

## 2. Traffic & Transport

Ridgeland's Residents Inc objects due to the uncertainty of transport links in the EIS as the Muswellbrook Mine Affected Road Network Plan [formerly Western Roads Strategy] is under review and because of previous unsafe Glencore construction traffic use of narrow, winding, , and the death of David Patten on Wybong Road (2009) in not dissimilar roadway circumstances to mine and construction vehicle use of Ridgeland's Road.

The review is predicated on closure to public use of Mt Pleasant Northern and Western Link Roads (Mach Energy Consent), Dartbrook Link Road (Western Roads Strategy), Wybong Road East (Mach Energy Consent), Ridgeland's Road and Bengalla Link Road (Bengalla Coal Consent) and the Muswellbrook Hunter River Flood Study.

Ridgeland's Road links the village of Bunnan to Muswellbrook, Denman and Sandy Hollow. It is a vintage alignment, one lane rough and undulating sealed road surface, poor, torn to no road edges, floodways and culverts with adjacent metre deep drains and holes, unsafe intersections, inadequate signage and guideposting and confusing line markings. It has significant forested roadside edges and environment and borders the largely forested fauna rich biodiversity offset adjacent. It is used by predominantly by through vehicles, local residents, agricultural and service vehicles, the school bus and tourists.

Mangoola Project vehicles are correctly prohibited from use of Ridgeland's Road and should remain so for reasons of human safety. All MCCOP project traffic should be required to use the Wybong PO Road alignment entry.

The existing Muswellbrook Mine Affected Road Network is discussed in the following pages.

Road Transport - Western Roads Strategy  
1997 to 2015

(Malfeasance transferring \$47 million (2013) cost from  
Mt Pleasant Mine Condition 7 to the Ratepayers)

## FUTURE ROAD OPTIONS

### 3.1 DESCRIPTION OF OPTIONS

Four future road network options are illustrated in *Figures 3.1, 3.2, 3.3 and 3.4*. These options are also combined with the opening of the Dartbrook Link Road to public traffic in Options 1D, 2D, 3D and 4D.

#### *Option 1A, Minimal Change Option*

This option has reasonable alternative access for Castlerock Road and Dorset Road residents to the west of the proposed mines. It includes the basic road network improvements suggested by the study steering committee namely:

- Close Castlerock Road for 5 kilometres west of Kayuga Road;
- Close Dorset Road between 3 and 5 kilometres west of Kayuga Road;
- Construct Mt Pleasant Northern Link Road (to Dorset Road);
- Construct Kayuga Northern Link Road (to Dartbrook Road);
- Complete Bengalla Link Road (to Wybong Road); and
- RTA to construct Muswellbrook Eastern Bypass (by year 2005/6 approximately).

#### *Option 1D, Dartbrook Link Road Extension*

This is similar to Option 1A, but includes the Dartbrook Link Road Extension which connects directly to Kayuga Road. This will enable the Dartbrook Link Road to be taken over as a public road by Muswellbrook Shire Council. This improves local access to the New England Highway and reduces potential future traffic increases on the alternative Blairmore Lane route to the north for both local and mine traffic. It also assists in reducing local traffic on Kayuga Bridge.

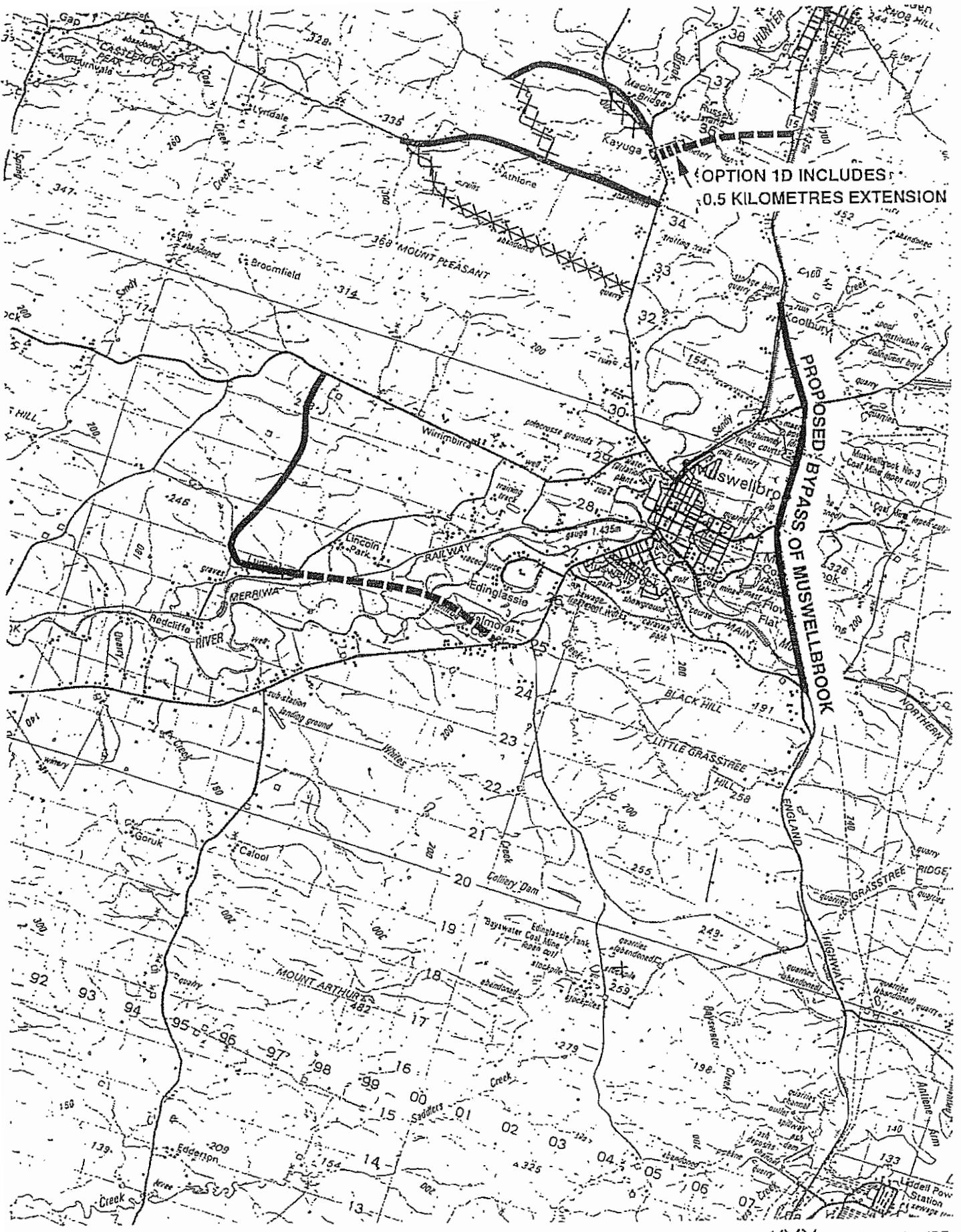
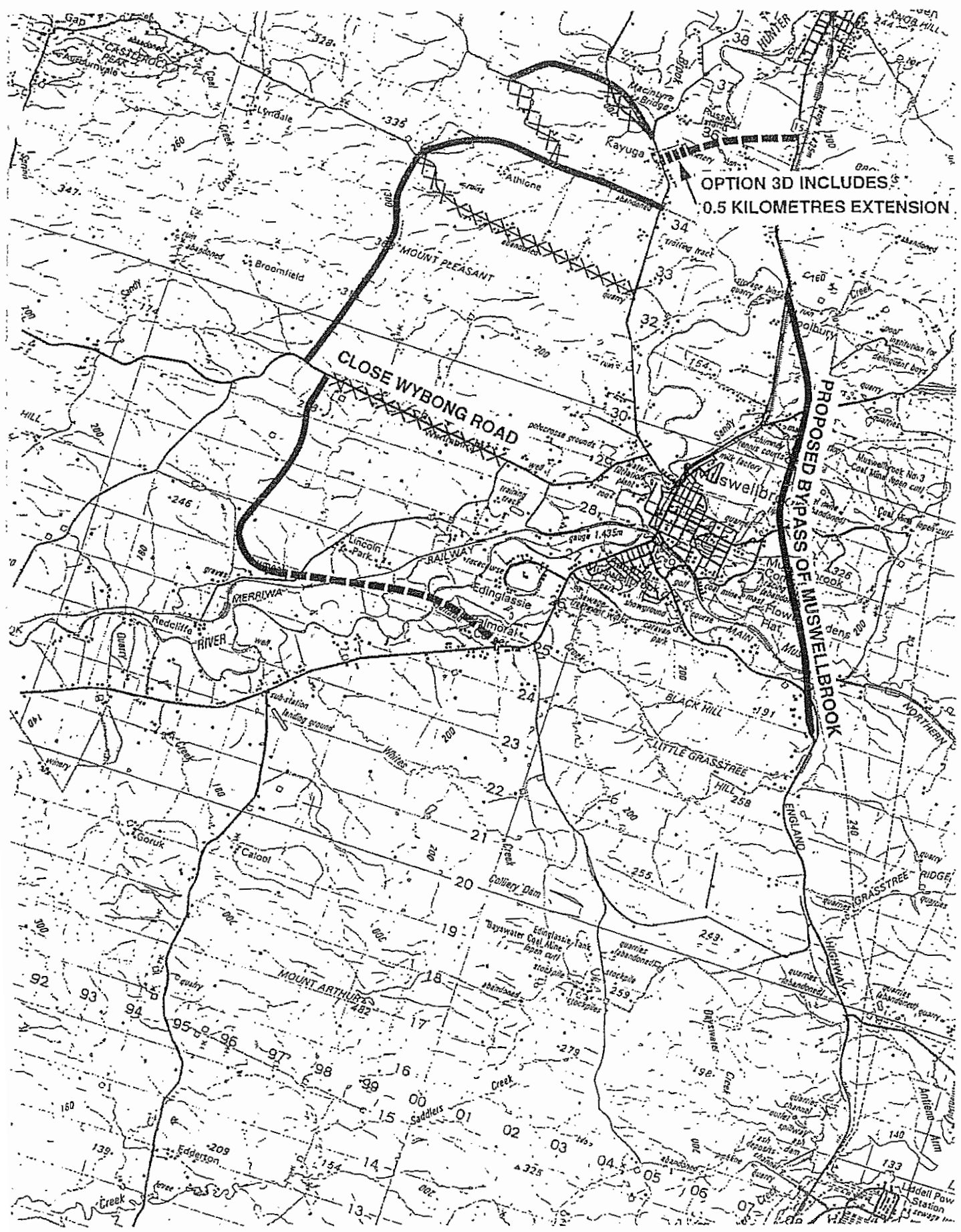


Figure 3.1

OPTION 1A/1D







OPTION 3D INCLUDES  
0.5 KILOMETRES EXTENSION

XXX ROAD CLOSURE

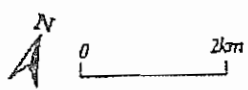


Figure 3.3 OPTION 3A/3D

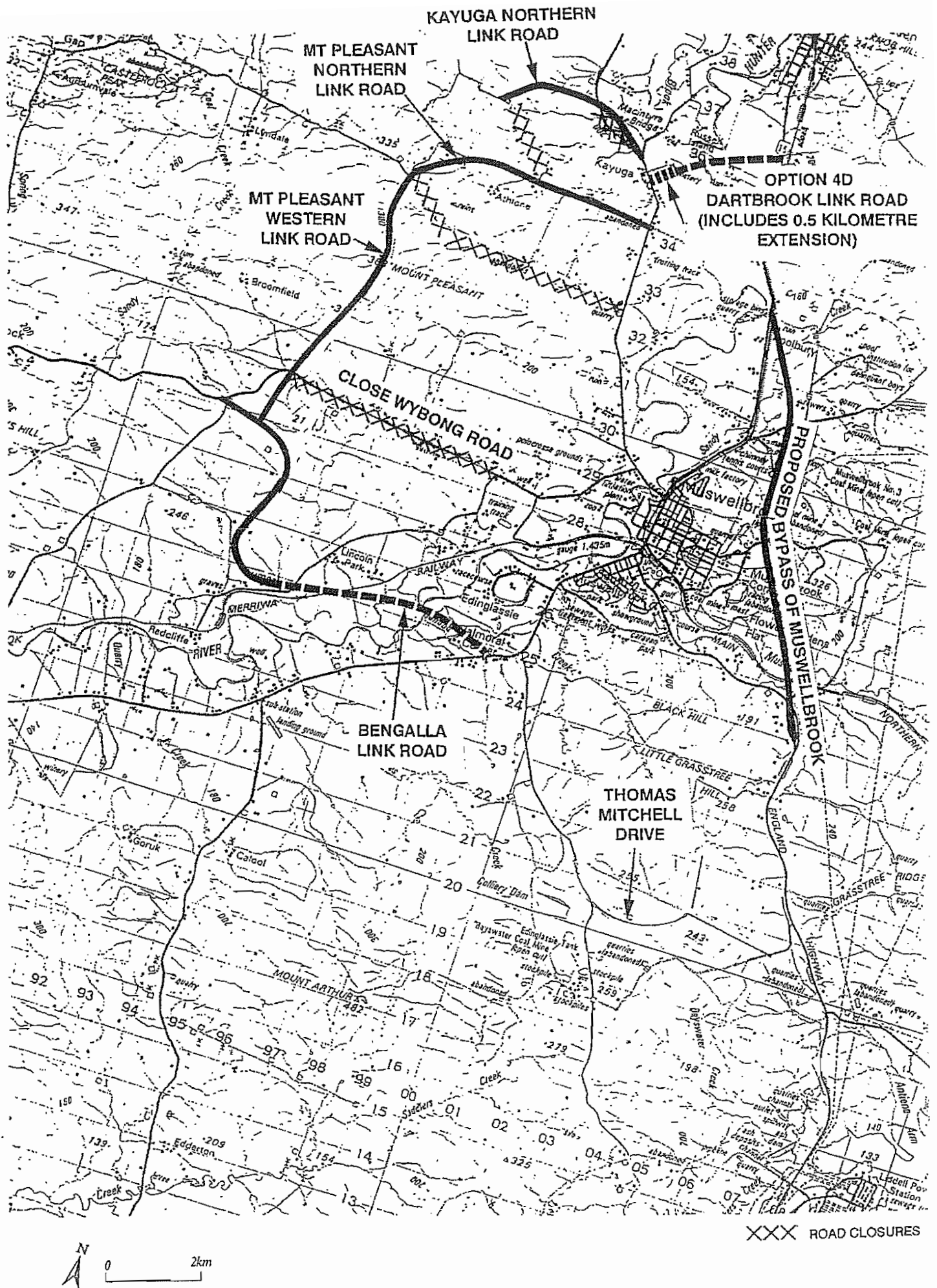


Figure 3.4 OPTION 4A/4D

*Option 2A, Mt Pleasant Western Link Road Option*

This includes all the road improvements and road closures in Option 1A, together with the Mt Pleasant Western Link Road. This additional link would give alternative access to the south for Castlerock Road residents but would primarily be used by Wybong Road traffic, Mt Pleasant mine traffic and Bengalla mine traffic travelling north. This option comprises the following road closures and road network improvements:

- Close Castlerock Road for 5 kilometres west of Kayuga Road;
- Close Dorset Road between 3 and 5 kilometres west of Kayuga Road;
- Construct Mt Pleasant Western Link Road (to Wybong Road);
- Construct Mt Pleasant Northern Link Road (to Dorset Road);
- Construct Kayuga Northern Link Road (to Dartbrook Road);
- Complete Bengalla Link Road (to Wybong Road); and
- RTA to construct Muswellbrook bypass (by year 2005/6 approximately).

*Option 2D, Mt Pleasant Western Link Road plus Dartbrook Link Extension*

This option is similar to option 2A, but includes the Dartbrook Link Road Extension.

*Option 3A, Close Wybong Road Option*

This option includes closing a section of Wybong Road and assumes that the Mt Pleasant Western Link Road and Bengalla Link Road would provide alternative routes to the north or south for Wybong Road traffic, Mount Pleasant mine traffic and Bengalla mine traffic. This option has the following road closures and road improvements:

- Close Wybong Road for 4 kilometres east of Bengalla Link Road;
- Close Castlerock Road for 5 kilometres west of Kayuga Road;
- Close Dorset Road between 3 and 5 kilometres west of Kayuga Road;
- Construct Mt Pleasant Western Link Road (to Wybong Road);
- Construct Mt Pleasant Northern Link Road (to Dorset Road);
- Construct Kayuga Northern Link Road (to Dartbrook Road);
- Complete Bengalla Link Road (to Wybong Road); and
- RTA to construct Muswellbrook Eastern Bypass (by year 2005/6 approximately).

