

*Honouring the past  
by securing the future*

**Waste Management Plan  
for the conservation and adaptive re-use  
of the Quarantine Station**

**Fourth Draft**

**May 2005**



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## Declaration and approval

This Waste Management Plan has been prepared to meet to the requirements of Condition 203 of the Conditions of Planning Approval for the conservation and adaptive reuse of the North Head Quarantine Station.

In preparing and granting approval for this Waste Management Plan all efforts have been made to comply with the Conditions of Planning Approval and relevant legislation. However, in the event of an inconsistency with this plan and any requirements of the Conditions of Planning Approval or relevant statutes; the Conditions of Planning Approval or the relevant statutes will prevail. Furthermore, the granting approval for this plan does not relieve the co-proponents of the obligation to obtain all other approvals from relevant authorities required under any other legislation.

Prepared by: Kristian Butcher, Construction Manager, Mawland Hotel Management and Q-Station Pty Ltd

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This plan was presented to the Quarantine Station Community Committee at its meeting on 16 December 2004.

This plan was approved by:

Tony Fleming, Deputy Director-General, Parks and Wildlife Division on behalf of the Department of Environment and Conservation on ..... 2005; and

Robert Black, Director, Urban Assessment Branch on behalf of the Department of Infrastructure, Planning and Natural Resources on .....2005.

## Acknowledgements

This Draft Plan was prepared by Kristian Butcher (Mawland Hotel Management).

Reviews and valuable input was provided by Simon McArthur (Mawland), Sian Waythe, Quarantine Station Environmental Manager (NSW NPWS) and Robert Black (Department of Infrastructure, Planning and Natural Resources).

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# 1. Introduction

## 1.1 Approval condition requirements

The Quarantine Station Approval Condition 203 requires, as part of the Environmental Management Plan, the preparation and implementation of a Waste Management Plan. The plan is to address the handling, stockpiling and disposal of waste construction, operations materials during all phases of the activity. The Plan shall include but not be limited to:

- a) Procedures to ensure that demolition and construction materials are stockpiled clear of environmentally sensitive areas;
- b) Waste avoidance and reduction measures, including strategies for recycling and reuse of waste materials;
- c) Procedures for the removal and disposal of waste at an appropriately licensed facility, including asbestos material;
- d) On site education and signage to promote and encourage 'no feeding' rules for wildlife and appropriate waste disposal procedures; and
- e) Procedures for regular litter inspection and collection.

The Waste Management Plan has been structured into waste management procedures for:

- Conservation and adaptation works; and
- Ongoing operations (accommodation, restaurant etc.)

These two major sections then address approval conditions a to e in turn, in recognition that the two activities generate fundamentally different waste by fundamentally different people and thus require fundamentally different waste management strategies.

As part of the Environmental Management Plan (EMP), the Waste Management Plan must be reviewed by the Quarantine Station Environmental Manager and the Quarantine Station Community Committee, and approved by the Department of Conservation (DEC) and the NSW Department of Infrastructure, Planning and Natural Resources (DIPNR).

The Waste Management Plan will be reviewed every five years as part of the review of the EMP.

## 1.2 Legislative requirements

The Waste Minimisation and Management Act (1995) introduced a State-wide scheme for licensing waste activities ([www.epa.nsw.gov](http://www.epa.nsw.gov)). According to this scheme, the wastes that pose the greatest threat to the environment need a licence. The purpose of the licence is to ensure that appropriate controls apply to the handling, storage, treatment and disposal of the waste. The Waste Avoidance and Resource Recovery Act 2001 repealed the Waste Minimisation and Management Act 1995 (following a review of the WMM Act in 2000). The Act made a number of changes to the waste management structures and directions in NSW including establishing Resource NSW, introducing extended producer responsibility for industry and amending the waste hierarchy to better reflect ecologically sustainable development.

Where relevant, waste management at the Quarantine Station needs to follow the document Environmental guidelines: Assessment, classification & management of liquid & non-liquid wastes. This basically requires:

- the use of licensed contractors to remove general waste, recyclable material and hazardous waste (asbestos); and
- demonstration that these licensed operators are disposing this waste at licensed facilities.

