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The Riverview Group
Disposal of Residual Waste in
the ACT
Options Paper
January 2012



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1. Introduction

1.1 Overview

The Riverview Group Pty Ltd (Riverview) is currently seeking to enter into a joint venture with the ACT Government to develop land at West Belconnen, most of which is adjacent to the West Belconnen Landfill Site (WBLS) for future residential development.

One of the constraints to developing part of this land is the current identification of the WBLS by ACT Nowaste as its emergency landfill site should its Mugga Lane Landfill Site (MLLS) be unable to accept waste. GHD is also aware of other significant issues relating to short and long term solid waste management within the ACT, which could impact upon the need for the identified emergency landfill capacity at the WBLS. As such, GHD recommended to Riverview that a review of the ACT's existing waste management strategy and waste disposal situation be undertaken to:

- Further understand the actual need for emergency landfill capacity at the WBLS;
- Identify possible alternative options for waste disposal in the ACT in the short and longer terms; and
- Provide a third party review of the issues currently relating to waste strategy and disposal within the ACT for subsequent presentation / discussion with the relevant ACT Government stakeholders.

1.2 Objectives

GHD were engaged by Riverview to review the ACT's current waste management strategy and residual waste disposal situation. The key objectives were to identify and assess significant issues including:

- Likely quantities of waste requiring landfill disposal, including the effect of ACT Nowaste's plans to implement additional resource recovery and waste processing activities;
- Emergency landfill capacity, including the identified capacity at the WBLS;
- Limited approved waste disposal capacity at the MLLS; and
- Approval of an extension to the MLLS, including likely timing.

Following completion of the above, GHD were also engaged to identify and review potential options for the short and long term disposal of residual solid waste generated within the ACT. This would include:

- Expansion of the MLLS;
- Additional landfilling at the WBLS;
- Transfer of the residual solid waste to other nearby landfill sites including the Woodlawn Bioreactor Landfill (WBL); and
- Development of new landfill site within the ACT (at the Fairbairn Pines site identified by CBRE Pty Ltd on behalf of Riverview).



1.3 Scope

In order to achieve the objectives outlined in Section 1.2 above, the following scope of works was undertaken:

1.3.1 Collection and review of relevant data, including:

- Existing ACT Waste Strategies;
- Data available on the MLLS, including data on the proposed expansion (both publically available and as agreed with ACT Nowaste);
- Data on the quantity of residual waste disposed of to landfill in the ACT;
- Consultation with Veolia Environmental Services Pty Ltd (Veolia) in relation to the WBL;
- Data on the potential new emergency landfill site located at Fairbairn Pines (e.g. site topographic map / plan, site geological / hydrogeological data etc.); and
- Inspection of the potential new emergency landfill site.

1.3.2 Preliminary assessment of the short and long term residual solid waste disposal options for the ACT, including:

- Expansion of the MLLS;
- Additional landfilling at the WBLS;
- Transfer of the residual solid waste to other nearby landfill sites including the WBL; and
- Development of new emergency landfill site within the ACT (at the Fairbairn Pines site identified by CBRE on behalf of Riverview).

1.3.3 Preparation of Options Paper for subsequent discussion with ACT Nowaste (and other ACT government stakeholders).



2. Existing Situation

2.1 Existing Waste Strategies

There are currently two waste strategies within the ACT as follows:

- *No Waste by 2010* (ACT Government, 1996); and
- *DRAFT ACT Sustainable Waste Strategy 2010 – 2025* (Department of the Environment, Climate Change, Energy and Water, 2010).

The *No Waste by 2010* document is likely to be superseded by the *Draft ACT Sustainable Waste Strategy 2010 – 2025 (Waste Strategy)* document in the near future.

The over-arching goals of the *Waste Strategy* are four-fold as follows:

- To generate less waste;
- To increase the rate of resource recovery to over 90% by 2025;
- To have a clean environment; and
- To have a carbon neutral waste sector.

2.2 Existing Waste Generation & Residual Waste Disposal Figures

The *Waste Strategy* notes that the amount of waste generated within the ACT increased on average by more than 5% per year between the financial years 1993/1994 and 2008/2009. In 2008/2009, the total amount of waste generated was 798,000 tonnes, with 214,000 tonnes being disposed of to landfill. Figure 1 below (sourced from the *Waste Strategy*) shows the total waste generated and sent to landfill within the ACT from 1993/1994 to 2008/2009.

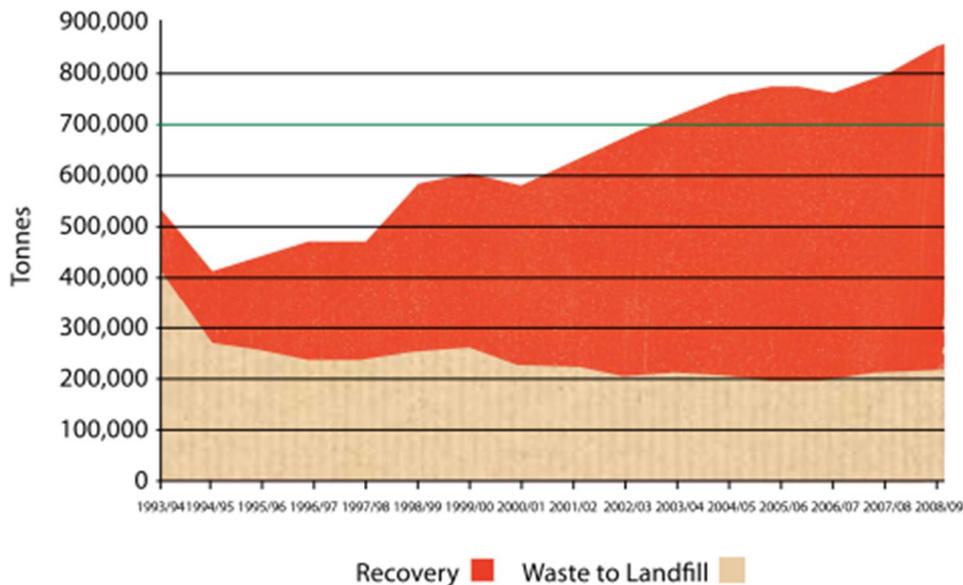


Figure 1 Total Waste Generation and Waste to Landfill

GHD notes that the *Waste Strategy* states that the rate of resource recovery within the ACT was 73% during 2008/2009. This appears to have been calculated as follows:

$$\text{Rate of resource recovery (\%)} = 1 - (\text{total tonnes to landfill} / \text{total tonnes generated})$$