*Option 3D, Close Wybong Road, with Dartbrook Link Road Extension*

This is similar to option 3A and includes the Dartbrook Link Road extension.

*Option 4A, Close Wybong Road, with Bengalla Link Road Diversion*

This is similar to Option 3A, but reduces local traffic detours for Wybong Road traffic from the west by connecting more directly to Wybong Road. An additional 1.35 kilometre link is included to the Mount Pleasant Western Link Road to the north. This option has the following road closures and road improvements:

- Close Wybong Road for 4 kilometres east of Bengalla Link Road.
- Close Castlerock Road for 5 kilometres west of Kayuga Road.
- Close Dorset Road between 3 and 5 kilometres west of Kayuga Road.
- Construct Mount Pleasant Western Link Road (to Wybong Road).
- Construct Mount Pleasant Northern Link Road (to Dorset Road).
- Construct Kayuga Northern Link Road (to Dartbrook Road).
- Complete Bengalla Mine Link Road with diversion to the west.
- RTA to construct Muswellbrook Bypass (by year 2005/6 approximately).

*Option 4D, Close Wybong Road, with Bengalla Link Road Diversion and Dartbrook Link Road Extension.*

This is similar to Option 4A but includes the Dartbrook Link Road extension.

### 3.2 CONSTRAINTS TO ROAD DEVELOPMENT

Constraints affecting the proposed alignment of the new road are identified in the following sections of this chapter, taking into account the following factors:

- Land ownership;
- Terrain;
- Environmental Factors;
- Intersections;
- Cost; and
- Overall feasibility.

None of the proposed link road options is likely to have significant ecological impacts on native flora or fauna. However, it should be noted that Aboriginal heritage items such as artefacts, camp sites and marked trees might occur along some of these proposed road alignments, particularly near water sources or the Hunter River or in areas which have not previously been extensively cleared. On this basis proposed road alignments identified in this report should be discussed with local Aboriginal groups.

### *3.2.1 Mt Pleasant Northern Link Road*

A preliminary road alignment is illustrated on *Figure 3.5*. The proposed route is about 5.5 kilometres long and generally follows the boundary between the Mt Pleasant and Kayuga mines. It deviates slightly to the south at the eastern end to follow Dorset Road, and the western end follows the property boundaries between Portions 73 and 45 to the south and 153 and 94 on the northern side.

At the western end the route climbs approximately 80 metres in 1.2 kilometres. It could connect with either Castlerock Road to the west or the Mt Pleasant Western Link Road to the south if required. The following design constraints have been noted in selecting the most suitable alignment for this road.

#### *i. Land Ownership*

The horizontal road alignment is constrained by a minimum curve radius of 560 metres for a design speed of 100 kilometres per hour. This constraint is not significant along most of the route to the east of the "Belgrave" property. However at the western end, the corners of property boundaries require the route to pass well within the boundaries of land to be acquired by the Mt Pleasant Mine.

#### *ii. Terrain*

The proposed route follows generally level terrain east of the "Belgrave" property with only one steep section for 500 metres, about 3.5 kilometres west of Kayuga Road. The route climbs fairly steeply west of the "Belgrave" property for 800 metres at gradients of up to nine per cent. This section requires up to seven metres of cut and fill.

#### *iii. Environmental Factors*

There will be no traffic noise or air quality impacts because properties adjacent to the proposed road will generally be acquired by the Kayuga or Mt Pleasant Mines.



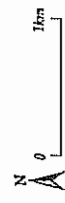


Figure 3.5  
 MT PLEASANT  
 LINK ROAD ALIGNMENTS

The elevated western section of the proposed road may have extensive views over coal mining operations which could be difficult to screen visually. Also, the existence of the road will prevent the future rehabilitation landscaping earthworks being undertaken consistently for both adjacent mines which will result in a future discontinuity of the landform to the north and south of the road.

*iv. Intersections*

The proposed road will have intersections at each end. All intermediate access points will be closed as a result of Kayuga and Mt Pleasant Mines.

*v. Cost*

The proposed road will have significant quantities of cut and fill near the western end and only minor earthworks at the eastern end. The overall average depth of cut or fill over the route will be between 1 and 1.5 metres, resulting in an average construction cost of \$1.1 million per kilometre (Appendix A). The estimated cost would be \$6.2 million including a new intersection at the eastern end.

*vi. Overall Feasibility*

Construction of the proposed route to 100km/hr design standard is feasible. Relatively steep gradients (8 to 9 per cent) on parts of the road are unavoidable because of the landform between the "Belgrave" property and Castlerock Road.

A major concern with this road however, is the possible sterilisation of valuable coal resources. The gross revenue to be gained from this "barrier coal" would be less than for the equivalent deposits beneath Wybong Road, (estimated as \$912 million in Section 7.3 of this report) but would still be highly significant, \$600 to \$700 million approximately.

In the next 30 years, some minor road realignments may be required to accommodate adjacent mining and rehabilitation operations.

### *3.2.2 Mt Pleasant Western Link Road*

A preliminary alignment for this road following the western boundary of the Mt Pleasant Mine is illustrated on *Figure 3.5*. The 4.9 kilometre long route passes close to the top of Mount Pleasant and generally follows existing ridge lines to the north and south. An alternative alignment passing through the Broomfield property one to two kilometres further west was also considered initially but was found to require significantly greater quantities of cut and fill to provide an equivalent road alignment.



i. *Land Ownership*

The alignment is contained within two property ownerships which may need to be acquired by Mt Pleasant Mine. It follows existing tracks for most of the route, although a 100km/hr design speed horizontal alignment requires a number of minor deviations from these tracks.

The southern end of the route will run alongside a future 66 kV electricity transmission easement. A crossing would be established for mine trucks travelling west to coal reject emplacement areas.

ii. *Terrain*

The proposed route is less steep than the Mt Pleasant Northern Link Road, with maximum gradients of seven to eight per cent for 300 metres to 400 metres either side of Mt Pleasant. There is only one major cutting required near the top of Mt Pleasant which has a maximum depth of eight metres, restricting the alignment to an 80 km/hr design speed vertical curve.

iii. *Environmental Factors*

The proposed route will have minimal environmental impacts as it will follow the boundary of Mt Pleasant Mine and there will be no residential properties in the vicinity. It may be difficult to screen mining operations from elevated sections of the proposed route near the ridge line.

iv. *Intersections*

The road will have no intermediate intersections but will require a rural T-intersection at the northern end to connect with Castlerock Road and the Mt Pleasant Northern Link Road. At the southern end, at Wybong Road, there will be another T-intersection.

v. *Cost*

The proposed route will have an average depth of cut or fill of approximately 1.5 metres and a typical construction cost of \$1.2 million per kilometre (Appendix A). The estimated cost would be \$6.2 million including two intersections.

vi. *Feasibility*

The proposed alignment appears feasible although some future issues must still be resolved such as provision for mine trucks to cross the route near the southern end and the need to accommodate both road and electricity easements.

3.2.3 *Kayuga Northern Link Road*

The alignment for the Kayuga Mine Northern Link Road is illustrated in *Figure 3.6*. The western section of the proposed route is 2.1 kilometres long and is required to provide alternative access to a small number of rural properties which would remain at the western end of Dorset Road.

The eastern 0.9 kilometres of the proposed route is a deviation of Dartbrook Road which enables an increased area of land to be mined.

i. *Land Ownership*

The proposed route is on land which has been acquired by Kayuga Coal Pty Ltd for the Kayuga Coal Mine.

ii. *Terrain*

The proposed route has one relatively steep section with a gradient of just over ten per cent extending for about 400 metres, about one kilometre from the western end of the new road.

iii. *Environmental Factors*

There are no residential dwellings near the proposed route which could be affected by traffic noise or dust. Erosion control measures will be required to accommodate changed drainage patterns in the creek catchment on the northern side, downstream of the proposed road.

The western end of the proposed road will be relatively elevated and will have views over Kayuga Coal Mine, which may be difficult to screen.

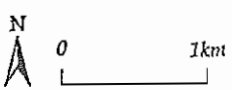
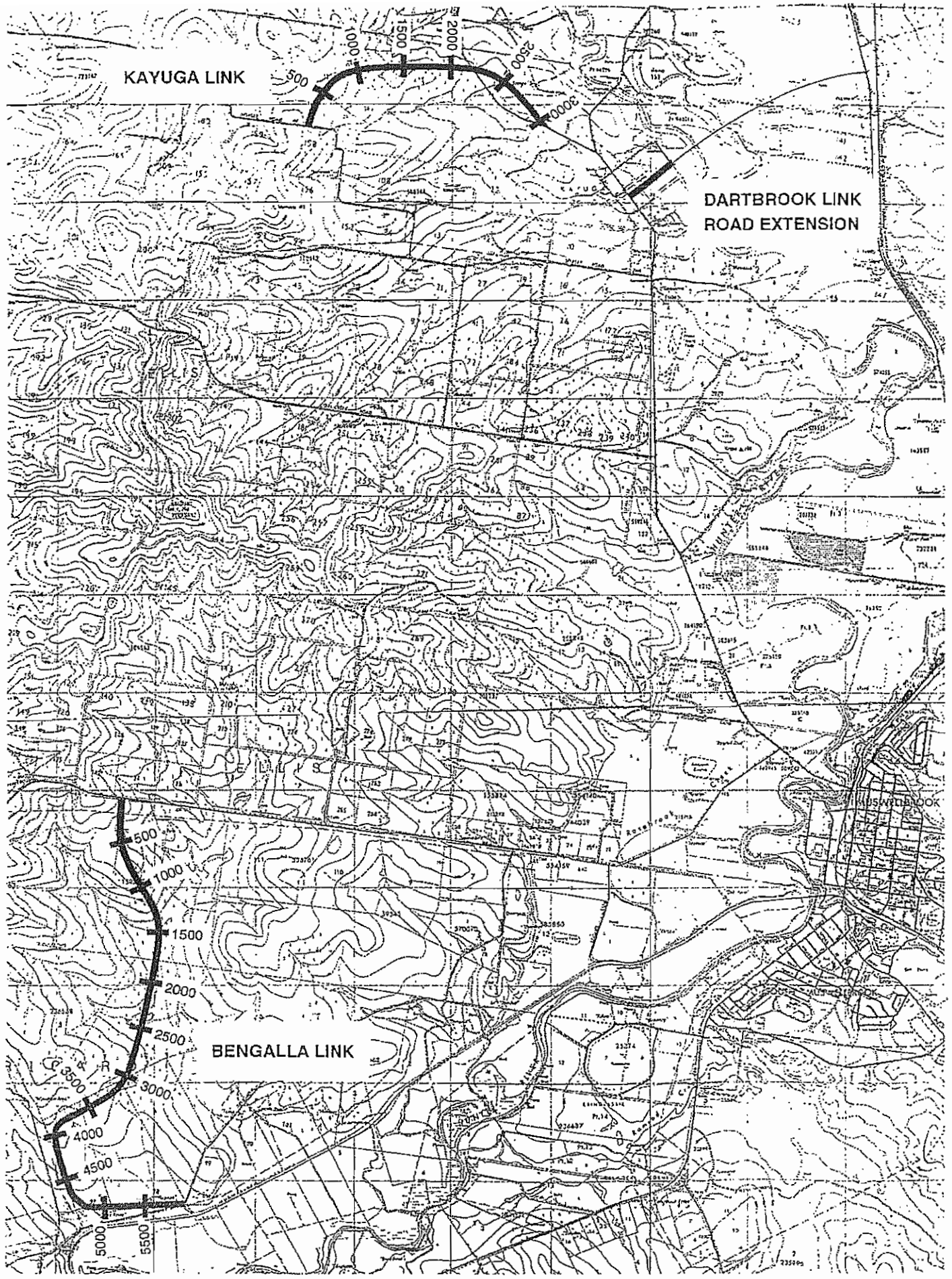


Figure 3.6 ADDITIONAL LINK ROAD ALIGNMENTS

*iv. Intersections*

The proposed route will connect into Dorset Road at a T-intersection at the western end. It will join the existing alignment of Dartbrook Road at the eastern end and will require a T-intersection approximately 0.9 kilometres from the eastern end to connect into Dartbrook Road to the north.

*v. Costs*

The proposed route will not require extensive cut or fill and could be constructed at a cost of approximately \$0.9 M per km (Appendix A). The overall estimated cost including the two intersections would be approximately \$3.0 M.

*vi. Feasibility*

The proposed route is feasible, with no significant constraints. The relatively steep 400 metre section with a gradient of over ten per cent is necessary because of the landform along the route and is acceptable for a minor road of this nature.

### **3.2.4 Completion of Bengalla Link Road**

Completion of the western section of the Bengalla Link as proposed in the Bengalla Mine EIS is illustrated in *Figure 3.6*. The route is approximately 5.0 kilometres long from the proposed Bengalla Mine Infrastructure Area to Wybong Road and is constrained by the proposed rail loading loop for Mt Pleasant Mine.

*i. Land Ownership*

The proposed route follows the western edge of the Bengalla Mine Lease Boundary. At the northern end, close to Wybong Road, the route passes across a property currently owned by E.E. Maclean and others which will need to be acquired to construct the Mt Pleasant Mine Rail Loading Loop. Elsewhere the route passes through properties already acquired by the Bengalla Mining Company.

*ii. Terrain*

As with other road links, this road has one section with a relatively steep gradient of approximately 7 per cent for 350 metres at the northern end. Elsewhere the route generally follows ground contours at between 160 - 170 metres, alongside the Bengalla Mine Lease Boundary and the future Mt Pleasant Rail Loop.

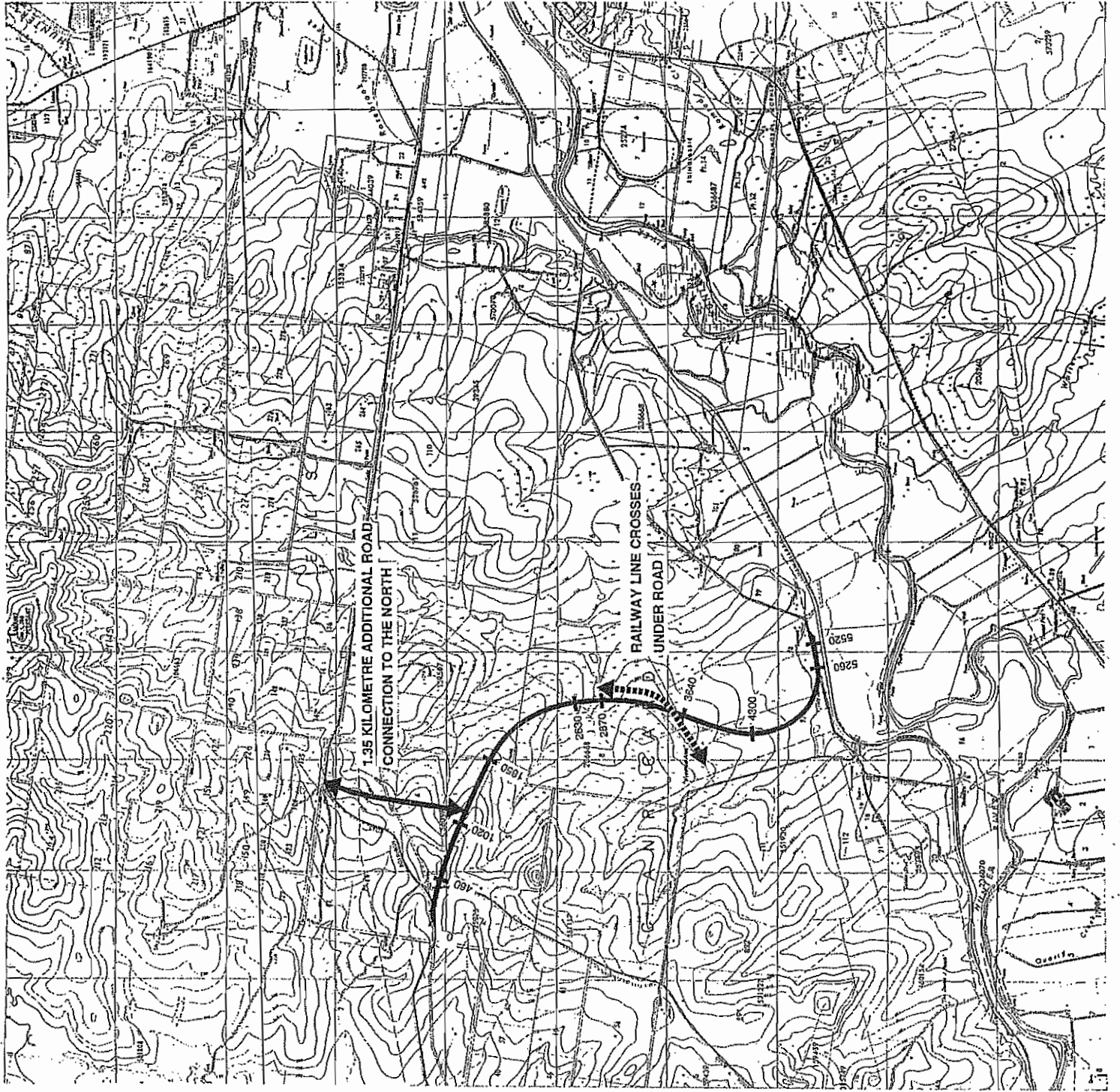


Figure 3.7  
BENGALLA MINE LINK ROAD  
DIVERSION TO THE WEST

i. *Land Ownership*

A substantial section of the proposed diversion passes through privately owned property. In order for this diversion to proceed, land ownership issues would need to be resolved.

ii. *Terrain*

Road gradients with this alignment are generally flat, being a maximum of five per cent, although this gradient is maintained for a considerable distance from 0.3 kilometres to 1.5 kilometres east of Roxburgh Road.

iii. *Environmental Factors*

There are no residential dwellings in the immediate vicinity of the route which would be affected by traffic noise or dust. Potential environmental impacts would primarily be construction related, including changes to drainage patterns. There would also be a redistribution of traffic on approach routes to the town of Muswellbrook.

iv. *Intersections*

There would be an additional intersection at the western end at Wybong Road, relocation of the intersection at Roxburgh Road and an additional intersection at the junction with the 1.35 kilometre long road connection to the north.

v. *Costs*

The diversion would be approximately 0.2 kilometres shorter than the route shown in the Bengalla EIS, resulting in a small saving in construction costs of \$0.2 million. However, for the Mt Pleasant proposal to proceed, the additional costs of a bridge crossing the proposed Mount Pleasant Rail Loop (\$1.0 million) and the additional 1.35 kilometre road connection to the north (\$1.8 million approximately) would need to be considered.

vi. *Feasibility*

The diversion would marginally decrease the construction costs for the Bengalla Mine Link Road and will provide a more direct connection to Muswellbrook for Wybong Road traffic from the west. Additional environmental impacts are minor but require land acquisition from private properties. Additional consideration will be required of the costs related to the development of the Mount Pleasant Mine if this diversion is adopted.

