

5.0 Project Description

This section provides more detailed information about the design and operation of the proposed landfill facility, from its concept design phase through to its final closure and the proposed, ongoing site rehabilitation works. The project description also directly refers to the contents of the Draft LEMP for the proposed landfill facility (refer **Appendix B**), which has been developed in response to the DGRs for the proposal (refer **Appendix A**).

5.1 Overview

The proposed landfill has been designed as five individually developed and operated “cells”, each having an expected lifespan of approximately 10 years, based on current waste generation and expected filling rates. The proposal would consist of the following main components:

- Leachate Barrier System.
- Leachate Collection and Conveyance System.
- Leachate Pond.
- Sedimentation Basin.
- Dry Basin.
- Internal Access Road.
- Biodiversity Offset Area.
- Diesel Storage Tank and bunded area.
- Site Amenities Building, including staff toilets, staff lunch room, office, first aid / OH&S facilities (eye wash facilities and fire extinguishers, etc) and car parking spaces for both staff and visitors.

The access road to the landfill is proposed to be a single lane carriageway from its intersection with Waterfall Way to the wheel wash location adjacent to whichever cell is operational at that time. A site layout plan is provided in **Figure 6**. The proposed landfill footprint and its associated buffer areas would be located on land in which two small farm dams on the Edington property are located.

5.2 Landfill Design

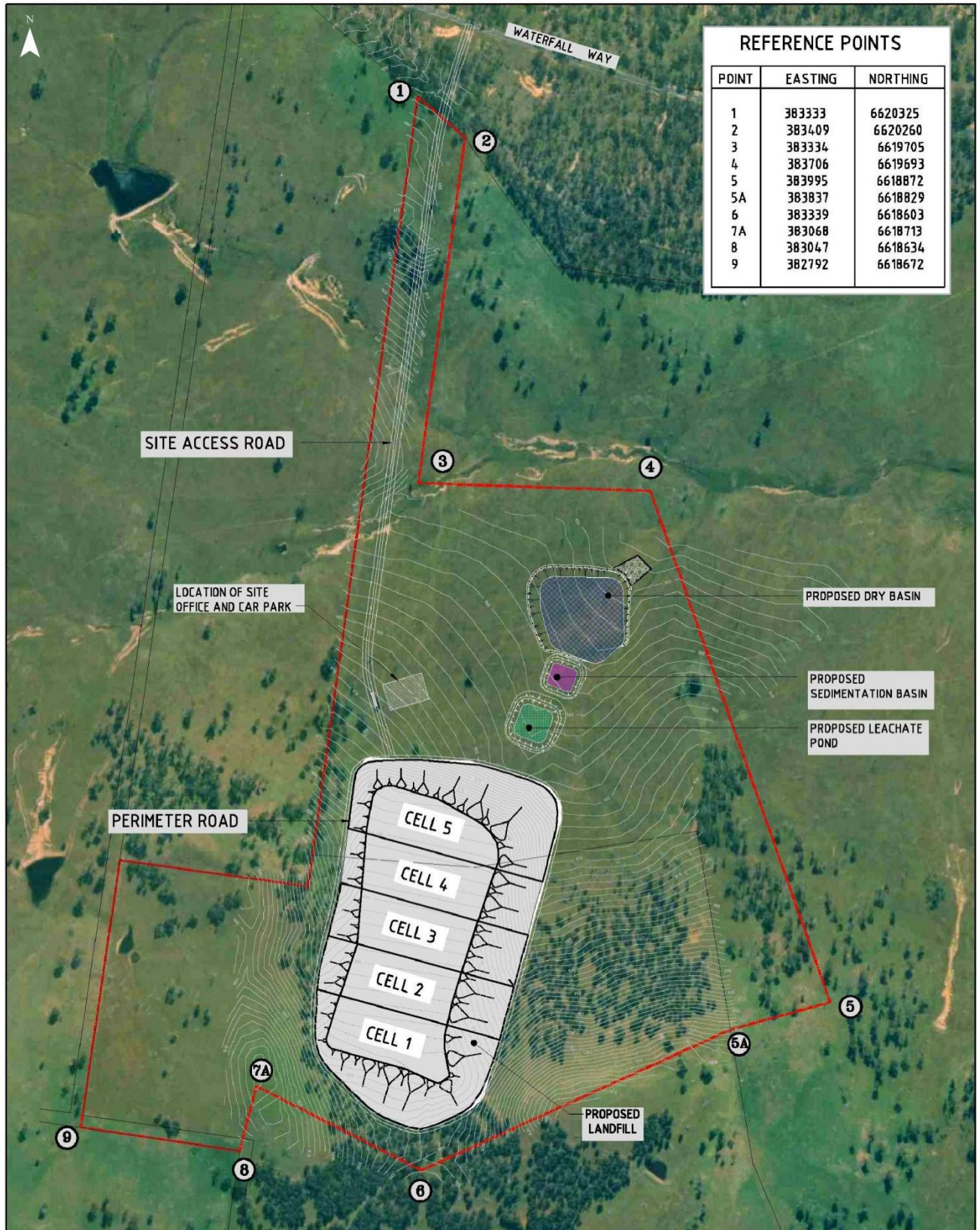
The proposed landfill facility has been conceptually designed and would be constructed in accordance with the *Environmental Guidelines: Solid Waste Landfills* (EPA, 1996). The proposed landfill has been conceptually designed as a conventional landfill to be constructed (for the most part) above natural ground level. Some limited excavation within the landfill footprint would be required for construction of the leachate collection system; to provide clay soils required as a construction material for the leachate barrier system; to provide other suitable soils required for intermediate and final cover of waste materials; and for final capping of the landfill. The final depth required for excavation would be determined by the actual geology of the site, however the excavation would not extend into hard rock. The final depth would also consider the local hydrogeology of the site as described by the findings of the investigation provided in **Appendix F**. The final depth for each waste cell would be determined during the detailed design phase when more detailed, site specific information about the site's underlying geology has been considered.

5.2.1 Cell Design

The proposed landfill would be divided into five cells, each of approximately equal volume. For design purposes, the cells have been numbered 1, 2, 3, 4 and 5, according to the order in which they are currently proposed to be constructed (i.e. Cell 1 is envisaged to be the first to be constructed / filled). Each cell has been designed to contain approximately 211,000 m³ of waste and cover material, assuming a waste compaction density of 0.85t/m³ and incorporating 20% cover material (measured as gross space). This equates to a useable life for each cell of approximately 10 years, based on the currently envisaged landfilling rate of 15,000 tpa.

The dimensions of each cell would vary as the depth available for landfilling would alter in accordance with each cell's location within the site. The cells that are proposed to be located lower in the existing valley (i.e. Cells 4 and 5) would have a smaller base, but greater depth than the cells proposed to be located higher in the valley (i.e. Cells 1 and 2). It is envisaged that cells would be in the order of 80 metres wide, 275 metres long and 14 metres high (deep) as shown on **Drawing CI-110** in **Appendix G**. A cross section of the landfill design is shown in **Figure 7**.

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REFERENCE POINTS		
POINT	EASTING	NORTHING
1	383333	6620325
2	383409	6620260
3	383334	6619705
4	383706	6619693
5	383995	6618872
5A	383837	6618829
6	383339	6618603
7A	383068	6618713
8	383047	6618634
9	382792	6618672

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INDICATIVE SITE LAYOUT PLAN

Source: AECOM (2008)

