Light Horse Business Centre
ThaQuarry Pty Ltd & ACN 114 843 453 Pty Ltd

Environmental Management Strategy

Incorporating

CEMP Stage 2(B)

and OEMP

LOCATION

Lots 1 - 4 DP 1145808

Version November 2011

TABLE OF CONTENTS

APPENDICES

A. Aboriginal Heritage Management Plan

B. Fire and Emergency Management Plan

C. Traffic and Transport Code of Conduct

D. Greenwaste Management Plan

E. Air Quality, Odour and Greenhouse Gas Management Plan

F. Noise Monitoring Plan

G. Landscape and Vegetation Management Plan

H. Amenity Berm Management Plan

I. Fencing and Security Management Plan

J. Pest, Vermin, Feral Animals and Noxious Weeds Management Plan

K. Soil, Water and Leachate Management Plan

L. Conveyor and Chute System Maintenance and Management Plan

M. Leachate Management System

1 PURPOSE AND SCOPE

This Environmental Management Strategy (the Strategy) has been developed to minimise environmental impacts from the LHBC Project by providing the strategic framework for environmental management across the approved Site, during the final stage of construction and the operation of the facility.

In item 3 of the Statement of Commitments for the Project, which forms part of the project approval, the Proponent has committed to developing and submitting a Construction Environmental Management Plan and an Operational Environmental Management Plan. This Environmental Management Strategy meets the requirements of the Statement of Commitments, by incorporating the Construction Environmental Management Plan for stage 2B, and the Operational Environmental Management Plan.

The Strategy is formulated from the requirements of Development Consent MP 06_0139 dated 22 November 2009. This approval is available to be viewed at http://www.dialadump.com.au/land/main/lhbc.sthml

The Strategy aims to:

- describe the roles, responsibilities, authority and accountability of all the key personnel involved in environmental management of the Waste Facility; and
- identify the statutory requirements that apply to the Waste Facility;
- describe how:
    - environmental performance is monitored and managed;
    - the local community and relevant agencies will be kept informed about the operation and environmental performance;
    - complaints will be received, handled, responded to and recorded;
    - disputes will be resolved;
    - non-compliance issues will be responded to;
    - cumulative impacts will be managed; and
    - emergencies will be responded to.

The Strategy applies to all components of the final stage of construction, and the LHBC Facility operations.

As a public document, the Strategy has been developed as an auditable management tool for the site and government agencies, and provides the community with information relating to environmental management at the LHBC Facility.

The Strategy also sets out the procedures for periodic review, auditing and where necessary, revision of the Strategy, so that it is maintained to reflect current operations to the satisfaction of the Director-General of Department of Planning (DoP).

Implementation of this Strategy will assist in minimising the environmental impacts of LHBC Facility by facilitating continual improvement in environmental performance.

The Strategy promotes proactive environmental management, which will facilitate ongoing compliance with environmental commitments and legislative requirements. It also identifies how LHBC will seek to maintain and build on its good relationship with the local community and other key stakeholders.

2 ORGANISATION OF THE EMS

This Strategy is designed for Waste Transfer and Materials Processing and the associated solid waste Landfill.

The Strategy has been developed as a 'controlled document' and is set out in a series of discrete sections which can be added to as the Strategy develops over time, and is modified with each license renewal, or amendment of a management plan.

Reference is made, where relevant, to the 39 Benchmark Techniques established in the Environmental Guidelines: Solid Waste Landfills (1996).

Table A1 summarises the Benchmark provisions and their relationship with environmental goals and identifies non-conformances with the published Benchmark Techniques.

Each page within each section is numbered such that further pages can be added without disrupting the numbering sequence i.e. page 23 new pages will be added to as page 23.1, 23.2 etc such that page 24 will remain as is. Each section of the Strategy therefore commences and ends on a separate page.

3 AUTHORISATION, REVISION AND DISTRIBUTION CONTROL

Hardcopies have been issued to those holders where electronic copies are not available. Holders of these copies will be given updates by email or post and are expected to update their hardcopy as appropriate.

Table 3.1 - Distribution Register

Copy No.	Holder
1	Managing Director LHBC
2	Group General Counsel LHBC
E	Group General Manager LHBC
3	DoP
E	Divisional General Manager
E	Site Operations Manager
E	OHS&E Committee Chairperson
E	Environment and Community Coordinator LHBC

E – indicates a controlled electronic copy is available on the holder's computer from the LHBC computer network.

A copy is also to be placed on the LHBC Waste Facility website.

The Managing Director, Group General Manager and Group General Counsel will be the only individuals with access to a soft copy capable of revision, and will be responsible for controlling access to that document.

4 ENVIRONMENTAL MANAGEMENT SYSTEM STRUCTURE AND POLICIES

This Strategy provides the strategic context for environmental management at the LHBC Waste Facility.

The Strategy outlines LHBC's commitment to proactive community and environmental management and demonstrates LHBC's commitment to reducing environmental and community impacts.

The Strategy includes a programme of environmental management and an implementation programme.

The document will require to be progressively modified and upgraded on a regular basis, or to correspond with the modifications to the site licensing requirements.

The Strategy will be retained at the office of the Site and be available for inspection by visiting OEH officers.

This Strategy provides an overview of the key strategies in place, to effectively manage environmental and community issues at the LHBC Facility.

Compliance with the Strategy will be ensured by training, inspections, audits and regular review, with the overall implementation objective being the continual improvement of the LHBC environmental performance.

5 LEGAL AND OTHER REQUIREMENTS

In order for LHBC to maintain compliance with statutory requirements applying to the LHBC Waste Facility, it is necessary that these requirements are identified and that performance against these requirements is regularly reviewed.

The LHBC Site Operations Manager will be responsible for maintaining a register containing a summary of all environmental statutory requirements, such that:

- all environmental legislative requirements are suitably identified and stored;
- all documents are easily located, retrieved and available when required; and
- all legislation is updated as required, with obsolete documents removed from service.

The following does not consist of a complete list of the legislative requirements that may apply to the Site during construction and operations. It is the responsibility of the Site Operations Manager to ensure that all legislative requirements are investigated and considered.

5.1 Environmental Planning and Assessment Act 1979

The EP&A Act provides the statutory framework for assessment for the Project.

The Project is classified as a Major Project under Section 75(b) of the EP&A Act, to which Part 3A applies. This is the Part under which Project Approval has been given.

5.2 Protection of the Environment Operations Act 1997

The POEO Act provides an integrated system of licensing for polluting industries. Schedule 1 of the POEO Act identifies types of developments and activities that require an Environment Protection Licence (EPL) for polluting industries and land uses.

An EPL will be sought from OEH for the construction works required in Stage 2B, and prior to the commencement of operations.

5.3 Waste Avoidance and Resource Recovery Act 2001

The Waste Avoidance and Resource Recovery Act provides a framework for the establishment of schemes encouraging the most efficient use of resources and to provide for a continual reduction in waste generation.

5.4 Sydney Water Act 1994

The Sydney Water Act provide a framework for granting operating licences for constructing, managing and maintaining systems or services, including the disposing of waste water.

A Trade Wastewater consent will be sought from Sydney Water for the disposal of leachate to the sewer, prior to the commencement of operations.

6 REGULATORY AUTHORITIES AND REQUIREMENTS

In order to maintain regulatory compliance, it is necessary to identify and understand the regulatory and other requirements applicable to activities at the LHBC Waste Facility.

It is the responsibility of the Site Operations Manager to be aware of changes to relevant legislation, policy and guidelines, and to notify the Operations Managers, General Manager and LHBC Group Environmental Manager of changes that may significantly affect the LHBC Waste Facility.

Means by which the Site Operations Manager will keep up to date with changes in legislation, policy and guidelines include:

- reviewing information from Department of Planning NSW and the OEH
- attendance at Group Environmental Meetings
- review of NSW WMAA Committee meetings;
- liaison with government agencies;
- seeking legal opinion, as required;
- advice from environmental consultants; and
- participation in professional development seminars.

Should a change in legislation be identified to impact on the operations the LHBC Waste Facility, the change management process will be followed to ensure the appropriate changes to the Site's operations are communicated and undertaken.

A number of development consents, licences, permits and agreements relate to LHBC Waste Facility operations. It is the responsibility of the Site Operations Manager to ensure that these approvals are renewed, as required, and that reporting requirements are met.

It is the responsibility of the LHBC Operations Manager, LHBC Divisional General Manager to ensure that LHBC meets its obligations under these approvals and the relevant legislation.

It is the responsibility of the Site Operations Manager to advise the LHBC Operations Manager and LHBC Divisional General Manager of his/her obligations under these approvals, and to prepare the necessary documentation to demonstrate compliance with the requirements of regulatory authorities.

Communication with statutory authorities and communication of statutory requirements to LHBC employees and contractors are to be conducted in accordance with LHBC specific communication processes.

7 OTHER EXTERNAL STAKEHOLDERS

An electronic database of all identified external stakeholders is to be maintained on Site. This includes but is not limited to:

- Neighbouring Residents;
- Community Groups;
- Regulatory Bodies;
- Aboriginal Groups; and
- Environmental Groups.

Stakeholders are to be provided with regular updates on the operational, environmental and social performance of the LHBC Waste Facility, through various communication channels detailed in this Strategy.

Relevant stakeholders are also to be consulted prior to commencement of significant new developments undertaken by LHBC, or changes to the proposed operations.

8 LANDFILL BENCHMARKS

LHBC, as the operator of the Material Processing Centre (MPC) and Waste Transfer Facility (WTF) expects to receive in excess of 2,000,000 tonnes of mixed and segregated waste per annum.

The residue from recycling will either be transferred from the site to another licensed waste facility or will be landfilled in the quarry pit.

The residue from recycling processes which is required to be landfilled will be weighed before being transported from the MPC/WTF site to the landfill site.

A quantity not exceeding 700,000 tonnes of solid waste and asbestos waste per annum may be landfilled at the solid waste landfill.

Table A1 - Relationship between Environmental Goals and Benchmark Techniques

ENVIRONMENTAL GOALS AND OBJECTIVES	APPLICABLE BENCHMARK TECHNIQUES (from DECCW, 1996) (1, 2 etc.) indicates Benchmark Techniques Number in DECCW, 1996[1]
WATER POLLUTION ❑ Preventing water pollution by leachate ❑ Detecting water pollution ❑ Remediating water pollution	❑ Leachate barrier system (1) ❑ Leachate collection system (2) ❑ Surface water controls (3) ❑ Groundwater monitoring network (4) ❑ Groundwater monitoring program (5) ❑ Surface water monitoring program (7) ❑ Leachate monitoring program (8) ❑ Water contamination remediation plan (9)
AIR POLLUTION ❑ Preventing and Controlling dust emissions ❑ Preventing landfill gas emissions ❑ Detecting and remediating landfill gas emissions ❑ Avoidance of Fire ❑ Management of Fire	❑ Landfill gas containment system (10) ❑ Fire prevention (12) ❑ Surface gas emission monitoring (17) ❑ Gas accumulation monitoring (18) ❑ Dust controls (34) ❑ Fire Fighting Capacity (38)

LAND MANAGEMENT & CONSERVATION ❑ Assuring quality of design, construction and operation ❑ Assuring quality of incoming waste ❑ Recording of wastes received ❑ Minimising landfill space used ❑ Maximisation of recycling	❑ Assurance of construction and materials quality (20) ❑ Screning of wastes received (21) ❑ Measurement of waste quantities received (22) ❑ Recording of the quantities, types and sources of wastes received (23) ❑ Compaction of waste (24) ❑ Recycling (25) ❑ Filling plan (27)
HAZARDS AND LOSS OF AMENITY ❑ Preventing unauthorised entry ❑ Preventing degradation of local amenity ❑ Preventing noise pollution ❑ Adequate fire-fighting capacity ❑ Adequate staffing and training	❑ Security of site (30) ❑ Litter control (31) ❑ Cleaning of vehicles (32) ❑ Covering of waste (33) ❑ Dust controls (34) ❑ Pest, vermin and noxious weed controls (35) ❑ Odour controls (36) ❑ Noise control (37) ❑ Fire Fighting capacity (38) ❑ Staffing and training requirements (39)

9 SITE MANAGEMENT

The following summarizes the various key personnel involved in the environmental management of the Site together with their roles, responsibilities and authority.

Position	Name	Phone	Email
Site Operations Manager	Yiorgos Crespis B.Eng (Civil)	0405 557 874	yiorgos@crespiprojects.com.au
Building Project Manager	Martin Carey	9714 5992	mcarey@globalprojects.nsw.com.au
Managing Director	Ian Malouf	9519 9999	ianmalouf@dadi.com.au
General Counsel	Christopher Biggs	9519 9999	chrisbiggs@dadi.com.au
Accredited Certifier	Vic Lilli	9715 2555	vlilli@viclilli.com.au
Principal Contractor	GMW – Jason French		Jason_french@gmwurban.com.au
Leachate Management System Quality Assurance	Douglas Partners - Ross McAlpine		Ross.mcalpine@douglaspartners.com.au

10 ROLES AND RESPONSIBILITIES

10.1 Directors and Executive Management

The Directors and executive management of ACN 114 843 453 Pty Ltd and ThaQuarry Pty Ltd (being 'the Landowners') shall:

- Comply with the requirements of all applicable environmental laws, regulations, legislations, licences, development consents and adopt practices that reflect commitment to the protection of environment;
- Adhere to the principles of sustainable development and life cycle management;
- Avoid areas of environmental significance where possible and practical rehabilitate those areas disturbed by the company's activities on an ongoing basis;
- Implement measurable objectives and targets that will trigger the impact on environment from conduct of company's operations;
- Conduct regular audits of the operations and apply results of audits and reviews to continually improve processes and implement control and measures that will mitigate environmental threats;
- Achieve savings on usage of resources energy, fuel and minimise waste generation by utilising the principles of reduce, recover, recycle and reuse in all aspects of the business operations;
- Provide employees with training, induction, information, resources and responsibilities necessary to achieve environmental objectives and targets; and
- Evaluate environmental technology and processes for best practices and continually improve on the Landowner's commitment to environmental management through a process of innovation, review and revision.

Overall supervision of the Site rests with LHBC during all phases of development, and including when the site becomes operational.

10.2 Site Project/Operations Manager

The Site Operations Manager (SOM) or equivalent will be appointed to perform the role of the Environmental Representative for the site.

The Site Operations Manager shall oversee the compliance with this Strategy and ensure the carrying out of all environmental monitoring as set out in this Strategy.

The SOM will be responsible:

- To ensure projects are delivered in compliance with the supplier performance monitoring;
- To ensure that the required records/documents are signed off;
- To ensure that the works and operations are carried out in accordance with the Environmental Management Strategy;
- To conduct all environmental monitoring in accordance with the environmental monitoring program contained in this Strategy;
- To ensure appropriate corrective action is taken when required;
- To report to LHBC, stakeholders and consent authorities as required, and keep all appropriate records;
- Where multiple Contractors are involved, to ensure the interface issues are identified and any necessary changes are made; and

- To (along with the Landowners) be directly involved with staff and contractor induction and training.

10.3 Principal Contractor: Stage 2B

GMW Urban Pty Ltd shall be responsible for the management and execution of all Site preparatory works as per the scope of works contained in the contract documents.

All specialist trades and subcontractors will be required before commencing work to sign acknowledging receipt and understanding of their obligations pursuant to this Strategy.

10.4 Public/Visitors

The public do not strictly have a role and responsibility however, due to site proximity or public actions and activities, may potentially be impacted by Site works. For this reason, various community consultation measures are included within this Strategy allowing for public involvement.

Visitors will be required to comply with all obligations in accordance with the Site induction, or to be accompanied by a representative of LHBC at all times.

11 CONSTRUCTION

11.1 STAGE 1: PRE-CONSTRUCTION SITE PREPARATION AND BULK EARTHWORKS

Commenced : On or about 5 March 2010

Status : Continuing

Expected conclusion : December 2011

Bulk Earthworks at the Site are still currently underway in accordance with the outline indicated by the Site Construction Environmental Management Plan for Stage 1 Early Works.

The purpose of those Stage 1 works has been to,

(a) establish ground levels for a building pad principally for the MPC building (and other buildings within the Project),
(b) to outline and prepare roads for paving and for drainage corridors and
(c) generally to rearrange ground levels within the Project area.
(d) Construct swales and drainage corridors from GPTs to OSDs, and
(e) Ensure land levels between the subject land and neighbouring land are at agreed interface levels.

11.2 STAGE 2A: GENERAL BUILDING AND INFRASTRUCTURE CONSTRUCTION

Commenced : On or about 15 October, 2010

Status : Continuing

Expected conclusion : December2011

GMW Urban Pty Ltd has taken formal possession of the building area of the site and has undertaken preparation of ground levels and begun the pouring of footings and the excavation of drains and infrastructure channels.

GMW Urban Pty Ltd has commenced the following:

- Construction of the Materials Processing Centre (MPC)
- Construction of the Greenwaste Area
- Construction of the Tarp Stand Area
- Construction and paving of access roads in and around the site
- Stormwater pipe and pit construction
- Potable water and electricity reticulation
- Streetlight installation

This involves the following,

(a) Site establishment including pedestrian and traffic control
(b) Foundations and footings for the MPC and other buildings
(c) Pavements and roadways
(d) The creation of grades to facilitate the laying in of services and stormwater drainage.
(e) Installations of new conduits, power supply potable water supply and sewer lines
(f) Installation of misting systems
(g) Placement of tanks and drains and gross pollution traps
(h) Installation of mechanical ventilation
(i) Concrete walls and foundation construction
(j) Concrete road pavement and building slab construction
(k) Building cladding/ roofing manufacture supply and installation, and
(l) Building fit out

11.3 STAGE 2B: CONSTRUCTION

Commencing : On or about November 2011

Status : Pending

Expected conclusion : January 2012

Stage 2B works will involve the following activities:

(a) Reshaping and landscaping of external amenity berms
(b) Installation of the basal liner, leachate collection system, sump, pumps and sequence batch reactors (treatment plant)
(c) Construction and installation of conveyor and chute, and
(d) Fencing and security

Sections 12 to 15 of this Strategy describe the activities to be undertaken during Stage 2B of construction.

Timeframes for construction are included below.

