



PART E

Alternatives Considered



E.1 Alternative Landfill and Resource Recovery Sites

The Proponent purchased the Euchareena Road Site on 31 January 2002 following a lengthy process to select a suitable site. A brief chronology of the site selection process to early 2002 is set out as follows.

- ▶ September 1997 - Orange City and Cabonne Councils' Joint Waste Management Committee commissioned a Regional Landfill Investigation/Feasibility Study – essentially a desktop study based on information available from Cabonne Council and various State government agencies.
- ▶ December 1997 - The Regional Landfill Investigation/Feasibility Study identified a range of constraints that would influence the selection of a suitable site. Two potential areas near the centre (or hub) of the Cabonne LGA were identified.
- ▶ July 1998 - A draft Heads of Agreement was prepared between Orange City and Cabonne Councils for the establishment and operation of a regional reprocessing facility. At that time, both councils recognized there should be less emphasis placed on land filling and more emphasis placed upon considering wastes as a resource.
- ▶ June 2000 - Circulation of an information brochure to residents of Orange City and Cabonne LGA's outlining the Councils' intention to locate a site for 'a reprocessing hub' to be acquired with the community's consent. A total of 11 community discussion meetings were held throughout Orange City and Cabonne LGAs as a follow up from the circulated information brochure.
- ▶ February 2001 - A discussion paper entitled 'Site Selection Criteria for the Regional Resource Processing Facility' was completed for the Councils' Joint Waste Management Committee. The paper included 22 criteria relating to regional, local and site specific issues. This document was advertised in the Central Western Daily and the Molong Express together with a request for offers of suitable land for the Councils' consideration that satisfied the site selection criteria.
- ▶ June 2001 - A final evaluation was undertaken of two sites offered following the February/March advertisement and two sites identified during the December 1997 feasibility study. The site now referred to as the Euchareena Road Site, was identified to be far superior than the other three sites assessed.

Throughout and following the preparation of the EIS for the Hub Regional Resource Recovery Facility, landowners around the Euchareena Road Site have regularly challenged the Proponent regarding the above process. There was an expectation of surrounding landowners, largely reflecting their rural/agricultural pursuits, that a waste management facility should not be located on prime agricultural land (in their locality). These landholders did not place the same emphasis upon the critical issues relating to on-site water management and the protection of groundwater resources (via a thick clay resource). Both of these issues were in fact paramount in the selection of the Euchareena Road Site.

Site selection criteria

The Proponent considered it important to seek community input into the criteria that were to be used to select a site for the facility designed and operated to manage the wastes generated in both Orange City and Cabonne LGAs.



Review of alternative sites

Whilst re-considering its approach to the overall project following the decision of the NSW Land & Environment Court, the Proponent commissioned Wright Corporate Strategy Pty Ltd (WCS) to undertake a further review of alternative sites for a waste facility comprising of some form of Alternative Waste Technology and a landfill for residual wastes. WCS in turn contracted Mr. Robert H. Amaral, an experienced waste management / geotechnical engineer, to undertake the further review of alternative sites.

Mr. Amaral prepared four assessments covering a total of 63 alternative sites between June 2008 and May 2009. His report for each site is reproduced within Appendix D.

The four assessments covered the following.

- Part 1: Fifty five (55) sites throughout Orange City, Cabonne, Blayney and Bathurst Local Government Areas. Each site was selected by Mr. Amaral initially as part of a desk-top study with the site evaluation of preferred sites involving a drive-by observation.
- Part 2: Four (4) sites throughout Cabonne and Parkes Local Government Areas provided to Orange City Council in response to a request to the public for Expressions of Interests for sites satisfying criteria assembled by Mr. Amaral. The four (4) sites offered to the Proponent were submitted during the period between 11 December 2008 and 12 January 2009, referred to as the Expressions of Interest period.
- Part 3: Three (3) additional sites within the Cabonne Local Government Area submitted confidentially following the closure of the Expressions of Interest period.
- Part 4: One (1) further site, namely Phillip Street Quarry, was considered further by Mr. Amaral.

An overview of the approach to Mr. Amaral's site selection process and the results of the process are outlined as follows.