According to the *Waste Strategy*, the population of the ACT in 2008/2009 was approximately 350,000 persons. This suggests that each resident of the ACT directly and indirectly generated approximately 2.28 tonnes of waste during 2008/2009 and that 0.61 tonnes of this was landfilled.

The population of the ACT is projected to be approximately 422,000 by 2022 and 500,000 by 2050 (Canberra Times, 2009) Based on these population projections (and assuming constant waste generation per person from 2008/2009 to these dates), preliminary calculations suggest that the ACT will generate approximately 962,000 tonnes of waste in 2022 and approximately 1,140,000 tonnes of waste in 2050. It is noted that the aim of the *Waste Strategy* is to reduce the quantities of waste generated in the ACT.

Looking forward, if the *Waste Strategy* resource recovery rate targets are achieved (85% by 2022 and at least 90% by 2025), in excess of 100,000 tonnes per annum of residual solid waste will still require disposal to landfill between 2022 and 2050.

2.3 Existing ACT Landfill Facilities

2.3.1 Background

There are currently two operational landfill sites located within the ACT. These are as follows:

- The Mugga Lane Landfill Site (MLLS), which is the ACT's main landfill site; and
- The West Belconnen Landfill Site (WBLS), which is predominantly closed / restored and currently acts as a) the ACT's emergency landfill capacity, and b) the ACT's asbestos landfill.



Further details on these facilities are provided in the following sections.

2.3.2 Mugga Lane Landfill Site

Based on GHD's review of the available data¹, it is understood that the MLLS (currently the ACT's main landfill site) has accepted approximately 190,000 to 210,000 tonnes of waste per year from 2002/2003 to 2008/2009. In 2008/9, approximately 214,000 tonnes of waste was landfilled and it is estimated that this will increase by about 1.5% per annum in future years. It is understood that municipal (MSW) and commercial / industrial (C&I) wastes comprise the majority of the waste landfilled at this site.

It is understood that recent landfill consumption rates at the MLLS are in the order of 0.86 to 0.88 tonnes of waste per m³ of landfill airspace. It is further understood that approximately 2.05 million m³ of consented airspace was available at the site in 2008/2009. Assuming an average landfilling rate of 214,000 tonnes per year (increasing at a rate of 1.5% per year) and an average landfill consumption rate of 0.85 tonnes per m³ of landfill airspace, the life of the MLLS would be approximately 7 years from 2008/9 i.e. it would close in 2015/16.

GHD understands that ACT Nowaste is in the early stages of applying for a significant extension to the MLLS, which could extend disposal capacity for a further 20 to 40 years. GHD understands that obtaining approval for this extension(s) if commenced immediately could take between 3 to 5 years. It is noted that this timescale does not include the time required to design, tender and construct the extension(s) so the site is capable of accepting waste for final disposal. GHD further understands that there may be significant opposition to the proposed extension(s), which is likely to increase the time required to gain the necessary approvals.

2.3.3 West Belconnen Landfill Site

Based on GHD's review of the available data², it is estimated that the WBLS (currently the ACT's asbestos / emergency landfill site) has accepted approximately 5,000 to 10,000 tonnes of waste per year from 2002/2003 to 2008/2009. It is understood that the only material currently landfilled at the WBLS is asbestos / asbestos contaminated soils.

The landfill consumption rate at the WBLS is not known, but based on the material landfilled would be expected to be relatively high (estimated to be in the order of 1 to 1.2 tonnes of asbestos waste per m³ of landfill airspace). The available quantity of airspace at the WBLS for landfilling asbestos / asbestos contaminated soils is not known but anecdotal evidence suggests that the two areas being landfilled (the Borrow Pit and the Asbestos Pit) will reach final disposal capacity within 5 to 10 years, from 2011 i.e. these areas will close between 2016 and 2021 (depending on construction works in the ACT, which dictate the quantity of asbestos waste generated / landfilled).

The specific waste disposal capacity available at the WBLS as an emergency landfill site is currently undefined. However, it could vary between approximately 80,000 m³ and 1,000,000 m³ depending on the area ultimately identified for landfilling. Assuming an average landfilling rate of 214,000 tonnes (of MSW & C&I wastes) in any one year, and an average landfill consumption rate of 0.85 tonnes per m³ of landfill

¹ Including *An Assessment of Mugga Lane Resource Management Centre's Capacity – Beyond 2013*; GHD (2010)

² Including the *DRAFT Report for the Riverview Group – Proposed West Belconnen Residential Development – Risks posed by Adjacent Landfill Discussion Paper*; GHD (2011)



airspace, the life of the WBLS as an emergency landfill could vary between approximately 4 months and four years.

GHD notes that the ACT EPA's expectations in relation to re-opening the WBLS as an emergency landfill site are that current standards for the design, operation and rehabilitation would be utilised by ACT Nowaste (specifically those contained within *Best Practice Environmental Management - Siting, Design, Operation and Rehabilitation of Landfills, Publication 788.1*; EPA Victoria (2010)).

