

Bombala Landfill Environmental Management Plan

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Introduction 1

1.1 General

Snowy Monaro Regional Council (SMRC) has developed this Landfill Environmental Management Plan (LEMP) to set out an environmental management framework for operation of the Bombala Landfill (the Facility). The Facility is a scheduled waste facility under the Protection of the Environmental Operations Act 1997 (POEO Act), however it does not require an Environmental Protection Licence (EPL). This LEMP is prepared to commit SMRC to operate the Facility in and environmental responsible manner. The LEMP is prepared considering all relevant legislation and guidelines.

The Facility is located to the east of the Bombala Township. The Facility services Bombala and the surrounding townships and rural properties. Recycling from the Facility is transported to a materials recovery facility (MRF) in the Australian Capital Territory (ACT). The operation at the Facility is designed to minimise waste disposed of in landfill.

1.2 Site Overview

Table 1: Overview of Bombala La	ndfill Site.
Category	Description
Name	Bombala Landfill
Address	191 Bucky Springs Road, Bombala 2623
Legal Description	Lot 123 DP 756819
	Lot 300 DP 756819
Ownership	Crown (Council is Crown Land Manager)
Area	7.06 ha
Zoning	RU1 – Primary Production
Previous Use	Nightsoil depot and grazing

1.3 Site History

SMRC operates the Bombala Landfill at 191 Bucky Springs Road, Bombala. SMRC was formed on 12th May 2016 as a result of proclamation by the NSW Minister for Local Government. The previous operator of the Bombala Landfill was the Bombala Council. The site has been in operation since the 1930s. The site was originally a nightsoil depot, however it is unsure of when the landfill commenced disposing of solid waste.

1.4 Revisions and Updates

SMRC will review and update the LEMP when any major management plans are implemented or at least once every 3 years to ensure it reflects the current operations at the Facility and any changes in regulatory requirements.

2 Purpose of Landfill Environmental Management Plan

2.1 General

This LEMP is a reference document for all personnel undertaking activities at the Facility. This LEMP is to be regularly updated to reflect the operations at the Facility and regulatory requirements. A copy of this LEMP should be kept at the Facility at all times.

Although not licenced, where possible, SMRC will operate the Facility as if it were licenced using the licenced facilities of Cooma Landfill and Jindabyne Regional Waste Management Facility as a reference.

2.2 Compliance with Guidelines

To provide a consistent and environmentally responsible approach to managing landfills within NSW, the EPA issued guidelines in 2016 for solid waste landfilling titled Environmental Guidelines: Solid Waste Landfills, Second Edition (Solid Waste Guidelines). A performance-based approach to landfill management has been adopted by the EPA that allows the most appropriate mechanisms to be implemented at each landfill site to achieve specific environmental goals. This LEMP and all operational procedures are consistent with the Solid Waste Guidelines.

3 Site Overview

3.1 Site Location

Bombala Landfill is located at 191 Bucky Springs Road, Bombala 2623. The landfill consists of the allotments:

- Lot 123 DP 756819; and
- Lot 300 DP 756819.



Figure 1: Location of the Bombala Landfill.

3.2 Site Ownership

Both Lot 123 and 300 DP 756819 are Crown Land with Council being the Crown Land Manager.

3.3 Licencing

Waste facilities in New South Wales (NSW) are governed by the POEO Act and the associated regulations. These include the *Protection of the Environmental Operations (General) Regulation 2009* (POEO General Regulation) and the Protection of the Environmental Operations (Waste) Regulations 2014 (POEO Waste Regulation).

Under the POEO Act the scheduled activities undertaken at the site are:

- Waste storage;
- Waste disposal (application to land).

Due to the size and amount of waste received/stored the facility the site does not require an EPL.

3.4 Planning and Development

There are no planning records surrounding the Facility. SMRC is committed to ensuring that any future development on the site is compliant with the Environmental Planning and Assessment Act 1979 (EP&A Act) and associated regulations and environmental planning instruments.

The landfill is zoned RU1 Primary Production under the Bombala Local Environmental Plan (LEP) 2012. Under the State Environmental Planning Policy (Infrastructure) 2007 (SEPP Infrastructure), RU1 is a prescribed zone for waste or resource management facilities.

3.5 Topography

The site is situated on the side of a gentle sloping hill (having a gradient of approximately 0.05-0.06) sloping form North East to South West. The highest point is 842m and the lowest being 826m. Within the site there exists a plateau which was created due to landfill activities.

The areas used for waste disposal are disturbed as well as the access roads to each section of the site.