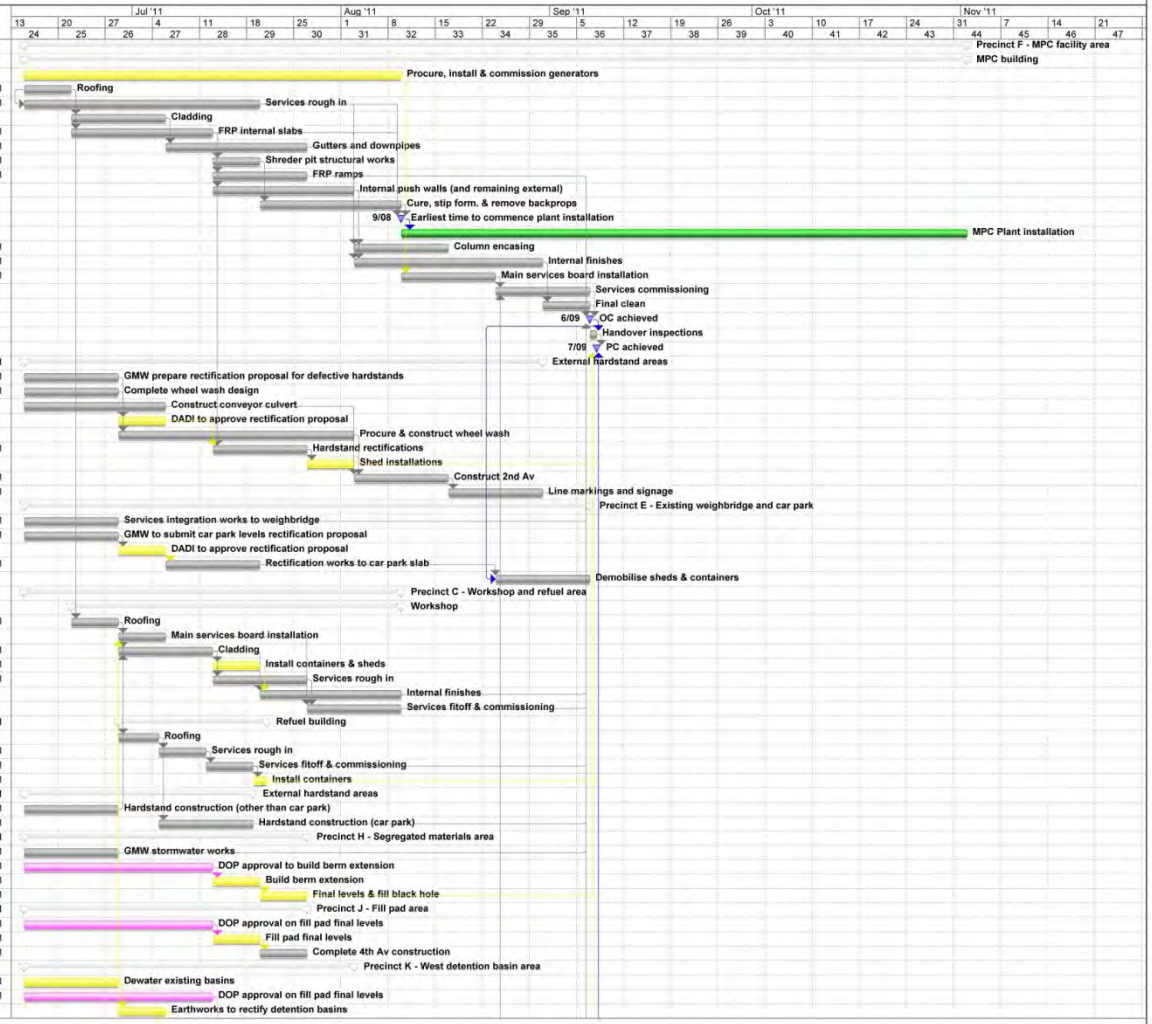
DIAL A DUMP INDUSTRIES
KEEPING AUSTRALIA CLEAN

LIGHT HORSE BUSINESS CENTRE

MASTER PROGRAMME

Issue date : 15/06/11
Issued by: YC

ID	Task Name	Duration	Start	Finish
1	**Precinct F - MPC facility area**	**100 d**	**15/06/11**	**1/11/11**
2	**MPC building**	**100 d**	**15/06/11**	**1/11/11**
3	Procure, install & commission generators	40 d	15/06/11	9/08/11
4	Roofing	5 d	15/06/11	21/06/11
5	Services rough in	25 d	15/06/11	19/07/11
6	Cladding	10 d	22/06/11	5/07/11
7	FRP internal slabs	15 d	22/06/11	12/07/11
8	Gutters and downpipes	15 d	6/07/11	26/07/11
9	Shreder pit structural works	5 d	13/07/11	19/07/11
10	FRP ramps	10 d	13/07/11	26/07/11
11	Internal push walls (and remaining external)	15 d	13/07/11	2/08/11
12	Cure, stip form. & remove backprops	15 d	20/07/11	9/08/11
13	Earliest time to commence plant installation	0 d	9/08/11	9/08/11
14	MPC Plant installation	60 d	10/08/11	1/11/11
15	Column encasing	10 d	3/08/11	16/08/11
16	Internal finishes	20 d	3/08/11	30/08/11
17	Main services board installation	10 d	10/08/11	23/08/11
18	Services commissioning	10 d	24/08/11	6/09/11
19	Final clean	5 d	31/08/11	6/09/11
20	OC achieved	0 d	6/09/11	6/09/11
21	Handover inspections	1 d	7/09/11	7/09/11
22	PC achieved	0 d	7/09/11	7/09/11
23	**External hardstand areas**	**55 d**	**15/06/11**	**30/08/11**
24	GMW prepare rectification proposal for defective hardsta	10 d	15/06/11	28/06/11
25	Complete wheel wash design	10 d	15/06/11	28/06/11
26	Construct conveyor culvert	15 d	15/06/11	5/07/11
27	DADI to approve rectification proposal	5 d	29/06/11	5/07/11
28	Procure & construct wheel wash	25 d	29/06/11	2/08/11
29	Hardstand rectifications	10 d	13/07/11	26/07/11
30	Shed installations	5 d	27/07/11	2/08/11
31	Construct 2nd Av	10 d	3/08/11	16/08/11
32	Line markings and signage	10 d	17/08/11	30/08/11
33	**Precinct E - Existing weighbridge and car park**	**60 d**	**15/06/11**	**6/09/11**
34	Services integration works to weighbridge	10 d	15/06/11	28/06/11
35	GMW to submit car park levels rectification proposal	10 d	15/06/11	28/06/11
36	DADI to approve rectification proposal	5 d	29/06/11	5/07/11
37	Rectification works to car park slab	10 d	6/07/11	19/07/11
38	Demobilise sheds & containers	10 d	24/08/11	6/09/11
39	**Precinct C - Workshop and refuel area**	**40 d**	**15/06/11**	**9/08/11**
40	**Workshop**	**35 d**	**22/06/11**	**9/08/11**
41	Roofing	5 d	22/06/11	28/06/11
42	Main services board installation	5 d	29/06/11	5/07/11
43	Cladding	10 d	29/06/11	12/07/11
44	Install containers & sheds	5 d	13/07/11	19/07/11
45	Services rough in	10 d	13/07/11	26/07/11
46	Internal finishes	15 d	20/07/11	9/08/11
47	Services fitoff & commissioning	10 d	27/07/11	9/08/11
48	**Refuel building**	**16 d**	**29/06/11**	**20/07/11**
49	Roofing	4 d	29/06/11	4/07/11
50	Services rough in	5 d	5/07/11	11/07/11
51	Services fitoff & commissioning	5 d	12/07/11	18/07/11
52	Install containers	2 d	19/07/11	20/07/11
53	**External hardstand areas**	**24 d**	**15/06/11**	**18/07/11**
54	Hardstand construction (other than car park)	10 d	15/06/11	28/06/11
55	Hardstand construction (car park)	10 d	5/07/11	18/07/11
56	**Precinct H - Segregated materials area**	**30 d**	**15/06/11**	**26/07/11**
57	GMW stormwater works	10 d	15/06/11	28/06/11
58	DOP approval to build berm extension	20 d	15/06/11	12/07/11
59	Build berm extension	5 d	13/07/11	19/07/11
60	Final levels & fill black hole	5 d	20/07/11	26/07/11
61	**Precinct J - Fill pad area**	**30 d**	**15/06/11**	**26/07/11**
62	DOP approval on fill pad final levels	20 d	15/06/11	12/07/11
63	Fill pad final levels	5 d	13/07/11	19/07/11
64	Complete 4th Av construction	5 d	20/07/11	26/07/11
65	**Precinct K - West detention basin area**	**35 d**	**15/06/11**	**2/08/11**
66	Dewater existing basins	10 d	15/06/11	28/06/11
67	DOP approval on fill pad final levels	20 d	15/06/11	12/07/11
68	Earthworks to rectify detention basins	5 d	29/06/11	5/07/11



Page 1

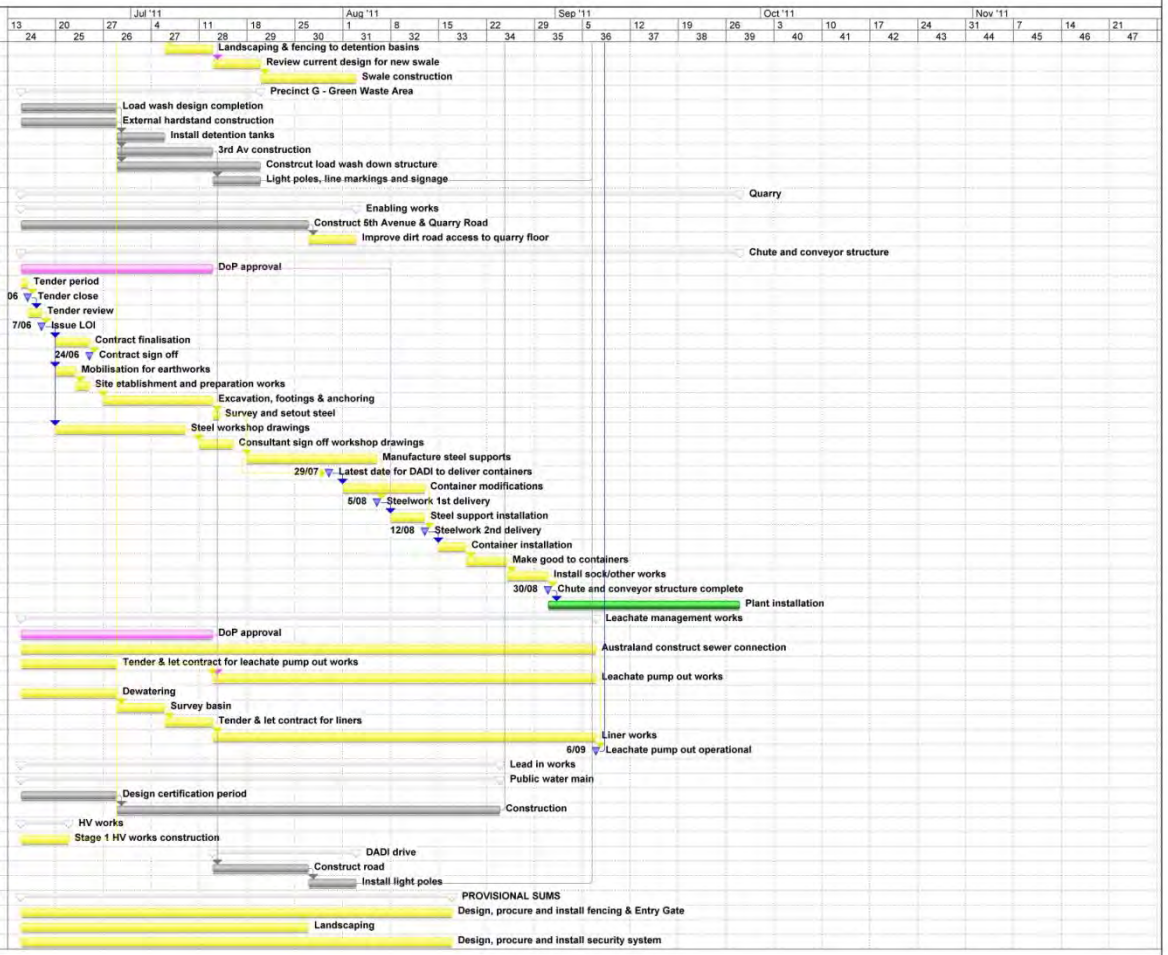
DIAL A DUMP INDUSTRIES
KEEPING AUSTRALIA CLEAN

LIGHT HORSE BUSINESS CENTRE

MASTER PROGRAMME

Issue date : 15/06/11
Issued by: YC

ID	Task Name	Duration	Start	Finish
69	Landscaping & fencing to detention basins	5 d	6/07/11	12/07/11
70	Review current design for new swale	5 d	13/07/11	19/07/11
71	Swale construction	10 d	20/07/11	2/08/11
72	**Precinct G - Green Waste Area**	**25 d**	**15/06/11**	**19/07/11**
73	Load wash design completion	10 d	15/06/11	28/06/11
74	External hardstand construction	10 d	15/06/11	28/06/11
75	Install detention tanks	5 d	29/06/11	5/07/11
76	3rd Av construction	10 d	29/06/11	12/07/11
77	Constrcut load wash down structure	15 d	29/06/11	19/07/11
78	Light poles, line markings and signage	5 d	13/07/11	19/07/11
79	**Quarry**	**75 d**	**15/06/11**	**27/09/11**
80	**Enabling works**	**35 d**	**15/06/11**	**2/08/11**
81	Construct 5th Avenue & Quarry Road	30 d	15/06/11	26/07/11
82	Improve dirt road access to quarry floor	5 d	27/07/11	2/08/11
83	**Chute and conveyor structure**	**75 d**	**15/06/11**	**27/09/11**
84	DoP approval	20 d	15/06/11	12/07/11
85	Tender period	1 d	15/06/11	15/06/11
86	Tender close	0 d	15/06/11	15/06/11
87	Tender review	2 d	16/06/11	17/06/11
88	Issue LOI	0 d	17/06/11	17/06/11
89	Contract finalisation	5 d	20/06/11	24/06/11
90	Contract sign off	0 d	24/06/11	24/06/11
91	Mobilisation for earthworks	3 d	20/06/11	22/06/11
92	Site etablishment and preparation works	2 d	23/06/11	24/06/11
93	Excavation, footings & anchoring	12 d	27/06/11	12/07/11
94	Survey and setout steel	1 d	13/07/11	13/07/11
95	Steel workshop drawings	15 d	20/06/11	8/07/11
96	Consultant sign off workshop drawings	5 d	11/07/11	15/07/11
97	Manufacture steel supports	15 d	18/07/11	5/08/11
98	Latest date for DADI to deliver containers	0 d	29/07/11	29/07/11
99	Container modifications	10 d	1/08/11	12/08/11
100	Steelwork 1st delivery	0 d	5/08/11	5/08/11
101	Steel support installation	5 d	8/08/11	12/08/11
102	Steelwork 2nd delivery	0 d	12/08/11	12/08/11
103	Container installation	4 d	15/08/11	18/08/11
104	Make good to containers	4 d	19/08/11	24/08/11
105	Install sock/other works	4 d	25/08/11	30/08/11
106	Chute and conveyor structure complete	0 d	30/08/11	30/08/11
107	Plant installation	20 d	31/08/11	27/09/11
108	**Leachate management works**	**60 d**	**15/06/11**	**6/09/11**
109	DoP approval	20 d	15/06/11	12/07/11
110	Australand construct sewer connection	60 d	15/06/11	6/09/11
111	Tender & let contract for leachate pump out works	10 d	15/06/11	28/06/11
112	Leachate pump out works	40 d	13/07/11	6/09/11
113	Dewatering	10 d	15/06/11	28/06/11
114	Survey basin	5 d	29/06/11	5/07/11
115	Tender & let contract for liners	5 d	6/07/11	12/07/11
116	Liner works	40 d	13/07/11	6/09/11
117	Leachate pump out operational	0 d	6/09/11	6/09/11
118	**Lead in works**	**50 d**	**15/06/11**	**23/08/11**
119	**Public water main**	**50 d**	**15/06/11**	**23/08/11**
120	Design certification period	10 d	15/06/11	28/06/11
121	Construction	40 d	29/06/11	23/08/11
122	**HV works**	**5 d**	**15/06/11**	**21/06/11**
123	Stage 1 HV works construction	5 d	15/06/11	21/06/11
124	**DADI drive**	**15 d**	**13/07/11**	**2/08/11**
125	Construct road	10 d	13/07/11	26/07/11
126	Install light poles	5 d	27/07/11	2/08/11
127	**PROVISIONAL SUMS**	**45 d**	**15/06/11**	**16/08/11**
128	Design, procure and install fencing & Entry Gate	45 d	15/06/11	16/08/11
129	Landscaping	30 d	15/06/11	26/07/11
130	Design, procure and install security system	45 d	15/06/11	16/08/11



12 STAGE 2B: LEACHATE COLLECTION, CONVEYANCE, TREATMENT AND DISPOSAL SYSTEM, AND CONSTRUCTION OF LANDFILL LINER

12.1 AIMS AND OBJECTIVES

- Construction of basal leachate sump and feeders shall be generally in accordance with specifications set out in NSW Landfill Guidelines and as modified by recommendations in the Soil Erosion and Leachate Management Plan in Appendix K.
- Construction and establishment of leachate receival, storage and treatment tanks.
- Installation and commissioning of pumping infrastructure, aeration equipment and filters into Sequence Batch reactor (SBR).
- Connecting SBR discharge line to sewer connection.
- Commissioning and operation.
- An Agreement has been entered into between the Landowner and Sumy Pty Ltd (neighbouring landowner) for access to the sewer discharge point which is located on the neighbouring land.

12.2 SCOPE OF WORKS

The Contractors must comply with this Strategy and the plan included in Appendix M, approved by the NSW Department of Planning and all of the conditions of the Environment Protection Licence for the works.

The scope of work to be completed under the contract for construction of the basal drainage layer and Leachate Management System infrastructure generally includes:

- earthworks to form the landfill sub-grade,
- installation of the basal HDPE liner,
- drainage layer pipe work, and
- drainage aggregate, geosynthetic materials, and leachate sump, together with the leachate riser.

Specifically, the Contractor must:

- Supply and erect project signboards, and secure and protect the site during works to the satisfaction of the Superintendent and relevant authorities;
- Do the setting out necessary to perform the work including all associated survey work;
- Drawings of the existing and required sub-grade surface grades are provided here Appendix M and shall be used by the Contractor to accurately set-out and construct the sub-grade surface;
- Installation and maintenance during construction of erosion and sedimentation control measures;
- Excavate soil/rock necessary to develop the finished surfaces;
- Undertake filling, compaction and grading of the basal level to establish the finished surfaces at the required minimum grades;
- Supply and install geosynthetic (geofabric) materials;

- Supply and install geomembrane (HDPE liner) materials;
- Supply and install geonet; and
- Supply "as-constructed drawings" in both digital and hardcopy format for respective components of the leachate management system.

12.3 NUISANCE

The Contractor shall take all necessary precautions to minimise noise, dust, mud, vibration and any other nuisance. Agreement shall be reached with appropriate authorities with respect to roads that may be used for importing materials and removing spoil.

Wheels of vehicles shall be cleaned as necessary to ensure against spoiling of local roads.

The Contractor shall so organise and conduct his work as to minimise inconvenience to residents near the site of the works by the control of noise, vibration, dust, mud and any other nuisance or emissions. Plant shall be fitted with effective silencing equipment.

12.4 OCCUPATIONAL HEALTH & SAFETY

The attention of the Contractor is drawn to the Occupational Health and Safety Act 2000, which require that employers ensure the health, safety and welfare of their employees.

The Contractor shall prepare an Occupational Health and Safety Plan in accordance with the Occupational Health and Safety Act 2000 for all work to be undertaken on the site.

12.5 GENERAL DESCRIPTION OF STRUCTURE.

The general structure of the leachate collection system will include installation of a network of 160 mm diameter polyethylene (PE) piping, installation of non-woven geotextile, placement of the leachate drainage (aggregate) layer, installation of leachate sump, leachate riser, leachate pumps, and placement of leachate storage tanks and treatment and disposal systems.

The construction of the leachate collection system will require:

- the carrying out of preparatory earthworks to the base of the pit by a suitably qualified contractor;
- the placement of a base layer of geofabric;
- the placement of the HDPE liner;
- the placement of perforated polyethylene drainage pipes in a drainage layer;
- the covering of the drainage layer with further geofabric;

12.6 CONSTRUCTION QUALITY ASSURANCE & TESTING PROGRAMME

The work is to be documented and be compiled into a report for approval by a suitably qualified Engineering Consultant and/or certified (e.g. C.P. Eng.) professional engineer with the Institution of Engineers Australia. A Construction Quality Assurance and Testing Programme (CQATP) including Inspection Test Plans (ITPs) has been developed and included in Appendix M.

Quality Control (QC) testing is the sole responsibility of the HDPE liner installation contractor and shall consist of appropriate certification and quality control testing to ensure that all works comply with these specifications and relevant standards.

The QC must be signed-off by the Site Project/Operations Manager noting that is does not fall under the contract for construction of the basal leachate management system.

Acceptance and approval of the geomembrane is a phased process based on quality control testing, which includes the manufacturer's and Contractor's quality control programme including shipping, handling, storage, installation and field testing. Certification and quality control testing results shall be received, reviewed, and approved by the Site Project/Operations Manager prior to use of these materials.

12.7 PREPARATORY EARTHWORKS PLANNING

Prior to commencement of earthworks, a licensed surveyor will survey the base of the quarry.

The survey will confirm whether sufficient grades to the lines indicated on the drawings (i.e. exhibit a transverse gradient of **>4%** and a longitudinal gradient of >2%) are present.

If the survey indicates further earthworks are required to meet the specified grades then such work will be undertaken by the Contractor as necessary.

Suitable clay material sourced on site may be utilised to form the requisite grade and as a sub base for the placement of the HDPE barrier.

No stones or other objects that will not pass through an 8 mm screen will be present in the top 40 mm of the surface to be covered (visual inspection).

The surface should form a firm, unyielding foundation for the membrane with no sudden, sharp or abrupt changes or breaks in grade. No excessive build up of water is to be present at the pond walls or base prior to placement of the liner.

12.8 GEOTEXTILES

Geotextiles are provided as protection layers for the basal HDPE liner and as a separation layer between the leachate collection system drainage layers and wastes.

Non-woven geotextile materials shall be new, mildew, insect and rodent resistant, and needle free. Geotextiles shall be suitable and durable for the intended application as satisfactorily demonstrated by similar and prior applications. Geotextiles shall be 100% polyester or polypropylene (with the exception of inhibitors and/or carbon black added for UV resistance), non-woven and needle-punched materials.

All geotextile materials shall comply with the requirements of AS 3706 -Geotextiles.

12.9 GRAVEL OR AGGREGATE LEACHATE DRAINAGE LAYER

EPA (1996) stipulates acceptable design as: over the liner a drainage layer should be installed of a thickness of greater than 300 mm. The drainage material should exhibit a coefficient of permeability K > 1 x m/s. The drainage media should be selected to have sufficiently large pore space to prevent encrustation.

Gravel or a combination of gravel and a geonet may be used.

To comply with the BT the gravel selected should be:

- Rounded;
- of grain size greater than 20 mm;
- smooth-surfaced;
- non-reactive in mildly acidic conditions;
- relatively uniform in grain size; and
- free of carbonates that could form encrustations around the collector pipes.

Obtaining a sufficient quantity of rounded river gravel (RRG) for large-scale projects in metropolitan Sydney can be difficult given limited supply and slow production of known RRG extraction sites.

For this project an alternative 40 mm basalt (crushed stone) aggregate is proposed.

The strength of basalt aggregates is broadly comparable to Emu Plains RRG based on analysis to AS1 141.22 previously completed by DP on similar projects.

Particle size distribution tests shall be undertaken for the aggregate to demonstrate that not greater than 10% is smaller than 40 mm in size and that not greater than 3% is smaller than 0.075 mm in size.

The Contractor shall submit, to the Superintendent for approval, certified NATA test results of sieve analysis, wet dry strength and hydraulic conductivity, together with a sample of the proposed material prior to delivery of the material to the site.

The Contractor shall also provide the Superintendent with written certification from the gravel supplier that all gravel material provided for the LCS meets the requirements of this Specification. The Specification for the drainage aggregate is presented in Table 3 below.

Table 3 - Specification for Leachate Drainage Aggregate

Title	AS
Methods for sampling and testing aggregates - Particle size distribution by sieving 53.0 mm – 90-100% passing 37.5 mm- <10 0.075 mm<3	AS 1141.11
Methods for sampling and testing	AS1141.22
Wet/ Dry Strength aggregates – Wet/dry strength variation Dry Strength (kN) >230 Wet Strength (kN) >I80 Variation (%)<35	
Constant Head Permeability Methods of testing soils for engineering Broadly in line purposes - Soil strength and consolidation with AS 1289.6.7.1 tests – Determination of permeability of a soill>IxIO $^{-3}$mls	AS1289.6.7.1

The drainage aggregate layer shall be 300mm thick placed in a manner that avoids damage to the leachate collection pipes. The aggregate is to be mounded around the leachate riser at least 100cm above the top perforations on the leachate riser as shown in drawings in Appendix M.

The gravel basal drainage layer shall be encapsulated by two geotextiles and shall also serve as bedding material for the leachate collection pipes.

The HDPE liner protection geotextile will serve to protect the HDPE liner from the angular drainage aggregate. The upper (separation) geotextile will help to minimise the potential for fines from the waste to clog the drainage layer.

The initial waste placed directly over the upper (separation) layer must be placed in a manner that ensures plant does not drive over it. No heavy compaction equipment (e.g. sheepsfoot roller) should be used until an initial 1500 mm of waste has been placed in order to minimise the generation of fines which may clog the geotextile and drainage layer.

12.10 LEACHATE BARRIER

EPA *Environmental Guidelines: Solid Waste Landfills* (1996) requires that a landfill site should have natural or synthetic barriers to protect environmental quality and be situated where there will be no adverse impact on existing and future development.

Benchmark technique No. 1 (BTI) in EPA *Environmental Guidelines: Solid Waste Landfills* (1996) requires a re-compacted clay or modified soil liner at least 900 mm thick with an in-situ co-efficient

of permeability less than 10^{-9}m/s and where a possible threat to groundwater may exist a flexible membrane liner with a minimum co-efficient of permeability of 10^{-4m}/s should be used.

The surface of the natural barrier must be formed to exhibit a transverse gradient of **>4%** and a longitudinal gradient of >2%.

12.11 BASAL LEACHATE LINER

The basal leachate liner must be installed on the prepared subgrade.

