This Technical Memorandum provides further information to support the Works Approval Application for the proposed Melbourne Regional Landfill (MRL) Extension. In particular, we respond to the letter from EPA titled ‘Initial Technical Review of MRL WA Application’.

1.0 LEACHATE MANAGEMENT

EPA Query 1 - EPA seeks further information on the leachate management modelling to ascertain whether drainage modelling has considered the 1 in 20 year storm event for a putrescible landfill after one lift of waste has been placed.

Appendix H of the Works Approval Application includes a Leachate Management Plan. The Leachate Management Plan provides information on the results of leachate generation modelling undertaken for both long term and short term leachate generation. The following methods were used:

- Short term leachate generation during storm events – peak discharge estimation using the rational method.

The leachate modelling is based on the sequence of landfill operations and filling defined in the Works Approval Application. As you will be aware, the HELP model is used to simulate various scenarios to form a long term model of the life of the landfill over periods ranging from 1 to 30 years (refer Section 4 of Appendix H). Scenarios were modelled for the Open Landfill, Interim Cap, Final Cap and the Long Term Simulation Period of 30 years.

HELP is used to model long term periods from 1 to 30 years using average rainfall and 90th percentile rainfall events consistent with EPA requirements of the BPEM1. Further, in order to assess the short term intense rainfall events, such as the 1 in 20 year storm event described in your enquiry, we have included Section 5 – Short Term Leachate Generation Modelling in the Leachate Management Plan.

In Section 5 – Short Term Leachate Generation Modelling, of the Leachate Management Plan we provide short term leachate generation modelling for 1 in 20 year Annual Recurrence Interval (ARI) rainfall events with various durations ranging from 30 minutes to 24 hour duration (refer Rainfall Events 1 to 5). Each landfill cell is considered in terms of its sequence of construction, operation and filling and comprises three sub-cells, as shown on Plate 2 (reproduced below).

As described in Section 5.1 – we have assumed a typical cell has a life of 2 years and a surface area of around 15 hectares. Each cell has three equal 5 hectare sized sub-cells. For this scenario, one 5 hectare sub-cell has a 20m thick waste layer, the second 5 hectare sub-cell has its first two waste lifts and is 5m thick with waste and the third 5 hectare sub-cell is not yet an active landfill cell. Further, Section 5.1 states:

1 EPA Publication 788.3, ‘Best Practise Environmental Management Guideline for the Siting, Design, Operation and Rehabilitation of Landfills’ (the ‘BPEM’), August 2015
The following assumptions were assigned to the short term rainfall event conceptual model:

- A typical cell has a life of 2 years and a surface area of around 15 Ha. Each cell has three equal 5 Ha sized sub cells of which 5 Ha has a 20 m thick waste layer, 5 Ha has its first two waste lifts and is 5 m thick with waste and 5 Ha is not yet an active landfill cell (not contributing to leachate).
- Waste filling will occur on a staged basis with one active sub cell (approximately 5 Ha) open at any one time.
- The 20 m thick waste layer has a surface slope of 5%.
- The 5 m thick waste layer has a surface slope of 0.2%.
- The open interim cap face is sloped at 3H: 1V towards the open cell.
- Runoff from one third of the interim cap slope (5 Ha) flows towards the open cell and is considered to be leachate.
- Runoff from the final capped cell and interim capped cell that does not grade towards the open cell is classified as stormwater and does not form leachate.
- Rainfall over the remaining open sub cell (with no waste) is diverted and classified as stormwater.
- Rainfall infiltrating into the interim capped cell and open cell with 20 m thick layer of waste is stored within the cell as the waste is below field capacity.
- Rainfall infiltrating into the 5 m thick waste layer is considered to generate leachate as the waste is at field capacity (i.e. saturated).