There is no proposal to remove contaminated land, but rather to cap any areas where risk has been identified. In this decision making and implementation, the following documentation should to be considered:

- National Environment Protection Measure (1999) – Guideline on investigation levels for soil and groundwater;
- NSW EPA (1994) Guidelines for assessing service station sites;
- Australian Standard AS1940-1993 'The storage and handling of flammable and combustible liquids';
- Australian Standard AS4482.1 – 1997 'Guide to the sampling and investigation of potentially contaminated soil: Part 1 Non-volatile and semi-volatile compounds';
- Work Cover NSW (1999) Dangerous goods series (DG310) 'Abandoning underground tanks for flammable or combustible liquids; and
- NSW EPA (1997) Guidelines for consultants reporting on contaminated sites.

## **2. Managing waste from conservation and adaptation works**

### **2.1 Forecast waste generation**

Conservation and adaptation works will generate waste from:

- excavation;
- demolition of building fabric such as concrete, asbestos walls and roofing;
- packaging from construction materials; and
- surplus construction materials.

Waste generation will be concentrated in the Wharf and First/Second Class Precincts. Contaminated land has also been addressed in Section 2.9 on Asbestos / Hazardous waste management.

### **2.2 Waste minimisation**

Large amounts of works related waste is historically generated as a result of poor materials selection and ordering. To minimise this situation the following measures will be adopted:

- material requirements will be accurately calculated to minimise waste from over ordering;
- the materials ordering process will aim to minimise packaging;
- materials safety data sheets will accompany all materials delivered to site (where required) to ensure that safe handling and storage procedures are implemented; and
- encouraging Subcontractors to minimise, reuse or recycle waste where possible.

### **2.3 Waste reuse and recycling**

Waste generation from conservation and adaptation works will be reused or recycled, where applicable.

Waste reuse is an optimum outcome and this application has the potential to be applied in the following areas:

- excavation of clean fill to be stored on site and reused for landscaping works or deposited in landfill collection depots; and
- wall linings that have been removed in an undamaged form could be reserved for additional material in conservation works.

### **2.4 Recycling**

Waste will be collected in small mobile bins and transported to a skip bin or larger container for removal by waste removal contractor. Waste that can be recycled will be sorted into the following categories:

- steel;
- timber
- paper/cardboard;
- glass;
- concrete; and
- masonry;

### **2.5 Waste stockpiling**

Stockpiling will occur during excavation and landscape works. Vegetated waste from exotic weed species will be removed from site, native species vegetation will be stockpiled on site and later converted into mulch, distributed around planted areas of the site (consistent with the Heritage Landscape Management Plan). Soil stockpiles will be stored in the Stone Masons Yard for future use or if unable to be used removed from site. Sediment controls will be installed downstream of stockpiles. Run-off from all areas where the natural surface is disturbed by construction including access ways and stockpile areas will be maintained free of pollutants before it enters the drainage system.

General Waste will be stored in mobile garbage bins and emptied into appropriate skip bins or picked up by the site waste transport vehicle.

For a detailed description of the waste transport vehicle and stockpiling of operational waste see Section 3.5.

### **2.6 Waste, soil and water**

Conservation and adaptation works will adopt the following measures to avoid contamination, erosion and sedimentation of the site and neighbours land, and waterbodies:

- ensuring construction staff are trained in the methods used to reduce contaminated waste and the procedures required for responding to all contingencies and emergencies;

- avoiding the storage or handling of fuels and chemicals in the vicinity of the watercourse running through the lease area;
- bunding to contain liquid spills at sites where liquid are to be stored;
- maintenance of the renovation area, work and storage sites in an orderly and hygienic standard;
- use of appropriate barriers such as silt fences to remove excess dirt from stormwater, and fix or replace any damaged systems;
- clean away dirt from drains, silt fences;
- place waste solvents in solvent drum provided;
- prevent concrete wash water from entering stormwater drains by washing trucks and equipment in dedicated areas where appropriate sedimentation controls are in place.

In such an event that soil contamination does occur the affected area will be fenced off from the public and dealt with in accordance with the Construction Safety Act 1912 Regulation and Occupational Health & Safety Act.

Contaminated soils will be classified as hazardous waste deposited into hazardous waste bins and disposed of by an accredited waste removal contractor at a licensed disposal station.