The liner will comprise a fully welded 1.5 mm thick smooth sided HDPE liner exhibiting a manufacturer specified minimum co-efficient permeability of 1 x 10-I4 m/s.

The liner shall be encapsulated by two geotextiles.

The Engineer, following inspection of the prepared subgrade, will review the need for the basal geotextile layer.

The basal leachate liner will be installed across the base of the proposed landfill area as shown in drawings in Appendix M.

12.13 LEACHATE COLLECTION FOR DRAINAGE BASAL LAYER - SPECIFICATION

Perforated collector pipes should be placed within the drainage layer at intervals of not more than 50 m to facilitate the collection and discharge of leachate.

These pipes should generally:

- Be a minimum 150mm in diameter;
- Be strong enough not to collapse under the weight of the waste;
- Have a minimum longitudinal gradient of 1%; and
- Be capable of being rinsed and monitored.

The polyethylene pipe and any fittings used shall comply with the requirements of relevant Australian Standards, including:

- AS 4130 Polyethylene (PE) Pipes for Pressure Applications
- S 4129 Fittings for Polyethylene (PE) Pipes for Pressure Applications
- AS 4131 Polyethylene (PE) Compounds for Pressure Pipes and Fittings
- AS 1463 Polyethylene Pipe EX~NS~CoOm~pounds
- AS 2033 Installation of Polyethylene Pipe Systems
- AS 2698.2 Plastic Pipes and Fittings for Irrigation and Rural Applications – Polyethylene Rural Pipes

Collection pipes shall be placed in above the surface of the basal geotextile and surrounded by coarse free draining aggregate. The pipes are to be perforated allow inflow of leachate.

Pipe perforations shall comprise 12 mm diameter holes. The locations of the holes should be

alternated in pairs at 150 mm intervals along the pipe.

Each alternate pair of holes should be located at 45 and 225 degrees to the vertical axis (pair 1) and 135 and 315 degrees to the vertical axis (pair 2).

Pipe spacing within the cell is ~ 2m5 o n both the 2 % gradient (i.e. less than the specified 50 m in the benchmark technique and consistent with ERM recommendation).

The collection pipes forming the basal drainage layer will not allow maintenance flushing (rinsing 1 monitoring) given that the basal layer will be abandoned at some stage.

Pipes joining the central collector pipe are to be placed at 45' angles and must be butt-welded using suitable junctions. Electrofusion welding of the collection pipes is also acceptable if preferred by the Contractor.

12.12 LEACHATE SUMP

The basal LCS will include a leachate sump located at the lowest elevation of the base (i.e. the eastern side of the landfill), so as to collect leachate in preparation for removal.

A 200 mm thick concrete pad will be poured at the base of the sump on which the leachate riser will be placed and supported. The leachate sump will be 0.5 m x0.5 m and 0.5 m deep.

Concrete used for the sump shall be sulphate resistant (SR) 50 MPa with a minimum of 40 mm cover before reinforcement on the surface exposed to leachate. The concrete sump shall be constructed in accordance with AS 3600.

12.13 LEACHATE RISER

The polyethylene pipe and any fittings used shall comply with the requirements of relevant Australian Standards, including:

- AS 4130 Polyethylene (PE) Pipes for Pressure Applications
- AS 4129 Fittings for Polyethylene (PE) Pipes for Pressure Applications
- AS 4131 Polyethylene (PE) Compounds for Pressure Pipes and Fittings
- AS 1463 Polyethylene Pipe Extrusion Compounds
- AS 2033 Installation of Polyethylene Pipe Systems
- AS 2698.2 Plastic Pipes and Fittings for Irrigation and Rural Applications – Polyethylene Rural Pipes

The sump will contain a 500 mm diameter vertical riser and housing for leachate extraction pumps.

The riser from the basal sump shall be DN500 PN20 PEIOO pipe and the riser from successive drainage layers shall be DN500 PN6.3 PEIOO pipe.

The lower 1.0m of each riser will be perforated with 25 mm diameter holes to allow the inflow of

leachate into the riser.

Aggregate used for the drainage layer will be placed to a minimum of 100mm above the perforated section.

The 25 mm diameter hole locations should be alternated in pairs at 50 mm intervals along the pipe. Each pair of holes should be located at 0 and 180 degrees to the vertical axis (pair 1)6,0 and 240 degrees to the vertical axis (pair 2) and 120 and 300 degrees to the vertical axis (pair 3).
Each riser must be anchored (bolted) to the respective concrete sump using an appropriate stainless steel collar. Each riser will be built up successively and a suitable socket must be used to electrofusion-weld each successive riser pipe section.

Under the Construction Quality Assurance and Testing Programme (CQATP) a constant falling head test must be performed on the perforated riser to ensure water loss of >6 L per second.

12.14 LEACHATE PUMPS

The water balance In order to maintain groundwater elevations at acceptable levels within the landfill pumping rates from the landfill will be required to range between 250 m^3 per day and 500 m^3 per day.

A submersible leachate pump (pneumatic or electric) will be installed at the base of the riser. The pump must be capable of pumping at the maximum rate predicted in the water balance and over the necessary head (i.e. 10 m based on the proposed depth of successive risers).

Leachate pumped to the top of the riser will then be pumped to the leachate storage tanks located at natural ground level. Specifications for the pump are included in Appendix M.

Hoses from the riser will be suspended overhead by a series of galvanised steel support frames capable of being moved to accommodate the sequencing of filling and the location of the active tipping face.

12.15 LEACHATE TREATMENT SYSTEM

Leachate treatment will be via sequencing batch reactors (SBR) or sequential batch reactors.

SBRs are industrial processing tanks for the treatment of waste water. Tanks to be placed at the site will be a minimum of four 110 kL tanks with decanting capacity of approximately 80 kL each.

12.16 LEACHATE TREATMENT TANKS WORKS

- Complete and make good the existing concrete cast tanks located at the eastern lip of the quarry. Ensure they are waterproof;
- Test and certify each tank for water holding;
- Procure and install telemetry controlled multivalve to ensure sequential filling of tanks from in pipe from leachate pump;

- Plumb pipes in parallel so that they sequentially fill, sparge settle and discharge;
- Ensure each tank is fitted with 4 Stormix aeration pumps and float valves to control commencement and cessation of filling;
- Procure & install discharge pump;
- Connect outlet from all tanks to a discharge pump discharging at approximately 7 L per second; and
- Install and connect poly line to sewer outlet with approved flow meter.

Proposed completion date: 6 weeks following grant of an EPL to carry out the works.

Supervision of works to be carried out by

Douglas Partners Pty Ltd
95 Hermitage Road
West Ryde NSW 2114
P + 61 2 9809 0666
F + 61 2 9809 4095

13 STAGE 2B: SHAPING AND LANDSCAPING OF AMENITY BERMS

13.1 AIMS AND OBJECTIVES

- To establish, maintain and provide a visual screen around the Project and the operational area of the facility;
- To maintain the berms as noise attenuation measures;
- To provide a shield against windblown litter and to mitigate airborne particle generation from stockpiles; and
- To ensure that site security is able to be adequately maintained without unduly impeding internal traffic flows.

13.2 EXISTING BERMS AND SCREENS.

To the north, north-east, east and west of the Project area are existing mounds of overburden excavated from the quarry. To the south-east of the quarry void is a natural hill which provides an existing berm relative to the adjoining project road of about 10 metres.

The remaining overburden mounds vary in height to a maximum height of about 30 metres.

Upon approval from the Department of Planning, bulk earthworks will be undertaken to ensure that they are stabilised, that drainage is provided and that they are landscaped in low maintenance regime in a manner to give an appearance consistent with surrounding lands.

Reshaping of the berms **within** the Project area has already taken place as part of the bulk excavation earthworks authorised by the Department of Planning in order to create building pads and allow for the future gradations of the land in relation to stormwater drainage.

13.3 VISUAL SCREENS NORTH WESTERN CORNER OF PROJECT AREA.

At the North-western corner of the Project area shown on the Complete Urban Plans as the intersection of First Avenue, Third Avenue and Fourth Avenue the 10 Ha Conservation Area of Cumberland Plain woodland largely provides a visual screen between the surburb of Minchinbury, the M4 Motorway and the Project. Further details are provided on page 78 of this Strategy.

This visual screen will be augmented by a reshaping of the western and northern berms so as to create a chicane between them through which vehicles can pass.

The addition of security gates as indicated in the Site Fencing and Security Plan in Appendix I across Fourth Avenue at the pinch point between the western and northern berms will secure the site outside of business hours.

13.4 WORKS

The works included in this section shall include the supply of labour and materials to install and/or construct:

- bulk earthworks & reshaping
- soil preparation
- soil works
- planting preparation
- planting installation, and
- hydroseeding.

14 STAGE 2B: SECURITY AND FENCING

14.1 AIMS AND OBJECTIVES

- Secure the operational area;
- Secure the perimeter of the Site;
- Secure access via roads; and
- Provide safety fencing around quarry void.

14.2 SCOPE OF WORKS

The site is rendered largely inaccessible by the steepness of the slopes and that it is surrounded by significant bunds or berms.

Gaps between the berms will be bridged by fences and lockable gates.

Existing perimeter fences will be made good and secure, and extended and replaced where needed. Where stock fencing does not exist, LHBC will install it.

14.3 EXISTING STOCK FENCES

LHBC is required to fence the perimeter of the site in stock fencing.

Stock fencing exists along the east and north of Lot 4 in DP 1145808, and along part of the boundary between Lot 1 and Lot 5 in DP 1145808.

LHBC will make good and secure all existing stock fences.

14.4 ADDITIONAL/NEW PERIMETER STOCK FENCING

Where stock fencing does not exist around the perimeter, LHBC will install it to the specification shown in Appendix I, longitudinally along the finished and landscaped berms.

To prevent unauthorised entry and to ensure security new additional lockable security gates will be installed.

Stock fencing will not necessarily delineate the boundary of Lots, and will not abut a Precinct Road. They are not required therefore to meet the requirements of the Precinct Plan in relation to fences.

14.5 ADDITIONAL/NEW SECURITY FENCING

Where it does not already exist, additional security fencing shall be installed, connecting the security gates to the nearest stock fence, provided that the security fence shall continue unless it can connect to a stock fence installed on ground not less than 1 metre higher than the highest point of

the security gates. The Fencing and Security Management Plan in Appendix I should be referred to for more detail.

The proposed fence line is to be constructed from 2.4m (1.8m out of ground) 50mm OD galvanised steel pipes at 3000mm spacing with black plastic coated 1800mm chainmesh.

There are to be 3 tension wires, all 2.5mm high tensile Waratah “Ezytye” wire. Two wires are to be placed along the top and bottom extremities of the chainmesh and the third is to be run and strained along the mid section. The chainmesh is to be clipped to these tension wires at no more than 300mm lineal spacing.

14.6 STOCK LINE FENCE CONSTRUCTION SPECIFICATIONS

The fence line will comprise of 1650mm Black Waratah star posts at 3500mm spacings, 100mm galvanised 2100mm Waratah “Easyslot” strainer posts and “Adjusta” stays will be used on either side of all gate openings, all corners with acute angles of less than 120 degrees and at least every 200m.

The fence will consist of 900mm “Hingedjoint” netting with a plain wire at the top line of the netting and a single 2.5mm plain wire in the top penetration of the post.

14.7 GATE SPECIFICATION

The proposed gate construction is to be engineered from 110mm galvanised steel tube main gate posts with twin 2100mm long x 4500mm wide swinging gates engineered to meet all relevant Australian standards.

The gate frames will be made from 50mm galvanised then poly coated or black painted steel tube to which will be attached 2100mm high black, poly coated chain wire mesh as meets Blacktown City Council’s requirements for Lots covered under SEPP 59.

The gates and adjacent fences do not connect or abut Precinct roads but nevertheless will be constructed to meet the requirements of the Precinct Plan.

14.8 ENTRY ROAD EARTHEN SAFETY BUNDS

Along the southern perimeter Lots 1 and 4 DP 1145808 there is an existing earthen bund which denotes the boundary between Lots 1, 4 and 5 owned by Hanson Construction Materials.

The roadway area 25 m wide of variable width is a right of carriageway marked “H” on the Deposited Plan.

The existing Earthen Safety Bunds will be retained with signposted access points for the entry and egress of vehicles onto and from the Right of Carriageway.

14.9 QUARRY VOID SAFETY FENCE

LHBC will construct a 1.8m high chainmesh fence along the exposed perimeter of the quarry void, tying into the existing locked gates located at the steep sections of the existing north eastern bund wall.

The fence would be constructed the entire perimeter of the exposed section of the quarry lip and the proposed fence line is to be constructed from 2.4m (1.8m out of ground) 50mm OD galvanised steel pipes @ 3000mm spacing with standard galvanised 1800mm chainmesh.

There are to be 3 tension wires, all 2.5mm high tensile Waratah “Ezytye” wire. Two wires are to be placed along the top and bottom extremities of the chainmesh and the third is to be run and strained along the mid section. The chainmesh it to be clipped to these tension wires at no more than 300mm lineal spacing.

This fence is not a boundary fence and nor does it abut a Precinct road. It therefore is not required to meet the requirements of the Eastern Creek Precinct Plan.

14.10 SECURITY

LHBC has made arrangements for security monitoring for the Site during the period outside normal operating hours. This includes regular after hours security patrols of the entire site, TV surveillance , alarm monitoring and appropriate alarm response capability.

15 STAGE 2B: CONVEYOR AND CHUTE

15.1 AIMS AND OBJECTIVES

- Construction of the weighbridge hoppers.
- Construction of the footings for the conveyor and chute.
- Construction of the conveyor.
- Construction of the chute.
- Commissioning and operation.

15.2 WEIGHBRIDGE HOPPERS

At the northern end of the MPC building, at the end of the plant and equipment that will process the waste, a weighing assembly will be construction.

The entire weighing assembly will be fitted with static measuring load cells of a kind approved by the NSW Department of Fair Trading and the entire assembly will be weighed as a weighbridge.

Alternating filling of weighing assembly will be achieved in accordance with the Conveyor and Chute System Maintenance and Management Plan in Appendix L. The Weighing Assembly consists of two separate conveyors operating and weighing alternately. When the conveyor reaches its established maximum weight that conveyor will automatically pause and the weight of the entire assembly will be automatically recorded for the purposes of OEH records. From the gross weight of the assembly and the waste (within the hopper upon it) will be deducted the unloaded or tare weight of the assembly, leaving a record of the waste together with the time, date and waste classification.

During the pause period of the first conveyor and hopper assembly (to enable weighing) a secondary conveyor will become operational and it too will begin to fill its second hopper to capacity. As the first assembly resumes movement (after weighing) the second assembly will pause in turn for its weight to be recorded in the same manner.

Each will operate alternately so that when one is filling the other is being weighed and emptied.

Following the recording of the weight of the waste filled hopper the conveyor will once again resume operation, discharging its contents onto another conveyor which is enclosed and passes within a culvert located underneath the road and thence to the downhill conveyor.

15.3 DOWNHILL CONVEYOR AND CHUTE

At the northern end of the MPC building, a covered conveyor will exit the MPC building.

Material discharged from the hopper will be carried by the fully covered downhill conveyor and in turn empty into a covered chute down which the waste travels the remainder of the distance to floor of the quarry.

The conveyor will be approximately 87m long running at 20 degrees with an effective width of 1500mm which will feed material into the chute. The chute will be 81m long running at 50 degrees with an internal diameter of 1.9m.

The conveyor will be running at 20 degrees and the chute at 50 degrees.

Footings have been designed for an allowable bearing capacity as noted in the pad footing schedule this foundation material shall be uniform and be approved by the engineer for this pressure before placing reinforcement or concrete.

15.4 GEOTECHNICAL CONSIDERATIONS

In establishing footings for the conveyor and chute, the Contractor will follow the directions provided by consulting engineers.

15.5 ACCESS AND WALKWAYS

The conveyor will be serviced via two platforms running parallel to the conveyor over its entire length. Entry to these platforms will be via the culvert. From the platforms all maintenance for the conveyor can be carried out. Access to the chute will be via an Abseil Access Corridor which will be mounted centrally on the top surface of the chute. Entry to the Abseil Access Corridor will be via the conveyor access platforms. From this corridor all aspects of maintenance and inspection for the chute can be carried out.

15.6 WATER SUPPLY

Pipework for the misting system, and water lances for removing blockages within the chute, will run alongside the Abseil Access Corridor and conveyor access platforms. Misting system must be established at the end of the chute, to suppress dust produced by exiting waste.

The water supply for the misting system and water lances is to come from the on-site irrigation system.

15.7 SAFETY

All aspects of the system will be adequately guarded as per the relevant Australian Standard:

Conveyors:

- AS 1755-2000 safety requirements.
- AS 1755-1986 Design, construction, installation and operation safety requirements.

Access:

- AS 1657-1992 Fixed platforms, walkways, stairways and ladders. Design Construction and installation.
- AS 4488 Industrial rope access systems specifications.
- AS 1891-1983 Industrial safety belts and harnesses.

Access to the conveyor will be via a locked gate in the culvert. Access to the conveyor and chute will only be granted to skilled and trained personal while the plant is shutdown.

This will be in addition to all required safety features i.e. emergency stops, lockouts etc.

The Contractor is responsible for adhering to the specifications in Appendix L, and performing all testing to the satisfaction of a qualified engineer.

16 OPERATIONS

LHBC expects to receive 2,000,000 tonnes of mixed and segregated waste through the MPC/WTF per annum. It expects that in excess of 80% of this material will be recycled and recovered for re-use and sale.

Waste material will be delivered to the site by a combination of light, medium and heavy vehicles, with loads typically varying from approximately 1 to 40 tonnes (t) in weight.

The waste transporters will be required to ensure that incoming loads are covered prior to entering the facility.

All waste carrying vehicles entering the Site will be weighed over the weighbridge.

The loads will be classified at the weighbridge in accordance with the Waste Classification Guidelines issued by the OEH (formerly DECCW).

Classification will be based on advice from the carrier, inspection of the carrier's documentation prepared in accordance with the OEH (2008) Waste Classification Guidelines and verification of this information by visual inspection using the weighbridge camera ('Check Point 1').

Non-complying loads identified (e.g. putrescible, liquid and chemical waste), will be recorded as a rejected load and redirected off-site.

Depending on its constituent material, incoming vehicles will be directed to unload at the appropriate area.

Material unable to be recycled at the site or separated (i.e. asbestos waste, loads that are so mixed they cannot be physically or economically separated), and loads of asbestos or asbestos contaminated materials, will be sent directly to landfill. The transporter will be directed down the quarry road to the bottom of the pit to unload directly into the tipface.

A spotter at the MPC will inspect all loads tipped to ascertain that the material conforms to the material classification and will identify any non-complying material missed at Check Point 1.

When the spotter identifies a non complying material during unloading, the vehicle will be reloaded with the non complying material, which will be recorded as a rejected load and will be directed off-site.

After unloading, vehicles will then be reweighed at the weighbridge to calculate the net vehicle weight and thereby recording the total weight of the load delivered, prior to exiting the site.

Waste acceptance and screen procedures, including the identification and handling of asbestos, are including in Section 42 of this Strategy.

The residue from recycling will either be transferred from the site to another licensed waste facility or will be landfilled at the adjoining landfill site in the quarry pit. The residue which is required to be landfilled will be weighed either in a vehicle over the Site weighbridge facilities and be transported to the landfill site, or by the weighing hoppers in the MPC which will subsequently discharge the waste via conveyor and chute down to the quarry pit.

Recycling will include, but not be limited to, both hardfill materials (sand, soil, concrete, brick and tile) and also specific materials (metals, plastics, paper, timber and vegetation).

Recycled materials for sale will meet specifications prescribed by the POEO Act and the *Protection of the Environment Operations (Waste) Regulation 2005*. Recycled products which do not pass testing will be retested, where appropriate, or subject to further processing or blending and then retested for compliance with the appropriate recycled material standard. Chemical testing for aggregates, sands, soils, compost and mulch will be assessed against the relevant EPA recycled products standards as required under clause 51A of the *Protection of the Environment Operations (Waste) Regulation 2005*. If required recycled material will be tested against Australian Standards and structural fill classifications. Recycled organics may also be tested against the Australian Standards AS 4454. Product testing may change in the future to meet any exemptions required by the OEH for recycled products.

Should the material still fail to comply with criteria and be deemed not fit for purpose, it will be quarantined at the WTS and sent to the adjoining landfill or off-site as appropriate.

Activities undertaken at the MPC/WTF will include receiving, sorting, screening, sieving, crushing, grinding, shredding, separating, composting, processing, recycling, recovering, and selling materials.

The materials to be processed and transferred or sold at the MPC/WTF will include:

- Brick
- Concrete
- Tile and ceramics
- Soil
- Rock
- Clay
- Wood/timber
- Greenwaste
- Glass
- Plastic
- Paper
- Cardboard
- Municipal waste that does not include food waste
- Virgin excavated natural material and other excavated materials
- Building and demolition waste
- Asphalt
- Ferrous and non-ferrous metals
- Foundry sand
- Railway ballast
- Tyres, and
- Any other waste classified as General Solid Waste (non-putrescible).

Unacceptable wastes include any materials which do not fall into the above categories. These include, but are not limited to:

- Liquid waste
- Hazardous waste
- Restricted solid waste
- General solid waste (putrescibles)
- Clinical, hospital and related wastes, and
- Loose, uncovered (non-bonded) or friable asbestos

Only suitably trained and experienced drivers employed by LHBC and operating under the Site OHS work direction will be permitted to drive a vehicle into or out of the quarry pit/void. At the base of the pit, the tip face is supervised by the landfill tip face operator.

Initial filling will commence in the north eastern corner of the quarry base at the deepest point and proceed south in a series of landfill tipping areas towards the south eastern corner. Once the south-eastern corner is reached, the filling area will proceed west and continue back to the northern side of the pit. Filling will progress in panels across the floor of the main tipping area which when completed will be reformed at the next level and the process repeated. Each sub-lift of the waste will be placed along a tipping face of no more than 50m length, with a daily lift thickness of no more than 2m. The initial lift will be 10 metres in height, with subsequent lifts of 15 metres.

Placement, spreading and compaction of waste will be effected at the tipping face by a steel-wheeled landfill compactor (TANA 52) and cover is placed and completed by a bulldozer. Daily cover of 150mm of VENM or other approved cover material shall be placed over the tipped and compacted materials, and at least two week's cover material will be stockpiled at the premises under all weather conditions.