2.3.4 Long Term Approved Landfill Disposal Capacity

GHD understands that there is no approved long term landfill disposal capacity in the ACT at present. Therefore, if the proposed Mugga Lane extension(s) are not approved prior to 2015/2016 (or an alternative disposal facility secured), ACT Nowaste may have no alternative but to utilise the available emergency landfill capacity at the WBLS or to export waste outside the ACT. The use of the capacity at WBLS may provide disposal capacity for the ACT until approximately 2019/2020. However, if the proposed MLLS extension(s) are not approved by then (or an alternative disposal facility secured), ACT Nowaste are likely to have no alternative but to export waste outside the ACT.

2.4 Summary of Existing Situation

The key points in relation to the existing situation are as follows:

- The ACT currently (2011) needs landfill disposal capacity for approximately 200,000 - 220,000 tonnes / year of residual solid waste. This is likely to increase in the near future until the ACT constructs additional resource recovery facilities;
- The ACT's *Waste Strategy* intends to increase resource recovery rates to approximately 90% by 2025. However, based on the available population projections for the ACT even if these targets are achieved, considerable quantities of residual solid waste (>100,000 tonnes / year) are still likely to require landfill disposal between 2022 and 2050. GHD notes that the ACT's population is projected to increase by approximately 43% from 2008/2009 to 2050 with likely associated increases in waste generation and required waste disposal;
- The ACT currently has two operational landfill sites (MLLS and WBLS), neither of which has more than 5 years disposal capacity (at the current landfill consumption rate). In combination, these two sites give a maximum consented landfill disposal lifetime within the ACT of around 8 to 9 years from 2011 (at 2011 landfill disposal inputs); and
- No long term approved landfill disposal capacity currently exists in the ACT. If the proposed MLLS extension(s) are not approved, designed and constructed prior to 2015/2016 (or an alternative disposal facility secured), ACT Nowaste may have no alternative but to utilise the available emergency landfill void at the WBLS or export waste outside the ACT



3. Potential Future Options

3.1 Short Term Options

In the event that the MLLS extension(s) are not approved, designed and constructed before 2015/2016, the following short-term³ options are available to ensure disposal of the ACT's residual solid waste (or waste generated during an emergency event):

- Reactivation of the WBLS as a major landfill site;
- Transfer to the Woodlawn Bioreactor Landfill; and
- Disposal of waste at other sites within the ACT or NSW.

These individual options are discussed in further detail below.

3.1.1 Reactivation of the WBLS

This option would entail directing all vehicles carrying residual solid waste for landfill disposal to the WBLS. Here the waste materials would be landfilled over areas of historical landfilled waste (an approach known as "piggy-backing").

This option may require approval of the final landform from the ACT Planning and Land Authority (ACTPLA) and a new / revised Environmental Authorisation from the ACT EPA. Initial discussions between GHD and the ACT EPA suggest that their expectation for this option is that the landfilling (design, construction, operations and rehabilitation) would be in accordance with modern landfill standards (specifically EPA Victoria's *Siting, Design, Operation and Rehabilitation of Landfills, Publication 788.1, 2010*).

This option would likely require significant engineering works prior to / during waste deposition at the WBLS. These engineering works would likely include upgrades to the weighbridge, removal of the existing landfill final cover materials, construction of new landfill cells, installation of basal lining systems and leachate collection systems and upgrades to the existing landfill gas collection system. GHD note that piggy-back landfill designs are often complex as they often require the placement of basal lining materials across areas of historical waste (which are subject to typical landfill degradation processes). As such, piggy-back landfill designs present a number of technical challenges in relation to ensuring an appropriate level of environmental control (e.g. for landfill gas and leachate emissions) is maintained.

As previously outlined, depending on the extent of the WBLS landfilled this option would be likely to provide between 80,000 m³ and 1,000,000 m³ of waste disposal capacity. Assuming an average landfilling rate of 214,000 tonnes (of MSW & C&I wastes) in any one year, and an average landfill consumption rate of 0.85 tonnes per m³ of landfill airspace, the life of this option would vary between approximately four months and four years.

A number of environmental issues may be associated with this option, including:

- Increased traffic impacts along the roads in West Belconnen from waste collection trucks and other vehicles associated with the landfill site (perhaps an additional 75 to 150 return truck trips per day assuming a 6 day week and each truck carries 5 to 10 tonnes of waste for disposal);

³ In this context, GHD considers short-term to mean 3 months to five years in duration.



- Likely increased visual, dust, odour, noise and litter impacts off-site;
- Likely increased risks to groundwater and stormwater from leachate generation / emissions;
- Likely increased risk of landfill gas generation / emissions; and
- The existing adjacent residential and industrial receptors, existing encroaching residential development (from the east), and the proposed Riverview residential development to the south, west and north of the WBL.

This option is likely to be a relatively low cost option (perhaps in the range of \$3 to \$5 million). However, this is heavily dependent on the requirements of the ACT EPA and the actual areas selected for landfilling operations.

3.1.2 Transfer to Woodlawn Bioreactor Landfill

This option would entail directing all vehicles carrying residual solid waste for landfill disposal to the Woodlawn Bioreactor Landfill (WBL), operated by Veolia Environmental Services (Veolia). Here the waste materials would be landfilled into the existing quarry void (available existing airspace in 2011 circa 30 million m³).

Preliminary discussions with Veolia have indicated that they would be prepared to accept waste sourced from the ACT for disposal at the WBL (within their current regulatory limits – see below) and that they would be able to accept the vast majority of the residual solid waste types requiring disposal (i.e. municipal solid, commercial and industrial, and construction and demolition wastes).

Currently the WBL is only permitted to receive 50,000 tonnes / year of waste from sources other than the Sydney metropolitan area. That said, Veolia are currently seeking to increase the limit on non-Sydney metropolitan area waste but only up to 150,000 tonnes / year (less than the ACT's current requirement of 220,000 tonnes / year and growing). Furthermore, it is not currently clear to GHD whether there may be cross-boundary issues in relation to transporting and disposing of waste materials generated within the ACT within NSW.

