

Mineral sands road study - Sues Road to Capel

Main Roads Department

**Report and recommendations
of the Environmental Protection Authority**

**Environmental Protection Authority
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Summary and recommendations

The Environmental Protection Authority has assessed a proposal by the Main Roads Department for a heavy haulage route for the transportation of mineral sands from the south coast to Bunbury. The route assessed in this report extends from the northern end of Sues Road to the present Bussell Highway north of Capel.

The proposed route connects to Mineral Deposits Limited Beenup mine via the remainder of Sues Road, Brockman Highway and Scott River Road. The mine and transport route to the top end of Sues Road was assessed by the Authority (Bulletin 483) in 1990 and approved by the Government in 1991. It is envisaged that mineral sands from the Jangardup deposit will also use this route, but the connection from the mine site to it has not been finalised by the proponent of that proposal.

The proposal was referred to the Environmental Protection Authority in August 1990. A level of assessment of Public Environmental Review (PER) was set, recognising that the route would traverse or be near farming lands, the proposed Whicher Reserve, the Ludlow Tuart Forest and the township of Capel. The proposal is the first road project which the Environmental Protection Authority has assessed, where social issues are critical. Because of this, public interest was high and 91 written submissions were received of which 56 were comprehensive submissions, mainly from individual land owners.

The proposal

The Main Roads Department proposes to construct a heavy haulage road route, primarily for the transportation of mineral sands products, from the northern end of Sues Road, in the Shire of Busselton to Capel, Western Australia.

The proposal had its origin in the approval of major new mineral sands mining ventures in the south coast region. These mines will generate additional heavy road vehicle traffic between the Augusta-Nannup region and Bunbury.

Issues

The key issues specifically relating to the road proposal are:

- social, especially the management of impacts on affected land owners
- protection of the Ludlow Tuart Forest
- management of impacts on the McCarley's Swamp - AMC Wetland system
- protection of the proposed Whicher Reserve
- development of a comprehensive dieback management plan
- protection of remnant vegetation
- road vs rail transport

These issues have either been addressed in commitments made by the proponent or in the recommendations of the Environmental Protection Authority. The Environmental Protection Authority's recommendations are outlined below.

Recommendation 1

The Environmental Protection Authority has concluded that, the alignment as amended (see Figure 4) during the process of interaction between the proponent, the Environmental Protection Authority, government agencies, and potentially affected land owners is environmentally acceptable and could proceed subject to:

- **the proponents commitments; and**
- **the Environmental Protection Authority's recommendations in this report.**

A key issue will be the ongoing review of social impacts.

Recommendation 2

The Environmental Protection Authority recommends that the proponent continue to consult with individual land owners on localised issues and compensation measures.

It is recognised that land owners along the route need to make operational and investment decisions about their properties on an ongoing basis. The prospect of the road proposal proceeding will affect land owners' plans and in some cases land owners will need to put plans for alterations or improvements to their operations on hold until a final decision about the road is made.

The Authority recognises the potential disruption and makes the following recommendation.

Recommendation 3

The Environmental Protection Authority recommends that the proponent implement the contractual arrangements, arrived at with land owners, within two years from the date of environmental approval.

Plans for the protection of vegetation on both State forest and private land are required. In this regard the Environmental Protection Authority makes the following recommendation.

Recommendation 4

The Environmental Protection Authority recommends that the proponent prepare a comprehensive Environmental Management Plan to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority and/or the Department of Conservation and Land Management as appropriate, which includes, but is not necessarily limited to:

- **comprehensive dieback management plans comprising dieback mapping and procedures for the prevention of the spread of dieback disease, developed in consultation with the Department of Conservation and Land Management, prior to any earthmoving operations through State Forest; and**
- **plans for avoiding remnant native vegetation and avoiding or replacing replanted trees on cleared farmland wherever possible, prior to any earthmoving operations on alienated farmland.**

The Plan should subsequently be implemented when earthworks commence in each case.

There was a high degree of public preference for rail transport in the submissions received.

Given the public preferences and the potential to reduce greenhouse gas emissions, the Environmental Protection Authority highlights the importance of public support for rail as a long term option.

Recommendation 5

The Environmental Protection Authority recommends that the Minister for the Environment and the Minister for Transport keep the rail transport option under review.

Conclusion

The Environmental Protection Authority, following assessment of the proposal and commitments made by the Main Roads Department, has concluded that the haulage route as refined by the Department in response to public submissions, and subject to the proponent's commitments and the recommendations of the Environmental Protection Authority, is environmentally acceptable.

In addition the Authority commends both the proponent and the community in participating in what could well be an important precedent setting project in terms of extensive public scrutiny and involvement.

1. Background

The Public Environmental Review prepared for the Mineral Sands Road, was the culmination of a three stage study to identify a suitable transportation route and to present the chosen route in a format for formal environmental assessment.

This proposal had its origin in the need to transport mineral sands from new mines on the south coast. The mines expected to use the route are the Beenup Mine near Augusta and the Jangardup Mine south of Nannup. Mineral sands transport will generate additional road vehicle traffic between the August-Nannup Region and Bunbury.

Consideration of transportation issues by a taskforce of Government officers led to a decision to utilise road transport as the medium term transportation method for both of the planned mines. This decision, by the Minister for Transport, was made following an Interdepartmental Taskforce Study of transportation for both the planned mines and other resource developments (1989), and the commitment by Mineral Deposits Ltd in their Beenup Environmental Review and Management Plan (ERMP) to use road transport via Sues Road and Bussell Highway to Bunbury.

This proposal forms Section 2 (Figure 1) of the overall route designated in the Beenup ERMP and the Government studies undertaken prior to this.

In assessing the Beenup mine proposal (Environmental Protection Authority Bulletin 483), the Authority concluded that the proposal for road transport to the top of Sues Road was manageable and environmentally acceptable. As mentioned above, this Public Environmental Review was the culmination of a three stage study of transport options, from the top of Sues Road to Capel, by consultants to the Main Roads Department.

Stage 1 of the study consisted of an examination of existing environmental and social conditions in the area north of the Vasse Highway. The study area was subsequently extended from Vasse Highway south to Sues Road to examine other potential links (Figure 2).

Stage 2 of the study involved a comparative analysis of 20 potential routes and identified Route Option B as the preferred option. The 20 options were identified from a possible 85 route alternatives after an initial elimination process to reject segments unacceptable on environmental or social grounds.

Stage 3 of the study involved detailing the preferred road option and represented a culmination of the other two stages. A report was produced for each stage.

The Public Environmental Review was subsequently prepared and this represented the fourth public report compiled in a very detailed review and assessment process.

The study was overseen by the Mineral Sands Road Study Steering Committee. The membership of this Committee is shown in Appendix 5. Representatives from the two mining companies, Mineral Deposits Limited and Cable Sands Pty Ltd, also participated in the Committee's deliberations.

2. Introduction

The Main Roads Department proposes to construct a new heavy haulage route, primarily for the transportation of mineral sands products, from the northern end of Sues Road, Busselton to Capel, Western Australia (Figure 2).

The Environmental Protection Authority determined that a Public Environmental Review was required to assess the proposal, following referral in 1990. A Public Environmental Review level of assessment was set in recognition that the route would traverse or be near farming lands, the proposed Whicher Reserve, the Ludlow Tuart Forest and the township of Capel.

The proposal is the first road project which the Environmental Protection Authority has assessed where social issues are critical.

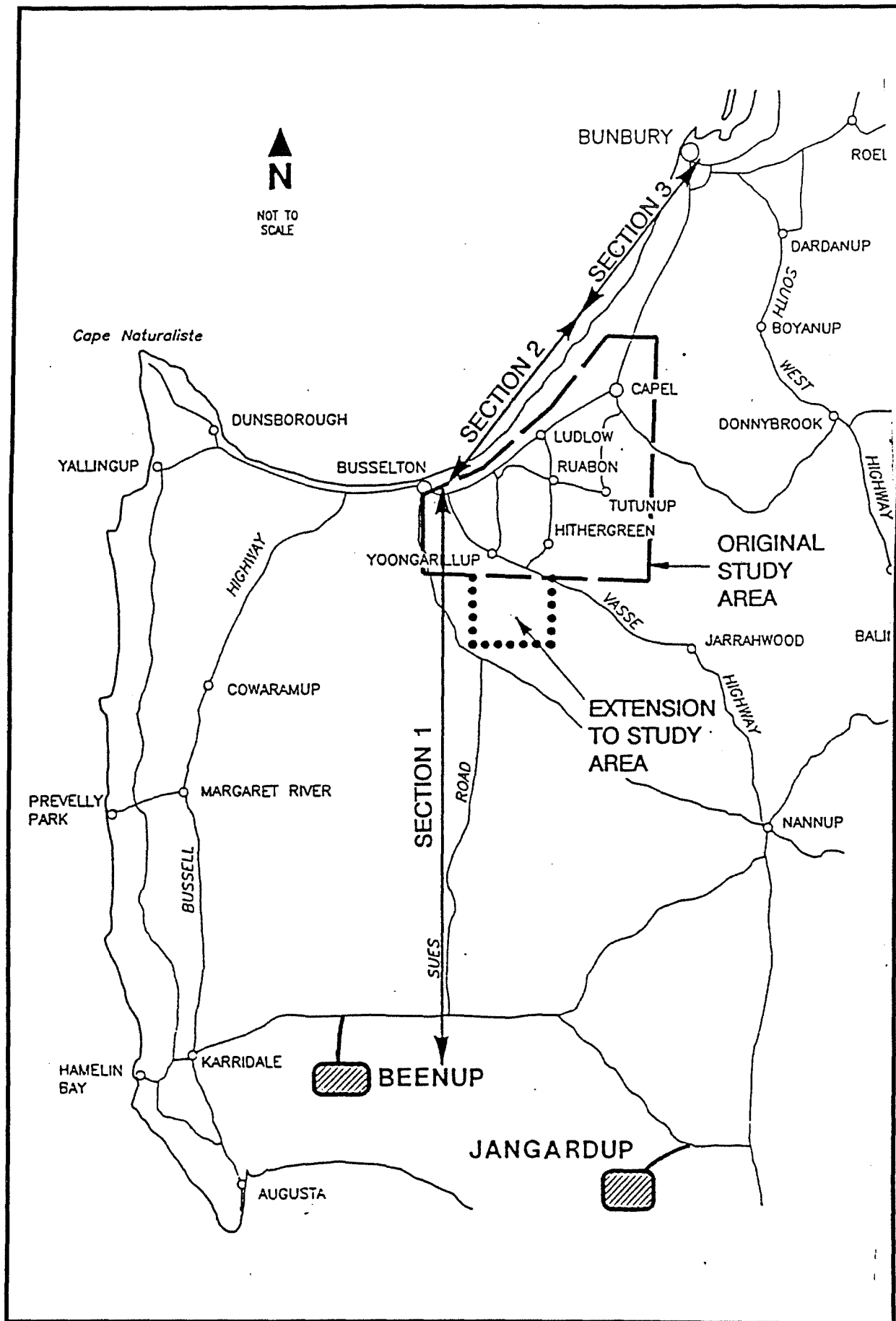


Figure 1. Section 1, 2 and 3 of proposed heavy haulage route.

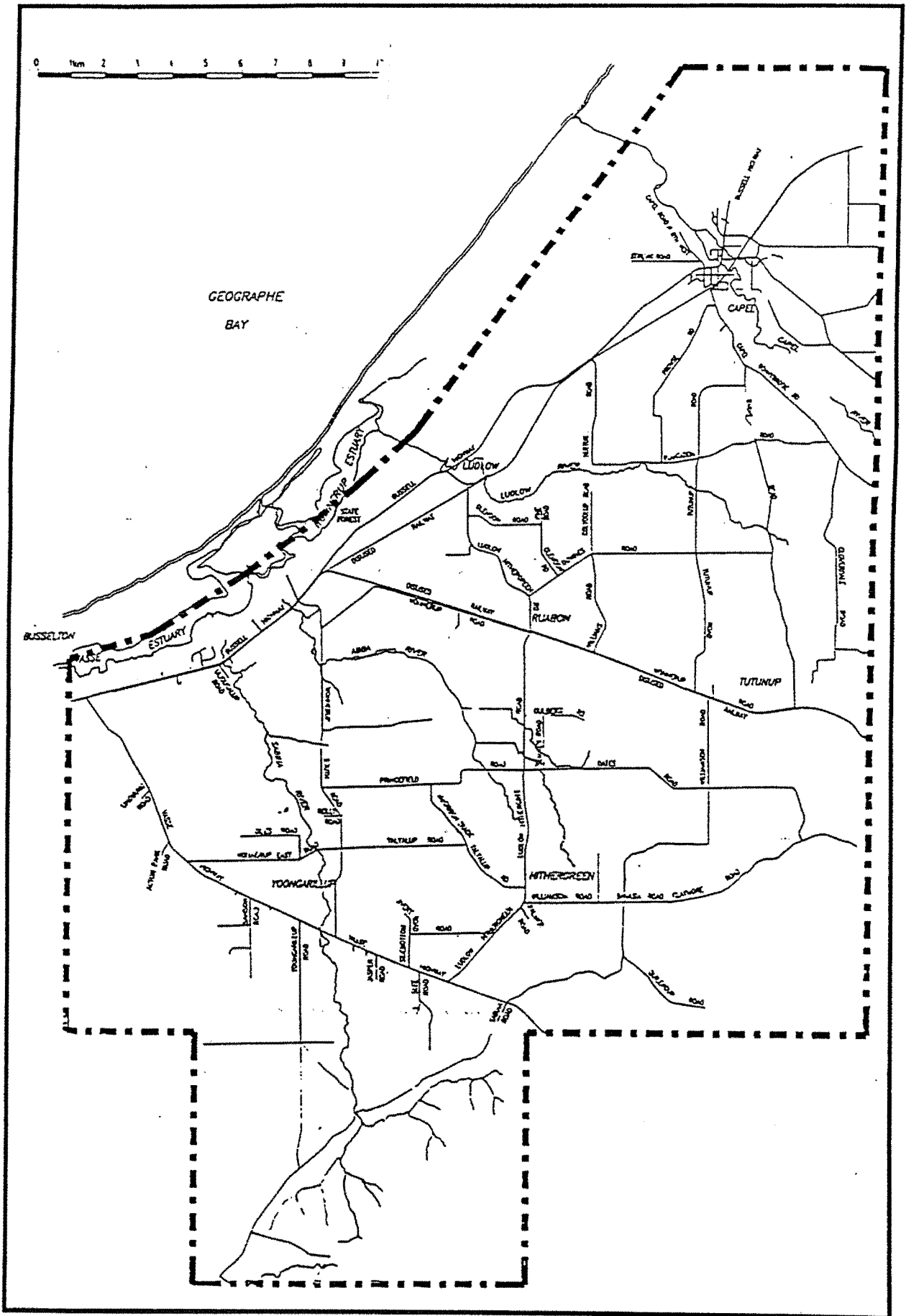


Figure 2. Study area.

Accordingly, public interest was very high and the proponent undertook extensive consultation and interaction with local communities. It is unlikely that any other road project to date in Western Australia has been subject to such extensive public scrutiny and involvement. In this regard the proponent and the community should be commended for participating in what could very well be an important precedent setting project. For this reason, the Environmental Protection Authority has included a comment and a review of both the public consultation programme and the methodology used to select the preferred route. Also included is a list of the criteria used to select the route. (Appendix 4).

It should be noted that while the criteria selected were relevant to this proposal, the same criteria would not necessarily be appropriate for future proposals. This is especially relevant to environmental criteria. In addition, care should be taken to not trade-off environmental, social and economic criteria in comparing project options for assessment by the Authority.

The Public Environmental Review was subject to an eight week public review period beginning in February 1991. Prior to the release of the Public Environmental Review, three other reports leading to the selection of the preferred route were also publicly released by the Main Roads Department.

Following the receipt of submissions on the Public Environmental Review from the public and advice from other Government agencies, the Environmental Protection Authority forwarded 56 of the most detailed submissions and a consolidated list of additional questions to the proponent (see Appendix 3 for the proponent's response).

The Environmental Protection Authority has considered the Public Environmental Review, all public submissions, other advice and the proponent's responses to the submissions in its assessment of this proposal.

3. The proposal

3.1 The route

The road route as proposed in the Public Environmental Review (Figure 3) can be broken broadly into two major sections:

- a The Capel and Ludlow Forest Bypasses, providing deviation of the existing Bussell Highway around the centre of Capel township and requiring a new bridge crossing the Capel River, and deviation to the south-east of the Ludlow Tuart Forest commencing north of the Ludlow River and settlement and rejoining south of the Sabina River.
- b The north-south component of the route, commencing at the (deviated) Bussell Highway just to the north-east of the Sabina River, and joining to the northern end of Sues Road at its junction with Jalbarragup Road.

The first section effectively provides the bypass of Capel previously planned by the Main Roads Department and the bypass of the Ludlow Tuart Forest called for in the Leeuwin Naturalist Region Plan. It would become the deviated Bussell Highway and thus the major highway route between Bunbury and Busselton. It would be designed to full highway standard and would allow for the long term duplication to dual carriageway of Bussell Highway.

Development of this portion of the route would allow the existing Bussell Highway through Capel to become a town access road, and the existing Bussell Highway between the Ludlow deviation and Sabina River, a local access road and scenic tourist route.

The second section provides the heavy mineral sand transport route connection to Sues Road, which is the primary purpose of the whole development. It will connect to Vasse Highway near the current Sanson Road junction.