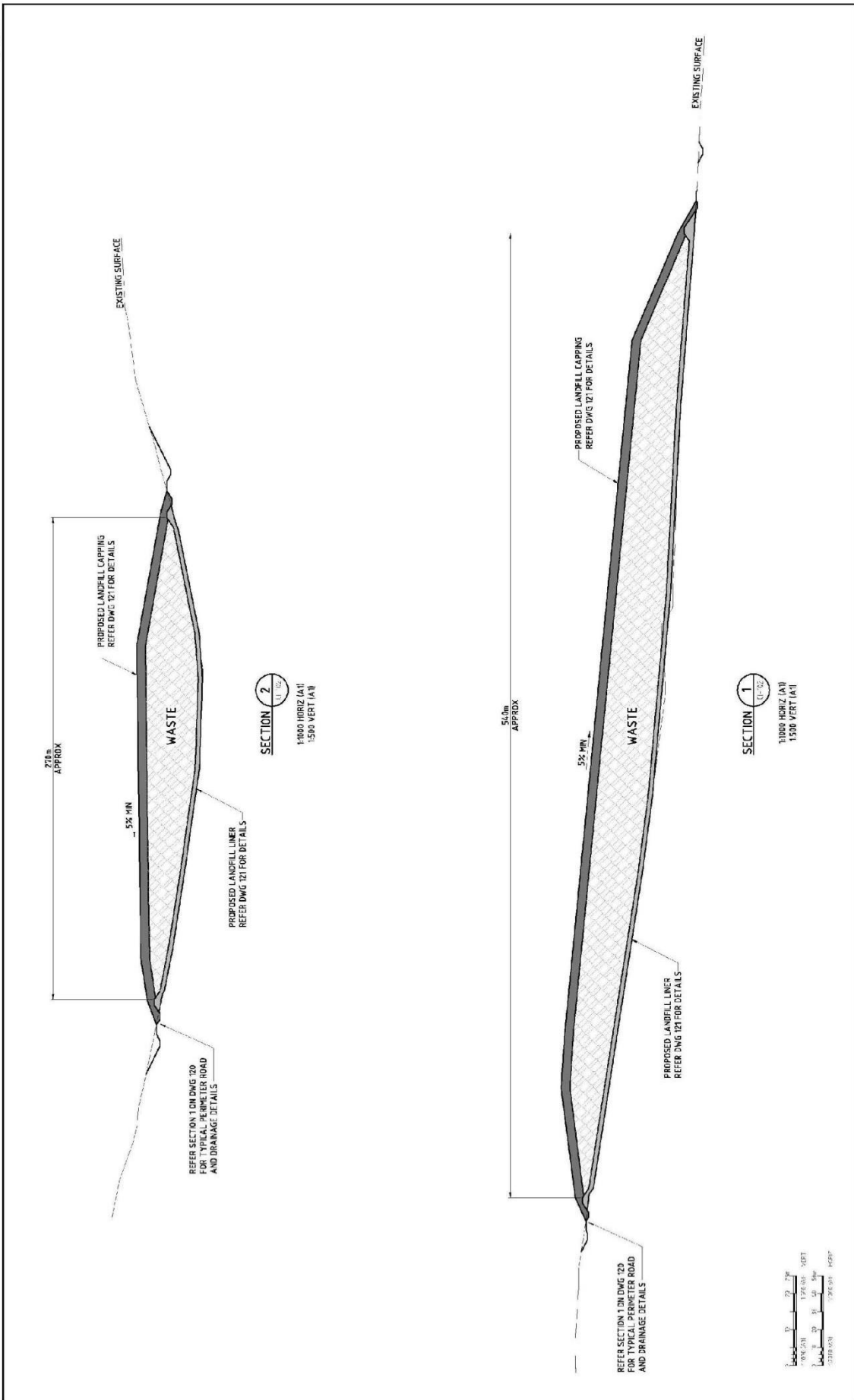
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Fig. **6**

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CROSS SECTION OF LANDFILL DESIGN

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Fig 7

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5.2.2 Leachate Barrier System

The leachate barrier system to be installed at the site would conform to the Benchmark Technique Number 1. It is currently envisaged that this would consist of a 900 mm thick layer of recompacted clay with a permeability of less than 10^{-9} metres per second (m/s), as a minimum requirement. The finally installed leachate barrier system may also exceed these minimum permeability criteria, in order to create further surety of the ongoing integrity of the barrier.

If there are insufficient volumes of appropriate clay material available from site excavation works to construct the required recompacted clay liner (to be determined during the detailed design phase), then an alternative composite clay / synthetic barrier system would be installed such as a landfill liner comprising a clay layer in combination with an artificial liner such as a Geosynthetic Clay Liner (GCL) or a High Density Polyethylene (HDPE) layer (or other equivalent). Any such composite barrier system would also be subject to approval by DECCW and would meet or exceed the minimum Benchmark Technique requirements.

If required, it is anticipated that any such composite barrier design would consist of the following:

- A clay bedding layer with minimum thickness of 300 mm and permeability of less than 10^{-9} m/s;
- A 1.5 mm thick HDPE with a permeability of less than 10^{-11} m/s would overlay the clay layer.

The leachate barrier system would contain leachate over the period of time that the waste poses a potential environmental risk, that is, the time until Final Storage Quality (FSQ) is achieved.

5.2.3 Leachate Collection and Conveyance System

An appropriate leachate drainage layer would be installed above the leachate barrier layer to enable leachate to be collected within the landfill and transported away via the conveyance system. The leachate drainage layer would consist of either a layer of 300 mm thick rounded river gravel or a suitable DECCW approved alternative. If required, any such alternative would consist of either a similar "gravelly" product, or an appropriate geomembrane layer. Final decisions about the actual nature of the leachate drainage layer would be made during the detailed design phase of the project, but would nevertheless still be dependent upon the availability of appropriate materials.

The leachate collection and conveyance system to be installed would consist of a series of slotted collection pipes draining via gravity to one of five leachate collection sumps (**Drawings CI-110 and CI-111 in Appendix G**). Each landfill cell would have a longitudinal gradient greater than 1% and a transverse gradient greater than 3% (such that leachate flows from the edge of the landfill footprint to the central area and towards the leachate sumps).

The leachate would be collected in the leachate sumps and be pumped to the leachate pond located to the north of the landfill footprint. **Drawings CI-110 to CI-114 (Appendix G)** show the progressive development of these cells and other ancillary infrastructure, including the location of the leachate pond.

The leachate pond would enable evaporation of as much as possible of the pure water component of the leachate, leaving the particulate and dissolved contaminants within the pond, to be transported off-site for re-processing/recycling and/or to a DECCW approved disposal site, if required. The pond would be sized to ensure leachate or other contaminated water would be wholly contained within the Project Site and there would be no discharge of leachate to the receiving environment (see **Section 8.3.3**).

5.2.4 Leachate Pond

Leachate generation rates would be determined by hydraulic modelling and water balance calculations. The leachate pond would then be sized accordingly. A freeboard of 300mm has been allowed comprising 150mm to capture the 1 in 25 year, 24hr storm volume from direct rainfall over the pond surface and an additional 150mm for wave action on the water surface without overflowing and would be surrounded by a compacted clay bund. The bund would have a capacity greater than 110% of the capacity of the leachate pond. The hydraulic head (i.e. water pressure) of the leachate would be maintained via the use of level monitoring devices at less than 300 mm above the landfill liner. The requirements for the lining of the leachate pond would be as for the leachate barrier system, described previously.

The proposed landfill has been conceptually designed to enable leachate to be reinjected into the active landfill or irrigated over landfilled areas which have been overlain by intermediate cover.

5.2.5 Landfill Gas Management

“Landfill gas” is the gaseous component of the various bi-products of the breakdown of organic wastes and other matter, over time, within a landfill mass. Landfill gas is made up a number of odourous and non-odourous gases, but mainly comprises methane (CH₄). Methane is an odourless, colourless gas which may be burned as a fuel source, if collected in sufficient quantities. Methane is a significant GHG (refer **Section 8.6**) which, if produced in any significant quantities, would need to be managed appropriately in order to not contribute to other off-site impacts.

The gas generated by the landfill would be contained by the leachate barrier system, by the covering of waste and by site capping and revegetation. The installation of a landfill gas extraction system is not considered necessary based on the type and volume of waste to be accepted at the facility. Nevertheless, during the initial operational phase of the proposed development, the landfill’s performance with respect to landfill gas production and other associated matters would be assessed and the results discussed with both the DECCW and DoP. Once the filling of Cell 1 is complete, landfill gas monitoring (perimeter well testing) would be conducted to determine if the amount of gas produced requires the installation of a gas extraction/control system. The installation of a gas extraction/control system would be required if perimeter well testing shows methane concentrations that exceed 1.25% of methane (measured as volume/volume) or 25% of the Lower Explosive Limit (LEL). All landfill gas “condensate” (i.e. liquids associated with the production of landfill gas) that would be collected by the landfill gas extraction system) would be managed as leachate.

Two suitable options for gas extraction/control would be:

- the application of a methane oxidation cap; or
- passive venting and using a filter (e.g. activated carbon or the like) to reduce emissions.

The methane oxidation cap is a “biological” cap that is used in preference to the standard compacted clay type of cap. It relies on a biomass that oxidises CH₄ as the landfill gas permeates through the soil media that constitutes the cap. Extensive research into this type of capping demonstrates a reduction in methane emissions from landfills of up to 10 times over a standard compacted clay cap. Research is currently being undertaken in Australia as part of the Australian Alternative Capping Assessment Program, which aims to amend the national capping requirements so that smaller landfills have an alternative to the prescriptive expensive caps that DECCW typically suggest.