## **2.7 Air and dust**

The following measures will be adopted to avoid excess dust and air pollution:

- keep exposed soil and roads moist so they don't generate excessive dust;
- avoid driving vehicles on unsealed areas unless directed by the Construction Manager;
- park works cars and trucks in designated areas only;
- remove excess soil from wheels and vehicle bodies before leaving the site; and
- report odorous soils excavated at the site;

## **2.8 Waste transfer**

The responsible management of waste during transfer activities will be achieved using the following measures:

- Transport of demolition debris and surplus excavated sand from the site will be undertaken in a manner that will prevent the release of material from transport onto surrounding streets.
- Trucks will be required to be covered prior to leaving the site. All roads and pedestrian footways surrounding the site will be swept to remove any debris associated with the works on the site.
- A specialised waste management company will be engaged to supply waste bins. Waste will be placed in dedicated and secure containers provided on site by an approved waste handling company awaiting pick up by the waste contractor.
- Site transport vehicles will tow waste receptacles to a designated pick up point for the waste contractor to remove from site. All waste receptacles to be covered.
- An appropriate licensed contractor will be responsible for ensuring that all legal requirements are met in regards to handling any prescribed waste.

- The contractor will provide transfer dockets from the landfill of waste transfer station to Mawland.  
For details of the transfer of waste by site vehicles see the operations section on waste transfer.

## 2.9 Waste removal and disposal

Building and demolition waste will be deposited into a skip bin that will be located close to the adaptation works, accessible to the removal transport and sensitive to visual impact. A minimum number of bins will seek to minimise visual impact. A specialised waste removal contractor will be used to remove and dispose of conservation and adaptation related waste.

## 2.10 Asbestos/hazardous waste management

### Asbestos

The DACMP generally supports the removal of asbestos cement products where there is a direct risk to people's health. The asbestos strategy (see conservation Works Program) aims to progressively remove asbestos products that could be touched, broken or damaged through visitor or guest use. The strategy seeks to paint or seal asbestos roofs and gutters that are in a stable condition and remove/replace any decaying asbestos products. All downpipes made of asbestos cement will be removed consistent with the building staging program. Vinyl asbestos floor tiles will be removed on a progressive basis as per the staging program. An approved contractor will be engaged for the removal and disposal, painting or sealing and repair of asbestos cement items. All works will be carried out in accordance with the Construction Safety Act 1912 Regulation 84A – 84J inclusive, Occupational Health & Safety Act (Asbestos Removal Work Regulation, 1995) and the Worksafe Australia Asbestos Code of Practice and Guidance Notes. Before commencement the approved contractor will be required to submit a 'safe work method statement' which will be attached to this plan.

**Table 1** lists the buildings containing asbestos and where the asbestos is present.

**Table 1 List of buildings containing asbestos (Manidis Roberts 2001)**

Building	Asbestos present
Boiler House (A6)	<ul style="list-style-type: none"> <li>▪ Pipe insulation for hot water pipes</li> <li>▪ Gasket materials on inspector hatches to boilers</li> <li>▪ Gasket material on boiler flue pipes</li> <li>▪ Material gaskets located in cupboards</li> <li>▪ Pipe insulation debris on the floor</li> </ul>
Building A9	<ul style="list-style-type: none"> <li>▪ Pipe insulation for hot water pipes</li> <li>▪ Asbestos insulation on washing machine</li> <li>▪ Corrugated fibre cement roofing and cappings</li> </ul>
A11 and A12	<ul style="list-style-type: none"> <li>▪ Pipe insulation for hot water pipes on ground floor and in loft</li> <li>▪ Corrugated fibre cement roofing and cappings</li> </ul>
A14 – A17	<ul style="list-style-type: none"> <li>▪ Corrugated asbestos cement sheeting lines the roofing of these buildings</li> </ul>
A20	<ul style="list-style-type: none"> <li>▪ Corrugated asbestos cement sheeting lines the roofing of this building</li> </ul>
H1 and H2	<ul style="list-style-type: none"> <li>▪ Corrugated asbestos cement sheeting lines the majority of the roofing of the two buildings</li> <li>▪ Deterioration of the underside of asbestos cement sheets that cover the verandah on the west side due to weathering</li> <li>▪ Lifting of asbestos cement roofing sheets, due to rusted roofing screws on the west side of the building as well as the walkway between buildings H1 and H2</li> </ul>
H3, H4, H5 and H14	<ul style="list-style-type: none"> <li>▪ Corrugated asbestos cement sheeting lines the majority of the roofing of these buildings</li> <li>▪ Asbestos cement associated with this roofing include guttering, downpipes, capping and flashing</li> <li>▪ Deterioration of asbestos cement guttering joins on south side verandah and walkway between buildings H4 and H5/H3 due to weathering</li> </ul>