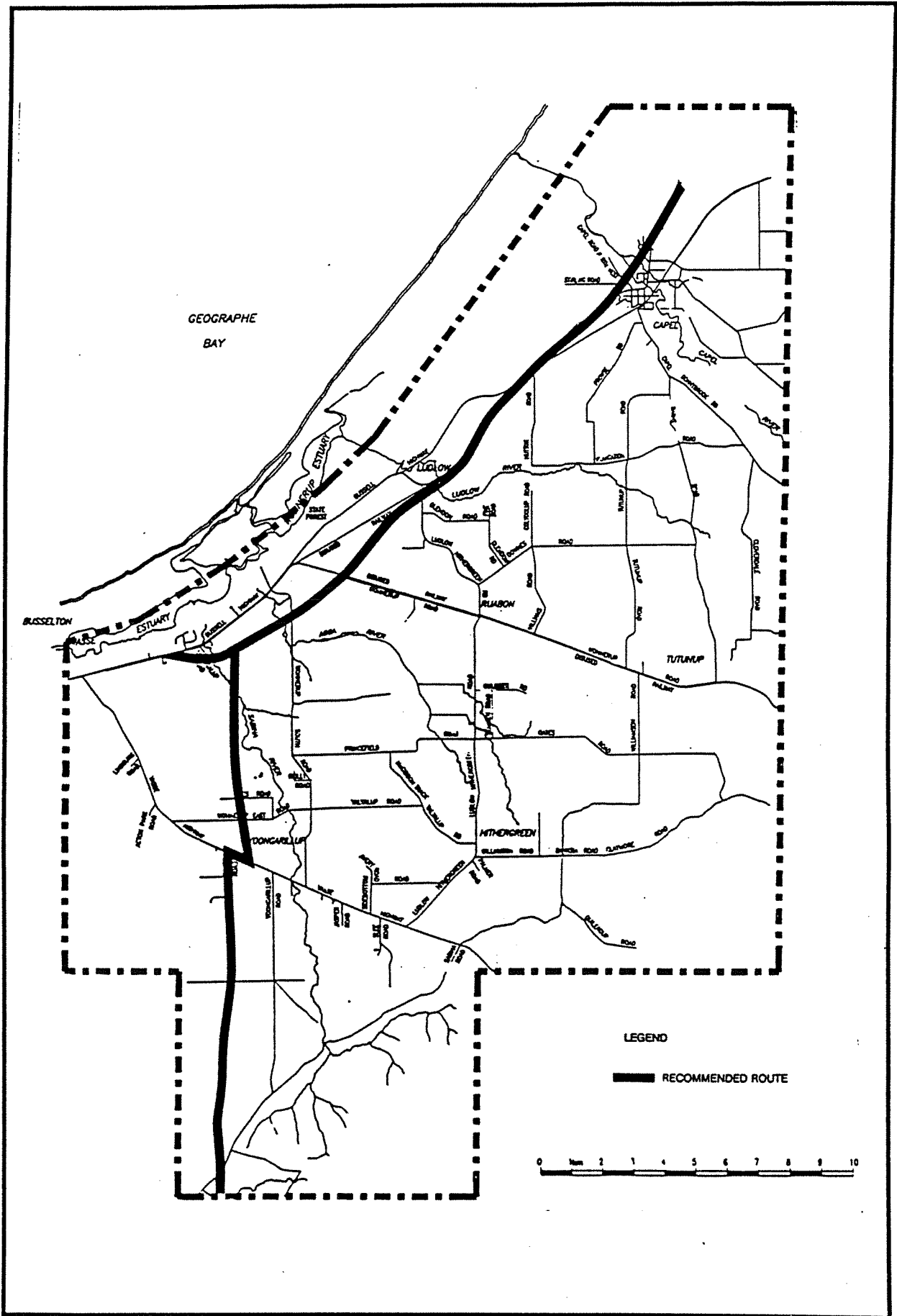


Figure 3. Route as shown in PER

While not directly related to the Main Roads Department's proposal, the route has also been identified by SECWA as one of four possible corridors for power supply to the Beenup mine site. However, no project has been submitted to the Authority for assessment.

3.2 Traffic

The route, in addition to carrying mineral sands, will provide a quicker route for traffic currently using Bussell Highway and Vasse Highway. The road also has the potential to provide a quicker route to and from the Augusta and Margaret River areas.

The Jangardup and Beenup mines are expected to transport an average of 88 loads of mineral sands daily. This will add almost 180 vehicle trip per day (vpd) to traffic volumes on the haulage road. There would also be a small number of additional vehicles due to suppliers and visitors to the mines coming from areas such as Perth and Bunbury.

Total traffic volumes on the Bussell Highway deviation are likely to be similar to existing volumes on Bussell Highway, ie generally ranging between 3000-5000 vpd, depending upon tourist impacts.

Between the Bussell Highway deviation and Vasse Highway, total volumes are likely to be in the range 600-800 vpd if Mowen Road remains unsealed.

South of Vasse Highway, total volumes are likely to be in the range 300-500 vpd.

3.3 Construction

The construction phase of the project could extend over a period of 40 weeks, depending upon weather. As the major portion of the proposed road does not currently have any made road, minimum disruption to existing traffic would occur.

Road making materials would be obtained from private sources and suppliers where possible and will include limestone, sand and gravel. Capel, Ludlow, Abba and Sabina Rivers would be crossed and appropriate bridges/culverts would be constructed.

4. Potential environmental impacts and management as given in the Public Environmental Review

The Public Environmental Review identified likely and potential impacts and outlined management measures specifically designed to minimise adverse impacts. The proponent's commitments are shown in Appendix 1. The impacts identified were:

- physical impacts - clearing, cut, fill;
- vegetation and flora impacts;
- wildlife impacts;
- drainage impacts;
- conservation impacts;
- landscape amenity - Whicher Reserve Scarp, recreation, wetlands, forest and conservation reserves, rehabilitation of borrow pits;
- social impacts - safety, school bus movements, intersection and property access points, safety of children, farm operations, loss of agricultural land, severance of property, impediments to movements of stock and equipment, housing and lifestyle, impacts on small holdings, dust, privacy and light impacts, noise impacts.

The above impacts were individually addressed in the Public Environmental Review and management measures proposed to minimise impact. The following gives a summary of some of the key impacts identified in the Public Environmental Review and the measures the proponent proposes to implement to manage them.

4.1 Flora

Generally the construction of the new road will require clearing of vegetation in State Forest, on private landholdings and in existing road verges.

Disturbed areas will undergo rehabilitation and revegetation.

The proposed road will lead to a downgrading of the existing Bussell Highway through the Tuart Forest and should alleviate existing impacts. The core of the proposed Whicher Reserve will be avoided but the route intersects the north-western sector of the buffer.

4.2 Fauna

Minor disturbance to fauna habitat may occur. The Main Roads Department will relocate any disturbed populations of valuable or rare fauna. Potential impacts relate to "corridor effects" where loss of habitat occurs due to corridor loss and habitat severance where current communities maintain cross road linkages. There is a possibility that western ringtail possums may exist in remnant peppermint stands. A commitment to undertake a survey for the possums in the vicinity of the Ludlow Tuart Forest has been given by the proponent.

An increased potential for roadkills will occur, mainly within and at the margins of State Forest.

4.3 Drainage and wetlands

Drainage impacts relate to road runoff ie erosion and inundation. These impacts will be managed by drainage design and erosion control measures. Impact on wetlands will be minimal due to avoidance of these areas by the road alignment and by diverting drainage to prevent it directly entering wetlands.

4.4 Dieback

That part of the Whicher Reserve to be traversed has experienced significant previous dieback deterioration. Management procedures for the prevention of the spread of the disease will be put in place as defined in consultation with the Department of Conservation and Land Management.

4.5 Safety

Increased vehicle traffic in the area will affect safety and impact will be minimised by appropriate road design for intersections, consideration of school bus movements and provision of safe pedestrian access. These matters will be addressed in the detailed design stage in consultation with appropriate authorities, operators and users.

4.6 Loss of farming land

Some property owners will lose agricultural land when acquisition procedures are enacted.

The detailed road alignment will be chosen so as to minimise the loss of land or unique resources. The proponent will pay fair and appropriate compensation.

4.7 Severance

Impacts caused by severing properties would be greatest on two properties and to a lesser extent on other properties. Measures to mitigate severance, arrived at by direct consultation with affected land owners, will be implemented and are likely to include matters such as the provision of stock underpasses, relocation of pens, fences and gates.

4.8 Lifestyle

Impacts on housing and lifestyle relate primarily to an increase in the level of traffic and associated noise, dust, vibrations and changes to the quiet rural character. The proposed route was selected to minimise the numbers of affected properties and houses.

4.9 Noise

Noise modelling has been undertaken for potentially affected residences and amelioration measures, ie screening, bunding and revegetation will be implemented. In extreme cases the proponent will give affected land owners an option for the property to be purchased.

4.10 Monitoring and management

Ongoing management and monitoring will be undertaken by the Main Roads Department, especially in relation to road safety, road maintenance, traffic accidents, traffic volumes, fauna road kills, and the progress of rehabilitation.

5. Summary of issues raised in submissions

A total of 91 submissions on this proposal were received by the Environmental Protection Authority. Names of submitters are given in Appendix 2. Most issues raised related to environmental and social impact and the detail and quality of the submissions was very high. Because of the detailed nature of the majority of the submissions, the Environmental Protection Authority decided to forward these submissions directly to the proponent. Permission was obtained from the submitters to do this. The Main Roads Department was requested to map the alternatives and the proposed amendments and contact the individual submitters directly (if they were directly affected land owners) to explore whether:

- the alternatives could be implemented in whole or part;
- a negotiated solution to the problem could be reached directly with the landowner; or
- where an alternative was not possible, why this was so

The proponent's response to these submissions is included in Appendix 3.

5.1 Issues

The Authority's assessment of the 91 submissions received indicated that the issues of greatest concern were:

- preference for rail over road transport;
- retention of trees, especially in rural lands;
- protection of wetlands;
- dieback control;
- compensation to landholders for loss of productive land, interference with farming practices and lifestyle impacts;
- road safety;
- safety of children along school bus routes;
- trucking hours;
- noise;
- dust;
- maintenance of services and the road;
- width of road corridor, especially through rural lands;
- report methodology.

While nearly all submitters favoured rail over road for the transport of mineral sands, a number of submitters supported the proposed road alignment. Reasons for support generally related to the benefits to road users in terms of travel time and the decrease in traffic through the Ludlow Tuart Forest.

The proponent has addressed the issues relating to potential impacts with commitments, which are listed in Appendix 1. In addition, the proponent's detailed response to submissions also includes additional commitments, especially to the individual land owners who will be directly affected if the road is constructed. (Appendix 3)

5.2 Public consultation

The process of public consultation was undertaken by the proponent in a genuine attempt to understand and resolve the issues of concern to potentially affected land owners. The process of consultation and negotiation of compensation measures is ongoing and will require refinement before construction commences.

The proposal was in the public arena four times throughout the staged consultation programme. The consultation was outstanding in its coverage and to the Authority's knowledge no similar study has been undertaken in Western Australia. The proponent and the community participated in a process in a most difficult social setting. The Authority appreciates the time and genuine effort of all parties involved to achieve the final proposed road alignment.

The information distribution to local land owners was criticised in some public submissions. The information missed some residents for a number of reasons including land owners being on holidays, land owners using mailing addresses in other towns and some information brochures could have been thrown out inadvertently. This is to be expected given the large area that was covered in Stages 1 and 2 of the study.

In addition some people received information, but chose not to participate. Although involvement cannot be forced, it is in the best interests of the people concerned to become involved.

As a result of the consultation, the final road route proposed is somewhat different from that presented in the original Public Environmental Review. This has meant impacts on individual land owners have changed. Some land owners not affected under the original proposal are now subject to a degree of impact under the amended proposal. The proponent will continue to consult with all land owners. Others originally affected have less impact with the amended alignment. It is recognised that people's choice about their degree of participation in the process would have been based on the likely direct impacts. The Authority believes however, that the proponents' commitment to public information and participation processes throughout the study period and the subsequent public review of the Public Environmental Review, enabled all relevant issues to be identified and adequate opportunities for those who wanted to be involved to do so. The Authority notes that the process of consultation and negotiation of ameliorative measures will continue.

6. Environmental impacts and their management

The Environmental Protection Authority has identified the key environmental issues requiring detailed consideration as:

- social, especially the management of impacts on affected land owners;
- protection of the Ludlow Tuart Forest;
- management of impacts on the McCarley's Swamp - AMC Wetland area;
- protection of the proposed Whicher Reserve;

- **development of a comprehensive dieback management plan;**
- **protection of remnant vegetation; and**
- **road vs rail transport**

The Environmental Protection Authority has made a number of recommendations below about the proposal in general and the key issues requiring additional environmental management.

Recommendation 1

The Environmental Protection Authority has concluded that, the alignment as amended (see Figure 4) during the process of interaction between the proponent, the Environmental Protection Authority, government agencies, and potentially affected land owners is environmentally acceptable and could proceed subject to:

- **the proponents commitments: and**
- **The Environmental Protection Authority's recommendations in this report.**

The Environmental Protection Authority considers that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years from the date of this report then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Authority.

The Authority notes that during the detailed implementation of proposals, it is often necessary or desirable to make minor and non-substantial changes to the designs and specifications which have been examined as part of the Authority's assessment. Because ongoing direct consultation is needed with affected land owners, the Authority believes that that is acceptable where it can be shown that the changes are not likely to have a significant effect on the environment.

6.1 Social

The Public Environmental Review covered the full scope of social issues in detail. Appropriate emphasis was placed on the social issues which were identified through both desk top studies and a comprehensive public consultation programme.

The route selected by the proponent's consultants was chosen on the basis of four criteria, one of which encompassed social considerations. The others were environmental, engineering and economic based criteria.

The study process has allowed the proponent to identify issues of relevance and to put forward a route with manageable impact. However, it was not possible to select a route with no social impact.

Despite the proponent's efforts to minimise social impact there remain residual impacts. These impacts vary from property to property and from individual to individual. They include impacts on the viability of properties; potential impact on the value of investments made; changes to amenity through increased access; additional traffic, and noise.

Because the proponent has the power of acquisition under the Public Works Act, some land owners felt that they had unequal power of negotiation. Some land owners were of the opinion that they had little influence under the process laid out under the Public Works Act and hence felt they were compelled to negotiate a settlement. Settlements however were negotiated by the proponent on the condition that the road proposal was approved by Government and proceeded.

In a number of cases the impacts could not be managed satisfactorily through mitigation measures. The remaining way to make the proposal acceptable was to institute compensation

measures. This was recognised by the proponent and negotiations for compensation are ongoing. Measures considered included property purchase, land swaps and monetary compensation for loss of land.

Although residents and the proponent were able to reach some type of agreement on mitigation and compensation measures it should be noted that not everyone was satisfied with all or part of their agreements. Agreements were reached primarily because of the compulsory acquisition powers available to the proponent. The proponent's commitment to adhere to the provisions of the Public Works Act, Section 63, will compensate the land owner for the value of the land acquired. However, as indicated in a number of the submissions received, some land owners will be of the opinion that the monetary value is not equal to the value they place on maintaining a farm which has been in one ownership for a number of generations. In this regard, more flexible compensation measures could have been considered (for example relocation to other properties of similar size and productive capability). However, the proponent is bound to act in accordance with the Public Works Act.

The proponent, in selecting and refining the route, was able to position the road in such a way as to be at an acceptable distance from dwellings. Where this was not achievable, the proponent will compensate people under the Act. Depending on the wishes of the individual land owner, this could include the purchase of the dwelling and the whole property in some cases.

It should also be noted that the road route offers little benefit to land owners along the route but has considerable costs. Therefore the proposal results in a biased distribution of the roads overall costs and benefits. The benefits are accrued by the State as a whole while the social costs are born by a few.

Recommendation 2

The Environmental Protection Authority recommends that the proponent continue to consult with individual land owners on localised issues and compensation measures.

It is recognised that land owners along the route need to make operational and investment decisions about their/properties on an ongoing basis. The prospect of the road proposal going ahead will effect land owners' plans and in some cases land owners will need to put plans for alterations or improvements to their operations on hold until a final decision about the road is made. The Authority recognises the potential disruption this may cause.

Recommendation 3

The Environmental Protection Authority recommends that the proponent implement the contractual arrangements, arrived at with land owners, within two years from the date of environmental approval.

6.2 Ludlow Tuart Forest

A key objective of the Mineral Sands Road Study was to provide a bypass of the Ludlow Tuart Forest. The objective arose from previous studies, (for example the Report of the Interdepartmental Task Force on the Transport Infrastructure for Proposed Mineral Sands and Other Resource Developments in South West, Western Australia and the Leeuwin Naturalist Study) and a publicly stated preference by Mineral Deposits Limited for a route avoiding the Forest.

Bypassing the Forest will alleviate impacts from the existing highway, and lead to its downgrading to a local and scenic tourist route. It would also alleviate pressure for widening the highway through the Forest which would involve the clearing of trees. The expected

decrease in traffic would also help to resolve concern about highway safety through the Forest.

Following the public review period, the Main Roads Department considered altering the route to retain a portion of the existing Bussell Highway. The main benefit of this deviation (Option A - see proponent's response at Appendix 3) was an economic saving due to the residual value remaining in the pavement. The Authority was concerned that this option was contrary to a key objective of the study, namely to avoid the Ludlow Tuart Forest and construct a bypass which would alleviate existing impacts arising from the Bussell Highway.

The proponents final decision to select Option B, will minimise social impact and achieve the objectives of by-passing the Forest and the McCarley's Swamp - AMC wetland area.

6.3 McCarley's Swamp - AMC area

The route detailed in the Public Environmental Review passed close to interdunal wetlands and swamps. Of particular importance is McCarley's Swamp, an important waterbird habitat.

A number of public submissions were made on behalf, or in support of AMC's wetland site which is opposite McCarley's Swamp. Of particular concern was the link between McCarley's Swamp and the wetland project, the potential adverse impacts as a result of runoff from the road, and possible interference with the movement of ground water. While the proponent outlined measures to manage these impacts, the Authority believes that avoidance of the wetland area will minimise or eliminate the risk of adverse impacts.

As a result of the public review period and the subsequent direct consultation with affected land owners, the Main Roads Department has amended the original Public Environmental Review route to accommodate the concerns raised by the public.

The Department in its response determined that since suitable alternative alignments exist within the proposed road corridor, the most prudent solution was to realign the route via Option B which avoids the swamp and wetlands and bypasses the Tuart Forest (Appendix 3 contains a series of maps showing the amended alignment.)

The Authority agrees that the amended route is manageable and will avoid impact on the Ludlow Tuart Forest and the wetland areas. The proponents commitment to continue direct consultation with land owners is fully supported and the Authority, again reiterates the importance of **Recommendation 2 and 3**.

6.4 Proposed Whicher Reserve

The Public Environmental Review detailed potential impacts from increased access to the proposed Whicher Reserve. Following an analysis of submissions received and further consultation with land owners, the Main Roads Department amended the original route to the preferred route shown in Figure 4 and in detail in Appendix 3.

The Authority sought detailed information from the Department of Conservation and Land Management to allow an assessment of the likely environmental impacts of variations to the Whicher Reserve part of the route which could affect other parts of the route to the north.

The Environmental Protection Authority has analysed the Department of Conservation and Land Management data in detail and integrated it with other issues to allow an assessment of the route as a whole. The Department of Conservation and Land Management had a clear preference for the original westerly Public Environmental Review alignment because it provided for the more efficient management of the forest.

