuyu (*Pennisetum clandestinum*), *Plantago lanceolata*, *Hypochaeris* species and castor oil plant (*Ricinus communis*).

The disturbed community has little to no intrinsic habitat value for native fauna. Stockpiled waste affords temporary shelter from weather and predation for terrestrial fauna. There is some ponding of water following rainfall events.

This disturbed grassland community has no conservation significance on a local, regional or statewide basis. Figure 5.2 shows local land use and vegetation communities.

ii. Fauna Recorded in the Area

Within the proposed development site the fauna species observed during field work and reported by workers at the site are listed in Table 5.5. These species were observed principally scavenging on waste at the landfill site. An employee reported the presence of a family of foxes observed on the site over time, also cats and rats have been observed in the area.

Table 5.5 FAUNA IDENTIFIED IN THE LANDFILL AREA AND ENVIRONS

Species	Common Name	Habitat	How Recorded
<i>Chenonetta jubata</i>	Australian wood duck	o,w	o
<i>Anas superciliosa</i>	Pacific black duck	o,w	o
<i>Anas castanea</i>	chestnut teal	w	o
<i>Pelecanus conspicillatus</i>	Australian pelican	o	o
<i>Egretta novaehollandiae</i>	white-faced heron	w	o
<i>Nycticorax caledonicus</i>	nankeen night heron	w	o
<i>Threskiornis molucca</i>	Australian white ibis	o	o
<i>Haliastur sphenurus</i>	whistling kite	o	o
<i>Gallinula tenebrosa</i>	dusky moorhen	w	o
<i>Fulica atra</i>	Eurasian coot	w	o
<i>Vanellus miles</i>	masked lapwing	o	

Table 5.5 FAUNA IDENTIFIED IN THE LANDFILL AREA AND ENVIRONS

Species	Common Name	Habitat	How Recorded
<i>Larus novaehollandiae</i>	silver gull	o	o
* <i>Streptopelia chinensis</i>	* spotted turtle-dove	f	o
<i>Ocyphaps lophotes</i>	crested pigeon	o, f	o
<i>Cacatua roseicapilla</i>	galah	o, f	o
<i>Platycercus eximius</i>	eastern rosella	o, f, w	o
<i>Malurus cyaneus</i>	superb fairy-wren	f, w	o
<i>Anthochaera chrysoptera</i>	little wattlebird	f	o
<i>Philemon corniculatus</i>	noisy friarbird	f	o
<i>Manorina melanocephala</i>	noisy miner	f	o
<i>Lichenostomus chrysops</i>	yellow-faced honeyeater	f	o
<i>Grallina cyanoleuca</i>	magpie-lark	o, f	o
<i>Rhipidura leucophrys</i>	willie wagtail	o	o
<i>Gymnorhina tibicen</i>	Australian magpie	o	o
<i>Corvus coronoides</i>	Australian raven	o	o
<i>Zosterops lateralis</i>	silveryeye	f	o
* <i>Sturnus vulgaris</i>	* common starling	o	o
* <i>Acridotheres tristis</i>	* common myna	o	o
* <i>Vulpes vulpes</i>	fox		l
* <i>Canis familiaris</i>	dog	o	i
* <i>Felis catus</i>	cat		l
* <i>Rattus spp.</i>	rat		l
<i>Litoria fallax</i>	eastern dwarf tree frog	w	ac
<i>Litoria lesueuri</i>	Lesueur's frog	w	ac
<i>Litoria peronii</i>	Peron's tree frog	w	ac
<i>Litoria tyleri</i>	Tyler's tree frog	w	ac
<i>Crinia signifera</i>	common eastern froglet	o, w	ac
<i>Limnodynastes dumerilii</i>	eastern banjo frog	w	ac
<i>Limnodynastes tasmaniensis</i>	spotted grass frog	w	ac
<i>Uperoleia laevisgata</i>	smooth toadlet	w	ac
Notes:	Habitat key o = open (including landfill site), w = wetland habitats, f = treed area and adjoining DSF Observation key o = observed, ac = audible call, i = indirect evidence; l = landfill workers record		

iii. *Threatened Species*

No threatened species were identified or are expected to occur within the area designated for development of the waste transfer station. The modified environment with little to no vegetation cover or habitat elements and does not provide critical habitat elements for threatened species known to occur in the Port Stephens area.

5.7.5 *Salamander Landfill Site and Environs*

i. *Vegetation Communities and Fauna Habitats*

Within the boundary of the Salamander landfill site there are two broad vegetation communities being disturbed grassland and wetland. The disturbed grassland community includes an area of grassland under regeneration dominated by couch grass (*Cynodon dactylon*) and open grassland structure characterised by largely introduced grasses and weed species. Along the property boundary and near the entrance facilities there are scattered remnant trees including swamp mahogany (*Eucalyptus robusta*), swamp oak (*Casuarina glauca*), *Melaleuca quinquenervia*, cheese trees (*Glochidion ferdinandii* var. *ferdinandii*) and planted coral trees (*Erythrina X sykesii*).

The drainage line on the southern boundary supports wetland species and is continuous with the estuarine wetland along Cromartys Bay. Within the property boundary the drainage line is characterised by an open forest dominated by swamp mahoganies (*Eucalyptus robusta*) with *Melaleuca quinquenervia* and *Casuarina glauca*. The trees are 15 to 20 metres in height providing 30 per cent foliage cover. The understorey on the banks of the drain is dominated by *Gahnia* sp., *Blechnum indicum*, *Lantana camara*, bitou bush (*Chrysanthemoides monilifera*) and castor oil plant (*Ricinus communis*). Emergent vegetation along the drain is dominated by *Typha orientalis*.

Towards the estuarine wetland, the wetland community changes to an inundated paperbark open forest dominated by flooded *Melaleuca quinquenervia* standing in open water with emergent edge vegetation being more floristically diverse including sedges and reeds.

The vegetation along the southern drain is degraded in parts and dieback is evident in the flooded paperbark open forest.

The drain on the northern boundary of the landfill site does not support emergent vegetation and has low habitat value. The banks are vegetated with introduced

grasses and weeds. This drains into the estuarine wetland in the north-east corner of the site.

On the southern boundary of the Salamander landfill site, the drainage line adjoins a dry open forest dominated by blackbutt (*Eucalyptus pilularis*) and rusty gum (*Angophora costata*) with *Banksia serrata* understorey and open sclerophyllous shrub understorey with grassy groundcover. This open forest is continuous with wetland vegetation around Cromartys Bay towards Taylors Beach and would provide a corridor for the movement of fauna. The open forest is characterised by ecologically mature trees providing foraging and nesting habitat for arboreal mammals and groundcover for small terrestrial fauna.

The estuarine wetland is characterised by sedgeland of *Baumea juncea* and *Juncus kraussii* with *Sarcocornia quinqueflora*. Mangroves (*Avicennia marina* var. *australasica*) occur along tidal channels through the wetland and fringe the bay. The boundary between the wetland and the landfill site is separated by a drainage channel fringed by swamp oak (*Casuarina glauca*).

ii. Fauna Recorded in the Area

Within the remainder of the landfill site and the immediate environs the fauna species observed during field work and reported by workers at the site are listed in Table 5.5.

The wetland community provides a diversity of habitats for water birds, ducks and amphibians as indicated in Table 5.5. The majority of amphibians recorded on the site were heard calling from the southern drainage line amongst emergent vegetation. *Crinia signifera* and *Limnodynastes tasmaniensis* were also heard calling from grassy soaks in the south-west of the landfill site.

The swamp mahogany along the drain provide potential koala habitat. No koalas were observed during field work nor reported by employees of the site. Where possible searches were made for the evidence of the presence of koalas however, the majority of swamp mahogany trees were standing in water or dense groundcover vegetation limiting detection of scats. This drain is continuous with wetland habitat around Cromartys Bay and would be expected to provide a corridor for the movement of koalas in the local area between Salamander Bay and the Taylors Beach area (see Section 4.7.6 for SEPP 44 assessment).

iii. Threatened Species

No threatened species were identified within the boundary of the Salamander landfill site. However the outer boundaries of the site, in particular the drain along

the southern boundary does provide habitat elements for a number of threatened species known to occur in the Port Stephens area. An assessment of the likelihood of occurrence of threatened species based on available habitat is provided in Section 5.7.8.

5.7.6 SEPP 44 Koala Habitat Assessment

The identification of *potential* koala habitat is based on an assessment of the percentage cover of koala feed trees as listed in Schedule 2 of SEPP 44. Only one Schedule 2 species was identified in the landfill site, being the swamp mahogany (*Eucalyptus robusta*).

No trees occur within the area designated for the waste transfer station, therefore the proposed development area does not provide potential koala habitat.

The wetland along the drain on the southern boundary of the landfill site is dominated by swamp mahogany and in accordance with the legislation, provides potential koala habitat. *Melaleuca quinquenervia* when in association with swamp mahogany will also be utilised by koalas (Phillips *et al*, 1996).

Scattered individual swamp mahoganies also occur near the entrance to the landfill site and in the environs. The landfill site occurs within primary koala habitat as mapped by the draft koala habitat atlas for Port Stephens LGA (Phillips *et al*, 1996). This is based on the *presence of tree species known to be preferentially utilised by koalas* as a dominate species of the overstorey vegetation. The effective conservation and management of primary habitat areas was identified as integral to the long term future of the koala in the Port Stephens LGA (Phillips *et al*, 1996).

Where possible searches were made for the evidence of the presence of koalas however, the majority of swamp mahogany trees were standing in water or dense groundcover vegetation limiting detection of scats. There is no evidence of koala activity at the base of trees near the entrance to the landfill site.

The southern boundary drain is continuous with wetland habitat around Cromartys Bay and would be expected to provide a corridor for the movement of koalas in the local area between Salamander Bay and the Taylors Beach area. There are no fences forming a barrier for the movement of koalas along this drain.

While the swamp open forest along the southern drain provides potential koala habitat, this area will not be modified by the proposed waste transfer station, and further assessment for *core* koala habitat has not been undertaken.

5.7.7 Threatened Species Assessment

Threatened species known to occur in the environs are listed in Table 5.6. These species have been recorded during other flora and fauna surveys in the Taylors Beach to Salamander Bay to Nelson Bay area and/or are recorded in the National Parks and Wildlife Service atlas of NSW wildlife and rare or threatened Australian plants (ROTAP) database. For the purposes of this assessment, local records have been defined as those occurring within a radius of five kilometres from the study area.

No threatened populations or ecological communities currently listed on the TSC Act, 1995 were recorded, or considered likely to occur, within the study area.

Of the species assessed in Table 5.6, twelve species are likely to occur within the immediate area of the Salamander landfill site in the wetland habitat and adjoining open forest. These are the powerful owl (*Ninox strenua*), masked owl (*Tyto novaehollandiae*), osprey (*Pandion haliaetus*), pied oystercatcher (*Haematopus longirostris*), little bent-wing bat (*Miniopterus australis*), squirrel glider (*Petaurus norfolkensis*), spotted-tailed quoll (*Dasyurus maculatus*), brush-tailed phascogale (*Phascogale tapoatafa*), eastern little mastiff-bat (*Mormopterus norfolkensis*), greater broad-nosed bat (*Scoteanax rueppellii*), koala (*Phascolarctos cinereus*) and wallum froglet (*Crinia tinnula*).

Table 5.6 ASSESSMENT OF LIKELIHOOD OF THREATENED SPECIES WITHIN STUDY AREA

Common/ Scientific Name	Status	Occurrence in Tomaree Peninsula	Likelihood of Occurrence in Development Site	Likelihood of Occurrence in Environs
Hollow-dependent birds				
glossy black cockatoo <i>Calyptorhynchus lathamii</i>	V	Tanilba Bay and Salt Ash. ¹	Low, no habitat elements	Low. Limited regional records, lack of suitable foraging resource in open forest, large nesting hollows available.
masked owl <i>Tyto novaehollandiae</i>	V	Nelson Bay ¹	Low likelihood may forage	Moderate. Suitable nesting habitat available in open forest in area, suitable foraging resource in region.
powerful owl <i>Ninox strenua</i>	V	Bagnalls Beach ² and Bobs Farm ³	Low, no habitat elements	Moderate. Suitable nesting and foraging habitat in area.
Other birds				
bush stone-curlew <i>Burhinus grallarius</i>	E	Lemon Tree Passage and Taylor's Beach. ¹	Low, no habitat elements	Low to moderate. Preferred habitat (lightly timbered open forest or woodland with a ground cover of short sparse grass and few, or no shrubs;) ¹⁰ absent from immediate environs. However, occasionally recorded in mangroves and saltmarsh where fringed by <i>Casuarina</i> thickets ¹⁰ and this habitat available in adjoining wetland.
wompoo fruit-dove <i>Ptilinopus magnificus</i>	V	Corlette Point. ¹	Low, no habitat elements	Low. Few local records, preferred habitat (rainforest) ¹¹ absent from study area.
superb fruit-dove <i>Ptilinopus superbus</i>	V	Corlette ¹	Low, no habitat elements	Low. Few local records. Lives in rainforest but will feed in adjacent mangroves or eucalypt forest ¹² . Rainforest absent from study area
osprey <i>Pandion haliaetus</i>	V	Tanilba Bay (nesting) ⁴ Shoal Bay ¹	Low, no habitat elements	Moderate. Expected to feed over Cromartys Bay. No nest sites identified in the area, known nesting sites at Tanilba Bay and Hawks Nest.

Table 5.6 ASSESSMENT OF LIKELIHOOD OF THREATENED SPECIES WITHIN STUDY AREA

Common/ Scientific Name	Status	Occurrence in Tomaree Peninsula	Likelihood of Occurrence in Development Site	Likelihood of Occurrence in Environs
pied oystercatcher <i>Haematopus longirostris</i>	V	Tanilba Bay, Lemon Tree Passage ⁴	Low, no habitat elements	Moderate. Preferred habitat (ocean beaches, estuarine sand, mudflats and saltings) ¹¹ available in adjoining wetland. Low likelihood of nesting in adjoining wetland prefer sand on estuarine or coastal beaches ¹³
sooty oystercatcher <i>Haematopus fuliginosus</i>	V	Boat Harbour ^{1,5}	Low, no habitat elements	Low. Preferred habitat is limited in the adjoining wetland (rocky intertidal shorelines, coral reefs or sandy beaches near intertidal mudflats) ¹³ .
Cave-roosting bats				
little bent-wing bat <i>Miniopterus australis</i>	V	Salamander Bay ^{6,7} Tanilba Bay, Gan Gan	Low likelihood of foraging in open area.	High, recorded at Wanda Avenue ⁶ . Expected to forage in adjoining open forest.
Hollow-dependent mammals				
squirrel glider <i>Petaurus norfolcensis</i>	V	Salamander Bay area ^{1,6,7} Bagnalls Beach ² , Nelson Bay, Anna Bay, Bobs Farm, Lemon Tree Passage ¹ and Salt Ash. ³	Low, no habitat elements	High, recorded at Wanda Avenue ⁶ . Expected to forage on swamp mahogany and <i>Melaleuca quinquenervia</i> along the southern drain and may have den sites in this area. High likelihood of dens and foraging in adjoining open forest.
brush-tailed phascogale <i>Phascogale tapoatafa</i>	V	Lemon Tree Passage area, Corlette, Soldiers Point, Boat Harbour, Anna Bay and Salamander Bay. ¹	Low, no habitat elements	High, recorded in immediate area. High likelihood of den sites in adjoining open forest.

Table 5.6 ASSESSMENT OF LIKELIHOOD OF THREATENED SPECIES WITHIN STUDY AREA

Common/ Scientific Name	Status	Occurrence in Tomaree Peninsula	Likelihood of Occurrence in Development Site	Likelihood of Occurrence in Environs
spotted-tailed quoll <i>Dasyurus maculatus</i>	V	Lemon Tree Passage, Salt Ash, Soldiers Point and Anna Bay to Boat Harbour area. ¹ Bagnalls Beach ²	Low, may forage in area	High, recorded in immediate area. High likelihood of den sites in area. May forage in area.
eastern freetail-bat <i>Mormopterus norfolkensis</i>	V	Salamander Bay. ⁷	Low, may forage on insects in area	Moderate. Expected to forage on insects in area, especially along the drain, and along the flyway (old road) between the southern drain and the open forest. May roost and forage in forested area.
greater broad-nosed bat <i>Scoteanax rueppellii</i>	V	Salamander Bay. ^{6,7}	Low, may forage on insects in area	High, recorded at Wanda Avenue ⁶ . Expected to forage on insects in area, especially along the drains, and along the flyway (old road) between the southern drain and the open forest. May roost in forested area.
Other mammals				
koala <i>Phascolarctos cinereus</i>	V	Numerous records for the Port Stephens area, particularly Tilligerry Peninsula. ¹	Low, no habitat elements	High, recorded at Wanda Avenue ⁶ . Feed trees swamp mahogany and <i>Melaleuca quinquenervia</i> along the southern drain. The southern drain and open forest habitat continuous with bushland and wetland towards Taylors Beach would function as wildlife corridor.
Frogs				
wallum froglet <i>Crinia tinnula</i>	V	Anna Bay Sandbeds, ¹ Salamander Bay. ⁷	Low, no habitat elements	High. Potential habitat (acid paperbark swamps, coastal sedgeland, wet heath and swamp forest) available in south of landfill site.

Table 5.6 ASSESSMENT OF LIKELIHOOD OF THREATENED SPECIES WITHIN STUDY AREA

Common/ Scientific Name	Status	Occurrence in Tomaree Peninsula	Likelihood of Occurrence in Development Site	Likelihood of Occurrence in Environs
Plants				
<i>Prostanthera densa</i>	V	Gan Gan Hill. ⁸	Not expected	Low. Suitable habitat (sclerophyll forest and shrubland, on coastal headlands and near-coastal ranges, chiefly on sandstone) ¹⁴ absent from immediate environs.
<i>Melaleuca groveana</i>	V	Fingal Bay to Shoal Bay area. ⁸	Not expected	Low. Suitable habitat (heath and dry woodland, often in exposed sites, restricted to high elevations) ¹⁵ absent from study area.
<i>Eucalyptus camfieldii</i>		Salt Ash. ⁸	Not expected	Low. Lack of records. Preferred habitat (coastal shrub heath on sandy soils on sandstone, often of restricted drainage) ¹⁶ available in environs.
<i>Diuris praecox</i>	V	Powerline easement between Bobs Farm and Anna Bay ^{3,9} .	Not expected	Low to moderate. Lack of local records. Occurs on hills and slopes of near-coastal districts in open forests with a grassy to fairly dense understorey. ¹⁷ In the local area, it appears to prefer open areas where it encounters less competition for sunlight than in forested habitats ⁹ .
leafless tongue orchid <i>Cryptostylis hunteriana</i>	V	Gan Gan Hill and hill at Lemon Tree Passage ⁹	Not expected	Low. Terrestrial orchid grows in coastal swamp heath on sandy soil and eucalypt woodland with <i>Blandfordia nobilis</i> ¹⁸ . Suitable habitat in region, low number of records.

Status as per Schedules 1 and 2 of TSC Act, 1995: E = Endangered; V = Vulnerable.

1 = NPWS Atlas of NSW Wildlife (Sept 98); 2 = ERM Mitchell McCotter (1995a); 3 = A. Finegan, ERM Mitchell McCotter, pers. obs.; 4 = Hunter Bird Observers Club (1998); 5 = N. Buchhorn, ERM Mitchell McCotter, pers. obs.; 6 = ERM Resource Planning (1995); 7 = Gunninall Consultants (1995); 8 = NPWS ROTAP database (Sept 98); 9 = G. Hillman, pers. comm.; 10 = Marchant & Higgins (1993); 11 = Klippel (1992); 12 = Blakers et al (1984); 13 = Smith (1991); 14 = Conn (1992); 15 = Wilson (1991); 16 = Hill 1991; 17 = Jones (1991); 18 = Leigh et al, 1984

5.7.8 *Eight Part Test*

The impact of the proposed waste transfer site on threatened species has been assessed in accordance with section 5A of the Environmental Planning and Assessment Act, 1979, (EP&A Act) as amended by the Threatened Species Conservation Act, 1995 (TSC Act).

The following assessment addresses the twelve threatened species recorded, or considered to have a moderate to high likelihood of occurrence, in the immediate environs of Salamander landfill site, being the wetland habitats in the landfill site and the adjoining open forest.

Threatened fauna species are assessed in groups with similar ecological requirements, as indicated in Table 5.6.

- i) *In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

For the purposes of this assessment, a 'local population' is defined as the population which occurs within the study area. A 'viable' local population is that which has the capacity to live, develop and reproduce under normal conditions.

☐ Hollow-dependent birds

Neither the powerful owl nor the masked owl were recorded during the field survey but are considered likely to occur, based on habitat suitability and records in the Tomaree peninsula.

The powerful owl and masked owl are dependent on mature trees with large hollows for roost and/or nest sites (Hollands, 1991; Debus and Chafer, 1994). These species are sensitive to a reduction in prey species associated with clearance of habitat. Both species have large foraging territories and the proposed development is unlikely to impact upon the species' foraging resources.

No evidence of nesting or roosting sites was found during the survey. Felling of hollow-bearing trees will not be required therefore, construction of the proposed waste transfer station is not likely to disrupt the life cycle of the powerful owl or masked owl species such that a local population will be placed at risk of extinction.

☐ Other birds

The habitat requirements of the osprey are a brackish or salty water body possessing a sufficient supply of fish and possible nest sites (Clancy, 1991). Nest sites are sited

in a tall tree, usually dead, located in exposed positions to provide easy access and good visibility (Clancy, 1991). The birds generally return to the same nesting site in subsequent years. A nesting pair were observed at Tanilba Bay in 1997 (HBOC, 1998). The osprey is likely to feed over Cromartys Bay and may select a nesting site in the environs of the Salamander landfill site. No nesting trees were identified in the area.

Construction of the proposed waste transfer station is not expected to impact on the fish population of Cromartys Bay and will not require felling of any trees. It is not likely to disrupt the life cycle of the osprey such that a local population will be placed at risk of extinction.

The pied oystercatcher may frequent the estuarine wetland and mudflat adjacent to the Salamander landfill site based on suitable habitat and records in the local area at Tanilba Bay and Bulls Island between Lemon Tree Passage and Taylors Beach. They may nest in the saltmarsh, however they typically nest near the high tide mark on coastal or estuarine beaches (Smith, 1991).

The proposed waste transfer station will not require the removal of any estuarine wetland habitat. Further the waste transfer station is not expected to add to the existing leachate drainage to the estuarine wetland as waste will be contained within the facility and removed from the site. It is considered that the proposed waste transfer station is unlikely to disrupt the life cycle of the pied oystercatcher such that any local population will be placed at risk of extinction, as suitable habitat identified within the study area will not be removed or modified.

□ Cave-roosting bats

The little bent-wing bat has been recorded in open forest near the Salamander landfill site. The little bent-wing bat is an insectivorous species which forages under the forest canopy. It is dependent on caves, old mines, stormwater channels or similar structures for the provision of sites winter hibernation and summer maternity roost sites (Dwyer, 1995). No roost sites were identified in the study area or are likely to occur, however a roost site has been recorded on Yacaaba headland (Ecotone Ecological Consultants, 1995a), hence the species uses the study area as part of a large home range. Forested habitat adjoining the landfill site will not require clearing, hence the proposed development is not likely to disrupt the life cycle of the species such that a local population will be placed at risk of extinction.

□ Hollow-dependent mammals

The brush-tailed phascogale, spotted-tailed quoll and eastern freetail-bat have not been recorded in the study area, but are considered likely to occur based on habitat suitability and local records. The squirrel glider and greater broad-nosed bat have

been recorded in open forest near the Salamander landfill site (ERM Resource Planning, 1995b). Both species are likely to roost in tree hollows and/or forage within the open forest to the south of the Salamander landfill site. Both species are also likely to forage along the southern drain in the landfill site.

The squirrel glider is an arboreal mammal dependent on mature trees with hollows for den sites, foraging on plant exudates and arthropods in open forest and woodland communities. The plant communities in which the species is typically found are characterised by gum-barked and winter flowering trees and *Acacia* species (Menkhorst *et al*, 1988). The squirrel glider is expected to forage on the swamp mahogany and *Melaleuca quinquenervia* which are winter flowering species. The study area provides several potential den sites, particularly within the open forest to the south of the landfill site.