The initial site access was via a registered Right of Carriageway off Old Wallgrove Road. Since the neighbouring property has commenced development by Australand, site access has been redirected by Australand to be via Wonderland Drive. The site entry point has not changed. This is not anticipated to change unless or until the precinct plan road connecting Archbold Road at the western extremity and the eastern extremity of the Hanson site is constructed. If any future changes to the access arrangement are proposed, the appropriate assessment and approval process would be undertaken as required and prior to establishment.

17 COMMUNITY CONSULTATION MEASURES

In order to provide clear and transparent opportunities for consultation with the Community and other stakeholders, to provide the opportunity to receive feedback; and to refine or improve relevant environmental practices, various Community Consultation measures associated with this Strategy have been developed. These include:

- The establishment of the Minchinbury Resident's Committee (comprising of not less than 3 local residents) and the ongoing liaison with Committee;
- The establishment of a website with relevant information;
- The establishment of a complaints hotline; and
- The establishment of other measures generally as outlined in the Strategy.

17.1 COMMUNICATION AND REPORTING

Effective communication between LHBC management, employees and contractors and communication between LHBC and external stakeholders is important for the successful operation of the LHBC Waste Facility Environmental Management Strategy.

All communication and reporting shall be undertaken in accordance with the specific procedures outlined within this Strategy.

17.2 INTERNAL COMMUNICATION

Internal communication is to be conducted in accordance with procedures developed by LHBC for Eastern Creek operations.

The LHBC Waste Facility Site Policy and general responsibilities are communicated to all personnel during an induction prior to commencement of work at the LHBC Waste Facility

The specific environmental impacts associated with particular aspects of the LHBC Waste Facility are discussed during regular toolbox talks.

All personnel are to report environmental incidents and non-conformances to their immediate supervisor who will then complete an incident/complaint form and forward the details of the incident or non-conformance to the LHBC Site Operations Manager or for investigation and corrective and/or preventative action.

The LHBC Site Operations Manager is to investigate the incident or complaint and prepare an investigation report, which includes recommendations for preventative and/or corrective action. Communication of complaints or incidents to the relevant managers will be undertaken as per the site incident reporting requirements.

17.3 EXTERNAL COMMUNICATION

All external reporting of environmental matters associated with the LHBC Waste Facility, including the annual and monthly reporting, shall be undertaken by the LHBC Site Operations Manager

External stakeholders identified in the site's stakeholder database are kept informed of the operational, environmental and social performance.

Communication with these stakeholders on environmental matters is to be undertaken in accordance with the agreed community engagement protocol.

LHBC produces a six monthly newsletter, which is distributed to all identified internal and external stakeholders. This newsletter details current operational, environmental and community issues, initiatives and site activities.

The LHBC Waste Facility Website will be maintained to provide the wider community with access to the LHBC Waste Facility monitoring results, details of current activities, policies, environmental management plans and monitoring programs and any other information in relation to the site operation that may be considered of interest to the community.

It is the responsibility of the LHBC Site Operations Manager to maintain the Website.

Information that will be publically available on the LHBC website (www.dadi.com.au/landfills) includes:

- The complaints hotline number: **9832 3333**;
- A copy of all current statutory approvals;
- A copy of the Environmental Management Strategy and associated plans and programs;
- A summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval;
- A Complaints Register, which is to be updated on a monthly basis;
- A copy of any Annual Reviews (over the last 5 years);
- A copy of any Independent Environmental Audit, and the Proponent's response to the recommendations in any audit; and
- Any other issues raised by the Resident's Committee.

17.4 MEDIA COMMUNICATION

Communication with the media is prohibited at the LHBC Waste Facility without approval from the LHBC Group General Manager

17.5 COMMUNITY CONSULTATIVE COMMITTEE

Consultation with the local community will be continued through the LHBC Waste Facility Community Consultative Committee (CCC) is accordance with the relevant development consents.

The CCC is required to meet three times a year, or as agreed by the Managing Director, throughout the life of the LHBC Waste Facility operations.

It is the responsibility of the LHBC Site Operations Manager to ensure minutes of the Committee meetings are taken and that these minutes are made available on the LHBC Waste Facility Website.

17.6 REPORTING

LHBC is required to periodically report on environmental management and compliance, including:

- an Annual Environmental Management Report;
- an Annual Environmental Protection Licence Return; and
- Monthly Site Reporting.

17.7 MONITORING & COMPLIANCE REPORTING

The various Community consultation measures identified above will ensure that:

- Any complaints are logged and appropriately recorded;
- All relevant initial data is obtained in order to determine whether a prima facie case exists to support the view that the complaint relates to the site and that an exceedance has or may have occurred;
- The Site Operations Manager will ensure that an effective complaint investigation is immediately carried out in order to determine the likely cause of the exceedance; and
- If as a result of investigation an exceedance of site environmental parameters is found to exist then appropriate measures will be immediately implemented (if required) by the issue of Work Directions or changes to operational procedures depending upon the nature or extent of the measures taken.

18 COMPLAINTS MANAGEMENT AND DISPUTE RESOLUTION

LHBC maintains a community response line.

The Complaints Hotline Number is 9832 3333

The number is accessible 24 hours per day.

The LHBC Site Operations Manager is responsible for ensuring that the currency and effectiveness of the service is maintained.

The existence of the community response line will be advertised at least quarterly in the local press.

Details are also provided on the LHBC Waste Facility website. The Site Operations Manager is responsible for ensuring the Hotline is advertised.

As a minimum, notification of complaints received via the community response line is to be provided by immediate SMS relay to the LHBC Site Operations Manager.

Complaints and enquiries do not have to be received on the Hotline and may be received in any other form.

Any complaint or enquiry relating to environmental management or performance is to be relayed to the LHBC Site Operations Manager and as soon as practical.

All employees are responsible for ensuring the prompt relaying of complaints.

The LHBC Site Manager is responsible for ensuring that all complaints are appropriately investigated, actioned and that information is fed back to the complainant, unless requested to the contrary.

A Complaints Register will be set up and maintained, and will contain:

- The date and time of the complaint
- The means by which the complaint was made
- Any person details of the complainant that were provided
- The nature of the complaint
- Record of operational and meterological condition contributing to the complaint
- All relevant work directions and correspondence and file notes; and
- If no action was taken in relation to the complaint, the reasons why no action was taken

The LHBC Site Operations Manager is to communicate all complaints to the Managing Director, General Manager and the relevant site functional manager as soon as practical, but as a maximum on the next working day.

A summary of complaints received and actions taken is presented to the LHBC Waste Facility CCC as part of the operational performance review.

A summary of complaints received and actions taken are included in the Annual Environmental Management Reports and the Annual Returns to the OEH.

19 DISPUTE RESOLUTION

In the event of a disagreement between LHBC and a member of the community, the LHBC Site Operations Manager will undertake the necessary liaison and communication to reach a resolution, which will involve an offer for a one on one meeting with the resident to discuss the issue.

In the case of an Environmental Complaint which is unable to be resolved to the satisfaction of the Complainant by the Site Operations Manager, one or more of the Resident's Committee will be invited to consult in relation to each such complaint received and in relation to the relevant investigation and attenuation measures which are implemented as a result of that complaint.

The purpose of this is to ensure the presence of and involvement by one or more impartial persons in the process so that verification is available, if required.

A six monthly review of work procedures and/or noise control procedures shall be undertaken in response to complaints or to issues raised by the Residents Committee.

In the event that the Complainant is dissatisfied with the actions taken by Site Management, the Site Operations Manager will convene a mediation meeting to which the Complainant, a Community Representative and an External Consultant with expertise in the area of the complaint will be invited for the purposes of exploring the issues and of mediation and reaching resolution with the Complainant.

Unresolved complaints may be referred to the NSW Department of Planning.

20 EMERGENCY MANAGEMENT PROCEDURE

20.1 EMERGENCY PREPAREDNESS AND RESPONSE

LHBC maintains a Fire and Emergency Management Plan, in consultation with external emergency agencies. The Fire and Emergency Management Plan is attached in Appendix B.

This Plan shall be reviewed annually and reassessed at least every 5 years.

20.2 EMERGENCY RESPONSE

Emergency response actions and responsibilities are detailed in the Fire and Emergency Response Plan.

During the conduct of the risk reviews, identification of all potential emergency situations that could result in significant environmental impacts is undertaken.

Emergency responses to these potential situations are to be incorporated into subsequent reviews and updates of all emergency procedures. An appropriate level of preparedness is maintained relative to the level of risk for each identified potential emergency situation.

All personnel receive an appropriate level of emergency preparedness and response training.

LHBC will maintain a dedicated emergency response team who undergo regular training and operational drills. Relevant managers are to consider emergency preparedness drills for such events.

Any changes to emergency procedures are to be documented and communicated to all personnel.

The responsible manager/foreman is to isolate the problem, contact emergency services (if required) and notify Work Safety Committee (WSC)/SPM.

Sydney Water	132 090	Integral Energy	131 008	Poison Information Centre	131 126
Ambulance	000	Telstra Cable Damage	132 203	Public Health Emergencies	9391 9000
Energy Australia	131 388	Gas	131 606	OEH	131 555

21 ZONING AND CURRENT DEVELOPMENT APPROVALS

The MPC/WTF site is owned by LHBC and the site is in an industrial zone covered by State Environmental Planning Policy No. 59 – Central Western Sydney Economic and Employment Area (Stage 3).

It is anticipated that the MPC/WTF and the landfill will be scheduled facilities each requiring a licence from the OEH.

The MPC/WTF will receive source materials principally for the purpose of recycling and material recovery. Materials which cannot be recycled or recovered will be transferred either to:

(a) the adjacent licensed landfill facility on the adjoining land for disposal by landfilling, or

(b) to an appropriate third party licensed facility (if appropriate) for disposal, by landfilling.

The relevant planning approval in this matter is Development Consent MP 06_0139 dated 22 November 2009.

This approval, inclusive of the condition in which this Strategy seeks to satisfy, is available to be viewed at http://www.dialadump.com.au/land/main/lhbc.sthml

21.1 SITE IDENTIFICATION AND LOCATION

The proposed site is a former quarry located immediately east of Archbold Road and south of the M4 Motorway, Eastern Creek within the Parish of Melville, County of Cumberland in the local government area of Blacktown.

The MPC site and landfill site comprises of two lots viz., Lots 1 and 4 in DP 1145808.

The MPC is located immediately adjacent to the former quarry void on Lot 1 DP 1145808 and on its northern, western and southern boundaries. The area to be occupied by the MPC is approximately 15 hectares.

21.2 ENVIRONMENTAL ISSUES ASSOCIATED WITH THE USE OF THE NOMINATED AREAS AS AN MPC AND A LANDFILL

The main potential impacts from the MPC may include:

- the potential for noise nuisances to neighbouring premises, noting that processing shall take place approximately 500 m from the nearest occupants located on the opposite side of the M4 motorway;
- dust and odour emissions from the site;
- wind blown litter; and
- impacts on surface water quality and effluent discharge.

An environmental monitoring programme to assess surface water quality, effluent discharge, groundwater quality, leachate, dust shall be undertaken and is discussed throughout this Strategy.

22 ENVIRONMENTAL AWARENESS, TRAINING AND COMPETENCY

Training forms an integral part of environmental management.

All personnel and contractors at the LHBC Waste Facility Site undergo Environmental Induction Training before being allowed to commence work on site.

Environmental Awareness training is conducted regularly and will be undertaken by all staff and permanent full-time contractors.

The training includes:

- the environment and community context within which the LHBC Waste Facility operates;
- the environmental policies and the importance of conformance;
- relevant legal and other requirements;
- the significant environmental aspects and impacts associated with the operation and relevant operational controls;
- their roles and responsibilities in achieving conformance with the environmental policies and requirements of the relevant Management Plans, including emergency preparedness and response requirements;
- the potential consequences of non-compliance with environmental policy and environmental requirements;
- community involvement/relations; and
- cultural awareness.

Employees and permanent full-time contractors will also undergo specific training undertaken as tool-box talks for relevant personnel.

This type of training is provided on an as-needed basis, for example, following the identification of a new risk or environmental risk, relevant changes in legislation or a change in operations.

The Site Operations Manager will oversee the identification of environmental training needs of personnel.

The responsibility for co-ordination of environmental training for the personnel is vested in the Site Operations Manager and Divisional General Manager.

These responsibilities include development of training modules and toolbox talks for operations that may potentially result in significant environmental impacts. Environmental training is incorporated into the broader training program for the site including health, safety and operational training.

Training module documentation and records of all training provided shall be maintained in the LHBC electronic filing system.

The effectiveness of training modules and sessions shall be periodically (at least annually) reviewed and the training modules updated as required.

All staff involved with weighbridge operations and inspections will be trained in the operation of the weighbridge and the entering of appropriate data regarding the classification of wastes.

In addition, all landfill staff will be suitably trained in the recognition of different types and categories of wastes and the legislative arrangements and regulations which govern waste disposal,

including the Waste Classification Guidelines. All landfill staff will also complete the 2 hour Asbestos Awareness training required by WorkCover.

The Site Owner will provide all new staff with suitable training and all existing staff will undergo an annual refresher course.

A record of training and safety meetings will be maintained in an on-site register.

The staff involved with the management of the facility, will be required to ensure that all operative and managerial staff have adequate training and that the training is updated on a regular basis. The training elements required (under the contract) include:-

- waste categories recognition;
- waste management practices;
- waste management regulations;
- environmental requirements of the operations of the landfill;
- separation of recyclable materials from wastes;
- operation of landfill equipment;
- compaction of waste and application of daily cover;
- operation of MCP;
- dust suppression;
- management of surface and groundwater;
- operation recycling machines (crushing plant);
- OH&S regulations and practices; and
- first aid.

LHBC will be required to provide details of the training records of all employees and contractors and 'log books' of all training courses and in-house training meetings held during the operation of the site, and should ensure that:-

- all operators of compaction or earthwork equipment are skilled at undertaking all tasks required of them;
- all staff or personnel monitoring for landfill gas, water sampling or water testing apparatus are familiar with the required testing and sample retention protocols, to a standard approved by the OEH;
- all staff should have training in OH&S, WorkCover Authority requirements and first aid; and
- all those who are to inspect or direct the placement of incoming wastes are capable of accurate data recording, and skilled at identifying wastes that are unacceptable.

23 ENVIRONMENTAL MONITORING, CORRECTIVE ACTION AND AUDITS

Environmental monitoring to determine conformance of the relevant Management Plans, and with the Environmental Monitoring Programme, and is to be managed by the Site Operations Manager.

Monitoring is undertaken in accordance with the Environmental Monitoring Programme and individual Management Plans.

The purpose of this monitoring is to provide a measure of the performance of the operation, which can be compared against the objectives, targets and performance criteria specified in the Environment Protection Licences, Consent Conditions and this Strategy.

All monitoring is undertaken using standard monitoring techniques and calibrated equipment operated by trained personnel.

Analysis of samples is to be undertaken in accordance with the Development Consent and OEH licence conditions.

All monitoring results are to be filed by the Site Operations Manager for LHBC and maintained on site for at least five years.

Monitoring results are to be compared against development consent, licence and permit conditions and any non-conformance recorded against the monitoring result.

In the event of a non-conformance the Site Manager and the Divisional General Manager are to investigate the cause of the non-conformance and recommend corrective and/or preventative action.

The effectiveness of the corrective and/or preventative action is to be assessed by analysis of the next available monitoring results and during the next monthly site inspection.

Any changes to work procedures as a result of the corrective or preventative action are to be documented and communicated as per the sites change management procedure.

Calibration records are kept of the monitoring equipment used.

Calibration will be undertaken in accordance with the equipment manufacturer's recommendations. Where monitoring is outsourced, the consulting body is responsible for maintaining calibration and supplying the relevant documentation.

Table 1- Environmental Monitoring Programme

Parameter	Determinants	Monitoring Points & Frequency	Proposed Environmental Trigger Levels			Environmental Management Plan - Immediate Action	Remediation Plan/Comments
Surface Water	As per site licence/ discharge parameters	2 Onsite Detention Basins, at entry and discharge point. Minimum Four times per year during a rain event and when there is a greater than 80% chance of discharge.	**Analyte**	**Unit**	**Proposed Criterion**	Any exceedance of trigger levels then revert to monthly monitoring to determine trends in groundwater quality	Identify origin of contaminants, make proposal for remediation, mitigation or removal of contaminant source if feasible.
			pH	pH Units	6.5 to 8.5		
			Dissolved Oxygen	% Saturation	80-110%		
			Ammonia	mg/L	0.91		
			Suspended Solids	mg/L	50		
			Total Organic Carbon	mg/L	10		
			Lead	mg/L	0.0044		
			Phenol	mg/L	0.4		
			Total Nitrogen	µg/L	350		
			Total Phosporous	µg/L	25		

Parameter	Determinants	Monitoring Points & Frequency	Proposed Environmental Trigger Levels			Environmental Management Plan - Immediate Action	Remediation Plan/Comments
Ground water	As per licence	Existing network of 12 operational groundwater bores. Continuous water level monitoring. Quarterly water quality monitoring for first 3 years after commencement of operations, then six monthly thereafter for key indicators (ammonia, nitrate, phenolics, major ions). Annual monitoring for full suite listed.	**Analyte**	**Detection limit (µg/L)**	**Remediation (µg/L)**	As above	As above. Reduce leachate level within void by pumping and increase storage capacity of the waste mass.
			pH	0.1 pH unit	6.5 to 9.0		
			Electrical conductivity	2 mS/m	ND		
			Redox potential	1 Eh	ND		
			Temperature	0.1	ND		
			Alkalinity	1000	ND		
			Ammonia	50	ND		
			Calcium	5000	ND		
			Chloride	5000	ND		
			Fluoride	500	1500		
			Iron	300	1000		
			Manganese	50	500		
			Magnesium	5000	ND		
			Nitrate	100	50000		
			Reactive Phosphorus	10	ND		
			Total phenolics	50	50		
			Potassium	5000	ND		
			Sodium	5000	ND		
			Sulphate	5000	500000		
			Total Carbon	50	ND		
			Heavy metals	5 to 100	ND		
Leachate	As per licence	Leachate sump.. Leachate volume discharged to sewer to be measured monthly. Leachate quality as per Sydney Water Trade Wastewater Consent tested every 22 days	In accordance with Sydney Water Trade Wastewater Consent			Cease irrigation until concentration reduces	Increase leachate treatment and/or storage capacity by addition of extra tanks.

Parameter	Determinants	Monitoring Points & Frequency	Proposed Environmental Trigger Levels	Environmental Management Plan - Immediate Action	Remediation Plan/Comments
Noise	All Affected Receivers LAeq(15minute) dB(B) 36	1 nominated location in each of Minchinbury and Erskine Park. Quarterly logging and monitoring during Year 1 operations or when noise complaints are received. Six monthly after first 12 months of operations, unless noise complaints received..	Complaints by neighbours or residents. All Affected Receivers LAeq(15minute) dB(A) 36	Identify source of noise impact at sensitive receiver and reduce emission. Re-monitor to check exceedances	No residual effects – respond to complainant
Dust	Dust Deposition Rates. Airborne Particulates	Dust Deposition Monitoring Points DDG1-4 and Dust Track Monitoring locations. Monthly.	**Maximum Total Deposited Dust Level :** 4g/m2/month (Annual Average) **Maximum Increase in Deposited Dust Level** 2 g/m2/month (Annual Average) **Dust Concentration Criteria (µg/m3)** 50 µg/m3 (annual average) 24 hr period **Dust Concentration Criteria (µg/m3)** 30 µg/m3 particulate matter PM 5 (annual average) 24 hr period 24 hour period every 6 days ***Trigger Level 1***: Remedial action is required under Trigger Level 1 when peak 1-hour concentrations are above 100 µg/m3 for three (3) consecutive hours and the wind is blowing from the site to the monitoring location. ***Trigger Level 2:*** Under extreme cases, open air crushing or screening site operations would be required to cease under Trigger Level 2. This applies when the rolling 24-hour concentration is above 50 µg/m3 for 24 consecutive hours and the peak 1-hour concentrations above 100 µg/m3 are also sustained.	Reduce dust emissions by increasing water spray and supervision of traffic and waste disposal.	Increase frequency of water sprays, further reduce vehicle speeds, ban dusty wastes. Cease outdoor crushing and screening works when trigger level 2 is exceeded

Parameter	Determinants	Monitoring Points & Frequency	Proposed Environmental Trigger Levels	Environmental Management Plan - Immediate Action	Remediation Plan/Comments
Landfill Gas	Air Quality, Odour and GHG Management Plan	3 groundwater bores and 25 locations on cover and buildings. Quarterly.	Trigger levels: 1.25% methane.	Identify source, obtain samples for trace gas analysis, inform OEH	Isolate area, apply cover if on landfill surface, consider activating alarm if beyond landfill boundary. Consider whether venting or flaring is appropriate.
Greenhouse Gas	As above	Landfill surface walkover. Monthly	**Chemical** / **Trigger Level (TWA)(ppb/v)** / **Action Level (IDLH)(ppb/v)** Hydrogen Sulfide / 1.5×10^6 / 3.0×10^8 Chloromethane / 50000 / 1.0×10^7 Vinyl Chloride / 5000 / ND Methylene Chloride / 50000 / 5.0×10^6 Chloroform / 10000 / 1.0×10^6 1,1,1 Trichloro-ethane / 125000 / ND Benzene / 5000 / 3.0×10^6 Toluene / 100000 / 2.0×10^6 Total Xylene / 80000 / 1.0×10^6	Additional cover and compaction.	Revise material being landfilled. If detected outside perimeter of landfill, install gas relief tranches and values with scrubbers within perimeter of landfill.
Aboriginal Cultural Heritage	Aboriginal Heritage Management Plan	Conservation Area and Ropes Creek riparian area.	Discovery of artifact, remains or items of potential cultural significant.	Cease activity in the area, quarantine and rope area off.	Notify Office of Heritage, local Aboriginal community groups
Ecology	Landscape and Vegetation Management Plan, and Pest, Vermin, Feral Animals and Noxious Weeds Management Plan	As above.	Unauthorised access to Conservation Area or Ropes Creek. Unauthorised removal of trees. Identification of notifiable and/or noxious weeds. Over 100 birds around landfill. Large swarms of insects, including mosquitoes.	Weed eradication. Blacktown Council to be notified of notifiable weeds. Bird scares. Pesticide.	The use of herbicides and pesticides to be approved by OEH.