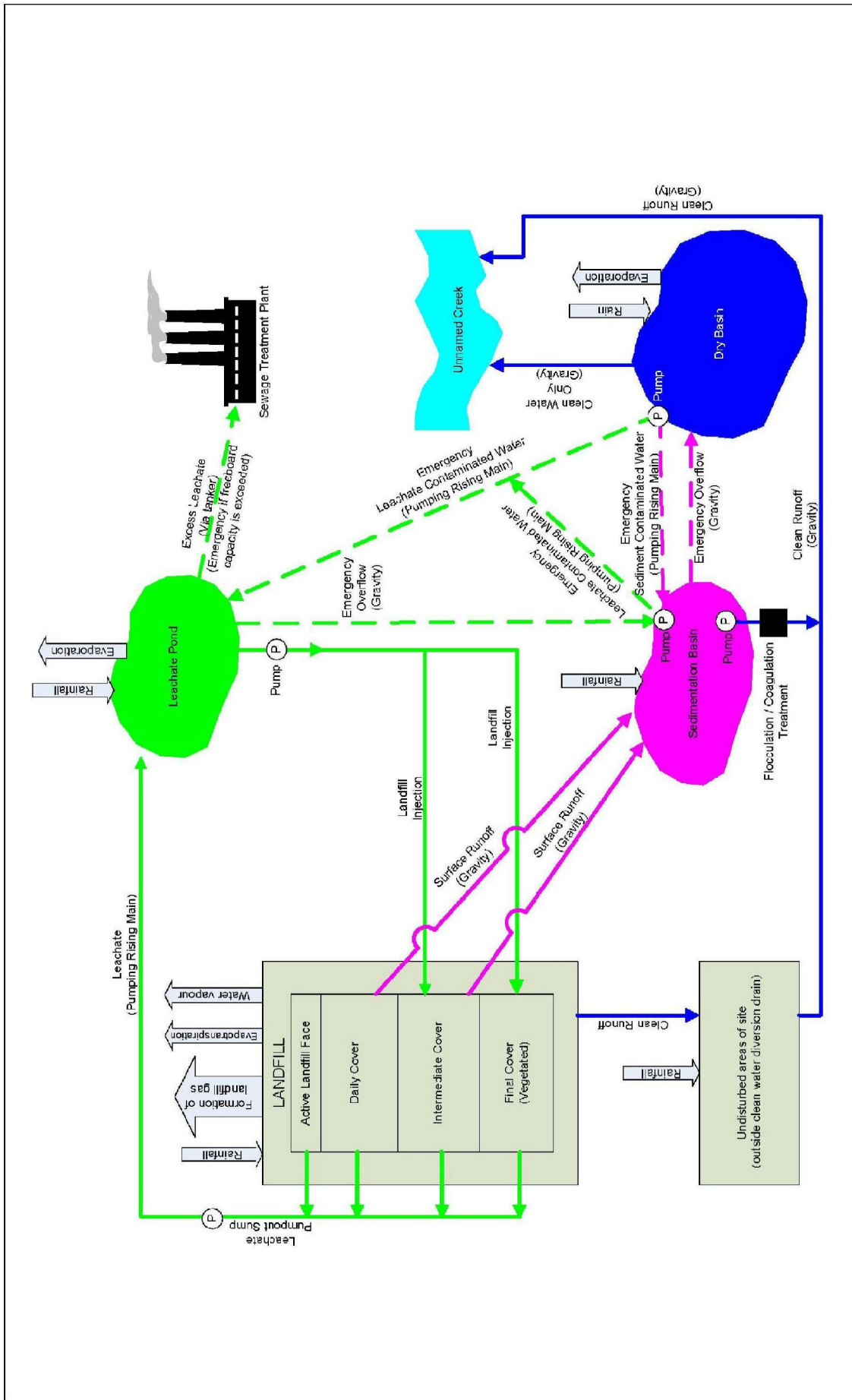
It is recommended that methane generation be monitored after the landfill is operating to determine whether there is sufficient methane produced to necessitate collection. The monitoring data would be assessed to consider whether the installation of a retro-fitted landfill gas system is required for electricity generation.

In the event there is insufficient landfill gas to generate electricity but there is sufficient volume to warrant collection, the gas would undergo thermal oxidation, via flaring. If flaring is to be undertaken, non-methane organic compounds (NMOC) emissions would be quantified by the landfill operator, in strict accordance with the Benchmark Technique Number 11, prior to and following any flaring activities taking place.

5.2.6 Stormwater Management

In order to minimise the potential for stormwater run-off from entering into the area of the landfill, the location proposed for the landfill footprint is at the highest elevation within the stormwater catchment. The provision of appropriately sized stormwater diversion drains and bunding is also an important part of the landfill design (see **Section 8.3.3**). The proposed stormwater management is shown in **Figure 8**.

All stormwater that falls onto the site will be classified as either “clean” stormwater, “dirty” stormwater or “leachate”, as per the following definitions.



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Clean stormwater

For the purposes of this EA, “clean” stormwater includes all waters which would fall on undisturbed areas outside the outer batter of the cell’s perimeter or “dirty” water drain and on all other undeveloped areas of the proposed landfill site. “Clean” stormwater also includes future surface runoff from finally capped and revegetated landfill cells. All clean stormwater would be diverted around the landfill footprint into the existing unnamed intermittent creek to the north of the Project Site. It is not envisaged that there should be any need for other treatment and/or containment of this clean stormwater.

Dirty stormwater

“Dirty” stormwater is water which falls on any disturbed and operational areas of the landfill, but which has not come into contact with any waste materials. Dirty stormwater may contain suspended sediments and as such would be diverted to the proposed sedimentation basin to the north east of the landfill footprint, in which sediments would settle out. Appropriately treated, clarified surface water from the sedimentation basin is intended to be reused on-site for dust suppression purposes and for irrigation of on site vegetation, where and when required.

Leachate

“Leachate” is defined as any water that has been in contact with waste and therefore would be potentially contaminated, including all water flowing from the proposed leachate collection system. Leachate includes all rainfall that would infiltrate through the landfill, both within the “active” filling areas and any finally capped areas. Leachate also includes any contaminated waters disposed by injection into the landfill, as well as any moisture contained within either the waste or any cover materials.

The leachate pond would contain, store and treat all collected leachate. In the unlikely or “emergency” case where the leachate pond overflows, all overflow waters would drain to the permanent sedimentation basin for emergency storage and appropriate treatment. The use of a dry basin may also be required to provide emergency containment, but only in very large storm events, i.e. greater than the 1 in 100 year event. In the event that the leachate pond and/or sedimentation pond overflow to the dry basin, leachate from the dry basin would be pumped back to either the sedimentation basin or leachate pond for treatment, once there is sufficient capacity in these ponds, and no leachate or dirty water would be released to the environment.

A Water and Leachate Management Plan (WLMP) has been prepared for the Project Site addressing surface water and leachate management and providing a suite of mitigation measures to minimise impact to the receiver environment (see **Section 8.3.3**).

5.3 Landfill Construction

The proposed landfill’s various site works, individual cells, ongoing management and final closure activities would be progressively conducted / constructed over a number of years, thus allowing for the incremental use of available materials and the more efficient planning for resource use. The site’s diversion drains, internal access roads and material stockpiles would be established, moved, removed and remediated stage by stage, as required over the total life of the landfill to final closure.

Construction of the proposed landfill would consist of the following general steps:

- Site preparation.
- Cell preparation.
- Liner and leachate collection system construction.
- Filling and cover.
- Final capping and site remediation.

Individual construction periods for discreet activities would always be less than 26 weeks duration. Potential impacts from construction activities are discussed in **Section 8.0**.

5.3.1 Construction Hours

Construction hours of the landfill would be between:

- 7am to 5pm Monday to Friday.
- 8am to 1pm Saturday.
- No work will occur on Sundays or on Public Holidays.

The Contractor may be able to work outside these normal hours with the prior permission of DECCW and only with appropriate noise and other pollution mitigation measures in place.

5.3.2 Site Preparation

Site preparation activities would aim to minimise the area to be disturbed and would include the following specific activities:

- Removal of existing fences, where necessary.
- Progressive removal of vegetation, where necessary, and 2 small farm dams.
- Installation of new fences around the boundary of the site and all required buffer zones.
- Construction of the access road and site entrance.
- Installation of erosion and sediment control measures.
- Installation of site services and amenities including power, telephone, sheds and water tanks.

The expected construction traffic on to / off the site during any 'worst case' timeframe is expected to be limited to the following movements over each weekday:

- Up to 10 construction trucks (total of 20 movements per day).
- Up to five passenger vehicles to and from site (total 10 movements per day).

5.3.3 Cell Preparation

Cells would be progressively constructed, commencing with Cell 1 near the southern end of the site, to enable a more efficient use of all required resources, as well as to minimise the overall level of disturbance to existing site vegetation.