The key assumption related to your query is the last dot point. For the purpose of the water balance, the 5m thick waste layer is considered to generate leachate as the waste is at field capacity. Further information is provided below.
Plate 1: Conceptual Cross Section for Short Term Rain Events
And further we describe in Sections 5.2 to 5.4 of the Leachate Management Plan that:

5.2 Rainfall Event 1

As presented in Plate 2, the open cell area of approximately 5 hectares encompasses a 5 m thick layer of waste. Based on the assumptions listed in Section 5.1, the 5 m thick waste layer is assumed to be at this thickness for approximately 3 months for the sub cell area of 5 hectares. A HELP model simulation was undertaken for an open cell scenario with a 5 m thick waste layer subject to a 90th percentile wet rainfall year. The leachate generated over three wet months was conservatively estimated by selecting the three highest leachate generation months from the HELP simulation for a 90th percentile rainfall year.

The total leachate generated from Rainfall Event 1 was estimated to be 6 550 m³.

5.3 Rainfall Event 2

The rational method was used to estimate the leachate generated from a 1 in 20 year ARI rainfall event over a duration of 30 minutes. All runoff from the open cell is classified as leachate. The runoff over the open cell and runoff from the interim cap face from the previous landfill cell (3H: 1V slope) into the open cell was estimated using the equation:

\[ Q = 0.278 CI A \]

Where
- \( Q \) = maximum discharge rate (m³/h)
- \( C \) = coefficient of runoff
- \( I \) = rainfall intensity (mm/h)
- \( A \) = catchment area (m²)

Using this method the volume of leachate generated for the 30 minute 1 in 20 year ARI storm event was estimated to be approximately 2 100 m³.

5.4 Rainfall Event 3

For a low intensity rainfall event it is assumed that rainfall falling over the open cell area with a 20 m thick layer of waste infiltrates into the waste and is stored within the waste layer.

As supported by HELP modelling sensitivity analysis, the 5 m thick layer of waste, placed over a 5 hectare area of open cell is assumed to be saturated. Therefore, all rainfall received in this 5 hectare area of open cell is assumed to be collected by the leachate collection drainage layer above the base liner as leachate.

Based on these assumptions, the volume of leachate generated by the 24 hour duration 1 in 20 year ARI storm event is estimated to be 4 600 m³.

As noted above, our waste layer thickness was assessed using a 5m thick layer, commensurate with the rate of filling of the landfill cells in the MRL Extension. We understand your query relates to how much leachate would be generated if the waste layer thickness was 2m (instead of 5m thick) and a 1 in 20 year rainfall event were to occur at the start of the cell life? In this case, the result would be the same as Rainfall Events 2 and 3 above, as the waste is assumed to be saturated in both cases and therefore all rainfall falling on the open cell generates leachate. Hence, we consider the leachate management plan already answers your query.

We consider this meets the intent of the EPA consideration to model leachate generation when the ‘first lift’ of waste is placed on the floor of the landfill cell and is saturated by a short term, 1 in 20 year ARI rainfall event. We consider this is equivalent to the BPEM requirement.

In addition we include various scenarios in Section 5 whereby the 1 in 20 year rainfall event occurs at various stages through the waste placement operations, which further satisfies the EPA BPEM requirement.
2.0 LANDFILL GAS MANAGEMENT

EPA Query 2 – Gassim model inputs have been provided separately.

EPA Query 3 – EPA has requested further information regarding specific actions that will be undertaken if confirmed landfill gas odours occur during landfilling operations.

The Works Approval Application includes several sections related to odour. In particular, odour is addressed in the Pacific Environment Air Quality Assessment report included as Appendix J which concludes that:

“The design and management of a landfill plays an extremely important role in odour emissions. The difference in odour impacts from a poorly managed landfill and a best practice operation is very significant. Minimising the opportunity for odour emissions requires attention to all of the significant potential odour sources, most particularly:

- the active face – by minimising the area of newly placed waste that is exposed to the atmosphere on a continuous basis, and ensuring that there is adequate daily cover to minimise emissions
- the active cell (apart from the active face) - by ensuring an adequate interim cap is in place and that active LFG capture is installed as soon as possible, using a sacrificial horizontal collection system.
- completed cells – by having in place an effective final cap, an efficient active LFG gas collection system and an effective monitoring and maintenance program to ensure no significant fugitive emissions. A vegetated cover will also help to reduce the potential for emissions through the surface.
- leachate – by minimising the generation of leachate. This is achieved by ensuring maximum integrity of cells and minimising water infiltration, ensuring that any exposed leachate storage is located well away from sensitive locations, and by monitoring of leachate condition and emissions.
- site works – by avoiding disturbance of previously placed waste, e.g., in developing or modifying the LFG capture system, when there is a risk that odour emissions will impact on sensitive locations. “

Discussion of odour management is included in Section 19.7 (Air Emissions) of the Works Approval Application which states that:

“19.7.2 Air Emission Sources and Indicators

The air emission sources for the proposed works are expected to be consistent with the existing works. The key sources of odour were identified as;

- Deposited waste;
- Landfill gas; and
- Leachate.”