24 INSPECTIONS

24.1 INTERNAL

Regular environmental inspections of the LHBC Facility Site operations are conducted. These inspections are conducted twice daily by the Site Operations Manager, and at least monthly by the Divisional General Manager and other managerial staff.

These inspections are to determine, in conjunction with the environmental monitoring and incident/complaint reporting procedures, on-site compliance with this Strategy.

Daily environment inspections are to be conducted by the Site Operations Manager or his/her delegate and the inspection results recorded on the inspection form in Annexure A.

Weekly workplace inspections are to be conducted by the Site Operations Manager or his/her delegate and the inspection results recorded on the form in Annexure B.

Any non-conformances are to be recorded on the inspection form and the cause of the non-conformance investigated by the Site Operations Manager.

Corrective and/or preventative action is to be recommended by the person undertaking the inspection and the effectiveness of the corrective and/or preventative action assessed at the next monthly site inspection.

The Site Operations Manager will report any significant non-conformances arising from site inspections to the Managing Director and General Manager.

24.2 EXTERNAL

Specific environmental monitoring requirements and instructions are located in the Environmental Monitoring Programme and the Management Plans incorporated in this Strategy.

Monitoring, including sampling with field instruments and the establishment of quality control and chain of custody protocols for laboratory testing will be the responsibility of an independent appropriately qualified environmental consultant. The taking and laboratory analysis of all samples or raw monitoring data shall only be conducted by quality endorsed (ISO9001) consultants using NATA approved laboratories.

25 INTERNAL AUDITS

Internal audits will be undertaken to assess whether the relevant Management Plan has been properly implemented and maintained and conforms to the environmental policy, objectives and targets of LHBC Executive Management Committee.

The results are communicated to senior management and employees in accordance with this Strategy. Actions and recommendations from internal audits undertaken on site will also be entered into the site's reporting database.

Internal auditors are to be selected on the basis of their understanding of environmental management principles of Waste Processing and landfill operations.

Internal auditors shall be suitably qualified and experienced and be capable of impartially and objectively auditing the Management Plans.

A schedule of Environmental Audits will be maintained within LHBC electronic files.

26 EXTERNAL AUDITS

Independent environmental audits of the operation are to be conducted at within six months of commencement of Operations in accordance with Condition 7 of the Schedule 5 of the Development Consent.

Thereafter external audits shall be conducted every 2 years unless the Director General of Planning NSW directs otherwise.

External auditors are to be selected on the basis of their understanding of environmental management principles waste processing and landfill operations.

The selection of external auditors will be the responsibility of the LHBC Executive Management Committee Manager and the appointment duties and tasks of the auditors must satisfy the criteria and requirements set out in set out Condition 7 of the Schedule 5 of the Development Consent.

Actions and recommendations from external audits will be communicated to senior management and employees in accordance with relevant communication procedures.

27 NON CONFORMITY, CORRECTIVE ACTION AND PREVENTATIVE ACTION

On receipt of an incident/complaint reporting form, site inspection form, hazard report or monitoring result that indicates a potential or actual non-conformance of the LHBC Waste Facility with the relevant Management Plan, the Divisional General Manager or Site Operations Manager is to undertake an investigation and recommend corrective or preventative action.

Details of the required action(s) are to be communicated to the relevant supervisor of the specific operations area and a copy of the communications kept with the investigation report.

The effectiveness of the requested action is to be assessed within one month of the non-conformance.

Corrective and preventative actions relating to environmental aspects specifically identified within the Development Consents are addressed within the dedicated Environmental Management Plans in the appendices to this Strategy.

28 REVIEW AND IMPROVEMENT

28.1 MANAGEMENT REVIEW

The review and revision of the Management Plans are to be undertaken by senior management, not less than every two years.

The Management Plan review will include:

- review of audit findings;
- results of monitoring programs;
- achievement of objectives and targets;
- relevance of the policy, objectives and targets to current and future conditions; and
- information and concerns of stakeholders.

28.2 STRATEGIC REVIEW

This Strategy will be reviewed, and revised as necessary, within three months of the completion of each Independent Environmental Audit in accordance with Condition 7 of the Schedule 5 of the Development Consent.

If any significant changes are made to the Strategy as part of one of these reviews, the revised Strategy will be provided to the DoP for approval.

29 REPORTING

29.1 ANNUAL REVIEW

An annual review will be submitted by LHBC to the satisfaction of the Director-General.

The annual review will describe the works that were carried out in the last year, a comprehensive report of the monitoring results and complaints records of the project of the past year.

29.2 ANNUAL REPORT

The LHBC will submit an annual report in accordance with

The annual report will be submitted within 60 days of license renewal date and comprise up to date data and information including a summary of reported incidents and license non-compliances, complaints, remedial measures, environmental monitoring data (graphed as required), including groundwater, leachate, landfill gas, air (dust), noise, surface water etc.

The report will summarise, interpret and comment on all environmental monitoring data.

29.3 COMPLAINTS REGISTER

The complaints register should include:

- The date and time of complaint;
- The method of lodging the complaint (including telephone record, or correspondence);
- Personal details of the complainant if given or available;
- The nature of the complaint and if it is a repeat complaint; and
- The follow up action, remedial measures and copies of correspondence.

The complaint records and related correspondence must be maintained for a minimum of 3 years after receipt.

29.4 SURVEYS

Topographic survey plans of the landfill prepared by a registered surveyor to a scale of 1:2500 and 1:500 will be provided to the OEH, together with an estimate of space utilisation during the previous reporting period.

Calculated waste density to determine compaction rates since the previous survey will also be provided.

Settlement rates will also be assessed based on differential heights of a fixed point relative to a control point off-site of the landfill.

Projected life expectancy of the landfill site will be estimated based on current waste intakes rates and remaining void space available. Based on the information obtained from such surveys projected filling plans will be generated to determine the overall progression of filling.

29.5 GROUNDWATER AND SURFACE WATER QUALITY

Groundwater data will be summarised, graphed and interpreted to determine trends and assess impacts against the baseline water quality at the site and evaluate any exceedances against

established environmental trigger levels. Similar reports will be compiled with regard to surface water quality. Results will be based on data obtained from proposed groundwater bores monitoring bores.

29.6 LEACHATE

Leachate quality and flow rate and any impacts on local water quality as a result of leachate emissions will be reported graphed and interpreted.

Observed failures in the leachate collection system, treatment system or barrier systems will also be reported. Trends in leachate quality will be highlighted with explanations.

29.7 LANDFILL GAS

Landfill gas monitoring results will be presented in graphical and tabular format and any exceedance of the 25% LEL level (1.25% methane) highlighted together with results of additional (trigger level) monitoring, including trace gas analyses.

Any exceedance of the environmental trigger level (25% LEL) recorded outside the landfill boundary or within buildings and structures on-site will result in the declaration of a landfill gas action plan.

29.8 MONITORING AND REPORTING OF INCIDENTS (BENCHMARK TECHNIQUE TABLES BM 1-39)

Regular reports will be a requirement of the site EPL. The report will take the form of an annual return document which will contain:

- a statement of compliance; and
- a monitoring and complaints summary.

Reports will include incident reports on any occurrence or incident which may lead to a non-compliance with operating procedures or a breach in license conditions.

In the case of an incident which is considered to constitute environmental harm under Part 5.7 of the POEO Act, the holder of the site licence will immediately contact staff, an will report the incident to OEH within 3 hours using the Pollution Control Hotline (131 555). Written details of the notification will require to be presented to the OEH within 7 days of the incident.

A written notice of the incident including proposed remediation or mitigation measures will be sent by registered mail and facsimile to the OEH.

Daily records and a site diary will be maintained which provides a record of incidents and remediation activities, as well as weather conditions, monitoring activities and the results of inspections of the site. Site inspections will occur at regular intervals as follows:

- prior to operations commencing each morning; and
- following site closure for the day.

Site inspections will be undertaken by the Site Operations Manager.

Any hazards or environmental problems or events will be recorded in the site diary/log for that day together with proposed actions to mitigate and remediate the problem.

Results of previous initiatives will also be recorded to determine the effectiveness of measures taken to mitigate problems.

The log will also contain a record of any complaints form received and measures taken to investigate and mitigate the problem.

Annual performance reports will be prepared according to the requirements of the site and to generally comply with the Environmental Guidelines: Solid Waste Landfills (Section 3.4).

Incidents which may require reporting on the above basis will inter alia include:-

- inadvertent disposal of or attempted entry to the site of unacceptable wastes;
- landfill fires;
- mixing of leachate and surface runoff;
- leachate collection system failure or blockage;
- leachate barrier system failure i.e. groundwater parameters exceeding established environmental trigger levels;
- implementation of water remediation plan;
- detection of surface gases or building above 25% LEL or 1.25% CH4 by volume;
- serious complaints by the general public;
- other potential breaches of environmental regulations under legislation administered by the DEC; and
- any proposed changes in the landfill's ownership, occupier or licensee.

All of the above incidents will be required to be reported to the OEH immediately by telephone with written advice to follow within 7 days.

29.9 MONTHLY REPORTS

Monthly reports of waste intakes will be provided to OEH on a standard pro-forma based on weighbridge records and provide total weights of incoming wastes broken down by category based on classification.

The report will be made available to the OEH by the 14th day of each month in the format specified by the OEH in the 'Environmental Guidelines: Solid Waste Landfills' (1996) or in subsequent revisions to the official returns pro-forma.

30 ABORIGINAL CULTURAL HERITAGE

The Aboriginal Heritage Management Plan is annexed in Appendix A.

Three zones have been identified on site and detailed in the figure below. Zone 1 represents area of high sensitivity, Zone 2 is an area of moderate sensitivity, and Zone 3 is highly disturbed and unlikely to contain any heritage items.

Figure 5: Assessed archaeological sensitivity zoning within the DAD Industries land (from JMcD CHM 2002, 2005). The non-hatched areas are Zone 3.

30.1 MANAGEMENT

The Site Project/Operations Manager and all employees of LHBC shall refer to the Aboriginal Heritage Management Plan.

The Aboriginal Heritage Management Plan will be reviewed annually.

No access will be permitted to Zone 1. Zone 2 will require further investigation if more extensive development proposals are considered in the future.

In the event that any item or relic of aboriginal cultural significance or any human remains are uncovered during construction, all work in the area is to cease. The Site Project Management will be informed. The area will be fenced and flagged to prevent further access until the matter has been appropriately assessed.

Similarly, in the event that previously unrecorded relics or human remains are encountered during inspections once operations commence, works in the area will immediately cease. The Site Project

Management will be informed. The area will be fenced and flagged to prevent further access until the matter has been appropriately assessed.

The NSW Heritage Office will be informed as will the Archaeologist and all relevant Aboriginal Liaison Group representatives.

Any management decisions in relation to the areas of high sensitivity are to be carried out in consultation with the Local Aboriginal Community.

As part of the Site induction process a specific, work direction be issued by the Site Project/Operations Manager to all relevant Sub-Contractors and employees (including relevant plans) prescribing that NO ACCESS be permitted at any time to Zone 1, except for those activities specifically permitted and supervised by the SPM.

The Site Project Manager shall monitor the Site daily and provide a weekly report to the Managing Director and Group General Manager.

30.2 COMMUNITY CONSULTATION

External stakeholders include the Aboriginal Stakeholder Groups identified in the Aboriginal Heritage Management Plan. External stakeholders shall be kept informed of operational, environmental and social performance of the Site.

LHBC will produce a six monthly newsletter, which will be distributed to external stakeholders. LHBC will maintain a website for access by the wide community with monitoring results, details of current activities, policies, management plans, monitoring programmes, and any other information in relation to the Site considered of interest to the community.

The newsletter dissemination and updating the website will be the responsibility of the Site Project/Operations Manager.

The Aboriginal Stakeholder Groups will be contacted directly if any works are proposed in Zone 1, or any future development is proposed in Zone 2.

30.3 COMPLAINTS

LHBC will receive complaints through its Hotline, website, or through the consent or licensing authority.

Any complaint or enquiry relating to environmental management or performance will be relayed to the Site Project/Operations Manager and soon as practicable. The Site Manager is responsible for investigating each complaint, ensuring action is taken, and ensuring that feedback is provided to the complainant.

The Site Project/Operations Manager will communicate all complaints to the Managing Director and Group General Manager, along with a summary of actions taken. The complaint will be recorded in the Complaints Register.

30.4 DISPUTES

In the event of a disagreement between LHBC and a member of the Aboriginal community, the Site Project/Operations Manager will undertake to liaise and communicate with the Aboriginal Stakeholder Groups, and offer a one on one meeting with the complainant.

In the case that the dispute is unable to be resolved in a meeting, one or more representatives of the Aboriginal Stakeholder Groups will be invited to consult in relation to each complaint, and the attenuation measure to be implements.

30.5 NON-CONFORMITY

If potential or actual non-conformance with the Aboriginal Heritage Management Plan is identified, the Site Project/Operations Manager is to undertake an investigation and recommend corrective or preventative action. The recommendations are to be implemented and reviewed within one month.

In the event that the perimeter of Zone 1 is breached, then the Site Project/Operations Manager will take immediate steps to reprimand the contractor or employee.

31 TRAFFIC AND TRANSPORT

The Traffic and Transport Code of Conduct is annexed in Appendix C.

Access to the Site via Archbold Road is prohibited.

Access to the Site shall be from the east, via the public precinct plan road network when the public road is made available. Until such time as the precinct road is made public, LHBC has a licence to use the private road built by its neighbouring developer.

31.1 MANAGEMENT

The Site Project/Operations Manager and all employees of LHBC shall refer to the Traffic and Transport Code of Conduct.

The Site Project/Operations Manager shall be responsible for enforcing the Code of Conduct, including:

- All operations are clearly identified by signs
- All speed restrictions and directional signs are to be enforced
- All drivers are to be unaffected by drugs or alcohol
- All loads are to be appropriately covered
- All drivers should be appropriately licensed for the vehicle they are driving
- Overloading does not occur
- There is no access to the Site from Archbold Road
- Vehicles associated with the facility do not park or queue on public road networks
- Radio communication will be appropriate and obscene language will not be tolerated
- No littering, and
- No driver transport dangerous articles, explosives or firearm in any vehicle on Site.

Individual drivers will be responsible for meeting their obligations under the Code of Conduct, including:

- Hold a current licence for the vehicle they are operating
- Strictly comply with traffic regulations
- Drive in a manner in accordance with road conditions
- Decrease speeds to minimize dust and noise
- Not use engine braking where noise is likely to adversely impact neighbouring properties
- Not operate machinery under the influence of drugs or alcohol
- Not operation machinery whilst suffering from fatigue
- Wear Personal Protective Equipment
- Not accept overloaded vehicles
- Accurately complete paperwork
- Ensure load is secure and covered
- Maintain vehicles in a clean and tidy condition
- Ensure no littering
- Not carry any dangerous article, explosive or firearm, and
- Not carry any animal in any vehicle at any time

31.2 MONITORING

Visual monitoring of all traffic movements on site will be carried out by the Site Operations Manager to ensure the safe movement of traffic and the protection of persons and property throughout the Site.

The Site will be inspected to ensure signage and traffic barriers are in place, clearly visible, and performing their function in direction traffic and alerting drivers of safety issues.

31.3 NON-CONFORMITY

Breaches of the Code of Conduct will result in the Site Project/Operations Manger issuing a warning to the individual, and the individual will be required to undergo counseling in relation to the Code of Conduct requirements.

If the individual continues to disregard the Code of Conduct, the Site Project/Operations Manager can choose the appropriate form of action, depending on the situation, including:

- Termination of employment
- Termination of contracts, in respect of contractors
- Banning of companies to the Site
- Banning of particular company employee from site, with the company to be informed and enforce the ban.

32 GREENWASTE MANAGEMENT

The Greenwaste Management Plan ("GMP") is annexed in Appendix D.

32.1 MANAGEMENT AND MONITORING

The Site Project/Operations Manager, Landfill Manager and all employees of the LHBC shall refer to the GWP.

No more than 20,000 tonnes of greenwaste will be stockpiled on Site at any one time.

On arrival at the weighbridge, loads of greenwaste will be directed to the greenwaste area.

Incoming materials will be supervised at time of tipping to facilitate removal of contaminating or non biodegradable materials and also materials which bio-degrade at a slower pace and may thereby inhibit the overall process.

The greenwaste will then be shredded and deposited in windrows to decompose, with the windrows being not higher than the surrounding walls.

The temperature of each windrow is to be tested daily and the results recorded.

Odour will be monitored daily.

Stockpiles will be tested quarterly, at 2 metre intervals, for the presence of methane.

Each windrow will be covered daily with appropriate material to minimise the inflow of water and the release of odours into the air.

In order to facilitiate and expediate the biodegradation process, blown air will be introduced at the base of each windrow of shredded material via perforated HDPE or steel pipes. One pipe will be located per windrow bay. Pipes are to be cleaned and maintained regularly.

At the end of the biological process, the stockpile may be assessed and tested with regard to the OEH Guidelines for soils on contaminated sites. Once the relevant guidelines have been met, the processed material may be disposed of by sale or landfilling.

Odour will be managed in accordance with the GMP and the Air Quality, Odour and Greenhouse Gas Management Plan.

Leachate will be managed in accordance with the GMP and the Leachate Management Plan.

32.2 COMPLAINTS

LHBC will receive complaints from the Community through its Hotline, website, or through the consent or licensing authority.

Any complaint or enquiry relating to environmental management or performance will be relayed to the Site Project/Operations Manager and soon as practicable. The Site Manager is responsible for

investigating each complaint, ensuring action is taken, and ensuring that feedback is provided to the complainant.

The Site Project/Operations Manager will communicate all complaints to the Managing Director and Group General Manager, along with a summary of actions taken. The complaint will be recorded in the Complaints Register.

32.3 NON-CONFORMITY

If potential or actual non-conformance with the GMP is identified, the Site Project/Operations Manager is to undertake an investigation and recommend corrective or preventative action.

If the temperature exceeds 70 degrees, the appointed Landfill Manager will then facilitate the appropriate procedures set out in the GMP to reduce the heat, including turning the windrow and lowering the height of the windrow.

Generally, mixing and turning should be avoided in windy and wet conditions, due to the potential to cause or increase an odour problem.

If the greenwaste material is odourous, BioMagic is to be applied in accordance with manufacturer's guidelines.

The Air Quality, Odour and Greenhouse Gas Management Plan is annexed in Appendix E.

Four dust monitoring locations have been identified on site and detailed in the figure below.

A meteorological monitoring station has been established with sensors to measure wind speed and wind direction.

The real-time dust monitoring has been conducted on a monthly basis in accordance with the NSW OEH "Approved methods for the sampling and analysis of air pollutants in NSW" (DECC 2005a).

Real time PM10 monitoring to assess the potential for off-site air quality impacts has commenced.

No exceedance has been demonstrated during Stage 1 or Stage 2A works. Monitoring of dust deposition rates will continue during Stage 2B works and throughout operations.

There are two PM10 concentration trigger levels required for the site, as follows:

- **Trigger Level 1** – elevated 1-hour average PM10 concentrations indicate that additional dust control measures are required; and
- **Trigger Level 2** – sustained elevated 1-hour and 24-hour average PM10 concentrations indicate that site activities should cease.

Trigger values are presented for two averaging periods and explained as follows.

- **Trigger Level 1**: Remedial action is required under Trigger Level 1 when peak 1-hour concentrations are above 100 µg/m3 for three (3) consecutive hours and the wind is blowing from the site to the monitoring location.

- **Trigger Level 2**: Under extreme cases, works would need to cease.

  This applies when the rolling 24-hour concentration is above 50 µg/m3 for 24 consecutive hours and the peak 1-hour concentrations above 100 µg/m3 are also sustained. The additional conditions for when this applies that the wind is blowing from the site to the monitoring location and that the elevated PM10 concentrations are not caused by an external regional pollution event such as a bushfire or dust storm. This is tested by examining the 24-hour PM10 concentrations at the OEH's monitoring sites at Prospect and St Marys.

Landfill gas emissions will be monitored, by the completion of quarterly surveys. Monitoring will comprise a walk over gas probe survey utilizing an infra-red scanning instrument. Gas detection is to occur at 25 pre-selected representative locations. These surveys will be included in annual reports to the OEH.

The Site Project/Operations Manager will perform regular (at least weekly) walkovers to undertake trace gas sampling and analysis. Trace gas trigger levels are shown in the table below.

Chemical	Trigger Level (TWA) (ppb/v)	Action Level (IDLH) (ppb/v)	Reference
Hydrogen sulphide	1.5×10^6	3.0×10^8	1
Chloromethane	50000	1.0×10^7	1 & 2
Vinyl Chloride	5000	ND	1 & 2
Methylene chloride	50000	5.0×10^6	1 & 2
Chloroform	10000	1.0×10^6	1 & 2
1,1,1-Trichloroethane	125000	ND	1
Benzene	5000	3.0×10^6	1 & 2
Toluene	100000	2.0×10^6	1 & 2
Total Xylene	80000	1.0×10^6	1 & 2

33.1 MANAGEMENT

The Site Project/Operations Manager and all employees of LHBC shall refer to the Air Quality, Odour and Greenhouse Gas Management Plan.

Monitoring of dust, landfill gas, greenhouse gas, and odour will be in accordance with the Air Quality, Odour and Greenhouse Gas Management Plan, and as summarised in the Environmental Monitoring Programme above.

The additional dust control measures to be implemented under Trigger 1 will depend on the activities occurring on-site at the time but may involve:

- Increasing the frequency of watering for exposed areas and stockpiles,
- Increasing the frequency of watering on paved and unpaved roads, and
- Modifying site activities such as ceasing any excavations or crushing and grinding.

Specific and regular tasks undertaken by the Site Project/Operation Manager will also seek to address the relevant criteria relating to dust and air quality.

Odour management at the Site will be undertaken in the form of the following operational practices, with the Site Project/Operations Manager to oversee that these activities are occurring:

- Daily cover of the active tipping face;
- Immediate burial of odourous or offensive wastes;
- Intermediate covering with 300mm of VENM or other approved alternative cover;
- Banning of all waste burning;
- Ensuring that emission controls on operational vehicles are acceptable;
- Inspection of waste loads to ensure that unacceptable/excluded wastes do not enter the site;
- Response to complaints from the general public regarding odour, resulting in attempts to identify the course of the odour and immediate removal, or undertaking air monitoring if the source is not readily discernible;
- The limited stockpiling of greenwaste, including the employment of aeration, covering, and the use of BioMagic.

33.2 COMPLAINTS

LHBC will receive complaints through its Hotline, website, or through the consent or licensing authority.