3.6 Geology and Hydrogeology

The areas geology is labelled as Devonian, which is comprised of shales, sandstones, conglomerates, interbedded felsites and basalts. On inspection of the site it was found that the site is situated on primarily shale. Overlaying this shale is a sandy/gravely clay. Ground water would be expected to flow from North to South or North East to South West.

3.7 Hydrology

Surface water is runs from North to South/North East to South West, across the site. The actual flow of surface will be hindered by roads and disturbances of the soil, but the general flow of water will flow with the slope of the land.

3.8 Climate

Climate data from the weather station in Therry Street Bombala, which is approximately 2.5 km from the Facility is summarised in Table 2 – Table 7. On average the annual rain fall is exceeded by the annual evaporation in the area.

Table 2: Monthly mean maximum temperature for weather station 070005, Therry Street in Bombala. Data is based on averages from 1912 to October 2018 (BOM, 2018).

Monthly Mean Max Temperature (°C)	January	February	March	April	May	June	July	August	Septemer	October	Novembei	December	Annual Average
Mean	25.6	25.0	22.7	18.6	14.8	11.6	11.1	12.7	15.8	18.9	21.2	23.9	18.5
10th percentile	22.6	22.8	20.9	16.3	13.3	10.2	10.0	11.3	13.7	17.0	18.6	21.7	17.5
Median	25.6	24.7	22.6	18.4	14.8	11.4	11.1	12.7	15.8	18.8	21.2	23.8	18.5
90th percentile	28.4	27.5	24.6	20.9	16.1	13.2	12.5	14.3	17.7	20.8	23.2	26.0	19.6

Table 3: Monthly mean minimum temperature for weather station 070005, Therry Street in Bombala. Data is based on averages from 1912 to October 2018 (BOM, 2018).

Monthly Mean Min Temperature (°C)	January	February	March	April	May	June	July	August	Septemer	October	Novembe	r December	Annual Average
Mean	10.5	10.5	8.6	5.2	2.0	-0.1	-1.2	-0.2	2.2	4.7	6.9	8.9	4.8
10th percentile	8.8	8.8	6.8	3.5	0.5	-1.8	-2.6	-1.3	0.8	3.3	5.6	7.3	4.2
Median	10.4	10.5	8.7	5.3	2.1	0.0	-1.3	-0.2	2.1	4.6	7.0	8.9	4.8
90th percentile	12.5	12.3	10.6	6.6	3.6	1.2	0.4	1.1	3.3	6.1	8.6	10.4	5.6

Table 4: Monthly rainfall for weather station 070005, Therry Street in Bombala. Data is based on averages from 1885 to October 2018 (BOM, 2018).

Rainfall (mm)	January	February	March	April	May	June	July	August	Septemer	October	Novembe	December	Annual Total
Mean	63.8	58.1	60.0	45.6	42.9	60.4	45.6	39.9	44.4	55.3	65.2	64.4	648.4
10th percentile	11.2	6.3	13.4	6.4	8.2	12.3	7.3	11.5	18.3	19.0	18.4	20.1	458.0
Median	54.8	46.2	45.1	32.7	29.6	39.8	29.3	31.6	37.2	50.0	55.9	50.6	625.8
90th percentile	128.6	110.4	131.8	106.1	88.2	138.5	115.8	91.0	86.4	89.5	123.8	124.9	858.3

Table 5: Mean wind speed for weather station 070005, Therry Street in Bombala. Data is based on averages from 1968 to 1999(BOM, 2018).

Mean Wind Speed (km/h)	January	February	March	April	May	June	July	August	Septemer	October	November	December	Annual
9:00 AM	8.3	6.2	6.2	6.6	5.4	5.5	6.0	7.5	10.7	10.7	9.6	9.1	7.6
3:00 PM	12.6	11.2	10.7	11	9.3	9.5	10.9	12.3	13.7	13.8	13.6	13.3	11.8

Table 6: Mean relative humidity for weather station 070005, Therry Street in Bombala. Data is based on averages from 1968 to 1999 (BOM, 2018).

Mean Relative Humidity (%)	January	February	March	April	May	June	July	August	Septemer	October	November I	December	Annual
9:00 AM	79	85	88	87	90	90	88	83	78	75	81	77	83
3:00 PM	51	55	54	58	63	64	59	56	54	53	52	54	56

Table 7: Average Evaporation rate for the Bombala area. Data is based on values from at least 10 years between 1975 and 2005 (BOM, 2018).