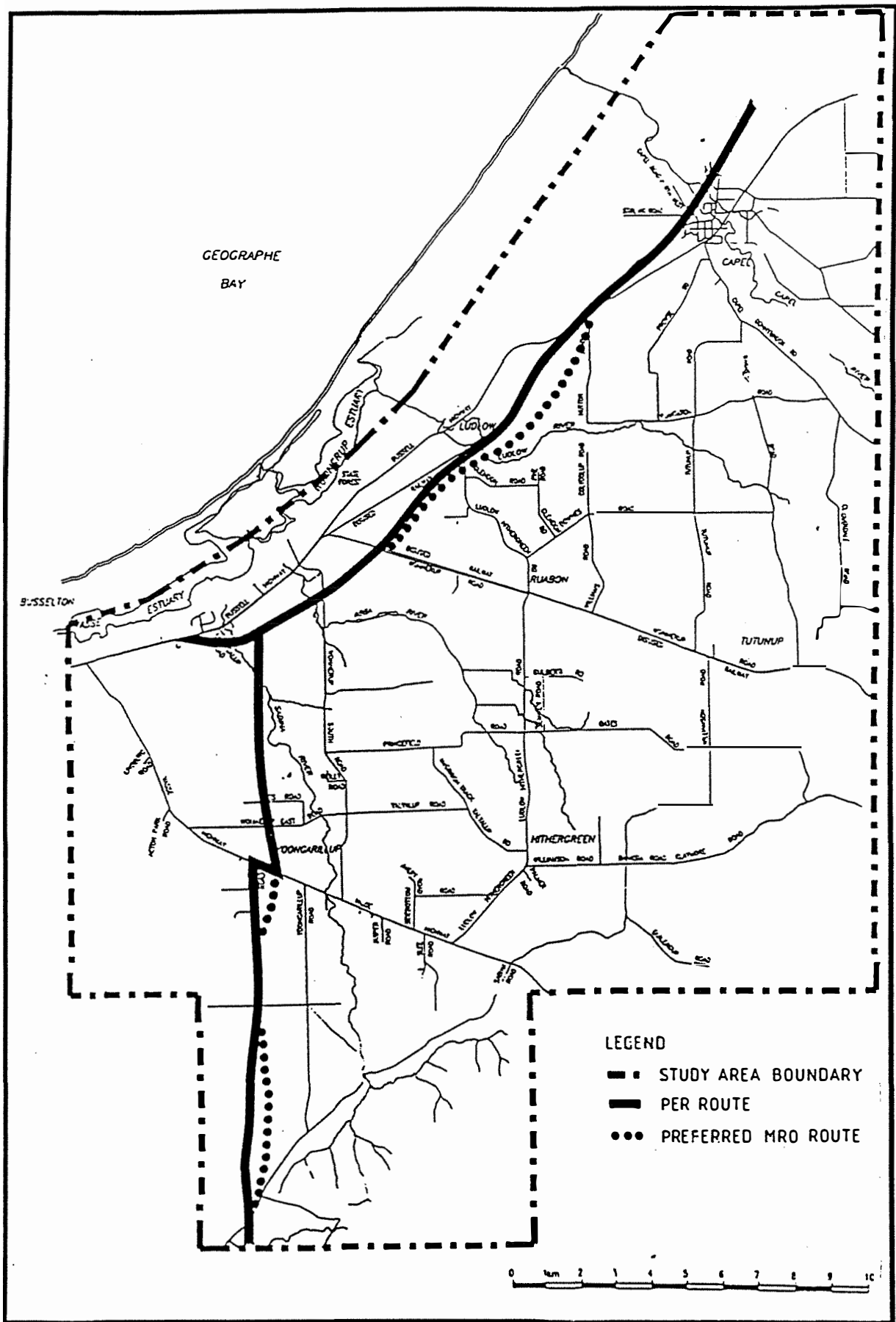


Figure 4. Recommended route as refined by public review and consultation.(N.B. Map not exactly to scale.)

The Authority assessed the preference of the Main Roads Department on environmental and social criteria separately. In doing this, the inherent problems associated with aggregating environmental, social and economic criteria are not encountered and the trade-off implicit in aggregating does not occur.

An analysis of potential impact on the western-most part of the Whicher Reserve Forest Block was carried out because this area has been proposed as the buffer zone for a conservation reserve.

The key issue identified by the Department of Conservation and Land Management, which is responsible for managing this forest block, was severance and attendant management factors including potential increases in fauna road kills and pest and disease introduction. An objective analysis of potential impacts (Table 1) indicates that while there are a few differences between the route originally developed in the PER and the Main Roads Department preferred route, on balance they are similar.

Table 1 also gives a comparison of the two alignments on key social considerations.

The Environmental Protection Authority concludes that either alignment could be environmentally manageable and thus environmentally acceptable on a balance of all environmental issues, including physical, biological and social.

The Environmental Protection Authority concludes that the Main Roads Department's preferred alignment is environmentally acceptable and **Recommendations 2 and 4** apply.

Table 1. Potential impacts through Forest at proposed Whicher Reserve Environmental Implications

Potential Impacts	Original PER Option	Main Roads Department Preferred Option
Length	3975M	3875M
Clearing area (1:2 road batter)	14.9ha	11.6ha
Forest Severance	less	greater
Visual impact	Manageable	Manageable
Rare flora	None on alignment	None on alignment
Rare fauna	None on alignment	None on alignment
Forest quality	Southern third - poor 20% - low/mod dieback impact	Southern third - poor 20% - low/mod dieback impact
Additional Dieback Risk	None	20ha requires risk management

Social implications

No. of land owners potentially affected	4	2
No. of land owners directly affected	2	2
Severance	More	Less
Approximate loss of farming land	8ha	6.5ha

6.5 Dieback

Phytophthora cinnamoni infected soil and vegetation is present in the proposed Whicher Reserve. The original Public Environmental Review route was located in an area where dieback infestation was believed to be widespread. Advice from the Department of Conservation and Land Management indicates that previous disturbance to the forest from clearing for agriculture means that all forest boundaries are presumed infected or at risk. Dieback mapping is being undertaken and will be available for the detailed design phase.

Following the public review period and associated consultation, the Main Roads Department arrived at their preferred final alignment shown in Figure 4 and in more detail in Appendix 3.

The amended road alignment also requires dieback management. The proponent has given an undertaking to liaise with the Department of Conservation and Land Management at the design and construction stages and, as considered necessary, develop appropriate dieback management procedures. However, the Authority considers dieback management to be a high priority and the practical control of the disease requires comprehensive management plans. Accordingly **Recommendation 4 below applies.**

6.6 Remnant vegetation

Remnant vegetation is present throughout the study area, especially as corridors on uncleared road reserves and verges and on unproductive and inundated areas of farm land. In addition, some submitters stressed the importance of minimising clearing of revegetated farm lands.

The proponent has indicated that it will pursue a policy of selective clearing, however the Authority considers that detailed management is required via an Environmental Management Plan. Therefore, **Recommendation 4 applies.**

Recommendation 4

The Environmental Protection Authority recommends that the proponent prepare a comprehensive Environmental Management Plan to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management as appropriate, which includes, but is not necessarily limited to;

- **comprehensive dieback management plans comprising dieback mapping and procedures for the prevention of the spread of dieback disease developed in consultation with the Department of Conservation and Land Management, prior to any earthmoving operations through State Forest; and**
- **plans for avoiding remnant native vegetation and avoiding or replacing replanted trees on cleared farmland wherever possible, prior to any earthmoving operations on alienated farmland.**

The Plan should subsequently be implemented when earthworks commence in each case.

6.7 Road versus rail transport

In its report on the Beenup Mine proposal, the Authority identified the potential for long term advantages of utilising rail transport for mineral sands. The Authority pursued the issue of greenhouse gas emissions related to the transport of mineral products. Both the proponent

(Mineral Deposits Limited) and the Department of Transport independently provided data which agreed closely and confirmed that transportation by road would generate about 35% more carbon dioxide than the cheapest (although apparently constrained by high initial capital costs) rail option. However, the Authority has not been able to examine in detail the social and environmental impacts of a specific rail route as no such proposal has been submitted.

Given the public preference and the potential to reduce greenhouse gas emissions, the Environmental Protection Authority highlights the importance of public support for rail as a long term option.

Recommendation 5

The Environmental Protection Authority recommends that the Minister for the Environment and the Minister for Transport keep the rail transport option under review.

7. Conclusion

The Environmental Protection Authority, following assessment of the proposal and commitments made by the Main Roads Department, has concluded that the haulage route as refined by the Department in response to public submissions, and subject to the proponent's commitments and the recommendations of the Environmental Protection Authority, is environmentally acceptable.

In addition the Authority commends both the proponent and the community in participating in what could well be an important precedent setting project in terms of extensive public scrutiny and involvement.

Appendix 1

Proponent's commitments

The Main Roads Department makes the following specific commitments regarding environmental protection and management. The Authority has listed the twenty-nine commitments under the following seven headings.

FAUNA

1. At the new Capel River Bridge, fauna pathways will be maintained by the Main Roads Department to Department of Conservation and Land Management's satisfaction beneath the bridge by provision of substantial freeboard beneath the bridge deck.
2. Suitable culvert construction in seasonally inundated areas will be built by the Main Roads Department in consultation with Department of Conservation and Land Management prior to earthwork construction to provide for aquatic, amphibian and reptile species.
3. Suitable fauna migration pathways in the McCarley's Swamp area will be provided by the Main Roads Department in consultation with Department of Conservation and Land Management and AMC Mineral Sands in the form of underpass culverts, linked to revegetation.
4. Prior to construction, a survey for western ringtail possums in the vicinity of the Ludlow Forest will be undertaken by the Main Roads Department if considered necessary by Department of Conservation and Land Management and WA Museum officers. If the survey is carried out, a management plan will then be prepared to the satisfaction of Department of Conservation and Land Management.
- 5.* Main Roads Department will provide suitable road signs warning motorists to be aware of likely fauna crossings.

SOCIAL

6. The construction programme will be managed by the Main Roads Department to maintain current access on Sanson Road, Vasse and Bussell Highways and other affected roads to the satisfaction of adjacent land owners.
7. Pull off areas for school buses will be provided by Main Roads Department as part of construction where warranted. Consultation with operators and users will be taken into account in selecting locations.
8. When designing the Capel River bridge, the Main Roads Department will make provision for cyclists and pedestrians to the satisfaction of the Shire of Capel.
9. Prior to construction, the Main Roads Department will provide, in consultation with owners, appropriate means for stock and equipment movement between severed portions of properties.
10. Prior to construction, the Main Roads Department will resolve with affected land owners, appropriate methods for stock management by the provision of underpasses or other stock management facilities.
11. If requested by the owners of severed properties or small holdings, the Main Roads Department will consider the purchase of part or all of the holding.
12. Road accident statistics for the haulage route will be kept by the Main Roads Department as part of its standard accident database.
13. If the haulage route is constructed, the Main Roads Department will monitor road safety, and monitor and maintain pavement conditions, drainage facilities and road signs consistent with standard practice.
14. The Main Roads Department will investigate the Shire of Capel's request that an underpass be provided at Capel Bridge for Capel North West Road.

15. The Main Roads Department will liaise with the Shire of Capel and the local people to help ameliorate any negative effects arising from the Capel bypass.
16. The Main Roads Department will accept social input and comments during the operational stages of the road, and if within its responsibility area, attempt to address or refer to other responsible parties.
- 17.* Amendments to the transportation route resulting from the Public Environmental Review process will be subject to consultation with land owners not previously affected by the route involving a further submission period where applicable.
- 18.* Marginal adjustments to the proposed route alignment are envisaged pending availability of detailed survey information along the route prior to the final design phase for the road. Further consultation with land owners adjacent to the road will be carried out where necessary as this design change information becomes available.
- 19.* Land owners will be compensated for land required for road reserve purposes under the Public Works Department Act Section 63 by the Main Roads Department.

REHABILITATION

20. On completion of construction, all borrow pits on private or public lands will be reinstated in accordance with Main Roads Department policy, and in consultation with the owners on private land or Department of Conservation and Land Management and other authorities on public lands.
21. During construction, road verges will not be cleared by the Main Roads Department beyond the corridor required for the construction of the road formation and earthworks, with the exception of horizontal curves required to maintain minimum sight distance consistent with Austroads standards.

SURFACE WATER

22. Specific design measures, including retardation basins, will be incorporated in the design by the Main Roads Department to the satisfaction of the Environmental Protection Authority in order to prevent direct drainage entry to McCarley's Swamp.
23. The Main Roads Department will incorporate erosion control measures in the drainage channel designs as necessary, to Austroads standards.
24. Appropriate erosion control measures (stone pitching, rip-rap, stilling basins etc) will be incorporated by the Main Roads Department in the design of the haulage road to Austroads standards.

PROPOSED WHICHER NATURE RESERVE

25. If required by Department of Conservation and Land Management restrictions to public access to internal forest roads will be installed by the Main Roads Department or Department of Conservation and Land Management in designated areas in the Whicher Reserve where these are intersected by the construction of the new road. Such restrictions may include appropriate barriers where appropriate to the satisfaction of Department of Conservation and Land Management.

POLLUTION CONTROL

26. The Main Roads Department will, in consultation with abutting land owners, provide noise attenuation measures at the following locations:-
 - CG 392 on the Capel Bypass
 - CG 17 on the Capel Bypass
 - Lot 1 on the Ludlow Bypass
 - CG 674 on Sanson Road

27. The Main Roads Department will undertake construction scheduling and management to minimise noise, dust and safety impacts resulting from the extraction and transport of construction materials.
28. Post-construction noise monitoring to gauge the effectiveness of noise amelioration measures will be carried out by the Main Roads Department. Results will be made available to interested parties.

OTHER

29. The Main Roads Department will conduct Biological and Ethnographical site surveys if so requested by Department of Conservation and Land Management or the Environmental Protection Authority, prior to detailed design of the haulage road. The results will be made available to interested parties.
- * Additional commitments resulting from the Public Environmental Review process.

Appendix 2

List of people and organisations making written submissions.

No	TITLE	INITIAL	OFFICER NAME	POSITION	NAME OR ORGANISATION	TOWN
1	Mr	T M	Peters	General Manager	AMC Mineral Sands Ltd	NEDLANDS
2	Mrs	E D			Anderson	CAPEL
3	Mr/Ms	K N			Anderson	BUSSELTON
4	Ms	J			Anderson	BUSSELTON
5	Dr	R	Purdie	Assistant Director	Australian Heritage Commission	CANBERRA ACT
6	Mr	F R			Avery	BUSSELTON
7	Mr & Mrs	A R & M J			Bamford	KINGSLEY
8	Mr	N			Bentley	CAPEL
9	Mr & Mrs	J A & M M	Adami	C/- Mr S Duffy	Bignell Fraser Real Estate	BUSSELTON
10	Mr & Mrs	J			Brockman	BUSSELTON
11	Ms	I			Busselton Environmental Coalition	BUSSELTON
12	Mr	C	Campbell	General Manager	Busselton Tourist Bureau (Inc.)	BUSSELTON
13	Mr	W H			Butler	PERTH
14	Dr	W G	Martinick	on behalf of	Cable Sands (WA) Pty Ltd	SUBIACO
15	Mr & Mrs	J & C			Campbell	CAPEL
16	Mrs	I			Casselton	BUSSELTON
17	Mr & Mrs	W & L			Chadwick	CAPEL
18	Mr & Mrs	A M & S E M			Chapman	BUSSELTON
19	Mr & Mrs	G A & M J A			Chapman	BUSSELTON
20	Mr & Misses	L, B & J			Collins	MORLEY
21	Mrs	S			Collins & Family	MORLEY
22	Ms	R	Siewert	Co-ordinator	Conservation Council of WA Inc.	PERTH
23	Mr & Mrs	A R & E			Cooper	CAPEL
24	Mrs	M B			Craigie	BUSSELTON
25	Mr	F			Crooks, Michell, Peacock, Stewart (WA) Pty Ltd	EAST PERTH
26	Mr	J			d'Espeissis	DUNSBOROUGH
27	Mr	M			Danischewsky	DUNSBOROUGH
28	Dr	S			Davies	MT HELENA
29	Dr	S	Shea	Executive Director	Department of Conservation and Land Management	COMO
30	Mr	D	Bills	Environmental Officer	Department of Mines	PERTH
31	Ms	I			Devoy	BUSSELTON

LIST OF SUBMISSIONS - MINERAL SANDS TRANSPORT ROAD PROPOSAL

No	TITLE	INITIAL	OFFICER NAME	POSITION	NAME OR ORGANISATION	TOWN
32	Mr	P			Dowden - Parker	via CAPEL
33	Mr	K J			Edwards	via MARGARET RIVER
34	Ms	J			Elphick	BUSSELTON
35	Messrs & Mrs	G, T R & J A			Espinos	BUSSELTON
36	Mr	K			Espinos	BUSSELTON
37	Mr/Ms	F L	Jennings		F L Jennings Nominees Pty Ltd	MELVILLE
38	Mr/Ms	K M			Forrest	BUSSELTON
39	Mr	A E			Franklin	VASSE
40	Mr/Ms	D			Gardiner	CAPEL
41	Mrs	B			Golden	CAPEL
42	Mr & Mrs	L & L	Devoy		Grice	BUSSELTON
43	Mr & Mrs	N L & E			Haddon	BUSSELTON
44	Mr	R G			Harvey & Family	BUSSELTON
45	Mr	L N			Inglis	ALBANY
46	Mr & Mrs	S & P N			Isopenko	CAPEL
47	Mr/Ms	I B			Keast	BUSSELTON
48	Mrs	A			Keast	BUSSELTON
49	Mr	D W			Kemp	BUSSELTON
50	Mr	L A			Kennett	BUSSELTON
51	Mr & Mrs	K & C			King	BUSSELTON
52	Mrs	I			Leithead	BUSSELTON
53	Mr/Ms	C S			Longhurst	QUINDALUP
54	Mr	B K			Masters	CAPEL
55	Ms	M F			Mcgrath	BUSSELTON
56	Ms	E	Smyth	Beenup Project Manager	Mineral Deposits Ltd	EAST PERTH
57	Hon	M			Montgomery MLC	ALBANY
58	Mr & Mrs	I G & S I			Pearce	via BUSSELTON
59	Mr	B D			Piggot	BUSSELTON
60	Dr	A			Pilgrim	HOVEA
61	Mr & Mrs	L N & J A			Price	via BUSSELTON
62	Mr & Mrs	S C & F J			Reeve	BUSSELTON

LIST OF SUBMISSIONS - MINERAL SANDS TRANSPORT ROAD PROPOSAL

No	TITLE	INITIAL	OFFICER NAME	POSITION	NAME OR ORGANISATION	TOWN
63	Cr	M			Reid	BOYANUP
64	Mr	F	Doyle	Wetlands Project Officer	Royal Australian Ornithologists Union	CAPEL
65	Mr/Ms	J L			Samwell	CAPEL
66	Mr	L			Scott	LUDLOW
67	Mr	G E			Scott	CAPEL
68	Mr	W S			Shackleton	MUNDARING
69	Mr	P J	Coulson	Shire Engineer	Shire of Busselton	BUSSELTON
70	Mr	R	Bone	Shire Clerk	Shire of Capel	CAPEL
71	Mr	R			Shore et al	BUSSELTON
72	Mr	S			Slee	BUSSELTON
73	Mr	K			Smith	BUSSELTON
74	Mr	A A			Standring	COWARAMUP
75	Mr/Ms	F J			Tame	BUSSELTON
76	Mr & Mrs	J & M			Teale	BUSSELTON
77	Mr & Mrs	P			Thorpe	CAPEL
78	Messrs	R W, E M & J			Torrent	BUSSELTON
79	Ms	T D			Turner	CAPEL
80	Ms	S			Virgin	CAPEL
81	Ms	B J			WA Wildflower Society (Inc)	NEDLANDS
82	Mr & Mrs	B J & E M			Walters	BUSSELTON
83	Mr & Mrs	D & J			Walters	BUSSELTON
84	Mr	T	Ford		Water Authority of W A	BUNBURY
85	Ms	J			Weld	BUSSELTON
86	Mr	D			Wendt	CAPEL
87	Mr	G	Houghton	on behalf of	Westralian Sands Limited	BUNBURY
88	Ms	S			Wheeler	BUSSELTON
89	Mr/Ms	B K			Winchcombe	DUNSBOROUGH
90	Mr/Ms	H A			Wynne	BUSSELTON
91	Mrs	A			Yugovich	CAPEL

LIST OF SUBMISSIONS - MINERAL SANDS TRANSPORT ROAD PROPOSAL

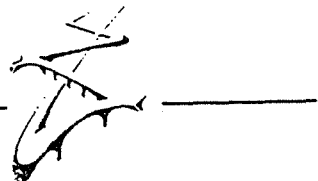
Appendix 3

Proponent's response

PART 1

MAIN ROADS DEPARTMENT

WATERLOO CRESCENT, EAST PERTH, WESTERN AUSTRALIA.
PO Box 6202 EAST PERTH WA 6004 Phone (09) 323 4111 Fax (09) 323 4430 Telex AA 92894



quiries
ur Ref
our Ref

Mr Terry on 323 4408

60-2086-2VC

75/90

Chairman
Environmental Protection Authority
1 Mount Street
PERTH WA 6000

ATTENTION: MR FRANK BATINI
A/DIRECTOR EVALUATION DIVISION

MINERAL SANDS ROAD STUDY - PUBLIC SUBMISSIONS

I refer to your letter of May 13 1991 and the attached submissions detailing major issues of concern to the public.

