

REPORT



Bathurst

Regional

Council

Rural Tips

Bathurst Regional Council Rural Tips

1. Introduction

In May 2004, Bathurst City Council and most of Evans Shire Council were amalgamated to become Bathurst Regional Council. The former Evans Shire Council operated 7 village landfill sites at Rockley, Sunny Corner, Trunkey Creek, Sofala, Wattle Flat, Hill End and Burraga. Each site does not require licensing by the DEC (EPA) because the amount of waste collected at each site is estimated to be less than 5,000 tonnes per annum.

Except for Rockley, the landfill sites are unmanned. Rockley is manned for 8 hours a week, but locked at all other times. Access to each landfill sites is limited to residents of the Council area who purchased a key.

As part of the above amalgamation, the area surrounding the village of Burraga became part of the Oberon Council area and this included the Burraga landfill site. Accordingly, this landfill site is not considered further in this report. Notwithstanding this, as the issues dealt with in this report are equally applicable to the Burraga site, an opportunity exists for the outcomes herein being applied across the local government boundary with agreement from both Councils.

2. The Case for Landfill Closures

In May and June of 2003, a joint inspection over two days of the landfill sites was carried out by Council staff and the Department of Environment and Conservation (NSW) (then EPA) staff. A letter report was prepared following these inspections. **(See Attachment 1.1)**

The report provided by the Authority indicated that there were a number of environmental issues affecting these sites. These are as follows:

1. There was evidence of past fires in the trenches at most of the landfills. Of particular concern is the fire hazard represented by the Sunny Corner landfill which is located near timber plantations.

As this particular issue was the current issue at the time of the inspections, it was pointed out that, notwithstanding that the landfills were being lit by persons unknown and not by Council, this uncontrolled burning was in breach of a number of sections of the POEO Act in relation to the control of burning, causing air pollution, and failure to prevent air pollution.

2. Four landfills are located near intermittent water courses or drainage lines that lead to watercourses (Wattle Flat, Burraga, Trunkey and Sofala) and accordingly, the location of these landfills therefore could potentially lead to water pollution incidents particularly during flooding, but also as a result of leaching.
3. Most of the landfills (in particular Wattle Flat, Sofala, Trunkey and Rockley) are at, or close to, full capacity. The situation at Wattle Flat is of particular concern.

The former Evans Shire Council considered the impact of this report at its meeting in September 2003 and resolved to implement the following, **(See Attachment 2.2)**:

1. A waste collection service collection be programmed for commencement 1 July 2004.
2. Adequate information be provided to the community to indicate that a waste collection service will commence in 2004.
3. Council commence negotiations with Blayney Shire Council and Bathurst City Council to achieve a mutually acceptable service outcome.
4. The waste collection be provided by private contract.
5. Contract documentation be prepared for commencement of a waste collection service from 1 July 2004.
6. Following the commencement of the collection service, all existing landfill sites to be closed.
7. Council notify the Environment Protection Authority of the intention to develop a collection program.

8. No action is taken in regard to expansion of landfill facilities at Burraga or Rockley until the collection service is further considered.

While a formal report was not prepared for this meeting, the relevant issues are as follows:

2.1 Fires

Each of the villages within the former Evans Shire relies on rainwater tanks for their water. None of the villages have a reticulated water supply. The provision of a standpipe for fire fighting purposes at each site from a reticulated source is therefore not available.

Other options for providing water such as dams, bores and on-site tanks were considered, however because of the remote nature of the site, the necessary infrastructure would be subject to vandalism and without constant review and testing, the equipment may not be available when required.

A further option is to fence the sites securely and to deny access to each site at particular times (ie man each site). This is not considered feasible on financial grounds but further, the complete security of each site could still not be guaranteed as access could be gained by cutting the fence, as has been the case at a number of sites.

Therefore, while the risk of fires at the existing landfills can be reduced, the risk can not be removed completely. Accordingly, if the tips are to remain open, this risk has to be minimised and the residual risk accepted.

2.2 Leachate Contamination and Groundwater at Solid Waste Landfills

The review of the unlicensed landfills outlined the potential for water by leachate and flooding at Wattle Flat, Burraga, Trunkey and Sofala. Further the EPA recommended strict environmental controls to ensure against inundation and to capture and contain leachate should be considered.

All four sites will therefore require the installation of a leachate barrier system and a groundwater monitoring program as soon as practicable. The leachate barrier system is designed and installed to prevent the leachate from contaminating groundwater, surface water or the subsoil. The groundwater monitoring program determines the success of the barrier system through the installation of a series of monitoring wells/bores or lysimeters on the site. The number required for each site is site-specific, however a minimum of two would be required per site. Sampling will be required for all monitoring wells/bores or lysimeters by a suitably qualified and approved person on a quarterly basis. A groundwater remediation plan should be developed if groundwater or subsoil contamination is confirmed via the groundwater monitoring program. The costs associated with groundwater remediation are immense and remediation may take several years.

2.3 Landfill Area Capacity

The estimate of the future life of each landfill site was made in consultation with Council's Ranger responsible for the operation of the six former Evans Shire Council landfills. These are as follows:

WASTE DISPOSAL SITE	EXPECTED FUTURE LIFE
Sunny Corner	December 2005 (based on fenced area)
Wattle Flat	March 2006
Trunkey Creek	July 2006
Rockley	September 2006
Sofala	July 2007
Hill End	10 years life (based on fenced area)

The costs associated with either an extension of the existing site or the commissioning of a new site would be extremely high. With new DEC conditions expected during 2005 much stricter environmental monitoring is expected even for unlicensed sites. A full and detailed review of environmental factors would also have to be undertaken. This is likely to include ground water monitoring as detailed above, a leachate barrier system, and other pollution monitoring system. Each site would need to be fully fenced and manned while open, on top of the costs associated with the purchase of the land. For Sunny Corner, Wattle Flat, Trunkey Creek, Rockley and Sofala, if each site is to be extended or relocated, then this would need to be implemented between now and July 2007. The availability of alternate sites has not been investigated at this stage, however this in itself may be difficult to find and expensive to purchase.

3. Options

On the basis of the high costs and unmanageable risks involved in keeping the tips open, then the best option available to Council is to close the existing landfills. However, to address Council's real commitment to not reduce services to the new regional area, Council should consider the provision of alternate waste management systems. These systems must better address the environmental management issues which the current landfills raises, while providing the community with an accessible, cost effective waste disposal service.

Prior to the landfills being closed, Council will have to undertake the preparation of a landfill closure plan, including a post-closure monitoring program plan. While guidelines exist for these management plans for licensed landfills, the Department of Environment and Conservation (NSW) (EPA) have indicated that for unlicensed sites, a plan should address the critical environmental goals for each site. These are defined as:

- Discharge of pollutants to water (i.e. ground and surface water)
- Emission of pollutants to atmosphere
- Land management and conservation
- Hazards and loss of amenity

Closure and post-closure monitoring plans are dealt with fully in section 4 of this report.

In addition to the waste services provided by Council through the availability of the landfill sites, private contractors do provide a waste collection service in the area. This service is not administered by Council in any way, and those residents who take up the service pay for it directly to the contractor. Approximately 10% of the former Evans Shire area is involved with this service.

3.1 Waste Collection

The former Evans Shire Council commissioned a Penry Jane Associates to prepare a report into waste collection in the then Shire area in July 2003. This report is **Attachment 2.1**. The report concludes with three options. For each of the options, vehicle capital and operating costs have been estimated with the following outcomes.

Option 1

1,848 households or approximately 72% of the Shire total are included in this option and a service would be provided on a fortnightly basis. Total cost is estimated at \$175,403 and the indicative cost per pick up is in the region of \$3.65 per lift or (\$1.83 for a weekly cost comparison) and \$95 per household served per annum (There is the option of combining two routes into one day have a weekly 7 day per week service, however, this sub-option has not been modelled.)

Option 2

1,172 households or approximately 46% of the Shire total are included in this option with the service being provided on a weekly basis. Total cost is estimated at \$154,153 and the indicative cost per pick up is in the region of \$2.53 per lift (on a weekly basis) and \$130 per household served per annum.

Option 3

Services would replicate the current arrangements expected that a skip be located at each landfill site. The total cost is estimated at \$192,750. Each compactor bin at the existing landfill sites would be changed on a weekly basis. Indicative costs are \$530 per week per landfill site or a total of \$27,500 per annum. This relates to an indicative cost per pick up is in the region of \$75 per household per annum (assuming that this cost would be apportioned to all households in the Shire).

Three options were examined in this report, each serviced different proportions of the community and providing different service configurations. Option 1 examines a service to as many properties as feasible based on a fortnightly cycle. Option 2 limits the service along 'main' shire roads and provides a weekly pickup service. Option 3 examines a centralised service to existing landfill locations, which would rely on the continued participation of households to bring discarded materials to these sites.

For each of the Options vehicle capital and operating costs were estimated with the following outcomes:

The report estimated that from the population of 5,200 (2,651 properties) 2,020 tonnes of domestic waste is generated per annum. It concluded that the population of the Shire is relatively well distributed amongst the 76 localities with a concentration of population immediately to the north west of Bathurst, concentrations to the immediate south as well as to the east along the Great Western Highway. The report also made the comment that the road system provides its own challenges in planning collection routes that are efficient in terms of distance travelled/households served and this will require special consideration in pursuing this level of service. On the basis that the quoted charges for option 1 and 2 are similar to that charge for the existing service in the city area, the provision of this service would appear to be economically feasible.

With the passage of time, not to mention the boundary changes as a result of the amalgamation, the information contained in the report requires review. Accordingly, the consultant which is now part of URS Australia, as been requested to provide its' estimate of cost to provide this review. The value of accurate information will be invaluable when, and if, tender documents are to be prepared for a waste collection service.

Areas which require review include:

- The estimate of costs should include tip fees for the Bathurst landfill site and/or a component to allow for waste management at this site.
- Check the suitability of the truck sizes used in the report given the area to be served and the distances to be covered.
- For equity across the rural areas, waste collection in excess of 90% should be considered, with the aim that overtime all properties have this service available.
- As detailed further in this section of this report, if transfer stations were also made available at each of the tip sites, what impact would this have on the collection of waste estimates used in the report.

- As recycling seems to have the support of the community, notwithstanding its low economic return, can recycling be included in the waste collection service, and if so, at what cost.
- A review of each option is required given the adjustment of the Council boundaries where not all of the former Evans Shire is part of the Bathurst Regional Council.
- Given that waste collection to the rural areas may include other components such as transfer stations, all costs associated with the provision of a waste management service should be included and charged accordingly.

Once these costings are reviewed, this study can be extended if the outcomes are considered feasible. A copy of their proposal for the extension of the study is **attached** (Attachment 3.1).

Transfer Stations

To provide a waste management facility for waste, unable to be accommodated in a 240 litre bin, transfer stations can be located at strategic locations throughout the rural areas. Given the accessibility of the existing landfill sites it seems appropriate, that transfer stations could be located at these sites. Some alternatives should however, be considered.

Based on the investigation undertaken as part of this review, the simplest design is that adopted by Lithgow Council. Two such facilities have been constructed in the Lithgow area with a third planned for the current financial year. A series of photographs showing the facility on Curly Dick Road, Meadow Flat is provided below:



The cost of the above facility is shown below:

Concrete slab	\$ 8,000
Shed & Block work	\$15,000
Earth Works	\$ 7,000
	<hr/>
	\$30,000

Operating costs to service these sites will be \$1,480 per week.

Some alternatives however, should be considered if transfer stations are to be used being:

- Combined facility to service both Wattle Flat and Sofala given the distance between the existing landfills is only about 5kms.
- If the existing landfill sites are considered for the sitting of the transfer station then it should be noted that each existing landfill site is in an excluded location. As such, each site is prone to vandalism and poor housekeeping. Alternative sites closer to the villages, and more highly visible sites maybe a better alternative in these terms, and give each community ownership of these facilities.
- A number of public meetings with the former Evans Shire Council over a number of years, with some community dissatisfaction existing in the Freemantle area have occurred over the lack of access to a landfill site. A transfer station to serve this area is considered appropriate.

In considering options different permutation of the available options can be considered. These could include:

- Due to financial constraints in anyone financial year, a landfill can be closed and the alternate waste management options implemented in that catchment area.
- The landfill at Hill End is small and does not have significant environmental issues. The cost of providing a waste collection service in this area would be expensive given its distance from Bathurst. Providing DEC gives concurrence, and the new guidelines soon to be implemented by the DEC for small rural landfills are not onerous, this landfill could remain open and upgraded to meet the new requirements. Involvement by the community in the operation of the landfill through the Progress Association could also be considered.

3.3 Conclusion

On the basis of the investigation undertaken in preparing this report, and given the intentions of the former Evans Shire Council, it is considered appropriate that:

- a) The existing rural land fill sites be closed except at Hill End, and the sites remediate in accordance with section 4 of this report.

- b) A waste collection service be implemented in the Council area except for Hill End. Tender documents be prepared for the provision of this service and Council provide a price as part of the tender process to provide this service.
- c) A waste collection levy be stock based on the revised 'Penry Jane' report and this be charged across the Council area. This levy will be subject to review over the first few years of operation and then by CPI. Some adjustments would need to be made to the levy in these circumstances:
 - i. Where a dwelling is not accessible for a waste collection service.
 - ii. Where a dwelling is so far from the road (say more than 1km) that moving the bin for road-side collection is not feasible.
 - iii. Where waste collection service is not available, like in Hill End as suggested above.
 - iv. The levy be constructed in two parts, to include the cost of the provision of the waste collection service plus a component to cover the cost associated with the construction and operation of the transfer station.
Transfer station be constructed at each of the existing localities of the existing landfills except:
 - i. Wattle Flat and Sofala have a common transfer station.
 - ii. A new site be chosen to service the Freemantle Road and Mount Rankin area.

The sites for the transfer station should be determined in consultation with the community and can include the existing landfill sites subject to their remediation. Other sites closer to the villages may have some advantages in terms of monitoring and will also be considered.

A contract let for the servicing of the transfer station which may include the amortising of the initial capital cost of the transfer station.

4. Post Closure Landfill Site Rehabilitation

In the preparation of this plan, a deal of research was undertaken in an attempt to understand what others had done in this area. The following documents were used in the preparation of this part of this report, and duly acknowledged.

1. Environmental Guidelines: Solid Waste Landfills – EPA (NSW)
2. Weddin Shire Council - Landfill Management Plans – Nulching and Environmental Services Today
3. Glen Logan Road Landfill LEMP – for Cowra Shire Council – Douglas Partners
4. Midure Region Waste Management Plan – Nolan – ITU Pty Ltd
5. Siting, Design, Operations and Rehabilitation of Landfills – EPA (Vic)
6. Netwaste – Easter Subregional Waste Management Plan – DW Corkery & Co
7. EPA Information Bulletin – Rehabilitation of Landfills exempt from Licencing EPA (VIC)

Also, the assistance of Mr Graham Ritter of Weddin Shire is also acknowledged.

4.1 Rehabilitation and Closure Principles

This Landfill Post-Closure Management Plan is modelled on the EPA documents “Environmental Guidelines – Solid Waste Landfills”. As the existing landfills do not require a licence, a full closure plan, however, is not required as a reflection of Council’s desire to take an active, responsible approach to waste management and care of the environment. Further as the Guidelines cover the full range of solid landfill sites, its application to smaller, sites is obviously excessive. However, standards less than the benchmark guidelines must be justified.

Notwithstanding the above, as stated earlier, the specific environmental goals for each site must be addressed. These environmental goals detailed in the guidelines and are expanded below:

4.1.1 Preventing Pollution of Water by Leachate

Over the past years, the landfill site has been burnt as described earlier. This was not part of Council’s management practice but by persons unknown. As such, the majority of hydrocarbons, pesticides and other volatiles would have been released into the atmosphere at the time of burning. As such, it is not expect that pollution of groundwater is likely.

Although it is expected that little or no leachate problems exist, as most of the sites are located adjacent to a water course, the potential for contamination cannot be ignored. Additionally, there is no information as to the depth that trenches were excavated and so excavation to ground water may have occurred.

It is proposed that all landfill sites scheduled for closure be rehabilitated to blend in with the adjacent rural land form, including the establishment of native grasses and the planting of local tree species. To do this it will require the importation of soil as a capping. A sealing layer of suitable soil is to be placed over the trenches to prevent the leaching of water into the covered trenches.

Several sites have been recommended as being suitable for the establishment of transfer stations following landfill closures. The surrounds of these facilities should also be designed to blend in with the landscape.