Evaporation (mm)	January	February	March	April	May	June	July	August	Septemer	October	November	December	Annual
Range	175-200	175-200	175-200	60-80	40-50	30-40	30-40	50-60	60-80	100-125	125-150	150-175	1000-1200
Min in Rage	175	175	175	60	40	30	30	50	60	100	125	150	1000

4 Facility Design

4.1 Access and Layout

The site is accessed from Bucky Springs Road, which Council is a controlling authority. All roads within the facility are unsealed.

The current layout of the Facility is shown in Figure 2.



Figure 2: Bombala Landfill site layout. The main features of the landfill site include the following:

- Site office;
- Site storage shed;
- Recycling bay;
- Resource recovery area;
- Green waste stockpile area; and
- Public tipping area.

These areas are described in more detail in the following section.

4.2 Site Facilities

4.2.1 Site Office

The site office comprises of a small demountable office. All vehicles enter the site via the site office. There will be a staff member in or near the site office at all times the site is open.

4.2.2 Site Storage Shed

The storage shed contains all portable equipment for the landfill. The shed is locked when not in use or attended.

4.2.3 Recycling Bay

The recycling bay comprises of a split level transfer station arrangement with two large skip bins for the storage of recycling. The arrangement is designed for ease of use to minimise the risk to the general public.

4.2.4 Resource Recovery Area

The resource recovery area comprises of several stations which are set out for easy separation of recycling. These include drop off areas for:

- Drummuster containers;
- Motor oil;
- Cooking oil;
- Mattresses;
- Degassed fridges;
- Scrap metal; and
- E-waste.

4.2.5 Green Waste Stockpile Area

Green waste is stockpiled in a cleared area to the south of the recycling bays. The green waste stockpile is separated from other waste and stockpiled in an arrangement to minimise the risk of fires.

4.2.6 Public Tipping Area

Waste for landfill is dropped off at the public tipping area. The tipping bay is a raised platform that is separated from waste so the public does not have to enter the landfill cell. Waste is covered and compacted daily.

4.3 Landfill Surface Contour Plan and Filling Plan

The proposed final landfill surface contour plan for the site is shown in Appendix A. The estimated capacity of the landfill (as of the 2 August 2018) is 96 120 m³, which does not include the volume of the final cap. The batters of the final landform slope of 1V to 3H.

SMRC is currently reviewing final landfill surface contour plan, the LEMP will be updated following the update. The new landfill plan will include a filling plan which will include several landfill stages, which will be progressively capped when completed. The design of the final capping layer has not been confirmed. The current proposed design is that design outlined in the Solid Waste Guidelines.

4.4 Staging of Landfilling

This section is reserved for landfill staging.

4.5 Stormwater Management System

The site currently has stormwater drains at the north and east of the site. These direct stormwater around the perimeter of the site. The northern section of the resource recovery area contains a series of stormwater drains. SMRC has engaged with an external consultant to develop a leachate and stormwater management network.

4.6 Leachate Management System

The landfill is not lined as was standard practice when landfilling commenced. Council will review the need for a landfill liner in the planning stage of new landfill cells.

The site currently contains a leachate dam to the south of the landfills cells, which is used to treat all generated leachate. SMRC has engaged with an external consultant to develop a leachate and stormwater management network, which includes the design of a leachate storage dam.

SMRC uses a new daily cover procedure consistent with the Solid Waste Guidelines, which will help reduce the generation of leachate. A staged landfill plan is currently in development which will enable to landfill to be progressively capped.

5 Waste Type and Quantities

The facility accepts both putrescible and non-putrescible general solid waste. The facility does not accept hazardous waste, restricted solid waste or special waste. The site previously accepted asbestos waste and waste tyres (special waste) with this ceasing in early 2018.

The waste categories and corresponding quantities received for landfill disposal are summarised for the last three financial years in Table 8. There is a large discrepancy in waste received last year when compared to previous years. SMRC is currently reviewing this discrepancy.

Landfilled waste		Year				
(Tonnes)	15-16	16-17	17-18			
Municipal Mixed Waste	3500	3800	450			
C&I + C&D MW	32	35	36			
Biosolids	-	-	450			
Bricks or Concrete	-	-	57			
Wood	-	-	18			
VENM	-	-	66			
Total	3532	3835	1077			
Total	3532	3835	1077			

Table 8: Waste categories that are disposed of at Bombala Landfill.

Table 9 contains the waste categories that were received at the Facility and diverted from landfill. The recycling from kerbside collection in the area is not included in the data as it is not stored at the Facility.