### 3.2.6 Dartbrook Link Road Extension

Opening the Dartbrook Mine Link Road to the general public would require a new road approximately 500 metres long, as shown in *Figure 3.6*.

#### *i. Land Ownership*

The 500 metre extension will traverse two blocks of pastoral land owned by the Shell Company of Australia and J & NM Lonergan. Each of these blocks would be severed into two portions.

#### *ii. Terrain*

The terrain is flat, which will minimise earthworks.

#### *iii. Environmental Factors*

Extending the Dartbrook Link Road will have no direct traffic noise or air quality impacts as no dwellings adjoin the route. There may however be some amenity impacts from additional traffic using Kayuga Road in the immediate vicinity.

The road would not be built up significantly above surrounding land and would not affect flooding patterns in the Hunter River. It would however sever two portion pastoral land.

#### *iv. Intersections*

The proposed road extension will have two intersections to connect with the Dartbrook/Kayuga Mine surface facilities access road and with Kayuga Road.

#### *v. Cost*

Likely construction costs will be approximately \$0.8 million per kilometre, because of the minimal earthworks (Appendix A). The total cost would be approximately \$0.7 million including the two intersections.

#### *vi. Feasibility*

The extension would be relatively straightforward and feasible, subject to acquisition of the necessary corridor. Opening this route as a public road would make Muswellbrook Shire Council liable for future maintenance costs of the existing 2.5 kilometre section of this road.



### 3.2.7 Future Muswellbrook Eastern Bypass

In the later years considered in this study there would be a major bypass of the New England Highway to the east of Muswellbrook.

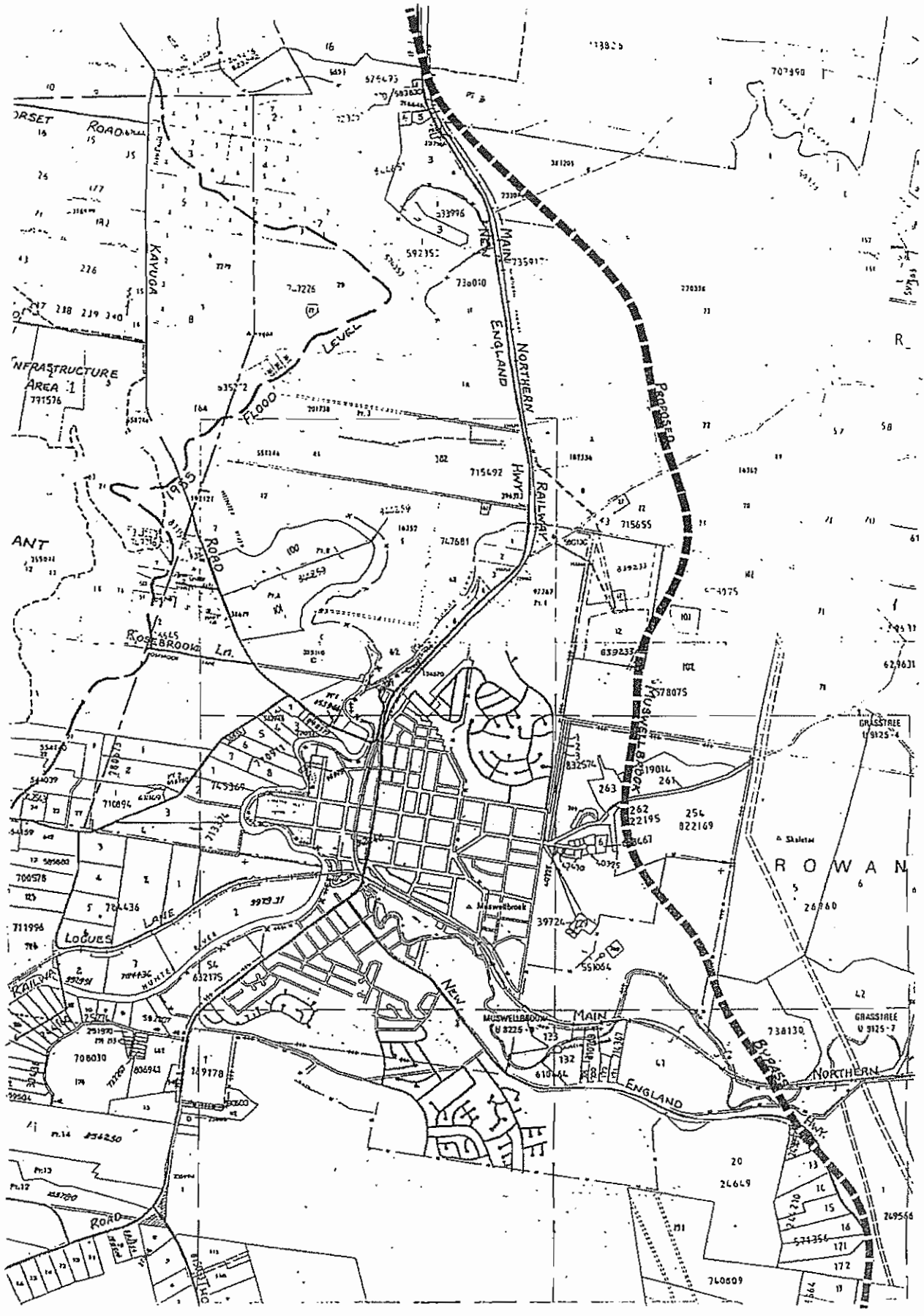
In 1992 the RTA considered six design options and found the alignment in *Figure 3.8* had the best mix of engineering and social benefits. This route is approximately 12 kilometres long. The estimated construction cost in 1992 was between \$32 M and \$42 M.

This route was selected by the RTA after considering a wide range of controls and constraints, namely:

- future residential expansion;
- development of sporting facilities;
- disused electricity sub-station;
- electricity transmission lines;
- current and future open-cut coal mining;
- Muswellbrook waste disposal centre;
- Aboriginal land grants and claims;
- sensitive environmental areas;
- landuse - residential and rural;
- interchange site potential;
- minimisation/optimisation of structures;
- local road network planning;
- Hunter River flooding; and
- future strategy including a possible Aberdeen bypass.

An internal bypass, suggested by the Muswellbrook Chamber of Commerce was considered, but failed to satisfy the National Highway design criteria as both ends of the bypass were preceded by a 60 km/h zone, the horizontal and vertical alignments were below standard, and the route could be severely flooded by the Hunter River.





N  
 Not to Scale

Figure 3.8 FUTURE EASTERN BYPASS

Mt Pleasant Mine Condition 7 Road Transport  
1997 to date

## **7.2 Road Transport**

1. The Applicant shall, as required by Council and/or the RTA:
  - (b) prior to the closure of Castlerock Road, construct at its own expense, the Mount Pleasant Northern Link Road to Dorset Road;
  - (c) prior to the closure of Wybong Road, construct at its own expense, the Mount Pleasant Western Link Road, from the intersection of the Bengalla Link Road to the intersection of the Mount Pleasant Northern Link Road, generally in accordance with Council's Western Roads Strategy;
  - (e) should the following intersections be required, undertake construction works at:
    - (i) the intersection of the Western Link Road and access to the mine site,
    - (ii) the intersection of the Bengalla Link Road and the Western Link Road,
    - (iii) the intersection of Castlerock/Mount Pleasant Northern Link Road and the Western Link Road,
    - (iv) the intersection of the Mount Pleasant Northern Link Road and Kayuga Road.
2. The Applicant shall contribute an amount, determined by Council to the maintenance costs of the Wybong Road between the mine access and Kayuga Road (including the Rosebrook Bridge) for the period from commencement of construction and concluding with the commencement of the use of the Bengalla Link Road by the Applicant.
7. Should a construction road be proposed, the Applicant shall provide either an overpass or underpass across Wybong Road, or other means of crossing Wybong Road, to Council's satisfaction.

## Hyder Report 2008

## 5.4 BCR results

The results of the cost-benefit analysis are given in terms of the following five decision criteria:

- Net present value (NPV), which is equal to the discounted benefits minus the discounted costs or the overall economic worth of the project. This is the decision criterion that the NSW Treasury Guidelines recommend when projects are mutually exclusive.
- NPV per \$ of capital invested, which measures the return on investment, explicitly taking capital constraints into account. It is the method recommended in the NSW Treasury Guidelines for ranking of projects.
- BCR - RTA is the discounted benefits divided by the discounted costs (capital and maintenance). This is the method recommended in the RTA Economic Analysis Manual. The inclusion of maintenance costs in the discounted costs implies that there is some restriction on the availability of both capital and recurrent funds for roads.
- BCR - Auslink is the net benefits (discounted benefits minus the discounted costs except capital costs) divided by the discounted capital costs. This method of calculation is used in both the NSW Treasury and Auslink Guidelines and gives a return on investment; and
- First year rate of return (FYRR), which is the net benefits in the first full year of operation divided by the discounted capital costs. The Auslink Guidelines state that it provides an indication of the project's optimal implementation time (past or future) and whether a deferral is warranted.

Appendix B includes the economic analysis results.

Table 5-9 Cost-Benefit Analysis Results by discount rate

Criteria	7%	4%	10%
Present value of investment costs	-152,305	-164,718	-141,235
Present value of benefits and other costs	65,045	108,329	42,192
NPV (\$'000)	-87,260	-56,389	-99,044
NPV per \$ invested	-0.6	-0.3	-0.7
BCR - RTA	0.4	0.7	0.3
BCR - Auslink	0.4	0.7	0.3
FYRR (%)	2.2	2.4	2.0

At the preferred discount rate of seven percent, the proposed Muswellbrook Bypass has a negative economic worth, with costs exceeding benefits by over \$87 million. The BCR is less than 1, using either method of calculation, and the FYRR is less than the discount rate.

- The southern section of the new bypass was forecast to carry about 12% more traffic than the northern section.
- The bypass would be effective in reducing traffic flows by an average of between 5,000 and 5,500 vehicles per day on the New England Highway over the next 30 years. This represents a traffic reduction of between 24% and 34% on the New England Highway after the bypass is built, and
- **The bypass will save approximately 5 minutes travel time.**

The cost-benefit analysis followed the Roads and Traffic Authority Economic Analysis Manual (December, 2007) and uses a seven percent discount rate, as recommended in the NSW Treasury Guidelines for economic appraisal. Sensitivity analysis was also performed using a four percent and ten percent discount rate. The estimated capital cost to build the Muswellbrook Bypass is \$185 million (2008 values), comprising \$178.8 million for construction and \$6.2 million for property acquisition. The estimated benefit cost ratios (BCR) of bypass is summarised in Table 5-1.

**Table 5-1 Estimated Benefit Cost Ratios (BCR) of bypass by discount rate**

Criteria	7%	4%	10%
Present value of investment costs	-152,305	-154,719	-141,236
Present value of benefits and other costs	65,045	108,329	42,192
NPV (\$'000)	-87,260	-56,391	-99,044
NPV per \$ invested	0.6	0.3	0.7
BCR - RTA	0.4	0.7	0.3
BCR - Austlink	0.4	0.7	0.3
FYRR (%)	2.2	2.4	2.0

At the preferred discount rate of seven percent, the bypass has a negative economic worth, with costs exceeding benefits by over \$87 million. The BCR is less than 1. The economic results of the proposed bypass improve at the more favourable four percent discount rate, although the economic worth remains negative. The most significant benefits from the bypass would be travel time savings, but they are well below the capital costs.

## 2013 RIO-TINTO Road Plan



# MINE AFFECTED ROADS NETWORK PLAN

Neil Pope – Director Community Infrastructure at Muswellbrook Shire Council; and  
Keith Blackmore - Senior Partner – Cardno

## Abstract

Muswellbrook is at the heart of a major coal resource and a number of large mines have developed and are expanding.

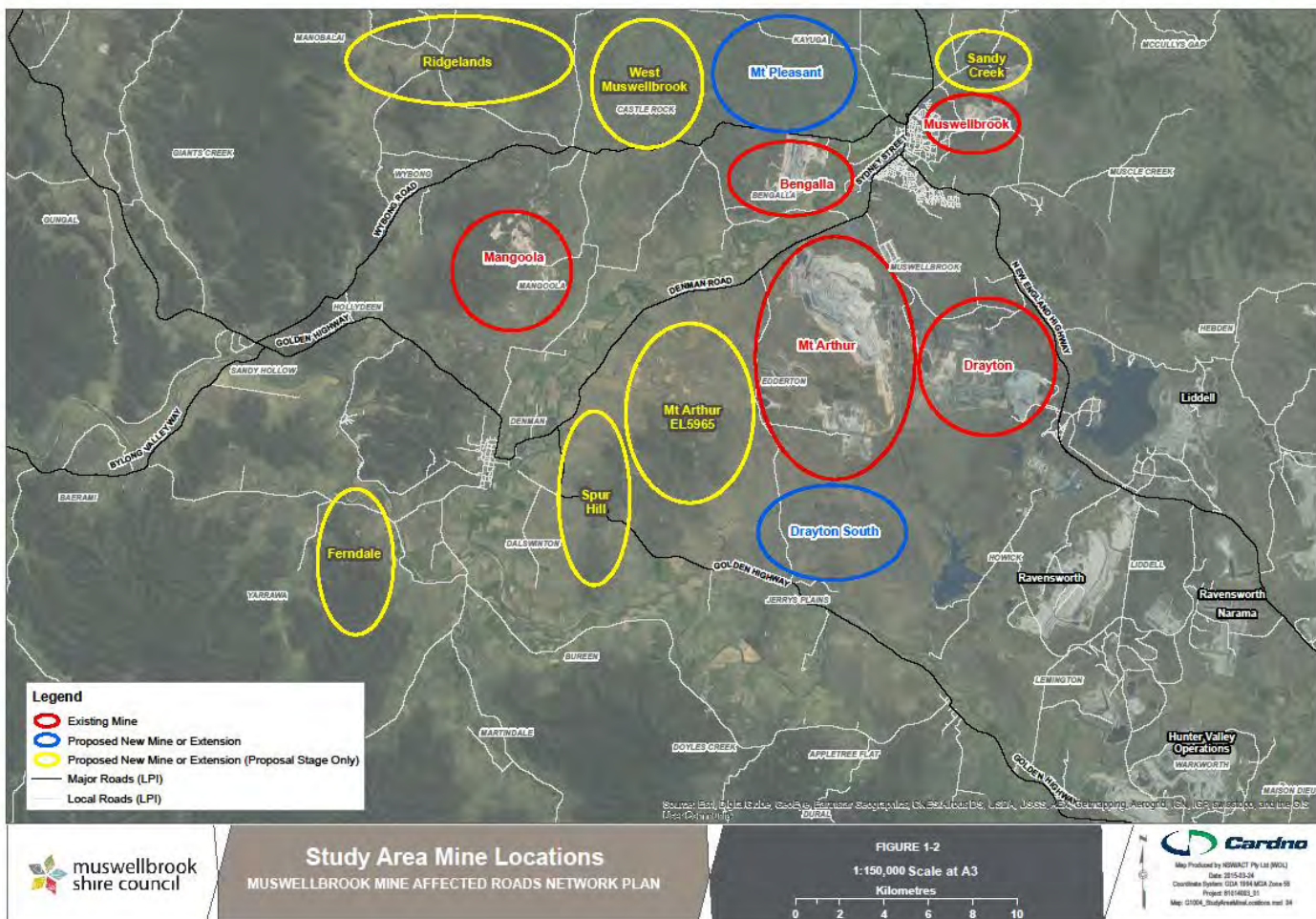


Fig 1 Study Area Mine Activity





Previous road planning has been informed by the 1997 Western Roads Strategy, and via reactive analysis to each application. The EIS generally have failed to capture the impacts on a network level. The 1997 Plan was becoming less relevant as mining investment plans have changed. Several major proposed road deviations caused the plan to be reviewed.