Where a transfer station is located at the now landfill site, the transfer station will be enclosed by a security fence to prevent unauthorised access and use. The appropriate form of the security fence will be selected for each site individually. The rehabilitated landfill will be outside the transfer station to avoid public access and is protected by a stock fence. Where possible, the landfill entrance road will be effectively secured by incorporating it as the transfer station access. A security gate can then be provided to allow access from the transfer station area to the rehabilitated landfill area for maintenance.

The sealing layer is to consist of a clay layer not less than 500mm thick and have a permeability less than $K=10^{-8}\text{ms}^{-1}$. This should be covered with 200mm of locally available topsoil, and seeded with appropriate species. The sealing layer will be compacted to 95% OMC in several thin layers with a slope of about 5% after final settlement to promote runoff and to divert stormwater flows around the waste trench, and to accommodate settlement.

The capping layer will also prevent access to the waste by insect, rodents and birds.

On-site drainage works will also be included to ensure stormwater flows leaving the site will not cause erosion on the site, or after leaving the site. Leachate and gas collection is not proposed as the sites are relatively small, and trench and fill systems are not conducive for collection.

If necessary, further landscaping will be carried out to compensate for ground movements.

A Construction Quality Assurance Plan (CQA) is needed for each site to document the following:

- area of the final capping and recorded on the survey plan.
- the thickness of the capping layers and the soil types used
- the levels of the final cap

Copies of the CQA will be submitted to the DEC (EPA) after rehabilitation is carried out and updated if any maintenance is carried out.

If necessary, further landscaping will be carried out to compensate for ground movements following closure.

4.1.1.1 Location of Suitable Clays

The location of suitable soil to provide the capping/sealing layer cannot be guaranteed at each site and accordingly, a program of soil testing is required to determine the suitability of the soil on site, or to locate an adjacent site of suitable material. Suitable soil will include clay materials having a permeability less than $K=10^{-8}\text{ms}^{-1}$. An estimate of cost to undertake this investigation has been provided being \$1,965.00 per site. The full proposal is **Attachment 4.1**.

4.1.2 Detecting Water Pollution

Given the conditions outlined above, it is considered reasonable that a water sampling regime be instituted. Where a creek is adjacent to the site, such as Trunkey Creek then the sampling points will be upstream and downstream of the landfill site.

Water sampling will be taken quarterly and after rain where appropriate. Comparison will be routinely made between samples results upstream and downstream of the site. Should discrepancies occur, staff will consult with the DEC (EPA) to determine the appropriate action.

4.1.3 Preventing Landfill Gas Emissions

As stated, collection of gas from trench and fill system is not feasible, particularly given the small size of each site. Given also that the 'burning off' has occurred over time and the waste uncovered for up to a year following dumped, landfill has emissions are expected to be low. Action will however, be taken to carry out a survey of the site utilising Council's sewer gas monitoring equipment and staff. The method used to carry out this survey will be provided in the EPA guidelines and is given below:

"Surface gas migration monitoring should demonstrate that the cover material is controlling the emission of landfill gas. This will be achieved by Council testing the atmosphere five centimetres above the ground surface in areas with intermediate or final cover where wastes have been placed. A field technician would then walk across the waste parallel to the boundary of the landfill until reaching the opposite side, and then repeat this procedure every 25 metres inward from the perimeter across the centre of the site to the opposite side of the waste landfill. This monitoring is to be performed on calm days (winds below 10 kilometres per hour).

The Council will instruct the technician on the need for due diligence following this procedure. Depressions in the cover material or surface fissures away from the sampling grid nominated above will also be investigated for methane emissions.

This monitoring will be conducted on a six monthly frequency using a calibrate methane has detector. If has emissions are found not to be a problem, approval from the EPA will be sought for less frequent monitoring.

The threshold concentration for closer investigation and potential action is 500 parts per million (v/v) of methane at any point on the landfill surface. Corrective action is necessary if this threshold is exceeded. This action can take the form of repairing or replacing cover material and/or installing gas extraction equipment.

Reports on monitoring and corrective action will form part of the annual report. This monitoring is to continue until the certificate of completeness is issued or the Council satisfies the EPA that landfill gas is no longer present in significant quantities to pose an environmental risk or inhibit revegetation."

4.1.4 Assuring Quality of Design, Construction and Operation

Staff and contractors will be required to make themselves familiar with the provisions of this Plan prior to being given access to the site. Clear responsibility for the implementation of this Plan will be placed with Council's Waste Manager. That

individual will be provided with the resources to ensure that the Plan is implemented in accordance with current environmental and engineering practice. All works will be ecologically sustainable and reflect the need to respect the environment and educate the community.

4.1.5 Preventing Unauthorised Entry

A new fence (stock proof standard) will be constructed along all boundaries. Because the fence and corner posts are missing in many places, a register surveyor will be engaged to carry a survey sufficient to enable the new fence to be erected on the property boundaries. A new gate will be installed at the existing access point. This gate will be locked. Where the existing boundary fences are in good condition and where they reflect accurately, the property boundary, they will be repaired to a stock proof standard.

Signs will be provided advising the general public that the site is closed, that the new landfill site for waste dumping is located at Bathurst. Signs will also be erected warning that unauthorised dumping will attract an on-the-spot fine. Signs will be erected on the access gate and or adjoining boundary fence.

Key access to the site will be provided only to approved staff, contractors and community groups after consultation with Council's Waste Manager. The key tag will flag the existence of this plan.

4.1.6 Preventing Degradation of Local Amenity

This plan is the first indication of Council's commitment to improving local amenity. The site has been left without any remediation or other work since its closure. By adopting and implementing this plan, Council guarantees improvement in local amenity. Council will provide the funding necessary to implement this Plan.

4.1.6.1 School Project

As a potential school project in the monitoring of natural regeneration processes, each site offers the potential to not only improve local amenity but enhance the community's respect for an understanding of the local environment. These sites provide an ideal opportunity to give those activities a practical focus when monitoring upstream and downstream biological activity. Accordingly, schools in the local areas will be approached to determine if they wish to be involved in this activity.

Post closure procedures should allow for the remediation of the site to include the local community. Council may chose to sponsor local community groups or schools for activities which may include revegetation and associated maintenance and the removal of weeds. These activities may be held in conjunction with such events as Planet Ark's National Tree Planting Day. The use of local community groups or schools would provide a level of ownership which may reduce the incidence of illegal dumpings thereby improving the security of the site. The level of ownership could be strengthened through the erection of signs on all boundary fences advising that it is the site of a regeneration project conducted by a local community group or school. Remediation works conducted by such groups or schools may allow Council to access funding for community groups it does not currently have access to. Council may assist the groups or schools to complete funding applications and/or provide any necessary in kind contributions.

4.1.6.2 Recycling

A significant volume of metal waste in the form of car bodies, wire, corrugated iron, tanks and whitegoods may exist on site. It is proposed, as part of this plan, to reclaim as much metal as possible for later recycling if this is feasible and cost effective. Existing natural timber such as fallen trees, logs etc will not be removed and will not be disturbed. In this way, the natural bush habitat will be emulated, providing micro environments for the myriad of insects, funguses etc.

4.1.6.3 Asbestos

It is inevitable that asbestos will be present within the landfill site. Any compressed sheet found during cleanup activities should be treated as if it were asbestos. Taking precautions as recommended by the EPA (wetting, avoid breaking, wrapping in plastic for transport etc), the asbestos should be placed on site where fill cover will exceed 500mm. There is little point in recording the location since much of the remainder of the landfill site is likely to contain some quantity of asbestos too.

4.1.6.4 Site "Tidying"

Work will be carried out to clean up all loose and 'vagrant' items of rubbish. An emu parade will be conducted to ensure that the surrounding environs of the site are free from loose rubbish. This clean up will include areas along the road reserve. These loose items of rubbish will be taken to a central point for either recycling or burial as appropriate.

4.1.6.5 Filling and Levelling

Once salvageable metal is removed it is proposed that any exposed rubbish is covered with fill. Work will also include filling and levelling areas where the ground/fill surface is pocked and hillocked. In this way a more 'natural' landform shape will be achieved. Fill should be obtained. In the first instance, from on-site. There are some mullock heaps and areas where spoil exists and later top soil will need to be provided to encourage seeding of native species. Filling and levelling will need to occur as soon as possible to enable these areas to stabilise prior to revegetation. If not, there is risk that establishing trees will fall over as fill settles. Where top soils obtained, soil stabilisation and erosion management works will need to be undertaken to ensure sediments are not eroded. The erection of silt fences and the sowing of native grasses are two such methods of reducing the effects of soil disturbance.

4.1.6.6 Revegetation

The site while being allowed to naturally revegetate from seeds from the area will also to be provided with seedlings for species not present.

Council's Parks and Garden staff will provide information about the best species to be used at each site and the best method of planting and propagation. Cognisants will be given to replicate the vegetation adjacent to each site.

4.1.6.7 Noxious Weed and Vermin Control

Action will be taken to ensure that annual inspections and spraying of noxious weeds occurs on site. This will be done with special care not to disturb native species or the creek environment.

There is the potential for some rabbit, feral cat, rat, mouse and fox harbourage. Action will be taken to bait or shoot any such vermin. Any baiting program will ensure that it does not endanger any native species.

4.1.7 Preventing Noise Pollution

Each site is relatively remote from residences. Once the initial work of removing recyclables and carrying out earthworks are complete, there will be no noise generating activity at the site at all.

4.1.8 Adequate Staffing and Training

In adopting this Plan, Council is committing to funding, over a period of time, the remediation of this site. Part of the ongoing funding will require Council to commit to provided staff with the skills to carry out the Plan. This includes familiarising staff with the Plan, with the principles of ecologically sustainable development, with the various vegetation management documents locally available (see Department Land and Water Conservation) and with current environmental and engineering practises.

4.1.9 Complaints

Any complaints in relation to the site will be handled using Council's standard 'complaints form'. Complaints will be stored on a property file specific to the site. All complaints will be investigated using the same procedure that Council has for other complaints. Complaints will be investigated expeditiously and without bias. Should a problem become evident that has occurred through Council action, immediate steps will be taken to rectify same.

5. Community Consultation Plan

This Plan is to be provided.

A handwritten signature in black ink, appearing to be 'David Swan', written over a horizontal line.

David Swan

MANAGER BATHURST WATER & WASTE AUTHORITY

ATTACHMENT 1.1

While the EPA will not be taking any further action on this occasion for observed breaches during the inspection, to ensure that improved waste management programs are implemented within Evans Shire that are satisfactory to the EPA, Council and the community, the EPA requires that Council:

- formulate, and submits to the EPA a report detailing what actions will be undertaken, in the short term (ie. next 3 months) to ensure appropriate waste management (including fire prevention) across the Shire, and;
- formulate, and submits to the EPA a report, detailing what actions will be undertaken in the medium to long term (ie. beyond 3 months) to ensure appropriate waste management (and fire prevention) across the shire.

In addition, the above details are required to be submitted to the EPA within 6 weeks of the date of this letter.

It should be noted that if the report isn't provided as requested, or the measures proposed in the report are not implemented or prove ineffective in appropriately managing wastes and preventing fires at Council landfills, the EPA will have to consider further regulatory action. This may include that the EPA issue a Notices of Preventative Action to Council regulating the operations at each of the landfills, to ensure compliance with solid waste guidelines, through preparation and implementation of waste management plans, monitoring and high level litter control.

Should you have any enquires in relation to this matter, please do not hesitate to contact Laurana Zochil at the Bathurst Regional Office of the EPA by telephoning 6332 7605.

Yours sincerely



DARRYL CLIFT
Head Regional Operations Unit Central West

Our reference : 260646
Contact : Laurana Zochil ph: 6332 7605

8 July 2003



40 JUL 2003

General Manager
Evans Shire Council
PO BOX 703
BATHURST NSW 2795
ATTENTION: BRIAN JONES

Dear Mr Taylor

MANAGEMENT OF LANDFILLS IN EVANS SHIRE COUNCIL

I refer to the inspections of Evans Shire Council landfills by Ms Laurana Zochil of the Environment Protection Authority (EPA) accompanied by Mr Brian Jones of Evans Shire Council on 21 May and 12 June 2003. The inspections follow several complaints received by the EPA regarding general poor management and fires at the landfills.

During the inspections of the seven Council landfills, Ms Zochil observed that there were a number of environmental issues affecting these sites, these included:

1. Evidence of past fires in the trenches at most of the landfills. Of particular concern was the fire hazard represented by the Sunny Corner landfill which is located near timber plantations.
2. Four landfills were located near intermittent watercourses or drainage lines that lead to watercourses (Wattle Flat, Burraga, Trunkey and Sofala); the location of these landfills could potentially lead to water pollution incidents particularly during flooding, but also as a result of leaching. These landfills required strict environmental controls to ensure against inundation and to capture and contain leachate.
3. Most of the landfills (in particular Wattle Flat, Sofala, Trunkey and Rockley) were at or close to full capacity. The situation at Wattle Flat is of particular concern.

With regards to fires, based on Ms Zochil's observations, the EPA believes that there is sufficient evidence to support action for breaches of:

- Clause 5(1) of the Protection of the Environment Operations (POEO) (Control of Burning) Regulation for failing to prevent or minimise air pollution;
- Section 126 of the POEO Act for causing air pollution by failing to deal with materials properly, and;
- Section 128 of the POEO Act for failing to prevent or minimise air pollution.

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PO Box A290 Sydney South NSW 1232 Australia
59-61 Goulburn Street Sydney NSW 2000

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ATTACHMENT 2.1



WASTE COLLECTION TRANSPORT STUDY

FINAL ISSUE

Prepared for
Evans Council

By
Penry Jane Associates Pty Ltd

(Final Issue) July 2003

et200603R(C1047 Transport Study Report)

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DOCUMENT CONTROL

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EXECUTIVE SUMMARY

An assessment has been undertaken to provide Evans Shire Council with the likely costs associated with a garbage collection service that may be integrated into the decision making process.

The report estimated that from the population of 5,200 (2,651 properties) 2,020 tonnes of domestic waste is generated per annum. The population of the Shire is relatively well distributed amongst the 76 localities with a concentration of population immediately to the north west of Bathurst, concentrations to the immediate south as well as to the east along the Great Western Highway. The road system provides its own challenges in planning collection routes that are efficient in terms of distance travelled/households served.

Three options have been examined in this report each servicing different proportions of the community and providing different service configurations. Option 1 examines a service to as many properties as feasible based on a fortnightly cycle. Option 2 limits the service along 'main' shire roads and provides a weekly pickup service. Option 3 examines a centralised service to existing landfill locations, which would rely on the continued participation of households to bring discarded materials to these site.

For each of the Options vehicle capital and operating costs have been estimated with the following outcomes:

- Option 1:** 1,848 households or approximately 72% of the Shire total. The service would be provided on a fortnightly basis with a total of 48,048 bin lifts per year. Total cost is estimated at \$175,403 and the indicative cost per pick up is in the region of \$3.65 per lift (or \$1.83 for a weekly cost comparison) and \$95 per household served per annum (There is the option of combining two routes into one day and have a weekly 7-day-per-week service, however, this sub-option has not been modelled).
- Option 2:** 1,172 households or approximately 46% of the Shire total. The service would be provided on a weekly basis with a total of 60,944 bin lifts per year. Total cost is estimated at \$154,153 and the indicative cost per pick up is in the region of \$2.53 per lift (on a weekly basis) and \$130 per household served per annum.
- Option 3:** Services would replicate the current arrangements and the total cost is estimated at \$192,750. Each compactor bin at the existing landfill sites would be changed on a weekly basis. Indicative cost are \$530 per week per landfill site or a total of \$27,500 per annum. This relates to an indicative cost per pick up is in the region of \$75 per household per annum (assuming that this cost would be apportioned to all households in the Shire).

Due to the specific physical and demographic characteristics of the Shire comparisons are difficult to make, however, in benchmarking against collection costs for a council located in the western part of the greater Sydney area, (who use an outsourced contractor) reveal costs of \$1.04 per lift, \$54 per annum per rate payer or a total of \$3.2M per annum. This charge is part of the domestic waste charge that includes tipping charges (\$52.70 per tonne) as well as a recycling service, which in 2001/2002 was \$211.90 per ratepayer.

INTRODUCTION

BACKGROUND

Evans Council is located in Central West NSW, and is characterised by predominantly agriculture, forestry and mining activities in addition to historic and tourist attractions. The shire surrounds the City of Bathurst and covers an area of over 4,250 square kilometres. Population is in the region of 5,200 dispersed amongst a number of small distinct villages as well as surrounding the city of Bathurst.