H7 to H11	<ul style="list-style-type: none"><li>▪ Corrugated asbestos cement sheeting lines the roofing of these buildings</li><li>▪ Deterioration of asbestos cement guttering joins due to weathering</li></ul>
P1, P2 and P4	<ul style="list-style-type: none"><li>▪ Corrugated asbestos cement sheeting lines the roofing of these buildings</li></ul>
Various areas	<ul style="list-style-type: none"><li>▪ Damage to gutters, downpipes and flashing</li></ul>

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## Chemicals

The following measures will be adopted to ensure the responsible disposal of oils, solvents and other chemical wastes:

- chemicals or chemical containers will not be placed in general purpose bins;
- chemicals will not be placed in stormwater drains or the sewer;
- waste paint (solid), paint containers, chemical containers, render, render containers will be placed in a hazardous waste bin; and
- any spills will be cleaned up immediately.

## Contaminated land

Contaminated land was identified in the EIS (Manidis Roberts 2001) as:

- building A18 (a disused diesel storage building and a bunded above ground fuel storage tank); and
- the northern outdoor area adjacent to building A6 (where underground diesel storage was located, and where coal, coke and ash waste from the boilers was stored).

These two sites were further investigated in 2003. The contaminated soil requires removal or capping in order for the proposed tourism uses to be implemented. Rather than excavating the affected soil, the overall approach will be to cap the affected area with a flexible or rigid pavement to reduce exposure risk, and undertake further investigations as required. Contaminated land assessment reports and any ongoing investigation of contaminated land shall be kept in a contaminated land file.

Therefore, contaminated soil will not need to be removed from the site as waste and does not need to be further addressed in this plan. The EMP will include a section on Management of the contaminated area.

### 2.11 Waste education

Contractors associated with conservation and adaptive reuse activity will undergo an induction program that outlines the relevant procedures within this plan and specifically:

- legal requirements for waste management;
- procedures for waste minimisation;
- the location of waste receptacles;
- the regularity of waste removal from site;
- recycling practices and procedures;
- potential risks and means to minimise them; and
- reporting procedures for breaches of the procedures.

## 2.12 Waste monitoring

Records will be kept regarding the amount of waste generated and removed from the site and also the extent of recycling. Waste transfer dockets will be collected and transferred into a record of the type and weight of construction waste being disposed. These records will be made available to the Quarantine Station Environmental Manager. The system will be regularly reviewed and monitored by the Site Manager to ensure its continual effective operation.

In addition, the Draft Integrated Monitoring and Adaptive Management System (Mawland 2004a) proposes waste monitoring of the following indicators:

- monthly volume of **non-recyclable** waste removed;
- monthly volume of **recyclable** paper and cardboard removed; and
- monthly volume of other **recyclable** material removed, ie. glass metal and plastic.

**Section 3.9** provides an acceptable range, benchmark, monitoring method and adaptive management responses for each of these indicators, taken directly from Mawland (2004), already reviewed by the relevant approval authorities.

## 2.13 Responsibility for waste management

Managing and monitoring waste generated by conservation and adaptation activity will be the immediate responsibility of the Construction Manager. A breach of these procedures likely to cause a physical impact upon the site will require reporting to the Quarantine Station Environmental Manager.

Regular litter inspection and collection will be inherent in all staff roles and should problem areas be identified the locations of waste receptacles will be reviewed. Inspections will involve:

- a daily morning check of all outdoor waste bins, CP1 and the Wharf Precinct by one of the site maintenance team to locate and remove any stray litter; and
- a weekly check by one of the maintenance team to locate and remove any stray litter around the rest of the built area.