Part 1: 55 sites through Orange City, Cabonne, Blayney and Bathurst LGAs

At the outset, the site selection process focused on selecting a site that would enable 'an environmentally secure landfill capable of receiving any residential or 'end of pipe' waste not suitable for any other purpose'. Mr. Amaral's site selection methodology initially focused on identifying sites based upon topography as this feature is fundamental to ensure the 'shape' of the landform could contain wastes and avoid 'run-on of surface water during rainfall events'. Mr. Amaral focused on topography for the initial sites selected as those sites at the head or top of an isolated catchment area are capable of being progressively filled from upgradient to downgradient with no external run-on of surface water. Suitable topography also provides benefits for visually screening a site.

The above process, based solely on topography, yielded 55 potential sites throughout Orange City, Cabonne, Blayney and Bathurst Regional LGAs (see Figure E.1-1). Three (3) of the 55 sites had been previously considered by the Proponent as part of the previous site selection process.

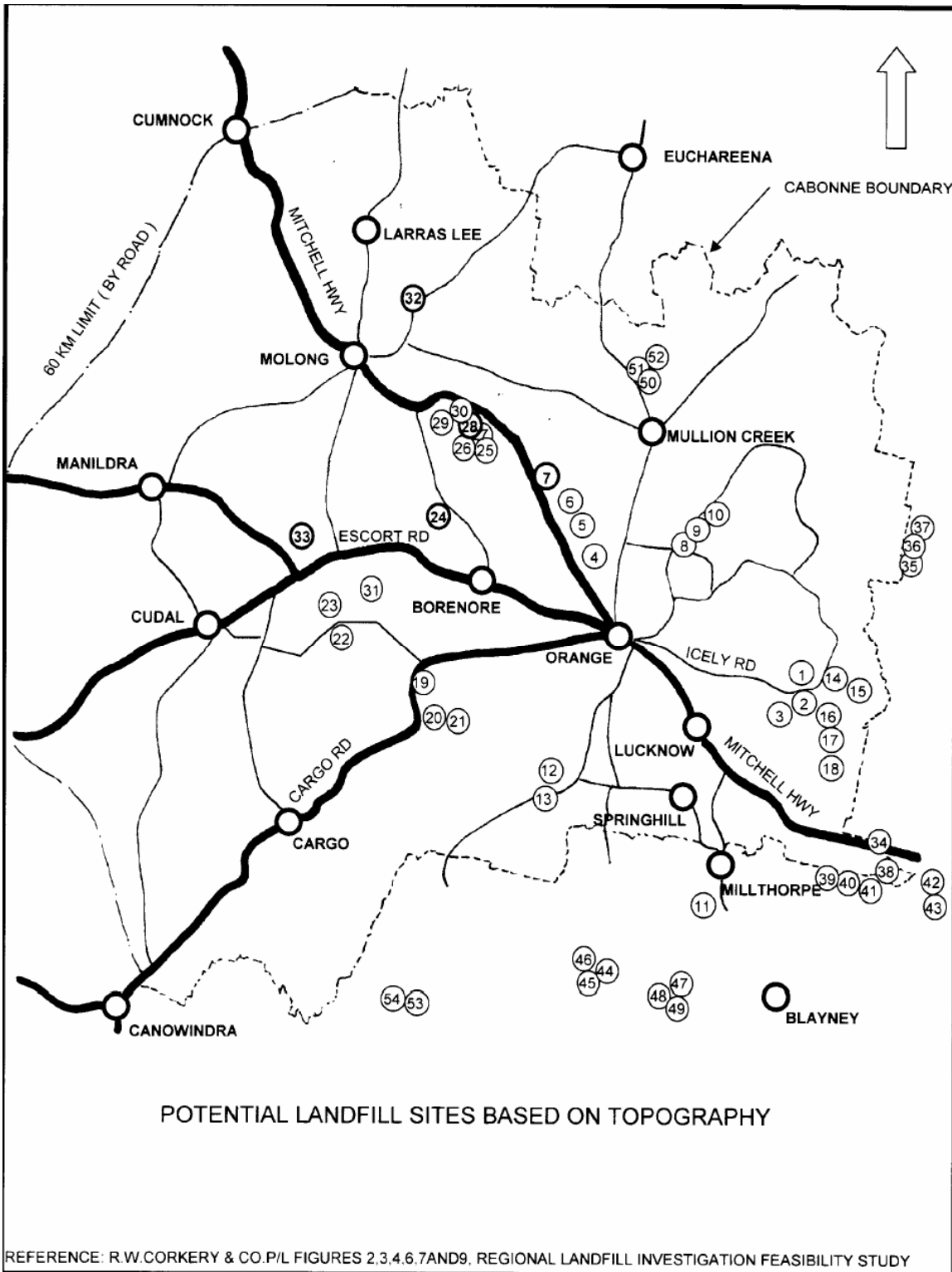


Figure E.1-1 Potential landfill sites based on topography

Mr. Amaral progressively reduced the number of sites through the consideration of a range of factors initially through a desk-top study and finally by undertaking a 'drive-by' view of the nine (9) preferred sites. The 'fatal flaws' factors should be evaluated by Mr. Amaral first including the following.

- ▶ Geology/soils/permeability
- ▶ Loss of amenity to existing or future residents
- ▶ Diverse or complex natural flora/fauna habitat
- ▶ Multiple titles to land
- ▶ Proximity to permanent water courses/water bodies
- ▶ Difficult/expensive access and/or development
- ▶ Landfill cover deficit

Table E.1-1 displays the sites discarded following the first stage of evaluation together with their reasons for being discarded. The Stage 1 process discarded 46 of the original 55 sites. Each of the remaining sites were viewed by Mr. Amaral from adjoining land or roadways. As a result of this process, four (4) further sites were discarded (see Table E.1-2).

Table E.1-1 Site selection summary (discarded sites – stage 1)