Currently council does not provide a waste collection service, however, operates seven small landfill sites where residents self haul waste. The council is examining the opportunity to improve the environmental outcomes by providing a centralised bin based collection service that would use the Bathurst City Council Waste Management Centre.

SCOPE

The scope of works for the Waste Collection Transport Study is to develop a cost structure for the collection service and provide collection service options. Excluded from this report are the costs of purchasing mobile garbage bins, repair of bins, tipping fees at Bathurst City landfill nor the current costs in operating the existing Shire landfills. It is understood that the outcomes of this report will be used in a broader report that will provide a comparison between the existing system and a proposed collection service.

REPORT STRUCTURE

The report is divided in to three main sections:

- Section 1. General description of Shire.
- Section 2. Cost structures and data. This provides background information and assumptions on the vehicles, travel distances, time related issues such as bin pick up cycles, and domestic waste generation rates.
- Section 3. Collection service options. Three options are examined in this paper.

Detailed supporting information for Section 2 and 3 are included in the appendices such as indicative vehicle costs, assumed fuel consumption rates, detailing of routes for each option including number of houses served, distances travelled and assumed tonnages collected.

Figure 1: Map of Evans Shire Council¹

PENRY JANE ASSOCIATES PTY LTD
ABN 33 082 561 162

The road system radiates out from Bathurst City with few roads linking radiating roads. Three major state highways dissect the Shire being the Great Western Highway, Mid Western Highway and Mitchell Highway and make up part of the 1,175km of roads. Apart from the state and regional roads 63% of roads in the Shire are unsealed gravel roads some of which are difficult to travel over in wet weather conditions. In addition many minor roads extend out of the Shire to neighbouring Council regions and provide access to a limited number of households.

All of these factors place particular challenges in defining appropriate collection routes, providing the most appropriate 'distance travelled/households served' ratio and balancing the following:

- Households served;
- Proximity to other households (densities);
- Tonnage carried;
- Time taken to undertake the routes in relation to normal shift periods;
- Distance travelled, and;
- The need where possible to create a circuit routes.

SECTION-2 METHODOLOGY, COST STRUCTURES AND DATA

2.1 METHODOLOGY

The following methodology was adopted:

- Initially collection vehicle data (such as fixed and variable costs, operating and performance data) was obtained from a number of Council and industry sources. These included Evans Shire Council maintenance workshop and vehicle suppliers and vehicle bodybuilders.
- An analysis was undertaken relating to likely waste generation rates and the profile of the Shire. This included examining the relative population/household densities of the Shire.
- An iterative process was undertaken to determine appropriate routes in relation to distance travelled, time taken, households served and tonnages collected. Extensive use was made of maps and a rural address database provided by Council. The database provided detailed information of property locations, road intersections and road lengths and enabled a relatively accurate mapping of each of the proposed routes of each option.
- Costs and operating and performance data were then applied to each option to determine the total costs and per lift cost.

2.2 VEHICLES

A number of sources were contacted to provide current cost and operating data for garbage collection vehicles. In addition the vehicle manufacturer and body fabricator were contacted also. Information for Options 1 and 2 in this report are based on an Iveco ACCO 2340G truck with a 6 x 4² dual control (left hand drive added) configuration fitted with a McDonald Johnston side loading compactor body with a 23 cubic metre capacity. These trucks have a legal load limit of 22.5 tonnes³ a net weight of 12.5 tonnes and capacity for 10 tonnes. A 4 x 2 truck configuration would only have capacity for 4.8 to 5 tonnes.

The indicative capital cost for one purpose built new collection vehicle has been estimated at \$41,900 per annum based on a five-year life and deducting the salvage value. Operator costs have been estimated at \$56,000 per annum that includes a portion of costs associated with supervision. Other costs that include insurance, registration, maintenance, fuel and the like have been estimated at between \$55,000 to \$77,500 per annum. Depending on the service option total costs are between \$154,153 and \$175,403 per annum. It has also been estimated that if a second hand vehicle were to be purchased for \$40,000 the overall costs would reduce by approximately \$20,000 per annum. Whilst the vehicle costs per annum would be reduced to approximately \$6,700 there would be an additional cost in maintenance.

Option 3 proposes a different vehicle configuration being a 6 x 4 hook lift truck (similar to Iveco ACCO) with a capacity upto 26 tonnes using a Roll On Roll Off (RORO) compactor bin. A bin would be located at each landfill (as a 'mini transfer station') with one empty spare that would be used to replace each full bin at the landfill locations. Indicative total costs for this option is approximately \$192,750 per annum.

Details of costs are included in Appendix 2 and GST has not been included in any costs. The cost of a contingency vehicle in the event of a breakdown has not been factored into the above costs. The contingency costs will depend on how the contingency is established and managed. For instance a second hand vehicle could be purchased or a service arrangement negotiated with Bathurst City Council for the use of a vehicle on an as "needs basis".

The costs above do not include for purchase of mobile garbage bins (MGB's), repair of bins, and tipping fees at Bathurst City landfill.

² Industry classification – first number is total number of wheels the second the total number of powered wheels.

³ A maximum of 9 tonnes on the front axles and 16.5 tonnes on the rear double axles.

2.3 TRAVEL DISTANCES

The following assumptions have been made regarding travel distances:

1. Use has been made of the Council rural address database that provides property locations relative to specific road distances.
2. Roads have been deemed single pass or return journey roads as follows:
 - Single pass roads are ones that are part of a one-way route, for example Sofala Road. For these roads it has been assumed that the collection bins are placed on one side of the road only (an alternative to this would be for the driver to stop and fetch the bin to one side of the road, although this alternative has not been modelled in this report). Placing collection bins on one side of the road is common practice in rural collection services.
 - Return journey roads (for instance highways or dead-end roads) bins would be picked up on both sides of the road.
3. The proposed routes have been developed so as to maximise the load at the end of each daily journey.
4. The destination landfill is within the Bathurst City Council region.

2.4 TIME ISSUES

In calculating the likely times for the services the following assumptions are made:

- Bin pick-up cycle 10 seconds.
- Average⁴ acceleration to 40km/hour is approximately 25 seconds.
- Average speed of a transport vehicle in an 80km/hour zone is 60km/hour⁵.
- Average speed of a transport vehicle in a 60km/hour zone is 40km/hour
- An allowance of 30 minutes for drop off and pick up of RORO bins.
- No allowance has been made for delays due to any traffic congestion.

2.5 DOMESTIC WASTE PER HOUSEHOLD

Data from the NetWaste Subregional Waste Management Plan⁶ dated December 2001 has been used to estimate the quantity of waste that will be presented by the residents of Evans Shire Council. This plan, covering the Local Government areas of Blayney, Cabonne, Forbes, Lachlan, Orange, Parkes and Weddin, indicated that from a population of 91,000 the domestic waste generation per household per annum was 0.762 tonnes or 0.254 tonnes per person per annum. Details are presented in Appendix 3.

Evans Council's population is 5,200 and based on the data supplied by Council it is estimated that there are 2,651 properties. Despite the lower persons per household figure (2 persons per household for Evans Council) this study uses the above household tonnage figure of 0.762 tonnes per annum or 2,020 tonnes per annum for the whole Shire. This tonnage reflects the assumption that householders will continue to adopt some form of organic composting on site, reducing the organic content although this would be partially off-set by recyclable materials being presented (as it is understood that at present no separate recycling service will be introduced).

⁴ Acceleration and braking times will depend on the gradient of the road, weather conditions and weight of vehicle. The assumption has been made that the vehicle will be half full.

⁵ The average speeds do not apply to garbage collection vehicles as the critical factor is acceleration and braking and distance between stops.

⁶ NetWaste Subregional Waste Management Plan prepared by R.W.Corkery & Co Pty Ltd and Nolan-ITU Pty Ltd (December 2001).

SECTION-3 COLLECTION SERVICE OPTIONS

Three options have been examined in this study:

1. Option 1 – Fulllest provision of service (to service as many properties as feasible)
2. Option 2 – Limited service along 'main' shire roads.
3. Option 3 – Centralised service to existing landfill locations, which would rely on the continued participation of households to bring discarded materials to these site.

3.1 OPTION 1

(a) *Route Description*

The proposed service would be divided into eight major routes to make up a fortnightly cycle as follows:

Route	Localities included
ROUTE 1 – WEST	Rock Forest, Vittoria, The Rocks, Dunkeld, Evans Plains, Bathampton, Fitzgerald Mount, Wimbledon, part of Georges Plains.
ROUTE 2 – NORTH WEST	Mount Rankin, part of Eglington, Billywillinga, Watton and Freemantle.
ROUTE 3 – NORTH	Part of Eglington, part of Mount Rankin, Duramana, Millah Murrah, Turrondale and part of Peel.
ROUTE 4 – NORTH EAST	Part of Peel, Wiagdon, Wattle Flat, Sofala, Crundie, Paling Yards Limekilns, Clear Creek and Yarras.
ROUTE 5 – EAST (above Great Western Highway)	Part of Glanmire, Napoleon Reef, part Walang, part of Yetholme, Kirkconnel and part of Meadow Flat.
ROUTE 6 – EAST (below Great Western Highway)	Part of Glanmire, Brewongle, O'Connell, Wambool, part of Walang, part of Yetholme, Locksley, Gemalla, Tarana and part of Meadow Flat.
ROUTE 7 – SOUTH INNER	Perthville, part Georges Plains, Cow Flat, White Rock, The Lagoon, Rockley Mount, Forsters Valley, Garthowen, Charlton and part of Rockley.
ROUTE 8 – SOUTH OUTER	Part of Georges Plains, Caloola, Arkell, Trunkey, Abercrombie, Triangle Flat, Bald Ridge, Nirraga, Gilmandyke and part of Rockley.

Table 1: Option One Routes

It is estimated that the total distance travelled will be in the order of 1,435km with an average of 179km. The shortest being 74.5km is Route 6 and the longest trip of 250km is Route 8. Total tonnage collected has been estimated at 55 tonnes with an average of 6.8 tonnes. The average distance between households is estimated at 0.78km. The time take to undertake the collection services were estimated to be between 2 hours and 45 minutes for Route 6 to 7 hours for Route 8.

(b) *Household's Served*

1,848 households or approximately 72% of the Shire total.

(c) *Frequency*

The service would be provided on a fortnightly basis with a total of 48,048 bin lifts per year.

(d) *Indicative Costs*

Total cost is estimated at \$175,403 and the indicative cost per pick up is in the region of \$3.65 per lift and \$95 per household served per annum.

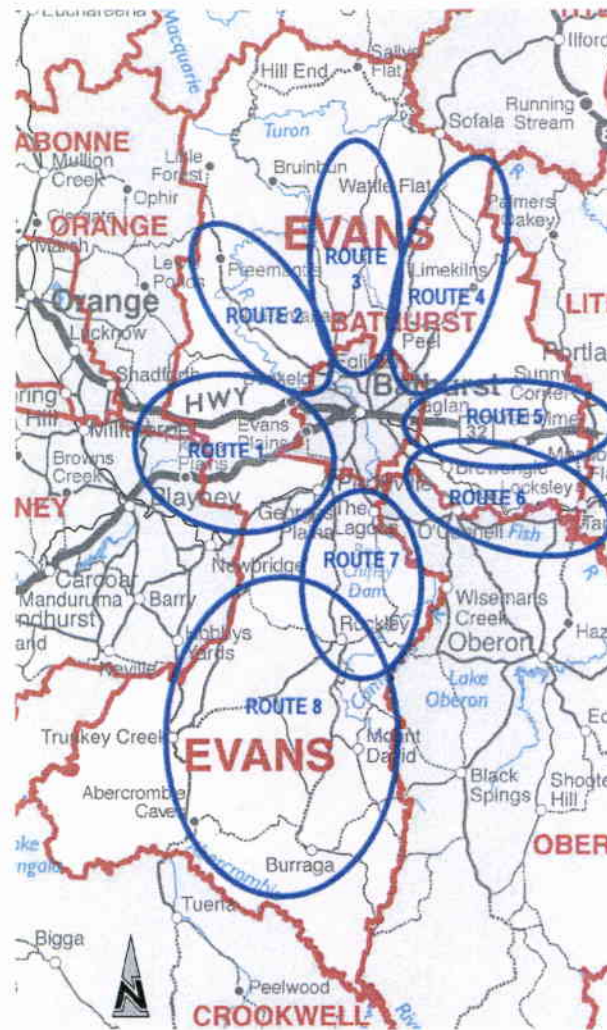


Figure 2: Map of Option 1

A detailed listing of the roads travelled and a larger map are included in Appendix 4.

3.2 OPTION 2

(a) Route Description

The proposed service would be divided into four major routes to make up a weekly cycle as follows:

Route	Localities included
ROUTE 1 – NORTH WEST	Mount Rankin, part of Eglington, part of Duramana, Billywillinga, Watton and Freemantle.
ROUTE 2 – NORTH & NORTH EAST	Duramana, Turondale, part of Crudie, Sofala, Wattle Flat, Peel, Yarras, Clear Creek and part of Limekilns.
ROUTE 3 – EAST	Glanmire, Napoleon Reef, Walang, Yetholme, Kirkconnel Meadow Flat, O'Connell, Wambool, Locksley, Gemalla and Tarana.
ROUTE 4 – SOUTH	Dunkeld, The Rocks, Vittoria, Evans Plains, Bathampton, Fitzgerald Mount, Perthville, Cow Flat, Rockley Mountain, Fosters Valley, Rockley, Charlton, Garthowen and The Lagoon.

Table 2: Option Two Routes

It is estimated that the total distance travelled will be in the order of 829km with an average of 104km. The shortest being 175km is Route 1 and the longest trip of 224km is Route 2. Total tonnage collected per fortnight has been estimated at 34 tonnes with an average of 8.6 tonnes. The average distance between households is estimated as 0.71km. . The time take to undertake the collection services were estimated to be between 5 hours and 30 minutes for Route 1 to 6 hours 45 minutes for Route 3.

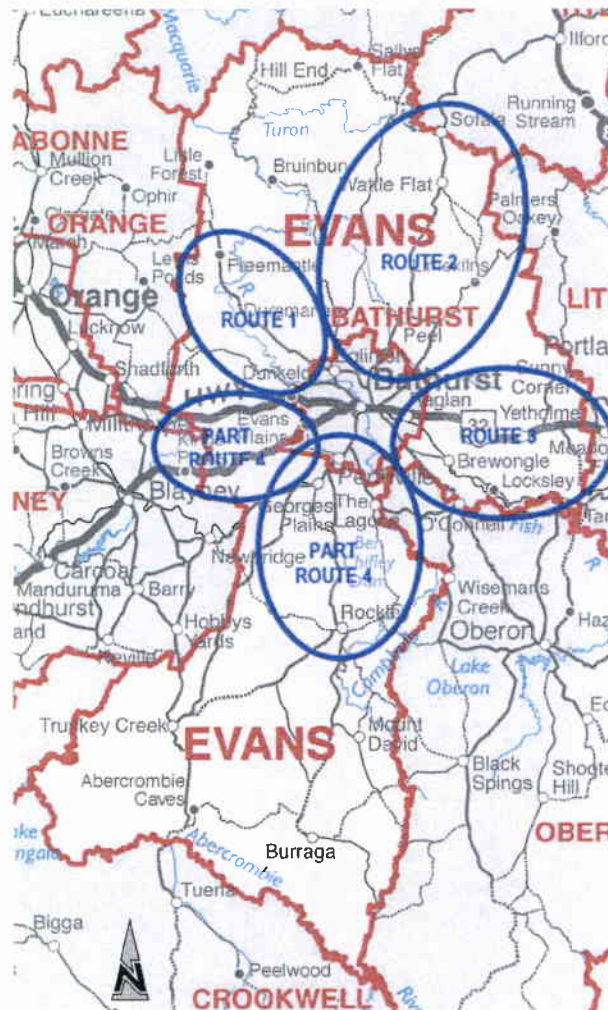


Figure 3: Map of Option 2

A detailed listing of the roads travelled and a larger map are included in Appendix 4.

(b) Household's Served

1,172 households or approximately 46% of the Shire total.

(c) Frequency

The service would be provided on a weekly basis with a total of 60,944 bin lifts per year.

(d) Indicative Costs

Total cost is estimated at \$154,153 and the indicative cost per pick up is in the region of \$2.53 per lift and \$130 per household served per annum.

3.3 OPTION 3

(a) Route Description

Direct travel to each of the seven landfills returning to dispose of waste at the Bathurst City Landfill. The seven routes would be undertaken on a weekly cycle. It has been assumed that Sofala and Sunny Corner could be combined on one day, as well as combining Wattle Flat and Rockley on a separate day.