Also, Section 8 (Contingency Planning) of the Landfill Gas Management Plan, included as Appendix H provides discussion of various contingency planning measures that respond to odour management as follows:

“8.2 Surface Gas Emissions

Corrective action for the exceedance of surface gas emission BPEM action levels may include;

- Investigation into the source of the LFG surface emission;
- Review of waste screening processes to ensure unacceptable waste is not being accepted at the Site;
- Providing thicker cover material or changing the cover material to an alternative material;
- Repairing or replacing cover material or landfill cap materials and surface erosion control methods such as vegetation establishment;
- Adjusting or installing gas venting or extraction equipment;
- Installation of perimeter gas collection trenches; and/or
- Repairing or replacing seals around cap penetrations.
- Evaluation of effectiveness of gas collection system;"

As Surface Gas Emissions are a potential source of odour all of these actions discussed in Section 8.2 will be considered and implemented as contingency measures in the event of a confirmed landfill gas odour at the MRL Extension.

Further, Cleanaway will undertake the following actions in the case of a confirmed landfill gas odour:

i) Investigate the source of the landfill gas odour.

ii) Assess the effectiveness of the landfill gas management system, the leachate management system (in particular the leachate storage ponds) and the active face of the landfill, as well as the interim capped sections of the MRL Extension.

With respect to the landfill gas management system the following actions are proposed:

iii) Assess landfill gas collection efficiencies in the active landfill cell.

iv) Balance the gas well field to ensure efficient collection of landfill gas.

v) Undertake a surface gas emission assessment using a hand held gas analyser to check for landfill gas emissions with particular attention to point source emissions, joins in pipework, assess for damage to the gas pipework and areas associated with penetrations of the cover soils.

vi) Where excessive surface gas emissions are encountered undertake remedial measures to minimise gas emissions in accordance with Section 8.2 of the Landfill Gas Management Plan. For example by repairing or replacing seals around penetrations in the cover soils or cap.

vii) Review the management of condensate and gas well maintenance and update or improve as required.

viii) Assess the effectiveness of the coverage of gas collection and whether additional vertical gas wells are required. Assess the effectiveness and spacing of the horizontal gas collection trenches and whether additional gas collection measures are required.

ix) Assess the integrity of the intermediate and final landfill caps to ensure that landfill gas is being collected efficiently and repair any defects where encountered in the cap to prevent the uncontrolled release of landfill gas.

With respect to the active face of the landfill the following actions are proposed:

x) Assess the effectiveness of the daily cover soils at the active face of the landfill operations. Provide thicker cover material on the active landfill face or change the cover material to an alternative material to further limit odour.

xi) Minimise the exposed active waste area and apply cover periodically through the day.

With respect to the leachate management system the following actions are proposed:

xii) Assess the effectiveness of the leachate collection system within the landfill cells to ensure that leachate is not blocking or impeding the efficiency of the landfill gas collection system. Check for partially flooded gas pipework and perched leachate impeding the collection of landfill gas.
xiii) Undertake air emissions monitoring at the leachate evaporation ponds and assess the potential for odour from the ponds.

xiv) Monitor the leachate aerators including an assessment of maintenance and operations.

xv) Assess the need for offsite disposal of leachate in the event of odour issues associated with the leachate evaporation ponds.

3.0 TRAFFIC
EPA Query 4 – Refer attached Traffic report.

4.0 AIR EMISSIONS
EPA Query 5 – A separate response to the EPA query with respect to air modelling is to be prepared by Pacific Environment.