This paper will explain how Council has devised a strategic approach and engaged with the State Government and four major mining companies as funding partners to develop a strategic plan and funding strategy to inform the planning and road management for the next twenty years. Council has engaged consultants Cardno to provide the technical and planning work.

**Key Words: Traffic Roads Network Planning Contributions Plan Collaboration**

## Introduction

The scale of the roadworks required to provide and sustain appropriate access to the enormous scope of the combined mining activities (Ref Figure 1) with the shire has the potential to severely impact on council's financial sustainability. Failure to provide adequate maintenance of these new and upgraded assets throughout the life of the mining phase could have serious safety and financial consequences.

It is also critical to assess the impacts of road network efficiency for all road users and to ensure the community is left with a suitable network legacy post-mining activity.



Muswellbrook productive mine capacity rose from 4Mt pa in 2001 to 62Mt pa in 2013. Further expansion is being planned, although the current downturn has caused delays to investment.

The Upper Hunter Strategic Regional Land Use Plan states (in Chapter 5): 'It is estimated that 63 per cent of the gross regional product comes from mining. Between 2006 and 2010, direct employment in mining in the region rose from 5,500 to more than 11,000. Mining support industries, such as engineering, construction, transport, logistics and human resources have also become well established in Singleton and

Muswellbrook.' (Department of Planning and Infrastructure, 2012)

Previous road planning in the North West sector was guided by the Western Roads Strategy (ERM Mitchell McCotter, 1997) and via reactive analysis to each application in other sectors. The EIS have failed to capture the impacts on a network level. We estimate that for every tonne of coal transported out (by rail), inputs represent around 4%. Inputs are road transported and include, for example: diesel; plant; explosives; and services. This has never been clearly identified in EIS analysis; but the heavy vehicle impacts are very significant in terms of Equivalent Standard Axle (ESA) loading. Construction activity can be intense and lead to abnormal use of roads with consequent accelerated damage. Development of a new mine costs in excess of \$1B (\$US), and see multiple contracts running concurrently and up to 700 construction workers on site. Council monitored these movements and compared them with EIS predictions and found that they were up to twice the predicted levels.



These are State Significant developments and the State is the consent authority; however, Council has successfully negotiated conditions into planning consents that attempt to attribute roadworks directly to the mines that have triggered them; and the application of ongoing contributions to maintenance, or in some cases maintenance agreements of sections of road for the life of the mine. Voluntary Planning Agreements

(VPA) bind these commitments to the consents.

The 1997 Plan was becoming less relevant as mining investment plans changed. Several major proposed road deviations caused the plan to be reviewed. The mines are generally progressing westward, and this meant mining through roads. The resulting cumulative impacts of the network efficiency were becoming an increasing concern.

### **Conceiving the Project**

Staff identified that a new road network plan was required. The aim is to manage logical, orderly and equitable provision of appropriate, efficient and safe road access to existing and planned mines.

We decided to follow the processes outlined in the RTA Publication - Network and Corridor Planning Practice Notes as they apply in this context. I (Neil Pope) had prior experience managing development a shire-wide plan for Taree urban growth in the early 1990's. We researched modern traffic survey methods and s94 Planning. The scope was expanded to include consideration of:

- Analysis of ESA-km;
- Maintenance over the life-cycle;
- Update of the Asset Management Plan;

The brief was developed as a two-stage process, with the second stage scope and pricing to be refined after completion of the first stage.

#### Stage 1

- (a) Document review
- (b) Traffic modelling sufficient to provide comparison of various options and scenarios; and finally to provide a rigorous basis (nexus) for planning, infrastructure and financing decisions to follow.
- (c) An appropriate arterial and collector road plan for the parts of the network predominantly servicing the

mining industry for the medium (20yr) and long (40yr) term.

#### Stage 2

- (d) Implementation and funding strategy; including:
  - Infrastructure required, and the triggers for provision.
  - A prioritised schedule of works.
  - All lands required (conceptual not survey accurate);
  - Operational and maintenance costs.

#### (e) Developer Contributions Plan

Detailed notes explained the issues and expectations under each sub-section.

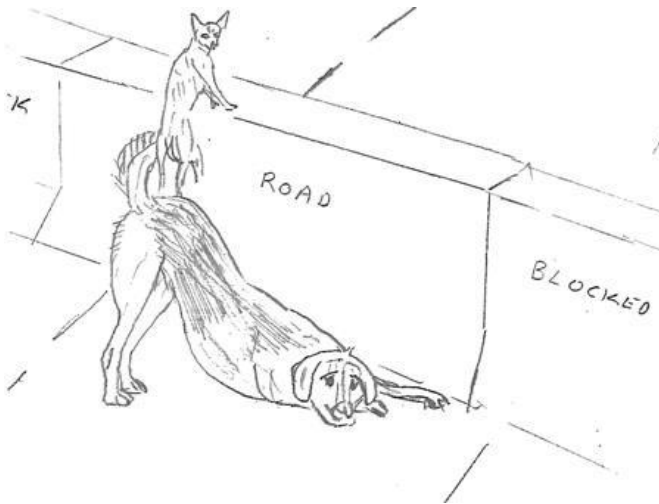
At the time of writing this paper, Stage 1 was complete; however, Stage 2 had not commenced

The preliminary estimate of the cost of the work was \$400,000. For context, the preliminary estimated scope of road and bridgeworks exceeded \$120M. In late 2012, staff put a proposition to Council that such a study was justified and represented value to the stakeholders. Council supported the project in principle, and was prepared to co-fund it; and authorised staff to seek funding contributions from key stakeholders.

A steering committee was formed to oversee the project: myself; one NSW Planning and Environment (DoPE) representative; one Roads and Maritime Services (RMS) representative; and one councillor.

Staff sought funding contributions of \$50,000 towards the Strategy from six industry members, RMS, and DoPE. Most stakeholders approached could readily identify the potential value to them. By April 2013, staff had received commitments of \$250,000 funding for the Strategy from four industry members and the DoPE. RMS provided in-kind support.





Without trust, respect and collaboration from the stakeholders this project would not have progressed

### The Contract

The brief was refined by the steering group members and a tender was formulated using AS 4122. The Request for Quotation (RFQ) was via Local Government Procurement Partnership's Vendor Panel (Prescribed under the regulation). Eight pre-qualified suitably experienced consulting companies were invited to submit quotations. In September 2013 the contract was awarded to Cardno.

Meetings were held with Cardno and the various stakeholders and the steering group to commence work. The mines were requested to provide information about their growth and development plans. The RMS were also investigating replacement options for Kauyuga Bridge; so it was decided to integrate this work with the strategy.

### Traffic Modelling

SkyHigh Traffic Data undertook origin-destination surveys in the district around Muswellbrook. The field method involved the use of video equipment to collect images of vehicles' numberplates at sixteen two-directional stations. Observations were classified into:

1. Non-heavy (light) vehicles

2. Heavy vehicles

3. B-doubles and larger vehicles

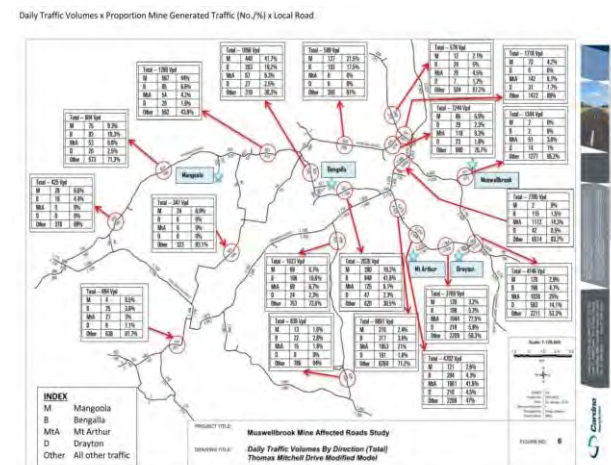
This analysis provides an indication of movements between observation stations as well as travel times. Vehicle number plates were observed within the study area over the course of the survey period, and these were processed and analysed for subsequent reporting.

The OD work was supplemented with conventional classification counts. The model was developed and calibrated against existing historical count records; and a number of growth rate forecasts.

Road works occurring on Thomas Mitchell Drive at the time of the counts affected the use of that route. The traffic model was adjusted accordingly to match pre-roadworks distributions of traffic available from previous counts and studies.

The base model can attribute traffic from various mines to the each network link by volume and by vehicle class.

Figure 2



Local 'Mine Related Traffic' in this study only refers to traffic with origin or destination at one of the four Muswellbrook mines on the day of the traffic count. It does not include the TMD Industrial Estate, or traffic that interacts with the many mines just outside the LGA. The proportion of mine-related traffic to total traffic volumes has been assessed to determine the

roads that are impacted the most by the local mines. The modelling identifies the proportion of local mine related traffic compared to total traffic, and the proportion of heavy vehicle (HV's) traffic including Multi-Combination Vehicles (MCV) for each road section. The % HV on the network studied attributable directly to the four mines varied between 26% to 70%.

The majority of the traffic (approx. 71%) on the northern section of Thomas Mitchell Drive (between the Industrial Area and Denman Road) is not directly linked to the local mines.

### ***Crash history***

Crash history was analysed; however, the relatively low numbers made drawing conclusions difficult. Within the five year period, three fatal crashes and 34 injury crashes were recorded. The fatal crashes occurred on Edderton Road and Wybong Road West, and the roads with the most crashes are Wybong Road (21) and Thomas Mitchell Drive (20).

Crash history was utilised during the recent upgrade design for works at: Edderton Rd where the two fatalities occurred; Wybong Road West, Bylong Valley Way; and for Thomas Mitchell Drive.

### ***Road Capacity***

The RMS mid-block level of service (LoS ) for rural roads is defined by a number of factors. An assessment of the existing road conditions identified that all road sections within the study area operate well within the acceptable LoS C or higher, apart from Thomas Mitchell Drive North between Denman Road to the Industrial Area (identified as a mid-block Level of Service of D) and over capacity by 124 veh/hr.

Detailed consideration was also given to constraints on over-size and over-mass vehicles, as these are very common at Muswellbrook.

### ***Future Demands on the Network***

In order to identify and model options, the future demands needed to be predicted.

Cardno tabulated existing consents and consulted with the various mines and the DoPE to develop 20 year and 40 year mine growth scenarios. Mine life expectancies were charted.

Summaries of mine planning listing: coal tonnages; employment levels; and mine progression planning. Although there is high uncertainty and a downturn at present; the proposed and potential mine operations identified will see mine activity continuing at an increased level within the Muswellbrook LGA for the foreseeable future.

Background traffic growth rates have been estimated at 0.9% from several sources:

- The Hyder (2008) Muswellbrook Bypass report states (on Page 66) that: The marginal through traffic growth on the New England Highway should be calculated at 1.45% between 2007 and 2020 and 1% until 2037.
- Census data period 2006 to 2011; growth was 0.83%pa).

The Shire has a diverse economy with various rural, urban and service sectors. All of these are critically important to a balanced diverse economy, which will continue to exist post mining. Viticulture and horse breeding are significant rural activities. There is small scale tourist industry activities associated with these operations. These activities do not generate large numbers of vehicles; but they do have very specific issues.



It is important that the operational needs of all road users be considered and that the impacts on safety and efficiency of the overall rural road network as a result of mining activity be properly assessed and mitigated to an acceptable level.

### Road Network Scenarios

The various options were compared by the steering group on a Multi-Criteria Analysis considering: Conceptual costs over lifecycle; Network Efficiency; Safety; Environmental; and Social

The network options need to provide safe and efficient local access from the State network, rather than alternative or parallel routes. Some of the local network is used for emergency purposes.



The Hunter River and floodplain and the Ulan railway line present significant constraints to additional linkages from Wybong Road to Denman Rd. Significant geographical constraints exist on the Golden Highway at Ogilvies Hill. The coal resource lease areas also constrain options significantly.

Within each precinct, several alternatives were compared. The evaluation has determined that the following strategies offer the best solution in the short, medium and long term.

<b>To improve the connectivity of Wybong Road to the New England Highway north of Muswellbrook, implement Option 1C which includes:</b>	<b>Estimated Cost (+ 30% Contingency)</b>
1. Replace the Kayuga Bridge in its current location	\$7M
2. Upgrade Aberdeen Street from Kayuga Bridge to the New England Highway	\$6.4M
3. Upgrade Wybong Road (East) and Kayuga Road from the new southern Link Road to Kayuga Bridge.	\$5M
<b>To address the proposed closure of sections of Wybong Road and Castlerock Road to facilitate coal extraction by the Mt Pleasant Mine, implement Options 2B and 3A which include:</b>	<b>Estimated Cost (+ 30% Contingency)</b>
4. Construct a Southern Link Road connecting Wybong Road (East) via Overton Road to the Bengalla Link Road west of the Hunter River crossing (Option 2B) in lieu of the previously proposed Northern and Western Link Roads	\$23M
5. Upgrade Dorset Road and connect to Castlerock Road (to rural road standard) to facilitate access to properties on these roads.	\$11M
6. Modify the proposed Bengalla Link Road Diversion (Option 3A)	\$33M
7. Extend Bengalla Link Road and Upgrade Wybong Road	\$21M
<b>To improve connectivity to, and the functioning of, the Main Road Network, implement Options 3C and 3D which include:</b>	<b>Estimated Cost (+ 30% Contingency)</b>
8. Upgrade Wybong Road (West) (Option 3C) and Reedy Creek Road (Option 3D) in the long term	\$42M \$12M
9. Pursue the reclassification of Thomas Mitchell Drive as a Main Arterial Road under State control	Nil



10. Reconstruction of Edderton Road (Northern and Southern Diversion) on the less efficient alignment	Northern \$25M Southern \$29M
11. Examine opportunities to forego the reconstruction of Edderton Road on the less efficient alignment (as proposed by Mt Arthur Mine and the proposed Drayton South Mine) in lieu of contributions for works to improve the safety and efficiency of the Golden Highway	Nil
12. Consult with NSW Roads and Maritime Services in relation to options to avoid or rectify problems associated with the Golden Highway. In particular: - the Ogilvies Hill alignment and gradients; - the ability of the bridge crossing of the Hunter River near Denman to accommodate oversize vehicles; and - potential mine subsidence impacts at Ogilvies Hill from proposed underground mining; and, - main road traffic within Denman township.	Nil

**Figures 3, 4 & 5** below show the specific initiatives that form the Road Network Plan recommendations.

The traffic impacts the critical alternative road improvements have been modelled to allow comparison of the respective traffic benefits. From this it was concluded that the Wybong Road to Bengalla Southern Link Road Connection was a viable alternative, in lieu of the Western and Northern Link Roads.

Growth comparisons were run through the traffic model for Yr 2034 and Yr 2054.

## Stage 2 Implementation Strategy and Developer Contributions Plan

This work was not complete at the time of writing this paper; an update will be given at the conference.

The work involves:

Works scheduling and cost apportionment (required upgrading and maintenance of local roads)

Preparation of a Developer Contributions Plan (based on the apportionment of traffic directly attributable to existing and future mining operations in the Shire).