Based on the ACT's 2008/2009 landfill waste disposal figures, approximately 75 to 150 return truck trips would be required per day assuming a constant waste disposal rate, a 6 day week and each truck carries 5 to 10 tonnes of waste for disposal.

The WBL is located approximately 94 Kilometres from the MLLS (i.e. a 190 Kilometre or 3 hour round trip excluding unloading time or travel time on-site). A significant section of the likely transport route between MLLS and the WBL is unsealed (i.e. gravel). This gravel road extends for approximately 23 Kilometres from Collector to the WBL. The suitability of this road to handle the number and type of truck identified above is likely to be low for more than a relatively short period of time.

There is currently no waste receival area at the WBL. Instead, waste delivery vehicles have to drive down into the quarry void and unload at the working face. There are occupational health and safety issues associated with driving down into the quarry void and disposing of the waste. Furthermore, the need to drive down into the quarry void and unload is likely to add an additional 0.5 to 1 hour to the total travel time per vehicle. This may result in the total return travel time for a single waste disposal vehicle leaving the MLLS for the WBL being between 3.5 and 4 hours.

To overcome some of the transport issues identified above, a temporary transfer station would likely need to be constructed within the ACT to enable loads of waste to be bulked up and transported on larger capacity vehicles (e.g. semi-trailers) to the WBL. As the typical capacity of a semi-trailer is



approximately 30 tonnes, this would allow the number of return truck trips per day to be significantly reduced (20 to 50 per day assuming a 6 day working week).

It is understood that the WBL currently landfills a total of circa 500,000 tonnes of waste/year (2011) and that the existing airspace in 2011 is circa 30 million m³. Assuming that the regulatory and transport issues could be overcome, that Veolia continued to accept a stable 500,000 tonnes of waste/year from the Sydney metropolitan area into the future, and that the ACT sent approximately 220,000 tonnes/year of residual waste for disposal at the WBL, it is anticipated that the WBL would be able to provide disposal capacity for ACT residual waste for approximately 35 to 45 years.

A number of environmental issues may be associated with this option including:

- Increased traffic impacts along the roads between MLLS and the WBL from waste collection / transfer trucks (perhaps an additional 40 to 150 return truck trips per day as identified above). As approximately 23 kilometres of the likely route is gravel road, dust issues would be likely to be significant under dry conditions;
- Increased greenhouse gas emissions would be associated with the transporting of waste to the WBL rather than a landfill within the ACT due to the greater travel distances involved;
- Likely increased dust, odour, noise and litter impacts off-site around the WBL;
- Likely increased risks to groundwater and stormwater from leachate generation / emissions around the WBL; and
- Likely increased risk of landfill gas generation / emissions around the WBL.

GHD notes that the transportation and disposal of residual solid waste at the WBL would direct a number of environmental issues / risks associated with the deposited waste (e.g. odour, dust, noise etc.) to the WBL rather than directing them to a re-activated WBL. That said, it is understood that the WBL is currently engineered to a higher standard than the WBL, is located in a circa 200 metre deep quarry void, and is located in an area with few current / likely future sensitive receptors. As such, the actual risks of off-site environmental impacts directly associated with the landfilling of waste at the WBL may actually be lower than the comparable impacts if the waste were to be landfilled at a re-activated WBL. However, this would depend on the final environmental control measures installed at the WBL if it was re-activated.

This option is likely to be a highly costly option. Additional waste transportation costs could be in the order of **\$14 million to \$28 million per year**⁴. These figures would decrease to approximately **\$5 million to \$6.25 million per year**⁵. However, if semi-trailers were used, investment in a temporary transfer facility at either the MLLS or WBL would be required. This may cost in the region of **\$3 to \$5 million**.

The additional waste being transported to the WBL would be subjected to the NSW waste levy, which is currently understood to be approximately \$85/tonne. This would result in an additional cost of approximately **\$19 Million per year** (assuming 220,000 tonnes of waste were landfilled per annum). It has been assumed that costs of disposal for landfilled waste (excluding the NSW waste levy) are / will be

⁴ Assuming waste transportation costs are \$150 / hour, return travel time for truck is 4 hours, truck carries between 5 and 10 tonnes of waste, total tonnes of waste to be disposed of per year is 220,000 tonnes, trucks work 6 days a week and between 75 and 150 return truck trips per day.

⁵ Assuming waste transportation costs are \$200 / hour, return travel time for truck is 4 hours, a semi-trailer truck carries 30 tonnes of waste, total tonnes of waste to be disposed of per year is 220,000 tonnes, trucks work 6 days a week and between 20 and 25 return truck trips per day.



comparable between the reactivated WBLS and the WBL (and therefore that there would be no further cost increases associated with landfilling the waste at the WBL versus the reactivated WBLS). GHD notes that the ACT government would have a much greater level of control over the landfill disposal prices (or price rises) levied at a site under its control (i.e. the re-activated WBLS) than at a site controlled by a third party such as Veolia.

Within the ACT, this option could be quite popular in some ways as the waste would be “out of sight, out of mind”. That said, the likely increase in household rates required to be levied by the ACT government to cover the additional costs associated with this option are likely to be unpopular.

Whilst pursuit of this option may reduce the number of jobs relating to waste disposal operations within the ACT, these jobs would be likely to be replaced (and possibly exceeded?) by an increase in jobs relating to waste transfer (i.e. truck drivers).

The gravel road between Bungendore and the WBL is not likely to be suitable for transferring significant quantities of waste for a significant length of time.

3.1.3 Transfer to another Site in the ACT or NSW

This option would entail directing all waste vehicles carrying residual solid waste for landfill disposal to another (as yet unidentified) site within either the ACT or NSW. Here the waste materials would be landfilled. There are a number of possible sites within both the Act and NSW where landfilling could occur as identified within the *Emergency Landfill Options Paper* (CBRE, 2011).