5.0 HOTSPOT MANAGEMENT PLAN
EPA Query 6 – Hotspot Management Plan

EPA has requested further information to supplement Section 19.9 (Fire Prevention) of the Works Approval Application. In particular, to provide further information on actions to prevent, locate and extinguish subsurface hot spots in the form of a Hotspot Management Plan. The following section presents the Hotspot Management Plan.

5.1 Hotspot Management Plan Objectives

A landfill ‘Hotspot’ refers to an area of waste below the landfill surface with elevated temperatures accompanied by heated gas products of thermal degradation, thermal oxidation and or combustion.

The objective of this Hotspot Management Plan is to prevent the occurrence of subsurface Hotspots and where encountered to identify and manage hotspots within the waste mass.

5.1.1 Hotspot Prevention

Subsurface Hotspots are difficult to detect and extinguish, so the primary objective is to prevent a subsurface Hotspot from starting. Fire prevention and control measures are discussed in Section 19 of the WAA as follows;

The control measures for fire prevention include;

- Inspection of incoming loads for ‘hot’ waste or burning materials.
- Use of spark arrestors on landfill operation machinery.
- Inspection of waste for ignition sources such as hot coals, car and marine batteries.
- Enforcement of No Smoking requirements for personnel and visitors.
- Highly combustible materials such as timber are buried as soon as practicable at the landfill active face.
- Waste loads are covered daily to prevent air intrusion and reduce the risk of spontaneous combustion.
- Cover materials are non-combustible.
- The composition and levels of LFG are frequently monitored to detect risk of fires or explosion.
Effective compaction of waste is another important control measure. At the commencement of the MRL Extension it is envisaged that Cleanaway will undertake the following activities:

a) Install fire fighting equipment including on-site water trucks and emergency procedures in accordance with Section 19.9.1 of the WAA.

b) Maintain a water supply utilising the onsite stormwater storage ponds discussed in Section 19.9.2 of the WAA and as defined in Appendix L – Stormwater Management Plan.

c) Undertake fire response training for Cleanaway operations personnel.

d) Undertake specific training for operations staff in early observation and methods for detection of hotspots.

e) Prepare site specific emergency procedures for fire as discussed in Section 19.15 – Contingency Planning, of the WAA.

f) Inspect incoming waste loads for ‘hot waste’ at the weighbridge and at the active face of the landfill during placement. Including inspection of waste for potential sources of hot waste such as hot coals, car and marine batteries.

g) Refuse to accept hot wastes or potential hot wastes and establish an area to isolate and control any incoming loads that need to be cooled and or managed in order to prevent the occurrence of a hot load.

h) Careful management of incoming waste loads that have the potential to generate heat once placed. For example, in the case of incoming waste with high percentages of green waste the waste would be spread in thin layers and or intermixed with non-combustible wastes during landfilling, with the aim to prevent spontaneous combustion of green waste.

i) Maintenance and inspections of daily and interim cover soil thickness to minimise air ingress into the placed waste. This will include regular inspections and maintenance of the surface of the cover soils and capping soils in particular around penetrations such as wells and gas infrastructure to prevent air ingress.

j) Regular inspections of the landfill for signs of hotspots within the waste mass, such as smoke, heat haze, burning smell, rapid localised differential settlement.

k) Regular monitoring of the landfill gas collected from the landfill for signs of the potential for hotspots. Regular monitoring of the landfill gas collections wells to balance the wellfields and prevent excessive air intake (well field balancing).

l) Cleanaway will implement a Landfill Operations Protocol that addresses landfill gas management and monitoring. The operating protocol sets out operating limits for the gas management system. In particular, to establish maximum levels for key landfill gas quality monitoring aspects such as; gas temperature, percentage of oxygen, carbon monoxide, nitrogen and the ratio of methane to carbon dioxide. The aim being to prevent and detect subsurface Hotspots by analysing the collected landfill gas.