The brush-tailed phascogale is largely arboreal, occupying a variety of habitats, however its preferred habitat is open dry sclerophyll forest with little ground cover, on ridges up to 600 metres altitude (Cuttle, 1983). The species nests in tree hollows with narrow entrances. Their diet consists mainly of arthropods, such as spiders and centipedes, as well as small invertebrates (Cuttle, 1983). The species will also forage on the ground and eucalypt nectar is extensively utilised when trees are flowering (Traill and Coates, 1993). The study area contains suitable foraging habitat, as well as several potential den sites, particularly within open forest to the south and east of the landfill site.

The spotted-tailed quoll typically occurs in open forest where it will spend much of its time hunting arboreally and terrestrially (Jones, 1996). The species inhabits a wide range of habitats including rainforest, open forest, woodland, coastal heath and inland riparian forest (Edgar and Belcher, 1995). The spotted-tailed quoll utilises various den sites including caves, rock crevices and hollow logs (Edgar and Belcher, 1995). The study area contains suitable foraging habitat, as well as several potential den sites, particularly within open forest to the south and east of the landfill site.

Little is known of the biology of the eastern freetail-bat. Most records have been in dry eucalypt forest and woodland east of the Great Dividing Range (Allison and Hoyer, 1995). The species roosts either singly or in small colonies in tree hollows and crevices, under loose bark, in caves and buildings. It was tentatively identified in dry forest in the Salamander Bay area (Gunninah Consultants, 1995) and may occur in open forest to the south and east of the Salamander landfill site.

The greater broad-nosed bat utilises tree hollows and the roof spaces of old buildings as sites for diurnal roosting, winter hibernation and summer maternity (Hoyer and Richards, 1995). Creeks and small rivers are favoured corridors for the greater broad-nosed bat where it hawks back and forth for its prey (Hoyer and Richards, 1995). This bat is a large species requiring a greater feeding range than

other insectivorous bat species. Little is known of its reproductive cycle other than a single young is born in January (Hoye and Richards, 1995). The greater broad-nosed bat has been recorded to the east of the landfill site (ERM Resource Planning, 1995b) and is expected to forage along the southern drain and may forage on insects in the open.

If roosting/sheltering/nesting sites for the above hollow-dependent species do occur within the study area, the life cycle of the species concerned is unlikely to be disrupted such that a local viable population is likely to be placed at risk of extinction, as hollow-bearing trees will not be removed and foraging resources will not be reduced.

□ Koala

Although not observed directly or indirectly within the study area, the koala is considered likely to occur, based on the high number of records for the local area and the availability of suitable foraging resource. In addition, Phillips *et al* (1996) report several active and inactive koala sites in the Taylors Beach/Salamander Bay area. Potential koala habitat was identified along the southern drain and open forest on the southern boundary and to the east of the study area. Prime koala habitat, as mapped by Callaghan *et al.* (1994) adjoins the southern boundary of the landfill site.

The southern boundary drain is continuous with wetland habitat around Cromartys Bay and would be expected to provide a corridor for the movement of koalas in the local area between Salamander Bay and the Taylors Beach area.

The koala is typically a solitary animal, moving infrequently and living in a small area or group of trees within the available habitat for long periods of time (Mitchell, 1990). Estimates of home ranges in Victoria are 1.7 hectares for males and 1.18 hectares for females with extensive overlap (Mitchell, 1990). They typically occur in low densities and a breeding population may consist of as few as 5 or 6 individuals (Callaghan *et al*, 1994).

The proposed waste transfer station does not require the removal of any foraging resource for the koala and is considered unlikely to disrupt the life cycle of the koala such that a local population will be placed at risk of extinction, as suitable habitat identified within the study area will not be removed or modified.

□ Wallum Froglet

The wallum froglet is confined to acid paperbark swamps of the wallum country (Cogger, 1992). Habitat includes coastal wallum sedgeland, wet heathland and swamp forest. The species breeds in late winter and calls from late winter to mid spring from the base of vegetation, especially sedges (Ferrier *et al.*, undated).

The wallum froglet was not recorded in the study area however suitable habitat is available in the environs along the southern boundary of the landfill site. If a local population of this species does exist, the proposed development is unlikely to disrupt life cycle of the species that a local viable population is likely to be placed at risk of extinction, as suitable habitat identified within the study area will not be removed or modified.

- ii) *In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the population is likely to be significantly compromised.*

No endangered population currently listed on the TSC Act, 1995 was recorded, or is considered likely to occur, within the study area.

- iii) *In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.*

No part of the remnant native vegetation currently within the Salamander Bay landfill site and environs will be modified or removed for the proposed waste transfer station.

Within the Port Stephens area, similar open forest habitat to that which occurs within the study area is in private ownership, recreational spaces or reserves. The long term security of these areas of habitat is not assured. Reserves such as Tomaree National Park (NP) contain minimal areas of similar habitat.

Estuarine habitat is poorly reserved in the Port Stephens area and on a broader regional scale, they are represented in Kooragang Island Nature Reserve and to a lesser degree at Hexham Swamp Nature Reserve and Myall Lakes NP. Estuarine and other coastal wetlands in Port Stephens are afforded some protection by SEPP 14. Swamp forest habitat is represented in Myall Lakes and Tomaree national parks.

On a broader regional scale, the Port Stephens area falls within the overlap of two biogeographic regions being the New South Wales north coast and the Sydney Basin. The New South Wales north coast biogeographic region extends from approximately Port Stephens to the Queensland border. Five to ten per cent of the region is reserved (Thackway and Cresswell, 1995). The Sydney Basin biogeographic region extends from the Hunter River to south of Sydney with greater than ten per cent of the region reserved (Thackway and Cresswell, 1995). Significant areas of habitat similar to those within the study area occur in local and regional conservation reserves including Myall Lakes NP, Tomaree NP, Limeburners Creek Nature Reserve (NR), Booti Booti NP, Lake Innes NR, Yuraygir NP, Broadwater NP, Glenrock State Recreation Area (SRA) and Munmorah SRA.

- iv) *Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community.*

The Salamander Bay landfill site, adjoining residential and light industrial developments already present barriers to wildlife movement in the local area. As the proposed waste transfer station will not require the removal of native vegetation, it is unlikely that currently interconnecting or proximate areas of habitat for threatened species will become further isolated by the development. The corridor of vegetation along the southern boundary of the landfill site will not be disturbed.

- v) *Whether critical habitat will be affected.*

At present, no register of critical habitat is maintained by the Director-General of the National Parks and Wildlife Service.

- vi) *Whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region.*

Within the Hunter region, several conservation reserves (such as national parks and nature reserves) and other areas which offer a certain degree of protection (such as state forests) contain known or potential habitat for those species known from, or considered likely to occur in, the study area. These areas include Myall Lakes NP, Tomaree NP, Booti Booti NP, Wallaroo SF, Karuah SF, Medowie SF, Bulahdelah SF, Myall River SF, Bachelor SF, Wallingat SF, Nerong SF, Glenrock SRA, Munmorah SRA and Kooragang Island NR.

While habitats are available in the conservation reserves and individuals have been recorded in reserves, the adequacy of representation of the species in the conservation reserves is generally unknown.

□ Hollow dependent birds

On the lower north coast, the powerful owl has been recorded from Myall Lakes NP, Bulahdelah SF (ERM Mitchell McCotter, 1997a; SFNSW, 1996), the Myall Lakes and Forster areas (Recher, 1975), near Hallidays Point (T. Peake, pers. obs., 1996), Wallaroo SF (NSW Atlas of Wildlife; SFNSW, 1996), Karuah SF (NSW Wildlife Atlas) Wallingat SF, Bulahdelah SF, and Myall River SF, as well as private property adjacent to Craven and Karuah SFs (SFNSW, 1996). In the Hunter Valley, the species has been recorded from Mount Royal State Forest (Shields *et al.*, 1992), the ranges west of Wybong, and Cedar Brush NR (HBOC, 1995). Individuals have also been recorded in public reserves and national park estates in the Newcastle area.

The masked owl has been recorded in Myall River SF, Wallingat SF (SFNSW, 1996) and Bulahdelah SF (ERM Mitchell McCotter, 1997a).

□ Other birds

The osprey has been recorded in Tomaree NP and would be expected to occur in coastal national parks on the north coast of New South Wales.

The pied oystercatcher has been recorded in Myall Lakes NP and would be expected to occur in coastal national parks providing estuarine habitat.

□ Cave-roosting bats

The little bent-wing bat has been recorded in Bulahdelah SF (ERM Mitchell McCotter, 1997b; SFNSW, 1996), as well as Bachelor SF, Wallaroo SF, Myall River SF, Nerong SF and Wallingat SF (SFNSW, 1996) and Myall Lakes NP. Roost sites are known from Bulahdelah Mountain, compartment 121 in Wang Wauk SF, Yacaaba headland and Balickera Tunnel near Wallaroo SF (SFNSW, 1996).

□ Hollow-dependent mammals

The brush-tailed phascogale has been recorded in Nerong State Forest, and is expected to occur within forests throughout the Bulahdelah Management Area (SFNSW, 1996).

The squirrel glider has been recorded in Myall River SF, Bulahdelah SF (ERM Mitchell McCotter, 1997b) Limeburners Creek NR near Port Macquarie (Quin, 1995), and Barrington Tops NP (Adam, 1987).

The spotted-tailed quoll has been recorded in Bulahdelah SF (SFNSW, 1996; NPWS Wildlife Atlas), Myall River SF, Craven SF, Nerong SF, Wang Wauk, Wallaroo SF, Medowie SF, Wallingat SF (SFNSW, 1996) and Myall Lakes NP.

Regional records for the greater broad-nosed bat are sparse. Known records in reserves include Barrington Tops NP (Adam, 1987) and Mount Royal SF (Shields *et al*, 1992).

Regional records for the eastern freetail-bat are sparse and include Barrington Tops NP (Adam, 1987), Barrington Tops SF, Stewarts Brook SF (AMBS, 1995) and Bulahdelah SF.

□ Koala

Conservation reserves within the Port Stephens area which contain either potential or core koala habitat include Tomaree NP, Moffats Swamp NR and Seaham Swamp

NR. However, the koala does not appear to be adequately represented in such reserves, as the area of conserved koala habitat is considered by Callaghan *et al* (1994) to be too small and too fragmented on its own to conserve the koala population of Port Stephens.

Regional conservation reserves outside of Port Stephens from which the koala has been recorded include Wallingat SF, Bachelor SF, Sugar Creek Flora Reserve (FR), and O'Sullivan's Gap FR (SWC, 1994), as well as Pokolbin SF, Heaton SF, Olney SF, Corrabare SF, Wyong SF and Watagan SF (Ecotone Ecological Consultants, 1995b). NPWS Atlas of Wildlife records also indicate sightings in Yengo NP and Dharug NP (SFNSW, 1995).

□ Wallum froglet

The wallum froglet is confined to acid paperbark swamps of the wallum country (Cogger, 1992) where they utilise a wide range of habitats. Within New South Wales, swamp forest dominated by broad-leaved paperbark (*Melaleuca quinquenervia*) are adequately conserved (Benson, 1989). Large tracts of this community are represented in Myall Lakes NP. Other regional conservation reserves containing potential habitat for the Wallum Froglet include Yuraygir NP, Limeburners Creek NR, Crowdy Bay NP, Broadwater NP. The species has been recorded near Lake Innes NR (AMBS, 1996) on the north coast, in Myall Lakes NP, Tomaree NP, Moffats Swamp NR and Awabakal NR.

vii) *Whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process.*

At present, the only key threatening process listed on Schedule 3 of the TSC Act is predation by the fox (*Vulpes vulpes*). The proposed waste transfer station should reduce scavenging in the landfill site with cessation of refuse dumping at the tip face and containment of waste within the waste transfer station.

Processes that are generally recognised as being detrimental, such as habitat clearance or modification, will not result from establishment of the waste transfer station on the existing landfill site. Furthermore, the proposed development may reduce weed dispersal currently resulting from the dumping of garden waste, by containing waste within the waste transfer station.

viii) *Whether any threatened species or ecological community is at the limit of its known distribution.*

□ Powerful Owl

The powerful owl occurs in south-eastern Australia on the coastal side of the ranges from south-west Victoria to Yeppoon, Queensland, extending west to the Pilliga scrub (Garnett, 1992).

□ Masked Owl

The masked owl (*Tyto novaehollandiae*) typically occurs in forest and woodland in a broad coastal strip around southern Australia from Cooktown to Pilbara, Western Australia (Garnett, 1992). In New South Wales, the species is generally confined to the coastal side of the Dividing Range, but is also recorded inland along rivers from the Victorian to Queensland border (Garnett, 1992).

□ Osprey

The osprey occurs along the New South Wales north coast south to Wonboyn Lakes however numbers decline in the south of the range and breeding records are largely north of Lake Macquarie (Marchant and Higgins, 1993).

□ Pied Oystercatcher

The pied oystercatcher is found around the entire Australian coast (Smith, 1991), except where coastal cliffs are present (Blakers *et al*, 1984). In New South Wales they are generally absent from the Sydney region (Smith, 1991).

□ Little Bent-wing Bat

The little bent-wing bat occurs in the coastal ranges of eastern Australia from the central coast of New South Wales to Cape York in Queensland (Kennedy, 1990), hence a local population would be near the southern limit of the species' known distribution.

□ Squirrel Glider

The squirrel glider occurs along the eastern coast of Australia from eastern South Australia to Cairns in northern Queensland (Klippel, 1992). In New South Wales, the species is patchily distributed along the Great Dividing Range, inland to the Pilliga and Coonabarabran, and along the coastal region from south of Sydney to the Queensland border (Austeco, 1994).

□ Brush-tailed Phascogale

The brush-tailed phascogale is patchily distributed around the Australian coast in areas with a rainfall exceeding 500 millimetres (Cuttle, 1982).

□ Spotted-tailed quoll

The spotted-tailed quoll is present in Tasmania and occurs throughout eastern Australia from Maryborough in Queensland to Portland in Victoria (Klippel, 1992). The species is largely disjunct over its present range (Edgar and Belcher, 1995). The species' range approximates areas that receive a mean annual rainfall greater than 600 millimetres, with higher densities being present in Tasmania and north-eastern New South Wales (Mansergh, 1983). In New South Wales the species is widespread along the coast and ranges from the Victorian to the Queensland border. The New England Tablelands provides a refuge area for the species, harbouring higher population densities than elsewhere in the state (Mansergh, 1983).

□ Eastern Free-tail Bat

A local population of the eastern freetail-bat would not be at the limit of its known distribution, which extends along the coast, east of the Great Dividing Range from Sydney to Maryborough in Queensland (Klippel, 1992)

□ Greater Broad-nosed Bat

A local population of the greater broad-nosed bat would not be at the limit of its known distribution, which extends along the coast from Maryborough in Queensland to Orbost in Victoria (Klippel, 1992).

□ Koala

The koala occurs in a scattered distribution along the east coast of Australia and inland areas from Eyre Peninsula to Townsville (Klippel, 1992). In New South Wales, the species occurs principally on the central and north coast, coastal ranges and adjacent slopes with scattered records on the north-west plains and south coast (Reed *et al*, 1990).

□ Wallum Froglet

The wallum froglet is distributed along coastal regions from Fraser Island in south-east Queensland through to Newcastle, New South Wales (Klippel, 1992). A local population of the species would therefore be at the southern limit of its known distribution.

5.7.9 Summary

The proposed waste transfer station will not require the clearance or modification of any natural vegetation or habitats. The development is unlikely to significant impact upon a species, population or ecological community currently listed on the TSC Act. It is therefore considered that a Species Impact Statement is not required for the proposed development.

The proposed waste transfer station will not add to the existing leachate seepage into the adjacent wetland. This combined with containment and removal of waste should in the long term enhance the natural environment by decreasing weed dispersal, scavenging and littering of adjoining habitats.

5.8 NOISE

5.8.1 Methodology

The following methods were used to quantify noise levels at the closest residences due to operation of the proposed waste transfer station:

- ❑ continuous noise logging;
- ❑ modelling of noise emissions from construction activities and site operations; and
- ❑ assessment of noise impact associated with increased traffic movements.

i. Continuous Noise Monitoring

Noise levels were measured at the nearest residence using a noise data logger. These results allow criteria limits for noise emissions to be set in accordance with EPA guidelines.

The following equipment was used to measure and log environmental noise levels:

- ❑ ARL EL215 noise data logger (serial number 194529); and
- ❑ Bruel and Kjaer Type 4230 sound level calibrator (serial number 1441415).

ii. Modelling

a. Construction and site operations

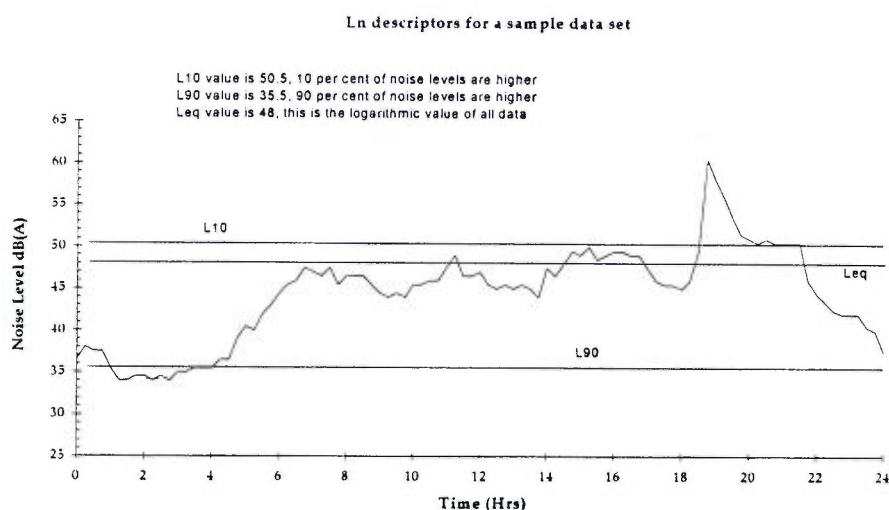
Noise levels from construction and operation of the waste transfer station were calculated using the NSW EPA approved Environmental Noise Model (ENM). This model takes account of noise attenuation due to distance, atmospheric absorption, barriers and the 'ground effect'.

b. Road Traffic Noise

As minimal change to existing traffic volumes occurs (see Section 3.9) a general discussion as to the likely change in traffic noise is provided.

iii. Statistical Descriptors

Environmental noise levels vary with time, therefore statistical descriptors are required to adequately characterise the noise environment. The L_{10} noise level is the level exceeded for 10 per cent of the time, and is approximately equivalent to the average of maximum noise levels. The L_{90} level is the level exceeded for 90 per cent of the time, and is approximately the average of minimum noise levels. The L_{90} level is often referred to as the 'background' noise level. The L_{eq} level represents the average noise energy during a measurement period.



5.8.2 Noise and Vibration Criteria

i. Construction

a. Construction Noise Criteria

The recommended noise criteria for construction operations are defined in the EPA Environmental Noise Control Manual (1994) and are listed below:

- ☐ for construction periods of four weeks and under, the L_{10} noise level due to the construction site should not exceed the existing L_{90} background noise level by more than 20 dB;
- ☐ for construction periods of between four and 26 weeks, the L_{10} noise level due to the construction site should not exceed the existing L_{90} background noise level by more than 10 dB; and
- ☐ for construction periods greater than 26 weeks, the criteria for a continuously operating source would apply, which would generally mean that the L_{10} noise level due to the construction site should not exceed the existing L_{90} background noise level by more than 5 dB.

In addition, the manual recommends that where noise is audible at residential premises, construction should be limited to the following times:

- ☐ Monday to Friday, 7.00 am to 6.00 pm;
- ☐ Saturday, 8:00 am to 1:00 pm; and
- ☐ no construction work to take place on Sunday and public holidays.

It is assumed that these conditions apply to residential receptors only.

b. Construction Vibration Criteria

Chapter 174 of the EPA Environmental Noise Control Manual (1994) provides vibration limits in buildings resulting from construction activities. Base limits relate to Z axis accelerations (rms) over a range of frequencies. These base limits are adjusted via a multiplying factor relative to the time period during which vibrations are occurring, the nature of vibration (continuous, intermittent or impulsive) and the receptor buildings use.

The Z axis base acceleration levels are as shown in *Table 5.7*.

Table 5.7 BASE ACCELERATION LEVELS

Frequency (Hz)	Acceleration Level (rms) m/s ²
1	1.00×10^{-2}
1.25	8.90×10^{-3}
1.6	8.00×10^{-3}
2.00	7.00×10^{-3}
2.50	6.30×10^{-3}
3.15	5.70×10^{-3}
4.00	5.00×10^{-3}
5.00	5.00×10^{-3}
6.30	5.00×10^{-3}
8.00	5.00×10^{-3}
10.00	6.25×10^{-3}
12.50	7.81×10^{-3}
16.00	1.00×10^{-2}
20.00	1.25×10^{-2}
25.00	1.56×10^{-2}
31.50	1.97×10^{-2}
40.00	2.50×10^{-2}
50.00	3.13×10^{-2}
63.00	3.94×10^{-2}
80.00	5.00×10^{-2}

Vibration multiplying factors are provided in *Table 5.8*.

Table 5.8 VIBRATION MULTIPLYING FACTORS

Place	Time	Continuous vibration	Intermittent or Impulsive
Critical areas	Day	1	1
	Night	1	1
Residential	Day	2	60
	Night	1.4	20
Office	Day	4	128
	Night	4	128
Workshops	Day	8	128
	Night	8	128

Notes: 1. Critical working areas are hospital operating theatres, precision laboratories etc..

2. Daytime is between 7 am and 10 pm and night time is between 10 pm and 7 am.

Vibrations levels appropriate for buildings in proximity to construction need to be determined on an individual basis using the information provided in *Table 5.7* and *Table 5.8*.

The EPA recommend that acceleration levels of vibrations generated on construction sites should be less than those listed under 'intermittent or impulsive' vibrations. They also recommend where measured acceleration levels exceed those permitted for 'continuous' vibration, then the following time restrictions be imposed;

- ☐ 7 am to 6 pm Monday to Friday;
- ☐ 7 am to 1 pm Saturdays; and
- ☐ none on Sundays or public holidays.

They further state that *if construction site vibration is not perceptible or within 'continuous' vibration limits, no time restriction should apply.*

ii. Waste Transfer Station Operations

In July this year the EPA 'Draft Stationary Noise Source Policy' (draft policy) was released. Although only a draft at this time, it is assumed the document reflects EPA philosophy on procedures for assessment of industrial noise. It is likely that the final policy will be very similar to the draft and the policy's intent will remain

unchanged. To ensure currency, the draft policy has been adopted for assessment of the project.

The draft policy covers the assessment of noise from "*stationary (industrial) sources*", through the establishment of noise criteria. The sources covered are described as "*essentially industrial sources that operate in a particular location*", and explicitly include mobile plant and equipment, including vehicles, which are within the property boundary of industrial premises or extractive industries.

Two basic forms of noise criterion are used in the Draft Policy - an 'intrusiveness criterion' and an 'amenity criterion'. For noise impacts to be considered acceptable, both must be met. An 'amenity criterion' and 'intrusiveness criterion' are applicable under the *Draft Stationary Noise Source Policy*, with the more stringent of the two being the controlling condition. The 'intrusiveness criterion' is based on the traditional "background + 5 dB" concept, and is in practice similar to previous criteria. The 'amenity criterion' is based on a maximum L_{eq} noise level from *all* stationary sources, which depends on the type of receiver and, for residences, the type of area (rural, suburban or urban).

The importance of the 'amenity criterion' would be in assessment of the cumulative impact of a proposal in conjunction with other proposed or already-existing industrial noise.

Where background noise levels are high, for example due to traffic noise, the amenity criterion is generally the determining factor. The relevant amenity criteria are shown in *Table 5.9*.

Table 5.9 AMENITY CRITERIA FOR STATIONARY NOISE SOURCES

Type of Receiver	Area	Time of Day	Recommended Maximum L_{Aeq} Noise Level, dB(A)
Industrial premises	All	When in use	70
	Suburban	Day	55
		Evening	45
		Night	40
Active recreation area (e.g. school playground, golf course)	All	When in use	55

Notes: 1. Source: Table 2.1 Draft Stationary Noise Source Policy.

2. Day: 7:00 to 18:00 ~ Evening: 18:00 to 22:00 ~ Night: 22:00 to 7:00.

iii. Transport

In this assessment, it is considered appropriate that traffic noise issues be related to criteria in the EPA's *Draft Environmental Criteria for Road Traffic Noise* document.