However, the planning / regulatory, technical, environmental, economic and social impacts / costs of these various possibilities have not been explored further at this time. At present, the reactivation of the WBLS or the transfer of waste to the WBL is considered to be the most likely viable short-term options (unless the ACT government declares an emergency scenario). Under a true emergency scenario the ACT government could essentially identify a site for waste disposal within the ACT and landfill it with expedited consideration of the potential impacts / costs identified above.

3.2 Longer Term Options

The following longer term⁶ options are available to ensure disposal of the ACT’s residual solid waste (or waste generated during an emergency event):

- Expansion of the MLLS (various options as detailed in *Assessment of Mugga Lane Resource Management Centre’s Capacity – Beyond 2013; GHD (2010)*);
- Transfer to the Woodlawn Bioreactor Landfill;
- Establishment of a new landfill in the ACT (Fairbairn Pines site); and
- Disposal of waste at other sites within the ACT or NSW.

These individual options are discussed in further detail below.

3.2.1 Expansion of the MLLS

This option would entail increasing the disposal capacity at the existing MLLS and continuing to direct all vehicles carrying residual solid waste for landfill disposal to this site. Here the waste materials would be

⁶ In this context, GHD considers longer term to mean in excess of five years in duration.



landfilled in new “extension areas”. A previous report prepared by GHD (*An Assessment of Mugga Lane Resource Management Centre’s Capacity – Beyond 2013* – GHD, May 2010) outlines a number of options for expansion at the MLLS in greater detail.

Many of the expansion options at MLLS require compulsory acquisition of the relevant extension areas (which are not currently under the control of ACT Nowaste), approval of the landfill extension from ACTPLA, and a new / revised Environmental Authorisation from the ACT EPA.

Furthermore, as the potential extension areas are currently zoned by the ACT Government’s *Territory Plan (2008)* (*Territory Plan*) as “Broadacre”, the zoning of the land would need to be altered within the *Territory Plan* if landfilling operations were to be extended into these areas. This would be likely to require an environmental impact assessment in accordance with the requirements of the *Planning and Development Act 2008*. Furthermore, these extension areas would need to be incorporated within ACT Nowaste’s *Waste Strategy*.

In addition to the environmental issues associated with extending an existing landfill site, any environmental impact assessment would need to further consider the following planning / regulatory aspects:

- Best use of the land / sterilisation of valuable land;
- Potential site after use; and
- Site selection process – is this the best place to landfill waste.

This option would require extensive engineering works prior to / during waste deposition at the MLLS. These engineering works would be likely to include clearing and grubbing of the site, preparation of the subgrade, construction of new landfill cells, installation of basal lining systems and leachate collection system etc.

Depending on the extent of the extension areas ultimately landfilled, this option would provide between 2,500,000 m³ and 8,750,000 m³ of waste disposal capacity (*An Assessment of Mugga Lane Resource Management Centre’s Capacity – Beyond 2013; GHD (2010)*). It is estimated that this amount of airspace could potentially provide between nine and thirty years of disposal capacity for the ACT’s waste.

There are a number of potential environmental issues currently relating to this option:

- Likely increased visual, dust, odour, noise and litter impacts off-site;
- Potential removal of an endangered ecological habitat;
- Likely increased risks to groundwater and stormwater from leachate generation / emissions; and
- Likely increased risk of landfill gas generation / emissions; and
- Proximity of sensitive receptors to the south of the site (400 to 800 metres from current site boundary).

Evaluation of the significance of these potential environmental impacts would need to be determined by further assessments (as part of an environmental impact assessment in accordance with the requirements of the *Planning and Development Act 2008*). It is considered that a number of these potential impacts could be minimised by high standards of landfill construction and operation and by maintaining appropriate buffer distances around the MLLS.

Initial discussions between GHD and the ACT EPA suggest that their expectation for this option would be that the landfilling design, construction, operations and rehabilitation would be in accordance with



modern landfill standards (specifically EPA Victoria's *Siting, Design, Operation and Rehabilitation of Landfills, Publication 788.1, 2010*). Initial discussions between GHD, ACTPLA, the ACT EPA and ACT Nowaste suggest that the MLLS extension areas may be considered to be suitable for a future landfill site if:

- Suitable assessments / justifications can be made / prepared; and
- Any future landfill design, construction, operations and rehabilitation is completed in accordance with modern landfill standards (specifically EPA Victoria's *Siting, Design, Operation and Rehabilitation of Landfills, Publication 788.1, 2010*).

Establishment and construction of these extensions has been previously estimated by GHD (2010) to be in the range of \$20 to \$40 million depending on the extension areas selected. It is noted that costs associated with long term design, operation, rehabilitation, monitoring and maintenance of the extension areas could also be considerable. However, ultimately costs will be heavily dependent on the requirements of the ACT EPA and the actual extension areas selected for landfilling operations.

3.2.2 Transfer to Woodlawn Bioreactor Landfill

This option is very similar to that outlined within Section 3.1.3. However, as this would be a longer term option, it would be expected that two transfer stations would be constructed within the ACT to allow waste to be "bulked up" and subsequently transported to the WBL by waste transfer trucks.

As previously outlined within Section 3.1.3, there are a number of actual or potential planning / regulatory issues associated with this option in the short-term. These issues would be likely to increase if this option were pursued in the longer term due to the need to construct / upgrade two transfer stations within the ACT. Development approvals and operational licences would need to be obtained / revised for these facilities for this option to be viable in the longer term. GHD have currently assumed that these transfer stations would be located at Mugga Lane (proposed new southern transfer station) and Mitchell (existing northern transfer station - would need to be upgraded / expanded).

Based on the figures previously presented in Section 3.1.3, it is estimated that the required number of waste transfer return truck trips per day would be in the order of 20 to 25 (assuming a 6 day working week).

As previously outlined within Section 3.1.3, there are likely to be issues associated with the 2 to 3 hour return travel times from the ACT to the WBL and the nature of certain parts of the transport routes (gravel roads).

