
Waste Management Plan

BADGERYS CREEK QUARRY AND BRICK MAKING FACILITY

September 2013

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1. Introduction

1.1. Purpose

This Waste Management Plan (WMP) has been prepared to outline the management measures to be carried out by Boral to minimise waste generation and maximise resource use in the operation of its Badgerys Creek Quarry and Brick Making Facility. This WMP follows the waste management hierarchy as described in the *Waste Avoidance and Resource Recovery Act 2001*, namely:

- avoiding unnecessary resource consumption;
- recovering resources for reuse, reprocessing, recycling or energy recovery; and
- disposal.

Management options higher in the hierarchy are favoured.

1.2. Scope and Application

This WMP is applicable to the quarrying, rehabilitation, brickmaking, and product storage and dispatch of Boral in its Badgerys Creek operations.

Management measures to increase energy efficiency are covered in the Air Quality and Greenhouse Gas Management Plan (AQGHGMP).

1.3. Interface with Environmental Strategy

In operational terms, the WMP aims to maximise the use of quarry resources and reduce the amount of waste to landfill. In this way, the WMP supports the Environmental Strategy of Badgerys Creek Quarry and Brick Making Facility by helping minimise harm to the environment.

1.4. Definitions and Abbreviations

Clean green waste	Non-fired clay suitable for reuse in the brick making process
Contaminated green waste	Non-chemical waste from the brick making and handling process, including fired brick waste and non-fired clay contaminated with foreign material that could foul the brick making process.
Unusable material	Excavated clay material not currently suitable for brick making based on the existing clay preparation equipment

2. Aspects, Impacts and Risks

2.1. Environmental Context

Boral is operating an existing quarry in Badgerys Creek, extracting clay resources and using these to manufacture bricks for the construction industry. These quarrying and brick making activities have been undertaken on the site for the past 30 years. Boral has received development approval to continue operations on the site, including extracting from existing and future new pits and operating the existing brick making facility at a bigger throughput.

Quarrying is carried out in campaigns of two- to three-month periods per year with extracted clay stored in stockpiles for brick making operations which run the entire year. Finished products are stored within the site for dispatch by trucks. The site also receives other raw materials required for brick making.

In 2012, Boral reviewed its brick production capacity due to current uncertain economic conditions and downturn in residential housing activity. Boral determined that the reduced demand could be supplied by its Bringelly Brickworks and therefore decided to temporarily shut down production at its Badgerys Creek facility. Quarrying and brick production will be suspended during the shutdown period but ongoing facility and equipment maintenance will be carried out. Operation of the retail display facility and the occasional dispatch of bricks from the remaining inventory on-site will continue.

Boral has sought a Section 75W modification to the conditions of approval for the expansion of the Badgerys Creek operations so that relevant environmental management measures can be modified or deferred during the shutdown period.

2.2. Aspects and Impacts

The Badgerys Creek Quarry and Brickmaking facilities involve activities which generate the corresponding waste as shown in Table 1 below.

2.3. Risk Assessment

Among the environmental risks from waste generation in Badgerys Creek's operations are the following:

- generation of fugitive dust from on-site stockpiles of unusable and contaminated green waste;
- wastage of clay resource from spillage and breakage;
- increased storage requirements on site for stockpiles of unusable and contaminated green waste;
- water pollution from contaminated water and waste materials if not contained and if disposed improperly
- increased disposal to landfill.

The above risks will be mitigated by the management measures outlined in this WMP.

Table 1 Aspects and Impacts of Waste Generation from Badgerys Creek Operations

Activity	Waste Generated	Management	Potential Environmental Impacts
Quarrying	Unusable material (including overburden)	Used for construction of noise attenuation bund and thereafter in backfilling Pit 2 to ground level.	<ul style="list-style-type: none"> • Dust • Erosion and sedimentation • Increased storage requirements widens project footprint, may sterilise underground resource, and create visual impacts
Brick making	Spillage (clean green and dry non-fired material)	Collected for reincorporation in the brick making process	<ul style="list-style-type: none"> • Inefficient resource use • Fugitive dust
	Breakage	Collected as contaminated green waste and stockpiled onsite	<ul style="list-style-type: none"> • Increased storage requirements widens project footprint, may sterilise underground resource, and create visual impacts
	Packaging waste (strapping, plastic wrapping,	Collected and segregated as general rubbish for offsite disposal by licensed contractors	<ul style="list-style-type: none"> • Increased disposal to landfill
	Dust from dust filters	Collected and returned to the process via an auger feed	<ul style="list-style-type: none"> • Fugitive dust if dust extraction system is not functioning
Dispatch	Breakage	Collected as contaminated green waste and stockpiled onsite	<ul style="list-style-type: none"> • Increased storage requirements widens project footprint, may sterilise underground resource, and create visual impacts
	Returns	Collected as contaminated green waste and stockpiled onsite	<ul style="list-style-type: none"> • Increased storage requirements widens project footprint, may sterilise underground resource, and create visual impacts
	Sewage (from Dispatch Hut)	Collected by licensed effluent disposal contractor	<ul style="list-style-type: none"> • Potential water pollution if released