5.1.2 Hotspot Management

In the event that a subsurface Hotspot is detected the following management actions will be implemented:

m) Notify EPA.

n) Identify the extent of the affected area and locate the hotspot mass. This would initially be undertaken by non-intrusive methods such as thermal imaging, surface heat monitoring and gas monitoring of individual vertical gas collection wells.

o) Shut down the active gas collection system to limit oxygen supply to the hotspot.
p) Undertake surface gas emissions monitoring to detect the potential for landfill gas emissions and hence for air ingress paths to the hotspot.

q) Apply additional thickness of low permeability cover soils to the top of the affected area to further seal the surface including around penetrations in order to prevent oxygen ingress to the subsurface hotspot.

r) Investigate the potential for additional measures to smother the fire and prevent oxygen ingress and implement if required. For example, the introduction of nitrogen or carbon dioxide gas to the waste mass locally at the hotspot to displace oxygen and extinguish the hotspot.

s) In certain cases where the hotspot is very shallow (near surface) it may also be possible to excavate and relocate the affected wastes to an approved contingency area where the hot loads can be spread in thin layers to cool and for hot wastes to be extinguished with water. This would need to be carefully assessed as the sudden exposure of hot waste to the air (oxygen) increases the risk of a surface fire upon uncovering of the waste.

t) Monitor the effectiveness of the actions to extinguish the subsurface hotspot by monitoring key landfill gas quality parameters, monitor leachate temperature and assess the landfill gas balance and quality at collection wells within and surrounding the affected area.

u) Once the subsurface hotspot is extinguished, progressively reintroduce landfill gas extraction taking care to monitor the key landfill gas parameters and regularly inspect the cover soils within and surrounding the affected area.

v) Investigate the source of the subsurface Hotspot and implement additional management measures to prevent a re-occurrence.

6.0 GREENHOUSE GAS

EPA Query 7 – Greenhouse Gas Generation Related to Fuel Usage

With respect to your query regarding measures to minimise greenhouse gas emissions, in particular fuel use, Section 19.17.3 of the Works Approval Application provides a description of various greenhouse gas mitigation measures including the use of hybrid earthmoving machinery with the ability to save energy, save fuel and therefore to reduce greenhouse gas emissions.

You requested that Cleanaway should set out the preferred option(s) for the minimisation of fuel use and if a decision has not been made at this point in time on the preferred option, to discuss the criteria for selecting which option(s) will be implemented.

The Works Approval Application states the following:

“19.17.3.3 Best Practice Assessment

The Best Practice options were assessed against the waste hierarchy. Waste minimisation was prioritised over other GHG reduction measures such as recycling and energy recovery. The greatest benefit to GHG emissions involved process change for waste generators and higher order waste minimisation strategies. While landfill operators may promote these strategies through education and demonstration programs, they are difficult to enforce and often rely on the implementation of environmental policies.

Source separation and resource recovery was not considered relevant for operation of the Extension. It is expected that the wastes to be received by the site will be pre-sorted. Composting was not considered to be a viable option due to the potential odour impacts. The Air Quality Assessment prepared by Pacific Environment identified the former Pine-Gro composting facility at the site as a major source of odour, this facility has now been decommissioned.

The costs and benefits were assessed for the proposed GHG reduction strategy for the Extension. An integrated approach is proposed for the site that includes;
Promotion of waste minimisation and reduction strategies through community engagement and Landfill Ops’ on site education centre.

Recovery of energy from landfill gas.

Implementation of eco efficient strategies including the use of hybrid plant.

The Greenhouse Gas Assessment identified LFG production as the area where the greatest savings in GHG emissions can be made. LFG management and minimisation strategies have been discussed in detail in Section 18.3 of the WAA and the Landfill Gas Management Plan attached in APPENDIX H.

LFG is collected and converted into electricity which is fed into the national grid as ‘green power’. By combusting LFG, methane is converted to carbon dioxide which has a significantly lower Global Warming Potential. The LFG collection and treatment process is a “preferred GHG mitigation strategy”. The preliminary design of the landfill gas extraction system is provided in Section 18.3. The addition of horizontal wells during filling and BPEM compliant engineered landfill cells is expected to significantly improve the collection efficiency of the system.

Landfill Ops currently use hybrid plant for landfill operations at the Existing Landfill facility and will consider expanding their hybrid fleet in the future. The plant uses energy-use technology such as regenerative braking, where kinetic energy is converted into another form of energy and stored or used immediately. The electric motor also functions as a generator to ease the load on the engine and save on fuel consumption.

Landfill Ops is currently assessing the results of a biodiesel trial. According to the Australian Government Rural Industries Research and Development Corporation in co-operation with CSIRO, GHG emissions for waste vegetable oil biodiesel is up to 89.5% less than diesel.