Where possible, the various options are linked to 'triggers'. The aim is to minimise the 'pool' of works to be funded by a contributions Plan; by, where possible, linking a section of work to a particular mining development.

Costing is being done on a lifecycle basis. We also require contributions for operational maintenance and periodic capital maintenance; not just the initial construction and upgrade costs.

For roads that will be permanently lost and for roads that will be significantly diverted to the extent that the route efficiency is permanently compromised, there should be an attempt to minimize the impact; but where inevitable, there shall be compensation.

If it is impractical to restore the network post mining; then that compensation could be either via works elsewhere on the Mine Affected Roads Network, or via a contribution.

The Network Plan and funding strategy will need to be a 'dynamic document' responding over time to the performance of the roads within the network, and to changing circumstances affecting the likely rate of growth in demand on the road network.

## Construction

Council is currently managing a very large capital roadworks program.

Council has been fortunate over the past two years during the development of this strategy to secure very significant grants and contributions towards the mine affected network from:

- Hunter Infrastructure Investment Fund (HIIF) \$4M;
- Resources for Regions (R4R) Rounds 1, 2 & 3 \$22.5M;
- Direct mine contributions \$7M;
- Councils own revenues \$3.6M

The work being done on this strategy and on the Thomas Mitchell Drive Contributions Plan has informed and supported the various application assessments and the composition of the grant applications which require sound planning and business cases.

Council has directed these funds to sections of the network that cannot be directly attributed (triggered) by a single mining activity. This \$37.1M has made a significant improvement to the network.



## Conclusion

The scope of the collective roadworks in this Plan is very significant; and certainly could threaten the financial sustainability of the council going forward if not carefully managed.

The strategy provides a means whereby mining related proposed changes to the local road network can be considered at least at a shire wide context and financial responsibilities fairly distributed to various stakeholders.

The completed Plan will be used by relevant government agencies (local and state) to guide the development of priority safety, traffic, asset and infrastructure maintenance, and improvements. It will also be used by industry and the community to understand proposed changes in the network over time that may influence their decisions

## References

Some text, and diagrams in this paper have been sourced from the Muswellbrook Mine Affected Roads Network Plan (CARDNO for MSC, 2015)

ARTC (2013) Hunter Valley Strategy – Final

CARDNO for MSC (2015) Muswellbrook Mine Affected Roads Network Plan

Department of Planning and Infrastructure (2012) *Upper Hunter Strategic Regional Land Use Plan*

ERM Mitchell McCotter for MSC (1997) Western Roads Strategic Traffic Study

GHD for Department of Planning and Infrastructure (2015) Thomas Mitchell Drive contributions plan

HYDER for RTA (2009) HW9 New England Highway Detailed Traffic Study and Modelling of Proposed Muswellbrook Bypass

CONFLICTED AS  
EMPLOYER IS RIO TINTO



## Authors Biography and Photographs

**Neil Pope** BE (Civil) MIE Aust.  
Director Community Infrastructure,  
Muswellbrook Shire Council  
PO Box 122 Muswellbrook NSW 2333  
Australia  
[Neil.pope@muswellbrook.nsw.gov.au](mailto:Neil.pope@muswellbrook.nsw.gov.au)



I have worked in this interesting role for the past 9 years. In 2006, this council was not financially sustainable. By a range of initiatives, Council has transformed itself into one of the most viable of its group, and is carrying out works programs that rival all but the largest councils in the state.

During this time Muswellbrook has experienced a mining construction boom. How Council leveraged this phase, was critical to its future sustainability. Planning and provision of renewed and upgraded public infrastructure has been a priority with record levels of expenditure each year, and set to continue for a few years yet.

Prior to this, I worked for 27 years in Local Government Engineering, 16 of those at Manager level. My experience includes large city growth councils to rural multi-purpose councils. My main interest these days is in infrastructure planning and associated financial management.

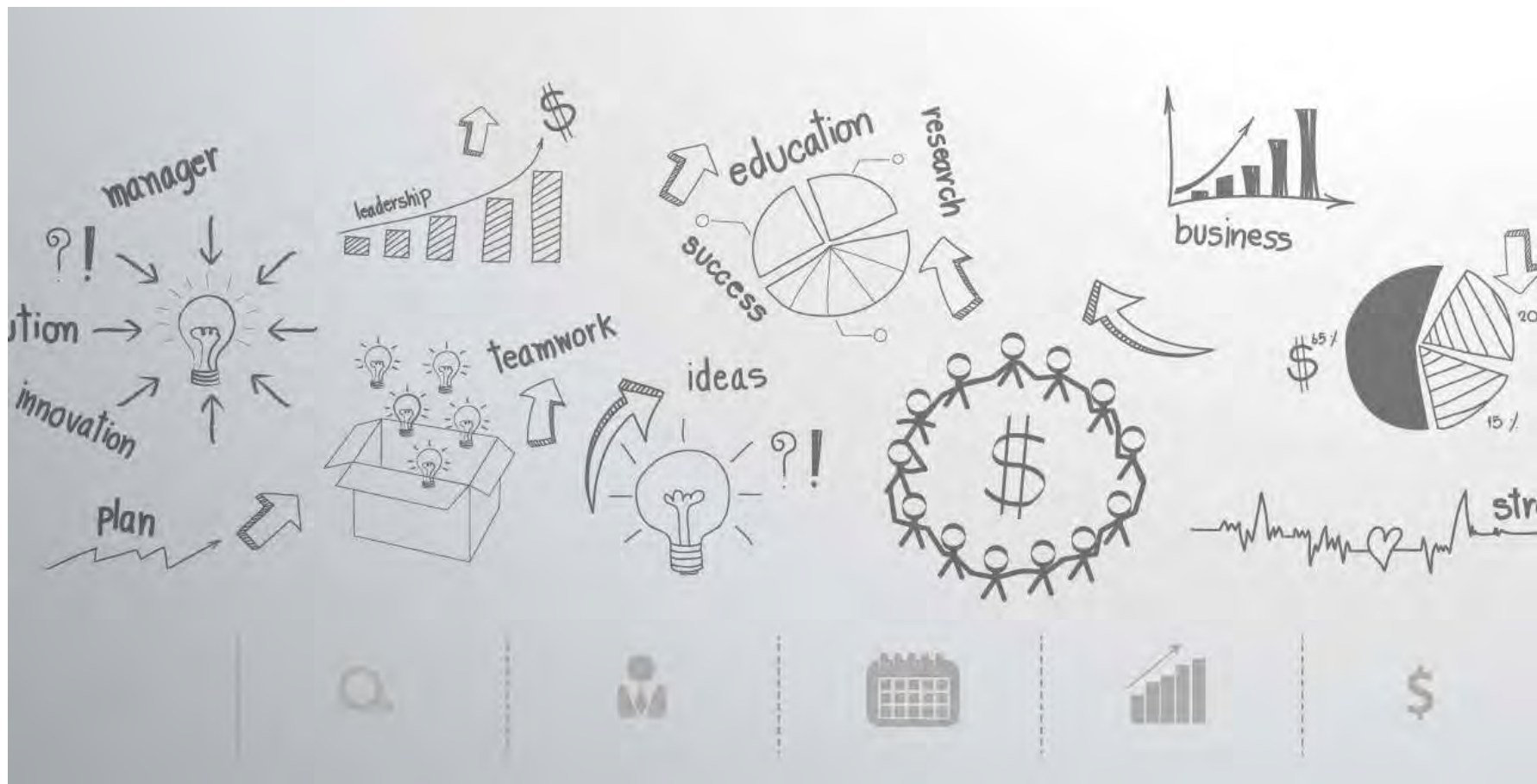
### **Keith Blackmore**

Senior Planner – CARDNO  
3/60 Beaumont Street, Hamilton NSW 2303  
Australia  
[Keith.Blackmore@cardno.com.au](mailto:Keith.Blackmore@cardno.com.au)



The Muswellbrook Mine Affected Roads Network Plan (Stage 1 of the Project) has proven to be a complex process involving detailed traffic analysis and growth forecasting for an industry subject to global fluctuations and extremes (almost on a daily basis). We now have a road plan that, subject to historical constraints, offers the best possible levels of efficiency and safety for its users. Stage 2 of the project will put in place a number of strategies that will implement the recommendations of the Road Network Plan over time.

Keith has been a practicing town planner since 1981, during which time he has gained broad experience in the preparation and assessment of major development proposals, project management of a number of innovative strategic planning initiatives, major rezoning proposals, urban design analysis and Land and Environment Court work. The diversity of the projects has not only enabled him to gain extensive planning knowledge and experience but also an understanding of the issues involved in related disciplines such as transport planning and environmental management.



Budget snapshot of 'Ros Kelly's whiteboard' as published by MSC

A Psychiatrist can explain the various meanings inclosed

Dancing rings around the public purse for personal exclusive benefit.

Cover for MSC Financial Overview

# Mayor: We're on track

Catherine Clifford

15 May 2015, 4 a.m.

THE mayor of Muswellbrook Shire, Martin Rush, said council's draft Budget for 2015-16 will meet the ongoing needs of the communities it serves.

Cr Rush said council will not be raising rates for the whole of its current term and the draft 2015-16 Muswellbrook Shire Council budget reflects that commitment.

The draft document was presented to a Muswellbrook Chamber of Commerce and Industry breakfast at the Muswellbrook Race Club on Tuesday.

Cr Rush said the 2015-16 Budget includes a number of measures that will invest in council's future financial security.

These will be achieved in three broad areas: a human resources organisational review; achieving energy efficiencies by sourcing 40 per cent of council's energy from renewables; and allocating additional resources to the Commercial Building Fund to extract higher yields.

"That was a fund that was begun in 2008 and in that year provided a zero dividend and by 2016-17 it will provide a \$1 million annual dividend to the General Fund.

"It's contributing about \$800,000 in the 2015-16 Budget," he said.

In response to a question from the floor about the Commercial Fund, Cr Rush explained the fund consisted of a number of properties, including Campbell's Corner, Market House, Loxton House, several residential properties and cash reserves.

He said the fund is operated strictly commercially and the properties are managed by a local real estate agent, yielding a dividend that ends up in council's General Fund as part of consolidated revenue.

Cr Rush said the revenue comes essentially from rentals of council's commercial holdings and it was council's intention to increase the yield by making careful investments.

"It is critical going forward because at some point the mining rate will start to decrease, and I'm not suggesting it's going to start to happen tomorrow or even in 10 years' time, but at some point it's going to reduce and the purpose of that Commercial Fund, in part, is to offset that devolution," Cr Rush added.

He also told the group \$21.4 million had been set aside for council's capital works program.

Major road repairs will take place on the Bylong Valley Way, Bureen Road, Wybong Road, Hebden Road, and the intersection of Crinoline and Palace Streets with the Golden Highway at Denman.

In 2015-16 allocations for re-gravelling gravel roads will increase by \$130,000, kerbing and guttering by \$60,000, bridge replacement by \$100,000 and car park improvements by \$230,000 most of which will be directed to Campbell's Corner and the western side of Bridge Street.

The mayor told the gathering the NSW government's Fit For The Future program, which aims to make sure local councils have a sturdy balance sheet in the years ahead, is now underpinning much financial decision-making.

"While Fit For The Future anticipates scores of mergers across the state, Muswellbrook Shire Council has been identified as having the scale and the capacity to continue to stand alone."

Cr Rush said council has recently released its mining-affected road network strategy.

"Consultation was undertaken with industry stakeholders to ensure that road re-alignments, road closures and construction of new roads are planned in a co-ordinated way leaving the present and post mining-affected road networks with maximum efficiency.

"Council anticipates a strategy of delivering considerable savings to the coal industry while creating a better and safer road network, both in the short term and in the long term," he said.

The public has until Tuesday, June 9, to lodge a submission on the draft 2015-16 council budget.

Determined in-camera by Neil Pope, Martin Rush and Cardno (Rio Tinto)



**UPBEAT: Muswellbrook Mayor Martin Rush presenting Council's draft 2015-16 Budget at the Muswellbrook Race Club.**



**The Muswellbrook Bypass (East) is UNVIABLE**

The proposed Muswellbrook By-pass

The Muswellbrook By-pass will remove through traffic from the New England Highway within Muswellbrook town centre and South Muswellbrook. The Hyder By-pass Traffic Study suggests that "the through traffic reduction is unlikely to reduce delays of local traffic entering the New England Highway" and "in the future, local traffic growth will dominate the traffic performance of key intersections within Muswellbrook town centre, even if the bypass is built". As such, the construction of the by-pass is unlikely to have any significant impact on the local road network. However, should a direct link from Wybong Road to the New England Highway be constructed (Options 1A and 1B of this Plan), this route would offer some efficiencies for traffic coming from and travelling to destinations in the north of the Shire (including south bound through traffic connecting to the by pass rather than using Bengalla Link Road and Thomas Mitchell Drive). In this case, the long term retention/reinstatement of Wybong Road would be beneficial in offering an alternative route for mine-related traffic in the north of the Shire.

**Long term Alternate Route**



2017 MSC MINE AFFECTED ROADS  
Community Objection

# Muswellbrook Mine Affected Roads

Road Network Plan

81014003



**DRAFT**

Prepared for  
Muswellbrook Shire Council

27 March 2015

**"- a nefarious strategy to devolve millions of dollars of road construction expenses required by Approvals for mining to the rate and tax paying communities of NSW and Muswellbrook from the coal mining industry of the upper hunter valley, leading to unsafe, inefficient and second rate roads and the waste of millions of dollars of scare public funds"**  
**J Shewan. Wybong Action Group, Ridgeland Community Association**

## 5.2 Options to Improve the Connection of Kayuga Road to the New England Highway



Figure 5-3 Options 1A, 1B and 1C

### 5.2.1 Option 1A – Extend Wybong Road (at Kayuga Road) to the New England Highway (at McCullys Gap Road)

*Assumptions* – Length 2.35kms (Approx.), two bridge crossings (50m and 100m long over creek and river) two major intersections, traffic control at intersections only.

- **Land Ownership** - Requires acquisition of privately owned farm land over the full length of the proposed road. Option would require the purchase and loss of productive agricultural land.
- **Terrain and Land Use** - Improved agricultural land on flood plain.
- **Environmental Factors** - Flood prone (1 in 100 Year Flood Level Approx. RL 148m AHD). This option involves construction within the flood plain and bridging over the Hunter River and Sandy Creek with potential to impact adversely on the flow of flood waters.
- **Intersections** – Roundabout at Kayuga Road. T-intersection at New England Highway
- **Road and Traffic Benefits**
  - Provides a direct connection from the extension of Wybong Road to the New England Highway for north bound traffic and to the McCullys Gap Road interchange on the proposed Muswellbrook Bypass for south bound traffic.
  - Provides an alternative to the Bengalla Link Road and Thomas Mitchell Drive route to gain access to the south without having to enter Muswellbrook CBD.



- **Cost – \$42M** (includes 30% contingency costs added). Includes the construction of a new bridge over the Hunter River. Existing Kayuga Bridge would remain for weight limited local traffic only.

### **5.2.2 Option 1B – Extend Wybong Road (at Kayuga Road) to Aberdeen Street at the New England Highway** (Refer to Figure 5.3 above)

*Assumptions – Length 0.85kms (Approx.), one bridge crossing (100m length over river), two major intersections, traffic control at intersections only.*

- **Land Ownership** - Requires acquisition of privately owned farm land over the full length of the proposed road.
- **Terrain and Land Use** - Improved agricultural land on flood plain. This option involves the purchase and loss of productive agricultural land.
- **Environmental Factors** - Flood prone (1 in 100 Year Flood Level Approx. RL 148m AHD). This option involves construction within the flood plain and bridging over the Hunter River with potential to impact adversely on flow of flood waters.
- **Intersections** – Roundabout at Wybong and Kayuga Road and intersection Aberdeen Street.
- **Road and Traffic Benefits**
  - Provides some improved convenience for north bound traffic.
- **Road and Traffic Weaknesses**
  - Duplicates the existing Kayuga Bridge/Aberdeen Street connection to the New England Highway.
  - Offers little advantage over the existing route.
- **Cost – \$30M** (includes 30% contingency costs added). Includes the construction of a new bridge over the Hunter River north of the existing Kayuga Bridge.