If littering proves to be an ongoing significant issue, then checking will expand to incorporate a simple recording system to inform the site manager of the location and nature of the problem so that a response can be developed.

### 3. Managing waste during the operational phase

#### 3.1 Forecast waste generation

**Table 1** presents the average and peak volumes of waste forecast from the combined fully developed operations (likely to be late Year 3). **Table 1** forecasts that the average daily amount is expected to be 5m<sup>3</sup> and that peak periods are likely to generate an additional 1.5m<sup>3</sup> amount of waste. Most of the waste generated is capable of being recycled (3.74m<sup>3</sup> of the 5.03m<sup>3</sup> average per day).

**Table 1 Average and peak waste likely to be generated from the operations**

Type of recyclable waste	Average m <sup>3</sup> /day	Peak m <sup>3</sup> /day
Cardboard	0.89	1.15
Paper	0.78	1.01
Glass, Metal, Plastic Commingled	1.14	1.48
Organic	<u>0.93</u>	<u>1.21</u>
Total recyclable waste	3.74	4.85
Non-Recyclable waste	<u>1.30</u>	<u>1.69</u>
<b>TOTAL WASTE</b>	<b>5.03</b>	<b>6.54</b>

**Table 2** compares the amount of waste generated by Q-Station accommodation and food and beverage services with that of a typical hotel and food and beverage operation of similar scale. **Table 2** suggests that Q-Station will generate:

- A higher proportion of plastic and glass waste due to the restaurant relying on bottled drinks over tapped alcohol and post mixers (due to limited building and outdoor storage space); and
- A lower proportion of paper and cardboard. Administration will be run as a separate operation to service the other businesses. Waste generation from this sector was not included in the table below.

**Table 2 Comparison of waste types between Q-Station and a typical hotel with food and beverage operations**

Waste type	Q-Station proportion	Typical hotel and F&B proportion
Food waste	22%	25%
Paper	16%	20%
Cardboard	19%	20%
Plastics	10%	7%
Glass	15%	8%
Metals	3%	6%
Other (non-recyclable)	15%	14%
TOTAL	100%	100%

Source: [www.greatforests.com.au](http://www.greatforests.com.au) May 2004

**Table 3** forecasts the type and amount of waste expected to be generated from all of the Q-Station operations once fully developed. **Table 1** forecasts that the restaurant and associated food and beverage services will generate the majority of the waste (3.22m<sup>3</sup> average per day), most of which will be in the form of packaging (cardboard, paper, glass and plastic).

**Table 3 Breakdown of waste generated by each operation when fully developed**

Q Station generators	Estimates		m <sup>3</sup> /day		Waste Types	% by Volume	Ave. m <sup>3</sup>	Peak m <sup>3</sup>
	People/day	Average	Peak					
<b>Restaurant</b>	<b>460</b>	<b>3.22</b>	<b>4.19</b>	Cardboard	20%	0.64	0.84	
				Paper	15%	0.48	0.63	
				Glass, Metal, Plastic Commingled	25%	0.81	1.05	
				Organic	25%	0.81	1.05	
				Non-Recyclable	15%	0.48	0.63	
<b>Accommodation</b>	<b>90</b>	<b>0.63</b>	<b>0.82</b>	Cardboard	20%	0.13	0.16	
				Paper	20%	0.13	0.16	
				Glass, Metal, Plastic Commingled	10%	0.06	0.08	
				Organic	5%	0.03	0.04	
				Non-Recyclable	45%	0.28	0.37	
<b>Conferences (30% day, 70% o'night)</b>	<b>250</b>	<b>0.50</b>	<b>0.65</b>	Cardboard	20%	0.10	0.13	
				Paper	20%	0.10	0.13	
				Glass, Metal, Plastic Commingled	20%	0.10	0.13	
				Organic	15%	0.08	0.10	
				Non-Recyclable	25%	0.13	0.16	
<b>Storytelling tours</b>	<b>500</b>	<b>0.50</b>	<b>0.65</b>	Cardboard	0%	0.00	0.00	
				Paper	10%	0.05	0.07	
				Glass, Metal, Plastic Commingled	30%	0.15	0.20	
				Organic	0%	0.00	0.00	
				Non-Recyclable	60%	0.30	0.39	
<b>Day staff</b>	<b>50</b>	<b>0.15</b>	<b>0.20</b>	Cardboard	10%	0.02	0.02	
				Paper	10%	0.02	0.02	
				Glass, Metal, Plastic Commingled	10%	0.02	0.02	
				Organic	10%	0.02	0.02	
				Non-Recyclable	60%	0.09	0.12	
<b>Residential staff</b>	<b>10</b>	<b>0.03</b>	<b>0.04</b>	Cardboard	10%	0.00	0.00	
				Paper	10%	0.00	0.00	
				Glass, Metal, Plastic Commingled	10%	0.00	0.00	
				Organic	10%	0.00	0.00	
				Non-Recyclable	60%	0.02	0.02	
<b>TOTAL</b>		<b>5.03</b>	<b>6.54</b>			<b>5.03</b>	<b>6.54</b>	