Landfill Ops will continuously seek opportunities for the more efficient use of energy during the construction and operation of the Extension in the areas of;

- Vehicle and equipment use;
- LFG collection and treatment; and
- Promotion of waste minimisation programs.

In preparing this response to EPA, Cleanaway has identified further options to be considered for the reduction of fuel use, described below.

Fuel Usage Minimisation Plan

In summary the options for minimising fuel use include the following:

- Hybrid plant for landfill operations with regenerative braking and electric motors.
- Use of biodiesel as a fuel substitute. Note, the current biodiesel trial shows this is not currently a viable option for the existing MRL facility.

And additional items identified as follows:

- The use of GPS equipment to ensure route efficiency of landfill vehicles as well as to optimise compaction achieved (i.e. using GPS to optimise compaction so that compaction machinery cease when maximum compaction is achieved rather than expending additional fuel for relatively low additional compaction).
- Driver training: training drivers on vehicle operation to achieve maximum fuel efficiency. This has been shown to achieve substantial fuel savings.
- Fleet maintenance i.e. renewing vehicles when necessary to ensure fuel efficiency and performing fuel-preserving maintenance (such as keeping tyres in good condition).
Given the approximate 10 year time period to the proposed commencement of the MRL Extension it is expected that technology changes will have an influence on the plant and machinery used and fuel efficiency aspects. As such, the minimisation of fuel usage will be revisited at the commencement of the MRL Extension using the following criteria:

1) Commercial Viability – having the ability to provide a reliable fuel source that is sustainable and compatible with Cleanaway earthmoving machinery and vehicle fleet.

2) Practical and able to be easily implemented.

3) Provides ‘Best Value’ compared to alternative options that reduce greenhouse gas emission by other mechanisms.

4) Satisfies regulatory requirements.

A triple bottom line assessment would be undertaken at the commencement of the MRL Extension taking into consideration the above criteria.

7.0 UPDATE TO FIGURE 27

The typical cap liner detail on Figure 27 has been updated to show the geocomposite drainage layer consistent with the Works Approval Application report. The updated Figure 27 is attached.
Reference: #15M9016200
10 May 2016

Cleanaway Waste Management Ltd
Level 4, 441 St Kilda Road
Melbourne VIC 3004 Australia

Attention: Penny Creswell

Dear Penny

RE: EPA INITIAL TECHNICAL REVIEW OF MRL WA APPLICATION
GTA RESPONSE TO TRAFFIC MANAGEMENT AND TRAFFIC IMPACT ASSESSMENT

As requested GTA has reviewed the Initial Technical Review of the MRL WA Application. The following sets out our response to each of the traffic management and traffic impact assessment matters for which EPA required further information including consideration to the EPA Best Practice Environmental Management (BPEM). In particular, I note that the objectives and required outcomes in Section 6.10 of the BPEM relating to traffic have been met.

a) The proposed truck route to the Site appears to be via Christies Road to the east and then Riding Boundary Road, however no certainty is provided on this (subsection 19.1.5 bullet point 2 only states “Restriction of truck entry routes. All heavy vehicles are expected to…..”). nor is there any further information on any traffic control devices/measures/enforceable contract arrangements that would restrict truck movements to this route. Additionally, it is not clear if ‘truck entry’ also covers trucks exiting the site. Clarification and details of any route restriction measures should be provided, noting this should apply not just to trucks but also public vehicles that may be depositing waste at the Community Transfer Station.

Vehicle access to the site (ingress and egress) will only be available from the Riding Boundary Road entrance via Christies Road. Riding Boundary Road functions as a local road and concludes approximately 150m west of Christies Road (i.e. it does not connect to Hopkins Road). Riding Boundary Road has recently been truncated immediately east of Christies Road due to the construction of the Regional Rail Link.

It is also noted that Christies Road is also discontinued to the south at its intersection with Middle Road. Middle Road is an unmade road that connects to Hopkins Road.

In this regard the only available existing route to the proposed site entry on Riding Boundary Road is via Christies Road from the north either from the Western Freeway or the Western Highway which is consistent with the existing access arrangements to the site.