Resource Recovery	Fi	nancial Yea	ar
(Tonnes)	15-16	16-17	17-18
Batteries	8.0	8.0	0.44
Commingled Recyclables	140	150	230
E-waste	-	5.0	0.84
Mattresses	8.0	8.0	4.1
Oil	8.0	8.0	5.1
Tyres	-	-	0.06
Vegetation or Garden	47	50	150
Total	211	229	391

Table 9: Waste categories that are diverted from landfill at Bombala Landfill.

6 Faculty Operation

6.1 General

The Bombala Landfill is operated by SMRC in accordance with this LEMP, Councils Policies and Procedures, and all relevant regulatory requirements. SMRC is committed to continual improvement of all waste facilities.

6.2 Planning

The LEMP review is to:

- Evaluate the rate of landfilling and revise the staging/filling plans as required;
- Review site operations and identify areas where site operations/performance canbe improved;
- Modify the LEMP to better reflect site operations;
- Make any changes arising out of legislative changes or changes in SMRC's waste management plan; and
- Update the LEMP incorporating all changes arising from the review process.

SMRC will review and update the LEMP when any major management plans are implemented or at least every 3 years.

6.3 Management, Supervision and Staffing

SMRC provides suitably trained and experienced personnel to manage, supervise, operate and maintain the Bombala Landfill in accordance with Councils policies and procedures, this LEMP and any relevant regulatory requirements. This shall include provision of Resource and Waste (R&W) staff to undertake the following:

- Correct categorisation of incoming waste;
- Maintenance and use of landfill plant;
- Maintenance of roads;
- Management and supervision of resource recovery and recycling areas;
- Management of stockpiles on site;
- Management, operation and maintenance of all environmental management controls on site;
- Management, operation and maintenance of all site facilities and structures;
- Managing cover material on site;
- Overall management, supervision, operation and maintenance of the waste management operations;
- Recording of incoming waste as per Councils policies and procedures and/or relevant regulatory requirements;
- Reporting requirements;
- Safe public access and working area;
- Security of site;

- Spreading and compaction of waste;
- Spreading and use of cover material; and
- Supervision of public tipping face and waste disposal areas.

6.4 Hours of Operation

Table 10: Opening hours of the Bombala Landfill.

Day	Opening hours
Monday	10:00 am – 4:00 pm
Tuesday	Closed
Wednesday	Closed
Thursday	Closed
Friday	10:00 am – 4:00 pm
Saturday	10:00 am – 4:00 pm
Sunday	10:00 am – 4:00 pm

6.5 Waste Screening

Bombala Landfill accepts the following waste types:

- Biosolids;
- Commingled recycling;
- Concrete, bricks or rock;
- E-waste;
- Green waste;
- Mattresses
- Mixed building waste;
- Mixed waste;
- Oil;
- Scrap metal;
- Timber;
- Tyres; and
- VENM.

All materials to be disposed of at the landfill or recycled is inspected and classified at the site office by SMRC R&W staff. All R&W staff members stationed at the site office shall be trained in the identification and classification of waste. Vehicles with unaccepted loads are refused entry to the site.

SMRC implements the following practices to ensure only permitted waste types are accepted at the Facility:

- Information of waste types accepted at the Facility on SMRC's website;
- Prominent signage at the site office of the price and type of all waste accepted at the Facility;
- Recommend alternative waste disposal methods if possible;
- Recording of all incidents of unacceptable waste in the daily log;
- Refusal of vehicles containing non permitted waste types; and

• Regular waste education and information sessions with community groups and at community events.

6.6 Waste Handling, Deposition, and Compaction

All waste and recycling dropped off at the Facility is directed to the correct drop off area to minimise the amount of waste handling. All waste to be landfilled is deposited in a manner to minimise nuisance, environmental impact and achieve maximum practical density after compaction. Waste will not be deposited into any areas with water pooling issues. The active waste area will be maintained in a dry condition as far as is possible during the life of the area.

Each layer of waste deposited in the landfill is evenly placed and compacted by landfilling equipment to achieve a minimum target density of 600 kg m⁻³, with an ideal goal of above 700 kg m⁻³. Large bulky items are broken up, if possible, prior to being deposited in the landfill cell.

Landfill compacting equipment shall generally make 3 to 6 passes over the waste and not exceed a 1:3 (V:H) slope due to reduced compaction and safety issues. During light rain, after long periods of dry weather, R&W staff are directed to compact recently used landfill areas to achieve greater compaction.

6.7 Filling Plan

SMRC has recently engaged a consultant to design a filling plan. This section will be updated upon finalisation of the filling plan.