Cell preparation activities would consist of the following:

- Clearing of existing vegetation.
- Excavation and storage of topsoil for cover/rehabilitation (capping).
- Excavation and storage of clay for liner.
- Excavation and storage of remaining material for cover.
- Preparation of cell foundation/load bearing surface.
- Allow a minimum 3% longitudinal fall across the site.
- Recovery of clay suitable for use in the liner.
- Recovery of topsoil and other soil material which would be stockpiled for suitable future use as cover material.

The sub-surface profile of the site consists of topsoil, clay, gravely clay, weathered rock and then hard rock. Excavation of any part of the site would typically cease when the top portion of the weathered rock is encountered. Any suitable clay reserves that are able to be found on the site would be used for the construction of the liner and for part of the capping layer. All excavated topsoil would be stockpiled separately for later establishment of the final vegetation layer of the capping. All remaining suitable material, including gravely clay and weathered rock would be utilised for either daily or intermediate cover.

5.3.4 Liner and Leachate Collection System Construction

The liner and leachate collection system would be constructed in accordance with the Quality Management Plan which would be prepared at the detailed design stage or immediately prior to the construction of the cell.

Construction activities would consist of:

- Construction of external bunds.
- Installation and compaction of landfill liner comprising a clay layer in combination with an artificial liner such as a GCL or a HDPE layer (or other equivalent) and construction of inter-cell clay bunds to enhance leachate collection.
- Placement of leachate collection pipes.
- Construction of leachate collection sumps.
- Installation of drainage material.

For the purpose of the draft LEMP, it is proposed that the leachate barrier system would be constructed in accordance with Benchmark Technique Number 1. The clay would be placed in maximum 150 mm lifts to ensure consistency of compaction and moisture and thereby ensure optimal performance of the barrier.

If, at the time of detailed design, a more complex, composite leachate barrier system is to be used, DECCW approval would be sought and the draft LEMP and EPL would be amended accordingly.

5.4 Landfill Facilities

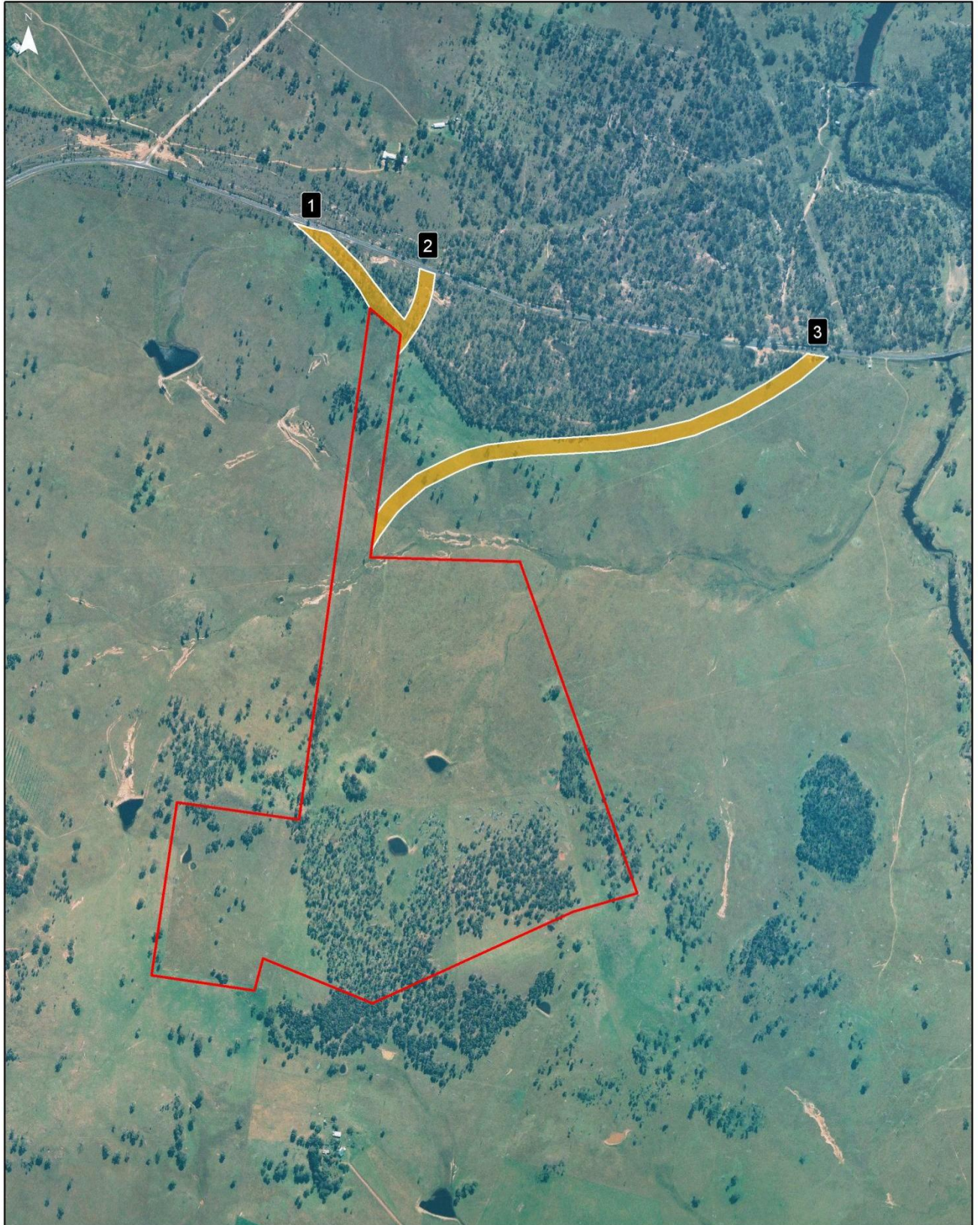
5.4.1 Access Road

Site Access

Three options for entry into the proposed landfill site have been identified, the approximate locations of which are indicated on **Figure 9**. The three proposed access routes were identified as follows:

- Route 1 follows the existing TSR.
- Route 2 is the most direct route into the site.
- Route 3 avoids the TSR.

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- ▭ Project site
- ▭ Access route

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ACCESS ROUTE OPTIONS**

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Source:



Fig. **9**

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A review has been undertaken to identify the constraints associated with each of these three possible route options. The potential implications associated with each have been identified, taking the following aspects into consideration:

- Flora and Fauna - Considerations were informed by the results of the flora and fauna surveys undertaken on-site within the TSR area (**Section 8.8**).
- Traffic - The results of the Traffic Impact Assessment that specifically addressed details with respect to the configuration of the proposed intersection (**Section 8.14**).
- Cost - Indicative costs associated with each option were calculated.
- Noise - A comparative noise assessment was undertaken for the three access route options (a more detailed noise analysis was carried out on the finally adopted access route).

The constraints review of the access route options is presented in **Table 16**.

Table 16: Constraints review of access route options

Aspect	Issue	Applicable to Access Route Options	Implications
Fauna	Habitat value assessed as high in the TSR and therefore significant impacts with removal.	1 and 2	Potential impacts to habitat value in terms of fragmentation and reduced connectivity. This may threaten species populations.
	Threatened bird species: <ul style="list-style-type: none"> • Speckled Warbler • Diamond Firetail. • Hooded Robin. 	1 and 2	Potential impacts to vulnerable species under the <i>NSW Threatened Species Conservation Act 1995 (TSC Act)</i> .
	Threatened mammal species: <ul style="list-style-type: none"> • Koala. • Eastern bent-wing bat. 	1 and 2	Potential impacts to vulnerable species listed under the <i>TSC Act</i> .
	Habitat connectivity	2 and 3	Option 2 would traverse through the centre of the TSR – isolating a small fragment to the west from the larger fragment to the east. Option 3 will create a barrier between the TSR and the compensatory habitat.
Flora	Threatened flora species: <ul style="list-style-type: none"> • Narrow-leaved black peppermint. 	1	Species vulnerable under both the <i>TSC Act</i> and the <i>EPBC Act</i> . It will be necessary to ensure that the access track is 30 metres from any of the marked species (refer Figure 9). This would not be possible for Option 1.
		2	Vulnerable species listed under both the <i>TSC Act</i> and the <i>EPBC Act</i> . It may be possible to ensure that the access track is 30m from any of the marked species (refer Figure 9).
	EEC: <ul style="list-style-type: none"> • Box-Gum Woodland 	1	EEC listed under both the <i>TSC Act</i> and the <i>EPBC Act</i> . If Option 1 was to be pursued, a referral may be required to the Commonwealth Minister for the Environment and Heritage, for assessment and approval.
		2	Listed as an EEC under both the <i>TSC Act</i> and the Commonwealth <i>EPBC Act</i> . If Option 2 was to be pursued, a referral may be required to the Commonwealth Minister for the Environment, for assessment and approval. Note: Option 2 would go through an already cleared area of land and would require less tree disturbance than Option 1.