Route	Localities included
ROUTE 1 – HILL END	Landfill
ROUTE 2 – SOFALA	Landfill
ROUTE 3 – WATTLE FLAT	Landfill
ROUTE 4 – SUNNY CORNER	Landfill
ROUTE 5 – ROCKLEY	Landfill
ROUTE 6 – TRUNKY CREEK	Landfill
ROUTE 7 – BURRAGA	Landfill

Table 3: Option Three Routes

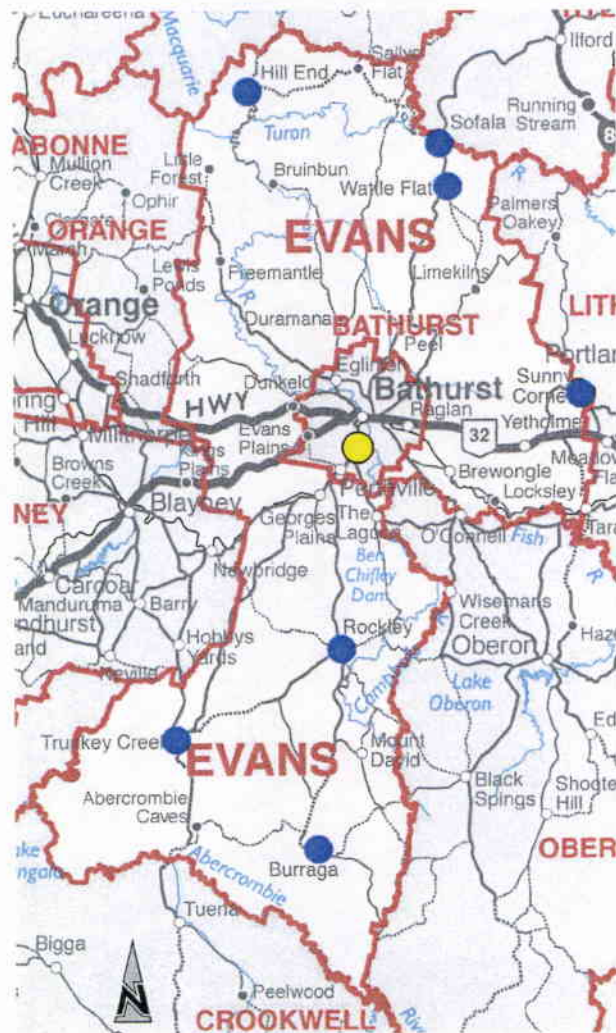


Figure 4: Map of Option 3

A detailed listing of the roads travelled and a larger map are included in Appendix 4.

It is estimated that the total distance travelled will be in the order of 846km with an average of 169km. The shortest being 132km is Route 6 and the longest trip of 216km is Route 3 and 5 combined. Total tonnage collected per week is difficult to determine. Theoretically if all householders use the landfill sites, the average weekly quantity will be 39 tonnes with an average of 5.5 tonnes per site. The average distance between households is estimated as 0.67km. . The time take to travel was estimated to be between 2 hours and 15 minutes for Route 5 to 5 hours 30 minutes for Route 1.

(b) Household's Served

Services would replicate the current arrangements.

(c) Frequency

Each compactor bin at the landfill site would be changed on a weekly basis.

(d) Indicative Costs

Total cost is estimated at \$192,750 that represents \$530 per week per landfill site or a total of \$27,500 per annum. This relates to an indicative cost per pick up in the region of \$75 per household per annum (assuming that this cost would be apportioned to all households in the Shire).

APPENDIX 1 – EVANS COUNCIL DETAILS

#	Postcode	Locality	Roads	Households
1	2795	Wattle Flat	15	142
2	2795	Mount Rankin	8	119
3	2795	Duramanana	9	101
4	2795	Yetholme	10	98
5	2795	Peel	12	92
6	2795	Turondale	4	77
7	2795	Rock Forest	4	74
8	2795	Billywillinga	5	73
9	2795	Glanmire	5	66
10	2795	Meadow Flat	7	60
11	2795	Triangle Flat	3	59
12	2795	Napoleon reef	7	58
13	2795	Georges Plains	5	57
14	2795	Perthville	7	53
15	2795	Brewongle	7	52
16	2795	Sunny Corner	7	52
17	2795	The Lagoon	5	50
18	2850	Hill End	5	48
19	2795	Trunkey	8	47
20	2795	Clear Creek	3	45
21	2795	Fosters Valley	6	42
22	2795	Isabella	3	42
23	2795	Mount David	6	42
24	2795	Limekilns	4	41
25	2795	Burruga	9	40
26	2795	Sofala	3	40
27	2795	Rockley	6	38
28	2795	Caloola	7	36
29	2795	Walang	6	33
30	2795	Abercrombie	5	32
31	2795	The Rocks	3	32
32	2795	Wimbledon	8	31
33	2795	Bruinbun	5	30
34	2795	Evans Plains	4	30
35	2799	Vittoria	6	30
36	2795	O'connell	5	28
37	2795	Watton	1	28
38	2795	Arkell	6	27
39	2795	Cow Flat	3	26

#	Postcode	Locality	Roads	Households
40	2795	Crudine	3	26
41	2795	Gowan	3	25
42	2795	Bald Ridge	3	24
43	2795	Killongbutta	2	24
44	2795	Locksley	4	23
45	2787	Tarana	4	23
46	2795	Eglinton	3	21
47	2799	Fitzgeralds Mount	2	21
48	2795	Rockley Mount	3	21
49	2795	Wambool	4	20
50	2795	Charlton	3	19
51	2795	Dunkeld	6	19
52	2795	Garthowen	2	16
53	2795	Gemalla	3	16
54	2795	Gilmandyke	3	16
55	2850	Sally's Flat	3	16
56	2795	Kirkconnell	4	15
57	2795	Wiagdon	1	15
58	2795	Judds creek	2	14
59	2795	Bathampton	2	13
60	2795	Millah Murrah	1	13
61	2795	Copperhannia	1	12
62	2795	Dog Rocks	2	12
63	2795	Paling Yards	3	11
64	2795	White Rock	2	11
65	2795	Freemantle	3	10
66	2795	Yarras	2	9
67	2795	Colo	1	6
68	2795	Wisemans Creek	1	5
69	2795	Fitzgeralds Valley	1	4
70	2795	Milkers Flat	1	4
71	2795	Ballyroe	2	3
72	2795	Jeremy	1	2
73	2850	Tambaroora	1	1
74	2795	Curragh	0	0
75	2795	Upper Turon	0	0
76	2795	Winburndale	0	0
		Totals	314	2,561

Table 4: Shire Localities

ROAD	LENGTH (km)
State Roads	116
Regional Roads	80
Sealed Roads	366
Gravel Roads	617
Total Length of Roads	1,179

Table 5: Shire Roads

APPENDIX 2 – COST DETAILS

GARBAGE COLLECTION VEHICLE

	ITEM	UNIT	RATE (excl GST)
1.	Truck (including left hand drive conversion)		
	Capital Investment ⁷	Dollars	\$150,000
	Estimate Service Life ⁸	Years	5
	Salvage Value	Dollars (at end of service life)	\$52,500 (35% residual)
	Cost of Debt (allowance) ⁹	Percentage	7%
2.	Body (Compactor)		
	Capital Investment	Dollars	\$100,000
	Estimate Service Life	Years	5 (as above)
	Salvage Value	Dollars (at end of service life)	\$35,000 (35% residual)
	Cost of Debt (allowance)	Percentage	7% (as above)
3.	Truck & Body (Total)		\$41,903/annum



Figure 5: Iveco ACCO 2350G Garbage Collection Vehicle

	ITEM	UNIT	RATE
4.	Truck & Body		
	Licences	Dollars	\$1,000
	Insurances (CTP & General) ¹⁰	Years	\$4,500
	Spare Equipment (inventory)	Dollars (per truck service life)	Arrangements with local spare parts suppliers
	Down Time	Service Days per year	As the options are for 4 days per week there is a spare day per week for service requirements

⁷ NSW Government Stores price

⁸ Varies between 4 and 7 years.

⁹ Dependent on method of purchase. If vehicle is bought with cash then the cost of finance is zero, however, the future (higher) cost of a new vehicle would need to be allowed for on an annual basis.

¹⁰ Dependent on Council's insurance risk profile.

	ITEM	UNIT	RATE
	Labour Costs (Driver) ¹¹	Dollars	\$48,000
	Labour Supervision ¹²	Percentage	\$8,000
5.	Average Load of Truck	Tonnes	10
6.	Average Truck Speed	km/hr	Varies
7.	Variable Costs		
	Average distance travelled	Kilometres (per annum)	36,000 (Option 1) 21,000 (Option 2)
	Fuel Consumption	Litres/100km	75
	Fuel (total yearly cost) (@ \$1:00 per litre)	Dollars	\$27,000 (Option 1) \$15,750 (Option 2)
	Service costs (per annum) ¹³	Dollars	\$45,000 (Option 1) \$35,000 (Option 2)

8.	TOTAL ANNUAL COST	OPTION 1	\$175,403
		OPTION 2	\$154,153

Table 6: Indicative Garbage Collection Vehicle Costs

HOOK LIFT TRUCK

	ITEM	UNIT	RATE (excl GST)
9.	Truck (including hook lift mechanism and hydraulics)		
	Capital Investment	Dollars	\$240,000
	Estimate Service Life	Years	5
	Salvage Value	Dollars (at end of service life)	\$63,000 (35% residual)
	Cost of Debt (allowance) ¹⁴	Percentage	7%
10.	RORO Bin (per bin)		
	Capital Investment	Dollars	\$20,000
	Estimate Service Life	Years	5 (as above)
	Salvage Value	Dollars (at end of service life)	\$7,000 (35% residual)
	Cost of Debt (allowance)	Percentage	7% (as above)
11.	Truck & 1 x RORO Bins (Total)		\$43,560/annum
12.	Truck & 8 x RORO Bins (Total)		\$67,000/annum

¹¹ Includes for wages at \$750 per week plus allowance of 50% for superannuation, long service leave, sick leave, public holiday overtime and holiday leave (approximately \$60,000 per annum). Proportioned to 4 day per week (approximately \$48,000 per annum).

¹² Supervisor @ \$80,000 all inclusive costs. Assumes supervisor supervises 10 operators = 10% (approximately \$8,000 per annum).

¹³ Includes for oil, tyres, servicing, repairs, apportioned costs for mechanics and mechanics overheads and workshop

¹⁴ As previous note for Garbage Collection Vehicle.



Figure 6: 6 x 4 Hook Lift Truck

	ITEM	UNIT	RATE
13.	Truck & Body		
	Licences	Dollars	\$1,000
	Insurances (CTP & General) ¹⁵	Years	\$4,500
	Spare Equipment (inventory)	Dollars (per truck service life)	Arrangements with local spare parts suppliers
	Down Time	Service Days per year	5 days per year
	Labour Costs (Driver) ¹⁶	Dollars	\$60,000
	Labour Supervision ¹⁷	Percentage	\$8,000
14.	Average Load of Truck	Tonnes	10
15.	Average Truck Speed	km/hr	45km/hour
16.	Variable Costs		
	Average distance travelled	Kilometres (per annum)	26,500 (Option 3)
	Fuel Consumption	Litres/100km	65
	Fuel (total yearly cost) (@ \$1:00 per litre)	Dollars	\$17,250 (Option 3)
	Service costs (per annum) ¹⁸	Dollars	\$35,000
17.	TOTAL ANNUAL COST		\$192,750

Table 7: Indicative Hook Lift Vehicle Costs

¹⁵ Dependent on Council's insurance risk profile.

¹⁶ Includes for wages at \$750 per week plus allowance of 50% for superannuation, long service leave, sick leave, public holiday overtime and holiday leave (approximately \$60,000 per annum).

¹⁷ Supervisor @ \$80,000 all inclusive costs. Assumes supervisor supervises 10 operators = 10% (approximately \$8,000 per annum).

¹⁸ Includes for oil, tyres, servicing, repairs, apportioned costs for mechanics and mechanics overheads and workshop

APPENDIX 3 – NETWASTE WASTE DATA

Data from NetWaste Subregional Waste Management Plan prepared by R.W.Corkery & Co Pty Ltd and Nolan-ITU Pty Ltd (December 2001)

2001 Data	Domestic Waste (tonnes)	Households with Waste Service	Population
Blayney	1,633	2,000	6,400
Cabonne	2,500	2,642	12,300
Forbes	3,120	3,426	9,941
Lachlan	1,796	2,200	7,300
Orange	11,840	14,786	36,137
Parkes	3,260	4,250	15,000
Wedden	560	973	3,850
TOTALS	24,709	30,277	90,928

Table 8: Details of Waste Generation for NetWaste Subregion

2001 Data	Number
Domestic Waste Collected ¹⁹	23,076
Number of Households	30,277
Population (rounded)	91,000
Persons per Household	3
Domestic Waste per Household per Annum	0.762 tonnes
Domestic Waste per Person per Annum	0.254 tonnes

Table 9: Household Waste Generation for NetWaste Subregion

¹⁹ Not all households receive a collection service.

APPENDIX 4 – ROUTE DESCRIPTIONS

OPTION 1

ROUTE 1 – WEST (Rock Forest, Vittoria, The Rocks, Dunkeld, Evans Plains, Bathampton, Fitzgerald Mount, Wimbledon, part of Georges Plains) (Estimated Trip Time: 6 hours 30 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Ophir Road	2	44	21.40	0.97	42.80	1.3
Pine Ridge Road	2	22	3.10	0.28	6.20	0.6
Travel into Bathurst to Mitchell Hwy					16.00	0.0
Mitchell Hwy	2	43	18.90	0.88	37.80	1.3
Marys Lane	2	4	1.20	0.60	2.40	0.1
Houses Lane	2	3	0.40	0.27	0.80	0.1
Back Swamp Road	2	16	4.60	0.58	9.20	0.5
Okay Creek Road	2	6	1.50	0.50	3.00	0.2
Callans Road	2	2	2.30	2.30	4.60	0.1
Hen & Chicken Lane	1	1	5.00	5.00	5.00	0.0
Western Hwy	2	45	16.40	0.73	32.80	1.3
Kellys Road	2	8	0.87	0.22	1.74	0.2
Bathampton Road	2	14	7.10	1.01	14.20	0.4
Fitzgeralds Valley Road	2	4	2.80	1.40	5.60	0.1
Wimbledon Road	2	23	7.50	0.65	15.00	0.7
Run in and out of Bathurst					30.00	
ROUTE 1 TOTAL		235		0.97	227.14	6.9

ROUTE 2 – NORTH WEST (Mount Rankin, part of Eglington, Billywillinga, Watton and Freemantle) (Estimated Trip Time: 5 hours 00 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Freemantle Road	2	111	29.90	0.54	59.80	3.3
Mount Rankin Road	2	19	5.50	0.58	11.00	0.6
Green Gully Road	2	3	1.70	1.13	3.40	0.1
Woodside Drive	2	13	0.67	0.10	1.34	0.4
Willow Tree Lane	2	32	8.10	0.51	16.20	0.9
Spring Close	2	7	1.30	0.37	2.60	0.2
Billywillinga Road	2	31	5.40	0.35	10.80	0.9
Long Ridge Road	2	10	1.60	0.32	3.20	0.3
Priors Lane	2	4	0.36	0.18	0.72	0.1
Howarths Road	2	3	2.10	1.40	4.20	0.1
Killongbutta Road	2	15	7.60	1.01	15.20	0.4
Run in and out of Bathurst					30.00	
ROUTE 2 TOTAL		248		0.64	158.46	7.3

ROUTE 3 – NORTH (Part of Eglington, part of Mount Rankin, Duramana, Millah Murrah, Turndale and part of Peel) (Estimated Trip Time: 6 hours 30 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Duramana Road	2	30	7.60	0.51	15.20	0.9
McGregors Lane	2	5	2.50	1.00	5.00	0.1
Howards Drive	2	12	3.00	0.50	6.00	0.4
Whalans Lane	2	11	3.20	0.58	6.40	0.3
The Bridle Track	2	22	17.20	1.56	34.40	0.6
Dingers Lane	2	2	0.70	0.70	1.40	0.1
Forge Road	2	3	5.10	3.40	10.20	0.1
Turndale Road	2	84	34.00	0.81	68.00	2.5
Glen Outram Lane	2	6	2.80	0.93	5.60	0.2
Box Ridge Road	2	37	6.90	0.37	13.80	1.1
Wingeratta Road	2	3	1.10	0.73	2.20	0.1
Quartz Ridge Road	2	2	0.00	0.00	0.00	0.1
Rivulet Road	2	27	11.00	0.81	22.00	0.8
Run in and out of Bathurst					30.00	
ROUTE 3 TOTAL		244		0.90	220.20	7.2