Each of the residual questions raised has been addressed and the responses set out on the attached list.

The more detailed submissions concerning alternative routes and potential impacts, are presented in plan format. The plans show a revised route and include a tabled list of submitters and the basic issue(s) of each submission. Each issue is addressed and suitably cross referenced to its corresponding location on the plan.

These plans are currently being prepared and will be forwarded to you at our earliest convenience.

J G O Hackett
DIRECTOR STRATEGIC PLANNING

June 20 1991

**PUBLIC SUBMISSION RESPONSES
MINERAL SANDS ROAD STUDY**

GENERAL ISSUES

Rail Option

- Q. Why was rail not considered in detail as an alternative to road options?
- A. A series of rail, road/rail and road options were considered in an earlier transportation study. The Government determined that transport of mineral sands from the Beenup and Jangardup mines would be by road.

Other Roads

- Q. Why was Acton Park Road and alternatives based on it not included within the terms of reference of the original studies?
- A. Acton Park Road and alternatives based on it were excluded from the study brief. Government commitments were made that the route from the mine sites to Bunbury was to be located via Sues Road and Sabina Road to the Vasse Highway.
- Q. Will Acton Park Road be utilised either by construction traffic or for mineral sands transport?
- A. Acton Park Road may be used for construction traffic depending on the location of sources of road making material. It will not be used for mineral sands transport from the Beenup or Jangardup mines once the permanent route is constructed.

Fringing Vegetation

- Q. Will the proponent consider minor alignment changes to retain useful trees on at least one side of the existing road?
- A. Yes.
- Q. Will the proponent consider reducing the road reserve width and allowing land owners to plant the belts of trees proposed on their own land rather than the road verge?
- A. The MRD would prefer to plan, implement and manage the landscaping in an integrated manner, retaining control over roadside vegetation. In addition it is necessary to maintain a minimum road reserve in some locations for the purposes of drainage, road maintenance and safety. This width may be less than that shown in the PER but would be subject to final design requirements. MRD would support the idea of adjacent land owners carrying out their own complementary landscaping.
- Q. How will these sorts of details be resolved?
- A. Design will be based on detailed site surveys and aerial photography.

Wetlands

- Q. What steps will the proponent take during detailed design to:
- Address the issues of possible impacts on/or severance of wetland habitats?
 - Avoid swamp land in preference to sandy rises?
- A. Commitments have been made to provide fauna underpasses and culverts for aquatic amphibian and reptile species in consultation with CALM.

Final alignment considerations will identify swampy and low lying lands and minimise intrusion on them.

Raw Materials

- Q. How will raw material sources be selected and finalised?
- A. During detailed design, all potential sources of raw materials will be identified and their reserves estimated. Final selection of sources will be based on a number of factors, including quality of product, cost and location.

In addition a detailed management plan will be prepared defining how material sources will be managed.

Dieback

- Q. What is the need for dieback control along the route, more particularly in forest, in remnant vegetation and on farmland?
- A. Some dieback has been identified along the route. A management plan for the control of dieback will be pursued through CALM.
- Q. Will a specific management plan addressing each land type be produced?
- A. Yes.

SOCIAL IMPACT ISSUES

Report Methodology

- Q. How much weight was given to the matrix evaluation in selecting the preferred route?
- A. The matrix was the basis for route selection. For further details please refer to the attachment **JUSTIFICATION OF THE MATRIX ASSESSMENT**.

Q. What value was given to the loss and interference with productive agricultural land?

A. Of 24 criteria evaluated, two specifically related to the number of agricultural properties severed or affected, while another three considered impacts on private property, loss of property, improvements and community acceptability. The cost of resumption has not been itemised but is included in the cost of the route.

Alternatives (during and after PER completion)

Q. Have (these) alternatives (to the preferred route) been examined?

A. All road alternatives suggested in the submissions have been assessed by the Main Roads Department. The preferred alignments resulting from this assessment are shown on the attached book of plans.

Q. How will these suggestions be incorporated in the final design of the road?

A. Suggestions which are evaluated as a benefit over the proposal described in the PER will be incorporated.

Compensation

Q. Will the proponent compensate landowners?

A. Yes. Compensation may take a variety of forms. Where private land is required the owner will be compensated financially. In this case compensation will be determined through individual negotiation with the land owner, in accordance with MRD policy as guided by the Public Works Act. Where severance is an additional impact, consideration will be given to further purchases of land or by provision of stock underpasses or other stock management facilities.

Farm Operations

Q. How will the proponent take responsibility for implementing fencing, relocation of facilities, new water supplies etc? Will this be done in consultation with land owners?

A. Potential impacts will be identified and resolved by consultation.

Safety

Q. How will the proponent ensure the safety of school children along the route?

A. As per PER Commitment No 11 (i.e. Pull off areas for school buses will be provided by MRD as part of construction where warranted. Consultation with operators and users will be taken into account in selecting locations).

Lifestyle

- Q. How will the proponent minimise impacts on lifestyles?
- A. There are no proposals for other land use change in the area and consequently it is anticipated that the area will remain primarily a farming area.

Trucking Hours

- Q. Has the proponent considered the hours that trucking can occur?
- A. Yes. However, the PER is dealing with the construction of the road and not the cartage of mineral sands. Page 97 of the PER refers.

Noise

- Q. How will the proponent minimise noise impacts?
- A. Noise bunding will apply at 4 locations but realignment of the route may avoid this need.

Services

- Q. Has the proponent investigated service provision, and its maintenance in certain locations - in particular, the servicing of the future population of Peppermint Beach?
- A. Steps will be taken to ensure maintenance of all existing services to residents to the west and north-west of Capel. However, provision of future services is a matter for the responsible servicing authorities. All existing service access to Peppermint Beach will be maintained.

Major Highway

- Q. Were other road users of the highway included in the impact prediction?
- A. Yes.
- Q. What measures will be incorporated into the design/construction of the road to minimise these impacts?
- A. Noise attenuation measures, landscaping, intersection design and appropriate property access points.

Width of Corridor

Have suggestions to vary the corridor width to incorporate a future rail reserve, or reduce its width to 30 metres to minimise the loss of agricultural land been considered by the proponent?

Variation of the road reserve width to include future rail requirements have not been considered. The nominal width of the proposed road reserve will be maintained at 40 metres, but detailed design may identify specific locations where this may be reduced.

Maintenance

Q. Who will be responsible for maintaining the road?

A. This has not yet been fully determined. It is likely that responsibility for maintaining the road will be shared by the State and the Local Government Authorities depending on road classification.

MAIN ROADS DEPARTMENT, WA

June 20 1991

MINERAL SANDS ROAD STUDY JUSTIFICATION OF MATRIX ASSESSMENT

Several submissions received by the EPA and forwarded to the MRD for comment questioned the validity of the matrix and its application in determining the preferred road option.

The PER gives only a summary of the extensive investigations, comparisons and sensitivity testing that was comprehensively included in the Stage II Report, which was released to the public in October 1990.

The Stage II Report, pages 10-70 inclusive, methodically details the process of road option analysis which was undertaken. Section 3 of this report outlines each criteria selected within the Engineering/Economic, Social Impact and Environment Assessment sub-group categories. It then proceeds to detail every option as affected by the selected criteria, their respective ratings to these criteria and why the ratings as defined were allocated.

Section 4.0 of the Stage II Report fully outlines the process of preferred option determination, giving factual and justifiable reasons for selection of the best six road options (B, D, F, G, M & Q) after initial ranking and subsequent weighting according to the three sub-group categories of the 24 criteria pertaining to the road options.

Section 5.0 of the Stage II Report relates the additional analysis conducted by the Study Team which evaluated two further options which were subsequently dismissed (ie they did not affect the top six options as previously defined).

The best six options were then assessed on the basis that the Bussell Highway and Capel Bypass would be constructed irrespective of the location of the preferred road option. Justification for this assumption is given on page 62 of the Stage II Report. A reduced matrix was applied using 16 of the initial 24 criteria, with eight criteria deleted as their relative impacts were deemed insignificant or irrelevant in the comparison process (page 65 of the Stage II Report details the reasons for the criteria omitted).

The revised matrix generally confirmed the results of the initial evaluation matrix.

Sensitivity testing for the best six options was then conducted, utilising weightings of $\frac{1}{3}$, $\frac{1}{2}$ or 1 for various criteria as detailed in Table 11 of the Stage II Report. Normalising and standardising (factoring) the ratings for each of the six options was then applied via two methods. The first method was to choose the lowest scoring (best) option on a particular criterion favoured as the reference for that particular criterion. All of the option ratings were then divided by that reference to arrive at a normalised rating. The second method was then to standardise the normalised ratings so that summation of all option ratings for each criterion would produce the same cumulative score (row sums are equal).

The same weighting procedure as previously described was then applied. Tables 12 and 13 of the Stage II Report detail the results of the two methods as applied.

Page 2

Regardless of the methods applied, Option B remained the favoured route.

The matrix and its application has been devised and successfully applied in a number of road studies by Mitchell McCotter & Associates in various projects undertaken in the Eastern States. The process was also fully described and accepted by the project steering committee, many members of which have extensive experience in the use of multi-criteria solution processes.

It is stressed that although certain assumptions and a minor degree of subjectivity was applied where this was required (ie where no 'hard' figures were available) the matrix represents the most reliable and balanced means by which an objective road option assessment could be undertaken.

MAIN ROADS DEPARTMENT, WA

June 20 1991

PL-10714

PART 2

STRATEGIC PLANNING

PROGRAMMES AND STRATEGIES

STATUTORY PLANNING

PLANNING SERVICES

ENVIRONMENT

MINERAL SANDS ROAD STUDY SUES ROAD TO CAPEL

A REPORT ON THE LOCATION OF THE
PROPOSED TRANSPORTATION ROUTE
FOLLOWING A REVIEW OF THE
PER SUBMISSIONS

MAIN ROADS DEPARTMENT

REPORT No 0133P

STRATEGIC PLANNING
DIRECTORATE

MAIN ROADS DEPARTMENT OF
WESTERN AUSTRALIA

July 1991

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1. INTRODUCTION

As a result of the Public Environmental Review (PER) submission process, the alignment changes suggested by concerned land owners and members of the public have been examined by the Main Roads Department. A summary of submissions received showing major impacts with possible solutions are tabled at Appendix A. Where it can be shown that increased environmental, social and economic benefits can be achieved by locating the road clear of the major concerns expressed in the submissions, the Department has amended the alignment proposed in the PER so as to maximise these benefits.

2. ROUTE ASSESSMENT

2.1 Bussell Highway

2.1.1 AMC Wetlands Centre - McCarley's Swamp Area

Of the 20 submissions received referring to the AMC/McCarley's area, six submissions indicated acceptance of the PER route because of nil or marginal impact to the area, while 14 submissions suggested an alternative alignment should be developed to avoid the major environmental and social impacts the route would have on the area.

The Department endorses the advice given by the majority of submissions and recognises the social impact problems the road will impose on the Ashton Street residents at Ludlow and the environmental sensitivity of the issues affecting the successful integration of the AMC Wetlands Centre with McCarley's swamp. The Department has determined that since suitable alternative alignments exist within the proposed road corridor, the most prudent solution is to realign the route via one of these alternatives. An assessment of locating the road via the alternative alignments indicated at Figure 1 is shown in Table 1.

TABLE 1

OPTION	LENGTH (KM)	CONSTRUCT LENGTH (KM)	CONSTRUCT COST (\$M)	ENVIRONMENT IMPACT	SOCIAL IMPACT
PER	7.8	6.0	\$1.9M*	Yes	Yes
A	8.0	2.0	\$0.8M* ₁	Yes	No
B	7.5	7.5	\$1.9M	No	No

* Includes Ashton Street noise bunding cost (\$200 000)

*₁ Includes provision for passing lanes (\$300 000)

From Table 1, Route Option A has the advantage of retaining the existing Bussell Highway for approximately 6 km of its length avoiding parallel duplication of roadworks. The retention of this section of the Bussell Highway would be desirable due to the high residual value remaining in the pavement. Refer road management information system data shown at Figure 2.

Adoption of Option A as the preferred interim Main Roads Department route as shown on Plan Nos 9122-27 and -28 forwarded to the EPA on June 24 1991 was based primarily upon the economic benefits of maximising the use of Bussell Highway and the shorter construction length required to join the Ludlow Forest Bypass alignment. Option B, was considered at this time as the alternative alignment having longer term importance as the corridor for future dual carriageway development (15+ years). Discussion with the Busselton Environmental Coalition and the Conservation Council of WA (Inc) has reinforced the Tuart sensitivity issues that would occur as a result of constructing the route via option A through the north - eastern corner of the Ludlow Forest National Park. The Department accepts the total preservation of the Ludlow Forest National Park advice received from these agencies and will adopt amended option B as the preferred location for the route, which is more clearly aligned to the transportation corridor shown in the Leeuwin Naturaliste Plan.

Additional land owners affected by the development of the amended alignment shown at Figure 1 is as follows:

OPTION B Hutton Road:

E.A. Higgins, CG 1614 & 1091-C/T 1078-960 & 1206-989

Glendon Road:

Forest Park Pty Ltd, CG 868-C/T 1306-655

Western Titanium Pty Ltd (AMC Minerals Sands Ltd),
CG1337 (CT1029/335) CG1324 (CT1197/937) CG1315
(CT1177/847) CG1174 (CT1688/404) CG2039 (CT1255/837)
and CG7 (CT1776/4)

Department of Conservation and Land Management,
State Forest No 12 locations 2907, 3628 and 1067.

Rifle Range in State Forest No 12,
Locations 1067 and 3628 -Lease 1316/40.

The amended route is located on the fringe of past mineral sand mining and State Forest pine plantation areas which may be rehabilitated in the future. Preliminary investigations of the area by the Department has located the route to make optimum use of existing vegetation for land scape screening purposes. The Department will approach the above owners to discuss the location of the proposed route prior to preparation of a suitable environmental report - see commitment 26. (Refer Appendix B)

2.1.2 Road 200 - Ruabon Road Area

Road 200 traverses the edge of a remnant wet land and because of the low lying nature of the landscape through this area, the need to provide large quantities of road embankment material can be averted by realigning the route approximately 150 m to the south onto higher ground mined and rehabilitated by AMC. Recent discussion with AMC has indicated agreement in principle to relocation of the road onto its land. (Refer Figure 3) A similar situation exists where the route occupies the Ruabon Road reserve. First stage development of the route will occur by improving the Ruabon Road alignment, with a need for the future location of the dual carriageway to be on higher ground south of the road reserve avoiding frontal resumption of locations 1243 and 217. AMC has indicated that top soil stockpiles adjacent to Ruabon Road will be landscaped after present mining has been completed in this area to allow for the future development of the road to dual carriageway status.

2.2 Vasse Highway to Sues Road

2.2.1 Sanson Road Area

Consultation in the field has been carried out with land owners affected by the proposed route to determine possible solutions to the agricultural based problems raised in the submissions. The Department has determined an amended alignment from this process (refer Figure 4) and resolved the following issues:

- . Noise impacts on Mr Jennings' house (submission 36) will be reduced as a result of through traffic not having to negotiate the staggered intersection/Z bend proposed by the PER. Vasse Highway will assume secondary importance status involving the construction of a 100 m divided intersection at-grade onto the transportation route.
- . The vegetation belt on the eastern edge of the Sanson Road reserve that Mr Slee (submission 71) would like to have maintained as a windbreak for stock, would not be affected by the proposed realignment. Retention of the route proposed by the PER, would require a 30 m wide resumption requirement to be carried out inside the western boundary of CG1216 involving an approximate area of 4.5 hectares to maintain the existing vegetation strip along Sanson Road. Resumption on the eastern boundary of CG1216 as a result of the amended alignment would involve an area of approximately 3.9 hectares of land that is devoid of vegetation. Acquisition would be carried out under the Public Works Act (Section 17 (1) and (2) in accordance with the Departments land acquisition procedures shown at Figure 13.

- . The social impact on Mr Pearce's property (submission 57) will be substantially reduced by realignment of the route proposed by the PER. Mr Pearce's house will be located approximately 260 metres from the amended route pending final design requirements.
- . The truncation of approximately 9 hectares from the north-west corner of Mr Torrent's property CG1342 (submission 77) created by the amended route would allow a separate subdivision to be negotiated with the Department of Planning and Urban Development.

Adoption of the amended alignment will introduce the following issues.

- . The proposed intersection stagger on the Vasse Highway would cut access to Mr Espinos' house on CG734 with a possible increase in noise level (existing house approximately 70 m from proposed centre line of road). Provision for the road reserve will require 10 metres resumption along the western edge of the property, involving an area of approximately 1.2 hectares.
- . Resumption through Mr Slee's property CG1216 will be transferred from his western and northern boundary to his eastern boundary.
- . Severance of Mr Westbrook's property CG1482 will have a severe impact on his new house that is presently under construction.

Possible solutions to the above issues:

- . Construct a new access to Mr Espinos' property and provide appropriate noise bunding at the side of his house. (commitment 18). Main Roads Department will negotiate purchase of land required for road reserve purposes -additional commitments 26, 27 & 29 (Appendix B).
- . Road reserve resumption through Mr Slee's property will involve similar negotiation to that above - additional commitments 26, 27 & 29 (Appendix B).
- . Mr Westbrook has indicated he will sell his property if a decision is made for the road to proceed through the Sanson Road area either via the PER proposal or an adjacent alternative alignment. Main Roads Department will consider purchase of the property - commitment 15.

An assessment of the amended alignment compared with the PER route is shown in Table 2.

TABLE 2

OPTION	LENGTH (KM)	CONSTRUCT LENGTH (KM)	CONSTRUCT COST (\$M)	ENVIRONMENT IMPACT	SOCIAL IMPACT
PER	2.9	2.4	\$1.05M*	Yes	Yes
Amen'd Route	2.3	2.3	\$1.03M* ₁	No	Yes

* Includes noise bunding - \$100 000 (CG674)

Includes Vasse Highway channelisation - \$400 000

*₁ Includes purchase of CG1482

Includes noise bunding - \$100 000 (CG734)

Because the amended route is 600 m shorter than the PER route, the road user cost savings to predicted traffic using the more direct alignment would be around \$33 000/annum.