Aspect	Issue	Applicable to Access Route Options	Implications
Traffic	Intersection	1	Option 1 has a potential issue with line of sight with the access/egress located along the existing TSR as a result of the sharp bend located west of the site of the habitat of various threatened bird species, including: <ul style="list-style-type: none"> - Speckled Warbler. - Diamond Firetail. - Hooded Robin
		2	Based on available technical data, it is expected that the traffic impacts associated with Option 2 should be minimal.
		3	Option 3 has potential grade issues associated with the upward incline of Waterfall Way, east of the Gara River. Any intersection proposed on the low point on the road for vehicles turning left on to Waterfall Way (from the proposed landfill site) may be problematic due to traffic travelling west down the incline.
Cost	Construction of the access road	3	Greater costs associated with having to construct an access road that is approximately 1.25km longer in length than the other Options 1 and 2. Agricultural land segregation; loss of connectivity between TSC and offset compensatory habitat; and additional land take required to construct the road.
Noise	Increased noise	3	Increased noise impacts due to increase in road traffic movements (length through site).
		1	Increased noise impacts to Strathaven property, as road would traverse parallel to site property boundary in this area.

Option 2 was selected as the preferred route as it:

- Provides a safe access point for local traffic.
- Provides a more direct route, would be the least expensive and would result in less noise impacts.
- Would have less impact on land use / property severance, in comparison with Option 3.
- Avoids clearing of the Narrow-leaved black peppermint, a vulnerable species protected by NSW and National environmental legislation.

The access road to the proposed landfill site would be a single lane carriageway some 1.8 kilometres long between the landfill site and the closest public roadway, Waterfall Way (RTA State Road MR 76, also known as Grafton Road). The access road would traverse the TSR from Waterfall Way and run parallel to the western boundary fence adjoining the Edington and Strathaven properties. All vehicular access to the site would be via Waterfall Way. It is not proposed to allow any routine public access to the proposed landfill for either waste disposal or other purposes. The access road would be bitumen sealed from the intersection with Waterfall Way to a wheel wash located near the landfill footprint.

Figure 6 shows the indicative location of the proposed access road. The access road would continue along the western boundary of the site and have a T-junction intersection with Waterfall Way. The required T-junction intersection with Waterfall Way would be designed as discussed in **Section 8.14.3**.

The proposed on-site access roadway would traverse a number of creek crossings and drainage lines. Adequately sized culverts would be provided at all creek crossings and drainage lines which would be designed so as not to impede flows generated by a 1 in 100 year storm event.

Intersection Design

The proposed location for the Option 2 access road as it would intersect with Waterfall Way is considered to meet Austroads criteria for Approach Sight Distance (ASD) and Safe Intersection Sight Distance (SISD) of 265 metres for a 100 km/h roadway. The SISD includes an additional 15 metres to take into account the 3.4% grade from the proposed intersection location to a crest located approximately 300 metres to the west. The total distance of approximately 280 metres from the highest point provides sufficient sight stopping distance for a driver of a vehicle travelling along Waterfall Way to react to vehicles entering and exiting the proposed landfill site.

The Traffic Impact Assessment (see **Section 8.14**) recommends that the T-junction intersection of the proposed access road with Waterfall Way should be based on a Type B (Austroads) right turn arrangement, in order to assist heavy vehicles negotiate left in/left out turns and provide an auxiliary (right turn) passing lane.

5.4.2 Perimeter Road

In addition to the main access road, a perimeter road would be located along the boundary of the landfill footprint for tipping and maintenance access to the active landfill cell.

5.4.3 Signage

Signage would be placed in appropriate locations on the site, clearly indicating the following issues:

- Speed limits.
- Direction to tipping area.
- Types of waste permissible.
- Site owner.
- 24 hour contact telephone number.
- No public access to the landfill.

5.4.4 Fencing and Security

A perimeter fence would enclose the proposed landfill, the diesel storage tank (used to service on-site equipment), staff amenities, leachate and stormwater ponds. The site would have a gate that would be locked outside of normal operational hours, or when the site is unattended. Members of the public would not have direct access into the landfill. Vehicles would only be able to access the site by passing through the site gate.

The proposed offset area (refer **Section 5.4.8**) would be fenced with wildlife-friendly fencing and a cattle grid would also be built into the access road to prevent cattle movement.

5.4.5 Amenities

Staff amenities would be located in a single storey demountable building and would comprise:

- Toilets for landfill staff.
- Staff lunch room.
- Site office.
- First aid /OH&S facilities (e.g. eye wash facility, fire extinguishers).
- Associated workshop and storage shed for materials and maintenance equipment.
- Staff and visitor parking.

The staff amenities would be located adjacent to the access road to the site, on the eastern side to ensure efficient movement on and off the site. The car park would be located adjacent to the amenities building, and would be hardstand with a suitable drainage system to manage surface water runoff.

5.4.6 Water Supply

Detailed water requirements would be estimated during the detailed design stage of the Project. It is not intended to use surface water run-off, farm dams or groundwater sources to meet the new landfill water requirement needs. The sedimentation basin and dry basin would be used for environmental management purposes (refer **Section 8.3.3**), namely runoff capture, dust suppression and stormwater control.

Water required for operational needs and in the amenities building would be supplied by rainwater tank(s) which would be installed on site to collect rainwater from the roof of the site amenities building. During dry periods, extra potable water supplies may be sourced from the 300mm water main that runs from Gara Dam to Armidale along Waterfall Way at the intersection of the access road.

To provide adequate fire fighting capacity to satisfy relevant building and other safety standards, the detailed design of the site would include appropriate provision of fire fighting water as part of the total water supplies to be stored on site.

5.4.7 Services

Electricity and communication services would be provided at the site. Sewage from staff amenities would be treated either via the use of a self composting toilet or otherwise temporarily stored within a septic tank and then pumped off site for appropriate treatment with other municipally collected sewage materials.

Diesel fuel would be stored on site for use in plant and machinery. The diesel would be stored in a tank with associated fittings and pipelines designed to comply with Australian Standard AS1940:2004 (Storage and Handling of Flammable and Combustible Liquids). The tank would be contained within a bunded area which would not be linked to any other part of the site. In accordance with industry standards, this bund would have a capacity of 110% of the tank's capacity in order that any potential spill would be fully contained within the bund, without any risk of overflow.

Suitable fire fighting apparatus and infrastructure such as fire hydrants, fire extinguishers and sprinkler systems would be provided within the buildings as needed and specified during the detailed design phase.

5.4.8 Biodiversity Offset Area

A 50 metre buffer zone has been included into the design of the proposed landfill facility. A Biodiversity Offset Area of approximately 61 hectares has also been included in the design of the Project Site. This offset area would surround the proposed landfill footprint and access route and would include:

- Stringybark woodland.
- Sedgeland.
- Grassland.
- Wetland.

A Biodiversity Offset Management Plan (**Appendix H**) has been developed for the site which details the objectives, management and monitoring measures associated with the Biodiversity Offset Area.

5.5 Landfill Operation

5.5.1 Alternatives Considered

Waste would either be placed in the proposed landfill and compacted or baled at the existing WTS within the Armidale Waste Management Centre prior to being transferred to and placed in the proposed landfill. The baling of waste at the WTS is currently being considered by Council and would involve the automated/mechanical compaction and wrapping/encapsulation of the waste (using a plastic landfill bale wrap material approved by the DECCW). Wrapped bales would then be transported to the landfill working face by trucks and forklifted into place. Since the landfilling of baled waste has no exposed work face and the bales can be easily stacked on top of each other, it is proposed that the lift heights for the waste can be up to 6 metres high. This proposed use of baling would also have the added benefit of minimising the need for daily and intermediate cover at the proposed landfill, thus reducing the various impacts of winning, transporting, storing and placing this cover material. It would also reduce the proposed landfill's longer term operational impacts. The viability of any future use of waste baling techniques has not been confirmed.

If baling of the waste is not viable, unbaled waste would instead be placed within the proposed landfill footprint and be compacted in lift heights of approximately two metres. All unbaled waste would be compacted insitu approximately 0.85t/m^3 . Daily cover would be placed in accordance with the procedures outlined in Benchmark Technique Number 33. This EA has assumed that unconsolidated waste would be placed in the proposed landfill cells and compacted insitu.