ROUTE 4 – NORTH EAST (Part of Peel, Wiagdon, Wattle Flat, Sofala, Crundie, Paling Yards Limekilns, Clear Creek and Yarras) (Estimated Trip Time: 5 hours 45 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Sofala Road	1.25	118	45.30	0.48	56.63	3.5
Solitary Lane	2	4	0.40	0.20	0.80	0.1
Hill End Road	2	20	10.80	1.08	21.60	0.6
Limekilns Road	1	79	38.80	0.49	38.80	2.3
Tableratong Lane	2	4	1.40	0.70	2.80	0.1
Pymont Lane	2	8	4.90	1.23	9.80	0.2
Collen Hagney Lane	2	9	3.50	0.78	7.00	0.3
Clear Creek Road	2	27	11.00	0.81	22.00	0.8
Run in and out of Bathurst					30.00	
ROUTE 4 TOTAL		269		0.70	189.43	7.9

ROUTE 5 – EAST (above Great Western Highway) (Part of Glanmire, Napoleon Reef, part Walang, part of Yetholme, Kirkconnel and part of Meadow Flat) (Estimated Trip Time: 4 hours 30 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Great Western Hwy	2	46	22.80	0.50	45.60	1.3
Glanmire Lane	2	13	3.90	0.60	7.80	0.4
Mersing Road	2	23	3.20	0.28	6.40	0.7
St Anthonys Creek Road	2	10	1.70	0.34	3.40	0.3
Napoleon Reef Road	2	12	3.95	0.66	7.90	0.4
Winburndale Dam Rd	2	4	1.30	0.65	2.60	0.1
Little Access Road	2	4	0.67	0.34	1.34	0.1
Waling Drive	1	14	4.40	0.31	4.40	0.4
Yetholme Drive	1	16	5.20	0.33	5.20	0.5
Macabees Road	2	16	2.20	0.28	4.40	0.5
Mount Homer Road	2	3	1.30	0.87	2.60	0.1
Barnetts Road	2	6	2.20	0.73	4.40	0.2
Sunny Corner Road	1	35	13.20	0.38	13.20	1.0
West Mitchell Road	1	3	0.00	0.00	0.00	0.1
Sherwood Road	2	4	1.80	0.90	3.60	0.1
McManus Road	2	4	0.94	0.47	1.88	0.1
Run in and out of Bathurst					30.00	
ROUTE 5 TOTAL		213		0.68	144.72	6.2

ROUTE 6 – EAST (below Great Western Highway) (Part of Glanmire, Brewongle, O'Connell, Wambool, part of Walang, part of Yetholme, Locksley, Gemalla, Tarana and part of Meadow Flat) (Estimated Trip Time: 2 hours 45 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Tarana Road	1	45	29.80	0.66	29.80	1.3
River Road	2	3	2.80	1.87	5.60	0.1
Locksley Station Road	2	6	1.40	0.47	2.80	0.2
Crescent Orchard Road	2	7	1.60	0.46	3.20	0.2
Diamond Swamp Road	1.25	23	10.20	0.44	12.75	0.7
Eusdale Road	1	21	7.20	0.34	7.20	0.6
Great Western Hwy	1	0	6	0	6.00	0.0
O'Connell Road	1	33	10.00	0.30	10.00	1.0
Blacks Mill Lane	1	12	1.40	0.12	1.40	0.4
Wambool Road	1	7	5.00	0.71	5.00	0.2
Brewongle Lane	2	13	7.60	0.58	15.20	0.4
Timber Ridge Road	1	18	6.50	0.36	6.50	0.5
Molybdonite Rd	2	12	3.20	0.53	6.40	0.4
Run in and out of Bathurst					30.00	
ROUTE 6 TOTAL		200		0.37	74.5	5.9

ROUTE 7 – SOUTH INNER (Perthville, part Georges Plains, Cow Flat, White Rock, The Lagoon, Rockley Mount, Forsters Valley, Garthowen, Charlton and part of Rockley) (Estimated Trip Time: 5 hours 00 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Trunkey Road	1	6	3.00	0.50	3.00	0.2
Sutherland Drive	2	10	1.40	0.28	2.80	0.3
Cow Flat Road	1	25	8.40	0.34	8.40	0.7
Quarry Road	2	4	3.10	1.55	6.20	0.1
Rockley Road	1	50	24.30	0.49	24.30	1.5
Perthville Road	2	9	2.30	0.51	4.60	0.3
Hollis Lane	2	9	2.70	0.60	5.40	0.3
Gestingthorpe Road	2	21	5.00	0.48	10.00	0.6
Ryan Road	2	18	5.50	0.61	11.00	0.5
Lagoon Road	1.5	56	33.00	0.88	49.50	1.6
White Rock Road	2	8	2.20	0.55	4.40	0.2
Glazebrook Road	2	3	1.50	1.00	3.00	0.1
Sinclair Lane	2	3	3.60	2.40	7.20	0.1
Run in and out of Bathurst					30.00	
ROUTE 7 TOTAL		222		0.76	169.8	6.5

ROUTE 8 – SOUTH OUTER (Part of Georges Plains, Caloola, Arkell, Trunkey, Abercrombie, Triangle Flat, Bald Ridge, Nirraga, Gilmandyke and part of Rockley) (Estimated Trip Time: 7 hours 00 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Trunkey Road	2	48	53.20	2.22	106.40	1.4
Brugess Road	2	4	4.30	2.15	8.60	0.1
Old Trunk Road	2	9	3.70	0.82	7.40	0.3
Hobbs Yards Road	2	22	9.50	0.86	19.00	0.6
Colo and Curragh Roads	1	38	0.00	0.00	0.00	1.1
Bald Ridge Road	1	25	23.40	0.94	23.40	0.7
Burruga Road	1	33	33.00	1.00	33.00	1.0
Triangle Flat Road	1	38	22.90	0.60	22.90	1.1
Run in and out of Bathurst					30.00	
ROUTE 8 TOTAL		217		1.16	250.70	6.4

OPTION 1 MAP

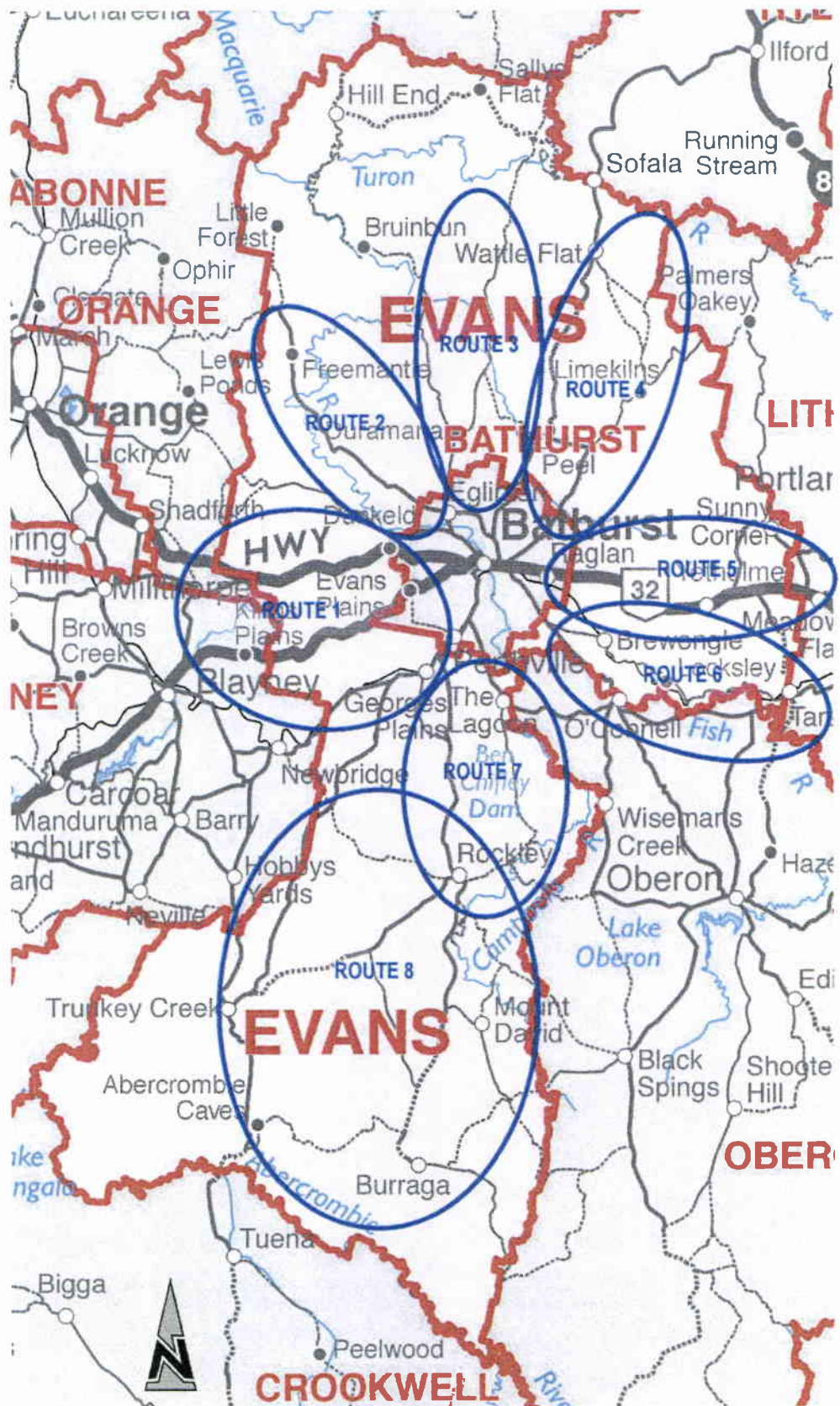


Figure 7: Map of Option 1

OPTION 2

ROUTE 1 – NORTH WEST (Mount Rankin, part of Eglington, part of Duramana, Billywillinga, Watton and Freemantle) (Estimated Trip Time: 5 hours 30 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Freemantle Road	2	111	29.90	0.54	59.80	3.3
Mount Rankin Road	2	19	5.50	0.58	11.00	0.6
Green Gully Road	2	3	1.70	1.13	3.40	0.1
Woodside Drive	2	13	0.67	0.10	1.34	0.4
Willow Tree Lane	2	32	8.10	0.51	16.20	0.9
Spring Close	2	7	1.30	0.37	2.60	0.2
McGregors Lane	2	5	2.50	1.00	5.00	0.1
Howards Drive	2	12	3.00	0.50	6.00	0.4
Whalans Lane	2	11	3.20	0.58	6.40	0.3
Billywillinga Road	2	31	5.40	0.35	10.80	0.9
Long Ridge Road	2	10	1.60	0.32	3.20	0.3
Priors Lane	2	4	0.36	0.18	0.72	0.1
Howarths Road	2	3	2.10	1.40	4.20	0.1
Killongbutta Road	2	15	7.60	1.01	15.20	0.4
Run in and out of Bathurst					30.00	
ROUTE 1 TOTAL		276		0.64	175.86	8.1

ROUTE 2 – NORTH & NORTH EAST (Duramana, Turondale, part of Crudie, Sofala, Wattle Flat, Peel, Yarras, Clear Creek and part of Limekilns) (Estimated Trip Time: 6 hours 45 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Duramanana Road	2	30	7.60	0.51	15.20	0.9
Turondale Road	2	84	34.00	0.81	68.00	2.5
Hill End Road	1	20	10.80	0.54	10.80	0.6
Sofala Road	1	118	45.30	0.38	45.30	3.5
Ardley Lane	1	0	7.00	0.00	7.00	
Limekilns Road	2	52	23.80	0.92	47.60	1.5
Run in and out of Bathurst					30.00	
ROUTE 2 TOTAL		304		0.74	223.90	8.9

ROUTE 3 –EAST (Glanmire, Napoleon Reef, Walang, Yetholme, Kirkconnel Meadow Flat, O'Connell, Wambool, Locksley, Gemalla and Tarana) (Estimated Trip Time: 6 hours 45 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Great Western Hwy	1	23	22.80	0.99	22.80	0.7
Glanmire Lane	2	13	3.90	0.60	7.80	0.4
Mersing Road	2	23	3.20	0.28	6.40	0.7
St Anthonys Creek Road	2	10	1.70	0.34	3.40	0.3
Waling Drive	1	14	4.40	0.31	4.40	0.4
Yetholme Drive	1	16	5.20	0.33	5.20	0.5
Sunny Corner Road	1	35	13.20	0.38	13.20	1.0
Great Western Hwy (return)	1	23	22.80	0.99	22.80	0.7
To start of O'Connell Road					12.00	
O'Connell Road	1	33	10.00	0.30	10.00	1.0
Wambool Road	1	7	5.00	0.71	5.00	0.2
Great Western Hwy	1	23	22.80	0.99	22.80	0.7
Diamond Swamp Road	1.25	23	10.20	0.55	12.75	0.7
Eusdale Road	1	21	7.20	0.34	7.20	0.6
Great Western Hwy	1	0	6.00	0.00	6.00	0.0
Timber Ridge Road	1	18	6.50	0.36	6.50	0.5
Brewongle Lane	2	13	7.60	1.17	15.20	0.4
Run in and out of Bathurst					30.00	
ROUTE 3 TOTAL		317		0.70	220.45	9.29

ROUTE 4 –SOUTH (Dunkeld, The Rocks, Vittoria, Evans Plains, Bathampton, Fitzgerald Mount, Perthville, Cow Flat, Rockley Mountain, Fosters Valley, Rockley, Charlton, Garthowen and The Lagoon) (Estimated Trip Time: 6 hours 30 minutes)

Road Name	One way or Return (1 or 2)	Number of Properties	Length (km)	Distance between Houses	Distance Travelled	Tonnes
Mitchell Hwy	2	43	18.90	0.88	37.80	1.3
Hen & Chicken Lane	1	1	5.00	5.00	5.00	0.0
Western Hwy	2	45	16.40	0.73	32.80	1.3
Hen & Chicken Lane	1	1	10.00	10.00	10.00	0.0
Trunkay Road	1	6	3.00	0.50	3.00	0.2
Cow Flat Road	1	1	2.50	2.50	2.50	0.0
Gestingthorpe Road	1	21	5.00	0.24	5.00	0.6
Rockley Road	1	50	24.30	0.49	24.30	1.5
Cow Flat Road	2	24	5.90	0.49	11.80	0.7
Lagoon Road	1	56	33.00	0.59	33.00	1.6
Ryan Road	2	18	5.50	0.61	11.00	0.5
Perthville Road	1	9	2.30	0.26	2.30	0.3
Run in and out of Bathurst					30.00	
ROUTE 4 TOTAL		275		0.76	208.50	8.1