2.2.2 Yoongarillup Road to Sabina Road Area

Consultation with land owners affected by the location of the proposed route between Yoongarillup and Sabina Roads (refer Figure 5) has determined a choice for the road to be realigned via existing local roads, ie Yoongarillup Road, Acton Park Road, Sabina Road and Jasper Road. As use of existing local road corridors will introduce additional social impacts and increased capital/road user costs due to longer travel distances, development of a direct alignment through the area is required. In order to try and resolve the problems raised by the people living between Yoongarillup Road and Sabina Road, two alternative routes (Options A & B) to the one shown in the PER, have been considered. The affect on the various land owners by these route options is summarised as follows:

- . The road alignment follows the route described in the PER with minimum truncation to the south-west corner of Mr Espinos' property (submission 35) CG1886 - Commitment 13, additional commitments 27 & 29 (Appendix B).
- . Mr Haddon's property (submission 42) CG1877 & CG1870 is affected by the proposed route as follows:

PER Option Severance

Road reserve requirement CG1877 approximately 3.3 hectares
Remnant section cut off CG1877 approximately 18.5 hectares

TOTAL 21.8 hectares
CG1877 Area 43.44 hectares

Option A Severance

Road reserve requirement CG1877 approximately 3.5 hectares
Remnant section cut off CG1877 approximately 9.4 hectares

TOTAL 12.9 hectares
CG1877 Area 43.44 hectares

Option B Severance

Road reserve requirement CG1877 approximately 3.3 hectares
Remnant section cut off CG1877 approximately 19.5 hectares
Road reserve requirement CG1870 approximately 0.6 hectares

TOTAL 23.4 hectares
CG's1877 & CG1870 Area 74.64 hectares

The alignment has been located to avoid a mechanical irrigator which Mr Haddon intends to install in the future. Provision of an underpass to service the severed section of the property will be negotiated pending final design requirements - Commitments 13 and 14, additional commitments 26, 27 & 29 (Appendix B).

- Mr Chapman's property (submission 18) CG1872 and 1873 is affected by the route as follows:

PER Option Severance

Road reserve requirement approximately 3.5 hectares
Remnant section cut off approximately 9.2 hectares

TOTAL 12.7 hectares
CG1872 area 40.53 hectares

Option A Severance

Road reserve requirement CG1872 approximately 2.1 hectares
Remnant section cut off CG1872 approximately 0.1 hectares
Road reserve requirements CG1873 approximately 1.1 hectares

TOTAL 3.3 hectares
CG's 1872 and 1873 area 81.03 hectares

Option B Severance

Road reserve requirement CG1872 approximately 2.5 hectares
Remnant section cut off CG1872 approximately 3.2 hectares

TOTAL 5.7 hectares
CG1872 area 40.53 hectares

Further consultation with Mr Chapman will be carried out to determine the appropriate way to allow for movement of stock and equipment between the severed portions of the property.

Mr Chapman has indicated that he is prepared to sell the WHOLE of his property if the road proceeds - commitments 13, 14 and 15, additional commitments 26, 27 & 29 (Appendix B).

- . Westralian Sands mining tenement (submission 86) extends across the location of the proposed road alignment. Consultation with the Company will proceed to explain the proposed design for the road - new commitment 26 & 27 (refer Appendix B).
- . The amended alignment over the Whicher escarpment will not affect the flow of ground water to properties CG3029 and CG3028 (submissions 43 and 72) - No commitment required to these properties.

An assessment of alternative alignment options between Yoongarillup Road and Sabina Road through the Whicher escarpment is shown in Table 3.

TABLE 3

OPTION	LENGTH (KM)	CONSTRUCT LENGTH (KM)	CONSTRUCT COST (\$M)	ENVIRONMENT IMPACT	SOCIAL IMPACT
PER	5.7	5.7	\$2.6M	Yes	Yes
A	5.5	5.5	\$1.9M*	No	No
B	5.7	5.7	\$1.8M	No	No

* Includes \$150 000 stock underpass between CG1872 and CG1873

The Departments preferred option A avoids the undulating terrain encountered by the PER route with a resultant decrease in major earth work cost. Other benefits attributed to the route are reduced forest clearing, increased aesthetic appeal to travellers due to decreased earth work impact on the landscape and improved traffic overtaking opportunity resulting from the more direct horizontal alignment geometry.

3. CONCLUSIONS

The Department has reviewed the alignment of the Mineral Sands Road as shown in the PER. Following consideration of the public submissions, amendments to the PER route alignment have been carried out with resultant social, environmental and economic benefits.

The location of the transportation route as a result of the review process is shown on Figures 6 to 12 and drawing No 9122-26-1 to 9122-32-1 inclusive. The Department will write to each owner affected by the amended PER alignment inviting them to attend a meeting on an individual basis to discuss the changes to the route and explain the Departments method of land acquisition and compensation procedure. These meetings are expected to take place in the Capel area during August 7 - 8 1991.

SUMMARY OF SUBMISSIONS

SUBMISSION NUMBER/NAME	AFFECTED LOC Nos	MAJOR IMPACTS	POSSIBLE SOLUTIONS	PER - EXISTING COMMITMENTS
1. AMC MINERAL SANDS LTD	35,1441,2036,7	1.1 Bussell Highway - mining of road reserve immediately south of Capel not resolved.	1.1 Subject to Environmental Assessment - road will be relocated to allow mining to commence.	22
1. AMC MINERAL SANDS LTD	1091,1614,1067,3628,2615,2607 5313,3209,1174,1815,1324,1337.	1.2 Proposed road will bisect a wetlands ecosystem - McCarley's swamp and AMC wetland centre.	1.2 Development of one of two alignment alternatives will avoid these issues.	26
1. AMC MINERAL SANDS LTD	1417,2678,323,3,352	1.3 Sterilisation of existing ore reserves in the vicinity of Ruabon Road and locations 3 & 352 will occur if development of the road proceeds.	1.3 Recent discussion with AMC indicates construction of the northern carriageway as a first stage would allow mining to proceed.	27
5. AUSTRALIAN HERITAGE COMMISSION Canberra		5.1 Off road drainage, alteration of flow regime, could affect the Vasse and Wonnerup estuaries downstream from proposed roadworks.	5.1 Road design will allow existing drainage to remain unimpeded. Offroad drainage will be channelled to existing drains where practical.	9
7. A. BAMFORD AMC Wetlands Project Officer Capel		7.1 Environmental impacts on McCarley's Swamp & AMC Wetlands have not been considered adequately. 7.2 Consider alternative alignment via Bussell Hwy as far west as Ludlow.	7.1 PER addresses environmental impacts associated with these areas and suggests solutions e.g. fauna migration pathways 7.2 Develop alternative alignment.	6, 8, 22 26
8. N. & J. BENTLEY Ludlow	1133,2844	8.1 Farm land use problems associated with proposed road.	8.1 Develop alternative alignment.	26
9. BIGNELL FRASER REAL ESTATE for J. & M. ADAMI	6	9.1 Sale of property impeded by proposed road location. 9.2 Route alignment involves minor truncation of south west corner of property	9.1 House is located 200m from existing Bussell Highway. Traffic impact has been transferred to rear of property. Access to property will be improved by lower traffic volume passing through the Ludlow Forest. 9.2 Compensation to be paid.	29
10. M. & J. BROCKMAN Bussellon	217	10.1 Proposed road involves excessive resumption of the best land on a small holding.	10.1 Alternative alignment can be developed - will involve future stage construction onto AMC land	26
11. BUSSELLTON ENVIRONMENTAL COALITION (BEC) Bussellon		11.1 Agrees with the proposed road passing between AMC wetlands and McCarley's swamp if road can divert surplus water away from the swamp	11.1 Alternative alignment needs to be considered due to difference in opinion between AMC and BEC on how McCarley's swamp should be managed	NC
13. W. H. BUTLER Bussellon	8	13.1 Transport product by slurry pipeline. 13.2 Upgrade Bussell Highway - 2 way road using rail easement. 13.3 Impact on tourism has not been fully considered 13.4 Parallel duplication of road will create havoc on fauna.	13.1 Slurry pipeline rejected by MDL. 13.2 Westrail want rail reserve to remain open 2 way road has major entrance road problems. 13.3 Proposed road will improve traveller access to Bussellon 13.4 Existing speed environment on road through Ludlow Forest will be lowered. Fences on existing road could be removed. Suitable signs warning of fauna will be incorporated on new road.	NC NC NC 28

SUMMARY OF SUBMISSIONS

SUBMISSION NUMBER/NAME	AFFECTED LOC Nos	MAJOR IMPACTS	POSSIBLE SOLUTIONS	PER - EXISTING COMMITMENTS
14. W.G MARTINICK & ASSOC. PTY LTD on behalf of CABLE SANDS (WA) PTY LTD	174,660	14.1 Objects to title Mineral Sands Rd - Bussell Hwy section of route not purposely built for the transport of mineral sands only 14.2 Objects to mineral sand traffic being restricted to the hours of 6.00 a.m. to 10.00 p.m.	14.1 The route will be designed to a standard that will allow safe travel of public (commercial/tourist) traffic 14.2 This is an operational matter that will be considered in relation to all trucks using the public road system.	N.C. N.C.
15. C. & J. CAMPBELL Peppermint Beach		15.1 Consider underpass/overpass, dual carriageway development for Capel Bypass to maintain safe access to Peppermint Beach.	15.1 Development of dual carriageway on Capel Bypass Alignment.	19 & 20
17. W. L. CHADWICK Ludlow	378	17.1 Social impacts - noise level, school children's safety.	17.1 Develop alternative alignment.	11, 25
18. M. & S. CHAPMAN Busselton	1872,1873,1874	18.1 Route should follow existing Yaongarrillup or Acton Park Roads. 18.2 Severe property severance is created by the location of the road. 18.3 reduce width of road reserve through property to 30m.	18.1 Greater social impacts, higher construction costs, increased road user costs would occur if existing roads were to be used. 18.2 Alternative alignments can be developed through the property to reduce severance. 18.3 Design of possible stock underpass between locations 1872 & 1873 will require a minimum road reserve of 40m.	N.C. 26 & 27 13
23. A. & L. COOPER Capel	17	23.1 Capel Bypass alignment has created extreme hardship for development of property - Social Impact	23.1 MRD negotiating purchase of property.	15
25. CROOKS MITCHELL PEACOCK STEWART (WAI) PTY LTD Perth		25.1 Slurry pipeline needs to be considered as an alternative method of transport. 25.2 Mineral sand size 170 - 200 micron, would need to be ground to 100 - 120 micron for transport by slurry method	25.1 Discussion with MDL indicates slurry pipeline was considered but failed on economic grounds 25.2 MDL have indicated product cannot be reduced to 100 - 120 micron size because of market requirements.	N.C. N.C.
28. S. DAVIES AMC WETLANDS CONSULTANT		28.1 Road project being used as an opportunity to improve the main road between Bunbury and Busselton 28.2 Doubts classes and rankings used in Matrix evaluation 28.3 Road bisects McCarley's swamp and AMC wetlands centre.	28.1 Road will be upgraded as traffic volumes increase Resource development, as in other areas of the state, have brought development of road forward 28.2 refer report supporting matrix evaluation 28.3 Develop alternative alignment.	N.C. N.C. 26

SUMMARY OF SUBMISSIONS

SUBMISSION NUMBER/NAME	AFFECTED LOC Nos	MAJOR IMPACTS	POSSIBLE SOLUTIONS	PER - EXISTING COMMITMENTS
31. I. DEVOY Busselton		31.1 Agrees with Route Option B, if road can act as a buffer to divert water flowing from AMC wetlands. 31.2 Provision should be made for the road corridor to be made wide enough to accommodate a future south coast rail requirement.	31.1 Alternative alignments need to be considered. 31.2 Rail proposal in the interest of Tourism should connect major population centres. Commercial rail in a similar corridor to road would experience massive engineering constraints.	26 N.C.
32. P. DOWDEN-PARKER Ludlow	69	32.1 Social impacts - requests development of alternative alignment.	32.1 Develop alternative alignment.	26
35. G. ESPINOS Busselton	1886	35.1 Road should be located on Sues/Sabino Road to Vosse Highway, thereby avoiding agricultural land. 35.2 Resumption on proposed road should be kept to a minimum. 35.3 Trees recently planted on patch of proposed alignment - will they be replanted if road proceeds.	35.1 Route Through Whicher Reserve rejected by CALM. Increased social impact on Vosse Highway. 35.2 Reserve width to be maintained at 40m. 35.3 Trees will be rehabilitated where necessary.	N.C. N.C. 13 & 27
36. F. L. JENNINGS NOMINEES PTY LTD Melville	1280	36.1 Proposed road should follow Acton Park Road. 36.2 Social impacts resulting from proposed "Z" bend development.	36.1 Acton Park Road excluded from study area. 36.2 Alternative alignment will be developed - Vosse Highway becomes a minor road.	N.C. 26
37. R. W. FORREST Ludlow/Wonnerup		37.1 Realign road to east of rail reserve between Ludlow and Hutton Road. 37.2 Avoid low-lying Road No 700 - large colony of racehorse goannas, rare ground parrots.	37.1 & 2 Develop alternative alignment to take advantage of higher ground.	26
39. D. GARDNER Copel	232	39.1 Agrees with Copel Bypass alignment. Provide dual carriageway, join North West Road and Stirling Road together.	39.1 develop dual carriageway. Provide single intersection access to Peppermint Beach by linking North West Road and Stirling Road together.	20
40. B. GOLDEN		40.1 Concerned about safety of cyclists and pedestrians using the proposed dual carriageway/bypass from the Hollis/Higgins Road areas. 40.2 Provide suitable dual carriageway crossovers for cyclist/pedestrian traffic to discourage use of Highway alignment. 40.3 Obvious entry to Copel to be maintained to lessen the impact of reduced traffic on local business.	40.1 & 2 Dual cycleway/pedestrian paths and crossovers to be addressed during the bypass design phase. 40.3 Suitable access to Copel will be maintained at the North and South of the townsite.	20 20

SUMMARY OF SUBMISSIONS

SUBMISSION NUMBER/NAME	AFFECTED LOC Nos	MAJOR IMPACTS	POSSIBLE SOLUTIONS	PER - EXISTING COMMITMENTS
41. L. & L. GRICE Busselton	3819,1974,371,3162,3731	41.1 Relocate proposed road onto disused Capel - Busselton railway and thence via Vasse Highway. 41.2 How will severed sections of property be managed? 41.3 Social impacts result from house being 90m from road.	41.1 Westrail will not close rail reserve. 41.2 Construct adequate cattle underpasses, cattle yards with allowance for offroad parking for stock transporters. 41.3 House is 170m from proposed road - impacts can be reduced by vegetation screening	13,14 25
42. N. & E. HADDON Busselton	1877,1878,1880,1879,1871,1870	42.1 PER fails to address long term effect of the road on the rural land and long term agricultural losses 42.2 Plans to irrigate using a mechanical sprinkler system may be in jeopardy due to the location of the road, and impact on ground water supply. 42.3 PER shows two route options through property and has failed to detail a direct route.	42.1 The Department of Agriculture opposes the proposed route and suggests that Sabina Road to Vasse Highway should form part of the route to avoid the agricultural strip. 42.2 Alternative alignment will avoid irrigator. Surface drainage will not be impeded by road. Sub-surface water supplies will not be affected by road compaction 42.3 Alignment shift developments on the Whicher Escarpment section of the route will provide direct access across location 1877 with reduced severance	N.C. 13,14 & 26 27
43 R. HARVEY	3029	43.1 Location of the proposed road may cut off water supplies from the Whicher Escarpment streams 43.2 Social impacts will occur as a result of passing travellers - vandalism, intrusion problems.	43.1 & 2 Heavy earthworks attributed to the location of the proposed road through the Whicher Escarpment may affect water supply to property. Development of an alternative alignment 800m east will avoid water supply and social issues	26
45. S. & P. ISOPENKO Capel	34	45.1 Realign Capel Bypass towards the west to reduce social impacts.	45.1 Purchase of COOPER LOT 17 will allow marginal shift to alignment	27
47. I. B. KEAST Ludlow	456	47.1 Social impacts - requests development of alternative alignment.	47.1 Develop alternative alignment.	26
48. D. KEMP	1885	48.1 Major agricultural land severance issues.	48.1 Road proposal apart from being located adjacent to location 1885 does not impact on the property	N.C.
50 K & C KING Ludlow	1	50.1 Social impacts	50.1 Develop alternative alignment	26
53 B. K MASTERS & ASSOC. ENVIRONMENTAL & EARTH SCIENCE CONSULTANTS Capel		53.1 Is of the opinion that the chosen route is acceptable from all respects, with minimal impact on both the natural and human environments	53.1 Alternative alignment will be developed to further reduce the natural and human environmental impacts	26

APPENDIX 'A' cont.

SUMMARY OF SUBMISSIONS

SUBMISSION NUMBER/NAME	AFFECTED LOC Nos	MAJOR IMPACTS	POSSIBLE SOLUTIONS	PER - EXISTING COMMITMENTS
55. MINERAL DEPOSITS LTD		<p>55.1 Proposed road will have positive impact on development of South West.</p> <p>55.2 Ludlow Forest section of road complies with Leeuwin Naturaliste Region Plan.</p> <p>55.3 The most cost effective road transport system is to operate 24 hours per day, 7 days per week.</p>	<p>55.1 Planning a new route involves intensive analysis of road user benefits to ensure optimum value is obtained from capital expended on road developments</p> <p>55.2 Alternative alignment will be developed near the Ludlow Forest to comply with the Leeuwin Naturaliste Region Plan.</p> <p>55.3 This is an operational matter that should be considered in relation to all trucks using the public road system.</p>	<p>NC</p> <p>26</p> <p>NC</p>
56 Hon M. MONTGOMERY MLC Member for South - West region		<p>56.1 Alternative alignment required by using Hutton Road link to Wannerup Road - avoid using Road No 200</p> <p>56.2 Safety concerns regarding Vasse Highway "Z" intersections.</p> <p>56.3 Can a guarantee be given that water seepage to summer moist areas on Haddon's property will not be affected by the road.</p>	<p>56.1 & 2 Develop alternative alignment</p> <p>56.3 Hydrogeology question - no guarantee, but it is unlikely that road construction through this area would affect water supply.</p>	<p>26</p> <p>27</p>
57. I. & S. PEARCE	674	57.1 Severe social impact on property.	57.1 Alternative alignment to be developed by resumption through location 1482	26
59. Dr. A. PILGRIM Hovea		59.1 Social, environmental impact issues - PER a waste of taxpayers money.	59.1 Development of alternative alignment will resolve major issues.	26
60. L. & J. PRICE Acton Park		60.1 Social impacts - stock underpass's receive more importance than safety requirements for school children. Damage to tourism industry?	60.1 Pull-off areas for school buses will be provided where warranted. Development of the road is more likely to enhance the tourism industry	11
62. M. REID Councillor - Capel		<p>62.1 Important that Capel Bypass does not cut off Stirling & Peppermint Grove areas from capel T/Site</p> <p>62.2 Separate titles required for severed land at proponents cost.</p> <p>62.3 Provide safe cyclist crossings on bypass and bridge over Capel river.</p> <p>62.4 Keep bridge over Capel river low to reduce noise and headlight glare.</p> <p>62.5 Provide suitable lighting at all intersections on bypass alignment.</p>	<p>62.1 Dual carriageway development will improve access to these areas.</p> <p>62.2 MRD will negotiate issues arising from severance of land.</p> <p>62.3 Provision of cycle/pedestrian paths will be addressed during final road design phase</p> <p>62.4 Balance of bridge height versus earthwork implications will be addressed during final design</p> <p>62.5 Suitable lighting will be installed.</p>	<p>12</p> <p>29</p> <p>20</p> <p>27</p> <p>20</p>