Any complaint or enquiry relating to environmental management or performance will be relayed to the Site Project/Operations Manager and soon as practicable. The Site Manager is responsible for investigating each complaint, ensuring action is taken, and ensuring that feedback is provided to the complainant.

The Site Project/Operations Manager will communicate all complaints to the Managing Director and Group General Manager, along with a summary of actions taken. The complaint will be recorded in the Complaints Register.

33.3 NON-CONFORMITY

If trigger levels are exceeded, the Site Project/Operations Manager will be informed immediately. The Site Project/Operations Manager will issue work directions as appropriate, to mitigate and suppress dust, or to remediate landfill gas or gas emissions.

The Site Project/Operations Manager shall monitor the site daily and report weekly to LHBC. It is the responsibility of the Site Project/Operations Manager to report any relevant exceedances to OEH.

Landfill gas emissions are most likely associated with breaches in cover material, caused by slippage or erosion on sloping surfaces. Under such circumstances, additional cover will be placed and compacted to rectify the problem and regular monitoring undertaken at an increased frequency to ensure that the gas hot spot has been rectified.

Specific responsibilities of the Site Project Manager that seek to address any unpredicted impacts and to improve the environmental performance in terms of dust/air quality issues include:

- Logging of weather conditions on a daily basis, including wind speed and direction and also by reference to the nearest BOM monitoring site,
- Direct the use of a water tanker to suppress dust on Site and on public roads where these have been disturbed by tracked mud or dust.
- Implementation of the following measures:
    - Restrict concrete dust generation by the use of water sprays
    - Remove mud from wheels and bodies of haulage equipment before they enter public roads and ensure loads are fully covered
    - Remove mud spilt on public roads
    - Service and maintain all plant and equipment powered by internal combustion engines to ensure exhaust emissions comply with regulations
    - Visually monitor and record dust emissions to ensure emission comply with regulatory requirements
    - Define of trafficked areas
    - Enforce vehicle speed limits
    - Install perimeter dust fences around the main area of operations to provide a barrier for dust emissions, and
    - Immediately clean spills of potentially dusty materials.

34 NOISE

The Noise Monitoring Program is annexed in Appendix F.

Noise levels should not exceed the noise limits presented in table below.

Location	Day LAeq(15 Min) dB(A)
All affected receivers	36

Results from attended Monitoring carried out during Stage 1 Bulk Earthworks have been compiled and assessed and reported upon. No breach of the noise limits set out in the Consent Conditions has been detected and No complaints received.

During Stage 2B works the Landowner will continue to rely upon feedback through the Community Consultation measures established in this CEMP.

This includes establishing and maintaining contact and liaison with a Resident Committee comprising a minimum of 3 householders in sensitive receiver areas and acting upon reports provided to the Site Project Manager.

Due consideration is given to minimizing the potential noise impacts on surrounding neighbours, and noise mitigation measures include restricting the house of operation on Site to:

- Monday – Friday: *7:00am to 6:00pm*
- Saturday: *8:00am to 4:00pm*
- No construction or operations on Sundays or public holidays.

Compliance with the hours of operation will continue throughout Stage 2B construction, and operations.

34.1 MANAGEMENT AND MONITORING

The Site Project/Operations Manager and all employees of LHBC shall refer to the Noise Monitoring Program.

Once operations commence, monitoring of noise will occur by an appropriately qualified consultant on a quarterly basis, at attended loggers to the north and west of the site. After the first twelve months of operations, if there have been no exceedances, then monitoring will be six monthly.

All on-site, fixed and mobile diesel powered plant equipment, excluding road vehicles, are to be correctly fitted and maintained in accordance with the manufacturer's specifications. Particular attention is to be given to engine exhaust system and the care and maintenance of mufflers.

If fixed machinery is identified as being a source that exceeds noise trigger values, the use of the machinery will cease until noise attenuation measures are implemented.

If the noise source is reversing beepers or alarms on moveable plant or trucks, then for those vehicles and plant on site then measures will be taken to adjust the tone and where appropriate reduce the volume of those appropriately so as to remove the potential for noise disturbance.

Temporary cessation of work may occur in windy conditions, until wind conditions are favourable.

The Site Project/Operations Manager shall monitor the Site daily and report weekly to LHBC.

34.2 COMPLAINTS

LHBC will receive complaints through its Hotline, website, or through the consent or licensing authority.

Any complaint or enquiry relating to environmental management or performance will be relayed to the Site Project/Operations Manager and soon as practicable. The Site Manager is responsible for investigating each complaint, ensuring action is taken, and ensuring that feedback is provided to the complainant.

The Site Project/Operations Manager will communicate all complaints to the Managing Director and Group General Manager, along with a summary of actions taken. The complaint will be recorded in the Complaints Register.

A six monthly review of work procedures and/or noise control procedures shall be undertaken in response to complaints or to issues raised by the Residents Committee.

34.3 NON-CONFORMITY

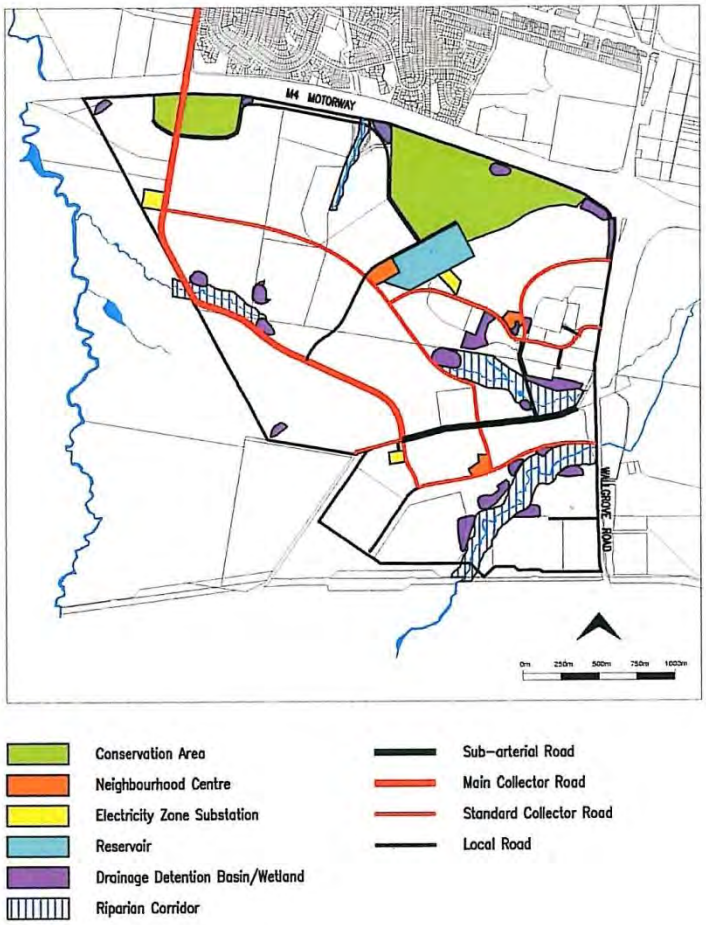
If non-conformance with the Noise Monitoring Program is identified, or trigger levels are exceeded, the Site Project/Operations Manager is to undertake an investigation and recommend corrective or preventative action. The Site Project/Operations Manager will issue work directions which will be implemented immediately.

It is the responsibility of the Site Project/Operations Manager to report any relevant exceedances to OEH.

35 LANDSCAPE AND VEGETATION

The Landscape and Vegetation Management Plan is annexed in Appendix G.

The Landscape and Vegetation Management Plan deals with three main areas, being the Conservation Area in the north-west corner of the Site, the Ropes Creek riparian area in the south-west corner of the Site, and the operational area.



35.1 MANAGEMENT

The Site Project/Operations Manager and all employees of LHBC shall refer to the Landscape and Vegetation Management Plan, and to the Pest, Vermin, Feral Animals and Noxious Weeds Management Plan (detailed below) in relation to weeding.

No access will be permitted to the Conservation Area or the Ropes Creek riparian area. The existing fences surrounding the Conservation Are and the Ropes Creek riparian area are to be maintained.

Existing unmade roads in the Conservation Area are to be left untouched as fire access trails. Trail bike tracks have been closed.

No vegetation or trees are to be damage or removed from the Conservation Area or the Ropes Creek riparian area, except for the removal of African Boxthorn and other noxious weeds in accordance with the Noxious Weeds Act and as supervised by the Site Project/Operations Manager.

Exotic species will not be used in any landscaping or re-vegetation on Site.

Monitoring of the Conservation Area and the Ropes Creek riparian area will occur daily by the Site Project/Operations Manager, from the points marked in the figures below.

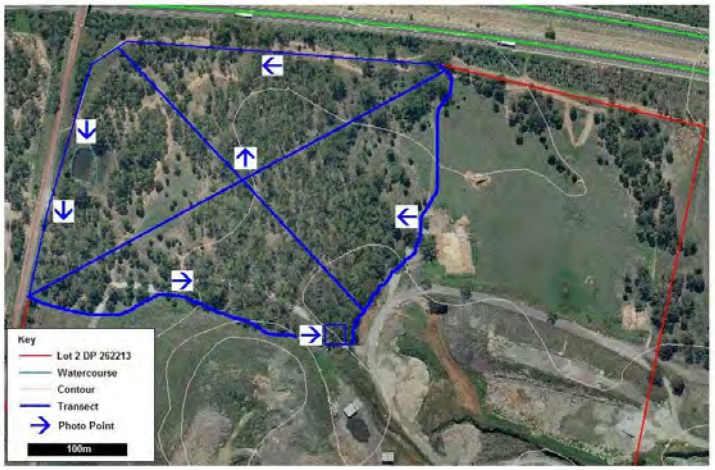


Figure 13. Conservation Area - Monitoring Points

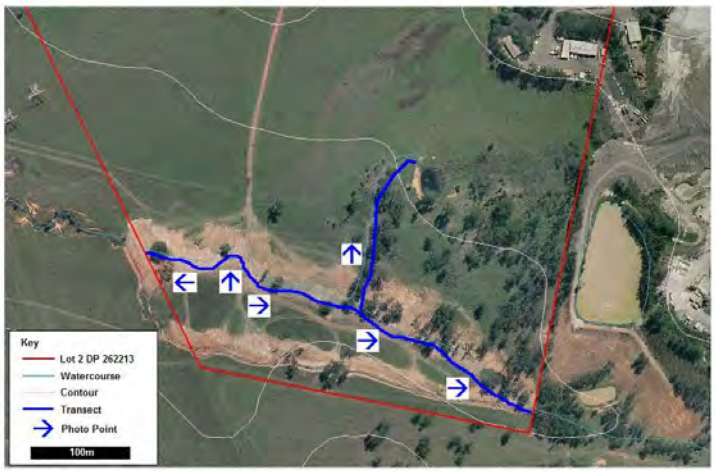


Figure 14. Riparian Habitat - Monitoring Points

Weed monitoring and reporting is to be carried out in accordance with the Landscape and Vegetation Management Plan, using the forms and checklists in the *Guidelines for Monitoring a Bushcare Project*.

The Site Project/Operation Manager will be responsible for the removal of the few goats and sheep currently on the Site.

The likelihood of encountering an endangered species on the work site or in the operations area is low, as this is highly disturbed quarry land. Movement of personnel, plant and machinery will be sufficient to cause animals to move on. There will be no vehicular movement outside the operational area, once construction has been completed.

A visual assessment of the Site, of the visual screens and vegetation cover, will be conducted by the Site Project/Operations Manager annually to consider the effectiveness of planting and providing recommendations for any additional screening measures (if needed).

The Landscape and Vegetation Management Plan will be reviewed within 5 years from November 2009.

35.2 COMPLAINTS

LHBC will receive complaints through its Hotline, website, or through the consent or licensing authority.

Any complaint or enquiry relating to environmental management or performance will be relayed to the Site Project/Operations Manager and soon as practicable. The Site Manager is responsible for investigating each complaint, ensuring action is taken, and ensuring that feedback is provided to the complainant.

The Site Project/Operations Manager will communicate all complaints to the Managing Director and Group General Manager, along with a summary of actions taken. The complaint will be recorded in the Complaints Register.

35.3 NON-CONFORMITY

If non-conformance with the Landscape and Vegetation Management Plan, by entry into either of the prohibited areas, is identified the Site Project/Operations Manager will take immediate steps to warn the individual(s), and require any damage to be made good.

If non-conformance with the Landscape and Vegetation Management Plan is identified, which may include the planting of exotic species or the inadvertent spread of weeds, the Site Project/Operations Manager is to undertake an investigation and recommend corrective or preventative action. The Site Project/Operations Manager will issue work directions which will be implemented immediately.

In the event that the perimeter of the Conservation Area or Ropes Creek riparian area are breached, then the Site Project/Operations Manager will take immediate steps to reprimand the contractor or employee.

36 AMENITY BERMS

The Amenity Berms Management Plan is annexed in Appendix H.

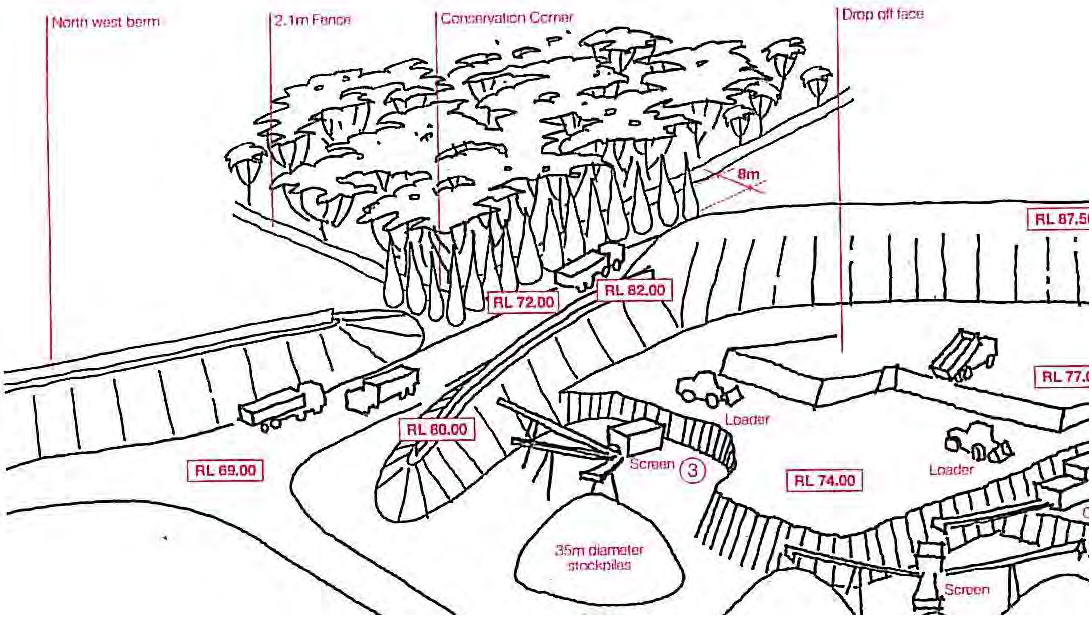
To the north, north-east, east and west of the operational area are existing mounds of overburden excavated from the quarry. These overburden mounds vary in height to a maximum of about 30 metres. All exceed the required 10 metres.

To the south-east of the quarry void is a natural hill which provides an existing berm relative to the adjoining proposed precinct road, and is about 10 metres in height.

LHBC is to regrade the berms and ensure that they are stablised, that drainage is provided and that they are landscaped in a low maintenance regime.

At the north-western corner of the operational area is the Conservation Area, which largely provides a visual screen between the suburb of Minchinbury, the M4 Motorway, and the operational area. It is proposed that this existing visual screen be augmented by the reshaping of the western and northern berms, so as to create a chicane between through which vehicles can pass. A sketch of the berms extensions is shown in the figure below.

Sketch Perspective



36.1 MANAGEMENT

The Site Project/Operations Manager should oversee the following works performed by the Contractor in accordance with the Amenity Berms Management Plan:

- bulk earthworks & reshaping
- soil preparation
- soil works
- planting preparation
- planting installation, and
- hydroseeding.

The Site Project/Operations Manager will inspect the Site daily, which will include an inspection of the matrix planted areas, and the hydroseeded areas. Litter is to be removed immediately upon observation. Plants are to be replaced within 2 weeks of observation that the plant has failed. Mulch is to be replaced within 2 weeks of observing that the mulch is deficient. Spent flowers are to be removed within 2 weeks of observation, and the areas are to be fertilized every 3 months. Water is to be applied as necessary to prevent plants from dehydrating, preferably early in the morning or late in the afternoon.

The matrix planting and hydroseeded areas are to be reviewed by way of a final inspection by the Contractor, a landscape architect, and the Site Project/Operations Manager upon the expiration of 12 months from planting. Any required rectification will occur within 7 days, and further planting will be considered at that time.

36.2 NON-CONFORMITY

If non-conformance with the Amenity Berms Management Plan is identified, the Site Project/Operations Manager is to undertake an investigation and recommend corrective or preventative action. The Site Project/Operations Manager will issue work directions which will be implemented immediately.

37 FENCING AND SECURITY

The Fencing and Security Plan is annexed in Appendix I.

Fencing and security of the Site comprises four components; the operational area perimeter, the Site perimeter, road entry, and quarry void safety fencing.

37.1 MANAGEMENT

The Site Project/Operations Manager and all employees of LHBC shall refer to the Fencing and Security Plan.

The Site Project Manager shall monitor the Site daily, for the maintenance of fencing, and to ensure that the Site is secured outside of operating hours.

37.2 COMPLAINTS

LHBC will receive complaints through its Hotline, website, or through the consent or licensing authority.

Any complaint or enquiry relating to environmental management or performance will be relayed to the Site Project/Operations Manager and soon as practicable. The Site Manager is responsible for investigating each complaint, ensuring action is taken, and ensuring that feedback is provided to the complainant.

The Site Project/Operations Manager will communicate all complaints to the Managing Director and Group General Manager, along with a summary of actions taken. The complaint will be recorded in the Complaints Register.

37.3 NON-CONFORMITY

If potential or actual non-conformance with the Fencing and Security Plan is identified, the Site Project/Operations Manager is to undertake an investigation and recommend corrective or preventative action. Work directions must be issued by the Site Project/Operations Manager immediately for the repair of any fences, locks, gates, or other breaches in security.

38 PESTS, VERMIN, FERAL ANIMALS AND NOXIOUS WEEDS

The Pests, Vermin, Feral Animals and Noxious Weeds Management Plan is annexed in Appendix J.

38.1 MANAGEMENT

The Site Project/Operations Manager and all employees of LHBC shall refer to the Pests, Vermin, Feral Animals and Noxious Weeds Management Plan.

LHBC will ensure that vermin, birds and insects are controlled through maintaining the landfill in a generally clean and tidy manner, including applying appropriate daily cover to the active tipping face.

No access will be permitted to the Conservation Area, except in accordance with noxious weed control measures outlined in the Pests, Vermin, Feral Animals and Noxious Weeds Management Plan, and as summarised in the Environmental Monitoring Programme above.

The Blacktown City Council must be notified by the Site Project/Operations Manager upon the discovery of category W1 weeds, or class 1, 2 or 5 notifiable weeds.

The Site Project Manager shall monitor the Site daily and provide a weekly report to the Managing Director and Group General Manager.

38.2 COMPLAINTS

LHBC will receive complaints through its Hotline, website, or through the consent or licensing authority.

Any complaint or enquiry relating to environmental management or performance will be relayed to the Site Project/Operations Manager and soon as practicable. The Site Manager is responsible for investigating each complaint, ensuring action is taken, and ensuring that feedback is provided to the complainant.

The Site Project/Operations Manager will communicate all complaints to the Managing Director and Group General Manager, along with a summary of actions taken. The complaint will be recorded in the Complaints Register.

38.3 NON-CONFORMITY

If potential or actual non-conformance with the Pests, Vermin, Feral Animals and Noxious Weeds Management Plan is identified, the Site Project/Operations Manager is to undertake an investigation and recommend corrective or preventative action. Work directions are to be issued by the Site Project/Operations Manager immediately upon determining the preventative action to be taken.

39 SOIL, WATER AND LEACHATE

The Soil, Water and Leachate Management Plan is annexed in Appendix K.

39.1 MANAGEMENT OF SOIL

During construction, the Contractors shall:

- Undertake regular waste clearing and wetting down of exposed construction areas to limit sediment erosion and waste contamination of construction areas. Construction areas include but are not limited to embankment and excavation areas, stockpile areas, site facility and storage areas and temporary work areas;
- Rehabilitate or revegetate construction areas on completion or where prompt revegetation cannot be completed, implement erosion control measures including siltation fencing until re-vegetation is completed;
- Install silt fences and hay bales downstream of disturbed areas, where required;
- Protect ongoing earthworks by temporary berms and drains to prevent the scouring of unconsolidated earthworks;
- Prior to major surface disturbance install drainage structures for waterways, catch drains which intercept flow, and sediment traps and basins to allow existing water flows to pass through the disturbed areas without mixing with unfiltered run-off from the disturbed areas;
- Construct graded contour drains or diversion channels around disturbed areas to ensure that all stormwater is directed away from disturbed areas;
- Keep sedimentation basin in a drawn-down state by preferential use of the water by tankers for dust suppression; and
- Wash out concrete delivery vehicles and wash down plant items a minimum of 20m from stormwater drainage systems and natural water courses.

The following erosion and sediment controls are or will be in place at the Site during operations:

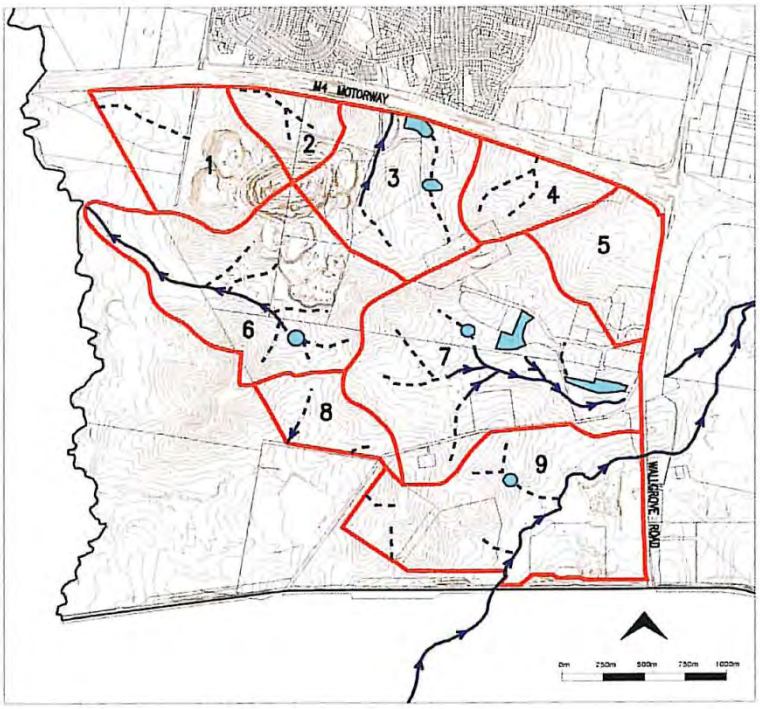
- Sediment traps and GPTs;
- The construction of adequate surface falls, drainage channels and/or contour drains to direct surface runoff away from the leachate producing areas of the MPC;
- the construction of detention basins/sumps; and
- The establishment of grass cover where required by hydro-seeding on areas including the upper quarry platforms and flanking areas.