Traffic noise criteria are defined in relation to the type of development and land use type of the receiver. As a new development application is being lodged for the waste transfer station the most relevant criteria are those for new land use developments with potential to create additional traffic on local roads. Table 5.10 shows the relevant criteria.

It should be noted that the site has been in operation as a landfill since 1975. The change of use to a waste transfer station is essentially a continuation of use in regard to traffic movements.

Table 5.10 EPA TRAFFIC NOISE CRITERIA

Type of Development	Criteria		
	Day dB(A)	Night dB(A)	Where Criteria already exceeded
New land use developments with potential to create additional traffic on local roads	$L_{eq}(1hr)^{55}$	$L_{eq}(1hr)^{50}$	Where feasible, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads, times of use, use of clustering, use of 'quiet' vehicles, and use of barriers and acoustic treatments. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB.
New land use developments with potential to create additional traffic on existing freeways/arterials	$L_{eq}(15hr)^{60}$	$L_{eq}(9hr)^{55}$	Where feasible, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads, times of use, use of clustering, use of 'quiet' vehicles, and use of barriers and acoustic treatments. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB.
New residential developments affected by traffic noise from local roads	$L_{eq}(1hr)^{55}$	$L_{eq}(1hr)^{55}$	Where feasible, existing noise levels should be mitigated to meet the noise criteria for occupants via judicious design and construction of the development. Relevant strategies will include building locations on site, internal layouts, building materials and construction techniques

Notes: 1. Source: Table 1 - Draft Environmental Criteria for Road Traffic Noise

5.8.3 Results

i. Continuous Noise Monitoring And Derived Criteria

a. Background Noise Levels

Noise levels were measured at 362 Soldiers Point Road for the period 25 September to 2 October inclusive using a noise data logger. Data was logged at 15 minute intervals with statistical parameters calculated including L_{eq} , L_1 , L_{10} , L_{90} , L_{99} , L_{max} and L_{min} .

Rating background level (RBL) was calculated from the logged data generally as per the draft policy. RBL represents the lowest repeatable background noise level for the area and is used in deriving 'intrusiveness criteria'. Results of background noise measurements are shown in Table 5.11. Graphs of measured noise levels are provided in Appendix B.

Table 5.11 BACKGROUND NOISE LEVELS

Location	Time	RBL * dB(A)
362 Soldiers Point Road	Day	41
	Evening	41
	Night	32

Notes: 1. Day: 7:00 to 18:00 ~ Evening: 18:00 to 22:00 ~ Night: 22:00 to 7:00.

* Rating Background Level

b. Construction Noise Criterion

The duration of construction activities at the site have been estimated as 20 weeks (GHD, 1998) which allows a background plus 10 dB limit. Therefore the appropriate construction L_{10} noise criterion is 51 dB(A) for the nearest residences.

Although not stated in the policy it is assumed the construction noise criteria are applicable for residences only.

c. Construction Vibration Criteria

Industrial buildings are nearest to the site. They are located approximately 50 metres from the nearest part of the transfer station site. This is where green waste,

car bodies, car batteries and white goods will be stored. Some vibratory rolling may be required for construction of the pad. The limits for an industrial site exposed to continuous vibrations are eight times the base acceleration values. Vibration limits and conditions should not be exceeded by construction of the pad given this multiplication factor and the distance to site.

Residential receptors are over 500 metres from the site and due to this distance the EPA vibration limits and conditions should not be exceeded by construction of the proposed waste transfer station. However, the access road is only approximately 60 metres from the nearest residential dwelling and vibration monitoring may be required during construction of that road section.

d. Operational Noise Criterion

The residential areas around the waste transfer station are classified as suburban as per the draft policy:

Suburban – an area defined as rural, rural-residential or residential on an LEP that has local traffic with characteristically intermittent traffic flows or with some commerce or industry. This area often has the following characteristics:

- decreasing noise levels in the evening period (1800 – 2200); and/or
- evening ambient noise levels defined by the natural environment and infrequent human activity.

Table 5.12 CRITERIA BASED ON SUBURBAN RECEPTOR CLASSIFICATION

Period	"Intrusiveness" Noise Criterion, L10 dB(A)	"Amenity" Noise Criterion, Leq dB(A)	Limiting Criterion
Day	46	55	Intrusiveness
Evening	46	45	Intrusiveness
Night	37	40	Intrusiveness

Notes: 1. Day: 7:00 to 18:00 ~ Evening: 18:00 to 22:00 ~ Night: 22:00 to 7:00.
2. Night time intrusiveness criterion based on the minimum background level of 30 dB(A) as per EPA policy

When identifying the limiting criterion it is important to note that different descriptors apply for intrusiveness and amenity. For the purpose of comparing L₁₀

and L_{eq} descriptors a relationship between the two must be established. It is assumed that the waste transfer station's L_{10} is approximately 9 dB higher than its L_{eq} emission due to significant periods of inactivity. This relationship was noted during attended monitoring of an industrial site having sporadic noise generation characteristics.

With amenity limits for suburban areas and the L_{10} and L_{eq} level relationships identified, the intrusiveness criteria become the limiting criteria in this case as shown in *Table 5.12*. As operating hours are within EPA daytime hours an L_{10} criterion limit of 46 dB(A) at the nearest residences applies to activities on the site.

Although not stated in the policy it is assumed that the amenity criterion for the nearby industrial area is applicable regardless of measured background, ie. an L_{eq} limit of 70 dB(A).

e. Traffic Criterion

The appropriate traffic noise limit for Soldiers Point Road is an $L_{eq(1hr)}$ of 55 dB(A). If existing traffic noise levels are above this then any increase must be limited to 2 dB. These limits are in accordance with the EPA draft transport policy. However, these limits are not specifically addressed in this assessment. Traffic volume changes associated with the proposal are so minor they become insignificant in terms of change to traffic noise level.

ii. Predicted Impacts

a. Construction Noise

This sections details noise modelling of construction activities to quantify expected noise levels at the nearest noise sensitive receptors. These calculations have been conducted by:

- determining the sound power level (SWL) of construction plant;
- entering site topography data into the model; and
- modelling the received noise level at the nearest receptors.

Only earthworks for the waste transfer station and access road construction activities are expected to generate significant noise. Results have been provided separately for these activities and for combined construction activity.

Noise levels have been calculated using atmospheric parameters of:

- 10 degrees Celsius; and
- 70 per cent relative humidity.

Plant sound power levels (SWL) were sourced from our library of technical data and are as shown in *Table 5.13* and *Table 5.14*.

Table 5.13 WASTE TRANSFER STATION CONSTRUCTION PLANT

Item	Maximum SWL dB(A)
Dozer	112
Truck	109

Table 5.14 ACCESS ROAD CONSTRUCTION PLANT

Item	Maximum SWL dB(A)
Grader	114
Vibrating roller (2)	112
Truck	109

Results obtained are as shown in *Table 5.15*.

Table 5.15 CALCULATED CONSTRUCTION NOISE LEVELS

Receptor	Waste Transfer Station L ₁₀	Access Road L ₁₀	Combined L ₁₀	Exceedance
Soldiers Point Road	37	63	63	12

Notes: 1. All values are dB(A).

b. Waste Transfer Station Noise

Noise levels at the nearest noise sensitive receptors as a result of site operations have been calculated using the same methodology as for construction activity noise. These results identify the need or otherwise for noise control.

Noise generating activities on site are:

- green waste shredding;

- ❑ dumping of recyclables into bins;
- ❑ dumping MSW inside the transfer station;
- ❑ handling of MSW within the transfer station by FEL; and
- ❑ truck movements on site associated with delivery and removal of waste.

A worst case operating scenario has been modelled to calculate maximum noise levels. As noise generation on site would typically be sporadic, L₁₀ noise levels have been assumed to result from truck movements.

The worst case scenario as modelled is simultaneous dumping of recyclables into bins (by one truck), handling of MSW inside the transfer station and one truck at full power in proximity to the recycling bins. Green waste shredding occurs irregularly and has not been included in this assessment.

Variations in received noise level can occur due to the range of atmospheric conditions typical for the site. The EPA consider this a significant problem if 'inversion conditions are predicted for at least 15% (or approximately 2 nights per week) of the total time in winter' and/or 'wind blows from source to receiver at speeds up to 3 m/s for more than 15% of the time in any season'. However, the EPA also state that 'as temperature inversions are usually prominent during night-time hours there is no need to consider their effects for a development that does not operate at night'.

Wind roses reveal that wind from source to receiver occurs as per Table 5.16.

Table 5.16 PERCENTAGE OF WINDS LESS THAN 3 METRES PER SECOND

Source to Receptor direction	Summer	Autumn	Winter	Spring
South east (Soldiers Point Road)	13/AM	17/AM	14/AM	15/AM

Notes: 1. Data is presented in the form of percentage/time of day.

Noise levels have been calculated using the same atmospheric parameters as for construction activity modelling and with the addition of 3 metres per second wind from source to receptor (as required from wind rose analysis).

Plant sound power levels (SWL) were sourced from our library of technical data and are as shown in Table 5.17.

Table 5.17 OPERATIONAL NOISE SOURCES

Item	Maximum SWL dB(A)
CAT 953B*	108
Truck dumping	109
Truck movement	109

Results obtained are as shown in Table 5.18.

Table 5.18 CALCULATED OPERATIONAL NOISE LEVELS, NEUTRAL ATMOSPHERIC CONDITIONS

Receptor	Worst Case L ₁₀	Typical L ₁₀	L ₁₀ Criterion	Typical Exceedance
Soldiers Point Road	38	34	46	NIL
	Worst Case Leq	Typical Leq	Leq Criterion	Typical Exceedance
Industrial Area	50	46	70	NIL

Notes: 1. All values are dB(A).

Table 5.19 CALCULATED OPERATIONAL NOISE LEVELS, DOWNWIND CONDITIONS

Receptor	Worst Case L ₁₀	Typical L ₁₀	L ₁₀ Criterion	Typical Exceedance
Soldiers Point Road	44	41	46	NIL

Notes: 1. All values are dB(A).

c. Traffic Noise

Traffic generated from the site will be generally as per current movements associated with it's use as a landfill. The only change will be an additional truck trip per day, this equates to two truck movements along Soldiers Point Road.

The current weekday traffic movement along Soldiers Point Road is 7379 vehicles per day. An increase in traffic of two movements is negligible (ie, an increase in

noise level less than 0.1 dB). Any acoustic change would not be noticeable and would be much less than daily variations in traffic flow.

5.8.4 Discussion

i. Construction

A 12 dB exceedance is predicted for construction noise. However, this is only applicable for road construction at the site entrance. Noise levels from construction of the site facilities are predicted to be well below the relevant limit.

ii. Operation

No exceedance of relevant limits are predicted for operational noise.

iii. Traffic

Traffic noise increase is negligible and much less than the daily variations in noise level which would normally occur.

5.9 ROADS AND TRAFFIC

5.9.1 Existing Traffic Conditions

i. Road Network

The landfill is south west of, and with access from, Soldiers Point Road. The road network in the vicinity is made up of Soldiers Point Road, Muller Street (100 metres south of the site) and George Road (400 metres north of the site).

Soldiers Point Road is an arterial road linking Salamander Bay and Soldiers Point. It is a two lane, two-way road which provides access to residential areas south of the site and industrial and commercial premises immediately north. In the residential areas south of the site the road has wide sealed shoulders which allow parking and also serve as a cycle lane. North of the site the shoulders are narrower but the cycle lane is maintained. The speed limit on Soldiers Point Road is 60 kilometres per hour in both directions.

Muller Street and George Road are both local roads providing access to residential areas.

Further south, Port Stephens Drive, Salamander Way and Nelson Bay Road are the significant roads in the regional road network. They are generally constructed to a high standard to carry high traffic volumes and heavy vehicles. Sections of Nelson Bay Road are currently being upgraded to two lanes in each direction to cater for existing and anticipated traffic growth.

ii. Access

Access to the site is from Soldiers Point Road, via a six metre wide combined entry and exit gate. The access gate is set 20 metres from the road. The access driveway is flared to about 15 metres wide at Soldiers Point Road.

iii. Traffic Volumes

Traffic counts were undertaken by Port Stephens Council on Soldiers Point Road south of the site during 1998. A summary of the count results is shown in *Table 5.20*.

Table 5.20 EXISTING TRAFFIC VOLUMES - SOLDIERS POINT ROAD

Parameter	Weekday	% heavy vehicles	Weekend	% heavy vehicles
Southbound				
daily	3,796	7.1	3,071	3.9
am peak hour	341	9.1	346	3.8
	(8:00 - 9:00 am)		(9:00 - 10:00 am)	
pm peak hour	345	5.5	270	3.0
	(2:00 - 3:00 pm)		(12:00 - 1:00 pm)	
Northbound				
daily	3,583	7.2	2,702	3.5
am peak hour	273	9.2	286	2.4
	(9:00 - 10:00 am)		(9:00 - 10:00 am)	
pm peak hour	330	3.3	225	2.7
	(3:00 - 4:00 pm)		(12:00 - 1:00 pm)	
Two way				
daily	7,379	7.2	5,773	3.7
am peak hour	604	9.4	632	3.2
	(8:00 - 9:00 am)		(9:00 - 10:00 am)	
pm peak hour	667	4.9	495	2.8
	(2:00 - 3:00 pm)		(12:00 - 1:00 pm)	

iv. *Site Traffic Generation*

a. *Daily Generation*

Data provided by Port Stephens Council indicates that average vehicle generation of the site is 1,632 vehicles per month (3,264 vehicle trips). The site is currently open Mondays, Wednesdays, Fridays and Sundays, or 17 days per month. This is equivalent to an average of 96 vehicles per day, or 192 trips on the surrounding road network.

The proportion of heavy vehicles in the traffic stream is approximately 25 per cent, or 24 vehicles per day when the site is open.

b. *Hourly Generation*

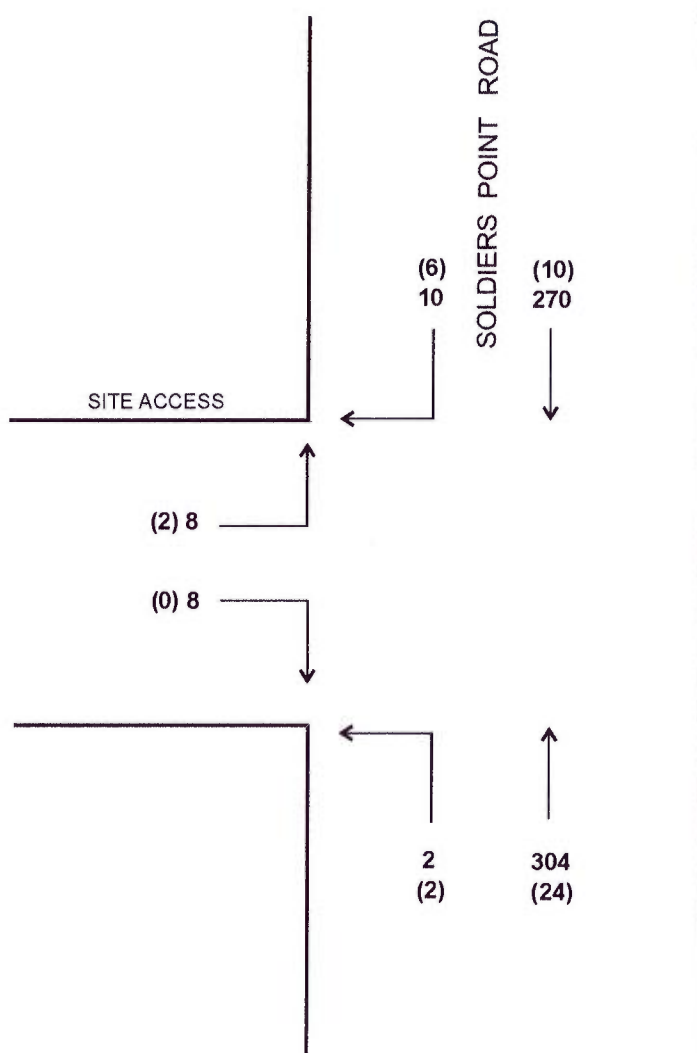
A survey of the existing site traffic generation was undertaken by ERM Mitchell McCotter on Friday 25 September 1998. The results of this survey provide indicative hourly traffic generation figures for the site, which are shown in *Figure 5.3*, and summarised in *Table 5.21*.

Table 5.21 INDICATIVE HOURLY SITE TRAFFIC GENERATION

Vehicle type	In	Out	Total
Cars	12	16	28
Trucks	8	2	10
Total	20	18	38

Table 5.21 shows that the existing site generation is 38 vehicle movements per hour, with arrivals and departures about evenly split. Additionally, the proportion of truck movements in this period was 26 per cent (10 movements out of 38), which is similar to the overall proportion of heavy vehicles which use the site.

An hourly generation of 20 vehicles is equivalent to 21 per cent of the daily traffic generated by the centre. Experience elsewhere suggests that peak hour flows of around 20 per cent of daily generation are not uncommon and it is therefore likely that the period surveyed was close to a peak hour at the centre. Although there may be times when traffic generation is greater than this, it is usual when assessing facilities of this type to design for an 85th percentile period rather than the absolute peak period. It is considered that the period surveyed is likely to be an 85th percentile period.



100 LIGHT VEHICLES
(10) HEAVY VEHICLES

58082FG53:raj/SB.cdr



Figure 5.3

INDICATIVE HOURLY TRAFFIC FLOWS



NOT TO SCALE

v. *Road Network and Intersection Performance*

The capacity of a road network is determined by the link capacity (number of lanes) and the capacity of its intersections. Intersection capacity is often the more critical factor because traffic from different roads competes for the same road space.

a. *Link Capacity*

The link capacity is determined by the number of traffic lanes and the level of interaction between vehicles and roadside activities, for example occasional parking and the number of intersections.

The existing daily traffic flows for Soldiers Point Road are relatively low, and well within the capacity of a high standard, two lane rural road.

The AUSTROADS Guidelines (1988) suggest a peak period mid-block capacity of 600 to 2,000 vehicles per lane per hour, depending on the road environment. The lower end of the range reflects a lane in which there are occasional parked vehicles, while the higher end of the range represents freeway type conditions. Soldiers Point Road is a rural road with no parking on either side in the vicinity of the site. It is estimated that the mid-block capacity of each lane is 1,200 vehicles per hour. *Table 5.22* below shows the link capacity for Soldiers Point Road.

Table 5.22 LINK CAPACITY FOR SOLDIERS POINT ROAD

Location	Number of lanes	Link capacity (vph)	Existing peak traffic flows (vph) ¹	Volume/capacity ratio (%)
North of the site	1	1,200	338	28
South of the site	1	1,200	332	28

Notes: 1. From *Figure 5.3*

Table 5.22 shows that during peak periods, Soldiers Point Road is currently carrying traffic volumes considerably less than its operating capacity.

b. *Intersection Performance*

The operation of the Soldiers Point Road/site access intersection has been analysed using the INTANAL program. INTANAL produces a number of performance measures, including:

- average delay per vehicle; and
- level of service.

The average delay per vehicle is used to estimate the level of service provided by the intersection. For signalised intersections, the average delay for all vehicles is used. For roundabouts, give way and stop signs, the average delay is selected from the movement with the highest average delay per vehicle. Table 5.23 below shows the relationship between average delay and level of service.

Table 5.23 INTERSECTION LEVEL OF SERVICE CRITERIA

Level of Service	Average delay per vehicle (s/v)	Traffic signals, roundabout	Give way and stop signs
A	less than 14	Good	Good
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Satisfactory but operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity and incidents will cause excessive delays; roundabouts require other control mode	At capacity and requires other control mode
F	> 70	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode

Adapted from RTA Guide to Traffic Generating Developments, 1993

The analysis showed that the intersection is currently operating at level of service A, which is a good level of service. The average delay for the highest delayed movement (right turns from the site) was 10 seconds per vehicle. The analysis confirms observations made of the intersection operation during a site visit.

vi. Road Safety

a. Sight Distances

There are good sight distances at the access point along Soldiers Point Road in both directions. To the north, sight distances are about 125 metres, and to the south they are several hundred metres. In order to determine whether there is adequate sight distance the speed environment should be considered. Soldiers Point Road has a

speed limit of 60 kilometres per hour and observations of traffic travelling along Soldiers Point Road suggest that traffic is travelling at or less than this speed. This speed is therefore appropriate to adopt in calculating sight distance requirements.

For a 60 km/hr speed environment, both the AUSTROADS guidelines (1988) and RTA Road Design Guide (1991) suggest a minimum approach sight distance of 55 metres for all approaches to an intersection. Both guides also suggest a safe intersection sight distance of 105 metres on the approaches to an intersection. Thus the access intersection currently satisfies all criteria for safe intersection design with respect to sight distances.

b. Accident History

A review of the most recent RTA accident statistics for roads in the Port Stephens area was undertaken for the five year period 1993 to 1997 inclusive. No accidents were reported at the site access point on Soldiers Point Road during this period. Two accidents were reported in the vicinity of the site - one involved a vehicle performing a u-turn north of the site (two injuries) and the other did not involve another vehicle. This good safety record suggests that no unusual safety problems exist at the access intersection.

5.9.2 Consultation

Consultation with the NSW Roads and Traffic Authority indicated that the EIS should consider the following issues:

- the likely number of trucks generated by the facility, their hours of operation and their frequency. Any noise impacts on residences along haulage routes;
- the potential impacts of traffic from the proposal on the operation of the roundabout at Port Stephens Drive/Nelson Bay Road; and
- the volume and type of vehicles likely to be generated by the proposal, including an assessment of their likely origins and destinations.

The first point relates to noise impacts and is addressed in *Section 5.9* of this EIS. The traffic assessment has addressed points two and three in the following sections.

5.9.3 Description of the Proposal and its Effects

The transfer station will continue to accept waste and recyclables from municipal services, commercial services and residential drop offs. These will be compacted

and transported to the waste management facility at Raymond Terrace or Solo Waste's materials recovery facility at Gateshead.

The waste transfer station would be open to waste collection vehicles between 7:30 am and 4:30 pm on weekdays, as in the existing situation. The station will continue to be open to the public on Mondays, Wednesdays and Fridays between 7:30 am and 3:30 pm and Sundays between 9:00 am and 3:00 pm, as in the existing situation.

In 1997, the landfill received some 22,342 tonnes of solid waste material. The waste transfer station has been designed to receive an estimated 35,747 tonnes per annum by the year 2021. This figure was estimated using the 1997 figure of 22,342 tonnes and assuming that waste quantities would increase by 2.5 per cent per annum.

Since April 1998 the existing landfill operation has been receiving waste from Raymond Terrace as an interim measure prior to the Bedminster facility opening in Raymond Terrace. Waste has been transported to Salamander Bay in this way at the rate of approximately 9,000 tonnes per year. Thus, for most of 1998, the waste received at Salamander Bay has been greater than the 22,342 tonnes per year 'base case' scenario described above. This waste has been transported in 60m³ skips and is expected to continue until about April 1999 when the Bedminster facility becomes operational.

Once the landfill closes and the centre begins operating as a transfer station, all waste which is currently accepted at the site would continue to be accepted. There would be two minor changes in the operation of the site once it becomes a waste transfer station, and these are:

1. waste currently brought from Raymond Terrace to Salamander Bay in transfer trucks would no longer be accepted at the transfer station but would be taken directly from Raymond Terrace to the Bedminster facility; and
2. locally generated waste would no longer be disposed in the landfill but would be transferred in skips to the Bedminster facility. All waste streams would be transferred in this way, except:
 - recyclables, which would continue to be collected by Solo Waste for processing at Gateshead, as is currently the case; and
 - green waste, which would be mulched on site and available for purchase by the public, as is currently the case. In the event that the supply of mulch is greater than demand, excess mulch would also be transported to Raymond Terrace for composting.

i. *Traffic Generation and Effects*

a. Short Term Scenario

The only additional traffic which would be generated by the transfer station would be transfer trucks bringing empty skips to the site and taking waste from the station to Raymond Terrace. Waste which is currently transported to the landfill from Raymond Terrace would no longer be brought to the transfer station.

The quantity of waste being transported to Raymond Terrace would be 20,600 tonnes per year based on 1997 waste volumes. This has been estimated as the total waste volume minus the volume of recyclables and about 40 per cent of the green waste volume. Hence it is assumed that 40 per cent of the green waste volume would be sold as mulch and the remaining 60 per cent would be transported to Raymond Terrace for composting. Changes in this assumption do not significantly affect the estimates of traffic generation or its impacts.