Site	Reason for discard	Site	Reason for discard
3	S, E(R), PW	30	EW
4	S, MT (buffer area)	31A/B	MT, LOA, E(R)
5	S, LOA, HP	24	LOA (Bathurst)
6	MT, HP, E(R), PW	35	D (Bathurst)
8	E(R), LOA, H	36	D (Bathurst)
9	LOA, S	37	D (Bathurst)
10	E(R), LOA, H, S	38	MT, EW, S
11	MT, S, D (Blayney)	39	D (Blayney), EW, LOA
14	H, LOA, E(R)	40	D (Blayney), MT, EW, LOA
15	E(R), H, LOA	41	D (Blayney), MT
16	E(R), H	42	D (Bathurst), E(R)
17	E(R),	43	D (Bathurst), E(R)
18	E(R), H	44	D (Blayney), LOA, PW
19	S, E(R), T, PW	45	D (Blayney), H
20	E(R), (LOA), PW	46	D (Blayney)
21	E(R), (LOA), PW	47	D (Blayney), MT, EW
22	E(R), MT	48	D (Blayney), EW, LOA
23A	E(R), MT	49	H, LOA, T



Site	Reason for discard	Site	Reason for discard
23B	E(R), MT	50	E(R), H
25	MT, PW	51	E(R), LOA
26	E(R), MT	52	E(R), LOA
27	MT, EW	53	D (Blayney)
29	EW, MT	54	D (Blayney), MT

LOA – Loss of Amenity E(R) – Difficult/Expensive Roadworks H – Diverse Flor/Fauna Habitat
 S – Special (Proximity to Orchards) MT – Multiple Land Titles PW – Proximity to Water Bodies
 IB – Inadequate Buffer EW – Exposure to Wind D – Distance from Orange
 HP – Historic Property T – Traffic Issue

Table E.1-2 Site selection summary (discarded sites – stage 2)

Site	Reason for discard	Comments
1	E(R) Icley Road	Very favourable site within a pint plantation. Poor intersection off Icley Road
2	E(R) Icley Road, EW	Would need extensive planting to provide visual screen and wind protection
12	E(R) on site, T	Would also require Giles Road/Four Mile Creek Road upgrades. Snow would provide OH&S issues at times in winter and possible road closures
13	E(R) on site, T	Would also require Giles Road/Four Mile Creek Road upgrades. Snow would provide OH&S issues at times in winter and possible road closures. Poor intersection off Four mile Creek Road

LOA – Loss of Amenity E(R) – Difficult/Expensive Roadworks H – Diverse Flor/Fauna Habitat
 S – Special (Proximity to Orchards) MT – Multiple Land Titles PW – Proximity to Water Bodies
 IB – Inadequate Buffer EW – Exposure to Wind D – Distance from Orange
 HP – Historic Property T – Traffic Issue

Table E.1-3 records a range of comments assembled by Mr. Amaral for the remaining five sites. Mr. Amaral favoured the discarding of one further site (No. 33) at that stage given the potential access difficulties and multiple owners.