During operations, the Site Operations Manager will ensure that:

- Flow velocities in drainage systems are limited by implementing sediment and waste collection barriers in order to minimise possible scouring and to encourage precipitation of particulates in run off;
- Vegetation in and adjacent to drainage lines is maintained;
- Remove silt build-up following large storm events; and
- Keep sedimentation basin in a drawn-down state by preferential use of the water by tankers for dust suppression.

39.2 MANAGEMENT OF SURFACE WATER

Surface water drainage flow paths are shown on the Blacktown Council diagram indicating pre-development flows below. These flows are maintained.



Arrangements for surface water management include:

- Separation of areas between clean run off and leachate areas (concrete bunds);
- Sediment traps and GPTs;
- Bunded areas provided for the storage of fuel and chemicals;
- Provision of storm-water collection ponds;
- The separation between leachate generating areas and clean areas;
- Water storage tanks;
- Provision of contour drains and feeder drain on inter-berm areas and batters of the upper platform. These drains redirect overland flow to appropriate paths for sediment control; and
- Diversion of potential inflows along the lip of the former quarry and in the vicinity of the weighbridge area to sediment pits and then to storm drains.

Stormwater from the MPC/WTF and the surrounding area discharges into the stormwater system and via GPTs (gross pollutant traps) to overland swales to onsite detention basins. The water will be collected in the basins for reuse onsite.

Water quality objectives for the catchment are based on the ANZECC (2000) criteria for protection of aquatic ecosystems and visual amenity

Table 39.1: Stormwater quality environmental trigger levels

Analyte	Unit	Proposed Criterion
pH	pH Units	6.5 to 8.52
Dissolved Oxygen	% Saturation	80-110%2
Ammonia	mg/L	0.91
Oil & Grease	mg/L	103
Suspended Solids	mg/L	503
Total Organic Carbon	mg/L	103
Lead	mg/L	0.00341
Phenol	mg/L	0.321
Total Nitrogen	µg/L	350
Total Phosphorous	µg/L	25

The surface water monitoring program must be able to demonstrate that surface water is not polluted by the Site. Surface water monitoring points will be established at each of the OSD discharge points.

Water at these locations will be monitored quarterly by an independent appropriately qualified expert to test compliance with Blacktown City Council's Stormwater Quality Control Policy (2005) and the Pollutant Retention Criteria. After the first 12 months, monitoring can reduce to six-monthly, if all tests have been in compliance with the specified water quality standards for discharge.

The Site Project Manager will be responsible for the following:

- The maintenance of the proposed stormwater controls including regular visual inspection of the stormwater treatment measures on a monthly basis and after major rain events;

- Will ensure an OSD Basin cleaning program – more frequently during earthworks and until revegetation takes place, and then based on results of regular visual inspections. Cleaning generally to consist of sediment and weed removal from the OSD basin and its associated sediment control/stilling basins. The OSD basins will have markers to show when sediment levels have accumulated and should be removed;
- Will ensure the GPT Cleaning Program be implemented, with monitoring occurring quarterly, and after each rain event;
- Conduct regular inspections of all water management safeguards
- Ensure that all diesel fuel, other fuel and any chemicals are stored in the bunded area allocated for its storage;
- Fuel and service all plant / equipment on a safe area away from any water course; and
- Monitor and test water quality, as required.

39.3 MANAGEMENT OF GROUNDWATER

At present, the risk to ground water quality is minimal, as the Site is a net receiver of inflow.

Monitoring will occur quarterly, in accordance with the Environmental Monitoring Program above, at the bores located on the figure below.

Table 39.2: Groundwater quality environmental trigger levels

Chemical Determinand	Analytical Detection Limit (µg/L)	Remediation Action Plan Limit (µg/L)
Field Analysis		
Electrical Conductivity	1 mS/m	ND
Ph	0.1 pH unit	6.9 -9.0 [2]
Redox Potential	1 Eh	ND
Temperature	0.1	ND
Laboratory Analysis (OEH)		
Absorbable organic halogens	10	ND (40*)
Alkalinity	1000	ND
Ammonia	50	ND (1000*)
Calcium	5000	ND
Chloride	5000	ND **
Fluoride	500	1500 [1]
Iron	500	1000 [2]
Manganese	50	500 [1]
Magnesium	5000	ND
Nitrate	100	50 000 [1]
Total phenolics	50	50 [2]
Potassium	5000	ND
Sodium	5000	ND
Sulphate	5000	500 000 [1]
Total organic carbon	50	ND

Groundwater monitoring will be conducted by a suitably qualified independent expert, as commissioned by the Site Project/Operations Manager

39.4 MANAGEMENT OF LEACHATE

Leachate will all be collected to the sump at the base of the quarry and pumped to the leachate treatment system prior to discharge to the sewer. The acceptable levels of analytes in the water will be determined by Sydney Water for the purposes of entering into a Trade Wastewater agreement.

Untreated leachate quality will be monitored on a quarterly basis. Results of quarterly monitoring are to be presented in the annual report the OEH, in tabular form and indicators will be graphed showing trends in leachate quality. The report is to be prepared by a suitably qualified external consultant on behalf of LHBC, as commissioned by the Site Project/Operations Manager.

Table 39.3: Proposed untreated leachate quality environmental trigger levels

Key Parameter	Normal Range mg/L	Trigger Level mg/L	Action Level mg/L
Ammonia	25-50	= 30 mg/L	50
Chloride	250-1500	= 3000 mg/L	15000
Nitrate	0.2-5.0	= 50 mg/L	150
pH	6.5-8.5	= 5.5 - 9.0	<5.5 or > 9.0
Dissolved organic carbon	70-1.00	= 100 mg/L	200
Sulphate	15-250	= 1000 mg/L	3000

Due to the nature of the landfill, the particular waste stream applied to land and the extraction methods for removal of biodegradable waste, the leachate expected to be generated will not have high concentrations of organic and inorganic materials that are characterized by putrescible waste landfills.

Leachate is collected through a herringbone system of pipes and liners at the base of the quarry, directing leaching water from the waste towards a sump. The sump can be accessed by a manhole/riser of concrete ring construction. Leachate is collected in the sump and will be pumped out of the landfill via a sump pump into a header tank, and then into a series of treatment tanks (sequence batch reactors).

Leachate will be monitoring after treatment, and before discharge to sewer, in accordance with the requirements of Sydney Water.

Leachate monitoring will be conducted by a suitably qualified independent expert, as commissioned by the Site Project/Operations Manager.

39.5 NON-CONFORMITY

In the event of an exceedance of environmental trigger levels for groundwater, a groundwater action plan or water contamination remediation plan as required under Benchmark No 9, will be instigated. The formulation of the action plan will depend on the nature and extent of the exceedance.

- OEH will be informed within 24 hours of the exceedance and within 14 days in writing and steps will be taken to re-sample from the locations which showed the exceedance of the established environmental trigger levels;
- Re-sampling results will determine if an adverse trend is developing, or whether the initial exceedances were isolated incidents or spurious readings;
- Once a trend has been established which indicates deteriorating groundwater quality or significant risk of harm then a suitable groundwater remediation action plan will be developed and notification of environmental harm made to the OEH;
- Detailed plans cannot be provided until the nature of the problem has been identified;
- Proposals for voluntary groundwater remediation (i.e. the groundwater remediation action plan) will be forwarded to the OEH for agreement under s 26 of the Contaminated Land Management Act 1997); and
- Results of the monitoring programme, details of any required action plans and implementation of the remediation programme and its results will be provided in the annual report as specified in the site license

If the surface water monitoring program detects water pollution, the Site Project Manager will investigate surface water pollution and institute additional sediment control measures.

In the event of unexpectedly large overland water flows the Site Project/Operations Manager shall take steps to implement additional sediment protection barriers and ensure water flows so far as practicable are diverted to grassed overland areas where siltation cannot enter into streams or watercourses.

If leachate trigger levels are exceeded, the Site Project/Operations Manager will be informed immediately. The Site Project/Operations Manager will issue work directions as appropriate, to perform maintenance on the treatment system and reduce offending analyte.

It is the responsibility of the Site Project/Operations Manager to report any relevant exceedances to OEH and Sydney Water.

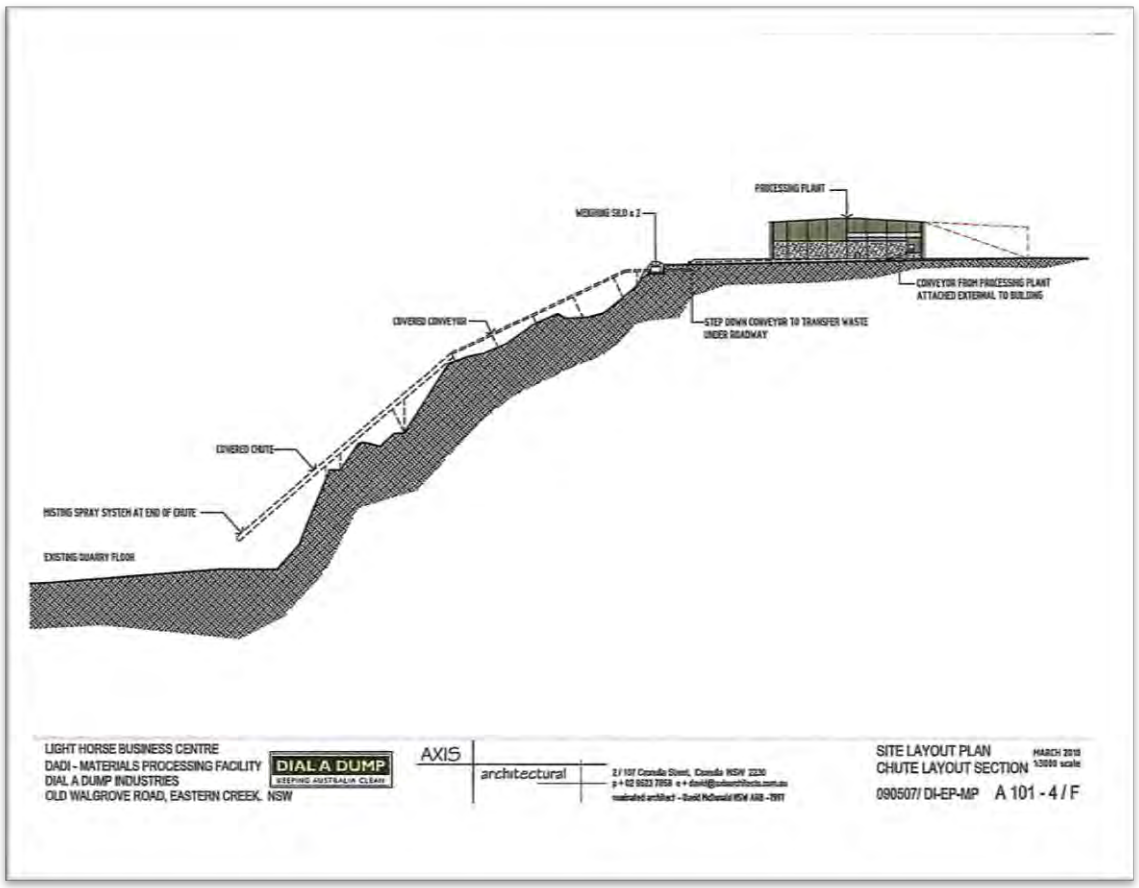
40 CONVEYOR AND CHUTE SYSTEM

The Conveyor and Chute System Maintenance and Management Plan is annexed in Appendix L.

All materials suitable for landfilling and incapable of being recovered, re-used or recycled will be directed from the MPC to the landfill premises.

Transfer to the landfill can occur in one of two ways:

1. By dump truck or road truck driving down the quarry road [this applies to all asbestos or asbestos contaminated waste], or
2. By conveyor and chute [this applies to all other non recyclable waste or residual waste transferred from the MPC].



40.1 MANAGEMENT

The Site Project/Operations Manager and all employees of LHBC shall refer to the Conveyor and Chute System Maintenance and Management Plan.

After construction, the Contractor will provide a manual for the maintenance and servicing of the conveyor and chute. This will be in accordance with various manufacturer requirements, and will become the operations manual for the maintenance of the system.

Should the conveyor become blocked the plant will be immediately shutdown and personal will unblock the conveyor manually via the two access platforms running alongside the conveyor.

Should the chute become blocked the plant will be immediately shutdown and personal will unblock the conveyor manually via the Abseil Access Corridor located on the chute. Direct access to the blockage would be through one of the three maintenance hatches located in the top surface of each 9M section of the pipe.

The blockage would be removed via high powered water cutting lances operated by skilled and trained personal. Each 9M section of pipe will have three 1250mm x 300mm maintenance hatches and one centrally located connection point for a water lance.

The water supply for the misting system and water lances will come from the on-site irrigation system.

In addition to the on-site misting system, the exit point of the chute will have a misting system fitted via the pipe flange. The water supply for the misting system will come from the on-site irrigation system. Pipework for the misting system will run alongside the Abseil Access Corridor and conveyor access platforms.

The Site Project Manager shall monitor the conveyor and chute daily and issue work directions for any maintenance required immediately.

No asbestos will travel on the conveyor or chute – it will be driven directly to the base of the quarry by truck.

40.2 NON-CONFORMITY

If potential or actual non-conformance with the Conveyor and Chute System Maintenance and Management Plan is identified, the Site Project/Operations Manager is to undertake an investigation and recommend corrective or preventative action. The recommendations are to be implemented and reviewed within one month.

41 LEACHATE MANAGEMENT SYSTEM

The Leachate Management System is annexed in Appendix M.

41.1 MANAGEMENT

The Site Project/Operations Manager and all employees of LHBC shall refer to the Leachate Management System and the Soil, Water and Leachate Management Plan.

The Site Project Manager will be responsible for overseeing the construction of the leachate liner and management system in accordance with the Leachate Management System.

Monitoring of leachate will be in accordance with the Soil, Water and Leachate Management Plan, and as summarised in the Environmental Monitoring Programme above. Leachate levels must comply with the requirements of the Trade Wastewater Consent, yet to be issued.

The Site Project/Operations Manager will be responsible for monitoring the levels of leachate in the storage tanks in the greenwaste area, and releasing excess leachate to the leachate treatment system to allow sufficient capacity for rain events.

41.2 DESCRIPTION OF THE FUNCTION OF THE BASAL LEACHATE MANAGEMENT SYSTEM

- Leachate in this system will make its way through gravity flow along a piping system towards a sump located in the lower part of the basal layer.
- The leachate management system comprises a main leachate drain with feeder drains of polyethylene (PE) construction. The system drains into a sump and will be accessed by a PE riser pipe.
- Leachate is collected in the sump and will be pumped out of the landfill via a sump-pump and first into a series of concrete or poly tanks for pre-treatment.
- Leachate will be pumped from the sumps using a submersible pump to holding tanks located at the eastern edge of the landfill. This area has been chosen for leachate treatment due to the proximity of an electricity supply and the location of the sewer connection.
- The leachate will undergo pre-treatment to reduce ammonia concentrations prior to discharge.
- Appropriate final filtering will be implemented to achieve any reduction in suspended solids as may be required by Sydney Water.

41.3 NON-CONFORMITY

If trigger levels are exceeded (standard mg/L concentration as per Sydney Water Trade Wastewater Consent), the Site Project/Operations Manager will be informed immediately. The Site Project/Operations Manager will issue work directions as appropriate, to perform maintenance on the treatment system and reduce offending analyte.

It is the responsibility of the Site Project/Operations Manager to report any relevant exceedances to OEH and Sydney Water.

42 WASTE ACCEPTANCE AND SCREENING

LHBC will intake a range of inert and solid wastes

42.1 WEIGHBRIDGE AND GATEHOUSE PROCEDURES

The site contains a double weighbridge and gatehouse located to the south of the MPC, on the western side of the upper level of the quarry precinct.

The gatehouse/weighbridge will be manned by suitably trained operators employed by the Licence holder.

Each vehicle entering the site will be logged into the site, the waste materials inventoried and recorded and then weighed in. The vehicles shall be weighed out over the (exit) weighbridge when exiting the Site.

The weighbridge operator is responsible for the overall management and maintenance of weighbridge systems and the related preparation of management reports.

The management reports shall detail the materials classified as non recyclable wastes which enter the site for the purposes of landfilling.

This information will be provided to the OEH in the form of returns under the waste 'contributions' levy (S 88 of the Act).

42.2 MINIMISING LANDFILL SPACE USED (BENCHMARK TABLE BM 24-25)

The utilisation of landfill space generally will be minimised by redirection of all re-usable, re-processable and recyclable wastes to the appropriate facility. In addition, all wastes arriving at the site will be screened at the weighbridge by the Site Owner staff, then at each unloading area and undergo a tertiary screening and inspection at the point of disposal.

Notices shall be posted to this effect and to specify the types and categories of wastes which will be accepted at the facility. The recycling or re-export of waste materials entering the MPC will help to minimise the volume of wastes actually landfilled, thereby preserving valuable landfill space for other uses

42.3 ASSURING QUALITY OF INCOMING WASTE (BENCHMARK TABLE BM 21)

A computerised system of recording waste entry will be implemented whereby the weighbridge load cell is linked to the main computer such that accurate records of the weight of incoming wastes can be recorded on a vehicle by vehicle basis.

The system is capable of being operated by a single user within the gatehouse and data obtained from the site can be transferred directly from the gatehouse to the Site Owner's Head Office.

Waste categorisation is required to be made by the gate operative who designates the incoming waste into the appropriate category according to OEH's Waste Classification Guidelines. All wastes being received at the facility must be tested and classified prior to receipt for disposal or recovery.

The gatehouse operative shall inspect appropriate documentation such as VENM certificates and waste classifications prepared in accordance with the NSW OEH Waste Classification Guidelines.

42.4 RECORDING INCOMING WASTES (BENCHMARK TABLES BM 21-23)

Quantification by weight and categorisation by type, which shall include a review of available documents, will enable the Site Owner to clearly distinguish between waste materials which are capable of recycling and those materials which cannot be recycled and must be disposed of by landfilling.

The records maintained by the MPC weighbridge also provide an accurate assessment of the amount of waste levy (tax) to be paid under S88 of the Protection of the Environment Operations Act and provides the Landfill Site Operator with the means of making waste returns to the OEH in the appropriate format.

Yearly calibration of the weighbridge is to be conducted to ensure that the weights recorded are accurate.

A valid calibration record issued by the Department of Fair Trading certifying that the weighbridge has been properly calibrated will be available for inspection at all times in the site office.

42.5 CLEANING OF VEHICLES (BENCHMARK TABLE BM 23)

A wheel wash bay or spray system is planned to be provided at the facility and all vehicles must use this facility should remnants of soil or refuse remain under the vehicle carriage.

All vehicles disposing of refuse on site must be advised via erection of signs that it is the vehicle operators' responsibility to ensure that any remnants of refuse or soil does not track out onto public roads.

A wash bay will also form part of the workshop facilities at the site.

42.6 SCAVENGING (BENCHMARK TABLES BM 21-23 & 30)

Scavenging of wastes is prohibited at all times other than by the operator in the normal course of diverting, handling and redirecting wastes for recycling, reuse or reprocessing.

No other scavenging or totting will be allowed. Security fencing, gates and gatehouse facilities to prevent unauthorised entry are outlined in Section 6 of the EMS.

42.7 WASTE SEGREGATION (BENCHMARK TABLE BM 21)

The operator will establish and operate a facility for the segregation and salvage of goods and materials segregated at the MPC which may be resold or transported off site for resale.

Such goods may include furniture, white goods, glass, plastic, metals, car parts and other recoverables which come into the site as mixed wastes.

The operator will maintain records of such quantities and sales to facilitate suitable record keeping of waste minimisation activities and to assist OEH in their statewide waste minimisation policy.

42.8 RECYCLING (BENCHMARK TABLE BM 25)

Materials expected to be received at the site will include both segregated materials and also mixed materials capable of being recycled or reprocessed. These will include but not be limited to brick, concrete, VENM, terracotta roof tiles, soils, green waste, timber, metals, paper and plastics.

Undifferentiated materials incapable of economic separation or later sale or which is the residue from recycling processes will be taken for deposition at a landfill.

Recycling will include, but not be limited to, both hardfill materials (eg. sand soil concrete brick and tile) and also specified materials (eg. Metals (including steel), plastics, paper, timber, vegetation, carpet and mattresses etc).

It is anticipated that this process will have the following effects:

a. it will allow the recovery of materials which are easily capable of reuse (such as metals);
b. it will permit the cleaning by screening of otherwise fully decomposed organic materials (where decomposition is complete) which will then be available as clean soil materials;
c. it will reduce the potentiality for gas and leachate production in landfilled materials by the removal of timbers and wood waste materials and vegetation for compost production.

Recycled materials for sale will meet specifications prescribed by the OEH resulting from changes to the POEO Act in July 2006.

At the MPC material will be sorted, processed, recycled and refined to engineered standards prescribed pursuant to the POEO Act. Reusable and surplus materials that have a commercial value resulting from processing at the MPC will be stockpiled, sold and transported off site.

Activities to be undertaken at the MPC will include receiving, sorting, screening, sieving, and crushing, grinding, shredding (green waste, wood waste and metals), separating, composting, processing, recycling, recovering, manufacturing, engineering and selling materials.

The materials to be processed and transferred or sold at the MPC will include:

- brick;
- concrete;
- tile;
- soil;
- rock;
- clay;
- foundry sand;
- wood waste;
- green waste;
- glass;
- plastic;
- paper;
- card board;

- municipal waste;
- dry waste;
- building and demolition waste;
- asphalt and bituminous materials;
- excavated materials;
- non-chemical waste generated from manufacturing or services; and
- ferrous and non-ferrous metals and scrap.