Waste would be transferred from the site in 60m³ skips. The expected number of skip loads for the 1997 scenario is shown in *Table 5.24*, and has been calculated using typical waste densities (or specific gravities) from Tchobanoglous et al (1993).

Table 5.24 ESTIMATED NUMBER OF SKIP LOADS, SHORT TERM SCENARIO

Waste Stream	Waste volume (tonnes)	Skip loads per year
Municipal	9,050	512
Other domestic	1,455	187
Green	904	51
Commercial and industrial	9,077	946
Building and demolition	121	3
Total	20,607	1,699

Hence, the total number of skip loads which would be transferred in the immediate short term would be 1,699 per year, based on 1997 operations. It is proposed to remove putrescible waste from the site every day, to reduce odour generation. Hence transfer trucks would be generated by the site per day on every day of the week except Saturdays, when the site would be closed.

Skips would be transported on an estimated 300 days per year, equivalent to the approximate number of days the station would be open. Based on this number of operating days and the expected number of skip loads per year from *Table 5.24*, there

would be an average of five or six trucks per day transporting waste from Salamander Bay to the Bedminster facility at Raymond Terrace.

Transfer trucks from Raymond Terrace would no longer travel to the site in the future. An estimated 9,000 tonnes per year of waste currently received from Raymond Terrace is equivalent to an average of two or three trucks per day. Therefore the expected short term increase would be three or four trucks per day which would not be noticeable on Soldiers Point Road or the wider road network.

b. Long Term Scenario

In the long term (2021), there would be an increase in traffic generation as the quantity of waste increases with population growth in the area. However, this increase in traffic generation would not result directly from the waste transfer station proposal, but would have occurred anyway had the existing landfill remained open. Additionally, traffic volume increases would be very gradual and hence not generally noticeable.

The number of waste transfer trucks taking waste from the site to Raymond Terrace would increase in the long term scenario, as shown in *Table 5.25*.

Table 5.25 ESTIMATED NUMBER OF LOADS, LONG TERM SCENARIO

Waste Stream	Estimated waste volume (tonnes)	Skip loads per year
Municipal	14,480	818
Other domestic	2,328	299
Green	1,447	82
Commercial and industrial	14,524	1,513
Building and demolition	194	4
Total	32,973	2,716

Table 5.25 shows that the number of loads would be 2,716 per year in 2021. Based on 300 operating days per year, there would be about nine loads of waste removed per day. This represents an increase of six or seven per day, or 12 to 14 truck trips per day on Soldiers Point Road. This small number of additional trucks on Soldiers Point Road and the regional road network would not be noticeable.

c. Issues Raised by the RTA

The site would continue to accept locally generated waste. Traffic would continue to arrive at and depart the site from the same locations as currently occurs. The only

difference would be the small number of additional transfer trucks which would travel between the site and the Bedminster facility at Raymond Terrace.

The impacts of three (short term scenario) and seven (long term scenario) additional loads per day on the operation of the Port Stephens Drive/Nelson Bay Road intersection would be negligible.

It is concluded that traffic impacts of the proposed transfer station would be negligible in both the short and long term scenarios. The capacity of Soldiers Point Road in the future situation would be unaffected by the proposal, and the existing good level of service currently provided by the Soldiers Point Road/site access intersection would be unaffected.

ii. Parking

Seven car parking spaces are proposed on site; four adjacent to the office building and three on the north-western side of the building opposite the recyclables storage area. The facility would employ three full time staff members, so there would always be four free spaces available for visitors or members of the public. However, demand for public parking would not generally exist, as vehicles would travel to the appropriate waste drop off areas. The proposed parking supply is considered appropriate.

Parking space dimensions will conform to Council's parking code and the requirements of the Australian Standard (AS 2890.1) for Off Street Parking Facilities.

iii. Access

The existing access arrangements would remain in place. The main access road pavement would be upgraded to a standard suitable for the type of heavy vehicles which will use it. However, as previously discussed, these vehicles would be the same as those which currently use the site. Other roads would be upgraded to a standard suitable for light vehicles. The access road would be seven metres wide and would generally follow the existing access road alignment.

The existing entry and exit gate to the transfer station is six metres wide. The RTA guidelines and the Australian Standard (AS 2890.2) indicate that separate entry and exit gates should be provided, each eight to 10 metres wide, for articulated vehicle access. The gate is proposed as a combined access point, and therefore does not conform to either of these requirements, as it would be catering for two way traffic and large vehicles. The gate would be widened to 10 metres to cater for two way traffic and semi trailer access to and from the site. This width would be adequate for the proposed operations.

The existing good sight distances at the site access intersection would not change, and no unusual safety problems are anticipated at the site access intersection.

iv. Internal Circulation and Layout

Separate collection and unloading areas are provided inside the site for the following waste streams:

- ☐ municipal waste;
- ☐ recyclables (including plastic containers, newsprint, mulch and green waste);
- ☐ car tyres, bodies and scrap metal;
- ☐ oil;
- ☐ building and demolition waste;
- ☐ car batteries;
- ☐ dead animals; and
- ☐ white goods.

Additionally, separate areas are proposed for commercial vehicles (north of the road through the transfer station building - two tipping bins) and private vehicles (south of the road through the building - four tipping bays).

Most access roads within the site will be sealed, seven metres in width with a 3.5 metre passing lane in each direction and will generally follow the existing road layout. The access road to the undercover dumping area has been designed for use by a large rigid truck, which is the largest vehicle anticipated to use this area.

Skip delivery and loading areas have been assessed with articulated vehicle turning templates. Manoeuvring areas have been adequately designed to accommodate semi trailers which will load and unload waste transfer skips.

The recyclables drop off area near R1 and R2 has been assessed with turning templates. A large rigid truck can manoeuvre adequately near both R1 and R2, and the area is adequately designed for the types of vehicles which will use it.

Tipping areas inside the transfer station have been assessed with turning templates which indicate that the area is adequate to accommodate a large rigid truck in the commercial tipping area. The private vehicle tipping bays are also adequately designed to accommodate the types of vehicles expected in this area.

It is concluded that the site layout is appropriately designed and will operate satisfactorily.

5.9.4 *Summary and Conclusions*

The main points relating to traffic and access for the proposed transfer station are:

- the existing landfill operation currently accepts locally generated waste, municipal waste from Raymond Terrace and recyclables from surrounding areas;
- all waste streams currently accepted at the landfill would continue to be accepted at the transfer station;
- the only traffic changes in the future situation would be that waste currently transported from Raymond Terrace would no longer be brought here. Instead, transfer trucks would take waste from the station to the Bedminster facility at Raymond Terrace;
- an additional three or four transfer trucks would be generated by the site per day in the short term and six or seven in 2021;
- the traffic impacts of the proposal would be negligible, as no noticeable changes would occur in traffic generation or distribution in either the short or long term scenarios. The capacity of Soldiers Point Road in the future situation would be unaffected, and the existing good level of service currently provided by the site access intersection would be maintained. There would be no impact on the Port Stephens Drive/Nelson Bay Road intersection;
- the proposed parking supply is adequate for the likely use of the site, and is considered appropriate. The parking area will be designed in accordance with Council's code and the relevant Australian Standard;
- the existing access arrangements would remain in place, however, the gate will be widened to 10 metres to allow easier flow for two way traffic and access for larger vehicles. The access way from the site to Soldiers Point Road would be sealed with heavy duty pavement appropriate for the type of vehicles which would use it;
- internal manoeuvring areas have been checked with turning templates and found to operate satisfactorily. Unloading areas for commercial and private vehicles are adequately designed to cater for the type of vehicles which would use them; and

- no unusual safety problems are anticipated at the Soldiers Point Road/site access intersection.

5.10 VISUAL CONSIDERATIONS

5.10.1 *Existing Visual Character*

Visual and scenic quality has been assessed in accordance with the Rural Land Evaluation Manual (Department of Environment and Planning, 1988). Relative scenic and landscape quality is assessed based on the following assumptions:

- relief and topographic ruggedness increases scenic and landscape quality (landform);
- as vegetation patterns become more diverse scenic and landscape quality increases (landcover);
- natural and agricultural landscapes increase scenic and landscape quality and 'unnatural' landscapes decrease scenic and landscape quality (landcover); and/or
- presence of waterforms, water edge and water area increases scenic and landscape quality (waterform).

Based on these assumptions, the area around the proposed waste transfer station site excluding the existing landfill area, is considered to have moderate to high scenic quality. High scenic quality includes areas with features of landform or landcover which are of outstanding, unusual, distinctive or diverse character.

The landscape around the proposed Salamander Bay Waste Transfer Station consists low-lying relief and topography and the vegetation cover ranging from open forest to SEPP 14 wetland. These features create contrast in the landscape and increase the scenic value.

The Lower Hunter Landscape Improvement Study (1983) was prepared by the Department of Environment and Planning to provide guidance to protect and improve the landscape in the Lower Hunter. This study identifies several urban, rural or natural landscape units in the Lower Hunter and the major characteristics, statutory issues and pressures for each unit. The proposed waste transfer station is located within the Port Stephens Unit defined in the Lower Hunter Landscape Improvement Study.

The visual assessment in the Lower Hunter Landscape Improvement Study (Dept. of Environment and Planning, 1983) for the Port Stephens Unit confirms the scenic quality of the area which was determined above. This document shows that the area of the proposed Salamander Bay waste transfer station is within the coastal landscape unit and consists of both distinctive and common visual variety.

In accordance with the Rural Land Evaluation Manual (Department of Environment and Planning, 1981), visual prominence is also important in assessing the visual and scenic quality of an area. Visual prominence considers the following landscape features:

- elevated ridgelines, crestslopes and associated steep slopes which form a visual boundary to major travel routes, use areas and waterbodies;
- visually significant stands of vegetation; and
- visually dominant elements such as mobile sand dunes, geological formations, etc.

The proposed waste transfer station is considered to have a low degree of visual prominence due to the low relief of the site.

5.10.2 Impacts

The main visual elements of the waste transfer station site will be the proposed enclosed shed. This building will not be visible to traffic on Soldiers Point Road. It will only be visible as traffic enters the existing landfill site itself. Dense vegetation along the southern boundary of the site shields the proposed transfer station from residences on Soldiers Point Road nearest to the existing landfill site.

Glimpses of the transfer station may be gained from some residences in Scott Circuit to the north-east of the site. This street is steep with extensive views to both the east and west.

Proposed landscaping described in Section 6.6 will enhance the entrance and parking areas of the site. Additional landscaping along the south-west and north-east of the transfer station as shown in Figure 4.3 is proposed to enhance the site for visitors to the site. This landscaping will consist of a row of *Casuarina glauca*, *Melaleuca quinquenrvia* or *Acaia* sp, providing an effective screen from ground level to well over eight metres in height at maturity.

The visual environment will not be affected by the proposed construction of the waste transfer station as the building proposed will not be visible from but a few dwellings. Landscaping proposed on the site will assist in enhancing site views and

screening. Following comments from the Salamander Bay Precinct Committee it is recommended that additional landscaping be undertaken at the entrance to the existing landfill site at its frontage to Soldiers Point Road.

5.11 HAZARD AND OFFENCE ASSESSMENT

5.11.1 Objectives

State Environmental Planning Policy No. 33 - Hazard and Offensive Development (SEPP 33) ensures that the safety and pollution impacts of a proposal are addressed at an early stage of the development application process. Through the policy, an assessment procedure is introduced which links the permissibility of a proposal to its safety and pollution control performance.

Applying SEPP 33 (DUAP, 1994) provides a methodology to determine whether a proposal is potentially hazardous or potentially offensive development. Although SEPP 33 only applies to industrial development and is not strictly relevant in this instance as the waste transfer station is not an industrial development, it is a useful tool to assess potential hazard and the issue of potential offence of the waste transfer station. If a proposal is either potentially hazardous and/or potentially offensive, SEPP 33 will apply, and an assessment of off-site risks and offence is required. The purpose of this section is to determine whether the proposed Salamander Bay waste transfer station is a potentially hazardous or potentially offensive development according to the criteria outlined in *Applying SEPP 33*.

5.11.2 Assessment of Hazard

SEPP 33 defines 'hazardous materials' as substances falling within the classification of the *Australian Code for the Transport of Dangerous Goods by Road or Rail*, otherwise referred to as the *Australian Dangerous Goods Code* (Federal Office of Road Safety, 1992).

To assess the potential hazardous risk of a proposal, SEPP 33 specifies screening thresholds based on the quantity of a potentially hazardous substance or based on the quantity of the substance relative to the distance from where it will be stored to the nearest site boundary. If the storage quantity proposed exceeds the relevant threshold, then the proponent is required to prepare a preliminary hazard analysis (PHA).

Details of hazardous materials proposed for storage at the Salamander Bay site are provided in *Table 5.26*. The quantities stored and the storage locations are given in the table.

Table 5.26 HAZARDOUS MATERIAL PROPOSED FOR STORAGE ON-SITE

Hazardous Material ¹	Classification ²	Maximum Quantity proposed for storage ¹	Storage Type ¹	Location ¹
Acetylene - Dissolved	Class 2.1	2 Cylinders < 5 m3 combined	Cylinder store	Workshop
Oxygen - Compressed	Class 2.2	2 Cylinders	Cylinder store	Workshop
Assorted Chemicals from sorting floor	Unknown	Unknown (relatively small)	Cylinder, bottle (liquid) and other	Sorting floor

Notes: 1. Information supplied by Port Stephens Council

2. Using the Australian Dangerous Goods Code (Federal Office of Road Safety, 1992).

From Table 5.26 it can be seen that materials proposed for storage at the Salamander Bay site are all Class 2 according to the *Australian Dangerous Goods Code* (Federal Office of Road Safety, 1992).

Hazardous substances of class 2 are gases which may be compressed, liquefied or dissolved under pressure. Class 2 is further subdivided into three sub classes. Class 2.1, class 2.2 and class 2.3 which include flammable gases, non flammable gases and poisonous gases respectively. Each of the hazardous materials proposed for storage at the Salamander Bay site are described below.

i. Class 2.1 (Flammable gases)

a. Acetylene

Acetylene is the only substance of this class proposed for storage at the Salamander Bay site. Acetylene is a flammable, dissolved gas with a light odour. Rough handling of cylinders containing acetylene (usually dissolved in a solvent such as acetone) or exposure to heat may cause delayed explosion and should therefore be avoided. Empty cylinders should be treated as full cylinders.

Acetylene will be stored at the Salamander Bay site in relatively small quantities with a maximum of two cylinders at the site at any time. It will be used for small-scale welding on site.

SEPP 33 states that if the quantity of dissolved acetylene proposed to be stored is less than one cubic metre then it is not potentially hazardous.

If the proposed store of acetylene does increase to be greater than one cubic metre, then the distance of the store from the nearest boundary must be considered. At distances above 100 metres, the screening threshold for this class of material is more than 1,000 cubic metres. As the store of acetylene is located approximately 150 metres from the nearest boundary, and the proposed volume of storage is well below the specified screening threshold.

ii. *Assorted Chemicals from Sorting Floor*

Small volumes of assorted chemicals sorted from MSW will be stored for a short time before disposal. As outlined in Section 4.2 many types of hazardous materials would be excluded from the facility. Specifically, wastes on site would not include explosive and flammable materials. Assorted chemicals will include disposed of household cleaners, garden chemicals and other general household waste in small volumes only. They are not considered potentially hazardous, and they will not be stored in large volumes.

iii. *Class 2.2 (Non Flammable, non toxic gases)*

Oxygen (compressed) for use in welding is the only gases of class 2.2 proposed to be stored at the Salamander Bay site. Class 2.2 is excluded from risk screening, as gases of this class are not considered potentially hazardous.

iv. *Assorted Chemicals from Sorting Floor*

Small volumes of assorted chemicals sorted from MSW will be stored for a short time before disposal. These chemicals will include disposed of household cleaners, garden chemicals and other general household waste in small volumes only. They are not considered potentially hazardous as they will not be stored in large volumes.

5.11.3 *Assessment of Offence*

A development is potentially offensive if, in the absence of safeguards, it would emit a polluting discharge resulting in significant offence. Applying SEPP 33 recommends the following be considered when assessing whether a proposal is potentially offensive:

- ❑ does the proposal require a licence under any pollution control legislation administered by the EPA? If so, the proposal should be considered potentially offensive;
- ❑ does the proposal require any pollution control approval pursuant to any legislation or by-law administered by the council?; and
- ❑ if such a pollution control licence or approval is not required, does the proposal cause offence having regards to the sensitivity of the receiving environment?

In assessing the potential offence of a proposal, the consent authority should use information on the quantity and nature of any discharges capable of causing significant offence. In the assessment, the nature of surrounding land use and proposed safeguards should also be considered.

The key issue in assessing the potential offence of a proposal is the presence of adequate safeguards to ensure control of emissions from a facility. In the majority of cases, compliance with a pollution control licence under EPA legislation is sufficient to demonstrate that a proposal is not offensive. Where the proposal does not require an EPA licence, additional licence requirements under other consent authorities need to be considered.

i. *Compliance with EPA requirements*

Applying SEPP 33 indicates that compliance with the EPA pollution control approval is sufficient to demonstrate that the proposal is not offensive.

a. *Clean Air Act, 1961*

Scheduled premises or equipment are defined under the *Clean Air Act, 1961*. The Salamander Bay waste transfer station is not classified as a scheduled premises and no scheduled equipment is proposed for use at the facility. As a result, the proposed facility will not require an EPA licence or pollution approval under the *Clean Air Act*, indicating that the proposal is not considered potentially offensive with regard to pollution of air.

b. *Clean Waters Act, 1970*

Under the provisions of section 19 of the *Clean Waters Act*, the proposed development will not require a pollution control approval from the EPA as water from within the transfer station will be contained and pumped to sewer. Compliance to Hunter Water Corporation's trade waste agreement for the site will

demonstrate that the proposal has sufficient safeguards to control pollution of waters.

c. Noise Control Act, 1975

Under the *Noise Control Act*, the proposed development is not classified as a scheduled premises, therefore will not require a pollution control approval from the EPA. As a result, the proposed transfer station will not require an EPA licence or pollution approval under the *Noise Control Act*, indicating that the proposal is not considered potentially offensive with regard to generation of noise.

ii. *Compliance with other requirements*

The existing Salamander Bay landfill site is licensed under the *Waste Management and Minimisation Act, 1995*. Under this licence, the existing landfill is required to comply with strict conditions assuring minimal offence. However, the transfer station will not require its own licence under the *Waste Management and Minimisation Act, 1995*.

5.11.4 Conclusion

Assessment under SEPP 33 indicates that the proposed Salamander Bay waste transfer station is not potentially hazardous. As such, the proposed development does not require a preliminary hazard assessment (PHA).

No EPA pollution control approvals are required. Therefore, the proposal is not potentially offensive.

5.12 SOCIO-ECONOMIC ISSUES

5.12.1 Population Characteristics

Port Stephens local government area (LGA) is divided into eight major areas or planning districts. The planning districts that are relevant to this proposal are Rural East and Tomaree Peninsula. The majority of Nelson Bay Road is located in the Rural East planning district of Port Stephens LGA and is the only road that services the Tomaree Peninsula planning district.

The Tomaree Peninsula planning district encompasses Soldiers Point, Anna Bay and the Nelson Bay/Shoal Bay areas.

Table 5.27 provides the most recent population estimates available and shows population statistics for the planning districts of the Tomaree Peninsula and the Port Stephens LGA.

Table 5.27 ESTIMATED POPULATION FOR TOMAREE PENINSULA AND PORT STEPHENS LGA

Planning District	1991 Census	Estimate to 30 June 1995
Nelson Bay	4767	5151
Shoal Bay	1993	2073
Fingal Bay	958	1456
Corlette	990	1316
Salamander Bay/Salamander/Taylors Beach	2158	3756
Soldiers Point	1025	1149
Anna Bay/ Fishermans Bay/ Boat Harbour/ One Mile Beach	2294	3084
TOTAL TOMAREE	14185	17895
TOTAL PORT STEPHENS LGA	43719	51885

Source: Port Stephens Council Community Profile 1995-96

The age distribution for the Tomaree Peninsula planning district and Port Stephens LGA are shown in Table 5.28.

Table 5.28 AGE DISTRIBUTION (1996 CENSUS)

AGE GROUP	Tomaree Peninsula	Port Stephens LGA	Hunter Region
0-4	6.4	7.9	7.1
5-9	6.2	8.2	7.4
10-14	6.2	7.7	7.3
15-19	5.2	6.3	6.8
20-24	5.1	5.7	6.9
25-29	5.5	6.6	6.7
30-34	5.7	7.3	7.2
35-39	7.3	8.0	7.7
40-44	6.2	7.2	7.2
45-49	6.3	6.4	6.8
50-54	5.8	5.2	5.5
55-59	6.0	4.9	4.5
60-64	6.3	4.7	4.2
65-69	7.1	4.8	4.5
70-74	6.6	4.1	4.0
75+	7.4	4.6	5.8

Source: Port Stephens Council (1996)

The 1996 Census data shows that 27.4 per cent of residents over the age of 60 reside in the Tomaree Peninsula area. This can be compared to 18.2 per cent for the Port Stephens LGA and 18.5 for the Hunter Region. These values reflect a high proportion of retirees in the Tomaree Peninsula area. Increased life expectancy and declining birth rates has seen significant ageing of the Australian population. The ageing population in the Port Stephens area has resulted substantially from migration of people in older age groups to the area from elsewhere.

There is also a significantly lower proportion of 15 to 34 year old residents in the Tomaree Peninsula area in comparison to the rest of the local government area and the Hunter Region. This suggests that young adults are drawn to other areas to seek employment and education opportunities.

5.12.2 Population Projections

The Port Stephens area has experienced high rates of population growth over recent years and this growth is expected to continue in the future. The population statistics and projections for the Tomaree Peninsula and Port Stephens LGA are shown in

Table 5.29. The projections are from the Port Stephens Council Community Profile for 1995-96 and are based on current population trends and land availability.

Table 5.29 POPULATION STATISTICS AND PROJECTIONS

AREA	1976	1981	1986	1991	1996	2001	2006	2011	2016	2021
TOMAREE PENINSULA	6,640	9,370	11,250	14,185	17,920	19,900	22,800	25,600	28,500	31,400
TOTAL LGA	21,000	28,650	36,000	43,719	51,290	59,900	68,000	76,000	84,100	92,200

Source: Port Stephens Council Community Profile 1995-96

Port Stephens LGA has experienced rapid growth over the 20 year period from 1986 to 1996. It is estimated that annual population growth will continue at around four per cent which is almost four times above the National, State and Regional growth rates.

5.12.3 Employment

Individual incomes in the Port Stephens LGA are generally very low. An estimated 77.7 percent of residents earn less than \$30,000 and 44.8 per cent earn less than \$12,000. Annual household incomes are also very low for the Port Stephens LGA with 46.5 percent of families earning less than \$30,000. This compares with NSW values showing that 41.1 percent of families earn less than \$30,000.

This low level of individual and family income can be linked to the employment areas and the number of retired people residing in the area. Tourism is a significant employment industry in the LGA, particularly the Tomaree Peninsula and it caters for more than a million visitors each year. However, employment in this sector is seasonal in nature which results in limited full time employment opportunities and lower annual average income.

5.12.4 Impacts of the Proposal

The proposed waste transfer station will employ three people on a full time basis. Currently, there are two full time and one part time employee/s at the existing landfill site.

The proposed waste transfer station at Salamander Bay will improve the amenity in the Salamander Bay/Soldiers Point area as the existing landfill will close to allow the transfer station to be built.

The closure of the landfill and construction of the waste transfer station will increase amenity by reducing the potential for odours from the site as municipal solid waste will be removed from the site on a daily basis.

5.13 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

5.13.1 *Definition of Ecologically Sustainable Development*

The national strategy for ESD details the Federal Government policy which seeks to achieve economic development in an environmentally sustainable manner. The four principles of ESD are listed in Schedule 2 of the Environmental Planning and Assessment Regulation (1994) as follows:

- *the precautionary principle - namely that if there are threats of a serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;*
- *inter-generational equity - namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;*
- *conservation of biological diversity and ecological integrity; and*
- *improved valuation and pricing of environmental resources.*

5.13.2 *Ecologically Sustainable Development Assessment*

i. *The Precautionary Principle*

The potential threats to the environment from the Salamander Bay waste transfer station have been fully assessed and are dealt with in *Chapter 5*. There is no scientific uncertainty regarding the potential impacts of the proposal and appropriate environmental safeguards will be installed.

ii. *Inter-Generational Equity*

The operation of the Salamander Bay waste transfer station will reduce the amount of waste which is deposited to landfill by increasing recycling and reuse of waste. The proposed construction of the transfer station will increase the efficiency of waste management in Port Stephens LGA and provide increased opportunities for resource recovery. As this transfer station is part of Port Stephens overall integrated waste management strategy, future requirements for landfill disposal will reduce and

resources will be divert from landfill to beneficial uses. These benefits will accrue to future generations as well as the present generation.