Activity	Waste Generated	Management	Potential Environmental Impacts
Plant and Equipment Maintenance	Used oil	Collected by licensed waste oil recycler	<ul style="list-style-type: none"> • Potential water pollution if not contained
	Scrap metal	Sorted into steel, copper wire and electric motors, with general steel products segregated in a scrap metal bin, and copper wires and electric motors stored separately. All scrap metal is collected by licensed recyclers	<ul style="list-style-type: none"> • Inefficient resource use if not collected and recycled
	Empty oil containers	Collected by licensed waste oil recycler	<ul style="list-style-type: none"> • Potential water pollution from residual oil if not contained
	Oily rags, used spill absorbent materials	Segregated and collected for offsite disposal by licensed waste contractors	<ul style="list-style-type: none"> • Contamination if disposed with general waste
	Contaminated water collected in storage bunds	Collected in sumps and pumped to tankers for offsite disposal by licensed contractors	<ul style="list-style-type: none"> • Potential water pollution if not contained
Plant and Office	Waste paper	Segregated for collection and recycling by licensed contractor	<ul style="list-style-type: none"> • Inefficient resource use
	General rubbish	Collected in general rubbish bins for collection and offsite disposal by licensed contractors	<ul style="list-style-type: none"> • Site sanitation if not contained
	Sewage	Liquid effluent managed via absorption trenches; retained solids removed by effluent disposal contractor	<ul style="list-style-type: none"> • Potential water pollution if treatment is ineffective
	Stormwater	Stored in Pit 1 for reuse in dust suppression; zero discharge to offsite waterways	<ul style="list-style-type: none"> • Silted runoff flowing to Badgerys Creek; • Missed opportunity to reuse water if not collected and stored
Shutdown Period	Minor waste from maintenance activities (scrap parts, used oil, oily rags)	Segregation for collection by licensed waste contractors	<ul style="list-style-type: none"> • Potential pollution is waste not collected properly
	Breakage from dispatch operations	Collected as contaminated green waste and stockpiled onsite	<ul style="list-style-type: none"> • Minor quantities only

Activity	Waste Generated	Management	Potential Environmental Impacts
	Sewage (from Dispatch Hut)	Collected by licensed effluent disposal contractor	<ul style="list-style-type: none"> • Potential water pollution if released
	General rubbish from Retail Display	Collected for offsite disposal	<ul style="list-style-type: none"> • Site sanitation if not contained

3. Requirements and Performance Criteria

3.1. Relevant Legislation

- *Waste Avoidance and Resource Recovery Act 2001 (WARR Act)*
- *Protection of the Environment Operations Act 1997 (POEO Act)*
- *Protection of the Environment (Waste) Regulation 2005 (POEO Waste Regulation)*

3.2. Standards and Guidelines

- *OEH Waste Classification Guidelines*

3.3. Approval Requirements

- Project Approval (under Sec 75J and Sec 75W of the EP&A Act 1979)

3.4. Permits and Licences

- Environmental Protection Licence No. 684 (existing EPL is subject to variation following recent project approval)

4. Training and Resource Requirements

4.1. Training

The induction for all site personnel and contractors working on site will cover waste management procedures, in particular the waste management hierarchy, and the proper segregation, collection and disposal of different waste streams. Emphasis will be given to the following:

- maximising the reuse possibilities of clean (non-fired) waste as raw material by avoiding spoiling this waste stream with contaminants that may foul the brick making process;
- properly storing used oils, empty oil drums and other (chemical and hydrocarbon) contaminated waste streams prior to collection by licensed contractors.