OPTION 2 MAP

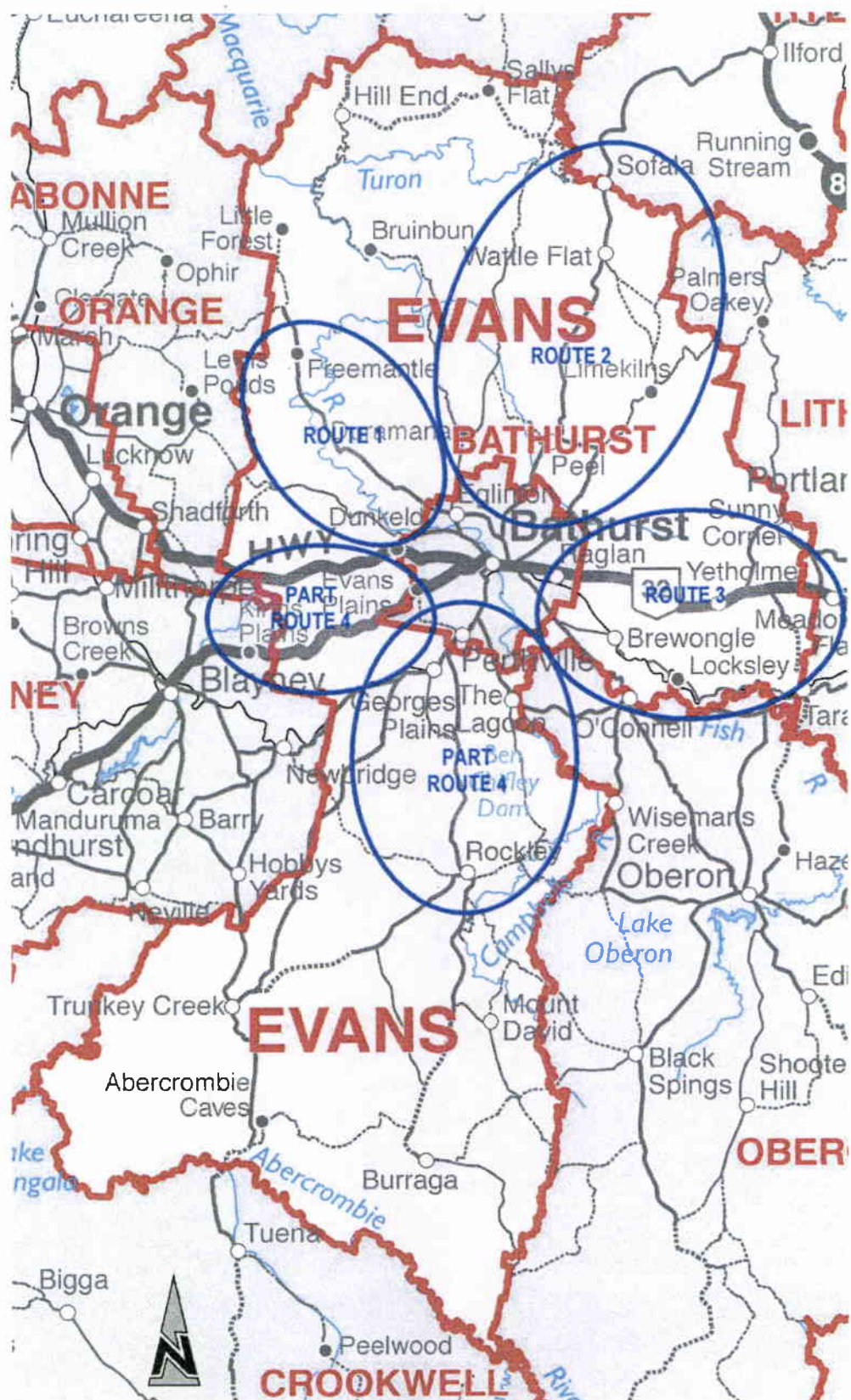


Figure 8: Map of Option 2

OPTION 3 MAP

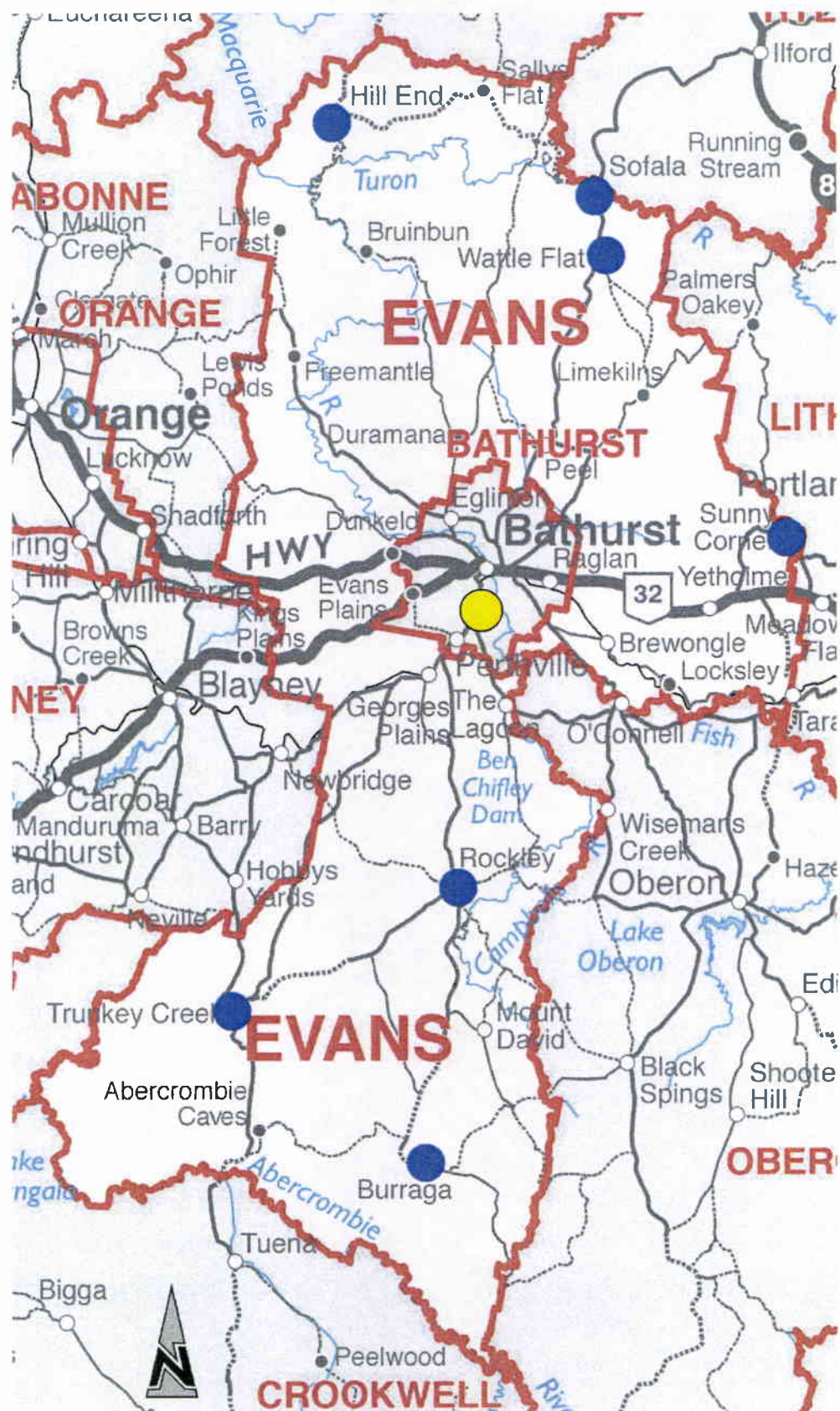


Figure 9: Map of Option 3

OPTION 3

ROUTE 1 – HILL END (Estimated Trip Time: 5 hours 30 minutes)

Road Name	One way or Return (1 or 2)	Length (km)	Distance Travelled
Sofala Road	2	45.30	90.60
Hill End Road	2	43.00	86.00
Run in and out of Bathurst			20.00
ROUTE 1 TOTAL			196.60

ROUTE 2 – SOFALA (Estimated Trip Time: 3 hours 30 minutes)

Road Name	One way or Return (1 or 2)	Length (km)	Distance Travelled
Sofala Road	2	45.30	90.60
Run in and out of Bathurst			20.00
ROUTE 2 TOTAL			116.60

ROUTE 3 – WATTLE FLAT (Estimated Trip Time: 3 hours 00 minutes)

Road Name	One way or Return (1 or 2)	Length (km)	Distance Travelled
Sofala Road	2	38.50	77.00
Run in and out of Bathurst			20.00
ROUTE 3 TOTAL			97.00

ROUTE 4 – SUNNY CORNER (Estimated Trip Time: 3 hours 15 minutes)

Road Name	One way or Return (1 or 2)	Length (km)	Distance Travelled
Great Western Hwy	2	33.40	66.80
Sunny Corner Road	2	9.70	19.40
Run in and out of Bathurst			20.00
ROUTE 4 TOTAL			106.2

ROUTE 5 – ROCKLEY (Estimated Trip Time: 2 hours 15 minutes)

Road Name	One way or Return (1 or 2)	Length (km)	Distance Travelled
Rockley Road	2	24.30	48.60
Run in and out of Bathurst			20.00
ROUTE 5 TOTAL			68.60

ROUTE 6 – TRUNKEY CREEK (Estimated Trip Time: 4 hours 00 minutes)

Road Name	One way or Return (1 or 2)	Length (km)	Distance Travelled
Trunkey Road	2	56.20	112.40
Run in and out of Bathurst			20.00
ROUTE 6 TOTAL			132.40

ROUTE 7 – BURRAGA (Estimated Trip Time: 4 hours 00 minutes)

Road Name	One way or Return (1 or 2)	Length (km)	Distance Travelled
Rockley Road	2	24.30	48.60
Burraga Road	2	33.00	66.00
Run in and out of Bathurst			20.00
ROUTE 7 TOTAL			134.60

ATTACHMENT 2.2

11. Waste Management

1. Waste Management Committee

It was resolved on the motion of Councillors Stark and Howarth that:

1. A waste collection service be programmed for commencement 1 July 2004.
2. Adequate information be provided to the community to indicate that a waste collection service will commence in 2004.
3. Council commence negotiations with Blayney Shire Council and Bathurst City Council to achieve a mutually acceptable service outcome.
4. The waste collection be provided by private contract.
5. Contract documentation be prepared for commencement of a waste collection service from 1 July 2004.
6. Following the commencement of the collection service, all existing landfill sites to be closed.
7. Council notify the Environment Protection Authority of the intention to develop a collection program.
8. No action is taken in regard to expansion of landfill facilities at Burruga or Rockley until the collection service is further considered.
9. Contact be made with Bathurst City Council in relation to waste matters including the matter of plastic bag restrictions.

2. Sunny Corner

For Council's information.

3. Landfill fires

For Council's information.

CERTIFICATE: This is Page No. 15 of the Minutes of the Ordinary Meeting of the Evans Shire Council held at the Council Chambers, Kelso, on Friday, 26 September, 2003.

(151880)

.....MAYORGENERAL MANAGER

ATTACHMENT 3.1



11 February 2005
Project No. Bathurst/001(a)

Bathurst Waste and Water Authority
c/- Bathurst Regional Council
Civic Centre
158 Russell Street
Bathurst NSW 2795

Attention: David Swan
Manager

Dear David,

**Subject: Proposed Waste Collection Service:
Transport Study – Review and Revision
Development of Tender, Contract and Evaluation Documentation**

Thank you for your email dated 2 February 2005 outlining Council's requirements regarding scope of works to update the findings of the Penry Jane Associates (PJA) Pty Ltd study undertaken for the previous Evans Shire Council in July 2003. URS is pleased to present our proposal to undertake a review and revision of the PJA report in line with Council's requirements.

1. Introduction

Bathurst Regional Council was formed in May 2004 with the amalgamation of part of the Evans Shire Council and Bathurst City Council. Historically residents of Evans have not received a waste collection service and it is understood that this situation prevails today. Residents are required to self-haul waste to one of six small landfill sites distributed with the region or to the Bathurst Waste Management Centre.

PJA were commissioned in mid 2003 to develop a cost structure for collection service options. At the request of Evans the previous study excluded specific costs such as purchasing mobile garbage bins, repair of bins, tipping fees at Bathurst City landfill and the current costs of operating the existing Evans landfills.

The outcomes of the PJA report were to be used in a broader report to be prepared by Evans providing a comparison between the existing system and the preferred proposed collection service. In late 2003 Evans Council requested URS to prepare a proposal to develop tender, contract and evaluation documentation for the waste collection service. This did not proceed, however, URS retains the expertise to undertake this work as outlined in this letter.

2. Scope of Works

URS understands that the scope of works is to review, revise and refine the issues addressed in the PJA report with the objective of Council using the revised report to form the basis of tender documents for the provision of collection service in the rural areas.

URS Australia Pty Ltd (ABN 46 000 691 690)
Level 3, 116 Miller Street
North Sydney, NSW 2060 Australia
Tel: 61 2 8925 5500
Fax: 61 2 8925 5555



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Manager
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Specifically Council requires:

- Tipping fees to be included in the costings, with GST if applicable;
- A review of the truck sizes recommended in the PJA report and assessment of the appropriateness of the vehicle in regard to the area to be served and the distances to be covered in the study area. We have assumed that the collection will be based on a MGB system;
- That 90% or more of households to receive a fortnightly collection service. It is understood that this is based on Council's preferred method of apportioning service costs across all ratepayers;
- The examination of the impact on the PJA Option 1 of transfer stations located at each of the current tip sites, plus an additional site along the Freemantle Road to the northwest;
- Cost of constructing and operating the transfer stations to be include the within the overall provision of waste services;
- Cost and viability of a monthly recycling collection service to be examined;
- The proposed collection routes to be reviewed to reflect the new Council boundary; and
- For the collection system(s) proposed and endorsed by Council to develop tender, contract and evaluation documentation with the aim of engaging a contractor to provide the nominated service(s).

3. Proposed Methodology

3.1 Transport Study – Review and Revision

The original project targeted a maximum of 72% of the households of the previous Council area. The new scope includes the potential use of transfer facilities at the existing landfills, cost of disposal and the potential for a recycling service.

The project will require amended collection routes developed from a balance of the following criteria including the:

- Number of households serviced;
- Household densities;
- Daily tonnage carried in the garbage truck;
- Truck capacity;
- Time taken to undertake the routes in relation to normal working shifts;

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- Daily travel distance; and
- The need to maximise route efficiency to minimise 'doubling back'.

The methodology for undertaking the work is as follows:

1. Review the data and information from the previous report and obtain new data. This will include:
 - Waste generation figures to provide base line data for the analysis;
 - Population and households (including forward projections);
 - Council boundaries;
 - Vehicle and transfer station costs;
 - Cost of bins and crates; and
 - Specific review of costs that have changed over the past 20 months including vehicles/ plant, labour, fuel and the like.
2. Obtain the updated version of the rural address database for the nominated area from Council and other GIS spatial information. It is anticipated that the database will be available in spatial format otherwise we recommend that Council obtain this information from the NSW Department of Lands for the Council area. It has been URS' experience in the past that this is the most effective way of obtaining specific council based information.
3. From the proposed catchments determine appropriate size and capacities of the transfer stations and examine how they would maximise efficiencies to the collection routes.
4. Prepare an indicative schematic of a standard transfer station will be include for the purpose of the cost analysis
5. Determine the appropriate collection routes that satisfy the above criteria. We would use GIS software MapInfo combined with the rural address database to develop the maps to cover the required percentage of the Council's households.
6. Review collection vehicle size, capacity and operation.

Steps 3, 4 and 5 will require an iterative interactive approach.
7. Duplicate the data and methodology used to determine the residual waste collection costs to establish the costs associated with a recycling collection.

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3.2 Development of Tender, Contract and Evaluation Documentation

To carry out this part of the project a request for tender package will be prepared. In accordance with local government tendering requirements this package will contain the following parts that are included in the project scope of works:

- Information to tenderers;
- Conditions of tendering;
- Formal instrument of agreement, tendering forms and schedules;
- Contract specification (or service specification), and;
- General conditions of contract (and any special conditions of contract).

In addition we will prepare the evaluation criteria and evaluation process and if required assist in the tender evaluation.

In so far as is practical and appropriate URS will use standard documentation, modifying this to suite the particular requirements of the project. In this regard it is understood that Council can supply a standard service contract and make available their legal representatives for drafting/vetting of contractual conditions.

4. Deliverables

URS will provide two hard copies and a PDF version of the Final Report. We have also provided an optional fee for a presentation to Council if requested.

5. Proposed Timing

The project can commence within one week of Council appointing URS. We understand that the transport report is required within a two-month time frame, however, it is anticipated that URS would complete the project prior to the Easter long weekend (25 March 2005).

In regard to the tender process this is dependent on a number of factors, however, in our experience one the formal decision has been approved by Council, that the tender can be ready for the market in 8 weeks, a time frame that includes a review process by Council. Tendering period for this type of work is typically 6 weeks and we have included an indicative period of 4 weeks for the tender evaluation process.

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6. Personnel

The project will be undertaken by the project team listed below:

Name	Position	Role
Einion Thomas	Principal, Solid Waste / Resource Recovery	Project Manager
Jacinta McMahon	Senior Environmental Engineer	Tender & Contracts
Charles Straw	Associate Engineer	GIS Specialist
Kelly Corcoran	Environmental Engineer	Project Officer

Einion Thomas will project manage and be responsible for the delivery of the project. For the first part of the project he will have a hands on role in the route selection, costings, data review and prepare the final report. Having been responsible for the original study for Evans Council Einion will provide continuity in regard to the original methodology and outputs. For the second part of the project he will develop the conditions of tender, service specifications, input into the contract and the tender evaluation documentation.

Einion has over 20 years experience in project management, development and business consulting environment. In the last 8 years he has had significant involvement in the environmental sector and in the project initiation of resource recovery infrastructure, contract development and service planning. As part of this experience he has lead a wide range of projects employing a range of contract types from service level agreement, service contracts, construction contracts through to sophisticated build own operate contracts.

Jacinta McMahon will work with Einion Thomas in assisting with the developing the conditions of tender, service specifications, input into the contract and the tender evaluation documentation. Jacinta is a Chartered Professional Engineer and a member of the Institute of Engineers Australia. She has over 6 years experience on a wide range of projects in the fields of environmental and civil engineering including design, project management, tendering, construction management and contract administration.