SUMMARY OF SUBMISSIONS

SUBMISSION NUMBER/NAME	AFFECTED LOC Nos	MAJOR IMPACTS	POSSIBLE SOLUTIONS	PER - EXISTING COMMITMENTS
63. ROYAL AUSTRALIAN ORNITHOLOGISTS UNION F. DOYLE AMC WETLANDS OFFICER Perth.		63.1 Preserve the link between McCarley's swamp and AMC wetland centre.	63.1 Develop alternative alignment.	26
64 J. L. SAMWELL Capel	12	64.1 Maintain service access to Peppermint beach by joining Stirling Rd to North West Rd.	64.1 Develop Capel Bypass as a dual carriageway.	20
65. L. SCOTT Busselton	1243,4220	65.1 Proposed road will impact on stock carting requirements. 65.2 Locate future second carriageway onto mining area adjacent to Ruabon Road.	65.1 Road design will provide for offroad parking of stock transporters. Alternative alignment can be developed.	14 26
66 G. E. SCOTT Capel	54,55,56,57,204,392,35,40,21,22,23,20.	66.1 Severe property severance, land use difficulties, social issues - may need to sell portions of property for retirement reasons.	66.1 Bunbury Division to discuss compensation, provision of stock yards, water points and hay sheds.	15
68. SHIRE OF BUSSELTON		68.1 No objection to location of route between Sues Road and the Vasse Highway. 68.2 Route should remain with Vasse highway to Bussell Highway. 68.3 Double "T" junctions on Vasse Highway should be examined for provision of rotary or roundabout.	68.2 Use of Vasse Highway will increase social impacts and road user costs (increased length) 68.3 Alternative alignment will be developed, with Vasse Highway becoming a minor road	N.C. 26
69. SHIRE OF CAPEL		69.1 Supports the need for a fully funded dual carriageway including two bridges over the Capel River on the bypass alignment. 69.2 Maintain access to Capel Townsite, Peppermint Beach and surrounding farmland areas.	69.1 Develop dual carriageway with double bridging over the Capel River. 69.2 Access will be maintained	20 20
70. R.SHORE Group of Concerned Local Citizens - Busselton		70.1 McCarley's swamp/AMC wetland environmental issues. 70.2 Alternative alignment required through eastern end of Ludlow Forest to avoid above issues.	70.1 & 2 Develop alternative alignment.	26
71. S. SLEE	1216	71.1 Vegetation on Sanson Road needs to be preserved for windbreak and shade purposes. 71.2 Is it possible to divert road away from Sanson Road?	71.1 Vegetation on Sanson Road would have to be cleared to allow road to be built with minimal resumption. 71.2 Alternative alignment will be developed on east boundary of location 1216, reducing vegetation impact	26 26

SUMMARY OF SUBMISSIONS

SUBMISSION NUMBER/NAME	AFFECTED LOC Nos	MAJOR IMPACTS	POSSIBLE SOLUTIONS	PER - EXISTING COMMITMENTS
72 K. SMITH Busselton	3028,4370	72.1 Concerned at number of kangaroo/wallaby fatalities ("road kills") that will occur as a result of the road location through the Whicher Escarpment Suitable fencing required between proposed road reserve and agricultural land.	72.1 Alternative alignment located approx. 800 metres towards the east. Permanent section of forest between the proposed road and agricultural area will provide safe haven for fauna.	3
73. A. STANDING Cawaramup		73.1 Favours rail transport.	73.1 Road transport of mineral sands decided by government.	N.C.
74. W. J. TAME Ludlow	379	74.1 Social impact issues.	74.1 develop alternative alignment.	26
76 A. YUGOVICH & P. THORPE Capel	8,15.	76.1 Capel Bypass - provide roundabouts, dual carriageway - connect Stirling Rd and North West Road	76.1 Develop dual carriageway, consider Stirling/N.W. Rds as service road during design phase.	20
77. J. TORRENT	1342	77.1 Resume western property boundary as an extension of Sanson Road. 77.2 Supply 6 wire (4 plain 2 barb) fence with gates where applicable. 77.3 Rehabilitate road verge with suitable trees 77.4 Provide approval for a 5 acre subdivision on Location 1342.	77.1 Alternative alignment will be developed involving approximately 9 hectare truncation of N.W. corner of Location 1342 77.2 Fencing will be supplied. 77.3 Road verge will be replanted where necessary. 77.4 5 acre subdivision subject to negotiation with DPUD	26 14 N.C. N.C.
78 T. TURNER Capel	16,18,19,25,26,24,4.	78.1 Severe property severance, land use difficulties, social issues	78.1 Capel Bypass alignment can be repositioned marginally on Lots 18,25,27 Compensation discussions required by Bunbury Division.	15
79 S. VIRGIN Ludlow	Pl. 456	79.1 Social impact issues 79.2 Truck operation curfew between 10.00 p.m. and 6.00 a.m. needs to be enforced.	79.1 Develop alternative alignment. 79.2 This is an operational matter that should be considered in relation to all trucks using the public road system.	26 N.C.
85 D. WENDT Capel		85.1 Don't build Capel Bypass underpass, extend dual carriageway from Stratham. 85.2 Join Stirling Road to North West Road.	85.1 Develop dual carriageway. 85.2 Develop Stirling Rd/North West Rd link	20 20
86. LANDUSE AUSTRALIA PTY LTD for WESTRALIAN SANDS LTD Bunbury	1872,1873,1874	86.1 A mining tenement exists over locations 1872, 1873 & 1874. The proposed road effectively sterilizes a heavy mineral sand resource.	86.1 Alternative alignment to be developed through the mining tenement. Consultation with Westralian Sands will proceed to explain road design requirements	26 & 27

SUMMARY OF SUBMISSIONS

SUBMISSION NUMBER/NAME	AFFECTED LOC Nos	MAJOR IMPACTS	POSSIBLE SOLUTIONS	PER - EXISTING COMMITMENTS
88. B. WINCHCOMBE Dunsborough		88.1 Proposed road is located on low lying land near McCarley's swamp and Road No 200. Need for realign.	88.1 Develop alternative alignment	26
89. H WYNNE Busselton		89.1 Proposed road bisects McCarley's swamp/AMC welland centre Road concept short sighted, not in best interest of the state.	89.1 Develop alternative alignment	26

APPENDIX 'A' cont.

**ADDITIONAL COMMITMENTS RESULTING
FROM THE PUBLIC ENVIRONMENTAL REVIEW (PER)
REVIEW**

26. Amendments to the transportation route resulting from the PER process will be subject to consultation with land owners not previously affected by the route involving a further submission period where applicable.
27. Marginal adjustments to the proposed route alignment are envisaged pending availability of detailed survey information along the route prior to the final design phase for the road. Further consultation with land owners adjacent to the road will be carried out where necessary as this design change information becomes available.
28. Main Roads Department will provide suitable road signs warning motorists to be aware of likely fauna crossings.
29. Land owners will be compensated for land required for road reserve purposes under the PWD Act Section 63 by the Main Roads Department.

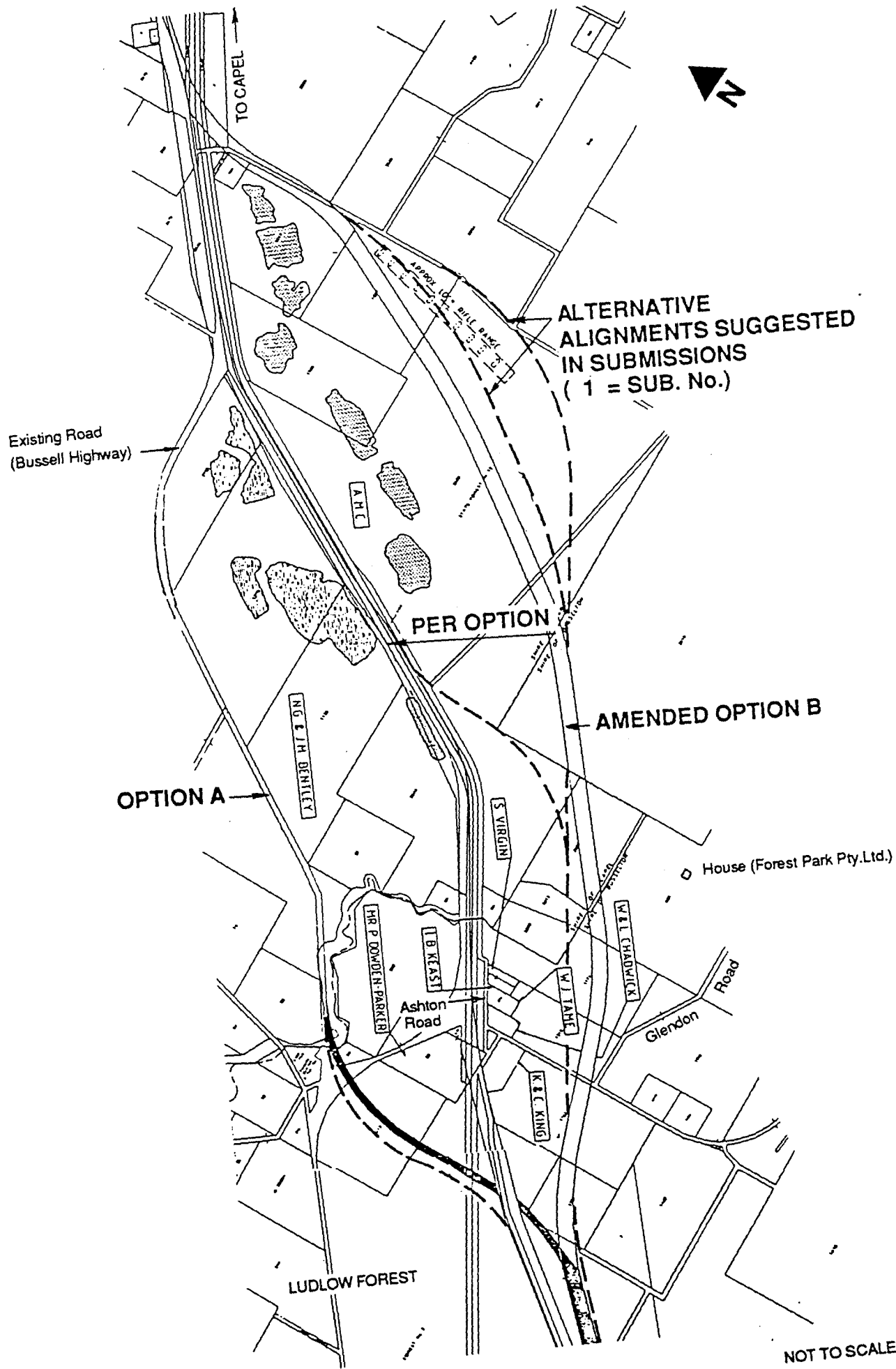


FIGURE 1

BUSSELL HIGHWAY
ROAD MANAGEMENT INFORMATION SYSTEM

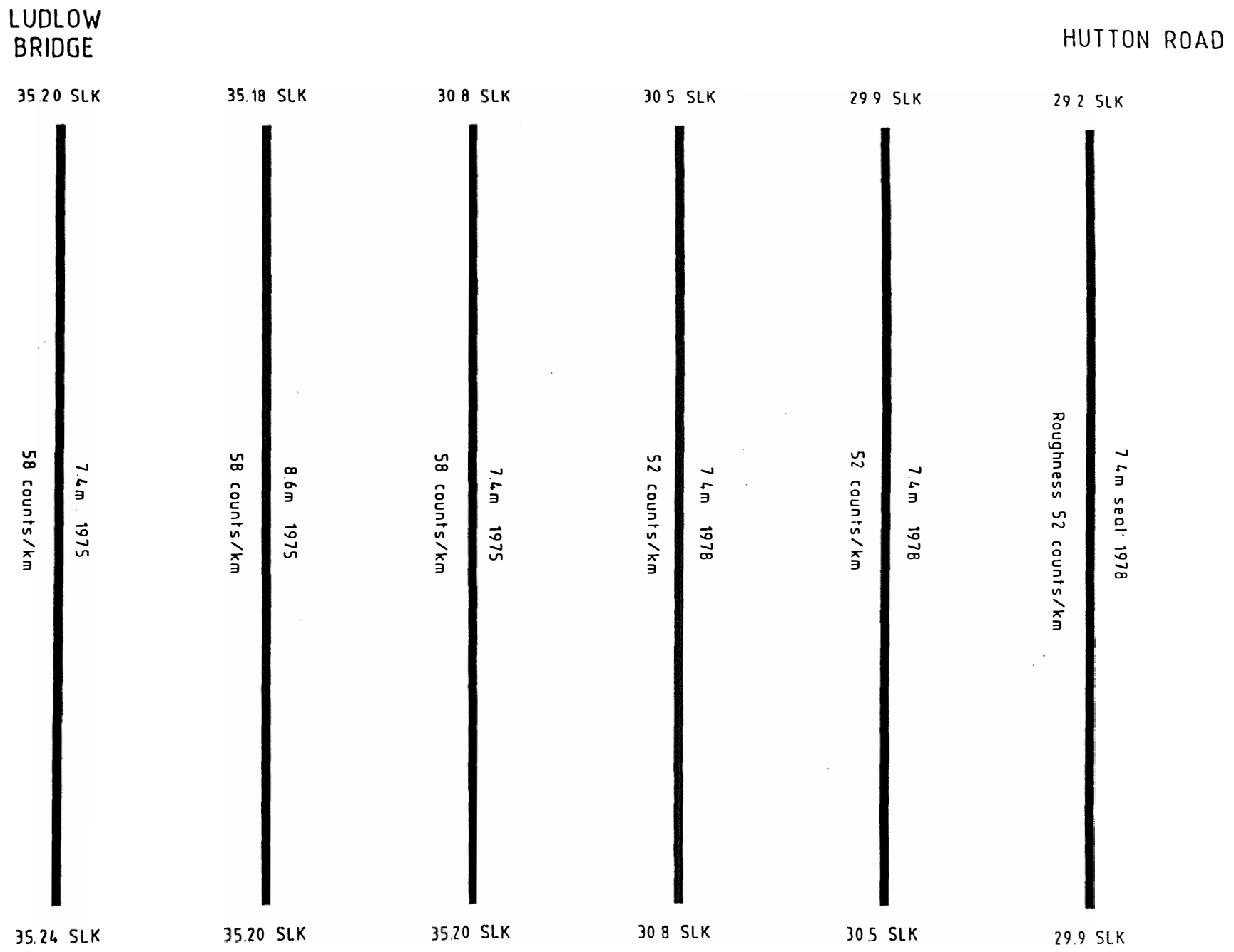


FIGURE 2

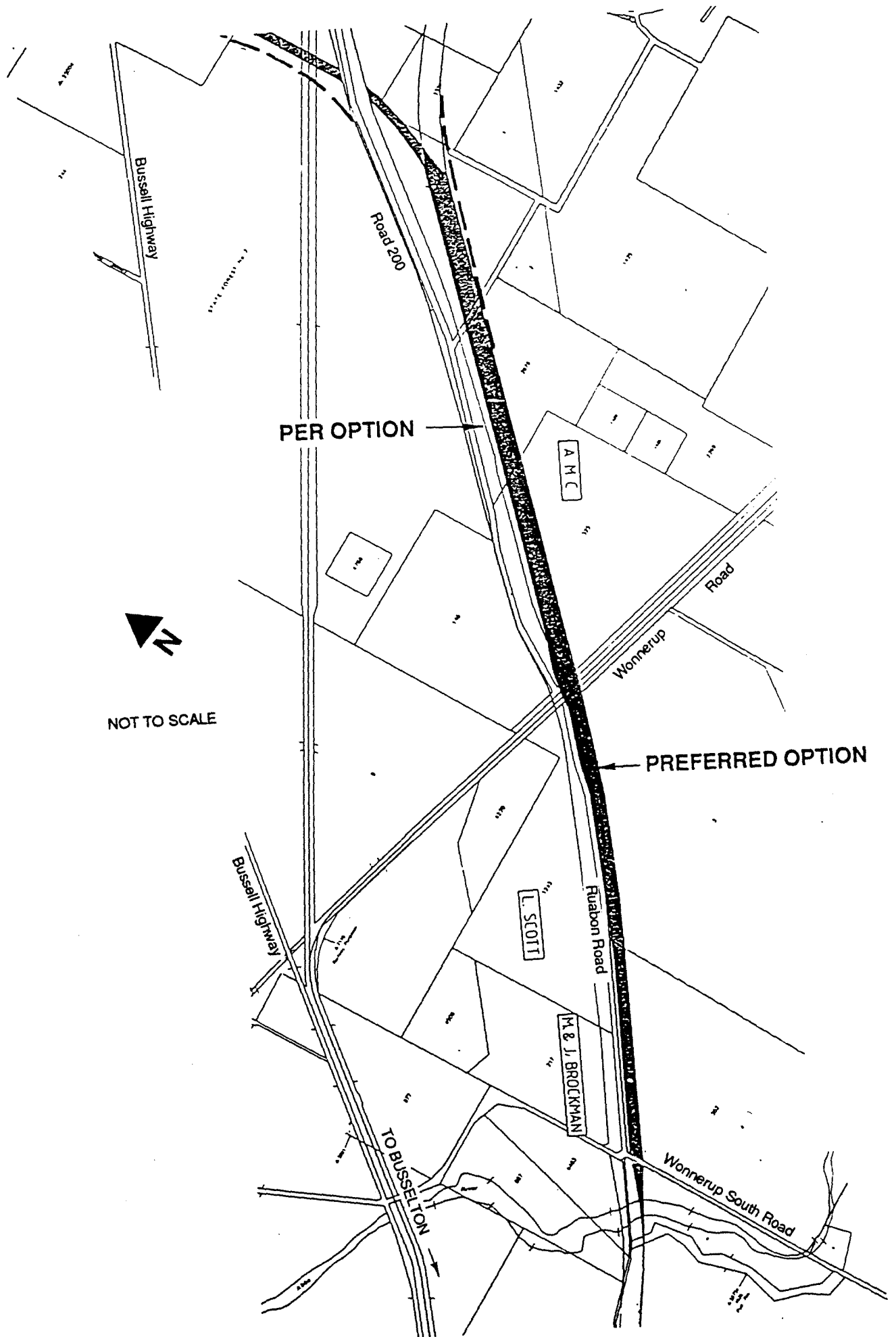
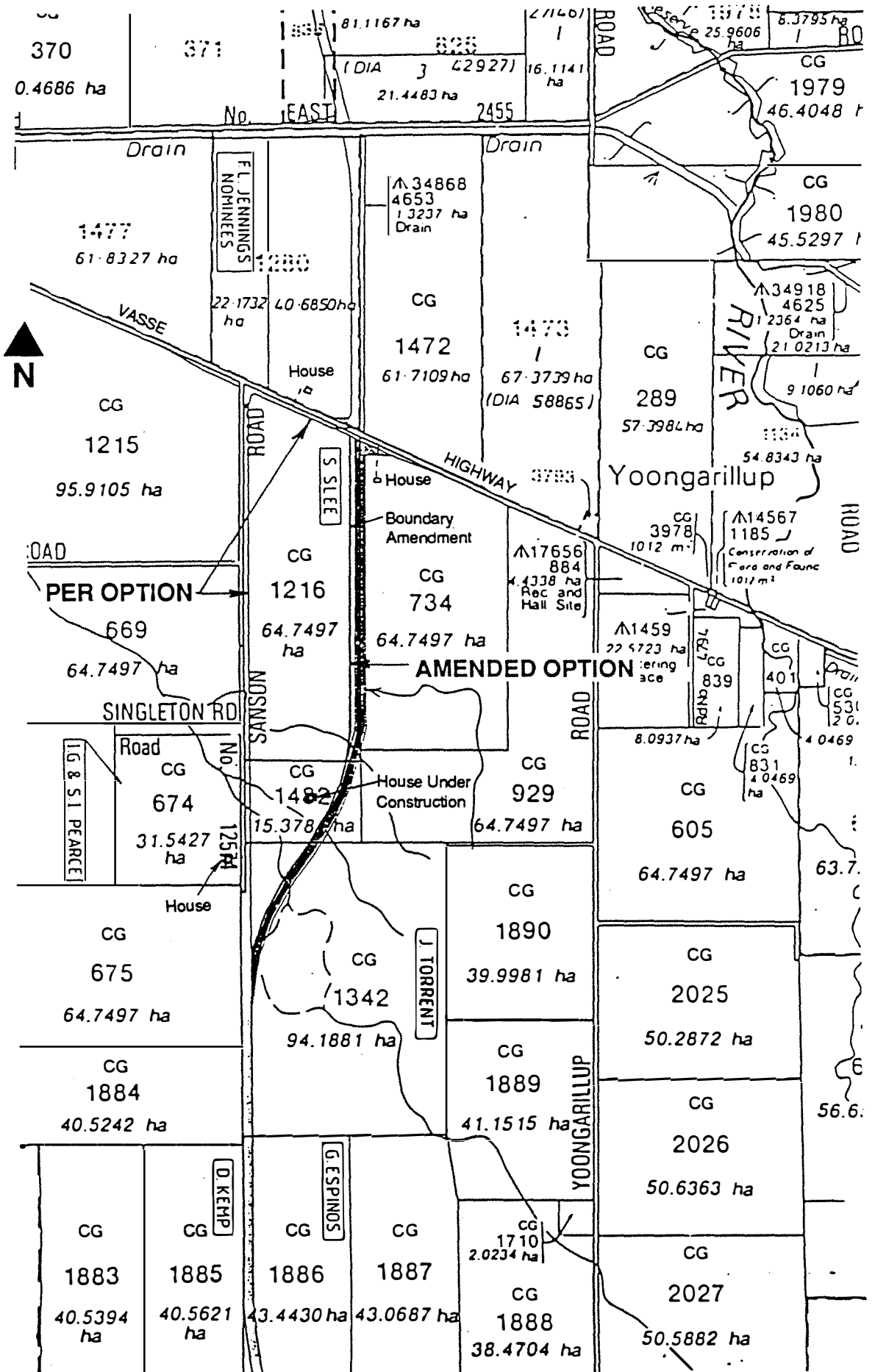