### 3.2 Waste minimisation

Waste minimisation can be applied in the following areas:

- bulk dispensers for hand basins in public bathrooms, private rooms and administration;
- double sided printers and copiers in administration;
- using reusable crockery in the restaurant and café;
- provision of re-useable containers in the restaurant (tupaware);
- provision of water dispensers in function rooms (rather than individual bottled water);
- ordering in bulk to minimise packaging; and
- calculated ordering as required to avoid excess stock/waste.

### 3.3 Waste reuse

Where possible waste will be reused, some potential applications include:

- reuse of glass bottles for drinking water on restaurant tables;
- reuse of glass and plastic containers for storage of other liquids;
- reuse of paper in administration offices;
- composting garden waste and clippings – stone masons yard; and
- composting some organic waste (such as standard compost bins or a worm farm).

### 3.4 Waste stockpiling

Operational waste stockpiling will be managed two levels to reflect two rounds of assembly and transfer. Level 1 consists of the daily collection points throughout the site and Level 2 provides a central collection point where bi-weekly (or more regular if demand requires) emptying and removal of waste from site will take place by an approved waste contractor. **Table 4** identifies how Level 1 stockpiling will work and **Table 5** identifies how Level 2 will work.

**Table 4 Application of Level 1 waste stockpiling**

Level 1 application	Further detail
Three fixed visitor rubbish bins	<ul style="list-style-type: none"> <li>▪ Locations are: inside A26 waiting shelter, adjacent to southern end of building A14-17 and outside building A12 for shuttle bus passengers to use</li> <li>▪ To feature spring loaded lids (to prevent foraging animals) and plastic lining (to limit odours and avoid food scraps remaining which would encourage foraging animals)</li> <li>▪ Designed to be aesthetically sympathetic yet contemporary design so as not to confuse with authentic heritage</li> <li>▪ These bins are for general rubbish</li> </ul>
Three sand based all weather cigarette bins	<ul style="list-style-type: none"> <li>▪ Locations are: outside back of building S1 for staff, outside northern entrance to A2 (for conference use) and outside A12 (for restaurant and all day visitor use)</li> </ul>
Several towable waste containers or	<ul style="list-style-type: none"> <li>▪ Stored between building A6 and A7I</li> <li>▪ At least three 2 cubic metre capacity bins at any one time in order to separate glass, paper and general waste</li> </ul>
A utility trailer to load MGB's onto	<ul style="list-style-type: none"> <li>▪ Top lid to prevent waste being blown out and tyne pockets to allow emptying by front-lift waste collection truck</li> <li>▪ Transport features to include: in-built tow wheels, tow link, socket and jockey wheel for moving of bin when not connected to tow tug</li> <li>▪ Custom exterior to match theme of era</li> <li>▪ These bins will be marked; glass/plastic, cardboard, general. This allows for separation at the source.</li> </ul>
Waste transferred from plastic bags into 240, 180 & 140 litre mobile garbage bins (MGB's)	<ul style="list-style-type: none"> <li>▪ Sufficient MGB's available to separate paper, glass and general waste</li> <li>▪ Size of bin to reflect its application and the bins will be stored out of sight, from overnight guests and touring visitors</li> <li>▪ On a daily basis or as required the bins would be manually pushed to the roadside where the towing rig will empty the MGB into one of its carriages using a MGB lifter</li> </ul>
MGB bin lifter	<ul style="list-style-type: none"> <li>▪ Maximum tip capacity of 90kg's</li> <li>▪ Quick attachment to side or end of 2 cubic meter towable bin</li> <li>▪ Light weight for ease of handling, suits 240, 180 &amp; 140 Litre MGB's and manual hand pump operation</li> </ul>
Soil and organic stockpiles	<ul style="list-style-type: none"> <li>▪ Stockpiles to avoid stormwater drains or grates and prevent flow of stormwater from stockpiles into drains, batter stockpiles to a 2:1 gradient or less</li> <li>▪ Contaminated soils must be placed in specific areas to be indicated by the construction/site manager and detailed in the Management Plan for Contaminated soils.</li> </ul>