5.5.2 Landfill Cell Operation

Landfill cell operations would be as follows:

- The open tipping face would be designed (i.e. sized) according to the needs (i.e. the operating dimensions) of the actual vehicle(s) being used by Council to deliver waste to the site.
- Given the limited number of vehicles that would be used to deliver waste to the landfill site each day (approximately three individual vehicle trips per day), the tipping face would need to be no greater than 5.0 metres wide by 6.5 metres long.
- Daily cover material 150 mm deep would be applied over the waste at the end of each day. Daily cover would be applied in an appropriate manner to minimise odour emissions and to discourage vermin, but also in a manner that would readily allow removal prior to commencement of the following day's tipping activities. Alternative daily cover material such as foams, plastic sheeting or tarpaulins may also be used, where approved by the DECCW, and if it can be shown that the use of these techniques is economically viable at this site.
- Intermediate cover of 300 mm would be applied over landfilled surfaces in areas that are not going to be used for more than the next 90 days. Intermediate cover would typically be applied in sections and would be applied and compacted in a manner that minimises the absorption of rain and discourages the transport of sediments. Intermediate cover would either be removed or "punctured" prior to any recommencement of landfilling over previously covered areas.
- Waste would be compacted to approximately 0.85 t/m^3 using a waste compactor and/or other machinery, in consideration of the weight of the waste.

5.5.3 Filling/ Staging Plan

The landfill concept design proposes that filling would commence in the south (i.e. at Cell 1) of the overall proposed landfill footprint area and extend towards the north (towards Cell 5), with the final landfilling area located at the north of the landfill footprint area (refer to the landfill staging Cells 1- 5, indicated on **Figure 6** and in **Appendix G**), according to the following proposed staging plan. It should be noted that the following is indicative only and these activities may not necessarily be carried out strictly in accordance with the list order below. Should Council consider any alternative waste technologies prior to actual landfilling, volumes of waste being landfilled will decrease significantly with a flow on impact to the life of the landfill.

Filling Sequence

0-5 years:

- Access road and site entrance to be cleared, grubbed and constructed.
- Screening trees planted along the access road.
- Security fence to be installed.
- Sedimentation basin constructed.
- Eastern area of Cell 1 cleared, grubbed and excavated.
- Cover material and clay won from excavation stockpiled separately on future Cell 2 (western area).
- Foundation for eastern area of Cell 1 prepared.
- Liner and bund for eastern area of Cell 1 constructed.
- Leachate collection infrastructure (collection pipes, drainage material) for eastern area of Cell 1 constructed.
- Leachate pond constructed.
- Leachate collection sump constructed.
- Leachate collection infrastructure for the eastern area of Cell 1 connected (i.e. pipes connected to sump, sump connected to leachate pond).
- Permanent sedimentation basin constructed.

- Filling of eastern area of Cell 1 in 2m lift heights.
- Western area of Cell 1 cleared, grubbed and excavated.
- Cover material and clay won from excavation stockpiled separately on future Cell 2 (western area).
- Foundation for western area of Cell 1 prepared.
- Liner and bund for western area of Cell 1 constructed.
- Leachate collection infrastructure (collection pipes, drainage material) for western area of Cell 1 constructed.
- Leachate collection infrastructure for Cell 1 connected.

6-10 years:

- Intermediate cover applied to eastern area of Cell 1.
- Filling of western area of Cell 1 in 2m lift heights.
- Filling of Cell 1 to final landform.
- Intermediate cover applied to all of Cell 1 area.
- Any remaining material stockpiled on future Cell 2 (western area) to be moved to future Cell 3 (western area).
- Eastern area of Cell 2 cleared, grubbed and excavated.
- Cover material and clay won from excavation stockpiled separately on future Cell 3 (western area).
- Foundation for eastern part of Cell 2 prepared.
- Liner and bund for eastern part of Cell 2 constructed.
- Leachate collection infrastructure (collection pipes, drainage material) for eastern area of Cell 2 constructed.
- Leachate collection sump 2 constructed.
- Leachate collection infrastructure for the eastern area of Cell 2 connected.

11- 15 years:

- Filling of eastern area of Cell 2 in 2m lift heights.
- Reinjection of leachate into Cell 1 area.
- Western area of Cell 2 cleared, grubbed and excavated.
- Cover material and clay won from excavation stockpiled separately on future Cell 3 (western area).
- Foundation for western area of Cell 2 prepared.
- Liner and bund for western area of Cell 2 constructed.
- Leachate collection infrastructure (collection pipes, drainage material) for western area of Cell 2 constructed.
- Leachate collection infrastructure for the western area of Cell 2 connected.

16- 20 years:

- Reinjection of leachate into Cell 1 area continues.
- Intermediate cover applied to eastern area of Cell 2.
- Filling of western area of Cell 2 in 2m lift heights.
- Filling of Cell 2 to final landform.
- Intermediate cover applied to all of Cell 2 area.
- Final capping applied to Cell 1 area.
- Any remaining material stockpiled on future Cell 3 (western area) to be moved to future Cell 4 (western area).
- Eastern area of Cell 3 cleared, grubbed and excavated.
- Cover material and clay won from excavation stockpiled separately on future Cell 4 (western area).
- Foundation for eastern part of Cell 3 prepared.
- Liner and bund for eastern part of Cell 3 constructed.

- Leachate collection infrastructure (collection pipes, drainage material) for eastern area of Cell 3 constructed.
- Leachate collection sump 3 constructed.
- Leachate collection infrastructure in the eastern area of Cell 3 connected.
- Leachate collection sumps 1 and 2 connected to permanent leachate pond.

21- 25 years:

- Filling of eastern area of Cell 3 in 2m lift heights.
- Reinjection of leachate into Cell 1 and Cell 2 area.
- Western area of Cell 3 cleared, grubbed and excavated.
- Cover material and clay won from excavation stockpiled separately on future Cell 4 (western area).
- Foundation for western area of Cell 3 prepared.
- Liner and bund for western area of Cell 3 constructed.
- Leachate collection infrastructure (collection pipes, drainage material) for western area of Cell 3 constructed.
- Leachate collection infrastructure for the western area of Cell 3 connected.

26- 30 years:

- Reinjection of leachate into Cell 1 and Cell 2 area continues
- Intermediate cover applied to eastern area of Cell 3.
- Filling of western area of Cell 3 in 2m lift heights.
- Filling of Cell 3 to final landform.
- Intermediate cover applied to all of Cell 3 area.
- Final capping applied to Cell 2 area.
- Any remaining material stockpiled on future Cell 4 (western area) to be moved to future Cell 5 (western area).
- Eastern area of Cell 4 cleared, grubbed and excavated.
- Cover material and clay won from excavation stockpiled separately on future Cell 5 (western area).
- Foundation for eastern part of Cell 4 prepared.
- Liner and bund for eastern part of Cell 4 constructed.
- Leachate collection infrastructure (collection pipes, drainage material) for eastern area of Cell 4 constructed.
- Leachate collection sump 4 constructed.
- Leachate collection infrastructure in the eastern area of Cell 4 connected.

31- 35 years:

- Filling of eastern area of Cell 4 in 2m lift heights.
- Reinjection of leachate into Cell 1, Cell 2 and Cell 3 area.
- Western area of Cell 4 cleared, grubbed and excavated.
- Cover material and clay won from excavation stockpiled separately on future Cell 5 (western area).
- Foundation for western area of Cell 4 prepared.
- Liner and bund for western area of Cell 4 constructed.
- Leachate collection infrastructure (collection pipes, drainage material) for western area of Cell 4 constructed.
- Leachate collection infrastructure for western areas of Cell 4 connected.

36- 40 years:

- ReInjection of leachate into Cell 1, Cell 2 and Cell 3 area continues.
- Intermediate cover applied to eastern area of Cell 4.
- Filling of western area of Cell 4 in 2m lift heights.
- Filling of Cell 4 to final landform.
- Intermediate cover applied to all of Cell 4 area.
- Final capping applied to Cell 3 area.
- Any remaining material stockpiled on future Cell 5 (western area) to be moved to outside of the landfill footprint area.
- Eastern area of Cell 5 cleared, grubbed and excavated.
- Cover material and clay won from excavation stockpiled separately outside of the landfill footprint area.
- Foundation for eastern part of Cell 5 prepared.
- Liner and bund for eastern part of Cell 5 constructed.
- Leachate collection infrastructure (collection pipes, drainage material) for eastern area of Cell 5 constructed.
- Leachate collection sump 5 constructed.
- Leachate collection infrastructure for the eastern area of Cell 5 connected.