FIGURE 3



NOT TO SCALE

FIGURE 4

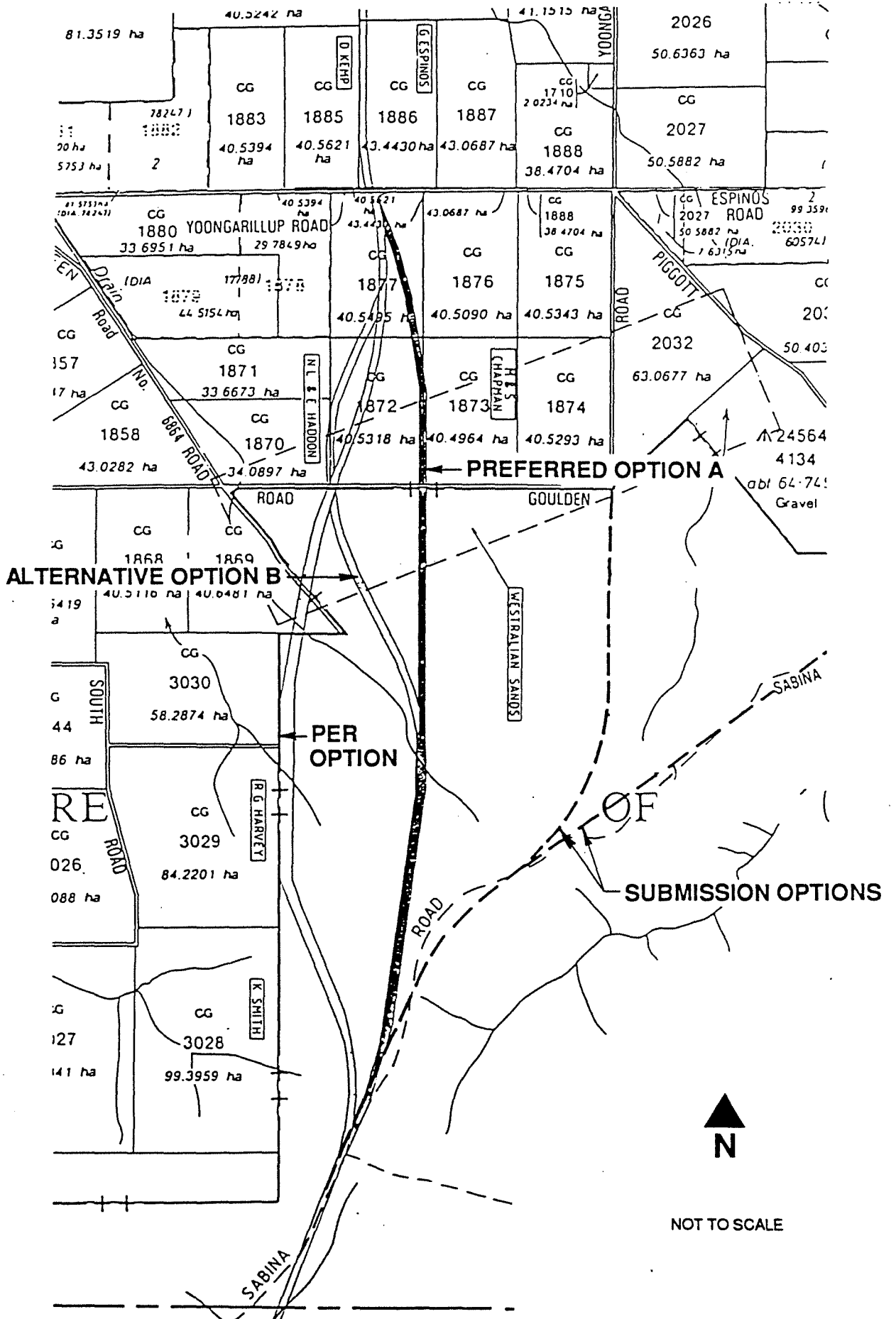


FIGURE 5

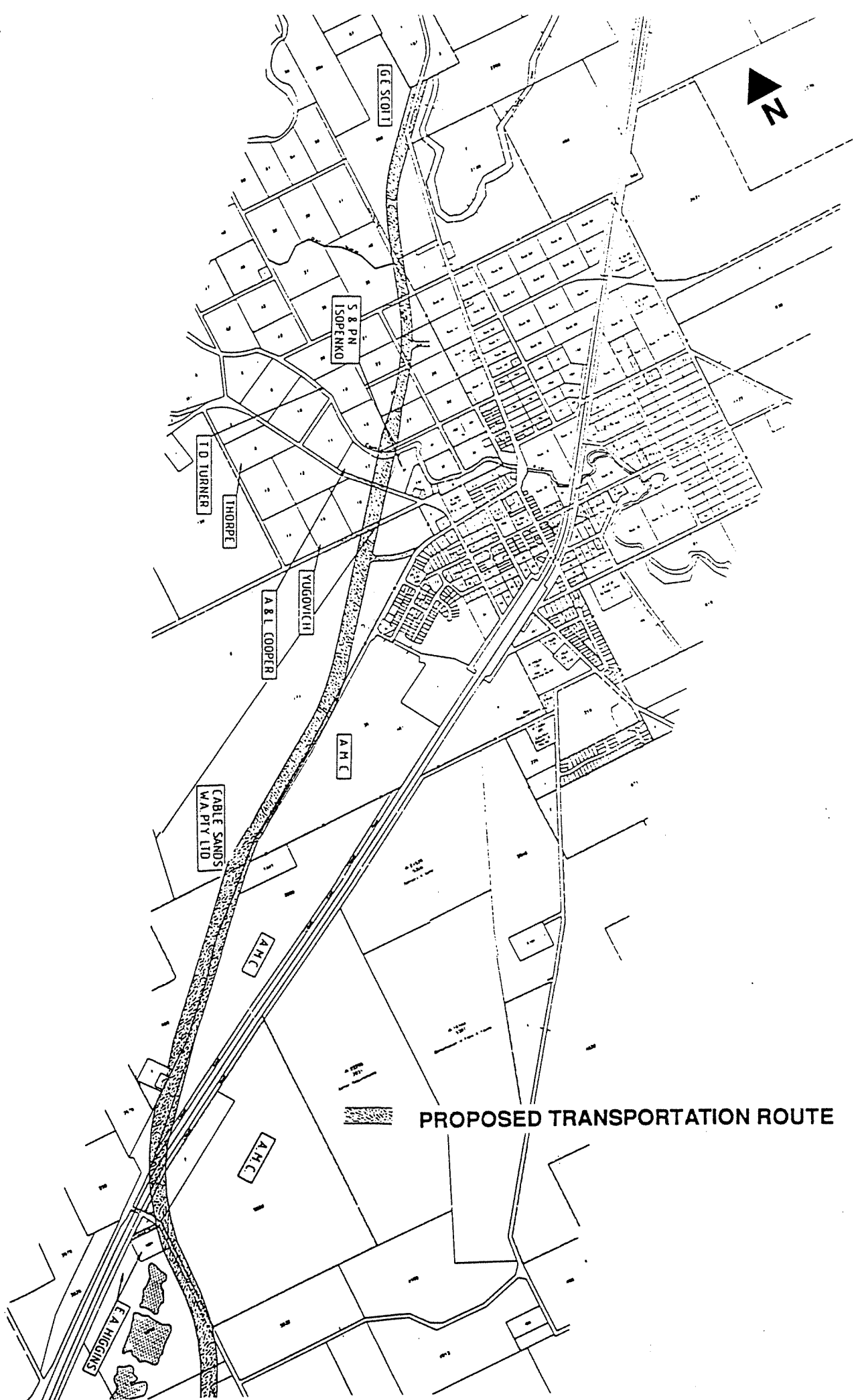


FIGURE 6

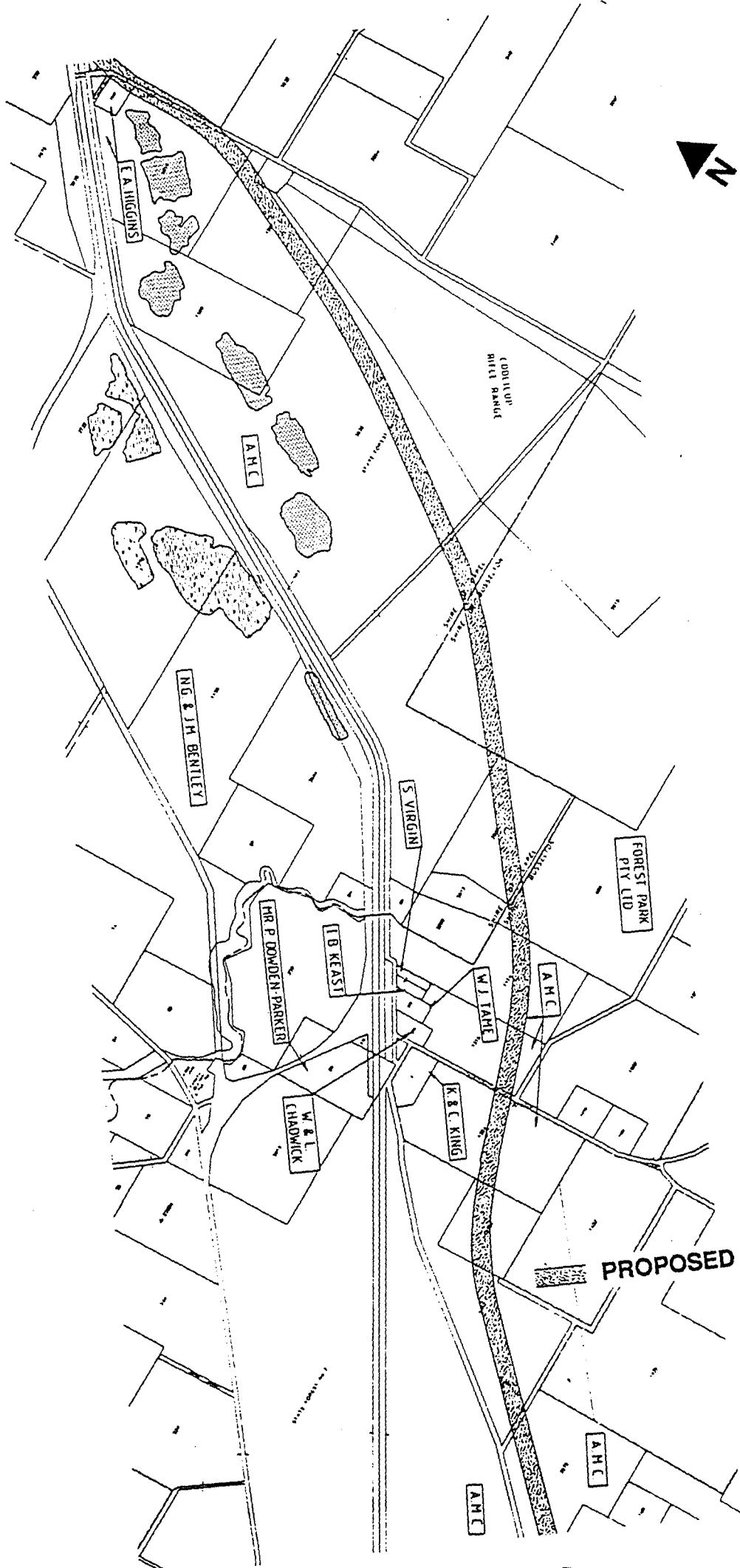
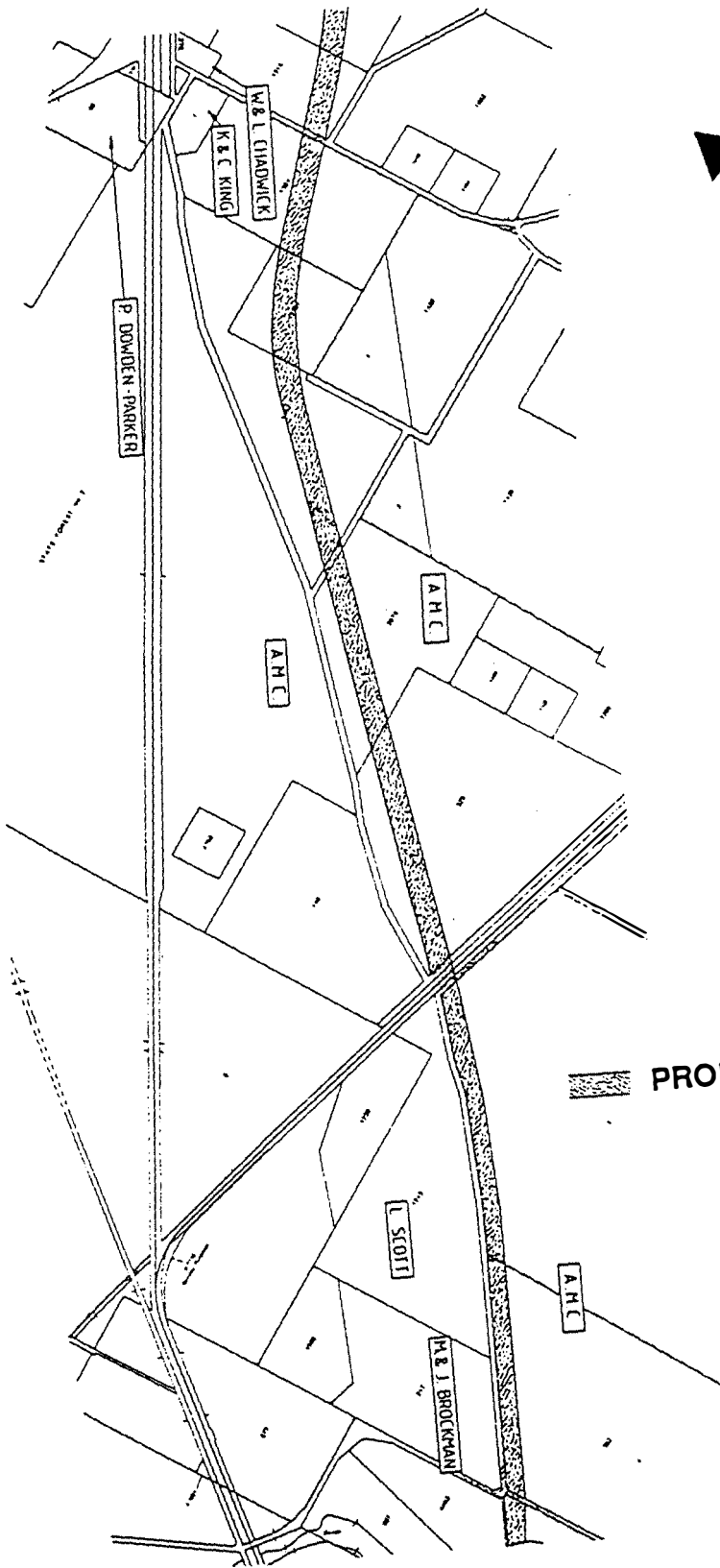