**Table 5 Application of Level 2 waste stockpiling**

Level 2 application	Further detail
Eastern side of building A24 for temporary waste storage	<ul style="list-style-type: none"> <li>▪ Ideal location due to: truck access, adjacent to maintenance workers to manage, distant from most habitation, and potential to create some screening of the waste containers</li> <li>▪ Towing rig to drop off the towable waste bins once they are full</li> <li>▪ Containers to be temporarily stored in a position that minimises visual impact, and screening may be used with a reversible medium to preserve the visual appeal of the site</li> <li>▪ Front loading truck to empty the bins on a bi-weekly basis, or as required</li> </ul>

To achieve an authentic interpretation of the cultural landscape, external rubbish bins need to be minimised to areas known to generate waste (the Wharf Precinct). The site will not be operated as an independently accessible attraction like Port Arthur, but a highly managed site where independent access is quite limited. Guests all have the opportunity to use bins in their rooms, lounges, bathrooms and conference rooms. In the spirit of adaptive management, additional bins can be installed at the strategic points where an ongoing problem becomes apparent. This approach has been adopted by most local and State governments.

The location of all weather cigarette bins is based on the location of promoted smoking areas:

- within a part of the outdoor eating area alongside building A6 (for independent visitors and guests);
- at the conference breakout area alongside A2 (day conference and overnight guests);
- behind building S1 (for staff);
- on the verandahs of the cottages;
- on the front verandah of building P13;

In the spirit of adaptive management, these points could be moved to reflect changing use or demand.

### **3.5 Waste transfer**

Waste will be transferred through the site using an electric towing rig. Towable containers or a trailer loaded with MGB's will be used to transfer collected waste from the Restaurant (building A6) for temporary storage to building A24. On route to A24 the Towing rig will stop at locations in the Wharf, First Class, Administration and Third Class Precincts to collect generated waste. Waste will be transferred on a daily basis to minimise odours and ensure empty waste receptacles are available for guests and staff. Features of the Electron Utility Tow Tug include:

- capable of towing up to 3 waste bins simultaneously and including a utility tray for transport of MGB's maintenance/cleaning equipment;
- battery power for quiet operation and two speed transmission for fully laden hill climb, and a maximum speed of 12kp/h;
- seating for a driver and a passenger; and
- custom body work to match the design of the people movers and fit into the interpretive theme proposed for the site.

### 3.6 Waste removal and disposal

A certified contractor such as Collex will be used to remove and dispose of waste from the site. The contractor will be required to show the necessary licences and use of approved disposal sites. A specialised waste management company will be engaged to supply waste bins. Waste will be separated and the appropriate contractor will be engaged to remove paper / cardboard, glass, plastics and general rubbish. The specialists waste contractor for recycling and disposal will take these bins off site.

### 3.7 Waste education

The main form of waste education will be a component on waste management within the Induction Program for relevant staff – particularly: the Site Manager; Food and Beverage Manager, Housekeeping Manager; and housekeeping staff. The waste management component of the induction program will feature the proposed procedures for removal, storage and disposal of waste for the various operations (as actioned in the training section of the EMP)

Interpretation will be used to direct visitors and guests to adopt minimal impact behaviour designed to avoid feeding wildlife and minimise waste generation and dispose of waste in suitable receptacles. This interpretation will be incorporated into guest compendiums and displays within the Waiting Shelter (A26) and the Luggage Store Visitor Centre (as actioned in the Visitor Management Plan (Mawland 2004b).