Mr. Amaral's initial report concluded that four sites should be short-listed for further evaluation.

Mr. Amaral's review of the four sites established that the Euchareena Road Site was a suitable site for waste disposal and the three alternative sites, whilst not tested geologically had potential. Although issues relating to visibility and exposure to wind would need to be managed.

Given none of the final alternative three sites were considered superior to the Euchareena Road Site, and the environmental attributes of the site were known to be excellent, the Proponent acknowledged it was appropriate to focus the long term land filling component of the Project (with the enclosed composting plant) at the Euchareena Road Site.

Table E.1-3 Site selection summary (recommended site)

Site	Comments
7	<ul style="list-style-type: none"> ▶ Excellent access of Mitchell Highway ▶ Located within 1 holding ▶ Although somewhat exposed (visual/wind) it could be readily buffered by extensive plantings (possibly pine forest) ▶ The likely good (low permeability) soil/rock sequence needs confirmation by test pitting/drilling ▶ Approximately 1 km to Historic Property buildings
24	<ul style="list-style-type: none"> ▶ Access via Escort Road and Amaroo Road is paved ▶ Likely located within 1 holding ▶ Exposed to SW wind. Could be buffered by extensive plantings (possibly pine forest) ▶ The likely good (low permeability) soil/rock sequence needs confirmation by test pitting/drilling ▶ Exposed to distant views from 2 properties
28	<ul style="list-style-type: none"> ▶ Excellent access off Mitchell Highway ▶ Located within 1 holding ▶ Exposed to SW wind. Could be buffered by extensive plantings (possibly pine forest) ▶ The likely good (low permeability) soil/rock sequence needs confirmation by test pitting/drilling
32	<ul style="list-style-type: none"> ▶ 40 km from Orange (transport costs will remain a problem) ▶ Traffic through edge of Molong ▶ Rural residential lots to south (maximum 7 to be developed?) ▶ Site could be readily buffered by extensive plantings (possibly pine forest) ▶ Proven good (low permeability) soil/rock sequence ▶ Proven deep (40 m) non-saturated soil/rock attenuation zone beneath site ▶ Poor quality groundwater (TDS>1,000 mg/L) ▶ Land owned by Orange City Council ▶ Needs resolution of potential bee colony contamination with abutting Owner
33	<ul style="list-style-type: none"> ▶ Possible multiple owners ▶ Access may need to be through adjoining properties ▶ Sandy Creek Road upgrade required (could be a total of 6-7 km depending upon access into site) ▶ The likely good (low permeability) soil/rock sequence needs confirmation by test pitting/drilling

Part 2: Four (4) sites throughout Cabonne and Parkes local government areas

A total of four sites were offered to the Proponent by two individual property owners, Cabonne Council and a company near Parkes that owns the former Parkes Gold Mine. Mr. Amaral assessed that each of the former sites would have been discarded in the first round of his initial assessment for reasons



comparable to many of the 44 sites included in Table E.1-1. The reasons for discarding the four sites are outlined below.

- Site A1: Loss of amenity; distance from Orange; Limited size, Unlined and pervious soil.
- Site A2: Proximity to water bodies, loss of amenity and limited size.
- Site A3: Distance from Orange; loss of amenity (trucked traffic through Parkes); major development costs required; existing pit has OH & S issues; complex shared responsibilities associated with developing this site (ownership & environmental).
- Site A4: Distance from Orange; difficult/expensive road works (creek crossing); proximity to water bodies; difficult development due to steep land; loss of amenity, extensive buffering from road required

Utilising the former gold mine at Parkes (Site A3) would require waste to be transported over 100 km each way. The site has no approval to operate as a landfill, and would likely remain in private ownership during and after use as a landfill.

Part 3: Three (3) additional sites within the Cabonne local government area

Three further sites were offered confidentially to the Proponent following the closure of the Expressions of Interest period. Mr. Amaral reviewed these sites and similarly established the sites were not suitable.