### **5.2.3 Option 1C – Upgrade Kayuga Road and Aberdeen Street from Wybong Road to the New England Hwy, including Replacement of Kayuga Bridge** (Refer to Figure 5.3 above)

*Assumptions – Length 0.85kms (Approx.), replace existing bridge, two minor intersections, traffic control at intersections only.*

- **Land Ownership** – Public road reserves.
- **Terrain and Land Use** – Existing public roads.
- **Environmental Factors** - Flood prone (1 in 100 Year Flood Level Approx. RL 148m AHD). This option involves construction within the flood plain and bridging over the Hunter River.
- **Intersections** – Roundabout at Wybong and Kayuga Road and intersection at Aberdeen Street.
- **Road and Traffic Benefits**
  - Provides some improved convenience and safety for north bound traffic.
- **Road and Traffic Weaknesses**
  - Existing route.
- **Cost – \$13M** (includes 30% contingency costs added). Includes the construction of a new bridge over the Hunter River at the existing Kayuga Bridge location.

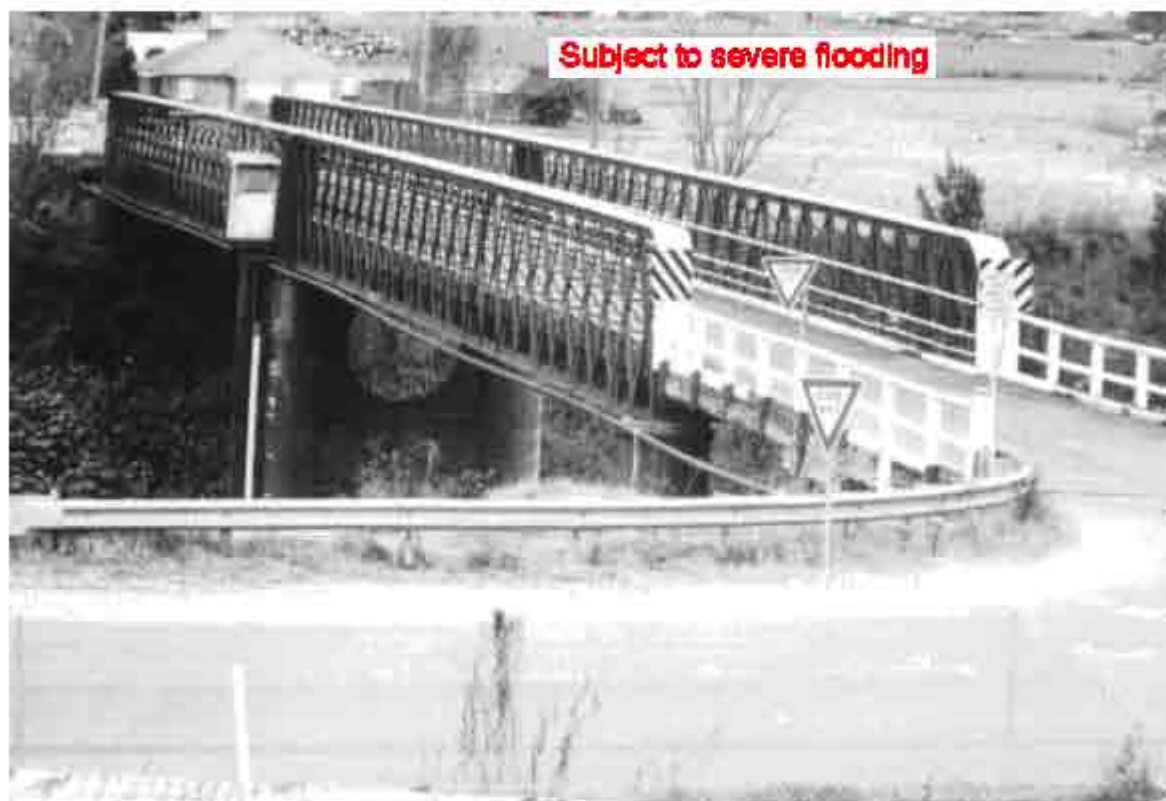
Note: Funding sources to be determined in Stage 2

← sneaky?

Submission to Muswellbrook Council Road Network Plan 27 March 2015

Field	Property Number
Value	Bridge
Field	Conservation Management Plan
Value	****

Images

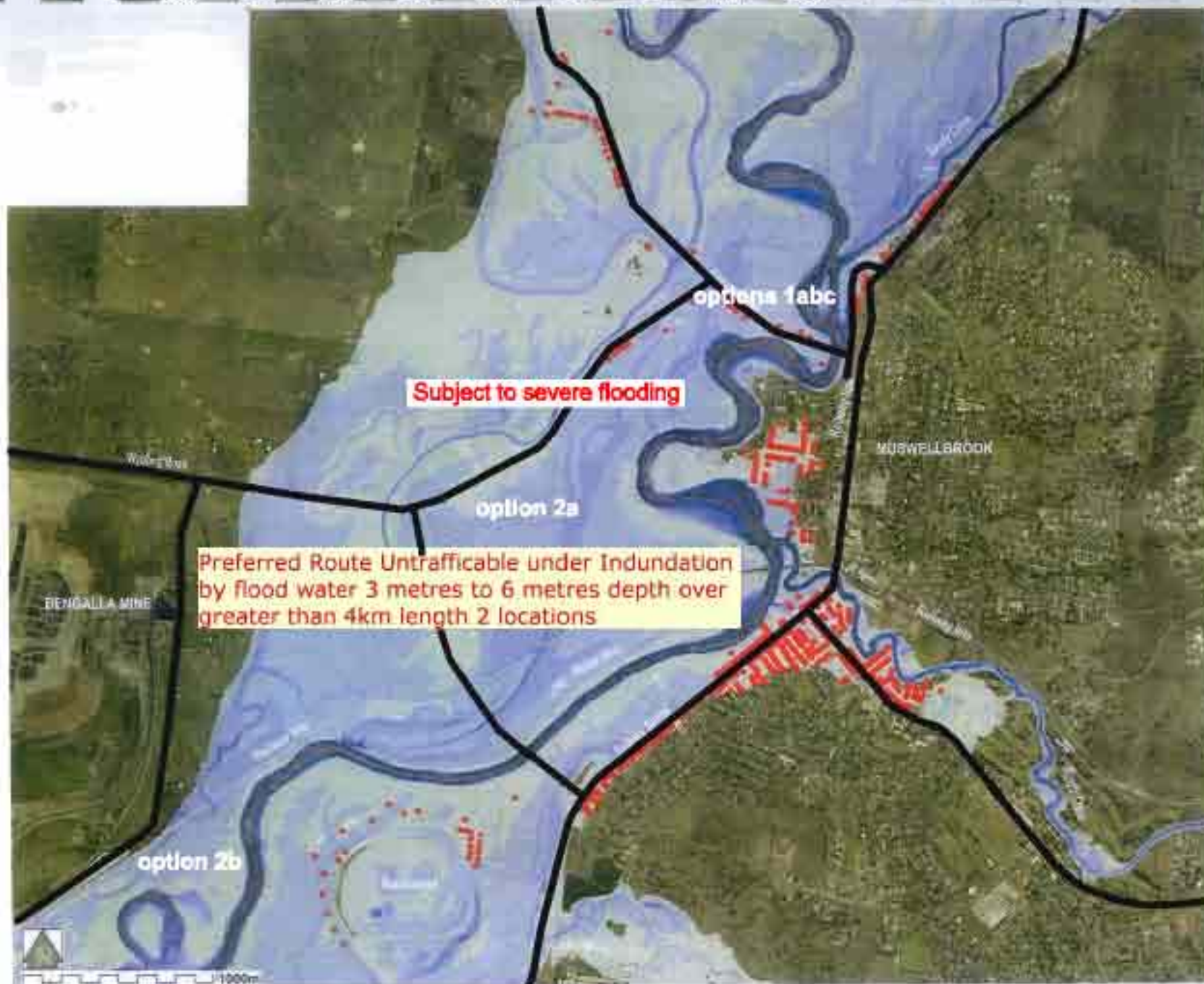


*Kayuga Bridge - General View*



FIGURE 8.2

DRAFT





### 5.3 Options to Address Wybong Road Closure in 2026



Figure 5-4 Options 2A and 2B



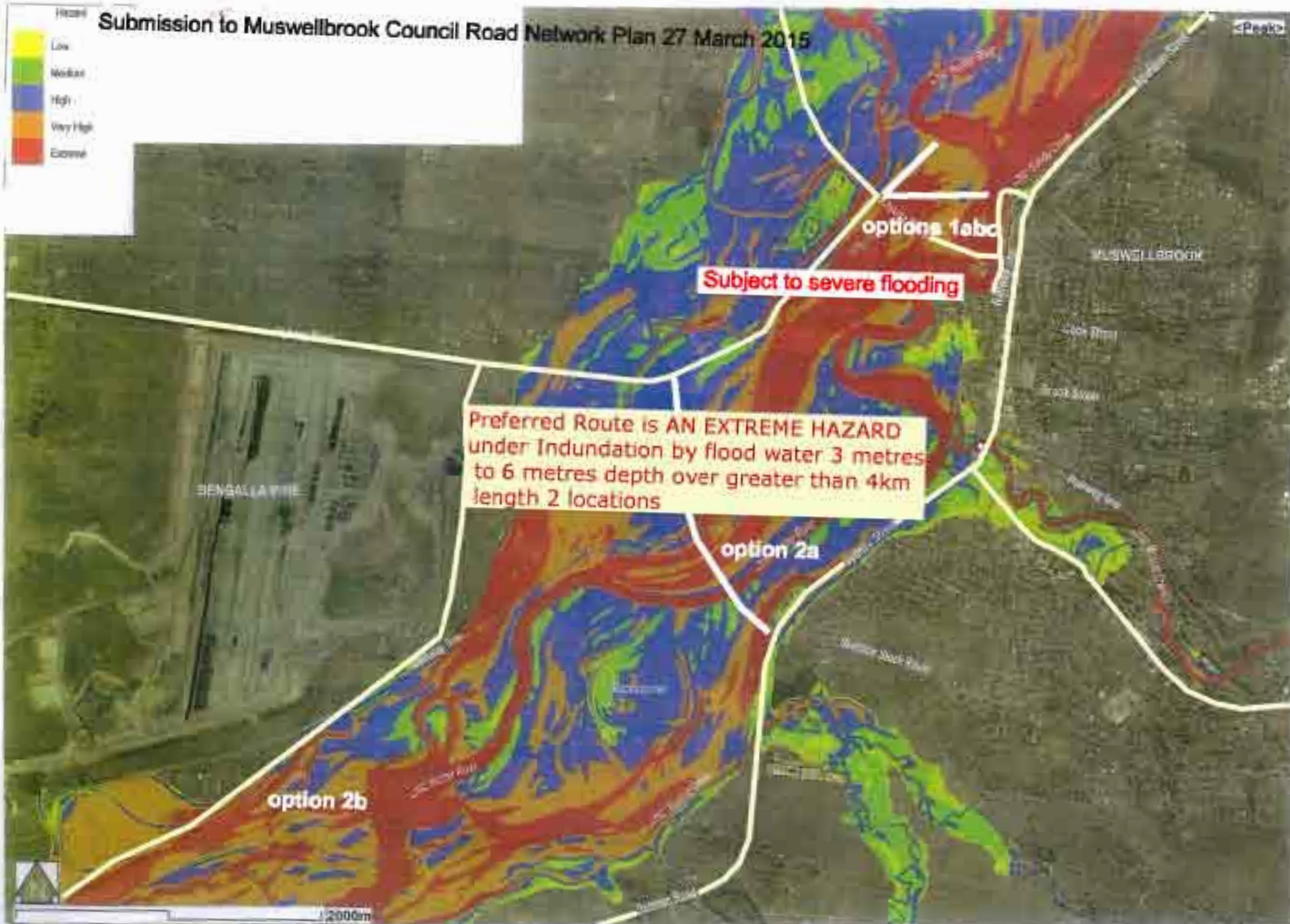
Figure 5-5 Option 2C Northern and Western Link Roads

#### 5.3.2 Option 2A – Connect Wybong Road (via Logues Lane) to Denman Road (at Skellatar Stock Route)

*Assumptions* – Length 2.3kms (Approx.), two bridge crossings (40m over rail line and 100m over river).

- **Land Ownership** - Requires acquisition of privately owned farm land over the full length of the proposed road.
- **Terrain and Land Use** - Improved agricultural land on flood plain. This option involves the purchase and loss of productive agricultural land.







- **Environmental Factors** - Flood prone (1 in 100 Year Flood Level Approx. RL 146m AHD). This option involves construction within the extensive flood plain, bridging over the coal rail haulage line and bridging over the Hunter River with potential to impact adversely on flow of flood waters. Upstream urban areas may be affected.
- **Intersections** – At Wybong Road and Denman Road
- **Road and Traffic Benefits**
  - Utilises the existing Logues Lane alignment.
  - Provides a connection to South Muswellbrook residential areas.

#### **Road and Traffic Weaknesses**

- Location provides little relief to anticipated mine-related traffic demands in the north-west.
- Flood plain extends for full length including over Wybong Road and Denman Road.
- Road subgrade and ramping on both sides of bridge within flood plain and floodway.
- Potential flooding implications (involves a significant reduction in the width of the flood way - urban areas upstream may be affected). To avoid interruption of flood waters, bridge lengths may need to be extended at considerable additional cost.
- Hunter River and the Coal Rail Line separation is significant (approx. 786 metres) likely to require one long bridge or two bridge spans.
- Acquisition of privately owned farm land involved.
- Potential opposition from residents at Skellatar Stock Route intersection and surrounds.
- **Cost – \$37M** (includes 30% contingency costs added)

#### **5.3.3 Option 2B – Connect Wybong Road (via Overton Road) to Bengalla Link Road**

*Assumption – Length 3.5kms (Approx.), one bridge crossing (40m over rail line), one major intersection, traffic control at intersection only.*

- **Land Ownership** – Bengalla Mine.
- **Terrain and Land Use** - This option involves the loss of some productive agricultural land.
- **Environmental Factors** - Flood fringe (1 in 100 Year Flood Level Approx. RL 143m AHD). This option involves bridging over the coal haulage rail line and some construction within the edge of the flood plain.
- **Intersections** - At Wybong Road and Bengalla Link Road.
- **Road and Traffic Benefits**
  - Provides a direct link between Bengalla Link Road to Wybong Road offering access to Kayuga Road and the New England Highway.
  - Offers an alternative to the proposed Mt Pleasant Western and Northern Link Roads at potentially less cost.
  - Utilises the existing flood-free Overton Road alignment.
  - Avoids the need for an additional river crossing and development within the floodway.
- **Road and Traffic Weaknesses**
  - Road and bridge ramping within flood plain.
- **Estimated Cost - \$23M** (Includes 30% contingency costs) **Could be funded by Mt Pleasant Mine as a cheaper alternative to the proposed Western and Northern Link Roads.**

subjective assertion  
NOT Fact

improper consideration

**5.3.4 Option 2C – Western and Northern Link Roads (Mt Pleasant Mine)**

*Assumption – Length 10.3kms (Approx.), 6.8kms of new road and 3.5km of road upgrade to Dorset Road, one major and one minor intersection, traffic control at intersections only.*

- **Land Ownership – Mt Pleasant Mine**
- **Terrain and Land Use** - This option involves the loss of some grazing land.
- **Environmental Factors – Undulating and cleared rural land.**
- **Intersections** - At Wybong Road and Kayuga Road.
- **Road and Traffic Benefits**
  - Addresses the proposed closure of Wybong Road.
  
- **Estimated Cost - \$47M** (includes 30% contingency costs)

MT Pleasant Project Environmental Assessment 9/1997  
Vol 1 Ch 14  
14.2.3 New Link Roads

MT Pleasant Mine Approval Conditions 22/12/99  
7.2 Road Transport

1. The Applicant shall, as required by Council and/or the RTA:
  - (a) At its own expense construct a bridge to carry the Bengalla Link Road over the proposed Mount Pleasant rail loop, in liaison with the operators of the Bengalla Mine;
  - (b) prior to the closure of Castlerock Road, construct at its own expense, the Mount Pleasant Northern Link Road to Dorset Road;
  - (c) prior to the closure of Wybong Road, construct at its own expense, the Mount Pleasant Western Link Road, from the intersection of the Bengalla Link Road to the intersection of the Mount Pleasant Northern Link Road, generally in accordance with Council's Western Roads Strategy;
  - (e) should the following intersections be required, undertake construction works at:
    - (i) the intersection of the Western Link Road and access to the mine site,
    - (ii) the intersection of the Bengalla Link Road and the Western Link Road,
    - (iii) the intersection of Castlerock/Mount Pleasant Northern Link Road and the Western Link Road,
    - (iv) the intersection of the Mount Pleasant Northern Link Road and Kayuga Road.