### 3.8 Waste monitoring

The Draft Integrated Monitoring and Adaptive Management System (Mawland 2004a) proposes waste monitoring of the following indicators:

- monthly volume of **non-recyclable** waste removed;
- monthly volume of **recyclable** paper removed; and
- monthly volume of **recyclable** material removed.

**Table 6** provides an acceptable range, benchmark, monitoring method and adaptive management responses for each of these indicators, taken directly from Mawland (2004a), already reviewed by the relevant approval authorities. All reasonable steps will be taken to minimise the generation of waste and maximise recycling across the site.

**Table 6 Waste-based part of Integrated Monitoring and Adaptive Management System (Mawland Hotel Management 2004a)**

<i>Indicators</i>	<i>Acceptable range</i>	<i>Benchmark</i>	<i>Adaptive management responses</i>
Monthly volume of <b>non-recyclable</b> waste removed	10 – 40 m <sup>3</sup> /month	Benchmark to be established during first monitoring	<p>If the result is above the acceptable range, consider one or more of the following actions:</p> <ul style="list-style-type: none"> <li>▪ Undertake a waste management audit to identify waste that can be reused or recycled;</li> <li>▪ Introduce staff incentives for reducing non-recyclable waste, such as an awards program, annual bonus, and gift vouchers to experiences; or</li> <li>▪ Design the proposed educational program on ecologically sustainable development to include activities that shift waste into recycled or reused streams</li> </ul>

			<ul style="list-style-type: none"> <li>▪ Increase the number of recycling bins available for guests to use</li> <li>▪ Introduce an interpretive program for guests on how to reduce their waste.</li> </ul>
Monthly volume of recyclable paper removed	2 – 5 bags/month	Benchmark to be established during first monitoring	<p>If the result is outside the acceptable range, consider one or more of the following actions:</p> <ul style="list-style-type: none"> <li>▪ Conduct a recycling audit to identify paper that can be recycled</li> <li>▪ Increase the number of paper recycling bins in offices and conference facilities</li> <li>▪ Audit paper consumption to determine if paper use can be reduced</li> </ul>
Monthly volume of recyclable material removed	To be determined within first year of full operation	Benchmark to be established during first monitoring	<p>If the result is outside the acceptable range, consider one or more of the following actions:</p> <ul style="list-style-type: none"> <li>▪ Undertake a waste management audit to identify waste that can be reused or recycled;</li> <li>▪ Introduce staff incentives for increasing recycling rates, such as an awards program, annual bonus, and gift vouchers to experiences;</li> <li>▪ Design the proposed educational program on ecologically sustainable development to include activities that shift waste into recycled or reused streams</li> <li>▪ Increase the number of recycling bins available for guests to use</li> <li>▪ Introduce an interpretive program for guests on how to reduce their waste.</li> </ul>

### 3.9 Responsibility for waste management

The overall management of operations generated waste will be the responsibility of the Site Manager (who will be the Construction Manager during the adaptation stages). The Site Manager will coordinate the waste management component of the induction program. The Site Manager will also delegate the Level 1 management of waste to each respective operations manager, directed more specifically as follows:

- for the overall site, visitor centre, storytelling tours, special events and administration, the Site Manager / Construction Manager;
- for accommodation, the Housekeeping Manager;
- for conferences and functions, the Conference and Functions Manager; and
- for the restaurant, the Food and Beverage Manager.

A breach of the waste management procedures requires notification of one of these operations managers, who in turn will report the incident to the Site Manager, who will determine whether the incident warrants reporting to the Quarantine Station Environmental Manager.

## 4. References

Mawland Hotel Management 2004a, Draft Integrated Monitoring and Adaptive Management System for the conservation and adaptive reuse of the North Head Quarantine Station.

Mawland Hotel Management 2004b, Draft Visitor Management Plan for the conservation and adaptive reuse of the North Head Quarantine Station.

Construction Safety Act 1912 Regulation 84A – 84J inclusive

Occupational Health & Safety Act (Asbestos Removal Work Regulation, 1995)

Worksafe Australia Asbestos Code of Practice and Guidance Notes.