MATERIALS TO BE LANDFILLED include Bonded and non friable Asbestos wastes and the residue of the materials listed above.

42.9 WASTE DISPOSAL ARRANGEMENTS AND METHODS (BENCHMARK TABLE BM 21)

Preliminary waste reception and visual screening (including questioning the waste transporter/driver regarding load characteristics) will be undertaken at the weighbridge facility.

All incoming vehicles and wastes will be directed through the waste reception area and the loads inspected by the weighbridge (gatehouse) operator.

Unacceptable (excluded) wastes shall be rejected, the OEH shall be informed of the waste details, carrier and origin, and the carrier told to deliver the waste to an alternative appropriate licensed facility.

Wastes shall be weighed at the weighbridge in gross tonnes, or in the case of the small vehicles the weight of waste shall be calculated using published weight factors in accordance with the OEH method.

The vehicles will then proceed beyond the weighbridge area along the main haul road where they will be directed by appropriate signage for unloading.

A suitably qualified and experienced person will be placed in a traffic management position to further determine the load contents and to assist in the determination of load contents

This person serves as an extra protective measure against the unloading of materials for which the MPC and landfill is not licensed or which the operator considers to be unacceptable.

42.10 SMALL LOADS: UNSEGREGATED WASTE MATERIALS

The Site Owner proposes a system of self-sorting of materials at designated areas of the site into receptacles placed and signposted for this purpose.

Materials capable of further separation or processing by crushing or grinding, thereby making them suitable for sale or for use in operational purposes, may be stockpiled in this area prior to treatment or where the treatment will occur.

42.11 LARGE QUANTITIES: BRICK, CONCRETE, DEMOLITION MATERIAL, VENM AND SOILS

Commercial quantities and hardfill type materials which are segregated prior to their arrival on site and do not require further treatment will be directed to the designated external area where these materials may be stockpiled.

42.12 UNSEGREGATED SOLID WASTE

General solid waste (mixed), after weighing on the inwards weighbridge will be deposited within the MPC.

Once tipping or emptying of vehicles is complete the vehicles return to weighbridge and are reweighed in order to determine the delivered amount.

42.13 MECHANICAL PROCESSES OF SORTING UNSEGREGATED MATERIALS

The mechanical process is achieved by the preliminary sorting and segregation, which takes place in the following locations:

primary sorting at the MPC in respect of the contents of small bins; and

secondary sorting in respect of the contents of large bins and truck loads of excavation material.

Mechanical processes consist of sorting and segregating materials so as to remove valuable recoverable materials – principally metals.

The aim of this preliminary gross sorting is to remove metals, wire, cylinders, batteries and materials of this nature which may be removed for re-use or have valuable re-use function without the need for intervention. The majority of this material can be removed by the use of a magnet or grapple.

Proscribed materials shall be removed and segregated at this stage; organic materials (including green waste) will be removed to the green waste stockpile;

Liquid and chemical wastes are unacceptable wastes and will be dealt with under the provision for unacceptable wastes; and

The remaining undifferentiated material will be subjected to an automated process of preliminary shredding followed by screening and sorting [by automated mechanical means] with the result that materials will be differentiated into different classes.

Plastics, paper, timber, metals (including steel), cardboard, will be removed to designated areas for processing and recycling or sent to third party processors.

Metals (ferrous and non ferrous) will be either removed to the steel processing area of the site for sorting, shredding and shearing or sent to third party processors.

42.14 FINAL SORTING PROCESS FOR DISPOSAL

Material which is residual following the automated sorting process will be transferred by conveyor to the Weighing Assembly for weighing prior to disposal at Landfill.

The capability will exist to re-circulate material back within the process if it should be thought desirable.

42.15 WASTE TRANSPORT TO THE TIPPING FACE OF THE LANDFILL

Public vehicles will not be permitted under any circumstances to enter the landfill.

Only suitably trained and experienced drivers employed by the landfill licence holder and operating under a site OH&S work direction will be permitted to drive a vehicle out of the MPC and into the quarry/landfill void.

All trucks carrying waste which pass into the Landfill area must be weighed before they enter the area and again immediately upon leaving the area.

Shredded un segregated waste will be deposited via conveyor belt into a weighing hopper where it will be weighed. When the hopper is filled and after weighing its contents will be transported via a covered downhill conveyor and chute to the Landfill working floor.

42.16 LIFE EXPECTANCY OF THE MPC (BENCHMARK TABLES BM 27 & 29)

The life expectancy of the MPC site is not linked to the life expectancy of the adjacent landfill. In line with the changes to the POEO Act which aims to reduce the amount of wastes landfilled and to move towards total resource recovery, the MPC area is expected to outlast the landfilling activities and remain a recycling activities area permanently, unless determined otherwise by the owner.

42.17 ACCEPTABLE WASTE CATEGORIES (BENCHMARK TABLES BM 21, 22 & 23)

The MPC/WTF Operator/Site Owner will ensure that only acceptable wastes are transported on to the site for either landfilling or recycling purposes.

Should the load contain chemicals or hazardous material the OEH will be informed of the nature of the load and the carrier's details including registration of the vehicle and the proposed destination (if known).

Acceptable wastes include:-

- Wastes, excluding putrescible wastes, that are assessed to be general solid waste (non-putrescible) under the Waste Classification Guidelines.
- Bonded (non-friable) asbestos, asbestos fibre and waste resulting from the removal of thermal or acoustic insulating materials or from processes involving asbestos material provided that such materials are delivered sealed in heavy duty polytarp or plastic.

Asbestos wastes: asbestos contaminated soils and solid waste will be transported directly to landfill and disposed of by landfilling.

42.18 SYNTHETIC MINERAL FIBRE WASTES (BENCHMARK TABLES BM 21-23 & 34)

These wastes may be delivered and disposed in sealed containers by prior arrangement.

42.19 SLUDGES - PLIABLE AND SPADEABLE WASTES (BENCHMARK TABLES BM 3, 21-23 & 34)

Spadeable moist wastes will be accepted for transfer and disposal only under the following conditions:-

- should contain no free liquid;
- dry enough to be spadeable;
- slump free at 1 vertical on 2 horizontal;
- not contain materials above concentrations prescribed by OEH as constituting 'restricted solid waste', 'hazardous wastes' or prescribed in the Scheduled Wastes Chemical Control Order, 1994;
- pass any prescribed leaching procedure; and
- other criteria established by OEH in guidelines or statutes as may become applicable.

42.20 SPECIAL WASTES (BENCHMARK TABLES BM 21-23)

Clinical and related wastes classified as special waste shall not be permitted into the MPC. Special wastes which may be accepted but require prior treatment or particular disposal procedures include:

- bonded or stabilised asbestos wastes (not including friable asbestos); and
- tyres.

42.21 TYRES

Tyres will be received, handled and disposed according to the OEH guidelines provisions set out in the site license.

Not more than 50 tonnes of tyres may be stockpiled on site at any one time.

42.22 SCHEDULED CHEMICAL WASTES

Scheduled chemical wastes are controlled by the Scheduled Chemical Wastes Chemical Control Order, 2004 under the Environmentally Hazardous Chemicals Act, 1985. Scheduled Chemical Wastes will not be allowed into the MPC or the adjacent Landfill site.

42.23 DRUMMED WASTES (BENCHMARK TABLES BM 21-23)

Drummed wastes must be in solid form. Any drummed waste that arrives at the waste delivery area in liquid form will be rejected and returned to the gatehouse/weighbridge. Gatehouse staff will be informed of the carrier details and nature of the wastes, if known.

On no occasion will the drums be opened for inspection by operators or supervisory staff. Drummed liquid wastes will be quarantined pending disposal by the transporter, owner or originator. The Site Operator will inform OEH and an Incident Report completed.

Drums containing authorised solid wastes will be accepted for transfer to an appropriately licensed landfill facility and disposed of there in accordance with their site licence conditions.

Drummed wastes shall not contain materials above concentrations prescribed by OEH as constituting hazardous wastes or prescribed in the Scheduled Waste Chemical Control Order 1994, and should pass any prescribed leaching test. The wastes should satisfy other criteria as established in the Waste Classification Guidelines.

42.24 EMPTY DRUMS (BENCHMARK TABLES BM 21-23)

Empty drums must be observed to be pre-punctured to a sufficient state where no liquid contents could be reasonably present within the drum. Waste drums will be crushed by compactor. Where appropriate, the drums may be made available for recycling.

Drums which are not punctured or are insufficiently punctured will be classified as drummed wastes and disposal arrangements for drummed wastes will apply. Puncturing of drums onsite by transporters or owners of the wastes will not be allowed. Waste owners or transporters who attempt to puncture drums at the MPC will be reported to the gatehouse/weighbridge (Supervisor Waste Management Facility) and directed back to the weighbridge quarantine area of the MPC and an Incident Report completed.

42.25 UNACCEPTABLE WASTES (BENCHMARK TABLES BM 21-23)

Unacceptable wastes include any materials which do not fall into the above categories. These include but are not limited to:-

- liquid wastes;
- explosives;
- poisons;
- dangerous goods;
- radioactive materials;
- clinical, hospital and related wastes;
- loose, uncovered (non-bonded) or friable asbestos;
- scheduled pharmaceuticals;
- hazardous waste,
- restricted waste
- scheduled wastes; and
- putrescible wastes.

Screening of wastes at the gatehouse/weighbridge would normally eliminate these wastes from entry to the site.

42.26 PUTRESCIBLE WASTES

Putrescible wastes include food or animal matter, and unstable or untreated biosolids. This material will NOT be allowed into the MPC or the adjacent landfill.

42.27 REMOVAL OF UNACCEPTABLE WASTES (BENCHMARK TABLE BM 21)

Vehicles attempting to leave unacceptable or excluded wastes at the MPC will be identified and directed to return to the weighbridge. The licensee (operator) will record details of the waste and carrier and communicate this information to the gatehouse and thence to the OEH under the provisions of the POEO Act.

If tipping has occurred then the operator will (if safe to do so), segregate and isolate and/or remove any unacceptable wastes which have been deposited at the MPC and transport the wastes to a designated quarantine area or other suitable location, where the wastes will be securely stored until off-site disposal arrangements are made by the original carrier.

If the carrier or owner of the wastes does not make arrangements for the waste to be collected within 24 hours a fee will be charged for storage of the wastes, and if within 48 hours the wastes have not been collected then the operator will make arrangements for the waste to be tested and disposed at an appropriate licensed facility and the owner or carrier of the wastes will be billed for the costs involved.

The site owner will inform OEH within 24 hours of the nature, origin, carrier, transporter and owner of the wastes and inform the OEH of the ultimate fate (if known) of such wastes. Details will be reported in monthly reports and summarised in the annual report.

42.28 BONDED OR STABILIZED ASBESTOS WASTES

The Site Operator will typically deal with bonded asbestos from the Construction and Demolition waste stream and not with loose and friable asbestos which can pose risks of generating airborne fibres if disturbed.

Asbestos wastes will be dealt with at the site through a series of measures as follows:

1) Staff training in accordance with the Industry Asbestos Awareness Course and follow up course by trained in house staff or by external trainers to be undertaken on a regular basis at least once a year;

2) Checking and inspection of incoming materials prior to stockpiling or processing to minimise the risk of asbestos wastes as follows:

    - First inspection will be conducted when the load arrives at the facility,
    - Second inspection at the checkpoint for traffic management and further load inspection, and
    - Third inspection when materials are unloaded.

3) Independent auditing of this system which minimises the risk of the presence of asbestos and other contaminants;

4) Recording of non-complying generators illegally disposing of asbestos wastes; and

5) Redirecting of asbestos wastes to other appropriate facilities or landfilled at the site in accordance with strict regulatory guidelines as set out below.

Wastes that contain asbestos will not be mixed with other wastes.

All asbestos will be carefully unloaded under supervision by the operator.

Disposal of asbestos will be required to meet the site license conditions and comply with Clause 42 of the Protection of the Environment Operations (Waste) Regulation 2005 NSW.

The requirements to be implemented by the site operators regarding the collection, storage and landfilling of asbestos wastes are as follows:

Unbagged, uncovered or unsecured asbestos fibre and dust waste will be directed back to the quarantine and gatehouse area for redirection and the OEH will be informed and an incident report completed. Waste that is classified as loose or fibrous will not be dealt with except in accordance with the following procedures:

- the waste will be bagged and covered in such a manner so as to prevent the emission of any dust;
- the waste will be collected and stored in impermeable bags,
- each bag will be made of heavy duty low density polyethylene of at least 0.2 mm thickness, and have dimensions of no more than 1.2 m in height and 0.9 m in width,
- each bag must be sealed by a wire tie, and contain no more than 25 kg of waste, and
- each bag must be marked with the words “CAUTION ASBESTOS” in letters of not less than 40 mm and which comply with AS 1319—1994, Safety signs for the occupational environment.

If asbestos waste in any form is stored in a bag, the following procedures will be followed;

- the bag will be placed in a leak-proof container that is used only for the purposes of storing asbestos waste;
- the container will be marked with the words “DANGER—ASBESTOS WASTE ONLY—AVOID CREATING DUST” in letters of not less than 50 mm and which comply with the Australian Standard, and
- the container will have a close-fitting sealed cover so as to prevent any spillage or dispersal of the waste.

If asbestos waste that is in the form of stabilised asbestos waste in bonded matrix is stored otherwise than in a bag, the following procedures will be followed:

the waste will be wetted so as to prevent the emission of any dust,

in wetting the asbestos waste, special care will be taken to ensure that the wetting process does not cause any emission of dust or lead to any discharge of polluted water, and

the waste will then be kept covered at all times.

Asbestos waste will be stored in a secure area so as to prevent entry by unauthorised persons and to prevent the risk of environmental harm and where possible will be stored separately from other types of waste.

Covered containers carrying bagged waste will be transported to the Landfill base by truck and not transported by chute. There the containers will be unloaded in the manner described below.

For the disposal of asbestos waste at the Landfill, the waste will be by way of burial at least to a depth of 0.5m on the same day it is received. Loads requiring separate burial (i.e. which have some loose fibres or are friable in condition) will be placed in pre-prepared trenches and immediately covered by the operator.

For logistic reasons co-disposal of asbestos materials if accepted with general refuse, will be practiced in preference to separate (monofill)/segregated asbestos burial at one (single) location in the Site.

In disposing of asbestos waste in any form at the landfill, the waste will be unloaded in such a manner as to avoid the creation of dust. The waste will not be compacted before it is covered and will not come into contact with any earthmoving equipment at any time.

42.29 OPTIMISING FILLING OPERATIONS AND MAXIMISING COMPACTION (BENCHMARK TABLES BM 22 & 24)

Upon arrival at the tipping face wastes shall be placed and spread on the tipping face .

The working face shall provide a safe working platform and prevent or substantially reduce nuisance from litter, dust and visual impact.

The tipping face shall also be constructed to minimise uncontrolled rainwater inflow i.e. the face will be, where feasible, topographically elevated above the surrounding fill area (or natural ground), or shall be protected by temporary earth bunding to prevent surface water run-in.

The waste will be compacted using a suitable waste compactor.

The compaction of refuse, and therefore density, will largely depend on variations in waste constituents, the state of decomposition, degree of control of placement, such as the thickness of daily cover, amount of compaction and the total depth of landfill.

The thickness of the refuse layer prior to compaction will greatly influence the density of the refuse. All waste will be compacted to maximise density. Waste will be placed in maximum layers of 0.25 m - 0.5 m prior to compaction.

Refuse layers of more than 0.5 m are unable to be compacted to a suitably high density, this results in a higher volume of refuse and increased void ratio.

The number of required passes of the compactor is dependent on the composition of refuse. However, in general, any passes greater than 4 or 5 is considered to have an insignificant affect on further compaction.

It is difficult to recommend the optimum number of passes without observation of the type of refuse being disposed. Operators on site gain experience and judgment as to the optimum number of passes needed to obtain the optimum compaction.

To maximise effective controls over waste placement and compaction the active tipping face shall not generally be more than 2 m in height and shall be oriented such that the placement of refuse is easily facilitated such that compactors can move from the base of the lift in an upwards direction to enable maximum load on the wastes and prevent pushing the waste down-slope, which reduces compactive effort.

42.30 COVER MATERIAL

Daily cover of 150 mm of VENM or other approved cover material shall be used.

42.31 COVERING OF WASTE (BENCHMARK TECHNIQUE TABLE BM 24, 27, 33, 34 AND 36)

Cover materials must ordinarily comprise virgin excavated natural materials (VENM) or alternative daily cover (ADC) as defined in the Environmental Guidelines: Assessment, Classification, & Management of Liquid & Non- Liquid Wastes (DEC, 1999), or other materials (such as sealed container bases) approved by DEC.

Suitable VENM cover material is located on site in stockpiles to the North east of the void.

Daily cover will comprise 150 mm of inert, granular or clay materials which will be over placed on the daily (compacted) waste intake at the end of each day's tipping operations. No further wastes will be emplaced that day once daily cover has been applied.

Intermediate cover will be placed on any area of the landfill which has been inactive for greater than 90 days. Intermediate cover will comprise 300 mm of VENM or other approved materials.

Alternative daily or intermediate cover materials such as foam, geo-hess, or other cover substitutes which utilise less volume (noting that 150 mm inert soil cover is the specified 'Benchmark Technique' in the Environmental Guidelines: Solid Waste Landfills (1996), may be employed as daily cover if approved by the DEC.

Stockpiled materials for use as landfill cover may be placed on completed areas of the landfill. A supply of cover materials equal to one months reserve will normally be required if off-site cover materials are to be utilised for daily cover or intermediate cover purposes.

All waste deposited at the Landfill facility will be covered at the end of each working day.

Alternative cover applications which reduce the void space used may be utilised, but will require to meet the goals of the relevant Benchmark technique (Benchmark No 33) and must be approved by DEC.

Where waste filling operations are abandoned temporarily for a long period (years), then the previous waste filling area will be covered by intermediate capping comprising a multi-layer SCM of

cap of 600 mm thickness. This cover may be partially removed and stockpiled for re-use when waste filling operations recommence in the area.

Adequate Cover Material for the life of the Landfill is located on Site.

42.32 EARTHWORKS COMPACTION TESTING

Compaction and density testing will be required together with appropriate permeability testing as part of the programme of PCM works.

Earthworks, monitoring and testing on capping works should be supervised periodically by an engineer to check and certify earthworks as well as installation and construction works under the programme.

Certification of all on-site testing should be provided by the technician and countersigned by the supervising engineer.

The form of the certification reports is beyond the scope of this Strategy, but an outline of the required documentation and proposed LCQA checklist is provided below:-

- Acceptance of materials by on-site technician based on visual observation and provision of routine sieve analysis by the contractor according to AS1289.C3.6.1.
- Determination of Field Moisture Content and Density Index by Nuclear Surface Moisture Gauge.
- Determination of Minimum and Maximum Dry Density of a Cohesion-less Soil.
- Determination of Field Wet Density & Hilf Density Ratio by Nuclear Surface Moisture-Density Gauge.
- Rapid Compaction of Soils by Hilf Rapid Compaction AS1289.5.7.1.
- Site Inspection Sheet - leachate drainage installation.
- Site Inspection Sheet - cover, berm and slope construction.

The provision of the proposed construction works and related QA programme is considered suitable to meet the proposed goals and objectives of the Environmental Guidelines - Solid Waste Landfills (1996).

42.33 LIFE EXPECTANCY OF THE LANDFILL (BENCHMARK TECHNIQUE TABLE BM 27 & 29)

Based on the current survey of the void space in the site undertaken by registered surveyors and taking into account current projections of disposal volumes per annum, noting that incoming waste is weighed in tonnes rather than measured volumetrically, then the projected life of the landfill is estimated at over 20 + years assuming that the completion level will be taken at average surrounding ground level.

Total projected void space amounts to over 13 Million cubic metres which at present estimated intake rates of approximately 500,000 tonnes per annum would provide waste disposal capacity well into the foreseeable future.

While the provision or capability should exist to landfill more than 1,000,000 tonnes per annum, it should be noted that recent changes to the POEO Act designed to encourage recycling and to discourage direct landfilling may significantly alter this projection.

If actual quantities to be landfilled are less than this upper limit the time period will be expected to extend considerably. Conversely, demand for disposal facilities for solid wastes may significantly shorten the projected lifespan of the landfill.

42.34 LITTER (BENCHMARK TECHNIQUE TABLE BM 24, 31 & 33)

The working face of the Landfill will be limited in dimension so far as possible to prevent, or substantially reduce, nuisance from litter, dust and any visual impact. However the depth of the pit and the shredded condition of the landfilled material will almost completely eliminate this problem.

All mixed loads of refuse liable to cause littering must be covered when they enter the site and may only be unloaded within the MPC building.

These measures rigorously enforced should significantly limit the opportunities for windblown litter at surface within the Facility perimeter.

Litter patrols will be undertaken both within the site and within a radius of 200 m of the site boundary. Any Litter found will be collected and appropriately disposed of.

Any litter adhering to fencing or in nearby trees or vegetation will be removed. Any drains clogged by or containing litter will be cleared and the litter disposed at the tipping face and covered immediately.

Vehicles entering the facility will be inspected by the weighbridge operative and tip face operator to ensure that loads are correctly secured.

Operators with loose loads shall be advised to service them in future and repeat offenders refused entry and reported to the OEH.

ANNEXURE A

To be completed daily by Site Operational Manager then retained on file.

Site Environmental Inspection							**Week Ending:**
Action	**Mon**	**Tues**	**Wed**	**Thu**	**Fri**	**Sat**	**Comments**
Noise							
Weather							
Traffic Management							
Conservation Area							
Fencing and Security							
Pests/weeds							
Dust							
Odour							
Soil and Water Management							
Sediment Controls							
Sediment Basins							
Roads clean							
GPTs							
Leachate							
Waste Management							
Greenwaste							
Stockpiles							
Weighbridge							
Conveyor/Chute							
Landfill							
Additional Comments							
Signature:			**Name:**				**Date:**

ANNEXURE B

Workplace Inspection Checklist				**Date:**	
Inspection by:			**Risk Level:** **1.** Action immediately **2.** Action within 24 hours **3.** Action within 1 week **4.** Hazard Report to be completed		
Item	**Risk**	**Action Required**	**By Whom**	**Completed By**	**Date**
To be completed by Site Operations Manager All actions completed and acceptable **Signed:**				**Date:**	