In addition, the proposed ameliorative measures will mitigate any significant impact the operation may have on the health of the environment. Overall, the Salamander Bay site will benefit the environment by reducing the amount of material landfilled.

iii. *Conservation of Biological Diversity and Ecological Integrity*

The Salamander Bay waste transfer station site is located on land which has been previously cleared of native vegetation. The biological diversity of the site is therefore low, and as no clearing of vegetation is proposed, the biological diversity of the site will be unaffected. Furthermore, the Salamander Bay waste transfer station proposal includes landscaping the site using endemic vegetation species, which will lead to an increase the biological diversity of the site in the future. Considering the proximity of the existing landfill to SEPP 14 wetland no 766, the proposed waste transfer station will allow the rehabilitation of the landfilled area such that the conservation status of the wetland is not further degraded.

iv. *Improved Valuation and Pricing of Environmental Resources*

The proposed Salamander Bay waste transfer station adds value to waste, through recycling and reusing domestic waste. This provides improved valuation and pricing of waste as an environmental resource and represents a significant increase in valuation of waste compared to landfilling of the waste.

In conclusion, consideration of the principles of ecologically sustainable development provides further justification for the proposal.

ENVIRONMENTAL MANAGEMENT AND MITIGATIVE MEASURES

6.1 INTRODUCTION

The proposed Salamander Bay waste transfer station will have in place a range of environmental controls to manage potential pollution and hazards associated with the operation. Minor additional landscaping is proposed to mitigate any impact from lighting and to improve visual amenity of the site.

A summary of the existing and proposed environmental management strategies is provided in the following sections. Environmental management procedures have considered the *Environmental Guidelines: Solid Waste Landfills* (EPA 1996) which the EPA has requested be referred to for the development of an Environmental Management Plan for the site.

6.2 WATER AND WASTEWATER MANAGEMENT

Management of wastewater and runoff from other parts of the site associated with its prior use as a landfill should be in accordance with Council's 'Landfill Environmental Management Plan' (CMPS&F) and are shown on Figure 4.3.

Wastewater from the transfer station site should be handled and treated in accordance with the 'Salamander Bay Waste Transfer Station Concept Design' (GHD). This involves capturing water off paved areas for collection in a water quality pond. Prior to this pond will be a litter pit and trash rack to remove any large litter. Surface water from up slope areas will be diverted around the site.

The concept design specifies a sewer connection to service the transfer and recyclables site and administration area. Washdown water from the transfer and recyclables areas as well as waste water from the amenities area would be directed to sewer.

6.3 LITTER AND VERMIN CONTROL

The Salamander Bay site will have in place quality procedures for the management of litter and vermin. These will be implemented as part of the waste transfer station's standard operating procedures.

6.3.1 *Litter Control*

The 2.1 metre high fence which surrounds the entire property generally effectively contains the majority of airborne litter within the site. In addition, the receival areas for MSW will be in a fully enclosed building, recyclable material will be deposited directly into skips and green waste and other bulky goods will be within a 2.1 metre high fenced area limiting the opportunity for litter on the site. Additional management of airborne litter is achieved through the following procedures:

- litter will be collected weekly by staff, or more frequently if required from around the site, including along the fence line, and placed in skips if recyclable or refuse bins for disposal;
- daily inspection of litter originating in the waste transfer station will be undertaken in adjacent properties and if required a manual clean up is carried out;
- experience has shown that litter is has the potential to be a significant problem during windy periods. On windy days, tarpaulins will be secured over any wind affected stockpiled material to minimise litter; and
- collection vehicles and other waste haul trucks are fully sealed prior to leaving the site to prevent littering.

If required, during periods of high wind, employees will be engaged to control litter, including inspection of neighbouring streets to remove any wind blown litter during and after the high wind event.

6.3.2 *Vermin Control*

Vermin generally become a problem when there is a regular source of food available. Vermin has been a problem during the operation of the Salamander landfill site due to the fact that waste is not always covered. However, the construction of the proposed waste transfer station will allow for the closure of the landfill and hence, food sources for vermin will be scarce. In addition, any recyclable material which contains food waste will be contained in a skip and will be removed from the site

within two days. If vermin are detected on site, affected areas will be sprayed to control the vermin and the cause of the outbreak is determined and remedied.

6.4 DUST AND ODOUR CONTROL

The transport of MSW from the site on a daily basis and the enclosed nature of potentially odorous materials stored minimises the potential for dust and odour generation (see *Section 5.4*). MSW and domestic waste will be stored predominantly within the fully-enclosed shed. This reduces the potential for odour and dust. Receipt of recyclables in partially enclosed skips also reduces the potential for dust and odour to leave the site.

Any materials stored outside the enclosed areas at the Salamander Bay site are non-putrescible waste with the exception of green waste, therefore the potential for odour generation is minor. The daily packaging and transport of putrescible waste to landfill also minimises the potential for odour.

To further reduce the occurrence of dust and odour, a deodorant and disinfectant could be sprayed around the site as required. Adequate ventilation will be installed in the shed.

6.5 FIRE FIGHTING

In the event of fire, the proposed transfer station will have in place fire safety procedures, a fire hydrant system and an adequate number of fire extinguishers placed in strategic points throughout the station.

All staff at the station will be fully trained in the procedures to be undertaken in the event of fire. The following actions and information is provided in the procedures:

- location of all fire extinguishers;
- directions to call the fire brigade;
- directions on when to try and extinguish a fire, and when to evacuate; and
- evacuation plan, including a designated assemble point within a safety zone.

6.6 HAZARDOUS SPILLS

The proposed waste transfer station will have a quality procedure in place for hazardous spills which illustrates the actions to be taken in the event of a spill. All staff are trained in these procedures.

Accidental spills of fuel, oil and other chemicals stored on site are infrequent and minimised through the following measures:

- ❑ any above ground fuel tanks will be fully bunded, with a capacity of 110 per cent of the tank;
- ❑ all vehicles and machines are well maintained and serviced regularly; and
- ❑ all collected MSW and recyclables are only unloaded from collection vehicles in the designated areas.

In addition, surface runoff from work areas where spills may potentially occur is excluded from stormwater, being collected in the underground water storage tank (see *Section 6.2*). Water from the tank is treated in an oil-water separator before being discharged to sewer under a trade waste agreement with Hunter Water.

In the event of an hazardous spill, the proposed transfer stations procedures are:

- ❑ where possible, an attempt should be made to contain the spill with appropriate barriers or absorbent materials;
- ❑ where it is safe to do so, flammable materials should be immediately moved away from the area of the spill;
- ❑ if the spill can not be contained or if it contains dangerous liquids which can not be disposed of in a safe and environmentally sound manner, the fire brigade and other relevant authorities (eg: EPA) are to be contacted; and
- ❑ in the event of a major spills or spills which pose a threat to staff on the site, all staff are to assemble in the designated safety zone and wait for further instruction. The site manager will count all staff and determine if any personnel are not present.

6.7 EMERGENCY PLAN

The proposed Salamander Bay waste transfer station will have in place quality procedures to be carried out in the event of an emergency situation. These

procedures will be identified as an Emergency Plan, which will be known to all staff at the transfer station. In the event of an emergency, the following procedures will apply:

- the office will be immediately notified on the nature and extend of the emergency;
- office staff will notify all personnel on site about the emergency using the public address system and any other means required;
- the appropriate emergency authorities will be contacted if required;
- all staff will report to the emergency evacuation area and wait for further instructions from the manager. The manager counts all staff to determine if any people are absent;
- neighbouring properties will be contacted if the emergency is a risk to their personnel or site; and
- staff will only be permitted to resume operations when notified from the appropriate authorities/authority that the emergency is over. The manager will be charged with the duty of managing staff movements during the emergency situation.

6.8 LANDSCAPING

The site will be landscaped to improve the visual amenity of the area and no unplanted exposed earth should remain on site. An information board describing waste processes used before, during and after the waste is deposited at the transfer station will be incorporated into the landscaping. The proposed landscaped area is shown on *Figure 4.3*. Details of the landscaping proposed in the concept design are provided below:

- appropriate erosion control measures will be installed prior to any construction works occurring on the site and will be removed on completion of all building and landscaping works;
- all areas disturbed during construction will be made good and grassed with a non-invasive low mowing species;
- mulched three metre wide buffer zones incorporating native tree and shrub tube stock planting will be located to the north and south of the structures to reduce the visual impact of the new facilities;

- tree planting will be carried out in the adjacent carpark and an entry sign to the facility provided to improve the arrival experience and provide shade in the carpark; and
- a wetland turf species will be used to line the detention basin and ensure a grass cover is maintained all time.

Suitable landscaping species would include species endemic to the area such as swamp oak (*Casuarina glauca*), *Melaleuca quenquenervia*, and *Acacia* sp.

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APPENDICES

Appendix A

AUTHORITY CONSULTATION

New South Wales Government Department of Urban Affairs and Planning

Ms Jane Gibbs
ERM Mitchell McCotter Pty Ltd
P O Box 71
Thornton NSW 2322

ERM Mitchell McCotter Quality System			
Referred to	JG	Ref. No.	58082
Date Received	16 NOV 1998	Contact:	
Source:	DUAP		
Data suitability check required	☒ Yes ☐ No	Our Reference:	
Data is:		Your Reference:	
Current	☒ Yes ☐ No		
Applicable to project	☒ Yes ☐ No		
Checked by:	J		
Proposed Waste Transfer Station			
Part lot 145 DP 715013 Soldiers Point Road - Salamander Bay,			
Attach explanation for no answers or data problems			
Signature:	J	Date:	16.11.98
	Pr. Manager		

S Fernando
N98/00328

Dear Ms Gibbs

Thank you for your letter of 15 September 1998 and fax dated 13 October 1998 seeking consultation with the Director-General for the preparation of an environmental impact statement (EIS) for the above development.

Under clause 55 of the *Environmental Planning and Assessment Regulation 1994* (the Regulation), the EIS should specifically address the key issues outlined below.

Key Issues

- The relevant aspects of Port Stephens LEP 1987.
- The impact of the proposal on the nearby SEPP 14 wetland No.766.
- The application of SEPP 33 in the event of the proposal being potentially offensive.

Attachment No. 1 outlines the statutory matters that must be included in any EIS under clauses 54 and 54A of the Regulation.

Attachments 2, 3 & 4 contain the type of information most likely to be relevant to your proposed development. Not all the matters they contain may be appropriate for consideration in your EIS; equally they are not exhaustive.

You should consult with Port Stephens Council and take into account any comments Council may have in the preparation of the EIS. The EIS should also address other issues that emerge from consultations with relevant local, State and Commonwealth government authorities, service providers and community groups.

Governor Macquarie Tower
1 Farrer Place, Sydney 2000
Box 3927 GPO, Sydney 2001

Telephone: (02) 9391 2000
Facsimile: (02) 9391 2111

Please contact Sohan Fernando on (02) 9391 2043 if you require any further information regarding the Director-General's requirements for the EIS.

Yours sincerely,

David Mutton
Acting Director
Development and Infrastructure Assessment
As Delegate for the Director-General

DEPARTMENT OF URBAN AFFAIRS AND PLANNING

Attachment No. 1

STATUTORY REQUIREMENTS FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT UNDER PART 4 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

In accordance with the *Environmental Planning and Assessment Act 1979* (the Act), an environmental impact statement (EIS) must meet the following requirements.

Content of EIS

Pursuant to Schedule 2 and clause 54A of the *Environmental Planning and Assessment Regulation 1994* (the Regulation), an EIS must include:

1. A summary of the environmental impact statement.
2. A statement of the objectives of the development or activity.
3. An analysis of any feasible alternatives to the carrying out of the development or activity, having regard to its objectives, including:
 - (a) the consequences of not carrying out the development or activity; and
 - (b) the reasons justifying the carrying out of the development or activity.
4. An analysis of the development or activity, including:
 - (a) a full description of the development or activity; and
 - (b) a general description of the environment likely to be affected by the development or activity, together with a detailed description of those aspects of the environment that are likely to be significantly affected; and
 - (c) the likely impact on the environment of the development or activity, having regard to:
 - (i) the nature and extent of the development or activity; and
 - (ii) the nature and extent of any building or work associated with the development or activity; and
 - (iii) the way in which any such building or work is to be designed, constructed and operated; and
 - (iv) any rehabilitation measures to be undertaken in connection with the development or activity; and
 - (d) a full description of the measures proposed to mitigate any adverse effects of the development or activity on the environment.
5. The reasons justifying the carrying out of the development or activity in the manner proposed, having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development.
6. A compilation, (in a single section of the environmental impact statement) of the measures referred to in item 4(d).
7. A list of any approvals that must be obtained under any other Act or law before the development or activity may lawfully be carried out.
8. For the purposes of Schedule 2, the principles of **ecologically sustainable development** are as follows:
 - (a) The precautionary principle - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
 - (b) Inter-generational equity - namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
 - (c) Conservation of biological diversity and ecological integrity.
 - (d) Improved valuation and pricing of environmental resources.

Note

The matters to be included in item (4)(c) might include such of the following as are relevant to the development or activity:

- (a) the likelihood of soil contamination arising from the development or activity;
- (b) the impact of the development or activity on flora and fauna;

- (c) the likelihood of air, noise or water pollution arising from the development or activity;
- (d) the impact of the development or activity on the health of people in the neighbourhood of the development or activity;
- (e) any hazards arising from the development or activity;
- (f) the impact of the development or activity on traffic in the neighbourhood of the development or activity;
- (g) the effect of the development or activity on local climate;
- (h) the social and economic impact of the development or activity;
- (i) the visual impact of the development or activity on the scenic quality of land in the neighbourhood of the development or activity;
- (j) the effect of the development or activity on soil erosion and the silting up of rivers or lakes;
- (k) the effect of the development or activity on the cultural and heritage significance of the land.

An environmental impact statement referred to in Section 78A(8) of the Act shall be prepared in written form and shall be accompanied by a copy of Form 2 of the Regulation signed by the person who has prepared it.

Procedures for public exhibition of the EIS are set down in clauses 57 to 61 of the Regulation.

Attention is also drawn to clause 115 of the Regulation regarding false or misleading statements in EISs.

Note

If the development application to which the EIS relates is not exhibited within 2 years from the date of issue of the Director-General's requirements, under clause 55(7) of the Regulation the proponent is required to reconsult with the Director-General.

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Department of Urban Affairs and Planning

ATTACHMENT NO 2

**ADVICE ON THE PREPARATION OF AN ENVIRONMENTAL IMPACT
STATEMENT (EIS) FOR A WASTE RECYCLING FACILITY.**

The reason for requiring an environmental impact statement for a waste recycling facility is due to their potential to create public or environmental nuisance due to noise, dust, odours and wastes which affect air and water quality.

The purpose of this paper is to outline various issues relevant to the preparation and consideration of an EIS for a materials recycling facility. It is intended to assist the preparation of the EIS. It is the applicant's responsibility to identify and address, as fully as possible, the matters relevant to the specific development proposal in complying with the statutory requirements for EIS preparation (see Attachment No. 1).

The matters nominated in this paper are not intended as a comprehensive identification of all issues which may arise in respect of such work. Some of the issues nominated may not be relevant to a specific proposal. On the other hand, there may be other issues, not included, that are appropriate for consideration in the EIS.

Information provided should be clear, succinct and objective and where appropriate be supported by maps, plans, diagrams or other descriptive detail. The purpose of the EIS is to enable members of the public, the consent authority (usually the council) and the Department of Urban Affairs and Planning to properly understand the environmental consequences of the proposed development.

1. Description of the proposal.

The description of the proposal should provide general background information on the location and extent of the works, existing and proposed, an indication of adjacent developments, and details of the site, land tenure, zonings and relevant forward planning proposals and any other land use constraints.

The extent to which the supply of raw materials and access to markets for the finished product has determined the location of the plant in preference to alternative sites should be stated.

This section should provide specific information on the nature, intent and form of the development. It should, as far as possible, include such details as the processes involved, wastes created and landscaping. A description should also be provided of associated operations such as the transport of materials and the use of the end product if such use is likely to have environmental implications.

Particular details that may be relevant include:

- . Characteristics and economic significance of the product.
- . Plans of operation.
- . Any proposals for future expansion, including staging and timing.

- . Capacity of plant now and in the future.
- . Sources and quantities of raw materials.
- . Type of processes, machinery and equipment to be used.
- . Expected life of the operation of the plant.
- . Number of persons to be employed.
- . Hours of operation.
- . Means of storage, location, quantity and details of necessary stockpiling.
- . Types and quantities of products for recycling and details of any storage required.
- . Access arrangements - truck routes, truck numbers, parking, etc.
- . Site drainage and erosion controls.
- . Water supply requirements.

2. Description of the Environment.

This should provide details of the environment in the vicinity of the development site and also of aspects of the environment likely to be affected by any facet of the proposal. In this regard, physical, natural, social, cultural and economic aspects of the environment should be described to the extent necessary for assessment of the environmental impact of the proposed development.

3. Analysis of Environmental Impact.

Potential environmental impacts usually associated with these types of operations are listed below. Where relevant to the specific proposal, these should be addressed in the EIS, taking into account the adequacy of safeguards proposed to minimise them.

- . Likely noise disturbance caused by the operations, including transport operations, on nearby residences, particularly at night.
- . Other impacts of trucking movements, including access across railways and on to highways.
- . Potential for air pollution, including odours, organic vapours and particulate matter.
- . Water management: including water requirements and the separating of clean and contaminated runoff before discharge; water treatment; quality and quantity of effluent for disposal.
- . Treatment and disposal of waste material.
- . Effects on the visual environment.

In addition, any potential for fire hazard or risks to public safety and any proposals to monitor and reduce environmental impacts should be included.

4. Contact with relevant Government Authorities.

In preparing the EIS, it is suggested that authorities, such as those listed below, should be consulted and their comments taken into account in the EIS.

- . The Environment Protection Authority in regard to air, water and noise impacts and relevant pollution control legislation requirements;

- . The Heritage Office if the proposal is likely to affect any place or building having heritage significance for the State;
- . the National Parks and Wildlife Service if Aboriginal places or relics are likely to be affected;
- . New South Wales Agriculture should be contacted if prime agricultural land may be affected by the proposal.
- . NSW Fisheries if areas of significant fish habitat will be affected.
- . Department of Land and Water Conservation if the proposal may have implications for soil erosion, or will disturb acid sulphate soils, or on water bodies subject to the legislative responsibilities of this agency.

It is the responsibility of the person preparing the EIS to determine those Departments relevant to the proposed development.

Department of Urban Affairs & Planning

ATTACHMENT NO 3

ADVICE ON THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR WASTE MANAGEMENT

The purpose of this paper is to outline various issues relevant to the preparation and consideration of an EIS for a waste management facility. It is intended to assist the preparation of the EIS. However, it is the applicant's responsibility to identify and address as fully as possible the matters relevant to the specific development proposal in complying with the requirements for EIS preparation (see Attachment No 1).

The matters nominated in this paper are not intended as a comprehensive identification of all issues which may arise in respect of a waste management facility. Some of the issues nominated may not be relevant to a specific proposal. On the other hand, there may be other issues, not included, that are appropriate for consideration in the EIS.

Information provided should be clear, succinct and objective and where appropriate be supported by maps, plans, diagrams or other descriptive detail. The purpose of the EIS is to enable members of the public, the consent authority (usually the Council) and the Department of Urban Affairs and Planning to properly understand the environmental consequences of the proposed development.

The particular matters outlined in the following should be included in the EIS.

1. Background information

Sufficient background information should be provided and include:

- Objectives of proposal;
- relationship with any regional waste management strategies;
- location of the operations and indication of existing and proposed adjacent developments;
- broad nature and extent of operations proposed;
- land tenure, boundaries, site details in relation to environmental planning instrument zonings and any other land use constraints.

2. Detailed description of proposal

This description should not only describe the proposal at the site but also describe all associated operations such as handling and transport of materials, disposal of wastes and residues, and safety, pollution and environmental controls incorporated into the proposal.

Particular matters to be covered include:

- Construction programme and practices;
- plans of operations, reception, segregation and control of incoming waste;

- nature of waste stream including chemical and physical properties, sources and volumes;
- quantities of waste stored and storage arrangements and safeguards of materials, particularly in regard to the storage and disposal of flammable, toxic or hazardous chemicals;
- nature, volume and disposal methods of waste produced by the management facility including fly ash, sludge and the like;
- resources recovery;
- air, odour, noise and vibration emission levels;
- site drainage and contamination controls particularly in regard to leachates, washdown and stormwater run off and contaminated fire water in the event of an emergency;
- plant capacity and major components, types of machinery and equipment to be used;
- stack height and characteristics including dispersion zone requirements;
- expected life of the plant;
- number of persons to be employed;
- hours of operation;
- access arrangements - truck routes and number of truck movements;
- daily operational plan;
- security, fire fighting and counter disaster provisions;
- proposals for landscaping.

3. Alternatives

The EIS should canvass alternatives to the proposed means/strategy of waste management, the proposed site and the proposed methods to undertake the operation.

In particular the EIS should:

- assess strategies which may enable resource recovery, or recycling as an alternative to this proposal or to reduce the scale of this proposal especially in regard to glass, ferrous metal, aluminium, paper, certain plastics and organic material suitable for composting;
- outline the criteria used in selecting the proposed site and justification of that selection, (particularly in terms of safety and pollution issues), including consideration of feasible alternative locations to the proposal and reasons for their rejection as well as the consequences of not undertaking the activity as proposed;
- review the existing performance of the proposed waste management method having regard to overseas experience and technologies as well as local landfill and waste minimising strategies.

4. Description of the environment

This description shall provide details of the environment in the vicinity of the development site and also of aspects of the environment likely to be affected by any facets of the proposal. In this regard, physical, natural, social, archaeological and economic aspects of the environment should be described to the extent necessary for assessment of the environmental impact of the proposed development. Particular attention should focus on existing air quality, ambient noise levels, climatic conditions, amenity and utility provision.

5. Analysis of impacts

The assessment of environmental impact and measures to be taken to reduce the impact should have particular respect to:

- Air emission controls, dispersion analysis which indicates ground level emission concentrations under likely atmospheric and weather conditions;
- water pollution controls, surface and groundwater;
- health implications for nearby residents, pedestrians, workers, school children and the like;
- likely noise and odour disturbance caused by the operations, including transport operations, on nearby residences;
- other impacts of trucking movements;
- potential for soil contamination;
- litter and dust control and any nuisance likely to be caused;
- treatment and disposal of residues and leachates;
- litter controls and site maintenance;
- landscaping measures and effects on the visual environment;
- monitoring (especially for emissions and leachates) and site management requirements.

The EIS should clearly specify whether any medical or quarantine wastes, asbestos bearing material and toxic and hazardous wastes are to be received and outline proposals for safe handling of these substances to avoid risk to public health.

In the event that toxic or hazardous substances are to be disposed of, treated or created, either temporarily or permanently, through the process of incineration or waste handling, the EIS should include a preliminary hazard analysis.

6. Authorities contacted

In preparing your EIS it will be necessary to consult with various authorities concerning licenses and approvals for the proposal or where the proposal may affect some aspect within their administration. Depending on the circumstances surrounding the proposal the following authorities may need to be consulted:

- Environment Protection Authority
- WorkCover
- NSW Department of Health
- Roads and Traffic Authority
- National Parks and Wildlife Service
- NSW Agriculture
- NSW Fisheries
- Department of Land and Water Conservation

It is however your responsibility to determine the authorities appropriate for consultation. Any response received should be incorporated in the EIS.

Department of Urban Affairs and Planning

ATTACHMENT NO 4

ADVICE ON THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR AN INDUSTRIAL WASTE DISPOSAL DEVELOPMENT

The purpose of this paper is to outline various issues relevant to the preparation and consideration of an EIS for an industrial waste disposal development. It is intended to assist the preparation of the EIS. It is the applicant's responsibility to identify and address as fully as possible the matters relevant to the specific development proposal in complying with the statutory requirements for the EIS preparation (see Attachment No 1).