FIGURE 7

PROPOSED TRANSPORTATION ROUTE



PROPOSED TRANSPORTATION ROUTE

FIGURE 8

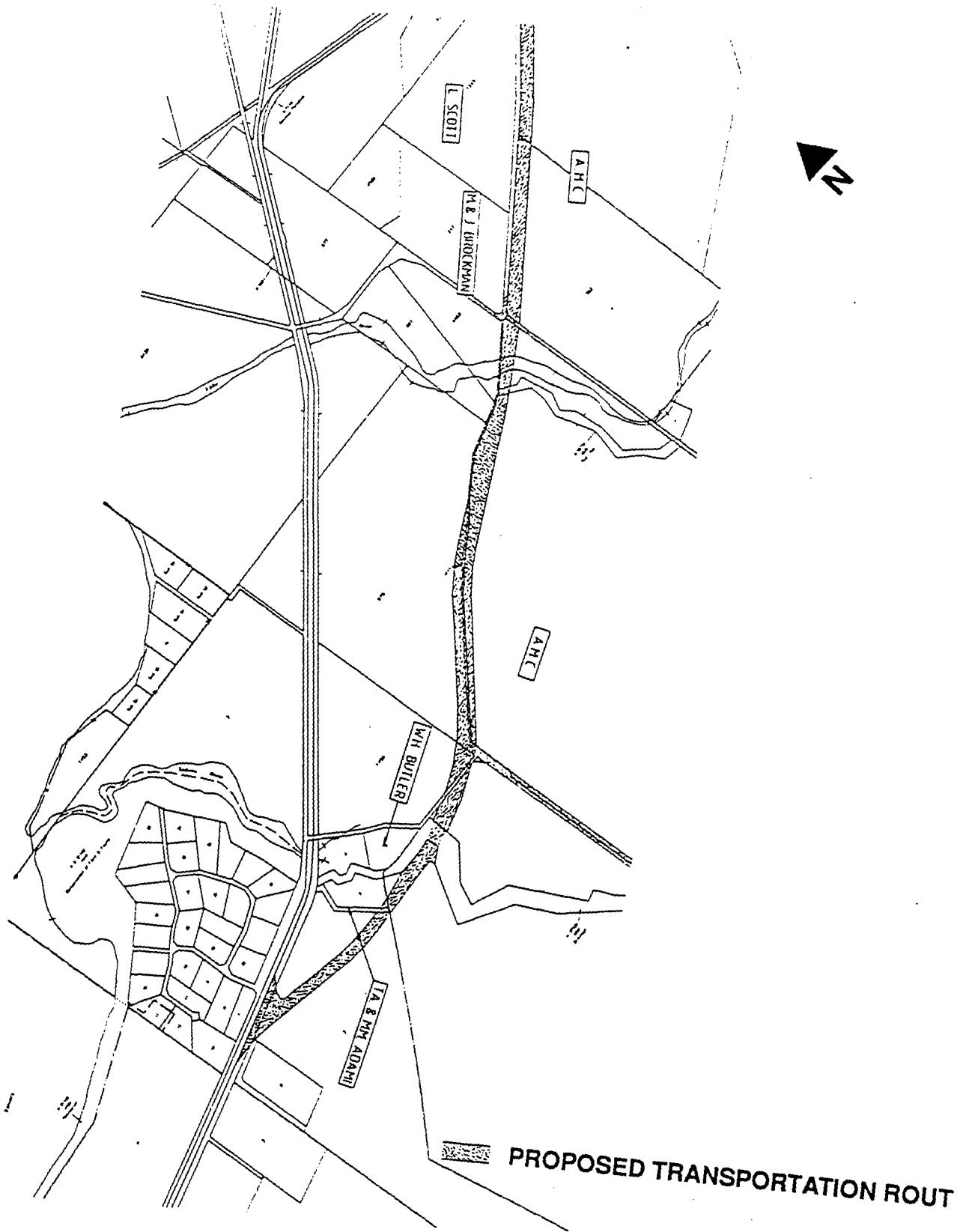


FIGURE 9

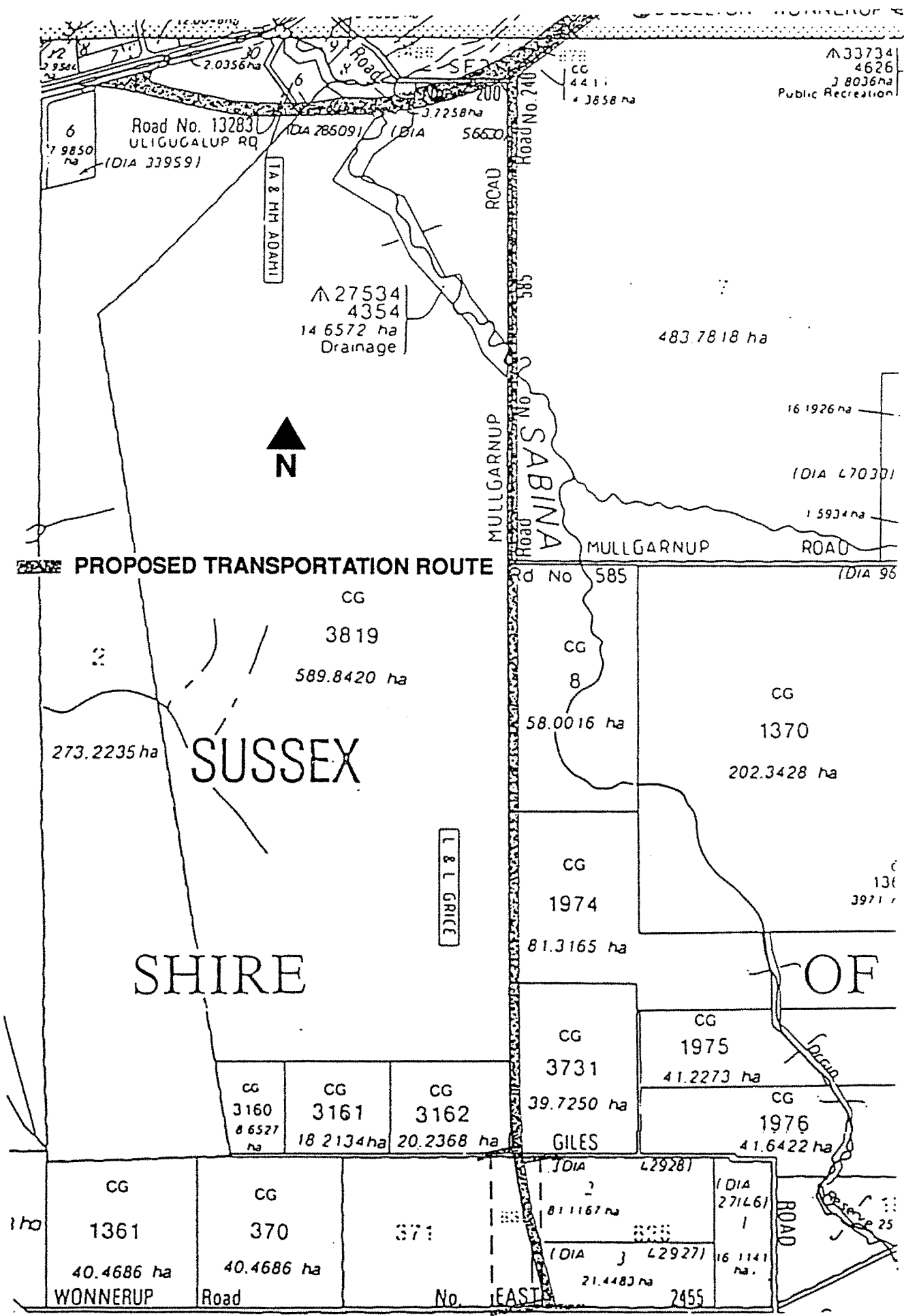


FIGURE 10

PROPOSED TRANSPORTATION ROUTE

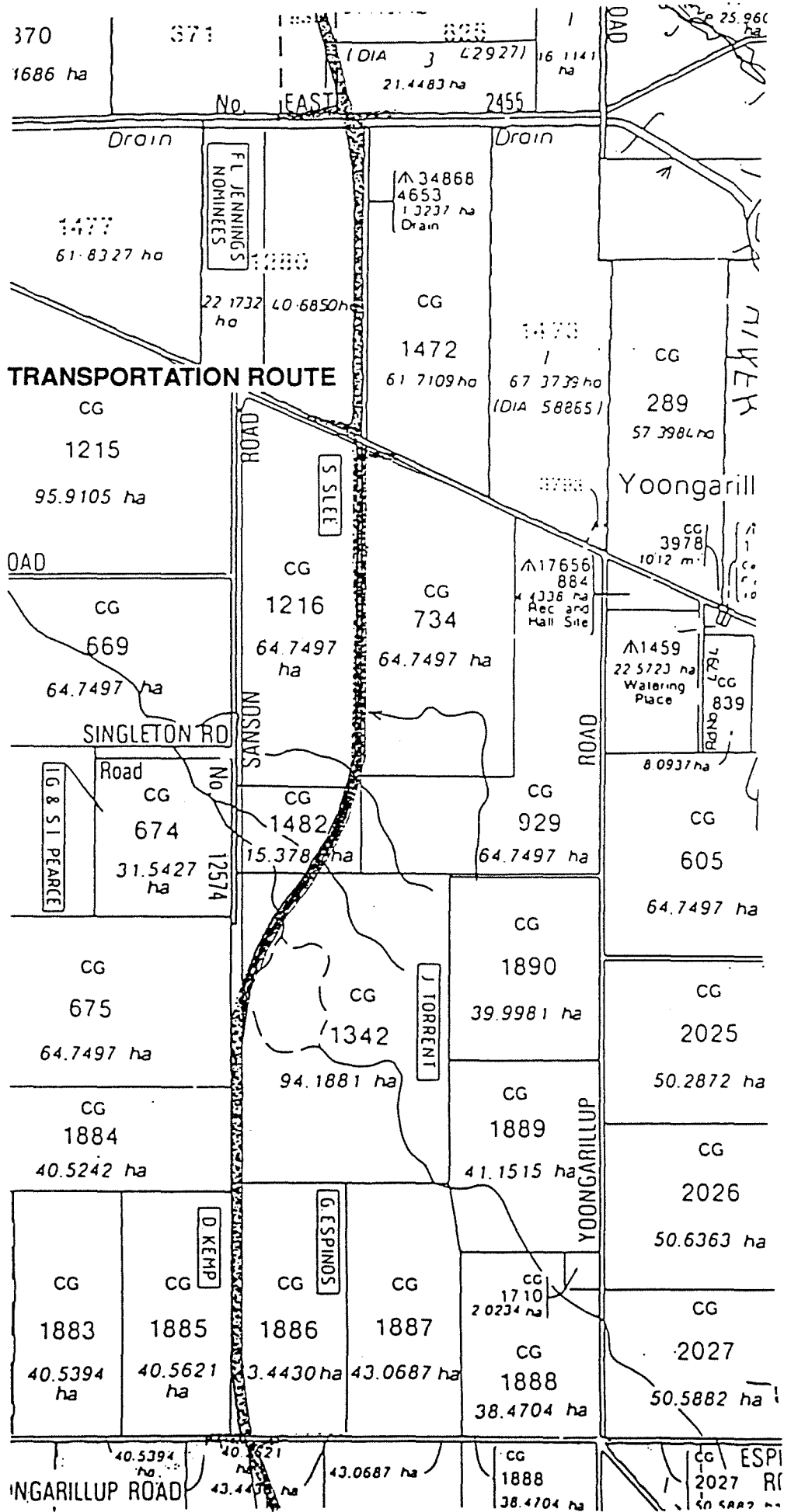


FIGURE 11

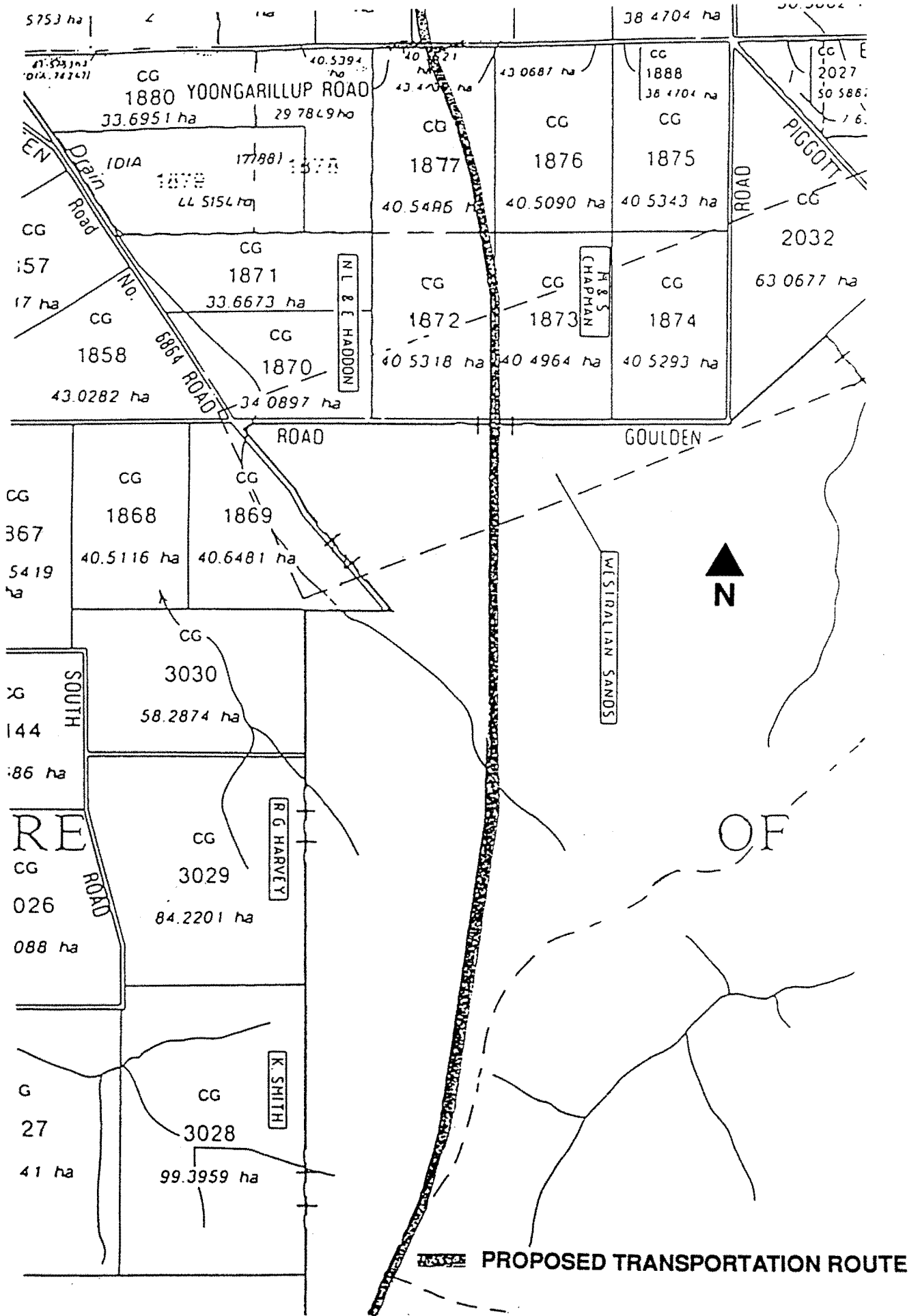


FIGURE 12

Appendix 4

**Criteria developed for use in selecting the preferred route and
comment on study methodology.**

The following is a summary of route selection criteria included in the Public Environmental Review document.

Engineering/Economic Criteria

- (i) Length - the actual distance in kilometres measured from the northern end of Sues Road to where the proposed Capel Bypass intersects Bussell Highway north of Capel. Some routes incorporating the Ludlow Forest Bypass include an additional road length not required for mineral sands traffic to provide a link to Bussell Highway south of Sabina River.
- (ii) Cost - the total cost in millions of dollars for establishment of the road including basic road cost, discount for existing pavement, relocation of services, railway crossings, land acquisition, bridges and culverts, property severance measures (underpasses etc) intersection realignments, compensation (or replacement) for property improvements affected.
- (iii) Haulage Costs - a flat rate per tonne kilometre for mineral sand product transport.
- (iv) Benefit Cost - a ranking from 1 to 18 with 1 the "best" and 18 the "worst" route. Option A was taken as the base case. Implicit in this factor were travel time, accident costs, vehicle operating costs (all vehicles using the road.)
- (v) Mining Landuse - a rating out of 5 which establishes the degree of conflict with operating mines and the mining interest of exploration licences, prospecting licences and mining leases, including the potential benefits the route may have as a transport route for affected mines (best - 1, worst - 5).
- (vi) Tourism Impact - a rating out of 10 which estimates the likely benefit of alternative routes to tourist traffic by predicting the amount of tourist traffic which would utilise the route.
- (vii) Contribution to Regional Planning - this criteria considers the significance of each route option as a component of the regional road network, expressed as a rating from 1 (best) to 5 (least benefit).
- (viii) Route Safety - a rating out of 10 which assesses comparative route safety in terms of the number of conflict points along a route. Includes numbers of road functions, property access points, farm severance necessitating road crossing for farm operation, crossing points for children to reach school bus stops.

Social Impact Criteria

The social impact criteria provide a mechanism for comparing routes according to impact on properties and residences. They are, in the main, measures of the cause of impacts. The perceptions and views of the affected communities are taken into account within this factor grouping. Community views are, however, so significant in the route evaluation process that a special community consultation programme designed to inform and be informed ran in parallel with the evaluation process. This was highly significant in shaping the content of the social impact evaluation, and later, in developing mitigation processes. Full details are given in the Stage II Report for the route alternative evaluation, and in Chapter 7.0 in respect of the recommended option.

Brief descriptions of the criteria follow:

- (i) Length through Private Property - the length in kilometres requiring purchase of private land either for road widening or new construction.
- (ii) Number of Properties Severed - the number of properties where separation of one part of a land holding from the remainder occurs due to a new road corridor.

- (iii) Number of Properties Affected - the number of land holdings affected by any loss of property, including but not limited to severance.
- (iv) Residences within 50 Metres - a measure of significant effects due to proximity, including noise, vibration and potential for dust. Could necessitate amelioration measures such as noise bunding.
- (v) Residences within 200 Metres - lesser impacts than under the previous criterion, including noise, lights at night, visual impacts, yet still requiring some measure. Number of houses (including those within 50 metres).
- (vi) Loss of Residences - counts the houses located so close as to potentially require acquisition of the house.
- (ix) Community Access - ranks the options according to their ability to improve local traffic access over that currently operative, including the provision of bypasses to Capel and Ludlow Forest, and centrality to population distribution.
- (x) Other Landuse Impacts - rated high, medium or low and a measure of impact on civic/community facilities, commercial and industrial activities, utilities, and tourism facilities.
- (xi) Archaeology - the likely impact due to proximity to the only known significant site (an artefact site) in the study area. Rated as significant or not significant.
- (xii) Heritage - classed as significant or not significant in terms of likely severance or destruction to listed heritage sites and places of historic interest.

Environmental Criteria

- (i) Flora - a rating between 1 and 5 based on impact on vegetation communities along routes. Includes consideration of reserved status, rare and endangered flora, relative abundance of community types, the ability to ameliorate by rehabilitation, and the resilience of affected communities.
- (ii) Fauna - a rating between 1 and 5 based on impact on fauna habitat loss or severance, occurrence of known breeding areas, drought refuges and nature reserves.
- (iii) Hydrology - considers road drainage effects on surface and groundwater hydrology, including turbidity increases in streams, increased or decreased inundation, and ability to ameliorate by drainage design. Classed as high, medium or low impact.

Study methodology - Comment by Environmental Protection Authority.

The Environmental Protection Authority is aware that the methodology used to select the preferred route is being examined favourably by other prospective proponents. In light of this, the Authority considers it helpful to give suggestions to assist in the development of the methodology. The Authority commends the proponent for applying such a detailed study process and is of the opinion that similar studies will assist other proponents and Government in developing and refining projects in complex and dynamic social environments.

The following points are offered to assist future proponents who may be interested in using similar methodology.

- the study appeared to give more weight to engineering/economic and social criteria than it did to environmental criteria. While this was recognised by the proponent, the Authority cautions future proponents against applying this study methodology in a

standardised manner. However, in this study, social issues were certainly the critical factors.

- there were elements of double counting in the matrix evaluation used to compare routes. While the proponent re-evaluated the routes using weighted measures (to adjust for such errors), the range of ranking values differed among criteria. The subsequent aggregation was perhaps too restrictive.
- the Authority suggests to proponents considering using such an approach in future, that it is useful to compare alternative options on social criteria, environmental criteria and engineering/economic criteria separately. This would highlight tradeoffs between the three groups of criteria and allow direct comparison of routes; ie is one better socially, another better environmentally and another better on engineering/economic criteria.

Appendix 5

Committee membership.

Mineral Sands Road Study Steering Committee

Shire of Capel

Shire of Busselton

Social Impact Unit

Department of Resources Development

Department of Planning and Urban Development

Department of Transport

Main Roads Department (Chair)

South West Development Authority

Environmental Protection Authority (Observer status only)

Representatives of Mineral Deposits Limited and Cable Sands Pty Ltd also participated in the Committee's deliberations.