6.8 Covering of Waste

6.8.1 Daily Cover

To minimise the impact of landfill operations, at the end of each working day R&W staff cover waste with a layer of compacted material to a minimum depth of 150 mm. The daily cover is applied to minimise water ponding and infiltration. Waste is covered throughout the day to further prevent environmental impacts. The material used for daily cover is VENM. SMRC ensures a minimum of two weeks of cover material is stockpiled on site. R&W staff attempt to recover and reuse daily cover as practical operations allow.

6.8.2 Intermediate Cover

When a filled area has not reached final landform height but will remain inactive for a period greater than 90 days, SMRC apply an intermediate capping layer. The intermediate capping layer comprises of 300 mm of compacted cover material. When landfilling is to recommence in an area that an intermediate cover has been applied R&W staff recover as much material as operationally possible. The recovered material is to be used as daily cover or other intermediate cover.

6.8.3 Special Waste Cover

Bombala Landfill does not receive any special waste. If special waste is found illegally dumped on site, and it is determined the best disposal option is to remain on site, SMRC shall ensure that the material is covered according to any regulatory or best practice covering methods relating to the specific special waste found.

6.9 Asbestos Handling

Asbestos is not accepted at Bombala Landfill. SMRC accepts asbestos waste at two other waste facilities located in the LGA. R&W Staff advise the public of the correct facilities for asbestos disposal. In the event that asbestos waste is found illegally dumped on site R&W staff dispose of the waste consistent with Councils asbestos handling and disposal procedure and the incident is reported through Councils incident reporting system.

6.10 Site Security

Outside of opening hours the site is secured by being locked. The site is surrounded by a 1.8 m high man proof fence on all sides. Only approved staff or contractors are provided with a key to the Facility.

6.11 Health and Safety

SMRC undertake all necessary precautions to ensure the safety of all personnel, users and visitors to the site. The supervising R&W staff undergo a full induction prior to commencing work at the site. Inductions for operational staff or subcontractors are conducted by the site supervisor consistent with Councils induction manual.

SMRC ensures that all R&W employees are instructed concerning potential hazards at the landfill and that safe working practices are observed by all sub-contractor staff.

SMRC provide, equip and maintain first aid treatment facilities at the landfill and have a person trained in first aid on site during all operating times.

It is the SMRC and their sub-contractors responsibility to be familiar with the provisions of the Work Health and Safety Act 2011 ("the WH&S Act") and regulations. The duties and all other obligations that the Act places will be properly discharged by SMRC and their sub-contractors, so that all workers are aware of their responsibilities under the WH&S Act.

SMRC ensure that all necessary protective clothing and safety equipment is available and/or issued to all R&W employees, is maintained in good condition, and is used where necessary.

SMRC ensures that site infrastructure is adequate to meet the WH&S requirements of SMRC and sub-contractor personnel, as well as the general public.

All contracts and tenders that SMRC makes for the site will ensure that contracting companies comply with applicable insurance and health & safety requirements. These companies include (but are not limited to) waste collection contractors, revegetation & landscaping companies, recycling contractors and environmental consultants.

6.12 Adverse Weather Operation

SMRC ensures that the landfill is able to accept solid waste under all reasonable weather conditions without compromising the environmental management of the site or safety of R&W staff, and the public. During adverse weather events the area of operation is reduced and certain areas closed. Alternative areas will be identified based on adverse weather conditions. In extreme weather conditions the site is closed until the risk of environmental damage or injury is reduced. Council will notify the public through social media and media releases of any impacts to the service level. Waste may also be diverted to another waste facility if practically possible or preferable to do so.

6.13 Fire Prevention and Control

No materials are intentionally burned on site. SMRC has a site specific fire management plan and trains all staff in relevant procedures to minimise the risk of a fire at the premises which includes but not limited to:

- Screening of loads to identify potential fire risks;
- Maintenance of safety measures;
- Regular covering of waste;
- Maintenance schedule for all firefighting equipment;
- Adequate firefighting equipment on site;
- Stockpile management procedures;
- Staff training;

In the event of a fire occurring at the facility, staff shall take prompt action to extinguish the fire if safe to do so. R&W Staff contact emergency services regardless of fire size. A PIRMP for the site has been implemented and will be activated if deemed appropriate according to the process in the PIRMP document.

6.14 Litter Control

SMRC has recently implemented several operation changes which have reduced the generation of litter at the site. These include:

- Reduction of active area size;
- Daily cover procedures; and
- More effective position of litter fencing.

SMRC monitors onsite litter as well as litter on neighbouring properties. These changes have decreased the amount of litter generation. SMRC is continuing to improve site operation to

further reduce litter generation. Regular litter picks are conducted by R&W staff to remove the litter on site and neighbouring properties.