Charles Straw will carry out all of the GIS work. Charles currently manages and coordinates all GIS related projects in the NSW/ACT Region as well as a small team of GIS Professionals supporting this work. He has developed and managed a number of project specific GIS databases for both large and small resource management projects. Clients include, Sydney Airport, Sydney Catchment Authority, the Department of Defence, the Crown Solicitors Office, NPWS, VicTrack, ACTPLA, as well as a number of confidential clients, state and federal government agencies and private companies.

Kelly Corcoran will undertake data review and research, work with Einion on route selection and undertake the cost modelling for the project. Kelly is an engineer with both an Environmental Engineering and Commerce degree.

Detailed CV's can be forwarded upon request.

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7. Proposed Fee & Transport Study – Review and Revision Commercial Conditions

Proposed Fee: Transport Study – Review and Revision

For this part of the project we have presented our fee in three parts:

- Lump sum price to carry out the work relating to the waste collection and described in the above scope of work is **\$9,830 (excl GST)**.
- Lump sum price to carry out the work relating to the recycling collection and described in the above scope of work is **\$2,970 (excl GST)**.
- The option of presenting to Council would be in the order of **\$1,000 (excl GST)** including travelling costs from Sydney.

Proposed Fee: Development of Tender, Contract and Evaluation Documentation

For the second part of this project the lump sum fee is **\$19,650 (excl GST)**, which includes for two visits to Council during the development of the documentation.

Out of Scope Work

Work outside the above scope will be discussed with Council and URS will prepare a lump sum amount agreed with Council prior to commencement of any additional work.

Validity Period

This proposal is valid for a period of 60 days from the date of this proposal.

Terms of Payment

URS will submit an interim invoice with the submission of the Draft Report and a final invoice with the submission of the Final Report.

Terms of Engagement

This proposal is subject to our Agreement for the Provision of Consulting Services, which is attached.

Conditions

In undertaking the project we have assumed the following:

- a) One option for waste collection based on the 90% plus household service coverage;

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- b) The current rural address database and if possible for this data to be provided in a spatial format provided by Council;
- c) It is understood that Bathurst operates a crate recycling system. We are assuming that the new recycling collection system to be reviewed in this study will be the same as the current system and that appropriate information relating to this service can be made available to assist in assessing the recycling option;
- d) Tipping costs at the Bathurst Waste Management Centre to be provided by Council;
- e) Costs of bins and crates will be included in the analysis;
- f) An indicative schematic of a standard transfer station will be include for the purpose of the cost analysis;
- g) One round of comments and review from the Draft Report;
- h) GIS base map of the current Council boundary to be provided by Council;
- i) It is assumed that only a minimal amount of GIS data manipulation will be required to the base data provided by Council prior to its use;
- j) No allowance has been made to purchase any additional GIS information;
- k) Two visits to Council during the Tender, Contract and Evaluation Process;
- l) That Council appoint a legal representative to review any legal issues in the documentation prior to tendering;
- m) Discussions with adjoining Councils have not been allowed for;
- n) Council to be responsible for any newspaper advertising;
- o) Council to issue the tender documents to the prospective tenderers;
- p) Council to respond to tender queries; and
- q) Tender evaluation nor negotiations with the tenderers are not included as it is difficult to determine a lump sum fee for this part of the work, as this fee will depend on the number of tenders received and requirements for interviewing and negotiating with tenderers. Once these parameters are known we will be happy to provide a lump sum fee for this part of the work.

8. Capability

URS is a professional services company providing environmental and engineering expertise to businesses and communities within Asia Pacific and around the globe. We are scientists, engineers, economists, planners, project managers and risk management specialists. Together we form a strong multi-disciplinary team bringing knowledge and experience to our work and providing clients with solutions.

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We have an extensive track record with local government in NSW as well as other States in Australia. Local government clients we current work with or have recently worked with include Lismore City Council, Gosford City Council, Bega Valley Shire Council, Cooma Monaro Shire Council, Snowy River Shire Council, Goulburn City Council, Penrith City Council, Randwick City Council, Canterbury City Council, Wollongong City Council, Wingecarribee Shire Council and Shore Regional Organisation of Councils (SHOROC) (made up of Manly, Mosman, Warringah and Pittwater Councils).

Within the waste management and resource recovery area we have experience in Policy, Strategy, Logistics and Audits, AWT/MRF Design & Project Management, EOI, Tender and Contract, Agreements/Business Improvement, Landfills/Site Optimisation, Cost Modelling, Environmental Monitoring and Reporting.

In Australia URS undertakes work in the areas of environmental due diligence, site assessment and remediation, planning assessments (including EISs, REFs), risk assessments, financial and economic modelling, geotechnical and civil engineering design, land development and structural engineering, air quality management, business risk management, community consultation, greenhouse/climate change services, landscape architecture, waste management and resource recovery, water/wastewater management and flood plain management.

9. Project Experience

The following is a short list of applicable projects demonstrating URS' and the nominated personnel's experience in similar project for Local Government.

Regional Organics Waste Inventory Study Cooma Monaro Shire Council November 2003 to February 2004	Cooma Monaro Shire Council commissioned URS to provide an audit of the waste streams deposited to landfill as well as developing a regional organic waste inventory. The aim of the inventory is to assess major commercial, industrial and agricultural sources of organic waste. The audit was undertaken in consultation with APrince Consulting with the inventory being developed through a comprehensive regional survey and physical inspections. Outcomes of this study will determine the future regional collection and processing opportunities.
Perisher Waste Collection Study PERISHER NSW Cooma Monaro Shire Council May to July 2004	URS engaged to undertake a least cost benefit-cost analysis of alternative waste management and location options for the Perisher Range Resorts. The study identified a number of options for the short and medium term future collection, transport and disposal of waste and recyclables as the Perisher Village area is further developed. The analysis calculated the cost of each option and identified the most cost effective mix of collection vehicles, transfer stations and bulk transportation for both winter and summer waste and recycling services.

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<p>Travel Impact Analysis Western Sydney Planning and Management Board (WSWB) November 1998</p>	<p>A preliminary locational study was undertaken across the whole of the western Sydney region examining the cost and time impacts for council garbage collection trucks servicing network of proposed new alternative waste treatment facilities and comparing these with the current travel arrangements. The study examined the of the impact of travel costs on long haul to remote landfill for the western Sydney community and was part of a broader analysis examining the location of resource recovery infrastructure for the region.</p>
<p>South East Organic Waste Management Plan South East Local Government Association, SA 2004</p>	<p>The South East Local Government Association (SELGA) represents 7 member Councils located in the South East region of South Australia. The plan was developed as organic material was identified as a priority waste stream in the Region from an earlier URS study. The plan reviewed existing resource recovery and treatment facilities and considering options and strategies for collection and processing of residual organics. The options and strategies developed by examining transport costs and efficiencies as well as infrastructure location and costs.</p>
<p>Eyre Peninsula Waste Management Strategy Eyre Peninsula Local Government Association, SA 2004</p>	<p>The Eyre Peninsula Local Government Association (EPLGA) is a regional organisation of Councils made up of 10 constituent Councils. URS developed a Waste Management Strategy to take a regional approach to waste management and to provide long-term direction for waste and recycling services for 15 to 20 years in to the future. The strategy was developed in consultation with the Councils, the Local Government Association, the Environment Protection Authority and Zero Waste SA. As part of the strategy development URS proposed options relating to the rationalisation of waste facilities and services developing a cost estimating model for waste management regionalisation in South Australia.</p>
<p>Waste Strategy Review ACT NOWaste November 2002</p>	<p>URS completed an Environmental/Social/Economic Review of NOWaste by 2010. This review included a detailed consideration of the costs and benefits associated with the strategy and consideration of purchasing new processing technology. URS categorised waste, reviewed recycling and waste to landfill rates over the past 10 years then projected forward over 20 years with expansion of NOWaste programs and investments in reprocessing technology and improved recycling infrastructure.</p>

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Waste Strategy Development Goulburn NSW Goulburn City Council June to November 2003	URS was commissioned by Goulburn City Council to assist with the development of strategies to manage waste in the region. The overall project included preparation and execution of a waste audit at the Sinclair Street Waste Management Centre, waste stream analysis, identification of recycling and co-generation opportunities and developing a waste management strategy for the Waste Management Centre.
SHOROC AWTT Terry Hills, NSW Shore Regional Organisation of Councils (SHOROC) October 2002 to May 2003	<p>Shore Regional Organisation of Councils (SHOROC) comprising of Warringah, Manly, Mosman and Pittwater Councils commissioned URS to manage the "Kimbriki" project.</p> <p>This project included a site optimisation study for the Kimbriki landfill site and preparation of tender and contract documents for Alternative Waste Treatment Technologies (AWTT).</p>
EOI, MRF Contract, Waste Service NSW September to December 2002	To improve resource recovery outcomes from one of Waste Service' materials recovery facilities the project included the development of Waste Service' procurement strategies and EOI development and evaluation.
MSW Pre Treatment Tenders WSWB May 1998 to February 2002	<p>Development of EOI and Tender documentation for the procurement of Alternative Waste Pre-treatment Technology for WSWB's network of pre treatment facilities.</p> <p>These facilities were to act as the common first point of receipt for the MSW generated in the nine WSWB councils. Extensive review and inspection of pre treatment technologies and secondary resource processing technologies in Europe and UK.</p>
Secondary Resource EOI WSWB June 1999 to June 2001	As part of the MSW resource recovery strategy of the WSWB developed and evaluated secondary resource processing technologies capable of processing outputs from pre treatment (organics, high calorifics, metals and inert materials).
Secondary Resource Tenders, Resource NSW March to June 2002	Resource NSW is the first organisation to contract for technology as alternative to landfill. The outputs of a pre-treatment process will be on sold to operators with the capacity to derive the highest net resource value from the organics, high calorific and inert fractions of materials. Responsible for developing and tender and contract documentation in association with Resource NSW and NSW Supply. (Department of Commerce).

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AWTT Tender, Fairfield City Council March to September 2002	<p>The first individual council in Sydney to independently seek tenders for and successfully contract with an alternative technology provider for their MSW.</p> <p>Responsible for developing the tender documentation and the performance and technical specifications. In addition development of the evaluation systems and procedures. Extensive client and client's legal representative liaison.</p>
TRANSPORT STUDY Evans Shire Council Completed June 2003	<p>Examination of the feasibility of implementing a new waste collection service within a rural context.</p> <p>The study developed a number of travel route options, developed capital and operating cost and performance information and applied these to the various options.</p>
EOI for Greenwaste Processing Technologies Cooma Monaro Shire Council, 2003	<p>As part of the Waste Management Strategy and Plan Development for Cooma Monaro Shire Council an EOI was developed for Greenwaste processing. Respondents were asked to define in feed requirements and the process examined technology maturity, locational issue, outputs, and transportation impacts.</p>
Service Level Agreement Randwick, NSW Randwick City Council February 2004 to June 2004	<p>Development of a Service Level Agreement to cover for the improved efficiency of delivering internal services provided by Council. The services covered in the agreement include:</p> <ul style="list-style-type: none"> • Green waste collection and green waste disposal; • Clean up services (scheduled, on-call and special pick ups); • Illegal dumping investigation and removal; • Litter bin collection, footpath cleaning and street cleaning; • Trade (commercial) waste and recycling.
Local Government Participation Agreements WSWB January 1999 to December 2002	<p>As part of a network of alternative technology waste/ resource management pre treatment infrastructure facilities to be developed on behalf of local government in western Sydney the WSWB required a standard participation agreement. A participation agreement was developed with Hawkesbury, Penrith, Baulkham Hills and Blacktown Councils to provide financial underpinning and supply of municipal solid waste to a proposed facility at South Windsor Landfill. The project required extensive liaison and negotiation to ensure consistency in agreements for all councils and ensure full understanding and alignment of goals.</p>



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Local Government Cooperation Agreement WSWB January 1999 to December 2002	Hawkesbury City Council was a key partner in the development of the first alternative technology waste/ resource management pre treatment infrastructure facility being developed by the WSWB. A cooperation agreement was developed (preceded by a MoU) with Hawkesbury that tied into a proposed site lease, contract and participation agreement. In addition the agreement included for the construction of a resident drop-off facility for the citizens of the Hawkesbury complementing the resource recovery goals of the alternative technology waste/ resource management facility.
Standard Service Contract Development Western Sydney Waste Planning & Management Board (WSWB) March to June 1997	To improve the outcomes of kerbside recycling services a standard service based contract was developed for use in council service contracts. The contracts have been used for recycling services in Hawkesbury, Liverpool, Baulkham Hills and Blacktown Councils.
MOU Greenwaste Services Western Sydney Waste Planning & Management Board (WSWB) February to June 2000	Bankstown City Council introduced a kerbside greenwaste collection service trial. To maximise the quantity of greenwaste available for resource recovery and processing a memorandum of understanding was developed between WSWB, Bankstown City Council, Cleanaway (as the collector) and a compost processor. The MoU clearly stated performance requirements and roles and responsibilities of the parties for the collection, sorting, processing and sale to market.

We would value the opportunity to discuss this proposal with you, if necessary, to ensure that we have responded to all aspects of your requirements. Please contact the Einion on 8925 5778 or 0417 241 143.

Yours sincerely,
URS AUSTRALIA PTY LTD

Einion Thomas
Principal
Solid Waste Management/Resource Recovery Practice Leader

encl

ATTACHMENT 4.1

**MACQUARIE
GEOTECH**

Macquarie Geotechnical
Unit 2/6 Kirkcaldy Street
PO Box 71
Bathurst NSW 2795
Telephone: 02 6332 2011
Facsimile: 02 6334 4213

Fax

To:	David Swan
Company:	Bathurst Regional Council
Fax:	6333 6115
From:	Robert Cox
Date:	19 January, 2005
Ref:	\\Mg-server\m\2005\Proposals\06-FX-BRC.doc
No. of Pages (incl. cover)	4
Subject:	Geotechnical investigations for proposed clay fill for rural tips

David,

We refer to our conversation on 17th January 2005 and your subsequent correspondence regarding the above mentioned project and now provide our estimate of costs for the sampling, laboratory testing and reporting.

Scope of Work

The investigation would comprise of the following:

- A detailed desktop study including a review of subsurface conditions (soil landscape, geology and hydrogeology), and a detailed review of available plans and documentation for the sites. This will identify areas where we anticipate suitable clay deposits may be located and subsequently a meeting would be arranged with Council to identify these areas so that access may be arranged for the fieldwork.
- Travel to and from each of the sites.
- Drilling, logging and sampling of boreholes to depths of approx. 1.0m in the proposed borrow pit areas. We have allowed ½ a day at each of the sites.
- Upon completion of the field work samples would be returned to our Bathurst NATA accredited laboratory for further assessment and testing. We recommend that the Laboratory testing comprise two stages. *Stage One* would be the bulk testing of twelve samples (two samples from each proposed site) for Emerson Classification (to determine dispersive nature of material) Grading and Plasticity Index (to assess clay content and reactivity). Upon completion of *Stage One* a review of the results would be undertaken by a Senior Geotechnical Engineer. *Stage Two* samples would then be identified and tested. *Stage Two* would involve the testing of six samples using the Falling Head Permeability Test (to assess soil permeability).
- Preparation and documentation of a geotechnical report. The report will include borehole logs, site plan showing locations of the boreholes, and provision of geotechnical design parameters and recommendations based on a review of geotechnical and geological site conditions and laboratory results.

Costs

Our fees for this work would be as follows;

▪ Desk Study & Liaison	\$500.00
▪ Travel & Fieldwork (allow ½ day at each site, 3 days fieldwork)	\$3,000.00
▪ Stage 1 Laboratory Testing (total of 12 samples)	\$3,720.00
▪ Stage 2 Laboratory Testing (total of 6 samples)	\$1,500.00
▪ Documentation & Laboratory Review	\$850.00
▪ Geotechnical Assessment, Reporting & Recommendations	\$1,150.00

Sub Total	\$10,720.00
GST	\$1,072.00
TOTAL	\$11,792.00
	(\$1,965 per site)

Timing

We could undertake the fieldwork immediately upon receiving written authorisation to proceed. We note that permeability's testing is required and therefore envisage our final reports would be available up to four weeks after completion of the fieldwork.

General

The work would be carried out in accordance with our Terms of Engagement (copy attached).

If you have any questions in relation to the foregoing please contact the undersigned on 6332 2011.