4.2. Resource Requirements

Four bin types will be made available for different waste streams:

- Green – for reusable non-fired material
- Red – for contaminated green waste and brick waste
- Orange – for metal waste
- Wheelie bins – for general waste.

Except for overburden, unusable material, contaminated green waste and captured stormwater, all other solid and liquid wastes generated from the Badgerys Creek operations are to be collected and disposed offsite by licensed waste contractors.

5. Management of Waste

5.1. Shutdown Period Management Measures

In April 2012, the proponent, Boral Clay and Concrete (NSW) announced the temporary shutdown of the quarry and brick making facility with effect from 30 March 2012. As at April 2013, the facility remained shut down. Boral will review its operations at a future stage, considering market conditions and business needs to determine when operations will recommence. During the shutdown period, activities at the facility will be limited. Hence, the opportunity for interactions with the environment during this period is limited. Waste sources during the shutdown period will be limited to domestic-type waste from the administration offices. This will be managed and disposed in accordance with the Council waste management regime.

During the shutdown period, the site's Health Safety and Environment Manager will be based at Badgerys Creek and will maintain a weekly environmental inspection regime including:

- Property boundary integrity, internal dam levels and neighbouring creeks;
- Raw material quarry pits and access roads;
- Internal access roads (paved and unsealed);
- Water tanks - water recycling (empty) and fire fighting supply tanks;
- Waste material areas and sewage treatment plant;
- Oil store, diesel tank and chemical store;
- Internal drainage from hardstands and access roads; and
- Factory buildings (internal and external).

The HSE Manager will also maintain regular contact with neighbouring residents to resolve any issues.

5.2. Quarrying and Construction Activities

Item	Action	Responsible Staff	When
General			
1	Where possible, the waste will be avoided, reduced, reused or recycled.	All staff and contractors	At all times
2	The Plant Manager will arrange for the provision of correctly marked bins or skips for the collection and storage of the various waste streams.	Plant Manager	At all times
3	Wastes will be suitably contained so as not to contaminate soil, surface or ground water, create unpleasant odour or attract vermin.	All staff and contractors	At all times
4	Active stockpiles will be sprayed with water to minimise dust.	Team Leaders	As required

Item	Action	Responsible Staff	When
5	Long-term stockpiles will be stabilised or otherwise protected to minimise erosion and sedimentation.	Team Leaders	As required
6	Implement proposed additions to the brick making process, i.e. dust collector, air receiver and brick dipping tanks, to reduce dust and the incidence of cracking in bricks, reducing waste overall.	Plant Manager	After recommencement of operations
Unusable Quarry Material			
7	Unusable material will be used to construct the noise attenuation berm along the eastern and northern boundaries of the quarry site.	Contractors	During development of new pits
8	Excess unusable material, after completion of the noise attenuation berm, will be placed as backfill to the exhausted Pit No. 2 to ground level as part of site rehabilitation.	Team Leaders	After completion of noise berm
Clean Green (Non Fired) Waste			
9	Clean green (non fired) waste is to be placed in green bins provided on site.	Operations staff	At all times
10	Clean green waste must not be spoiled by other waste material so as to maximise reuse possibilities.	Operations staff	At all times
11	The clean green bins are to be emptied in the Clean Waste Storage Area located to the west of Box Feeder 1 Ramp.	Team Leaders	At all times
12	If clean waste bins cannot be emptied in the designated area due to wet weather, the bins will be emptied on the north west corner of the Souring Bay.	Team Leaders	During wet weather only
13	Clean green waste temporarily placed at the Souring Bay will be moved by front end loader to the Clean Waste Storage Area before the end of the shift.	Team Leaders	Before end of shift
14	Green waste can be crushed for reuse in the production of commons at a rate of 1 in 4.	Team Leaders	As required
Yard and Sales Area Waste			
15	Segregate fired brick waste (breakage, returns) from general rubbish (plastic packaging, sample boxes, etc.).	All staff and contractors	At all times
16	Dispose of general rubbish in general waste wheelie bins.	All staff and contractors	At all times