As outlined within Section 3.1.3, it is anticipated that the WBL would be able to provide disposal capacity for ACT residual waste for approximately 35 to 45 years.

A number of environmental issues may be associated with this option including:

- Increased traffic impacts along the roads between the ACT and the WBL from waste transfer trucks (perhaps an additional 20 to 25 return truck trips per day assuming a 6 day week and each truck carries 30 tonnes of waste for disposal). As approximately 23 kilometres of the likely route is gravel road, dust issues would be likely to be significant under dry conditions;
- Increased greenhouse gas emissions would be associated with the transporting of waste to the WBL rather than a landfill within the ACT due to the greater travel distances involved;
- Likely increased dust, odour, noise and litter impacts off-site around the WBL;



- Likely increased risks to groundwater and stormwater from leachate generation / emissions around the WBL; and
- Likely increased risk of landfill gas generation / emissions around the WBL.

GHD notes that the transporting and disposal of residual solid waste at the WBL would direct a number of environmental issues / risks associated with the deposited waste (e.g. odour, dust, noise etc.) to the WBL rather than directing them to a site within the ACT or elsewhere within NSW.

This option is likely to be a highly costly option. Additional waste transportation costs could be in the order of approximately **\$5 million to \$6.25 million per year**⁷.

The additional waste being transported to the WBL would be subjected to the NSW waste levy, which is currently understood to be approximately \$85/tonne. This would result in an additional cost of approximately **\$19 Million per year** (assuming 220,000 tonnes of waste were landfilled per annum). It has been assumed that costs of disposal for landfilled waste (excluding the NSW waste levy) are / will be comparable between a landfill site within the ACT (or elsewhere in NSW) with the WBL (and therefore that there would be no further cost increases associated with landfilling the waste at the WBL verses one of these other sites. GHD notes that the ACT government would have a much greater level of control over the landfill disposal prices (or price rises) levied at a site under its control than at a site controlled by a third party such as Veolia.

In addition to the costs outlined above, the costs for constructing / expanding two transfer stations to handle approximately 220,000 tonnes of waste/year would be anticipated to be in the range of \$5 to \$10 Million (approximately \$2 to \$3 million to expand / upgrade Mitchell, and approximately \$4 to \$5 Million to build a new transfer station at MLLS).

Within the ACT, this option could be quite popular in some ways as the waste would be “out of sight, out of mind”. That said, the likely increase in household rates required to be levied by the ACT government to cover the additional costs associated with this option are likely to be highly unpopular.

Whilst pursuit of this option may reduce the number of jobs relating to waste disposal operations within the ACT, these jobs would be likely to be replaced (and possibly exceeded?) by an increase in jobs relating to waste transfer (i.e. transfer station operatives, truck drivers etc.).

This option would be likely to allow the gradual development of the portion of the West Belconnen land that is currently impacted around the WBL (and possibly some land around the MLLS).

The gravel road between Collector and the WBL is not likely to be suitable for transferring significant quantities of waste for a significant length of time. An option could be to upgrade the existing gravel road to an asphalt road. For the 23 kilometres between Collector and the WBL, this could cost in the region of \$4 to \$7 million.

3.2.3 Establishment of a new landfill in the ACT (Fairbairn Pines site).

This option would involve establishing a new long term landfill site within the ACT at the Fairbairn Pines site (FPS) (located off Pialligo Avenue in the ACT) and directing all vehicles carrying residual solid waste for landfill disposal to this site. Here the waste materials would be landfilled within an engineered landfill located within the existing “bowl” landform.

⁷ Assuming waste transportation costs are \$200 / hour, return travel time for truck is 4 hours, a semi-trailer truck carries 30 tonnes of waste, total tonnes of waste to be disposed of per year is 220,000 tonnes, trucks work 6 days a week and between 20 and 25 return truck trips per day.

It is noted that this “bowl” area of the site could initially operate as an emergency landfill (thereby removing the need to retain the WBLS as the ACT’s emergency landfill) and subsequently be expanded to act as a long term landfill facility (>20 years) for the ACT. Figure 2 below shows the location of the FPS and the “bowl” area.