The matters nominated in this paper are not intended as a comprehensive identification of all issues which may arise in respect of this type of development. Some of the issues nominated may not be relevant to a specific proposal. On the other hand, there may be other issues, not included, that are appropriate for consideration in the EIS.

Information provided should be clear, succinct and objective and where appropriate be supported by maps, plans, diagrams or other descriptive detail. The purpose of the EIS is to enable members of the public, the consent authority (usually the Council) and the Department of Urban Affairs and Planning to properly understand the environmental consequences of the proposed development.

1. Existing Environment

The EIS should pay particular attention to the following matters when describing the existing environment:

- i) planning controls: - development control and land use (present and anticipated) should be determined through consultation with Council. If investigations lead to identification of sites at the boundary of the local government area you should also consult with neighbouring local councils.

Adjacent land use, including the location and distance to residences and other occupied buildings should be mapped for subsequent assessment.

- ii) geography: - assess the potential for wind as well as drainage (katabatic drift) of odours relative to adjacent land use. The potential for airborne matter should also be assessed.
- iii) hydrology: - water is generally a valuable resource and in many cases the presence of water courses and drainage lines will limit the utility of sites. Design of the site must incorporate drainage work to prevent unnecessary contamination of rainfall runoff, and ensure that any runoff which is contaminated can be stored and treated. The

liability of the site to flood inundation should also be assessed. Information in this regard should be sought from the Department of Water Resources and the Council.

- iv) soils:- soils over certain areas may be highly permeable and the advice of the Soil Conservation Service should be sought at the outset, with regard to soil mapping.
- v) hydrogeology:- consideration of groundwater resources may also be relevant. The advice of the Department of Land and Water Conservation should be sought to ascertain the location and depth of aquifers, ground water drainage directions, water quality, present usage and potential, groundwater recharge areas and any other information on the dynamics of this resource, having regard to the effect of other adjacent land uses such as irrigation, on rise in water tables.
- vi) vegetative cover:- In many agricultural and urban areas the existence of natural vegetation may assume special significance. In this sense selection of a cleared site would be preferable to an uncleared site.

Wetlands are also important nature conservation areas and site selection near a wetland may result in degradation from site runoff.

- vii) truck routes: - consideration should also be given to likely truck routes. Scenic and tourist drives should be avoided and the route should be flood free.

2. Description of proposal

This description should not only describe the proposal at the site but also describe all associated operations such as handling and transport of materials, disposal of wastes, and pollution control safeguards.

Particular matters to be covered include:

- . Criteria used in selecting the proposed site and justification of that selection, (particularly in terms of safety and pollution issues), including consideration of feasible alternatives to the proposal and reasons for their rejection.
- . Full description of any further extractive works which will occur, including volumes of materials to be extracted, proposed use of extractive material.
- . A list of the major chemical materials, plus any hazardous materials, to be disposed of, and the amounts to be disposed of.
- . A brief description of the type of machinery and equipment to be used.
- . A description of the safety, pollution and environmental controls incorporated into the proposal.
- . Details of quantities stored and storage arrangements of materials, with safeguards proposed to control their impact on the environment, in particular the storage and disposal of flammable, toxic or hazardous chemicals.
- . Transportation arrangements including means of access to site, details of on-site parking and loading/unloading and mode of transport proposed for receiving raw materials, including details of proposed haul roads.

- . Workforce requirements, including transport workforce.
- . Hours of operation.
- . Proposals for any intended future expansion, including a statement of any proposals for staging of the proposed development and the likely implementation timing.

3. Site management

Handling of wastes will to some extent be defined by the nature of wastes, the quantities involved and the site characteristics. The Department encourages recycling of packaging and other materials. The opportunity should be investigated for establishing a facility to handle glass, ferrous metal, aluminium, paper and certain plastics for recycling. While storage areas for recycling will take up some of the area of the depot, the life of the depot may be significantly increased and the amount of earthworks reduced by sorting. The potential for recycling/recovery of waste materials could be discussed with the Environment Protection Authority.

There are several advisory documents on this aspect of waste disposal and it is suggested that specific reference be made to the the Environment Protection Authority's Environmental Standards WDI - "General Condition of Approval for Land Fill Waste Disposal Depots" and WD2 - "Environmental Criteria for Landfill Waste Disposal in New South Wales".

A number of substances are also subject to the Environmentally Hazardous Chemicals Act 1985. Substances may for instance be listed as a chemical waste, or be subject to a chemical control order under this Act. The EIS should clearly specify any substances to be received at the facility which are so classified, and demonstrate that all EPA requirements will be complied with.

Medical Wastes

The EIS should clearly specify whether any medical wastes are to be received and outline proposals for safe handling of these substances.

The EIS should also demonstrate that there is no significant threat to human health from these substances.

Asbestos

The EIS should clearly specify whether any asbestos bearing material is to be received by the facility. Measures to prevent the dispersion of any asbestos fibres should be clearly specified in the EIS.

Toxic and Hazardous Materials

Any toxic and hazardous wastes to be received by the facility should be clearly described and identified. The likely environmental impact of these substances should be identified and measures to mitigate their impact should be proposed.

Any likely impacts of these substances on human health (in the case of people living near, and working at the site) should be specified, and measures taken to protect the health of workers and nearby residences from these effects should be specified.

In the event that toxic or hazardous substances are to be disposed of, the EIS should include a preliminary hazard analysis.

The preliminary hazard analysis should include:

- . A comprehensive identification of possible sources and causes of potentially hazardous incidents;
- . A detailed outline of all operational and organisational safety controls, and their basis;
- . A generalised consequence/probability quantification of the most relevant hazardous incidents identified above;
- . An assessment of cumulative risk levels expected from the proposed development and safety implications for surrounding land uses.

The adequacy of the proposed safeguards should be evaluated against the risk levels above.

In addition to the matters mentioned in 'B' above, the EIS should include:

- . An outline of emergency/counter-disaster principles for the installation and commitments that existing procedures will be reviewed and updated before commissioning;
- . Commitments for hazard and operability studies to be undertaken as an integral part of the design;
- . A comprehensive description of fire prevention and protection measures with details of the basis upon which they have been formulated;
- . Commitments for a detailed fire safety study as part of the design.

4. Analysis of environmental impact

Assessment of the environmental impact and measures to be adopted to ameliorate impacts especially with regard to:

- . Water pollution controls, surface and groundwater, monitoring measures.
- . Likely noise disturbance caused by the operations, including transport operations, on nearby residences.
- . Other impacts of trucking movements.
- . Gas movement, odour, monitoring measures.
- . Treatment and disposal of solids and sludge.
- . Landscaping measures and effects on the visual environment.
- . Any likely affectation of sites of Aboriginal archaeological or heritage value if located in the vicinity of the operations.
- . identification and assessment of impact associated with any further extraction works.

5. Alternatives

The EIS should assess strategies which may enable resource recovery, or recycling as an alternative to this proposal or to reduce the scale of this proposal.

It should be noted that in some cases the proposed recovery of waste products may involve manufacture of chemicals or separation of materials and storage of chemicals such that the processes and operations may in themselves be designated developments as defined by the Regulation.

6. Contact with other authorities

In preparing your EIS it will be necessary to consult with various authorities concerning licenses and approvals for the proposal or where the proposal may affect some aspect within their administration. The following authorities may have an interest in your proposal:

- . State Pollution Control Commission
- . Department of Water Resources
- . Department of Agriculture and NSW Fisheries
- . Soil Conservation Service Division of Department of Conservation and Land Management
- . Department of Health
- . Roads and Traffic Authority
- . National Parks and Wildlife Service

It is however your responsibility to determine the authorities appropriate for consultation. Any response received should be incorporated in the EIS.

7. Monitoring

The EIS should discuss the need for an ongoing monitoring program.



ERM Mitchell McCortter Quality System			
Referred to	JK	Ref. No.	58052
Date Received	1	038	
Source	EPA		
Date			
Does it require a truck?	Yes ☒	No ☐	
Date			
Applicable to project	☒	☐	
Checked by	JK		
Answers or data			
bbs		JK	Date 15-10-95

NSW Government Offices
117 Bull Street Newcastle West NSW 2302
PO Box 488G Newcastle NSW 2300
Tel 02 4926 9971 Fax 02 4929 6712

The site should be assessed for actual and potential acid sulphate soils and where necessary a description given of the strategies to be used to control acid sulfate drainage.

using the methodology described in the publication *Assessing and Managing Acid Sulfate Soils*, (EPA 1995)

Water Quality Impacts

The EIS should identify the receiving waters and describe the likely impact on Surface water and groundwater as a result of runoff or percolation from the site.

Transfer stations handling putrescible waste can generate a high-strength leachate that has the potential to pollute ground and surface waters, and can quickly turn anaerobic and generate odours. The waste should therefore be handled under cover within sealed hard-wearing areas, such as concrete, with drains to collect all the leachate for disposal. Leachate is best disposed of to sewer or to an on-site STP after screening out the coarse material

All trafficable areas used by waste vehicles should be sealed and cleaned of litter and sediment on a regular basis. Discharge from this area should be via a trash screen and a first-flush system to collect litter and sediment. Facilities should be provided for wheel and truck washing at the site.

The transfer trucks should be designed so that any leachate generated in transit is collected for appropriate drainage at the landfill or back at the transfer station.

Air Pollution

The main causes of air pollution at a transfer station are dust, litter, fire, odours from rotting waste or chemicals, and air toxics from industrial waste. The EIS should demonstrate that consideration will be given to these factors at the design stage.

Dust suppression should be considered over the waste unloading and handling areas. This usually consists of fine misting water sprays (to which odour masking agents are added). The building should be enclosed to reduce dust dispersion, and ventilation air drawn out of the building should be passed through cyclones or plate separators to settle the dust before discharge.

Litter should be managed by enclosing the waste unloading and handling areas, and good housekeeping.

The facility should have the equipment and trained personnel to handle the outbreak of fire at the facility should it occur. The gate house should be separate from the unloading area, and if "hot" loads are discovered they should be directed to a separate area where fire-fighting equipment is available. All litter at the site should be promptly picked up, and the build up of dust in the structure of the building (ie, purlins, rafters) kept to a minimum.

Odours are best managed by ensuring all wastes are promptly transferred to the transfer vehicles, and the pit or compactor totally emptied at the end of each day. Particularly odorous loads such as fish waste and viscera should not be unloaded but should go directly to the landfill.

Waste screening at the gate house and unloading area should look for chemical wastes that may generate air toxics, usually from the volatilisation of solvents or fumes from reacting wastes. Facility staff should have training on how to handle such an event.

Transfer trucks must be designed so that litter and dust are not emitted during transport.

Waste Minimisation & Management

Recyclable wastes should not be mixed with waste for disposal and the facility should provide for the separate collection of these recyclable materials.

The operator of the facility should implement a system to record the source, type and amount of incoming wastes to allow for the tracking of unacceptable wastes or potentially recyclable wastes coming into the facility, and to determine if a license from the EPA is required.

Loss of amenity and hazards

Transfer stations can pose a threat to local amenity due to odour, dust, pests, vermin, litter, and noise. The EIS should assess the impacts on nearby sensitive receptors and outline appropriate control measures to be implemented.

Statutory Requirements

If the Transfer station receives less than 30,000 tonnes per annum, there is no requirement to be licensed under the Waste Minimisation and Management Act (1995) (WMMA), however, the proponent will need to monitor the amount of waste received at the station and apply for licence if this amount is exceeded. Therefore, accurate records will need to be kept of the amounts handled.

The proponent will need to determine if Pollution Control Approval (PCA) and/or Pollution Control Licence (PCL) is required for any of the works. If a PCA and/or PCL is required as well as Development Consent, the proposal will fall under the integrated development process with different obligations and timeframes to be met. Should the latter occur, to enable the EPA to assess the proposal and provide its general terms of approval within the required timeframe, the DAVEIS must contain all the relevant information as outlined in this letter.

Towards the end of 1998, current pollution control legislation i.e. *Pollution Control Act 1970*, the *Clean Waters Act 1970*, the *Clean Air Act 1961*, the *Noise Control Act 1975*, the *Environmental Offences and Penalties Act 1989* and the major regulatory provisions of the *Waste Minimisation and Management Act 1995* will be repealed and consolidated into the *Protection of the Environment Operations Act 1997* (POEO Act). Until that time, the regulatory provisions of the WMMA and Pollution Control Act will apply.

I trust this information has been helpful. Should you wish to discuss further, please contact Carol Archer on telephone 02 49269821.

Yours sincerely



Pam Dean-Jones
Head Programs Unit, Hunter
for Director-General

your ref: 58082L02SB
our ref: ER 928

MANAGER
ERM MITCHELL MCCOTTER, (THORNTON)
PO BOX 71,
THORNTON 2322



Wednesday, 21 October, 1998

ATTENTION: Ms. J. Gibbs

21-10-98

Dear Madam

EIS REQUIREMENTS - SALAMANDER BAY WASTE TRANSFER STATION

I refer to your letter dated 15 September 1998 requesting this department's comments in regard to the above proposal. I apologise for the delay, but the Department has now reviewed this matter and provides the following information addressing the principle issues:

SURFACE WATER MANAGEMENT

The EIS should specify the on-site management and potential risks to surface water management for the site. In particular, the SEE must address:

1. Current surface water status of the site, including location and flows of creeks and watercourses, and current water quality.
2. Flow directions and pathways downstream of the site, particularly if any flow is likely to be directed toward SEPP 14 wetland no. 775a.
3. The water management system of the proposal, including clean water diversions around the site, internal segregation of water, storages and any disposal mechanism which is required for on site contaminated water.
4. The likelihood and type of contamination of water involved in the operation, and any treatment, storage or disposal problems which may eventuate.
5. Any particular leachate types which may be generated as a result of the proposed operation, and any remediation or amelioration which is required for leachate on site.
6. Contingencies for spillages, leachate loss or contamination of watercourses downstream of the site, and a description of monitoring procedures for watercourses downstream of the site.

GROUNDWATER

The EIS should provide a description of the groundwater hydraulics of the aquifer system(s) with supporting data. Requirements include providing details on the following:

- detailed geologic mapping to identify adverse geologic conditions (e.g., fracture zones, out-of-slope bedding, fault zones, or other geologic discontinuity's) and any proposed remedial measures.
- different aquifers systems present in the area including their extent and inter-relationships,
- physical and chemical characteristics of aquifers (permeability, storativity, aquifer chemistry)
- flow directions and rates of flow,
- any connections to the surface water bodies or any dependent ecosystems.

The EIS should include details of any potential changes to the existing groundwater regime as a result of the development. Issues include:

- predicted volume of groundwater flow into the landfill over the lifetime of the station,
- changes in water levels and post landfill recovery
- emplacements
- waste management
- methods to control groundwater contamination from leachate
- impacts of dewatering on short-term and long-term changes to groundwater features, related surface

- water bodies and any dependent ecosystems, existing and potential groundwater users in the area
- detailed descriptions of any conceptual models used to make predictions

Under Part V of the Water Act (1912), all proposed groundwater works including bores for the purpose of extraction, dewatering, testing or monitoring must be licensed with DLWC prior to their installation. The EIS should include information regarding:

- locations and construction details of all proposed bores, including their purpose
- if required, expected annual groundwater extractions from individual dewatering bores

Other general information should be provided on:

- details of the proposed monitoring programs, including water levels and quality data
- the reporting procedures for the monitoring program including mechanism for transfer of information
- details of the projected effects of any final void on the groundwater regime
- contingency plans for the rehabilitation of aquifers if there is any adverse impact on the beneficial use of the aquifer system as a result of development.
- details of existing and/or potential groundwater users within the area of the development
- funding assurances covering the anticipated postclosure maintenance cost i.e.-going monitoring for the nominated period
- if required, hydraulic properties, strength and contaminant attenuation capacity of lining material to prevent leachate mobilisation

Any reports or documents on groundwater studies which are referenced in the EIS relating to the assessment of groundwater should be made available to the DLWC for review.

ACID SULFATE SOIL

Deposited NSW coastal soils that are within one metre sea level (AHD) have a high potential to be affected by acid sulfate soil (PASS) materials. The development site may be so affected. A soil survey and soil analysis program should be conducted by the proponent to determine total potential soil acidity and depth to PASS material prior to commencing site work. Where PASS material is to be excavated the proponent will treat the material. Guidelines on preparing such plans are available from the Environment Protection Authority.

EROSION CONTROL SPECIFICATIONS -

The EIS should include a strategy to control erosion and sedimentation which includes at least the following:-

- sequence and staging of development works
- procedures for maintenance of erosion and sediment measures
- location of critical areas (water bodies, drainage lines, unstable slopes, rock outcrops, hard cover areas, flood plains and wet areas)
- location and description of existing vegetation
- location of all earthworks including roads, areas of cut and fill or land regrading
- location and design criteria of erosion and sediment control structures
- diversion of uncontaminated up-site runoff around area to be disturbed
- existing and final contours,
- revegetation program.

VEGETATION

The proponent should determine if the Native Vegetation Conservation Act (1997) is applicable to the proposal and if so apply to have vegetation cleared under permit.

FLOODING ASPECTS

The principal objectives of the State Government's Flood Policy are to reduce the impact of flooding and flood liability on individual owners and occupiers and to reduce private and public losses due to flooding. Under the Flood Policy, proponents of development in flood prone areas are required to demonstrate that local flooding will not be exacerbated as a result of their development and that development is designed in expectation of flooding.

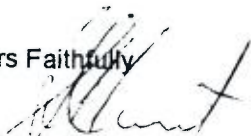
The site is located adjacent to Cromartys Bay in wetlands and is subject to inundation (refer to 1:25000 Topographic Map Port Stephens). The area appears to be subject to flooding from:

- local catchment runoff
- tidal inundation
- elevated water levels in the Port Stephens Inlet as a result of major ocean storm events and wave runup which could pump up water levels.

In preparing an EIS for the proposed waste transfer stations consideration should be given to the potential impact of the development on flood behavior, and the impact of flooding on the development, in accordance with the principles set out in the Government's Floodplain Development Manual. As indicated in the Manual, the local council is responsible for setting the flood standard and development control conditions for the area.

I trust the above information is of assistance in regard to your consideration of this proposal. Should there be any further enquiry in this matter, please contact Mr Jeff Hunt, Resource Planning Manager, at our Newcastle Office on 02 49299850.

Yours Faithfully



Jeff Hunt, Resource Planning Manager
Resource Assessment and Planning, Hunter Region

362.5395/98;1
Mr B J Bradley
Tel: (02) 49 240 332
Fax: (02) 49 240 342
colin_nunn@rta.nsw.gov.au



www.rta.nsw.gov.au

ERM Mitchell McCotter
P O Box 71
THORNTON NSW 2322

Attention: Jane Gibbs

Hunter Region
59 Darby Street
(Locked Bag 30)
Newcastle NSW 2300
Telephone (02) 4924 0240
Facsimile (02) 4924 0347
DX 7813 Newcastle

ENVIRONMENTAL IMPACT STATEMENT - SALAMANDER BAY WASTE TRANSFER STATION

Dear Madam

I refer to your letter dated 15 September 1998 (your reference 58082L02SB) concerning conditions for the proposed Salamander Bay Waste Transfer Station.

Soldiers Point Road and Port Stephens Drive are Local Roads and are the responsibility of Port Stephens Council. Council should also be approached with respect to conditions which may be applied on Soldiers Point Road and Port Stephens Drive.

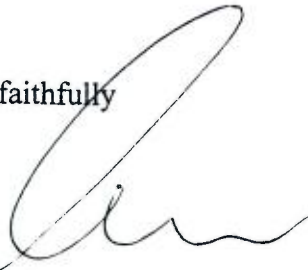
The Environmental Impact Statement should address the following issues:

- a) The potential noise impacts for residents along the haulage route of trucks, particularly along Nelson Bay Road. This should consider the number of trucks, their hours of operation and their frequency;
- b) The potential impacts on the operation of the roundabout at the junction of the Port Stephens Drive and Nelson Bay Road;
- c) The Environmental Impact Statement should include details of the proposed volume and type of vehicles likely to be generated by this development. Additionally, the Environmental Impact Statement should present an assessment of the origin and destination of vehicles associated with the proposed waste transfer station.

Subject to the above being satisfactorily addressed in the Environmental Impact Statement, the proposal should be acceptable.

The RTA reserves the right to comment further after the Environmental Impact Statement is submitted.

Yours faithfully



C W Nunn
Development Manager
Hunter Region

28/10/18

(02) 49709525
ERM Mitchell McCotter Quality System

Referred to	JG	File No.	58082
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Date
Received 20 SEP 1988

Source HWC

78

Explanation for 1

3

78

28918



Hunter Waste Planning and Management Board

2 October 1998

ERM Mitchell McCotter
PO Box 71
THORNTON NSW 2322

Attention: Ms Jane Gibbs

Dear Ms Gibbs,

RE: ENVIRONMENTAL IMPACT STATEMENT - SALAMANDER BAY WASTE TRANSFER STATION

I refer to your letter dated 15 September 1998 relating to a proposed waste transfer station to be located at Salamander Bay.

In terms of the Board's requirements, a standard 'suite of tools' are utilised in assessing and preparing submissions related to Waste Management developments. These 'tools' include:-

- Conformance with, and support of, the objectives and aims of the Waste Management and Management Act. (Specific reference should be made to the Waste Management hierarchy.)
- Conformance with, and support of, programs contained within the Hunter Regional Waste Plan. (Specific reference should be made to individual programs.)
- Conformance with, and support of, the objectives listed in the Cross-Regional Waste Flow Document. (Should the facility handle waste from outside the Hunter Region.)
- Conformance with, and support of, programs contained within the generating regions' waste plan. (Should the facility handle waste from outside the Hunter Region.).

Reference should be made to legislation and the contribution made to specific Regional Waste Plan programs in the Environmental Impact Statement.

Please do not hesitate to contact me if you have any further queries.

Yours faithfully,

A handwritten signature in dark ink, appearing to read 'Tony Cade', with a long, sweeping horizontal stroke extending to the left.

Tony Cade
General Manager



ERM Mitchell McCotter
PO Box 71
THORNTON NSW 2311
Attention: Jane Gibbs

NSW DEPARTMENT OF MINERAL RESOURCES
Minerals and Energy House, 29-57 Christie Street
(P.O. Box 536), St Leonards, NSW 2065, Australia
Phone (02) 9901 8888 · Fax (02) 9901 8777
DX 3324 St Leonards

Ms Gibbs

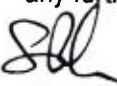
Your ref: 58082L02SB

**ENVIRONMENTAL IMPACT STATEMENT
SALAMANDER BAY WASTE TRANSFER STATION**

Thank you for your letter of 15 September 1998 concerning the above proposal.

There are no known extractive resources or mineral deposits of commercial interest affected by the above proposal. The Department of Mineral Resources therefore has no objection to the proposal and has no further comment to make at this time.

Please contact Mr. John Whitehouse, Geologist, Geological Survey on telephone 02 9901 8513 if you have any further inquiries concerning this matter.


SR Lishmund
for Director General.

29/9/98

JG 58082

DMR

7/8

7/8 1.10.98



NSW
NATIONAL
PARKS AND
WILDLIFE
SERVICE

Ms Jane Gibbs
ERM Mitchell McCotter
PO Box 71
THORNTON NSW 2322

ERM Mitchell McCotter Quality System			
Referred to	JG	Ref. No.	58082
Date Received	29 SEP 1998		
Source:	NPWS		
Data suitability check required	Yes ☒	No ☐	
Data is:	Current ☒	☐	
	Applicable to project ☒	☐	
Checked by:	JB		
Add an explanation for 'no' answers or data			
Date: 29.9.98			

Your Ref: 58082L02SB
58082L02LT
Our Ref: 96/370

Dear Ms Gibbs

**EIS - Salamander Bay Waste Transfer Station
SEE- Lemon Tree Passage Waste Transfer Station**

Thank you for your letters dated the 15 September in which you consult with the National Parks and Wildlife Service (NPWS) with regard to the requirements for the environmental impact statement for the proposed Salamander Bay waste transfer station and the statement of environmental effects for the proposed Lemon Tree Passage waste transfer station.

The NPWS has statutory responsibilities for the protection and care of native flora, native fauna and Aboriginal sites and for the management of NPWS reserves. Accordingly the NPWS has an interest in ensuring that potential impacts to these attributes are appropriately assessed.