6.15 Quality Assurance

6.15.1 Design

Any design work of proposed modifications for the Facility will be undertaken by suitable qualified and experienced personnel.

6.15.2 Construction

Any construction work of proposed modifications for the facility will be undertaken by suitably qualified and experienced personnel. Quality assurance assessment of major construction works will be conducted during their construction phase. Prior to the commencement of any major construction works, SMRC will prepare a construction quality assurance and testing programme as part of the construction project management.

6.15.3 Operation

Operation of the landfill is undertaken in accordance with this LEMP, Councils Policies and Procedures and relevant regulatory requirements.

7 Recycling and Resource Recovery

7.1 General

SMRC is continually looking for alternative methods to maximise materials recovery and minimise the amount of waste going to landfill. These methods are outlined in Councils Waste Strategy which is updated from time to time. SMRC has set diversion targets which are also outlined in Councils Waste Strategy. The design and operation of the Facility are aimed at meeting these targets.

7.2 Commingled Recyclables

R&W staff direct customers to dispose of commingled recycling into skip bins. Council allows residential loads of commingled recycling to be dropped off at the facility free of charge to encourage recycling. The skip bin is serviced by a recycling contractor and taken to a materials recycling facility, where it is sorted and recovered.

7.3 Green Waste

R&W staff direct customers to depose of green waste into the green waste stockpile. Council has implemented free disposal of green waste up to 0.5 m³ to encourage the separation of green waste from mixed waste. Council periodically has the green waste mulched and uses the mulch internally to rehabilitate the site

7.4 Scrap Metal

R&W staff direct customers to dispose of scrap metal waste into the scrap metal stockpile. Ferrous and non-ferrous metals are not separated, however both are accepted. The stockpile is serviced by a scrap metal contractor and processed externally. Fridges that have not been degassed and are separated from the metal stockpile until degassed, which is organised by the R&W Supervisor.

7.5 Waste Oil

Both cooking and vehicle oil are accepted at the facility. R&W staff will direct customers to the correct storage container (cooking or vehicle). Vehicle oil is stored in a bunded tank and cooking oil is stored in 44 gal drums. The oil is taken by a contractor periodically.

7.6 Virgin Excavated Natural Material (VENM)

Virgin excavated natural material (VENM) is accepted at the site free of charge and is used on site as daily or intermediate cover. Excess material received is stockpiled consistent with the requirement of keeping a two week stockpile.

7.7 E-Waste

E-waste such as TV's and electrical appliances are accepted at the facility. The E-waste is collected in skips, which are serviced by an E-waste recycling contractor.

7.8 Mattresses

The facility accepts all types of mattresses, which are stacked and stored in a cage. The cages are serviced when full and are taken to a mattress recycling facility.

8 Environmental Management Measures

8.1 General

SMRC undertakes all practical measures to minimise the environmental impact of the Bombala Landfill. The areas identified for improvement by the EPA include:

- Covering of waste
- Leachate management
- Storm water management
- Litter and debris control

Council has implemented or in the process of implementing measures to address these areas. Measures for covering of waste are outlined in Section 6.8. Leachate and stormwater management controls are currently being designed by an engineering consultant. Litter and debris control measures are outlined in Section 6.14.

8.2 Water

8.2.1 General

SMRC undertakes all practical measures to prevent contaminated waters leaving the site. Site operations will generate different quality waters, including:

- Run-off from undisturbed areas within and upstream of the landfill site (clean stormwater runoff);
- Run-off from rehabilitated (revegetated) areas of the landfill site (clean stormwater runoff);
- Run-off from disturbed areas of the landfill site (potentially turbid stormwater runoff);
- Run-off from within the active landfilling area (potentially leachate);
- Run-off from the recycling area (potentially contaminated); and
- Leachate from within the landfill. Management of water at the landfill is aimed at:
- Minimising the generation of contaminated water;
- Preventing deterioration of water quality standards in local surface waterways and groundwater in the vicinity of the site; and
- Ensuring that water is available to meet operational requirements. Clean stormwater will be diverted around disturbed areas of the site to minimise the generation of leachate and sediment laden water.

The following sections outline the management of clean stormwater, sediment laden water, and leachate.

8.2.2 Stormwater

There are four main types of stormwater generated on the site:

- Clean stormwater run-off from undisturbed and rehabilitated / revegetated areas of the site;
- Potentially sediment laden stormwater run-off from disturbed areas of the site;

- Potentially contaminated stormwater run-off from the recycling & waste transfer area; and
- Potentially leachate contaminated stormwater run-off from the active landfilling area.