Item	Action	Responsible Staff	When
17	Dispose of brick waste as contaminated green waste in red steel bins.	All staff and contractors	At all times
Contaminated Green Waste and Brick Waste			
18	Contaminated green and dry waste is to be placed in red steel bins provided on site.	All staff and contractors	At all times
19	Red bins are to be emptied in the Contaminated Green Waste Storage Area located at the south east area of the plant.	Team Leaders	As required
20	If contaminated green waste bins cannot be emptied in the designated area due to wet weather, the bins will be emptied on the Souring Bay.	Team Leaders	As required
21	Contaminated green waste temporarily placed on the Souring Bay will be moved to the Contaminated Green Waste Storage Area by front-end loader before the end of the shift.	FEL Operator	As required
General Waste			
22	General waste, including strapping, plastic wrapping, raw material bags, solid building waste, gloves and wood, is to be placed in either green (rubbish) or blue (recycle) wheelie bins.	Operations staff	At all times
23	Oily rags and used oil-absorbent materials that only contain non-volatile petroleum hydrocarbons and do not contain free liquids will be disposed of as general waste.	Workshop staff, maintenance contractors	At all times
24	Green wheelie bins are to be emptied into Veolia waste bins for collection and disposal offsite.	Shift Team Leaders	As required
Operation and Maintenance Waste			
25	Waste oil will be placed in sealed containers within the bunded chemical storage area.	Operations and workshop staff, maintenance contractors	At all times
26	Empty oil drums will be covered and placed within the bunded chemical storage area.	Operations and workshop staff, maintenance contractors	At all times

Item	Action	Responsible Staff	When
27	Any supervisor can arrange collection of waste oil or empty oil drums as required.	Shift team Leader	As required
28	A collection docket needs to be filled, with the waste consignee (destination) section completed by licensed transporter.	Shift team Leader	As required
29	Spilt oil or fuel and hydrocarbon water mixtures collected in sumps in the bunded storage areas will be pumped out to tankers by licensed liquid waste contractors and disposed offsite.	Licensed liquid waste contractors	As required
30	Scrap metal will be sorted into steel, copper wire and electric motors.	Operations and workshop staff, maintenance contractors	At all times
31	General steel scraps are to be disposed of in the general scrap metal bin.	Workshop staff, maintenance contractors	At all times
32	Smaller scrap metal can be stored in the small orange metal bin outside the south wall of the filters shop which needs to be emptied into the general scrap metal bin when full.	Workshop staff, maintenance contractors	At all times
33	Scrap copper wire and electric motors are to be stored separately.	Workshop staff, maintenance contractors	At all times
34	Collection of scrap metal waste will be arranged as required.	Maintenance Manager	As required.
35	Ensure dust from the crushing plant bag house is returned to the process via an auger feed.	Operations staff	At all times
Sewage Effluent			
36	Liquid effluent from the Plant, Office and Farmhouse Sewage Systems is to be directed to absorption trenches.	Plant Manager	At all times

Item	Action	Responsible Staff	When
37	Retained solid effluent is to be removed by an effluent disposal contractor.	Effluent Disposal Contractor	Monthly – for the office; Bi-annual – for the Plant and Farmhouse; Or as required during the Shutdown Period
38	All effluent from the Despatch Hut Sewage System is to be collected by an effluent disposal contractor weekly.	Effluent Disposal Contractor	Weekly, or as required during the Shutdown Period
Site Stormwater			
39	Site stormwater will be directed to Pit No. 1 or any other active water storage ponds.	Team Leaders	At all times
40	Water in storage ponds will be reused for dust suppression on internal roads and material stockpiles.	Team Leaders	As required

6. Monitoring

Monitoring of the implementation of the WMP will be undertaken as part of regular site inspections by the HSE Officer. Waste storage areas will be inspected daily to ensure that waste materials are properly managed, contained and removed from site to minimise risks of contamination or odour problems.

6.1. Reduced Scale of WMP Monitoring Activities during the Shutdown Period

Due to the significantly reduced level of activities limited to facility maintenance, operation of the retail display and occasional dispatch of bricks from the inventory remaining on-site during the shutdown period, monitoring for compliance with the WMP (e.g. inspection of waste storage areas) will be scaled down as required during the period of shutdown.

7. Reporting

Copies of waste collection docket will be filed by the HSE Officer according to a waste stream's classification as a record of quantities disposed or recycled.

A summary report on compliance with this WMP prepared by the HSE Officer will be included by the Plant Manager in the regular production reporting. Corrective actions will be formulated, implemented and reviewed for any significant non-compliance noted.

8. WMP Forms and Procedures

8.1. Forms

Nil.

8.2. Standard Procedures

BC-ESOP-101 Standard Operating Procedures – Waste Management (Issue 3, dated 14/07/2011).