Part 4: Phillip Street Quarry

Mr. Amaral reviewed the suitability of the Phillip St Quarry near the Ophir Road RRC and considered the quarry as an opportunistic site with the following major drawbacks which would make it difficult to obtain approval to be developed as a landfill.

- ▶ Loss of amenity for many local residents into the future (likely in excess of 50 years).
- ▶ The site is relatively close to an existing watercourse (Blackman's Swamp Creek).
- ▶ Groundwater is being extracted within 1.3 km of the site.
- ▶ The upper filling levels will be exposed to views and wind.
- ▶ Current traffic (5 days per week) would be increased (7 days per week).
- ▶ Operating the quarry and landfill jointly could create long term OH & S issues relating to the high quarry walls.

It is further noted that the Phillip Street Quarry has in the order of 3 million tonnes of high quality hard rock suitable for the production of a range of aggregates suitable for use throughout Orange City for its long term development. Realistically, this quarry which has an approval to extract the subject rock at a rate of between 50,000 t/yr and 75,000 t/yr could have an operational life of between 35 and 50 years.

To forego the extraction of this resource would be short sighted on the Proponent's behalf as its close proximity to Orange City and future development areas around the city. Increased development costs, particularly for the Proponent if this resource is not fully exploited. Furthermore, the importation of aggregates from the quarries surrounding Orange i.e. at Shadforth and Larras Lee (average 80 km return trip to Orange). The Proponent recognises, given the success/need for the stormwater harvesting program near Blackman's Swamp Creek, there is likely to be considerable benefit for the void created within the quarry to be used for stormwater harvesting.

E.2 Consolidate all Waste Operations in Orange

The scope to conduct AWT operations and continue waste disposal at the Ophir Road RRC was raised as a possibility during the Land and Environment Court case. However, the landfill is approaching its ultimate capacity and with other resource recovery operations already taking up much of the above ground space at the site, insufficient space is available for an AWT facility. Further, the only vacant land located near the waste management site is being used by the Proponent for stormwater harvesting – a vital need, given the current drought position in Orange and the Central West generally.

Some stakeholders have raised the idea of siting an AWT facility at a nearby Phillip Street Quarry. This proposition ignores the fact that the quarry is in current use and is far from depleted with some 3 million t of rock remaining. To access a similar material for use in orange would require transport from some 20 km away, generating truck movements, fuel and greenhouse gas emissions similar to the transport of materials to Euchareena road of some 44 km to a total volume of 1.5 million t.

In any case, the Proponent recognises the land use conflict issue that would be presented by placing an AWT in this increasingly urban context. The actual operating experience in Australia with AWTs is that odour and noise impacts can extend beyond confined operating site boundaries – a challenge that is not present at the Euchareena Road Site.

A further issue for the Proponent would be the operating complexity and increased cost brought about by having waste management activities at three sites.

This broad option also misses the point that the landfill within the Ophir Road RRC is nearing completion and access to new landfill capacity will be required in as few as five years see section A.4 on Justifiable Demand.

E.3 Alternative Regional Landfill Possibilities

Possible alternatives to the Project include making use of existing landfills already in operation at other regional centres. To provide a viable alternative to the 40 year expected life of the Euchareena Road RRC landfill, a regional landfill would need to have a large capacity. This would rule out most of the landfills operated by other regional councils in the Central West, as they are of small capacity, and their current consents would not be likely to permit large quantities of extra wastes to be received from Orange.

However, there is a council operated landfill at Dubbo some 150 km distant which has sufficient capacity to accept waste from Orange for at least 40 years, even if no recovery of food/garden organics occurs. In this Environmental Assessment (Section D.1.1), financial modelling of two options involving long term use of the landfill at Dubbo has been undertaken. One involves sending only residuals to Dubbo (continuing to offer a separate food/garden waste collection and enclosed composting service to Orange residents), while the second involves sending all wastes to Dubbo.

This has demonstrated that although it is technically feasible to proceed this way, both would be more expensive than the Project, and sending all waste to Dubbo (the base case) would not provide any improvements in diversion. Both would leave the Proponent with little control over future CPRS liabilities and landfill levies. Transport costs would be significant in both cases. There is also a probable need for the landfill host to gain appropriate new statutory approvals.