SMRC has engaged a consultant to upgrade the water management controls. The fundamental approach of the upgraded water management controls in regards to stormwater management are as follows:

- Maintain undisturbed and rehabilitated / revegetated areas as filters for sediment from disturbed sub-catchments;
- Minimise disturbed areas on the site;
- Maintain all stormwater run-off from disturbed areas as diffuse as possible to minimise sediment loads and maximise the opportunities for the vegetation to strip sediment from the run-off. Any concentration of flow over bare and disturbed areas should be avoided;
- Establish and maintain erosion controls (re-vegetation, silt fencing etc.) on disturbed areas as required;
- Ensure that water falling on the recycling/waste transfer area does not leave the site, by placing a series of bunds around the perimeter of this area (as required) and directing this water to a sediment basin or other collection facility; and,
- Ensure that water falling in the active landfilling area does not leave the site and is managed in an environmentally appropriate way by diverting to leachate collection infrastructure.

All drainage structures will be designed in accordance with the relevant design criteria including those specified in the Solid Waste Guidelines, NSW Department of Environment and Climate Change's Managing Urban Stormwater: Soils and Construction, Volume 2B – Waste Landfills, 2008 and Australian Rainfall and Runoff. Where required, approvals licences will be obtained for the drainage structures from SMRC, NSW EPA, and/or the Department of Lands.

8.2.3 Leachate

Leachate is deemed to include all water that has come into contact with waste. The water management control upgrade will include designing considerations to treat all site leachate in a leachate storage dam. The fundamental approach of the upgraded water management controls in regards to leachate management are as follows:

- Diverting upstream stormwater runoff where practical;
- Minimising exposed areas of the active landfilling area by daily covering of the disposal area;
- Grading filled areas to direct surface water runoff away from the active waste disposal area;
- Appling an intermediate capping layer to areas not to be unused for more than 90 days; and
- Progressive capping and rehabilitation of landfilled areas.

All leachate collected by the leachate collection and storage systems is managed by SMRC to prevent adverse impacts on local surface waters and local groundwater. All leachate collected is stored, treated and disposed of in accordance with this LEMP, and the relevant EPA guidelines.

8.2.4 Maintenance

All stormwater drainage, recycling area drainage, and leachate management works will be maintained in proper functioning order. Maintenance will include:

- Regular cleaning of drains/pipes/pits and removal of accumulated sediments;
- Removal of flow concentrations from disturbed areas; and
- Stabilisation of eroded drains.

8.3 Landfill Gas

The site is not sufficiently large and does not have sufficient risk associated with landfill gas to warrant specific landfill gas management measures.

8.4 Odour

The landfill operations minimise the generation and effects of odours from the waste management operations on adjoining land users. Odours are minimised by:

- Not disposing of waste in standing water;
- Depositing waste in thin layers to maximize compaction;
- Use of daily cover;
- Use of intermediate cover; and
- Minimising disturbance of previously filled areas.

Odour complaints of odour are kept in accordance with SMRC complaint management system.

8.5 Dust

All practical measures to minimise the emission of dust are taken by SMRC, these include:

- Immediate burial and covering of dusty loads;
- Speed limits enforced;
- Earthworks undertaken on days with little wind; and
- Use of water cart as required.

8.6 Litter

All practical measures are taken by SMRC to minimise the litter generation due to landfill operation, these include:

- Maintaining small active filling area;
- Regular compaction of waste;
- Use of daily cover; and
- Use of litter fences on site.

All loads entering the site are required to be covered.

8.7 Vermin

The method of vermin control at the Facility includes the regular compaction of waste and use of daily cover.

9 Environmental Monitoring

9.1 Water quality monitoring

There is currently no water monitoring program at the Facility. Council is currently reviewing the site operations and will update the relevant section after the review.

9.1.1 Leachate

No current leachate monitoring program.

9.1.2 Stormwater

No current stormwater monitoring program.

9.1.3 Groundwater

No current groundwater monitoring program.

9.2 Landfill Gas

The site is not sufficiently large and does not have sufficient risk associated with landfill gas to warrant routine monitoring.

9.3 Amenity Issues

9.3.1 Dust

No current dust monitoring program.

9.3.2 Noise

No current noise monitoring program.

9.4 Complaint Handling

SMRC handles any complaints through its existing corporate record management system. Complaint records include:

- Date and time;
- Complaint method;
- Any personal details if provided;
- Nature of complaint; and

• Action taken by Council (if no action a reason why no action was taken).