To assist in this regard, it is recommended that the matters referred to in the attached guidelines titled "General Guidelines for Impact Assessment" be addressed in your assessment where appropriate. These guidelines also provide information on any approvals that may be relevant under the National Parks and Wildlife Act and a summary of the NPWS' databases which may be of assistance to you in your assessment.

Please contact me on (02) 9585 6675 if you have any questions concerning this matter.

Yours sincerely,

Susan Harrison 25/9/98

Susan Harrison
Environmental Planning Officer
Sydney Zone

Sydney Zone
6th Floor
43 Bridge Street
Hurstville NSW
Australia
PO Box 1967
Hurstville 2220
Fax: (02) 9585 6442
Tel: (02) 9585 6678



NSW FISHERIES

Jane Gibbs
Project Manager
ERM Mitchell McCotter
PO Box 71
THORNTON 2322

Your Refs: 58082L02SB
58082L02LT

Our Ref: PS804002

Dear Jane,

Re: Waste Transfer Stations at Salamander Bay and Lemon Tree Passage

Thank you for giving NSW Fisheries the opportunity to comment on the proposal.

The issues related to the waste transfer stations are mainly related to the potential for contamination of the nearby waterways, which contain extensive oyster cultivation and commercial and recreational fishing resources.

Our preference is that all leachate and runoff water be collected and treated on site with disposal to the sewers. This will isolate the risk of contamination from the waterways.

- The issue of water contamination, particularly in the Salamander Bay area should be addressed, with particular emphasis on the claims of leachate from the present landfill entering Cromarty's Bay. Consequently, to determine and assess the treatment of water from the site a comprehensive water quality monitoring programme should be put in place. This can be used to assess current water quality and as a base for future monitoring of runoff quality. Of particular interest are the drains from the vicinity of the existing landfills and the nearby bays.
- The Lemon Tree Passage site should be developed to ensure that contamination of the groundwater cannot occur.
- Transfer of waste should be in containers that are sealed to reduce the risk of spills of liquid waste between the stations and final repository for waste. If the waste is to be transferred wet, the liquid should be contained in a tank and be decanted at the final destination, not discharged on the road.

For further information, please contact me on (02) 4980 4931.

Yours sincerely

Scott Carter
A/Senior Conservation Manager (Central)

ERM Mitchell McCotter	
Referred to	JA. 58082
Date Received	24
Source	NSW Fisheries
✓	
✓	
✓	
24.9.98	



NSW Agriculture

Regional Director - Hunter Region
PO Box 123 Maitland NSW 2320
Phone (049) 302 444 Fax (049) 302 410

Our Ref: Glenda Briggs
Agricultural Environmental Officer

Your Ref: 58082L02AB

22 September, 1998

ERM Mitchell McCotter ,
PO Box 71
Thornton 2322

Attention Jane Gibbs

Salamander Bay Waste Transfer Station, Statement of Environmental Effects

I refer to your letter of 15 September 1998 requesting NSW Agriculture comments on matters to be included in the statement of Environmental Effects for the proposed waste transfer depot at Lemon Tree Passage.

The Department's concerns for such developments relate to any impacts the development may have on Agricultural production and associated resources such as land and water. NSW Agriculture is also strongly committed to the principles of sustainable development and the protection of the State's natural resources. In particular the Department advises that the statement of environmental effects should include an assessment of whether the proposal will:

- cause a loss or alienation of agricultural land
- have an adverse impact on rural landholders or surrounding agricultural activities
- affect the long term productivity and fertility of agriculture land, such as through soil erosion, acidification, salinity, nutrient and chemical toxicity, weed proliferation, or feral pests
- adversely affect surface or groundwater quality
- threaten significant vegetation communities or faunal habitats, such as remnant coastal vegetation and wetlands.

Although outside the declared *Phylloxera* quarantine area, Port Stephens LGA adjoins the Hunter zone and important viticultural operations. As such it is critical that no material which may contain any form of plant material of the *Vitus* species is transferred ~~outside of the shire into restricted areas~~ without a permit.

Yours faithfully


Glenda Briggs
Agricultural Environmental Officer
Hunter Region

ERM Mitchell McCotter Quality System	
Referred to	JG
Date Received	23 SEP 1998
Source:	NSW Ag
Data suitability check required	☒
Data is:	☒
Current	☒
Applicable to project	☒
Checked by:	
Attach explanation for 'not answers' problems	
Signature:	 239-98



prelet21/a
22 September 1998

ERM Mitchell McCotter
PO Box 71
Thornton
NSW 2322

Attention: Jane Gibbs

Dear Jane

RE: EIS for Salamander Bay Waste Transfer Station.

The Soldiers Point / Salamander Bay / Taylors Beach Precinct Committee wish to have the following points raised in the EIS.

(1) We are concerned about the number of truck movements per day along Soldiers Point Road to and from the transfer station when it opens. Recently, residents along that section of road petitioned Council in an endeavour to have a quieter road surface made, and the transfer station will increase the number of trucks using that road. Also, when the transfer station is in operation, loaded trucks will be going up the hill on Soldiers Point Road to Port Stephens Drive en route to either the co-composting facility or to a Materials Recovery Facility. This will create more vehicle noise than at present, when the vehicles going up the hill are empty.

We suggest that access to the Transfer Station be from the 'old' Port Stephens Drive, with the only entrance to that section of road being from Port Stephens Drive. We believe this suggestion is an environmentally friendly solution to the problems associated with heavy truck movements in the residential area along Soldiers Point Road.

(2) The present entrance to the landfill area is anything but attractive, particularly as it is on a the main road to Soldiers Point. We suggest that as part of the development of the transfer station that this entrance be beautified in such a way that the present Recycling area be hidden from view, preferably with a hedge and garden.

(3) Precinct members suggest that the present landfill area be made into a special garden, which could be a major tourist attraction. It would not only be attractive, but would be an example of how a most unattractive location can be converted to a valuable asset.

Thank you for your invitation for our comments.

Yours sincerely

Lindsay Harvey (secretary)

ERM Mitchell McCotter Quality		
Referred to	JA	Ref. No. 58082
Date Received	28 SEP 1998	
Source:	PRECINCT Committee	
Data suitability check required	✓	
Data is:	✓	
Current	✓	
Applicable to project	✓	
Checked by	JB	
Please refer to the following answers		



NSW NATIONAL PARKS AND WILDLIFE SERVICE

ABORIGINAL CULTURAL HERITAGE AND THE INTEGRATED DEVELOPMENT ASSESSMENT PROCESS

INFORMATION FOR APPLICANTS

1 July 1998

This information is presented to assist you to lodge an integrated development application with your local council. Part 4 of *Environmental Planning and Assessment Act 1979* has recently been amended. The new *Environmental Planning and Assessment Amendment Act 1997* provides a single system for the development, building and subdivisions aspects of a proposal, and involves the linking of some approvals granted by State government agencies under other environmental legislation. Development proposals which require an approval or licence from one or more of these State agencies (refer to section 91 of the *EP&AA Act*) are known as an integrated approval. The basis of the IDA process involves applicants providing up-front the information necessary for agencies or approval bodies to determine if they will give the general terms of approval necessary for granting additional approvals.

The National Parks and Wildlife Service (NPWS) is one of the State government agencies which has been included in the IDA process, in relation to its responsibilities for Aboriginal relics and Aboriginal places under Section 90 of the *National Parks and Wildlife Act 1974*. Under Section 90, it is an offence to knowingly destroy, deface or damage a relic or Aboriginal place without the consent of the Director-General of the National Parks and Wildlife Service.

When is the NPWS an approval body in the IDA process ?

The NPWS is an approval body in the IDA process when a development will impact on an Aboriginal relic or Aboriginal place, thereby requiring a consent to destroy from the Director-General of the National Parks and Wildlife Service. Threatened species, populations and/or ecological communities do not trigger the IDA process as the *EP&A Act* and *Threatened Species Conservation Act* eliminated the need for separate licensing or approvals in relation to these issues.

- 1) A 'relic' is known to exist on the land to which the DA applies; and/or the land to which the DA applies is an Aboriginal place, immediately before the DA is made (as per s.91 (2)(a-b), *EPA Amendment Act 1997*); AND
- 2) The development proposal will destroy, deface or damage an Aboriginal 'relic' or Aboriginal place, and a consent to destroy from the Director-General of the National Parks and Wildlife Service will be required, as per section 90 of the *National Parks and Wildlife Act 1974* (note damage to an Aboriginal relic or place may be direct damage or result from indirect impacts).

Under the *NPW Act*, a 'relic' is defined as any deposit, object or material evidence (not being a handicraft made for sale) relating to indigenous and non-European habitation of the area that comprises NSW, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains (as defined within the meaning of the *NPW Act*). Relics are confined to physical evidence. Aboriginal 'relics' are commonly referred to as Aboriginal sites.

An 'Aboriginal place' is a place which has been declared so by the Minister for the Environment because he or she believes that the place is or was of special significance to Aboriginal culture. It may or may not contain physical relics.

It should be noted that those places in the landscape which have particular meaning for Aboriginal people, for example, spiritual areas or natural mythological areas, and where there are no physical remains of Aboriginal occupation are not protected under the *NPW Act*, unless they have been declared an 'Aboriginal place'.

What is a 'known' Aboriginal site or an Aboriginal place ?

For the purposes of the IDA process, the NPWS considers that a relic may be considered to be 'known' if:

- It is registered on the NPWS Aboriginal Sites Register; and/or
- It is an Aboriginal site known to the Aboriginal community; and/or
- It is located during surveys (eg: archaeological, anthropological) or test excavations conducted prior to lodgement of the DA.

An Aboriginal place is considered to be known if it has been declared by the Minister, and gazetted.

How do I find out if there is an Aboriginal site on the land ?

To find out whether the land you want to develop contains known Aboriginal site/s or an Aboriginal place, you need to:

- Consult with the Aboriginal community groups to identify the location of Aboriginal sites. They may be aware of sites that have not been registered with NPWS.
- Contact the Aboriginal Sites Registrar at NPWS and request a site search to obtain a listing of registered Aboriginal sites. The Register only includes those Aboriginal sites which have been reported to NPWS. **Attachment 1** provides general information on the Aboriginal Sites Register, and a site search request form.
- Undertake an assessment of the known Aboriginal site/s and/or undertake survey of the subject land to locate Aboriginal sites. Test excavations may be required as part of this investigation to verify the location of Aboriginal sites. Such excavations need to be undertaken before the DA is submitted. A permit is required from NPWS for such investigation and if all information is attached to the application the processing time is 8 weeks.

Once you have this information, you need to assess whether the development proposal will impact upon an Aboriginal site or an Aboriginal place. While the *NPWS Act* provides for the destruction of Aboriginal sites, this should always be considered as a last option, and in-situ conservation is the preferred option.

How to find out whether land contains a gazetted Aboriginal place

An Aboriginal place may be considered known if it has been declared by the Minister, and gazetted. Information on whether a proposed development site contains an Aboriginal place may be obtained by contacting the NPWS Aboriginal Sites Register (refer **Attachment 1**).

What information do I need to include with my development application ?

You need to clearly state in your development application to Council whether your proposal would impact on a known Aboriginal site or an Aboriginal place. To assist Council in deciding whether the IDA process is triggered, it is suggested that you provide Council with:

- Evidence of consultations with the Aboriginal community group/s, which clearly outlines the extent of their involvement in the assessment process, and their views on the proposal.
- A copy of a site search from the NPWS.
- Where a field survey and/or archaeological test excavations are carried out, a copy of the assessment report.

If the IDA process is triggered through the presence of known Aboriginal site/s and/or an Aboriginal place which would be impacted by a proposed development, Council will contact the NPWS seeking its general terms of approval. In order to provide general terms of approval the NPWS will need the same level of information required to make the actual decision.

Applicants need to include two types of information in their IDA application:

1. Aboriginal cultural heritage assessment which involves consultation with Aboriginal community groups. The NPWS is committed to working in partnership with Aboriginal community groups in the management of sites and requires community assessment of any Aboriginal sites.
2. Archaeological assessment which involves the assessment of Aboriginal sites and their management based on archaeological heritage criteria.

The following advice sets out the NPWS information requirements in more detail. Not all applications will attract the same information requirements. As some of this information is of a technical nature, the NPWS suggests that you consider engaging a reputable archaeologist to assist in the preparation of an IDA.

1. Aboriginal Cultural Heritage Assessment

Aboriginal sites can be the physical remains of Aboriginal occupation of an area or alternatively, an area that has particular meaning for Aboriginal people, for example, spiritual areas or natural mythological areas. It is important to consider that Aboriginal heritage is not only valuable to Aboriginal people but also to those people who are interested in learning from the early inhabitants of Australia. Proposed developments that alter landscapes can impact on these various types of Aboriginal sites.

1.1.1 Aboriginal Community Group/s Consultation

Applicants should contact (as early as possible) local Aboriginal community groups, including Local Aboriginal Land Councils, any known Tribal Elders Corporations and Native Title Claimants and, if required, archaeological consultants, to ensure that proper consultation processes are carried out.

The purpose of Aboriginal involvement is:

- To identify the Aboriginal cultural values of Aboriginal sites and places of significance to the Aboriginal community that may be affected by the proposal in a timely manner so that potential impacts can be avoided wherever possible;
- To notify the local Aboriginal people in sufficient detail about activities or developments which may impact on Aboriginal heritage, so that their concerns can be identified on a fully informed basis;
- To ensure that where there are Aboriginal people who hold cultural knowledge, they are able to contribute to the assessment process in ways that are culturally acceptable to them; and
- To identify whether there are culturally acceptable mitigative measures when impacts are considered to be unavoidable by the applicant.

It is essential that applicants provide NPWS with evidence of these consultation discussions with Aboriginal community groups and the extent of their involvement with the assessment process. Usually a letter from the respective groups is included in the appendix of the

assessment report to document their views and recommendations. To obtain a list of Land Councils and Native Title claimants contact:

NSW State Aboriginal Land Council

PO Box W125

Parramatta NSW 2150

Ph: (02) 9689 4444

Department of Aboriginal Affairs

Level 5

83 Clarence Street

Sydney NSW 2000

Ph: (02) 9290 8700

The Environmental Planning and Assessment Amendment Regulation 1998 (Schedule 1, 53AA) allows 46 days (from the date of DA lodgement) for the Director-General of the National Parks and Wildlife to undertake any further Aboriginal community consultation, if the Director-General of the NPW considers that such consultation is required before the Director-General can make a decision concerning the general terms of approval, and consultation commences within 25 days after the date of DA lodgement.

1.1.2 Aboriginal Cultural Heritage Assessment Report

The report should contain:

1. Information on the nature, timing and location of consultation, including the identification of individuals and/or groups consulted and copies of any correspondence from those individuals and/or groups;
2. A statement of the Aboriginal community group/s understanding of the values of the known Aboriginal site/s and/or Aboriginal place located on the development site. This may include social, spiritual, historic, and archaeological values.
3. A statement of the Aboriginal community group/s response to the development and their requirements (if any) for mitigation or impacts and/or conservation of known Aboriginal sites.

2.2 Archaeological Assessment

The NPWS' requirements for archaeological assessment are summarised below. It should be noted that the assessment of individual Aboriginal sites and the development of management strategies may not require that all of the following information requirements are addressed, however, the relevance of each requirement needs to be considered for each proposal. As a statement of general approach, the assessment of Aboriginal sites should be directed towards their conservation and protection, with participation of the Aboriginal community groups of a particular area. While the *NPW Act* provides for the destruction of Aboriginal sites, this option should always be considered as a last option and must be well supported.

In addition, the NPWS has produced a draft document "*Aboriginal Cultural Heritage Standards and Guidelines Kit*" 1997 which sets out in detail NPWS requirements for reporting on Aboriginal sites and assessments (refer **Attachment 2** for information on this kit).

2.2.1 Locational Context:

- description of location of study
- legislative and cadastral context (eg: Lot, DP)

2.2.2 Description of Development Impact

- type of development
- extent of direct impacts
- extent of potential indirect impacts (eg: run-off, increased visitation)
- flexibility of project design
- staging and how this might effect present or future management decisions

2.2.3 Assessment Context

- the brief for the work being undertaken for this particular project
- objectives of the assessment

2.2.4 Archaeological Context

- targeted review of known archaeology of region and previous work in the study area to identify range of expected archaeological evidence relative to the project and landscape
- type/s of Aboriginal sites
- synthesis and evaluation of this information to identify archaeological issues. These issues will provide the basis for defining the archaeological assessment and management context relevant to this study, and the development of appropriate management options, with protection/conservation being the primary consideration

2.2.5 Site Condition

- previously reported condition and present condition of the Aboriginal site/s
- whether the condition of the Aboriginal site/s would be affected by the development (eg: fragile site, increased visitation)
- past land uses in the study area (to include previous surface impacts, where the assessment involves sites that may be buried such as campsites, burials)
- effects of past land uses on the land surface
- description of ground surface conditions and supporting tabulated data (for surveys)
- assessment of how the landsurface conditions have revealed, concealed, destroyed, impacted on or preserved archaeological evidence and how this relates to archaeological potential and the condition of sites in these contexts

2.2.6 Methodology for Investigation

- framework for the present investigation based on the analysis of previous archaeological work
- how the landscape context and previous land surface impacts is relevant to the study objectives
- description of the scope and method of recording and analysis by which the objectives of the study will be achieved
- the method whereby a clear and supportable significance assessment will be undertaken a supportable rationale for any proposed test excavations

2.2.7 Landscape Context

- description of landscape classification and land units being used for the study, to include the identification of any paleo-features
- assessment of how the landscape relates to models of site location and archaeology
- identification of areas of archaeological sensitivity

2.2.8 Survey Strategy (where appropriate)

- description of input from the Aboriginal community to the survey method
- the proposed field methodology, such as type of sampling strategies and survey coverage which need to be targeted to the objectives of the study

2.2.9 Field Methods

- full description of methods used
- sample areas
- criteria for variation in methods adopted

2.2.10 Survey Coverage Data

- description of survey coverage and the effectiveness of that coverage for detecting potentially buried Aboriginal sites (this needs to be fully described and evaluated within the context of the objectives and the study plan. Specific methods are detailed in the NPWS Standards & Guidelines Kit)

2.2.11 Analysis and Reporting

- detailed Aboriginal site description/s including tabulated data
- comprehensive evaluation of the study results (for potentially buried archaeological deposits this includes incorporating the information on archaeological potential and the reliability of survey coverage)

2.2.12 Archaeological Significance

- the significance criteria and attributes used for the assessment need to be fully supported by the information presented on the archaeological and landscape context of the site/s (eg: representativeness, rarity, information potential, potential meanings, social/historical values)

2.2.13 Conclusions of the Study

- evaluation of potential impacts on known Aboriginal sites
- areas of archaeological sensitivity and potential (if relevant)
- establish clear relationship between significance assessment and impacts
- consideration of various management options, specifically identification of conservation options
- description of mitigation works required

2.2.14 Management Options

- recommendations for conservation and other management options based on the results of the archaeological report and discussions with the land owner / manager and the Aboriginal community group/s

- incorporation of management options from Aboriginal community group/s where these relate to the management options being proposed for Aboriginal sites or an Aboriginal place

The following maps are essential:

- location of study area (1:25,000 map series where available)
- development layout if known, flexible components of design if applicable
- (for surveys) survey/sample landscape units, locations/routes of survey, Aboriginal site locations
- (for surveys) survey coverage data
- locations referred to in the text
- land units and topographic information used
- land surface history highlighting the disturbed and intact deposits

A comprehensive glossary of terms used should also be provided.

Subsequent to the grant of development consent.

Please note that while you may have been granted a development consent, you are still required to apply to the NPWS for a consent to destroy an Aboriginal site and/or Aboriginal place. You have up to three (3) years to apply to the NPWS for a consent to destroy an Aboriginal site or an Aboriginal place. This will involve the submission of an application and the payment of a fee to have the application assessed. For more information about how to applying for a consent to destroy, contact the relevant NPWS office (see below).

What happens if an Aboriginal site is found on the land after a development application is lodged or a development consent is granted ?

It is possible that an 'unknown' Aboriginal site could be identified on the land over which a development application has been lodged or development consent has been granted. The NPWS strongly advises that an adequate assessment of Aboriginal heritage values of the land is carried out prior to lodgement of the DA, so that this situation does not arise. However, in the event that this does occur, all works on or adjacent to the Aboriginal site must cease, and you must identify a conservation option to protect the Aboriginal site or seek a consent to destroy the Aboriginal site from the Director-General of NPWS. A development consent granted under the *EP&A Act* does not equate to a Section 90 consent issued under the NPW Act. A consent to destroy an Aboriginal site must be granted pursuant to the *NPW Act* before an Aboriginal site or Aboriginal place can be destroyed. Failure to obtain this consent may result in prosecution.

Fees

The NPWS will charge a fee of \$250 to process the development application for an integrated approval. This fee should be paid by cheque and attached to the integrated development application. The cheque should be made out the National Parks and Wildlife Service.

This fee is only for the processing of an integrated development application. You may be required to pay separate fees to the NPWS to obtain a site search from the NPWS Aboriginal

Sites Register, and/or a fee if you apply to the NPWS for an application for consent to destroy an Aboriginal site.

Contacts

The National Parks and Wildlife Service has an Aboriginal Heritage Division which manages Aboriginal heritage. The Division consists of 4 geographic units, which are aligned with the NPWS Zone boundaries (ie: Northern, Western, Southern and Sydney). These boundaries are shown on **Attachment 3**.

For further information on NPWS requirements for Aboriginal heritage assessment contact:

Manager, Central Cultural Heritage Unit Aboriginal Heritage Division NSW National Parks and Wildlife Service PO Box 1967 HURSTVILLE NSW 2040 Ph: (02) 9585 6674 Fax: (02) 9595 6442	Manager, Northern Cultural Heritage Unit Aboriginal Heritage Division NSW National Parks and Wildlife Service Locked Bag 914 COFFS HARBOUR NSW 2450 Ph: (02) 6659 8245 Fax: (02) 6651 6187
Manager, Southern Cultural Heritage Unit Aboriginal Heritage Division NSW National Parks and Wildlife Service PO Box 2115 QUEANBEYAN NSW 2620 Ph: (02) 6298 9736 Fax: (02) 6298 4281	Manager, Western Cultural Heritage Unit Aboriginal Heritage Division NSW National Parks and Wildlife Service PO Box 1007 DUBBO NSW 2830 Ph: (02) 6883 5345 Fax: (02) 6884 9382

ATTACHMENT 1



THE ABORIGINAL SITES REGISTER OF NSW **GENERAL INFORMATION**

The National Parks and Wildlife Service maintains the Aboriginal Sites Register of NSW. The Register includes a computer database and site recording cards for all recorded Aboriginal sites in NSW, in addition to a database index of archaeological reports and a library of these reports. Information from the Register may be made available for a variety of uses.

What information is available?

Information relating to recorded Aboriginal sites in a particular area may be made available upon request. The information is generally available in the form of a standard report from the Register database. This report lists all recorded sites within and/or surrounding the area of interest, with each record including the site identifying number, site type, site location and Australian Map Grid co-ordinates, date of recording and the name of the recorder of the site.

If the area of interest is particularly large (eg. a river catchment), a Data Licence Agreement may be required. This agreement is a legal contract document between the Director-General of the National Parks and Wildlife Service and a named client, and is designed to ensure that any data supplied under the agreement is used appropriately.

In some cases, written support from the relevant Local Aboriginal Land Council may be required before information can be provided from the Register.

How is the data provided?

Site information will generally be provided as a standard computer print out, however, digital computer formats on disk may be available for specific purposes.

Is there a charge for data?

The cost for supply of a standard report is \$30 per search area. An urgent database search may be conducted for \$60. More complex reports may incur an additional charge.

In particular circumstances there may be no charge for a report (eg. for Aboriginal Land Councils, research purposes etc.). The waiving of any charge requires discussion with the Aboriginal Sites Registrar.

There is no charge imposed for a Data Licence Agreement, however, any data supplied under a Licence Agreement will generally be charged at the current "cost of transfer".

Are there any limitations in the data?

It is essential to note that a report from the Register does not represent a comprehensive list of all Aboriginal sites in a specified area. A report lists recorded sites only. In any given area there may be a number of undiscovered and/or unrecorded sites. As a result of this limitation, and the fact that all Aboriginal sites are protected under NSW legislation, the NPWS may recommend that a survey for Aboriginal sites is conducted where development is proposed.