A second possible landfill site with sufficient future capacity is the Woodlawn Bioreactor landfill, near Goulburn. This site is disadvantaged by the transport distances and freight rail logistics, which may result the journey taking 3-5 days to complete. To accommodate this, the Proponent would probably have to purchase two sets of dedicated rail wagons. Hence there would be valid concerns about the state of the putrescible waste when it arrived at the site, due to the time spent in sealed containers.

In this situation, there would also be a need for the landfill host to gain appropriate statutory approvals. The scheme would also leave the Proponent open to landfill practices and gate pricing over which it would have only limited control or recourse. This option would also not assist the Proponent in achieving the State waste avoidance and resource recovery targets.

Another alternative that has been raised by community groups is the use of the Cadia Mine site for landfilling. This would require an area to be allocated for a landfill within the existing buffer zone which has been acquired by Cadia. The area would need to be appropriately located (i.e. so as not to impact on Cadia's mining activities) and terms negotiated so as to give adequate long term control to the Proponent for waste disposal purposes, by entering into a long term lease/licence arrangement.

Advantages outlined by the community group were avoiding the need to upgrade Euchareena Road, and that the environmental and social issues facing the mine (although on a larger scale) are supposedly the same as those faced by the Proponent in operating its own waste facility. However, it is understood that Cadia did not respond to the Proponent's Expression of Interest for a new site, and that Cadia has not contacted the Proponent to express any interest in operating a waste facility on its land.

One site offered during the Expression of Interest process was the former gold mine site near Parkes (refer Photo E.3-1). This site did not meet the distance requirement for the site selection process, in that it was more than 100 km away from the Ophir Road RRC. It also has difficult slope stability issues that

would make landfilling potentially unsafe. Both of the above-mentioned options would leave the Proponent with little control over future CPRS liabilities and landfill levies. Transport costs would be significant in both cases. There is also a need in each case for the landfill host to gain appropriate new statutory approvals.

Another option raised in public forums has been the possible use of the old sale yards site siding for a waste facility, to transport waste from Orange on this rail link to an unspecified site near a rail line. Without knowing the distances involved, it is reasonable to say that the challenges and costs would be similar to the Woodlawn rail option discussed above.



Photo E.3-1 Former gold mine site near Parkes

E.4 Alternative Routes

A number of alternative routes between the previously proposed facility (The Hub) on the Euchareena Road Site and Mitchell Highway were investigated in the *Transport and Traffic Assessment Report* (Transport and Urban Planning 2005). The following is a summary of the conclusions of that investigation:

Euchareena Road

The longer-term use of Euchareena Road would require costly road pavement and sub-grade improvements together with intersection improvements with the Mitchell Highway. In the shorter term, road pavement/ shoulder maintenance including improvements to line marking and route delineation together with improvements to Back Creek Bridge may accommodate a low to moderate increase in daily truck traffic.

Shades Creek Road

The longer term use of Shades Creek Road would require costly road pavements and sub-grade improvements together with an improved intersection treatment at the Mitchell Highway. In the shorter term improvements to the road pavement would be required to accommodate truck traffic.

The adoption of this route would require all future truck traffic to travel through Molong to the north making this route the longest and most circuitous route to the facility for non-local traffic.

Belgravia Road

The longer term use of Belgravia Road would require costly road pavements and sub-grade improvements together with an improved intersection treatment at the Mitchell Highway. In the shorter term improvements to the road pavement would be required to accommodate truck traffic.

The adoption of this route would cater for trucks originating in Orange but may require all future truck traffic from Molong to travel south through Molong making this route the longest and most circuitous route to the proposed facility for local traffic.

Other Routes

Other routes considered were:

- Euchareena Road/ Back Saleyards Road/ Deight Road;
- Euchareena Road/ Back Saleyards Road/ Molong Street/ Marsden Street/ Wellington Street;
- Euchareena Road/ Belgravia Road/ Strathmore Lane;
- Euchareena Road/ Back Saleyards Road/ Molong Street/ Marsden Street/ Stuart Street; and
- Euchareena Road/ Copper Hill Road.

It was concluded in the Transport and Urban Planning (2005) report that these four route options were considered to be unlikely to be economically viable or adequately satisfy design constraints and road safety parameters in terms of intersection treatments with the Mitchell Highway, pavement suitability and the infrastructure improvements required to provide acceptable route performance levels.