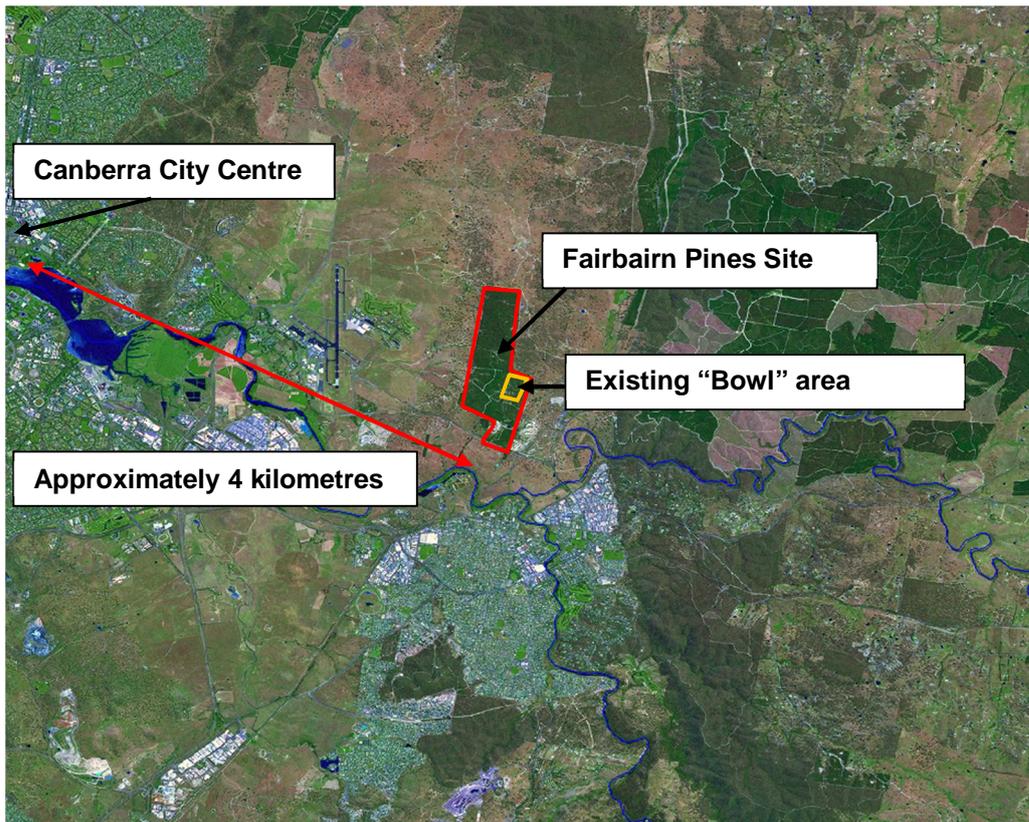


Figure 2 Location of FPS in the ACT

Preliminary assessment of the available data (including a site visit / walkover) suggests that the bowl area is likely to be suitable as either an emergency landfill site and / or a long term landfill site. However, as with any site there are a number of issues that require further consideration / investigation in relation to establishing a landfill site at this location. These are discussed in further detail below.

Approximately 1/3 of the FPS’ land area is currently owned by the ACT Government, the remaining 2/3 of the land area is owned by the Commonwealth Government. The bowl area falls wholly within the 1/3 of the land area owned by the ACT Government and is likely to be sufficient for emergency landfill purposes. Depending on the capacity required for a future landfill, the ACT Government may need to acquire some of the Commonwealth Government owned land.

This option would require development approval of the new landfill from the ACTPLA and an Environmental Authorisation from the ACT EPA. Furthermore, as the land is currently zoned by the ACT Government’s *Territory Plan* (2008) as “Hills Ridges and Buffer” with a “Plantation Forest” overlay, the zoning of the land would need to be altered within the *Territory Plan* if a permanent landfill site was to be established there. This would be likely to require an environmental impact assessment in accordance



with the requirements of the *Planning and Development Act 2008*. It is noted that the FPS is currently utilised as a pine forest plantation. As such its associated ecological value is relatively low.

Furthermore, this site would need to be incorporated within ACT Nowaste's *Waste Strategy*.

In addition to the environmental issues associated with a new landfill site, any environmental impact assessment completed would need to further consider the following planning / regulatory aspects:

- Best use of land / sterilisation of valuable land;
- Potential site after use; and
- Justification / need for a landfill at the FPS.

This option would require extensive engineering works prior to / during waste deposition at the FPS. These engineering works would be likely to include upgrades to the access roads, installation of weighbridge and associated services, clearing and grubbing of the site, preparation of the subgrade, construction of new cells, installation of basal lining systems and leachate collection system etc.

Depending on the extent of the bowl area ultimately landfilled, this option would be likely to provide between 1,000,000 m³ of waste disposal capacity (if only operated as an emergency landfill to replace that capacity at the WBLS) and 5,000,000 to 10,000,000 m³ of waste disposal capacity (if operated as a long term landfill site). Assuming an average landfilling rate of 214,000 tonnes in any one year, and an average landfill consumption rate of 0.85 tonnes per m³ of landfill airspace, the life of this option would vary between approximately four and forty years. Further capacity may be able to be achieved if other areas of the FPS were considered for landfill waste disposal as well as the bowl area.

There are a number of potential environmental issues currently relating to this site:

- Increased traffic impacts along the roads in Fairbairn (principally Pialligo Avenue) from waste collection trucks and other vehicles associated with the landfill site (perhaps an additional 75 to 150 return truck trips per day assuming a 6 day week and each truck carries 5 to 10 tonnes of waste for disposal);
- Removal of non-native vegetation (considered to be of low significance);
- Increased visual, dust, odour, noise and litter impacts off-site;
- Increased risks to groundwater and stormwater from leachate generation / emissions;
- Increased risk of landfill gas generation / emissions; and
- Proximity of Canberra Airport (3 kilometres to the west) and other sensitive receptors to the south, east and west of the site (400 to 800 metres from site boundary).

Evaluation of the significance of these potential environmental impacts would need to be determined by further assessments (as part of an environmental impact assessment in accordance with the requirements of the *Planning and Development Act 2008*). It is considered that a number of these potential impacts could be minimised by high standards of landfill construction and operation and by maintaining appropriate buffer distances around the FPS.

Initial discussions between GHD, ACTPLA, the ACT EPA and ACT Nowaste suggest that the FPS may be considered to be suitable for a future landfill site if:

- Suitable assessments / justifications can be made / prepared; and



- Any future landfill design, construction, operations and rehabilitation is completed in accordance with modern landfill standards (specifically EPA Victoria's *Siting, Design, Operation and Rehabilitation of Landfills, Publication 788.1, 2010*).

Establishment and construction of this site is likely to be a relatively costly option (perhaps in the range of \$15 to \$25 million for an emergency landfill site with a capacity of 1,000,000 m³). These costs would be expected to be greater if a more long term option was pursued (especially if costly land acquisition was required). It is noted that the costs associated with long term design, operation, rehabilitation, monitoring and maintenance of a new landfill site could also be considerable. However, ultimately costs will be heavily dependent on the requirements of the ACT EPA and the actual areas selected for landfilling operations. It should be noted that the initial investment into this site as an emergency landfill would help to ensure the ACT's long term emergency and future waste disposal capacity.

Due to the FPS' relative proximity to Canberra city centre, waste transportation costs to this site from within the ACT are considered likely to be comparable to those already incurred by transporting waste to the MLLS.

This option would likely allow the gradual development of the portion of the West Belconnen land that is currently impacted around the WBLS (and possibly some land around the MLLS).