Locational details are recorded as grid references. It is important to note that there *may* be errors in these recordings. If accurate site locations are required it may be necessary to confirm the locations on the ground.

If the information provided is to be used for ongoing purposes, it is recommended that regular updates are obtained as new records are continually being added to the database.

How to obtain Aboriginal sites data

To obtain information about recorded Aboriginal sites, a written request should be forwarded to the Aboriginal Sites Registrar (a request form is available if required). All requests must include;

- Company/organisation name (if applicable)
- Contact name, phone number and address details
- Purpose for which the information is required
- Copy of a topographic map with the area of interest clearly marked
- A cheque for \$30 per search area, made out to the NPWS (unless other arrangements have been made with the Registrar)

Applications should be forwarded to:

**The Aboriginal Sites Registrar
NPWS
PO Box 1967
Hurstville, NSW 2220.**

or fax (02) 9585 6466

Further information

For further information about the Aboriginal Sites Register, please contact the Aboriginal Sites Registrar (02 9585 6471, fax 02 9585 6466) or the Database Co-ordinator (02 9585 6843, fax 02 9585 6466).

ATTACHMENT 2



Aboriginal Cultural Heritage Standards and Guidelines Kit

c o m p r i s i n g

Guidelines for Aboriginal Consultants

These *Guidelines* aim to clarify for Aboriginal consultants the type of reporting required for heritage assessments. The *Guidelines* reflect the Service's commitment to partnership with Aboriginal stakeholders in protecting and managing Aboriginal cultural heritage.

•

Standards Manual for Archaeological Practice in Aboriginal Heritage Management

The *Standards Manual* sets out current best practices in this diverse and developing field. The *Manual* encourages archaeological methodology to be relevant to the management context. It has been developed in partnership with the professional community and will be supplemented by regular updates.

•

Guidelines for Archaeological Survey Reporting

These *Guidelines* set out in detail the requirements of NPWS for survey reports submitted by archaeologists. The object is to enhance the comparability of survey reports as well as to promote transparency and predictability in the industry by making clear the needs and expectations of NPWS as the reviewing agency.

•

Guidelines for Aboriginal Heritage Impact Assessment in the Exploration & Mining Industries

These *Guidelines* provide industry-specific advice to applicants of exploration and mining ventures. They were prepared by NPWS in cooperation with the NSW Minerals Council and the NSW Department of Mineral resources.

To obtain a copy of this valuable kit please send a cheque for \$70 made out to
NPWS to:
Cultural Heritage Services Division, NPWS, PO Box 1967, Hurstville NSW 2220
Enquires to
Denis Byrne (02)9585 6571 denis.byrne@npws.nsw.gov.au
Anthony English (02)9585 6464 anthony.english@npws.nsw.gov.au
Daphne Siu (02) 9586 6642



NSW NATIONAL PARKS AND WILDLIFE SERVICE

GENERAL GUIDELINES FOR IMPACT ASSESSMENT

The National Parks and Wildlife Service (NPWS) has an interest in the potential impacts of proposals on the following:

- areas of native vegetation;
- areas of potential value as habitat for native fauna;
- sites and places of Aboriginal cultural heritage, including areas of archaeological potential; and
- land dedicated under the *National Parks and Wildlife Act 1974 (NP&W Act)*.

If these attributes are anticipated to be present in your study area and / or likely to be impacted, it is recommended that assessments by a suitably qualified person be undertaken to determine the extent of impact. The NPWS suggests that the following basic details be included in the assessments:

- the qualifications and experience of the person undertaking the work; and
- a detailed description of survey methodology including survey design, sampling methods, weather conditions, time and duration of surveys and location of any survey sites and transect lines.

Specific issues that are recommended to be addressed by the assessments are detailed below.

General information

- description of the proposal and the way in which the environment will be modified;
- map(s) placing the proposal in a regional and local setting;
- applicability of Local Environmental Plans, Regional Environmental Plans and State Planning Policies to the proposal;
- information on the current and past land uses of the site and that of the surrounding area; and
- appropriately scaled maps which identify the location and extent of any areas of native vegetation and fauna habitat and Aboriginal cultural heritage value in relation to the area of proposed development.

Impacts

- prediction of the likely impact of the proposal on land dedicated under the *NP&W Act*;
- prediction of the likely impacts of the proposal on areas and items of natural significance, such as native vegetation and fauna habitat, and on Aboriginal heritage sites and areas of cultural significance. This should include consideration of any off-site impacts; and
- assessment of measures available to minimise the impact of the proposal on these attributes, including potential conservation options, alternative development options and monitoring programs, if appropriate.

Native flora, fauna and threatened species

The following information is considered necessary to assess the potential impact of a proposal:

- detailed description and mapping of all vegetation communities in the study area;
- identification of any vegetation communities or plant species which are of local, regional or state conservation significance (including threatened species, populations, ecological communities or critical habitat listed under the *Threatened Species Conservation (TSC) Act*). The criteria for establishing significance should be documented;
- description of known or expected fauna assemblages within the study area;
- identification of fauna habitat likely to be of local, regional or state significance (including habitat of threatened species, populations, ecological communities or critical habitat listed under the *TSC Act*);
- identification of habitat corridors and linkages between areas of remnant native vegetation which may assist faunal movement through the area and an assessment of the conservation significance of these; and
- prediction of the likely impact of the proposal on the above attributes (quantification of the extent of impact where practical).

In addition to these general requirements, there are specific requirements relating to the assessment of a proposal and its potential impact on threatened species, populations, ecological communities, their habitats and critical habitat.

The provisions of the *TSC Act* and related provisions of the *Environmental Planning & Assessment Act* should be considered when undertaking the assessment of a proposal. In addition to the *TSC Act* itself, further information on the provisions of the *TSC Act* may be obtained from the Department of Urban Affairs and Planning Circular No. A13 (12 December 1995). The NPWS has also produced Information Circulars on the *TSC Act* which may be obtained by contacting the NPWS Information Centre on (02) 9585 6333.

Concurrence provisions

Where a consent authority determines that a proposal is likely to have a significant effect on threatened species or their habitats, a species impact statement (SIS) must be prepared in accordance with the requirements of the Director-General of the National Parks and Wildlife Service. If, after considering the SIS, a consent authority intends to grant approval to a proposal that will have a significant effect on threatened species or their habitats then the concurrence of the NPWS is required. If the Minister for Urban Affairs and Planning is the consent authority the concurrence of the NPWS is not required, but consultation must occur with the Minister for the Environment before development consent is granted.

The process and timeframes for development applications that require concurrence are detailed in Division 2 of the *Environmental Planning and Assessment Regulation 1998*.

Aboriginal heritage

General issues

For the purposes of these guidelines Aboriginal heritage is considered to include "relics" and places of significance to Aboriginal communities.

Under the *NPW Act*, a 'relic' is defined as any deposit, object or material evidence (not being a handicraft made for sale) relating to indigenous and non-European habitation of the area that comprises NSW, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains (as defined within the meaning of the *NPW Act*). Relics are confined to physical evidence. Aboriginal 'relics' are commonly referred to as Aboriginal sites.

An "Aboriginal place" is a place which has been declared so by the Minister for the Environment because he or she believes that the place is or was of special significance to Aboriginal culture. It may or may not contain physical relics.

It should also be noted that there are places in the landscape which have particular meaning for Aboriginal people, for example, spiritual areas or natural mythological areas. Although these areas are not protected under the *NPW Act*, unless they contain physical remains of Aboriginal occupation or have been declared an 'Aboriginal place', it is recommended that the potential impact of proposals on such places also be considered in the assessment process.

Assessment process

It is recommended that an assessment be conducted of the Aboriginal cultural values of the study area if the proposal involves disturbance to substantially unmodified ground surfaces. If the study area is considered to have archaeological potential or cultural significance then it is recommended that a survey and assessment be undertaken in accordance with NPWS guidelines. These guidelines are contained in the NPWS' publication "Aboriginal Cultural Heritage: Standards and Guidelines", which may be purchased by contacting the NPWS' Cultural Heritage Conservation Division on (02) 9585 6571.

Should any Aboriginal archaeological sites be present in the study area, you should consider the requirements of the *NP&W Act* with regard to Aboriginal relics. Under s90 of the *NP&W Act* it is an offence to knowingly damage or destroy relics without the prior permission of the Director-General of the NPWS.

In assessing Aboriginal heritage values, consideration should also be given to whether the study area is likely to contain places of cultural significance to the Aboriginal community. It should be noted that places of cultural significance to the Aboriginal community are not limited to archaeological sites. An assessment of cultural significance should involve consultation with community representatives and if necessary, documentary research to establish whether there are any places of traditional or historic significance to the Aboriginal community.

Integrated Development Assessment

Under recent amendments to the *EP&A Act*, a range of approvals and licences issued by various agencies have been integrated with the development approval process. Section 91 of the *Environmental Planning and Assessment Amendment Act 1997* lists the approvals of agencies which are included in the integrated development assessment (IDA) process.

This includes Section 90 approvals under the *NP&W Act* regarding consent to knowingly destroy, deface or damage or knowingly cause or permit the destruction or defacement of or damage to an Aboriginal relic or Aboriginal place. Where a relic or an Aboriginal place is known to occur on land prior to the lodgement of a development application, and the development proposal will damage, deface or destroy the relic or Aboriginal place, thereby requiring a consent to destroy from the Director-General of the NPWS, the NPWS will become an approval body.

It should be noted that where a relic or Aboriginal place is found to occur on land after a development application is lodged, separate NPWS approval will still be required under Section 90 of the *NP&W Act*.

To assist Councils and applicants in the IDA process, the NPWS has prepared detailed guidelines (copy attached). These outline the role of the NPWS in the IDA process and describe the information that needs to be submitted in an integrated development application. In summary, two types of information are required:

- Aboriginal cultural heritage assessment which involves consultation with the Aboriginal community groups. The NPWS is committed to working in partnership with the Aboriginal community groups in the management of Aboriginal sites and requires community assessment of any Aboriginal site management; and
- Archaeological assessment which involves the assessment of Aboriginal sites and their management based on archaeological heritage criteria.

Environmental impact statements

Where an environmental impact statement (EIS) is required to be prepared for an integrated development, the Director-General of the Department of Urban Affairs and Planning (DUAP) must request each approval body to provide their requirements in relation to the EIS. If the approval body does not provide those requirements within 14 days then the Director-General of DUAP must inform the applicant and the applicant must consult with the approval body to obtain its requirements for the EIS.

If an EIS is to be prepared for an integrated development that involves a Section 90 approval under the *NP&W Act*, the NPWS will be requested to provide its requirements for the EIS. In this situation, the NPWS requirements for the EIS are the same as for any IDA proposal that requires a Section 90 approval under the *NP&W Act*. These requirements are detailed in the attached guidelines.

Databases

The NPWS has two GIS databases which may provide information of use to you if you proceed to undertake further assessment. These are:

- ☐ Atlas listing of fauna and flora records in NSW;
- ☐ Aboriginal Sites register.

The material from these databases is available upon written application and the receipt of the appropriate fee. If you are interested in obtaining access to the Atlas database, please contact the Data Licensing Officer, GIS Division, on (02) 9585-6684. Records from the Aboriginal Sites register may be obtained upon written application to the Registrar, Cultural Heritage Conservation Division, on (02) 9585-6471.

Further Information

For further information please contact:

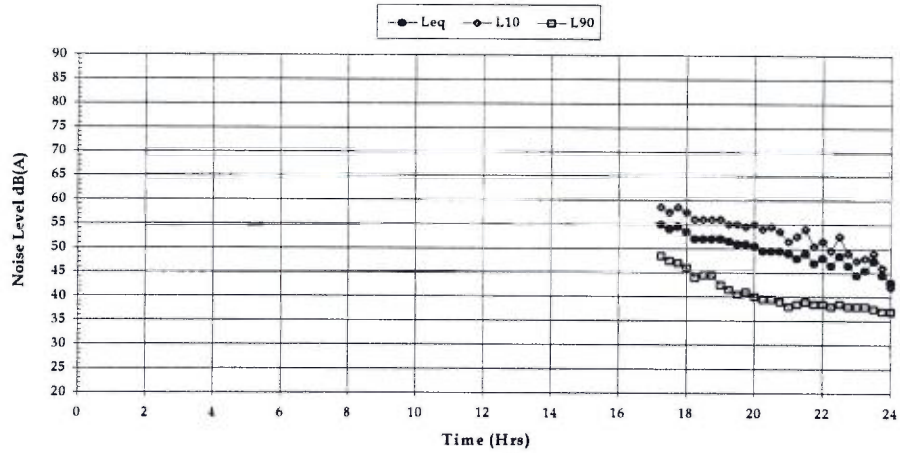
Manager, Environmental Planning Unit
Sydney Zone
NPWS
PO Box 1967
Hurstville NSW 2220

Ph - (02) 9585 6674
Fax - (02) 9585 6442

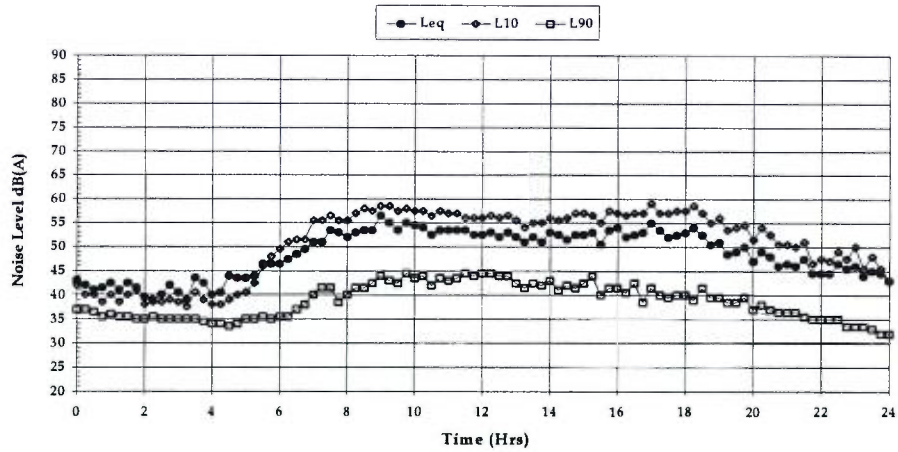
Appendix B

NOISE LOGGER DATA

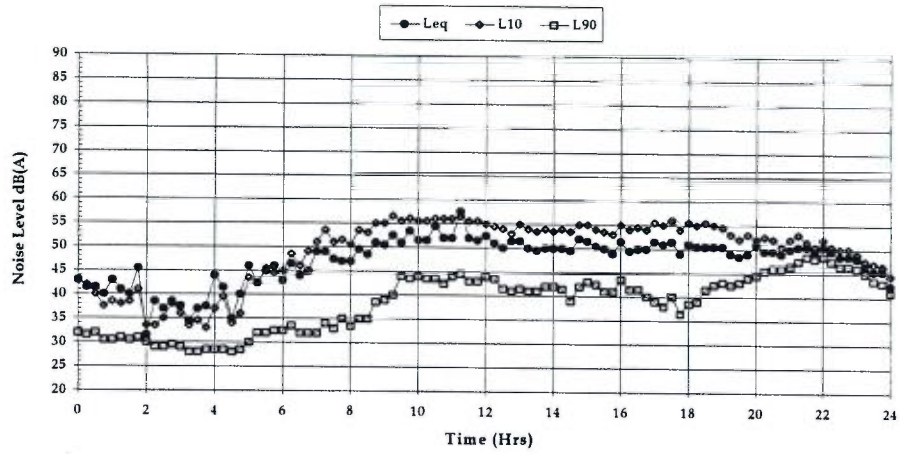
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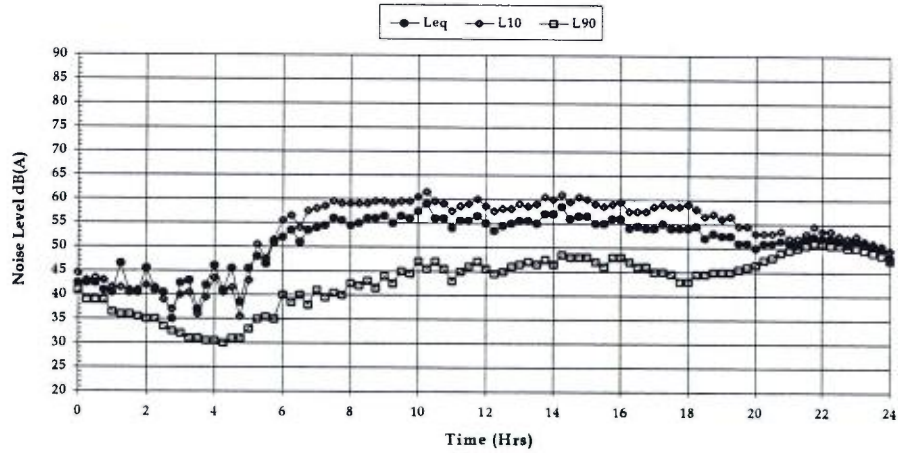
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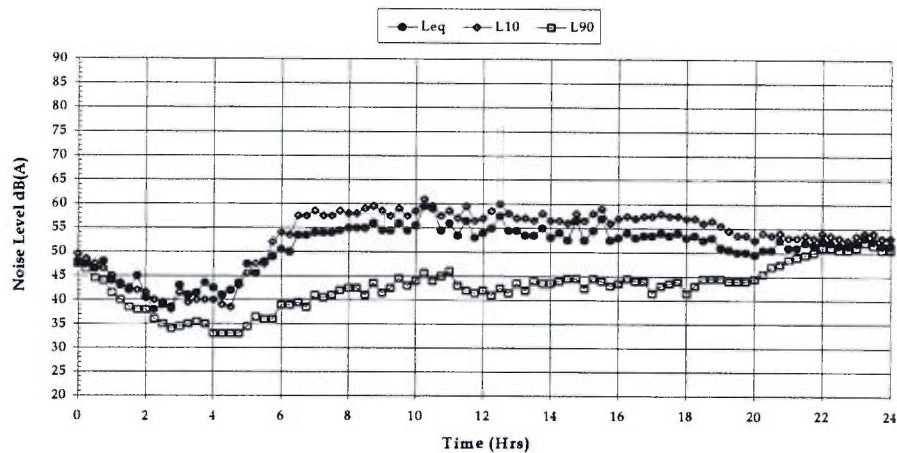
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27 September, 1998



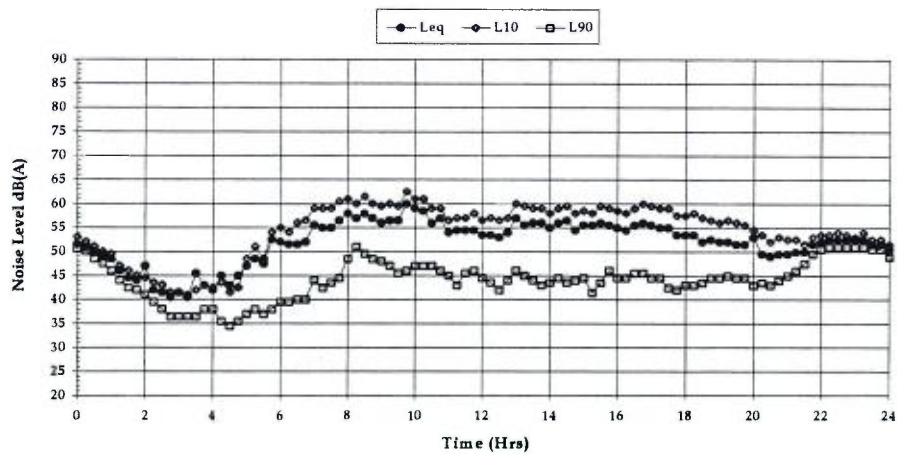
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28 September, 1998



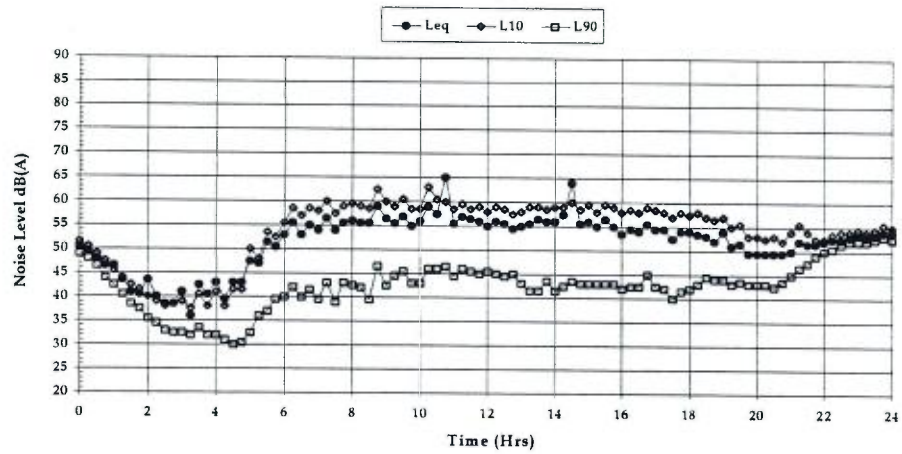
362 Soldiers Point Road, Soldiers Point
29 September, 1998



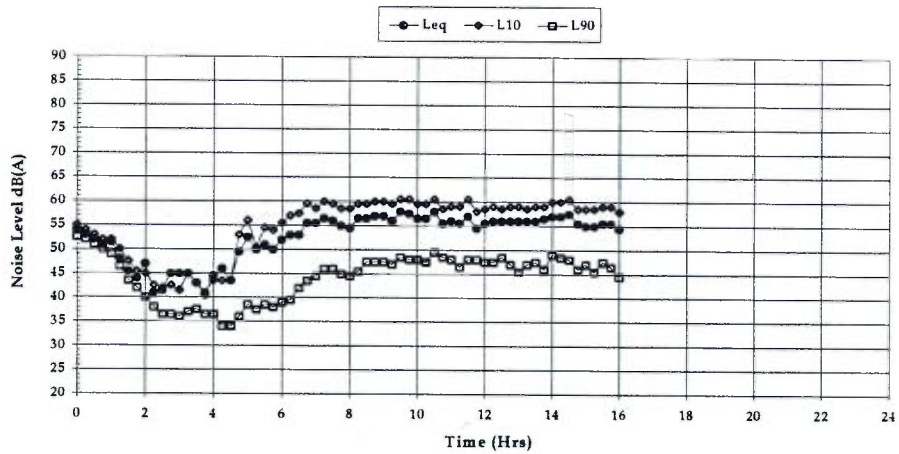
362 Soldiers Point Road, Soldiers Point
30 September, 1998



362 Soldiers Point Road, Soldiers Point
1 October, 1998



362 Soldiers Point Road, Soldiers Point
2 October, 1998



Appendix C

STUDY TEAM

The following team from ERM Mitchell McCotter undertook environmental assessments at the Salamander Bay waste transfer station in collaboration with Iain Challis from Port Stephens Council.

Steve O'Connor	Project Director
Jane Gibbs	Project Manager
Naomi Buchhorn	Flora and fauna assessment
Tony Welbourne	Noise and vibration assessment
Andrew Martin	Odour assessment
Joshua Hollis	Traffic assessment
Katie Weekes	Socio-economic characterisation
Jenni Davies	Graphics
Sue Parsons	Graphics
Louise Neville	Word Processing

Appendix D

FORM 2

SUBMISSION OF ENVIRONMENTAL IMPACT STATEMENT (EIS)

PREPARED UNDER THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 - SECTION 77

EIS PREPARED BY

Name:

Stephen O'Connor

Qualifications:

BTP (Hons), MSc (Hons)

Address:

PO Box 71, Thornton, 2322

in respect of:

Construction of waste transfer station

DEVELOPMENT APPLICATION

Applicant Name:

Port Stephens Council

Applicant Address:

PO Box 42, RAYMOND TERRACE 2324,

Land to be developed: Address

Soldiers Point Road, Salamander Bay

Lot No. DP/MPS, Vol/Fol etc.

Part Lot 145 DP 715013 Parish of Tomaree
County of Gloucester

Proposed Development

Construction of a waste transfer station on
an existing landfill at Salamander Bay

ENVIRONMENTAL IMPACT STATEMENT

An environmental impact statement (EIS) is attached

CERTIFICATE

I certify that I have prepared the contents of this Statement and to the best of my knowledge

- it is in accordance with clauses 51 and 52 of the Environmental Planning and Assessment Regulation 1994, and
- it is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

Signature:



Name:

Stephen O'Connor

Date:

22 / 1 / 99