41- 45 years:

- Filling of eastern area of Cell 5 in 2m lift heights.
- ReInjection of leachate into Cell 1, Cell 2, Cell 3 and Cell 4 area.
- Western area of Cell 5 cleared, grubbed and excavated.
- Cover material and clay won from excavation stockpiled separately outside of the landfill footprint area.
- Foundation for western area of Cell 5 prepared.
- Liner and bund for western area of Cell 5 constructed.
- Leachate collection infrastructure (collection pipes, drainage material) for western area of Cell 5 constructed.
- Leachate collection infrastructure for the western area of Cell 5 connected.

46- 50 years:

- ReInjection of leachate into Cell 1, Cell 2, Cell 3 and Cell 4 area.
- Intermediate cover applied to eastern area of Cell 5.
- Filling of western area of Cell 5 in 2m lift heights.
- Filling of Cell 5 to final landform.
- Final capping applied to Cell 4 area.
- Final capping applied to Cell 5 area.

The irrigation of the intermediately capped areas would sustain the growth of grass and some small plants that would be required to manage wind and water erosion. No trees would be planted, as tree roots can damage the capping layer. Trees can also be difficult to remove when the landfill is finally completed. It should be noted that all run-off from the irrigation of these areas would be collected, contained and treated as leachate.

Stockpiles of material intended for cover or capping would be stored "one cell ahead" of the currently used active landfilling area, as per the details of the filling / staging plan outlined. For example, when Cells 1 and 2 are being filled, material would be stockpiled on the footprint of Cell 3. Any excess material not required for the filling of Cells 1 and 2 would then be moved downhill to the next cell for future use. Excess cover material may also be used for final capping.

5.5.4 Filling and Cover

Each cell would be separated from adjacent cells by permanent inter-cell bunds. As each cell is filled with waste, inter-cell clay walls would be progressively constructed above the waste height to contain all waste and leachate. Cover material would be applied to waste at the end of each day's landfilling.

Typical daily filling activities consist of the following:

- Placement and compaction of waste.
- Application of daily cover over waste at the end of each day's filling.
- Removal or puncturing of daily cover prior to placement of waste.
- Application of intermediate cover where required.

5.5.5 Landfill Capping

Intermediate cover would be applied over any landfilled areas that would be exposed for more than 90 days. The intermediate cover would comprise 300 mm of cover material that has been sufficiently compacted, but would still allow the absorption of irrigated leachate.

The application of final capping over the landfilled areas would commence within 30 days of the final landfill height being reached in that cell, if weather permits. Final landfill capping would progress with the availability of further suitable capping material.

Once final capping of any individual part of the landfill area has been completed, the area would be revegetated with shallow rooted native grasses and shrubs that are of local provenance. This would return the landfill footprint to its pre-existing land-use condition, suitable for agricultural purposes.

The capping system would be constructed in accordance with Benchmark Technique Number 28. The capping system currently proposed would consist of the following:

- A revegetation layer, approximately one metre thick. The final capped landfill would be revegetated with appropriate grasses and possibly with shrubs. A suitable layer of soil of appropriate but varying thickness that would suit the root depth of any proposed vegetation would be required to avoid potential root damage to the sealing layer. Shrub species would be carefully chosen with this potential in mind.
- A 300 mm thick, gravel drainage layer (with permeability of not less than 10^{-5} m/s) beneath the revegetation layer that would drain water that passes through the revegetation layer away from the sealing layer, in order to prevent water ingress into the landfill mass.
- A 0.5 metre thick layer of clay would form the sealing layer, preventing ingress of surface water. This clay would have a permeability less than 10^{-8} m/s.
- A gas drainage layer would be located immediately above the waste. A number of gas vents would be keyed into this gas drainage layer to keep gas levels close to the landfill mass below the required LEL and to ensure that such gas is directed in a controlled manner away from the landfill.
- A sealed bearing surface would consist of rolled and compacted intermediate capping, which would be in place immediately after completion of landfilling at each cell to its final, maximum height.

It has been assumed that, as a minimum, the procedures outlined in Benchmark Technique Number 28 would be used. However it is noted that in the future, DECCW approval may be sought to use various other demonstrably better capping techniques that may be available at the time of capping design.

5.5.6 Proposed Operational Conditions

Operating Hours

The normal operating hours of the landfill would not be outside the DECCW recommended hours of 6am to 5:30pm Mondays to Fridays and from 8am to 6:30pm Saturdays. The landfill would generally operate between the hours:

- 7am and 5:30pm Monday to Friday.
- 8am and 6:30pm Saturday.

The landfill would only operate on Sundays and public holidays in the case of emergencies.

Equipment

Construction and operation of the landfill footprint and development of each individual cell would typically utilise the following machinery:

- Excavator.
- Dozer.
- Water Cart.
- Compactor.
- Grader.
- Tipper Truck.
- Truck.
- Scraper.

Heavy machinery would be maintained offsite and mobilised on site when required. The water cart would be maintained on site as necessary.

Staff and Organisational Structure

Figure 10 indicates the proposed staffing and organisational structure proposed for the operation of the landfill. The structure may be amended to suit the operational requirements of the site as required.

All staff would be made aware of the manner in which the site is to be operated and managed to ensure compliance with the LEMP, the consent conditions and the EPL for the site.

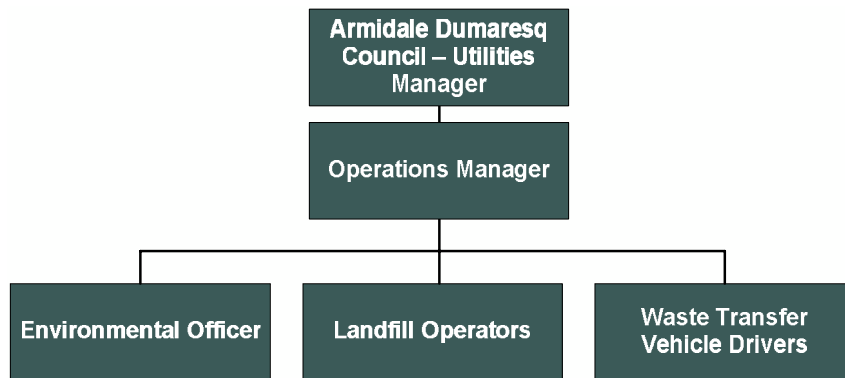


Figure 10: Proposed Staffing and Organisational Structure

Landfill Operation Responsibility

The day to day operation of the proposed landfill facility would be the responsibility of the Operations Manager. The Operations Manager would be employed by Council or another party on behalf of Council. The operators would be responsible for the daily operation of the landfill to ensure compliance with the landfill licence, development conditions, all relevant regulations and the LEMP. The Operations Manager would also ensure that all of the monitoring, repairs and maintenance are carried out at the site in accordance with the LEMP.

This structure may differ, should Council elect to use a Contractor to manage the site on its behalf or operate the waste transfer vehicles. A Contractor would work under a contract stating strict key performance indicators to ensure correct operation.

Litter and Illegal Dumping Control

The final LEMP would include control measures to prevent litter and illegal dumping. Litter would be controlled on a day to day basis by using a combination of the following measures:

- Portable litter fences around the tipping face.
- Ensuring that all wind blown litter that leaves the site is retrieved.
- Regular inspection of all litter fences, perimeter fences and gates.
- Clearing of litter from fences and gates as required.
- Signage of entry and exit gate to advise transport operators that they can be fined for any litter on public roads resulting from their improper transport of waste.

The following covering procedures would be implemented at the landfill site:

- Waste would be covered at the end of each day's landfilling activities with 150mm of cover material approved by DECCW or alternative daily cover as approved by DECCW.
- Removal or puncturing of daily cover prior to placement of waste.
- Application of intermediate cover to a depth of 300mm over surfaces which will be exposed for more than 90 days.
- Removal or puncturing of intermediate cover prior to placement of waste.

The final operating procedures would address illegal dumping and may include signage around the perimeter of the site.

Waste Accepted at the Landfill

The total volume of material to be landfilled at the proposed landfill facility would be approximately 15,000 tpa. In order to allow the initial commencement of landfilling operations, it is Council's intention to seek an operating licence to landfill General Solid Waste (putrescible) material, including putrescible material and other general waste recognised by the DECCW under this "putrescible" definition for general solid wastes. It is Council's longer term objective, however, to begin operating the landfill, as soon as possible in the future (and then until final closure) only as a General Solid Waste (non-putrescible) facility, when appropriate additional off-site sorting and/or treatment technologies are able to be procured and successfully employed.