If the complaint is deemed significant enough to be categorised as a pollution incident as defined by the POEO Act, the Bombala Landfill PIRMP is be activated.

10 Site Closure and Rehabilitation

10.1 Final Landuse and Site Rehabilitation

The site will be revegetated and maintained. There is currently no determined final landuse design for the site, however it is likely that it will remain as a waste management facility routinely monitored by the R&W Department.

Closure and rehabilitation of the site will be as detailed in the Landfill Closure Management Plan (LCMP).

10.2 Landfill Closure Management Plan (LCMP)

SMRC will prepare and submit the LCMP to the NSW EPA at least six months prior to the planned last load of waste being received at the site for disposal. The LCMP will address in detail the following:

- Final land use and landscaping and revegetation;
- Final capping;
- Post closure management and maintenance;
- Post closure environmental management eg. of groundwater, landfill gas, leachate, and stormwater;
- Post closure environmental monitoring and reporting;
- Certificate of completion; and
- Implementation program.

10.3 Post Closure Management

Post closure management of the Bombala Landfill will include ongoing environmental management, environmental monitoring and maintenance consistent with the LCMP.

10.3.1 Environmental Management

Ongoing environmental management of the site will be undertaken by SMRC following closure of the site for landfilling. This would consist primarily of:

- Ongoing management and maintenance of stormwater measures;
- Ongoing management and maintenance of the leachate management system; and
- Ongoing management and maintenance of any future waste transfer station.

It is anticipated that following site closure and redevelopment, SMRC will continue to monitor the environmental impacts of the site and conduct landscaping and gardening activities.

SMRC will ensure that all leachate collection, stormwater controls and reporting practices are maintained at the same level employed during the operational life of the landfill consistent with

the LEMP. These environmental management measures will continue until SMRC can demonstrate that the landfill does not pose a threat to the environment.

SMRC will ensure that waste materials are not received for landfilling at the site after the landfilling operations cease. Any waste materials that are intended for use in the rehabilitation will be documented and reported in the same method used during the operation of the landfill. Any waste materials received for transfer off-site or processing will be directed to the appropriate location on-site.

10.3.2 Environmental Monitoring

Bombala Landfill currently does not have an environmental monitoring program. Environmental monitoring post closure will be consistent with the monitoring schedule set out in the LCMP

10.3.3 Maintenance

SMRC will undertake regular inspection and maintenance of the final landform post the implementation of the LCMP. Landscaping required to maintain the site integrity will be implemented. Post closure maintenance will be outlined in the LCMP and will at minimum will include the following:

- Monitoring of surface water drains and structures, and undertaking repairs where necessary;
- Filling of any cracks that may occur in the final cover layer;
- Filling of depressions created by settlement of the landfilled waste (to ensure shedding of surface water runoff);
- Replacement of vegetation affected by landfill gas or erosion if necessary, to maintain the denseness of the vegetation cover;
- Engagement of appropriately qualified consultants to design remedial works if significant areas of vegetation are impacted from landfill gas, leachate or landslips;
- Repairing erosion scours; and
- Ensuring that all monitoring boreholes and locations are maintained and operational as required.

11 Reporting

11.1 Record Keeping

The POEO Waste Regulation requires SMRC to record all waste received at the Bombala Landfill. SMRC ensures that all waste received are recorded and logged in Councils reporting system.

11.2 Yearly Waste Report

SMRC submits an Annual Waste Report (the WARR report) for Bombala Landfill on a yearly basis to the NSW EPA.

11.3 Incident Reporting

Any incident that represents a threat to the environment (as outlined in the PIRMP) will be communicated by SMRC to all relevant authorities within 24 hours of SMRC first becoming aware of the incident. Written notice will follow within 7 days of the incident. Examples of incidents that require reporting include but are not limited to:

- Identification of non-domestic quantities (>200 g/tonne) of hazardous waste mixed amongst solid waste;
- Fires at the landfill;
- Entry of leachate or waste into the stormwater management system;
- Identification of any failure of an environmental protection system; and
- Any other incident or observation that could potentially pose an immediate environmental hazard outside normal operating conditions.

11.4 Landfill Airspace Surveys

SMRC engages a suitably qualified surveyor to undertake a topographic survey of the landfill, at minimum, yearly to determine the landfill airspace consumed. An update of airspace remaining will be sent to Councils senior management following airspace calculations. The data is used for operational management related the site filling plan.

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APPENDIX A Bombala Landfill Surface Contour Plan





Bombala landfill - Indicative waste design model - version 1

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