Yours sincerely



Robert Cox
Geotechnical Engineer
Macquarie Geotechnical

Attached: Terms of Engagement

Macquarie Geotechnical - Terms of Engagement
ABN 73 102 691 056

1. SCOPE OF SERVICES

Macquarie Geotechnical will provide to the client, being the person requiring the services and for whom the services are being rendered, the consulting services described in these Terms of Engagement and the accompanying documents.

2. SKILL AND CARE

In providing the services, Macquarie Geotechnical will exercise the degree of skill, care and diligence normally exercised by professional consultants performing services of a similar nature.

3. CHANGE OF SCOPE OF SERVICES

The services described in the accompanying documents are based on facts known to Macquarie Geotechnical at the time of preparation of those documents including information supplied by the client. Subsequent information may indicate that the scope or timing of the services must be redefined or the client may request changes to the scope or timing of the services. If there is a change in the scope, order or timing of the services, Macquarie Geotechnical will be entitled to amend the price by an amount reasonable in the circumstances. Macquarie Geotechnical will provide the client with an amended scope of and schedule for the provision of the services and an amended price each of which will be deemed to have been approved by the client if not objected to within 10 business days after receipt by the client.

4. FEES

The client must pay Macquarie Geotechnical the fee and the reimbursable expenses (together called 'the price') as set out in the accompanying documents. A markup of 10% will be applied to the total cost of all reimbursable expenses to cover the cost to Macquarie Geotechnical of finance, administration and coordination. Reimbursable expenses include, but are not limited to, travel and accommodation, equipment use/hire, communications, computer usage and fees charged by other professional consultants as part of the agreement. The price may be subject to periodic rise and fall adjustment in accordance with the formula (if any) set out in the accompanying documents. Unless otherwise stated in the accompanying documents, the price is exclusive of any government impost or tax.

5. TERMS OF PAYMENT

The client must pay all amounts invoiced within 30 days after the date of the invoice. Any amount not paid within that period will attract interest from the date of invoice until payment at the reference or indicator rates used by Macquarie Geotechnical's principal banker plus 6% per annum. Payments received will be applied firstly against any interest owing under this clause and secondly against the outstanding invoice amount. Invoices may be rendered monthly for services performed in the preceding month, and when the services have been completed.

6. DELAYS AND CHANGES IN THE LAW

If events beyond the control of the client or Macquarie Geotechnical result in delay to any schedule agreed for the provision of the services, that schedule will be amended to the extent necessary to compensate for the delay. Macquarie Geotechnical will be entitled to an extension of time for providing the services equal to the delay. Macquarie Geotechnical may adjust the price to reflect any increase in costs or loss incurred as a result of the delay unless the delay is caused by Macquarie Geotechnical. If after the date of engagement of Macquarie Geotechnical under these Terms of Engagement there is any change to laws, licences, permits, approvals or statutory authorities relevant to the services and that change directly or indirectly increases the costs of performing the services or results in any loss being incurred by Macquarie Geotechnical, then the price shall be increased accordingly.

7. TERMINATION/SUSPENSION

The client may terminate the services of Macquarie Geotechnical if Macquarie Geotechnical is in substantial breach of its obligations relating to the services and that breach has not been remedied within 30 days after receipt of a written notice from the client identifying the breach and requiring it to be remedied. On termination by the client, the client shall pay Macquarie Geotechnical all invoice and interest amounts outstanding at the date of termination, the price for all services rendered up to the date of termination, and the amount of all expenses incurred and commitments made in relation to the services.

Macquarie Geotechnical may suspend or terminate its obligations relating to the services:

- if any money payable to Macquarie Geotechnical has been outstanding for more than 30 days; or
- if the client is in substantial breach of any of its obligations relating to the services which has not been remedied within 30 days after receipt of a written notice from Macquarie Geotechnical identifying the breach and requiring it to be remedied.

8. TIME LIMIT FOR MAKING CLAIMS

Macquarie Geotechnical, its members, servants, agents and sub-consultants, shall be deemed to have been discharged from all liability whatsoever in respect to the services, whether under the law of contract, tort or otherwise, at the expiration of one (1) year from the completion of the services, unless otherwise provided in the accompanying documents. The client (and persons claiming through or under the client) shall not be entitled to commence any action or claim whatsoever against Macquarie Geotechnical, its members, servants, agents or sub-consultants, in respect of the services after that date. For the purposes of this clause, Macquarie Geotechnical contracts on its own behalf and on behalf of its servants, agents and sub-consultants.

9. LIMITATION OF LIABILITY

The liability of Macquarie Geotechnical, its members, servants, agents or sub-consultants to the client arising out of the performance or non-performance of the services, whether under the law of contract, tort or otherwise, shall be limited to: the cost of supplying the services again, or paying the cost of having the services supplied again. The maximum liability of Macquarie Geotechnical, its members, servants, agents or sub-consultants, to the client arising out of the performance or non-performance of the services, whether under the law of contract, tort or otherwise, shall be the price actually paid by the client in respect of the services up to a maximum of \$60,000, unless otherwise provided in the accompanying documents. For the purposes of this clause, Macquarie Geotechnical contracts on its own behalf and on behalf of its servants, agents and sub-consultants. The client acknowledges and agrees that neither Macquarie Geotechnical, nor its members, servants, agents or sub-consultants, will be liable under the law of contract, tort or otherwise for economic loss, whether direct or consequential, suffered by the client or any indirect or consequential loss of any kind. Macquarie Geotechnical does not give any warranty nor accept any liability in relation to the performance or non-performance of the services except to the extent, if any, required by the law or specifically provided for in these Terms of Engagement or the accompanying documents. If, apart from this clause, any warranty would be implied wholly or in part by law, custom or otherwise, that warranty is to the full extent permitted by law hereby excluded. Nothing in these Terms of Engagement shall be read or applied so as to purport to exclude, restrict or modify or have the effect of excluding, restricting or modifying the application in relation to the supply of any goods or services pursuant to these Terms of Engagement of all or any of the provisions of Part V of the Trade Practices Act 1974 (as amended) or any relevant State or Territorial legislation which by law cannot be excluded, restricted or modified. Notwithstanding, and without limiting the provisions of this clause and clause 8, the client acknowledges and agrees that no member, servant, agent or sub-consultant of Macquarie Geotechnical will have any separate or individual liability to the client. The client will indemnify and hold Macquarie Geotechnical harmless against all claims, costs and demands by third parties in respect of the services.

10. INTELLECTUAL PROPERTY RIGHTS

Macquarie Geotechnical retains copyright and all other intellectual property rights in the drawings, reports and other documents and concepts provided by Macquarie Geotechnical as part of or in connection with the services. The client shall have a licence to use the drawings, reports and other documents provided by Macquarie Geotechnical in connection with the services for the purpose for which those drawings, reports and other documents are prepared. The client shall not use or make copies of those drawings, reports or other documents for any purpose other than that for which they were originally prepared.

11. RE-USE OF DOCUMENTS

If without Macquarie Geotechnical's approval, the client re-uses for any purpose other than that for which originally prepared; or makes any alteration to: any drawings, reports, document or other items supplied by Macquarie Geotechnical as part of the services, then the client does so at its own risk. The client will indemnify and hold Macquarie Geotechnical harmless against any claim made against Macquarie Geotechnical and all expense incurred by Macquarie Geotechnical, including legal expenses on a full indemnity basis arising out of any such re-use or alteration.

12. RETURN OF DOCUMENTS

The licence conferred upon the client pursuant to this clause will terminate upon: a) failure of the client to make any payment under these Terms of Engagement on the due date; and b) the termination of the agreement for the provision of the services by Macquarie Geotechnical and, upon request by Macquarie Geotechnical, the client will then return to Macquarie Geotechnical all drawings, reports and other documents provided by Macquarie Geotechnical as part of or in connection with the services, together with all copies or duplicates made by the client.

13. NO ASSIGNMENT

The client may not transfer, sublet or assign any of its rights or obligations under these Terms of Engagement without the prior written consent of Macquarie Geotechnical. Macquarie Geotechnical may engage another consultant to assist it in a specialist area. Macquarie Geotechnical will not require the client's consent where it is paying for the fees and costs of such consultant. If however Macquarie Geotechnical is of the view that the cost of Macquarie Geotechnical should be a disbursement to the account of the client, then it will be required to first obtain the client's consent to such engagement.

14. CONSTRUCTION SERVICES

Any opinion of construction costs prepared by Macquarie Geotechnical is supplied for the general guidance of the client only. Since Macquarie Geotechnical has no control over competitive bidding or market conditions, Macquarie Geotechnical cannot guarantee the accuracy of such opinions as compared to contract bids or actual costs to the client. Macquarie Geotechnical is the client's professional representative for the services and may make recommendations to the client concerning actions relating to the client's contractors; however Macquarie Geotechnical has no authority to direct or supervise the means, methods, techniques, sequences or procedures of construction selected by the client's contractors. For projects involving construction, the client acknowledges that under general professional practices, interpretations of construction documents in the field are normally required and that performance of construction related services by the design professional for the project permits errors or omissions to be identified and corrected at no or comparatively low cost. The client indemnifies and holds Macquarie Geotechnical harmless from all claims made against the Company and expenses incurred by Macquarie Geotechnical, including legal costs on a full indemnity basis, arising from the performance of construction related services by persons other than Macquarie Geotechnical.

15. INSURANCE

Macquarie Geotechnical will maintain insurance coverage for professional, public liability, motor vehicle, workers compensation and employer's liability in amounts in accordance with legal requirements and Macquarie Geotechnical's own business requirements. Certificates evidencing such insurance coverage will be provided to the client on request. For projects involving construction, the client agrees to require its construction contractor, if any, to include Macquarie Geotechnical as an additional insured on its policies relating to the project.

16. DISPUTES

If Macquarie Geotechnical and the client are unable to resolve any dispute, then it must be referred for mediation by an appropriate person (an architect, builder, lawyer or other person) depending on the nature of the dispute. Unless otherwise agreed between Macquarie Geotechnical and the client, the mediation will be conducted through the Australian Commercial Disputes Centre or any other agreed mediation organisation in accordance with its principles and practices at that time. If the dispute has not been resolved in this manner within one (1) month after first being identified as a dispute to be referred to mediation, then Macquarie Geotechnical and the client may exercise any of their other legal rights.

17. ANALYSIS OR TESTING

Where any analysis or test is to be made by Macquarie Geotechnical or its servants, agents, suppliers or sub-contractors, then Macquarie Geotechnical or its servants, agents, suppliers or sub-contractors shall not be liable for any loss or damage to or deterioration or destruction of any of the client's samples or property to be tested or analysed, unless due to the negligence of Macquarie Geotechnical.

18. GOODS AND SERVICES TAX (GST)

The Client acknowledges that all amounts payable by it to Macquarie Geotechnical under or by reason of these Terms of Engagement are exclusive of Tax. Macquarie Geotechnical may charge to and recover from the client an amount (Additional Amount) equal to any purported Tax in relation to these Terms of Engagement or performance of the services that is imposed or purported to be imposed upon Macquarie Geotechnical (in each case ignoring tax credits available to Macquarie Geotechnical), by increasing the amounts payable by the client or including an Additional Amount as a separate item in an invoice. Additional Amounts are not refundable in any circumstances. A separate Additional Amount applies to each supply of services. An Additional Amount shall also include an amount equal to the amount of purported Tax borne by, or charged by any person to, Macquarie Geotechnical in respect of goods, services and/or other things acquired by or paid for by Macquarie Geotechnical to the extent they were acquired or paid for in connection with the performance by Macquarie Geotechnical of any of its obligations under this agreement for which an input tax credit concerning GST or refund of GST cannot be obtained by, or if obtained is subsequently denied to, Macquarie Geotechnical.

19. AMENDMENT OF TERMS OF ENGAGEMENT

These Terms of Engagement may be amended only in writing signed by representatives of Macquarie Geotechnical and the client. These Terms of Engagement and the accompanying documents set out the whole of the agreement for the provision of the services. Client's purchase order or other terms and conditions are incorporated in and made a part of these Terms of Engagement only to the extent that such description is consistent with these Terms of Engagement and the accompanying documents. No other terms or conditions shall be binding upon Macquarie Geotechnical unless accepted in writing.

**Communication Plan
Rural Waste Management Strategy**

February 2005

Introduction

Bathurst Regional Council is reviewing its waste management services to rural residents. The following plan outlines some key activities recommended for implementation of significant changes to waste services to village residents. The plan relates to the closure of landfill tip sites in six villages; Rockley, Sunny Corner, Trunkey Creek, Sofala, Wattle Flat and Hill End. The tip closures will affect residents within the village and from surrounding rural properties. There may be potential for implementation of the program in Burruga in consultation with Oberon Council.

Aim

- To educate residents about the need for change in waste services and the affect of changes in EPA standards for rural waste services.
- To develop open channels of communication between the village communities and council throughout the research, implementation and follow-up stages of the program.

Objectives

- To prepare residents for inevitable and significant change in waste service delivery.
- To provide accurate and timely information to all affected residents.
- To develop an ongoing relationship between the new Council and village residents.
- To promote an environmentally friendly image of Council
- To work with the community to develop positive long term environmental outcomes that enhance the lifestyle of the Region
- To improve living environment of the Region.
- To manage risk of long term environmental damage to village environments

Strategies

It is suggested that the communication plan for the Waste Service Review be run in three stages;

Phase	Tactic	Cost	Timeframe
1. Research <ul style="list-style-type: none"> To establish community expectations about waste services Establish what they already know To identify number of affected residents and profiles Establish key supporters eg schools, progress assoc, individuals 	<ul style="list-style-type: none"> Community survey – focus questions on environmental values, satisfaction with current service Meeting with local schools and progress associations 	<ul style="list-style-type: none"> Existing budgets Travel time 	TBC
2. Educate <ul style="list-style-type: none"> Inform community of inevitability of change Your Waste Service is Changing' campaign Could be linked with implementation phase depending on timing of tip 	<ul style="list-style-type: none"> Ratepayers newsletter story Info brochure/post cards letterbox drop Posters provided at high traffic areas in the village Signage at tip sites Webpage on BRC site with feedback form option 	<ul style="list-style-type: none"> Brochure numbers TBC approx \$1,000 Letterbox drop \$500 Posters \$500 Signage \$2,000 School and community visits by Council (staff and Councillor participation) 	TBC

closures	<ul style="list-style-type: none"> ▪ Enlist program ambassadors eg schools, groups or individuals who will promote the strategy ▪ Produce education kits ▪ Local Media campaign – radio and print 	<ul style="list-style-type: none"> ▪ n travel and staff time) 	
<ul style="list-style-type: none"> ▪ 3. Implementation ▪ Tips are closing ▪ New cost structure ▪ Transfer station operation ▪ Set up evaluation tools for annual review 	<ul style="list-style-type: none"> ▪ Ratepayers news ▪ Village meetings ▪ Brochure in rates notice ▪ Radio Advertising ▪ Community projects get underway ▪ Fridge magnets listing collection days delivered with rates notice ▪ Introduction of Council sponsored Local Environment Awards 	<ul style="list-style-type: none"> ▪ No cost ▪ Existing budgets for radio ads ▪ Brochure production est \$1000 ▪ Awards program admin, prizes etc...\$500 	TBC

Key Messages

Key to the success of the impact of and campaign material, media activity, education programs is the development of a series of **key messages** that are reinforced through all activities of the plan. These will be developed in the research phase but could include;

- EPA guidelines recommend closure of village landfill sites as no longer viable waste removal option
- Landfill closure is inevitable

- Landfill has high risk of long term environmental pollution
- Closure of landfill sites will remove safety hazards to village eg fire and improve environmental quality
- Closure of landfill sites will improve environmental aesthetics of villages eg less loose litter
- Increased cost for collection service will be shared by all regional residents
- Waste service fee is based on type of service offered and scaled accordingly for rural and urban residents
- With an established system and more resources, Bathurst Regional Council will offer rural residents garbage collection service at a cheaper rate than what would have been available from Evans Shire Council.
- Landfill closure will provide an opportunity for the village community to develop a unique local environmental initiative
- Council will provide ongoing support to residents throughout the process

Risk Analysis

- Opposition from rural residents through media campaign.
- Negative media opinion toward Bathurst Regional Council seen as imposing higher costs on rural residents
- Opposition from residents due to lack of information.
- Increase in illegal dumping
- Impact of increase to BRC landfill site

Evaluation

1. **Media Report** – a report detailing media coverage and its value (positive, negative, neutral) will evaluate effectiveness of communication plan and changes to waste service
2. **2006 Community Survey** –will provide opportunity to evaluate community response to tip closures and new waste collection systems
3. **Website survey** – Can be conducted at any time or as part of regular monitoring and review of program.