Schedule 1 of the *POEO Act* contains the following definition of General Solid Waste (putrescible) materials:

general solid waste (putrescible) means waste (other than special waste, hazardous waste, restricted solid waste or liquid waste) that includes any of the following:

- a) *household waste containing putrescible organics,*
- b) *waste from litter bins collected by or on behalf of local councils,*
- c) *manure and nightsoil,*
- d) *disposable nappies, incontinence pads or sanitary napkins,*
- e) *food waste,*
- f) *animal waste,*
- g) *grit or screenings from sewage treatment systems that have been dewatered so that the grit or screenings do not contain free liquids,*
- h) *anything that is classified as general solid waste (putrescible) pursuant to an EPA Gazettal notice,*
- i) *anything that is general solid waste (putrescible) within the meaning of the Waste Classification Guidelines,*
- j) *a mixture of anything referred to in paragraphs (a)–(i).*

It should be noted that car tyres are not currently accepted for landfill disposal at the Armidale Waste Management Centre. Car tyres must therefore be disposed by other methods, off site. As car tyres are not part of the existing waste stream at the Armidale Waste Management Centre, it is unlikely the proposed landfill facility would accept or dispose of any car tyres.

All greenwaste collected by Council would continue to be composted or mulched at the existing landfill at the Armidale Waste Management Centre and made available for re-use. Greenwaste would not be disposed of in the proposed landfill facility, except whenever significantly contaminated loads of materials are collected (i.e. contaminated by the inclusion of “foreign” or otherwise uncompostable matter / objects).

The Armidale Waste Management Centre would continue to separate all clean, recyclable material from other wastes that would be directed to landfill. All potentially recyclable material that is separated from other wastes would continue to be recycled, including glass and plastic bottles, all recyclable metals and “E-waste” (i.e. electronic waste, mainly consisting of obsolete home or office computing hardware).

Waste would be received at the proposed landfill facility in trucks travelling from the Armidale Waste Management Centre. All trucks heading for the proposed landfill facility would first be weighed at the Armidale Waste Management Centre weighbridge and records would be kept and filed in accordance with the DECCW’s required waste regulatory system (see **Section 5.6**).

It is estimated that the traffic flow to and from the proposed landfill facility would be a minimum of approximately six vehicles per day. This estimate is based on the following:

- Three waste transportation vehicles, transporting waste from the Waste Management Centre to the proposed landfill for disposal.
- One heavy truck transporting cover material to the landfill.
- Two staff (passenger) vehicles.

Outside normal operational hours the perimeter fence of the landfill facility would be locked at the entrance gate to prevent any vehicles from entering and exiting the landfill without generating a permanent record.

5.6 Waste Screening

5.6.1 Procedures for Acceptance of Waste at the Armidale Waste Management Centre

The principal waste screening process would occur at the Armidale Waste Management Centre. The waste screening process would involve:

- Clear identification and classification of waste materials prior to arrival at the WTS.
- Use of a fully approved weighbridge (at the WTS), calibrated and stamped annually, to accurately record weights of waste delivered.

The generator, transporter or Armidale Waste Management Centre staff would be requested to assess and classify the material prior to its arrival at the proposed landfill facility. The above information would be reviewed by the Operations Manager, including a check of analysis used to assist in the classification. Any queries would be referred back to the generator, transporter or Armidale Waste Management Centre staff.

The weighbridge (at the WTS) would record the following on the site database:

- Date.
- Time.
- Vehicle Registration.
- Customer.
- Gross weight, tare weight, net payload.
- Waste type.

Note: the tare weight of all vehicles (i.e. the weight of an empty vehicle) used to transport waste from the transfer station to the proposed landfill would be known and kept on record.

After vehicle / waste details have been entered at the WTS, the weighbridge operator would direct drivers from the weighbridge to the proposed landfill facility on Waterfall Way. Vehicles would be directed by the landfill operators to the appropriate tipping area. Once the vehicle has tipped its load at its specified location, the loads would be checked for conformance. Any non-conformance would be reported to the Operations Manager and the landfill operator would then address the particular disposal requirements for that load type. All deposited waste would be covered in accordance with the procedures specified in the LEMP.

5.6.2 Inspection at Disposal Point

The landfill operators would be trained to recognise wastes that are not permitted to be accepted at the site. A list of non-conforming wastes and the methods recommended for handling or movement would be developed prior to landfilling commencing at the site and will form part of the routine working procedures of the operator.

If the operator is in any doubt as to the contents of any load, the load would be left in place and the Operations Manager consulted. In the event that part of, or all of the load is to be rejected, the load would be isolated, loaded onto vehicles, returned to the Armidale Waste Management Centre and stored within skips until the appropriate action for correct disposal is determined.

The placement of waste would be monitored at all times to ensure that no liquid, hazardous or medical waste is placed in the landfill. This would be facilitated by:

- Waste checking procedures at the existing WTS and again at the proposed landfill facility to identify non-conforming wastes.
- Systems and procedures to record weights, waste type and disposal location.
- Grid system covering the site to identify waste tipping areas for future reference.

Non conformance would be recorded in the *Environmental Monitoring Annual Report* as part of the LEMP.

5.7 Environmental Management

5.7.1 Landfill Environmental Management Plan (LEMP)

A LEMP would be developed for the proposed landfill facility in accordance with the NSW EPA *Environmental Guidelines: Solid Waste Landfills* (1996). The objective of the LEMP will be to ensure that a high level of environmental performance is maintained throughout the life of the landfill. The LEMP and the management strategies outlined therein are intended for review on an annual basis or where significant changes to site operation are proposed. Where necessary, the LEMP would be modified as new and more appropriate strategies and technologies become available.

The LEMP would contain, but would not be limited to, the following:

- Statutory and other legal requirements.
- Project Site descriptions, layout, regional geology, hydrogeology, physical setting.
- The proposed landfill facility preliminary design, objectives and operational framework.
- Key environmental, operational and rehabilitation issues.
- Environmental management responsibilities and training.
- Monitoring and reporting provisions.

Prior to construction a Construction Environmental Management Plan (CEMP) would be prepared and would form part of the LEMP. The LEMP would also identify the specific environmental management measures which would govern operations of the proposed landfill facility. Some of these management measures are discussed below and detailed in **Section 8.0** of this EA.

A draft LEMP is attached as **Appendix B** and is further discussed in **Section 9.2.3**.

5.7.2 Odour Management

Odour would be managed at the proposed landfill facility by the placement of daily cover over the active tipping area. In addition, waste loads received at the proposed landfill facility that are particularly odorous may require the application of cover as soon as the load has been tipped, rather than at the end of the day. Leachate in the leachate pond would be managed to ensure that the leachate pond does not become a source of excessive odour.

Odours created at the proposed landfill facility would be managed according to the Benchmark Technique Number 36 –Odour Controls. An assessment of odour impacts is presented in **Section 8.5.3**.

5.7.3 Dust Suppression

Dust would be managed at the site by dust suppression methods including a wheel wash, sealed access road, covered loads on trucks, water spraying of the perimeter road and limited truck movements and speeds. At the tipping face, after waste is tipped and compacted, a water cart would be used as required to minimise dust generated. The exposed area of waste within the landfill would be covered at the conclusion of each day's waste transfer using soil, plastic covers or shredded green waste, or other approved alternative daily cover material. An assessment of dust impacts is presented in **Section 8.5.3**.

5.7.4 Stockpile Management

All excavated material would be stockpiled in designated stockpile areas at the Project Site. The proposed landfill facility has been conceptually designed so that the final landform would complement the existing topography of the area with the highest point of the final landfill landform, i.e. the stockpiles, being approximately 14 metres above the base of the existing ground level.

Stockpiles would be managed through the use of sedimentation and erosion control measures during both the construction and operational stages of the project, as detailed in the LEMP. These control measures would include:

- Sediment fencing.
- Drainage swales.
- Bunding around stockpiles.
- Detailed design would confirm the exact location and dimensions of the stockpiles.

5.7.5 Environmental Monitoring

Monitoring of all facets of the proposed landfill facility including air, water, noise and waste would form an integral part of the LEMP as it:

- Provides early warning of any possible contamination or breach of the capping layer.
- Ensures that the strategies and plans detailed in the LEMP are being adhered to, and if not, sets out the appropriate corrective action.
- Allows for problems or issues to be highlighted that may require the LEMP to be changed, to ensure continued effective management of the site, in line with the environmental goals.
- Provides necessary facts to fulfil DECCW reporting requirements.

A complete outline of monitoring programs would be included in the LEMP. Environmental Management and Monitoring is discussed further in **Section 9.0**.

5.7.6 Occupational Health and Safety

An OH&S Management System would be established for the proposed landfill facility. Site employees would be inducted to the OH&S Management System prior to commencing work. OH&S management is discussed further in **Section 9.2.5**.