Similarly, the only available route to the Community Transfer Station for trucks and public vehicles is Christies Road via the Western Freeway or the Western Highway.

In the future as the surrounding arterial road network is developed, additional access routes to the Riding Boundary Road entrance/exit point are expected to become available. In particular, it is expected that Christies Road will in the future be upgraded to
an arterial road and extend further south to Boundary Road. All access to the site would still remain via Christies Road to Riding Boundary Road.

As all access to the landfill is via Christies Road, the access route is located away from sensitive land uses with no existing or proposed residential uses between the Western Freeway/Western Highway and the site access. As such, the access arrangements are considered to be consistent with the objectives of the BPEM.

b) It is unclear if there is a need for and what if any traffic control devices (i.e. traffic islands and merging lanes) will be implemented at the site entrance and egress points off Riding Boundary Road and on the junction with Christies Road (and/or Hopkins Road if in fact traffic will use this western route).

Other than the standard access treatments for the site (weighbridge etc.) there is no requirement for traffic control devices at the site entrance off Riding Boundary Road as Riding Boundary Road discontinues at the site access point. As such, while Riding Boundary Road is a public road, it serves no other purpose other than access to the landfill and related on-site industries and there is no external traffic using Riding Boundary Road.

The intersection of Riding Boundary Road and Christies Road is already constructed and operates as an unsignalised T-intersection with a separate right turn deceleration lane on the north approach of Christies Road to facilitate right turn entry to Riding Boundary Road.

As discussed above, no access to the site is currently or proposed to be provided via Hopkins Road.

Given the above, no traffic control devices are required at the site access point (ingress and egress) or at the existing intersection of Christies Road and Riding Boundary Road.

c) Whilst the TIA in Appendix I discusses the existing Accident Statistics over the last five years in Section 2.2.4, it is not clear if the road network considered here just relates to the roads to the east of the site (i.e. along the ‘proposed entry routes’) or also the network to the west (i.e. Hopkins Road). Furthermore, the TIA does not then discuss or report on whether accident rates will be influenced by the proposed extension with greater numbers of vehicles (and throughout the 24 hour period, not the current opening times).

The growth in landfill related traffic of 1% per annum is less than the anticipated background growth in traffic on the surrounding road network. This relatively minor growth in landfill related traffic volumes could not be expected to impact on the safety and function of the surrounding road network. There is also no traffic engineering reason to suggest that operation throughout a 24-hour period would result in any additional road safety issues.

It is noted that no access to the site is proposed via Hopkins Road and as such no analysis has been undertaken of the existing operation of Hopkins Road both in terms of capacity or safety.

d) The TIA focuses on peak hour traffic flow impacts, such that it is unclear if there will be any effect on the local road network and traffic flow derived effects from the longer 24 hour opening time now proposed.

The traffic impact assessment documents the anticipated increase in traffic volumes on a peak hour and daily basis. In relation to the capacity of the surrounding road network to accommodate additional traffic, it is standard practice to assess the peak hour operation
which may include both the road network peak hour (in this case the AM peak hour between 7:30am – 8:30am) and the site development peak hour (in this case 12pm – 1pm).

The analysis conservatively assumes that the traffic growth will occur proportional to the existing traffic generation profile of the landfill site. If operation was to occur throughout a 24-hour period, it is expected that there may be a flattening of the site peak hour as traffic generation potentially spreads over a longer period of time. Given that there is adequate road capacity to accommodate the existing AM road network and site generated peak hour traffic on the basis of existing operating hours, any operation throughout a 24 hour period will spread the traffic and would be expected to lessen the traffic impact during these peak periods.

Section 6.3 of the TIA does assess the daily traffic volumes and confirms that the anticipated daily traffic volumes on Christies Road will remain well within the indicative maximum daily volume.

External traffic volumes during the evening and night time period are significantly lower than during the day so any additional landfill related traffic that occurs overnight will have a negligible traffic impact on the surrounding road network.

I trust the above is clear and satisfactory for your requirements. Naturally, should you have any questions or require any further information, please do not hesitate to contact me on 9851 9600.

Yours sincerely

GTA CONSULTANTS

Simon Davies
Director