**Options to Improve Connectivity from the North West Sector to the Main Road Network**

- **Option 3A** – Modified Bengalla Link Road Diversion
- **Option 3B** – Connect Wybong Road (via Mangoola Road, Roxburgh Road and an existing crown road reserve) to Denman Road
- **Option 3C** – Upgrade Wybong Road (West)
- **Option 3D** – Upgrade Reedy Creek Road to the Golden Highway



**Figure 5-1 Options 1A to 3B**



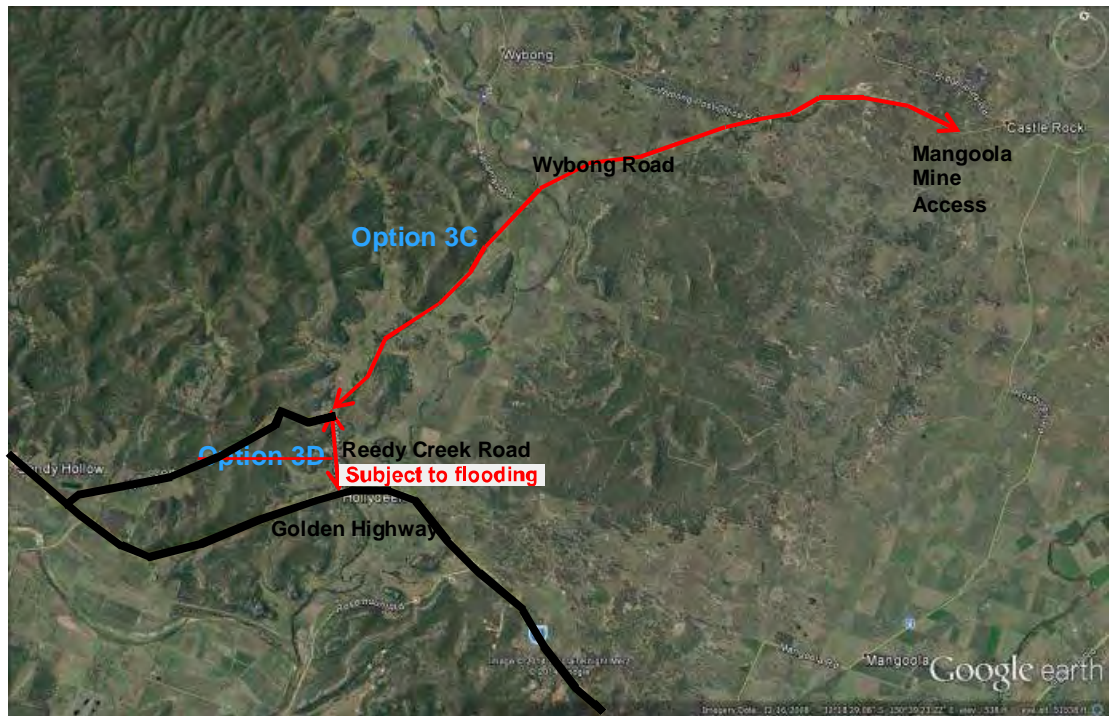


Figure 5-2 Options 3C and 3D

#### 5.4 Option 3A – Modified Bengalla Link Road Diversion

(Refer to Figure 5-1 above)

*Assumptions* – Length 5.2kms (Approx.), 2 major intersections, traffic control along route, nil property acquisition.

- **Land Ownership** – Existing public road reserve. ← residence adjacent
- **Terrain and Land Use** – Public road.
- **Environmental Factors** – Minimal.
- **Intersections** - Existing
- **Road and Traffic Benefits**
  - Utilises the existing road reserve. No land acquisition involved.
  - Crossings of the Hunter River and the Coal Rail Line are existing.
- **Road and Traffic Weaknesses**
  - Concentrates all traffic to a single travel corridor.
- **Cost** – \$33M (includes 30% contingency costs)

**Option 3A IS IRRELEVANT** as the Modified Bengalla Link Road is mandated by DOP Approval for Bengalla Continuation Project which Council has no standing to seek modification.

This Option includes the western diversion of Bengalla Link Road as proposed in the Mine Continuation of Bengalla Mine. However, it also seeks to have the road alignment and intersections in the north located to best facilitate the future extension of the road to the north west to link with Wybong Road to provide a more direct travel path. The road extension and associated intersection with Wybong Road would be pursued in the longer term and would be funded by new mines in the north-west.

← improper consideration



**5.5 Option 3B – Connect Wybong Road (via Mangoola Road, Roxburgh Road and an Existing Crown Road Reserve) to Denman Road**



**Figure 5-6 Option 3B**

*Assumptions – Length 9.58kms (Approx.), 3.5kms new road and 6.08kms upgrade of existing, one bridge crossing (100m over rail line and river), one multi-cell box culvert crossing (Mangoola Road), two major intersections and two minor intersections, traffic control along route and at intersections, limited property acquisition.*

- **Land Ownership** – Public road reserve and privately owned farmland. Some land acquisition involved.
- **Terrain and Land Use** – Undulating existing road in the north. Flood prone improved agricultural land in the south. This option involves the purchase and loss of some productive agricultural land (near Craig's End) and some grazing land (to straighten Mangoola Road and for the bridge and approaches).
- **Environmental Factors** - Flood Level Approx. RL 128m AHD. No significant implications for flooding impacts from a reduction in the width of floodway and flood storage. The location is well downstream of any urban areas.
- **Intersections** – Upgrade existing intersection at Wybong Road, minor intersections at Roxburgh Road and major intersection at Denman Road
- **Road and Traffic Benefits**
  - Intersects with Wybong Road in the vicinity of Ridgeland Road (Mangoola Mine entrance and future West Muswellbrook Mine) – Future mine-related traffic generators.
  - Utilises a significant section of the existing Mangoola Road and Roxburgh Road alignments.
  - Elevated land on the north-western bridge approach reducing the extent of the bridge ramp on one side.
  - Hunter River and the Coal Rail Line are reasonably adjacent to each other (approx. 300 metres).
  - Existing road reserve south of the Hunter River connecting to Denman Road. Minimal land acquisition.
  - Results in a better distribution of traffic by providing an alternative travel path to the Bengalla Link Road.
  - Facilitates the efficient movement of vehicles to and from the south (alternative to Thomas Mitchell Drive) in the long term **with the potential to connect to the Golden Highway by a realigned Edderton Road.**
- **Road and Traffic Weaknesses**
  - Involves some vertical (levelling) and horizontal (straightening) adjustments to the existing road alignment.

rabid inconsistency

ignores single lane acidified, water infiltrated substrate, light traffic construction



- **Cost - \$63M** (includes 30% contingency costs added) - NB. This route lies partially within the Mangoola Mine EL area and the West Muswellbrook EL area. Opportunity may exist for conditional land dedication thereby reducing the estimated cost.

improper consideration

### 5.6 Option 3C - Upgrade Wybong Road (West) from Mangoola Mine Access to Reedy Creek Road

(Refer to Figure 5-2 above)

*Assumptions - Approx. Length 13.5kms, four minor intersections, one major intersection, traffic control along the route, nil property acquisition.*

- **Land Ownership** - Existing road reserve.
- **Terrain and Land Use** - Undulating narrow road surrounded by unimproved rural land.
- **Environmental Factors** - Flooding at Pheynys Creek causeway.
- **Intersections** - One major intersection and four minor intersections.
- **Road and Traffic Benefits**
  - Utilises the existing Wybong Road alignment.
  - No land acquisition.
- **Road and Traffic Weaknesses**
  - Existing rural road would require reconstruction to widen and improve durability.
  - Major intersection improvements required at Reedy Creek Road and Golden Highway.
- **Cost - \$42M** (includes 30% contingency costs added). A significant proportion of the upgrading of Wybong Road could be justified as works-in-kind required from future mines in the north.

improper consideration

### 5.7 Option 3D - Upgrade Reedy Creek Road to the Golden Highway

(Refer to Figure 5.2 above)

*Assumptions - Length 1.4kms (Approx.), one minor intersection at Wybong Road, one major intersection at Golden Hwy, traffic control along the route, nil property acquisition.*

- **Land Ownership** - Existing road reserve.
- **Terrain and Land Use** - Undulating narrow road surrounded by unimproved rural land.
- **Environmental Factors - Nil**
- **Intersections** - One major intersection and one minor intersection.
- **Road and Traffic Benefits**
  - Utilises the existing Reedy Creek Road alignment.
  - No flooding or environmental issues.
  - No land acquisition.
- **Road and Traffic Weaknesses**
  - Major intersection improvements required at Reedy Creek Road and Golden Highway.
- **Cost - \$12M** (includes 30% contingency costs added). A significant proportion of the upgrading of Wybong Road could be justified as works-in-kind required from future mines in the north.

residence adjacent

flooding occurs

improper consideration

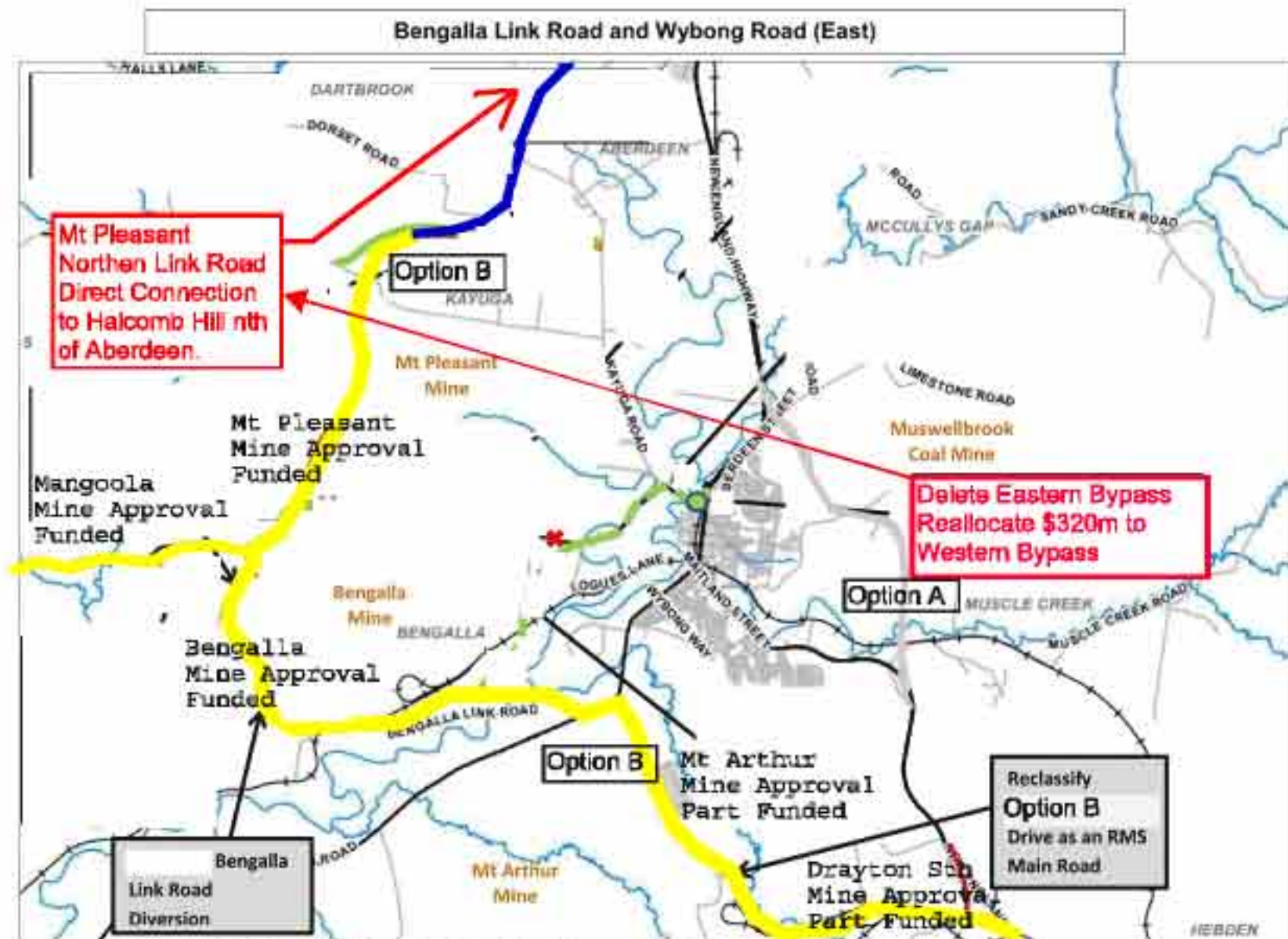


Figure 6-1 Road Network Plan (North-eastern Sector)



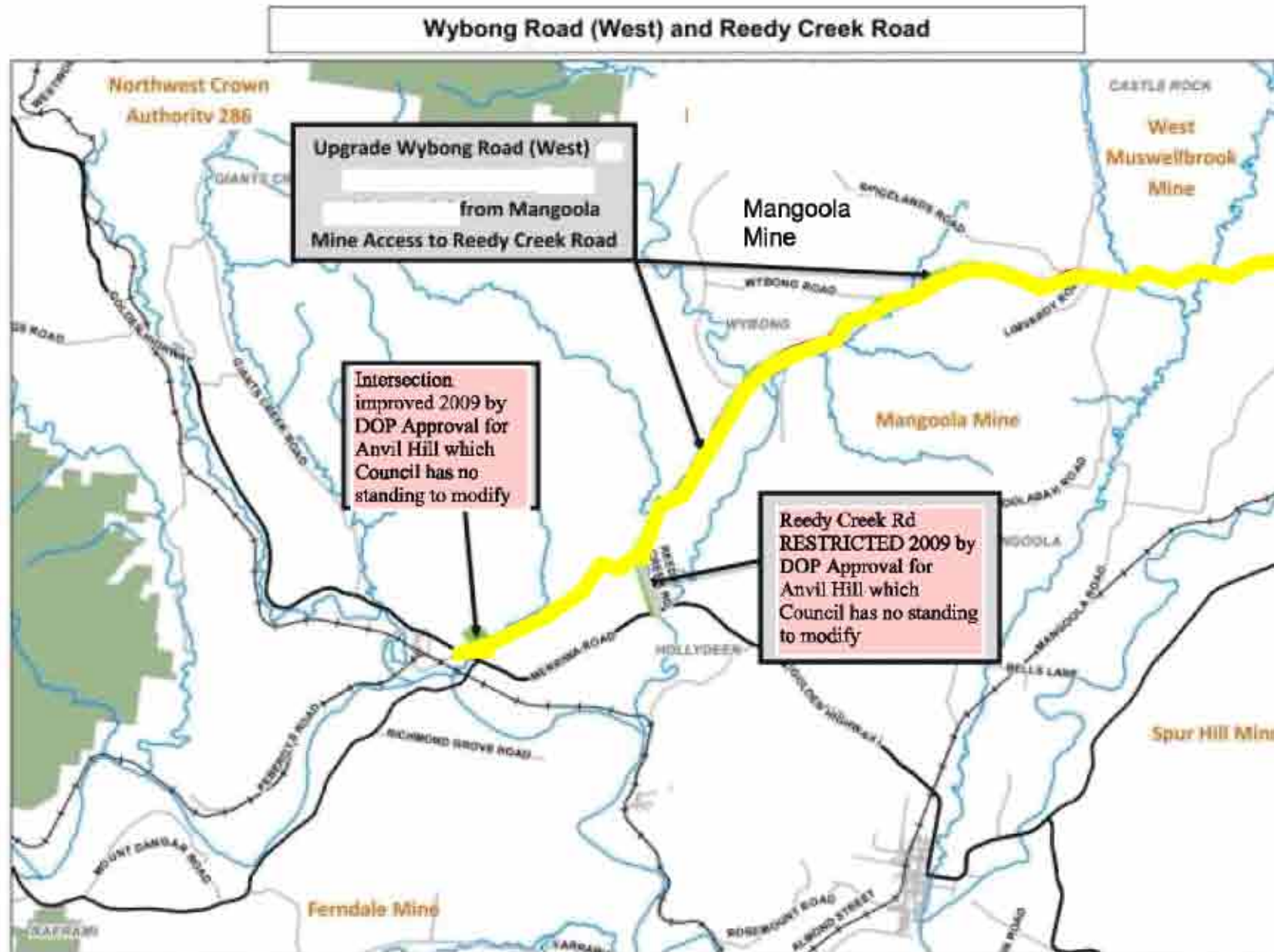


Figure 6-3 Road Network Plan (Western Sector)

**THE ONLY SENSIBLE OPTION**

### 3.12.3 Reedy Creek Road

Reedy Creek Road provides a short cut for drivers seeking to gain access to Wybong Road (West) from the Golden Highway and vice versa. It is assumed that only drivers with local knowledge would use this shortcut. It is not a road significantly impacted by mine-related traffic. While the volumes of traffic utilizing this road are relatively low, there is some concern in relation to the adequacy and safety of the design of its intersection with the Golden Highway. Additional investigations are needed in relation to the geometrics of the road and the intersections, and the need to improve safety for drivers.