3.2.4 Transfer to another Site in the ACT or NSW

This option would involve directing all vehicles carrying residual solid waste for landfill disposal to another (as yet unidentified) site within either the ACT or NSW. Here the waste materials would be landfilled. There are a number of possible sites within both the Act and NSW where landfilling could occur as identified within the *Emergency Landfill Options Paper* (CBRE, 2011).

However, the planning / regulatory, technical, environmental, economic and social impacts / costs of these various possibilities have not been explored further at this time. At present, the expansion of the MLLS, transfer of waste to the WBL, or establishment of a new landfill in the ACT at the FPS are considered to be the most likely viable longer term options.



4. Conclusions

4.1 Existing Situation

The key points in relation to the existing situation are as follows:

- The ACT currently (2011) needs landfill disposal capacity for approximately 200,000 - 220,000 tonnes / year of residual solid waste. This is likely to increase in the near future until the ACT constructs additional resource recovery facilities;
- The ACT's Waste Strategy intends to increase resource recovery rates to approximately 90% by 2025. However, based on the available population projections for the ACT even if these targets are achieved, considerable quantities of residual solid waste (>100,000 tonnes / year) are still likely to require landfill disposal between 2022 and 2050. GHD notes that the ACT's population is projected to increase by approximately 43% from 2008/2009 to 2050 with likely associated increases in waste generation and required waste disposal;
- The ACT currently has two operational landfill sites (MLLS and WBL), neither of which has more than 5 years disposal capacity (at the current landfill consumption rate). In combination, these two sites give a maximum consented landfill disposal lifetime within the ACT of around 8 to 9 years from 2011 (at 2011 landfill disposal inputs); and
- No long term approved landfill disposal capacity currently exists in the ACT. If the proposed MLLS extension(s) are not approved, designed and constructed prior to 2015/2016 (or an alternative disposal facility secured), ACT Nowaste may have no alternative but to utilise the available emergency landfill void at the WBL or export waste outside the ACT.

4.2 Short Term Options

Based on the available information (and assuming that the extension(s) to the MLLS is not granted in time), the following conclusions are made:

- There are three possible short term options for waste disposal of the ACT's waste (Reactivation of the WBL; Transfer of waste to the WBL and / or disposal of waste at another unidentified location within the ACT or NSW);
- Reactivation of the WBL as a major landfill site is likely to cost in the region of \$3 to \$5 million and could provide waste disposal capacity for between 4 months and 4 years depending on the area landfilled. There are some issues that would need to be overcome to make this option a reality, but these are not considered to be insurmountable;
- Transfer of the ACT's waste to WBL is likely to cost in the region of \$25 to \$40 million per year (approximately \$19 million in NSW Landfill Levy per annum), and could provide disposal capacity for 35 to 45 years. There are some issues here relating to the WBL accepting waste from the ACT and existing road conditions, which could be difficult to overcome and may prevent this option becoming a reality;
- There is not currently sufficient data available to assess the third possible option of disposing of the waste within another landfill within the ACT or NSW; and



- Of the two short term options assessed in greater detail, reactivation of the WBLS as a major landfill site is likely to be the most practical and cost-effective short-term option. However, this option will only provide a maximum of 4 years of waste disposal capacity for the ACT and would be likely to temporarily restrict any proposed residential development adjacent to this site.

4.3 Longer Term Options

Based on the available information, the following conclusions are made:

- There are four possible long term options for waste disposal of the ACT's waste (Expansion of the MLLS; Transfer of waste to the WBL; Establishment of a new landfill site at the FPS and / or disposal of waste at another unidentified location within the ACT or NSW);
- Expansion of the MLLS is likely to cost in the region of \$20 to \$40 million and could provide waste disposal capacity for an additional 9 to 30 years from 2015, depending on the extension area(s) ultimately landfilled. There are some issues that would need to be overcome to make this option a reality, but these are not considered to be insurmountable (although time is running out for approval of these options);
- Transfer of the ACT's waste to WBL is likely to cost in the region of \$25 to \$30 million per year (\$19 Million on NSW Landfill Levy per annum) plus \$5 to \$10 million to construct / retrofit two transfer stations within the ACT, plus \$4 to \$7 million to upgrade the gravel road between Collector and the WBL. The WBL could provide disposal capacity for the ACT's waste for 35 to 45 years. There are some issues here relating to the WBL accepting waste from the ACT and existing road conditions, which could be difficult to overcome and may prevent this option becoming a reality;
- Establishment of a new landfill in the ACT at the FPS is likely to cost in the region of \$15 to \$25 million for a 1,000,000 m³ facility, which could provide waste disposal within the ACT for 4 years. However, if additional investment was made into this site (perhaps of the order of a further \$10 to \$20 million), waste disposal capacity could potentially be increased to between 5,000,000 and 10,000,000 m³, which could provide disposal capacity for between twenty and forty years;
- Of the three long term options, expansion of the MLLS or construction / operation of the FPS as a major landfill site are likely to be the most practical and cost-effective long-term options;
- Identification of the FPS as the ACT's current emergency and future long term landfill would provide approximately 30 to 40 years additional waste disposal capacity within the ACT, and would allow investigations into any proposed residential development adjacent to the WBLS to commence; and
- There is not currently sufficient data available to assess the final possible option of disposing of the waste within another landfill within the ACT or NSW.



5. References

No Waste by 2010 (ACT Government, 1996)

DRAFT ACT Sustainable Waste Strategy 2010 – 2025; Department of the Environment, Climate Change, Energy and Water, (2010)

Assessment of Mugga Lane Resource Management Centre's Capacity – Beyond 2013; GHD (2010)

DRAFT Report for the Riverview Group – Proposed West Belconnen Residential Development – Risks posed by Adjacent Landfill Discussion Paper, GHD (2011)

Emergency Landfill Options Paper, CBRE Pty Ltd (2011)

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Territory Plan; ACT Government (2008)



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