Reasons for Reedy  
Creek Rd rejection  
for Mine Access in  
2006 Approval.

Table 5-1 Cost/Benefit Analysis

Road Improvement Option	Estimated Cost (\$M) includes 30% Contingency Costs	Potential Environmental and Land Use Impacts	Traffic Benefits	Comments
1A - Extend Wybong Road to NE Hwy (at McCullys Gap Road)	\$42M <b>Funding ?</b>	Significant	Good long term (with Muswellbrook Bypass)	All subject to Closure by Flooding with Extreme Risk to road users  Options 1C, 2A, 2B have significant adverse amenity impact to commercial premises (Pet-Medical Equine) and Aberdeen St and Ford St residences.
1B - Extend Wybong Road to NE Hwy (at Aberdeen St)	\$30M <b>Funding ?</b>	Significant	Moderate	
1C - Replace Kayuga Bridge, upgrade Wybong Road (East) and Kayuga Road from the new southern Link Road to Kayuga Bridge, upgrade Aberdeen Street from the New England Hwy, to the new Kayuga Bridge	Replace Kayuga Bridge \$7M Upgrade Wybong and Kayuga Rd \$9M Upgrade Aberdeen St \$6.4M	Minimal <b>Funding ?</b> High Residential Impact Heritage Bridge	Moderate	
2A - Connect Wybong Road (via Logues Lane) to Denman Road (at Skellatarr Stock Route)	\$37M <b>Funding ?</b>	Significant	Minimal	
2B - Connect Wybong Road (via Overtori Road) to Bengalla Link Road	\$23M <b>Funding ?</b>	Minimal	Good	
2C - Western and Northern Link Roads (Mt Pleasant Mine)	\$47M <b>NIL Public Cost</b>	Moderate	Moderate	Required by Mt Pleasant Mine Approval at Mt Pleasant Cost
3A - Modified Bengalla Link Road Diversion	\$33M (Modification of design would be at minimal additional cost)	Minimal	Moderate	Modified Diversion is cosmetic, irrelevant and un-necessary.
3B - Connect Wybong Road (via Mangoola Road, Roxburgh Road and an Existing Crown Road Reserve) to Denman Road	\$63M <b>Funding ?</b>	Significant	Moderate	Subject to Closure by Flooding with Extreme Risk to road users
3C - Upgrade Wybong Road (West) from Mangoola Mine Access to Golden Hwy	\$12m est <b>NIL Public Cost</b>	Minimal	Minimal (in short term) Good (in long term)	Upgraded 2010 by Mangoola Mine Approval (Recommended Option)
3D - Upgrade Reedy Creek Road to the Golden Highway	\$12M <b>Funding ?</b>	Minimal	Good	Not Feasible



Road Improvement Option	Estimated Cost (\$M) includes 30% Contingency Costs	Potential Environmental and Land Use Impacts	Traffic Benefits	Comments
A - Muswellbrook Bypass (East)	\$320m public funded	Significant	Minimal (Hyder)	Rendered Irrelevant by superior Western Bypass
B - Muswellbrook Bypass (West) ie Option 2c (plus extension to Halcomb Hill)	\$47m est as required by Mt Pleasant Approval with Dorset Rd to Halcomb Hill extension funded by part reallocation of \$320m from redundant Muswellbrook Bypass (East)	Minimal	High Benefit	Provides a flood free (Keys Bridge excepted) well graded, 90km/hr Heavy Vehicle, Oversize and Highway Bypass to west of Aberdeen and Muswellbrook linking with Bylong Valley Way and Golden Highway at Sandy Hollow and Golden Highway at Edderton Road within existing funding envelope, with substantial savings while addressing the mining access needs to flood free access to Shire west & northwest and freeing the CBD of Heavy Vehicle, Oversize and through Highway traffic. Minimal Cost Option with most benefits.



## 5.10 Overall Assessment of Options

In assessing the overall performance of the road network over time, the following points need to be kept in mind:

1. The current road network will continue to function satisfactorily in the short term (0-10 years) until new mines and mine extensions result in traffic numbers approaching road capacity, and performance limits resulting in reduced levels of service at intersections and increased accident risks.
2. There is a significant cost to Mt Pleasant Mine associated with the closure of Wybong Road and the construction of the proposed Northern and Western Link Roads (Estimated at \$47M) to provide a connection between Wybong Road and Kayuga Road (and the New England Highway beyond). A significant cost saving could result if efficient alternative solutions for connection to the New England Highway are feasible.
3. Options 1A, 1B, 2A, and 3B all involve the construction of new roads and bridges within the flood plain of the Hunter River. Consideration will need to be given to the upstream impacts on flood behaviour due to obstruction of flows (i.e. increased velocities and depths of water during major flood events).

"The proposed Muswellbrook By-pass - The Hyder By-pass Traffic Study suggests that "the through traffic reduction is unlikely to reduce delays of local traffic entering the New England Highway" and "in the future, local traffic growth will dominate the traffic performance of key intersections within Muswellbrook town centre, even if the bypass is built".

"the long term retention/reinstatement of Wybong Road would be beneficial in offering an alternative route for mine-related traffic in the north of the Shire. "

The "significant cost to Mt Pleasant" is AN IRRELEVANT consideration to provision of effective and efficient road transport planning to the community by Council and is worthy of referral to NSW Auditor & Parliament

Re-allocation of \$320m from the Muswellbrook Bypass East to Option B Muswellbrook Bypass West is the most efficient solution for connection of the mines to the Shire West to the New England Highway and to bypass highway traffic from the CBD and south Muswellbrook.

### Evaluation of Option B Muswellbrook Bypass West

The Option B Muswellbrook Bypass West makes efficient greenfield use of existing road alignments and mining approval related road realignments to bypass Aberdeen and Muswellbrook townships to and from north, south and west (New England Highway, Golden Highway, Bylong Valley Way ie Dubbo-Merriwa, Lithgow-Bathurst-Mudgee, Putty-Singleton, Scone) extending high quality highway upgrades from the Hunter Expressway at Branxton and pending Singleton Bypass to Halcomb Hill and pending Scone Bypass to Parkville for less than the projected cost of the Muswellbrook Bypass East alone., approx 120km of highway upgrades that fulfil all current and 20yr projections for the price of 10km Muswellbrook Bypass East that 'fails' basic project objectives & assessment criteria (Hyder)



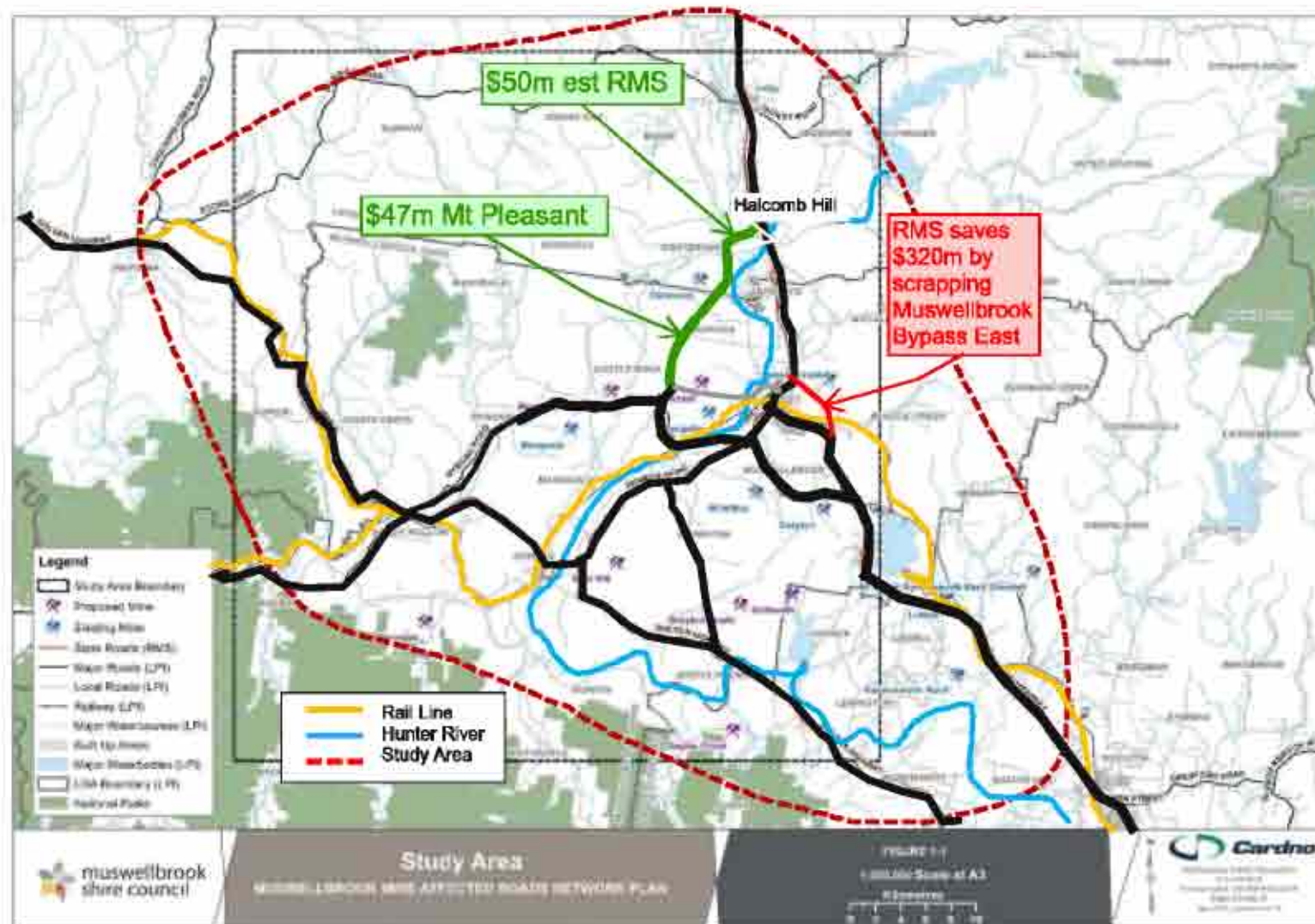
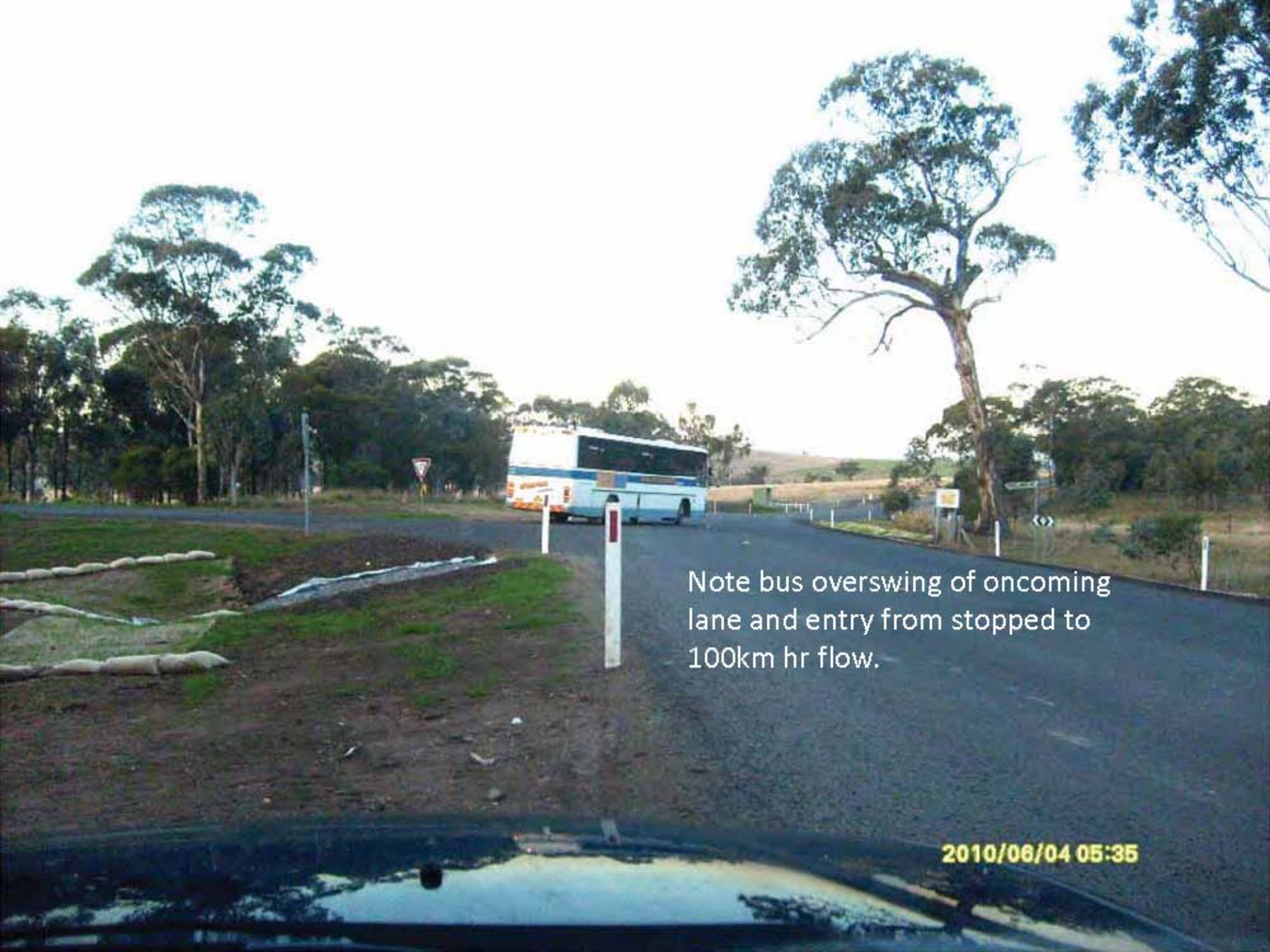


Figure 3-2 Corridor Study Area

A blue and white bus is driving on a road, moving from left to right. The road is dark asphalt. On the right side of the road, there is a large, mature tree with a thick trunk and dense foliage. In the background, there is a line of trees and a clear sky. The bus is in the middle of the road, and its front is slightly angled towards the right. The overall scene is a rural or semi-rural road environment.

Note bus overswing of oncoming lane and entry from stopped to 100km hr flow.

2010/06/04 05:35







































News  Business

# Wybong residents' anger over fatal smash

BEN SMEE

12 Jan 2010, 11:11 a.m.

SPOT: Action group members John Shewan, front, and Edna Clay, Len Hamson and David Clay on Wybong Road yesterday.- Picture by Peter Stoop

ANGRY Wybong residents say that planning authorities ignored years of warnings that the narrow, winding Wybong Road would not support heavy vehicle traffic from the Mangoola mine at Anvil Hill.

Wybong Action Group spokesman John Shewan said yesterday it was "disgraceful" that Muswellbrook Shire Council had allowed mine construction work to begin before required roadworks had been completed.

Mayor Martin Rush dramatically withdrew approval for early construction work at Anvil Hill after contractor Dave Patten was killed on Wybong Road last week.

Mr Patten's ute collided with an oversized truck carrying machinery to the mine.

Mr Shewan said the action group warned the council and NSW Department of Planning two years ago that allowing large vehicles to use the narrow road was an accident waiting to happen.

Wybong residents were not aware that support for early construction had been given until The Herald reported yesterday that the council had withdrawn its approval.

"[Allowing work to begin] is a disgraceful thing to happen," Mr Shewan said.

"It's disgraceful that it did happen because the community put in so much effort to warn the council and the mining company and the [NSW] Department of Planning."

Mr Shewan said the stretch of road where Mr Patten was killed was not wide enough for oversized traffic.

"The road is so narrow that any wide load travelling would really require traffic [in the opposite direction] to be stopped," he said.

Cr Rush emphasised yesterday that the council still supported the establishment of the coalmine, despite moving to stop work at the site.

In a statement yesterday, Cr Rush said the council and Xstrata Coal were working through technical matters and hoped to resolve traffic issues by Monday.

Under a motion enacted by Cr Rush using executive powers, support would be reinstated should the council and Xstrata agree about a new traffic management plan for the coalmine.

The Department of Planning confirmed yesterday the mine's development approval would be unaffected by the council's recent action.

Greens MP Lee Rhiannon called on Planning Minister Tony Kelly to investigate the matter.