Appendix 3 Reviews of the Harden Report by Hitchcock and Cairnes

Review of additional documents related to Brunswick Heads to Yelgun Upgrade, State Highway No. 10 – Pacific Highway

Lorraine Cairnes,

Fathom Consulting, Sydney, Australia

August 2002

Review of additional documents related to Brunswick Heads to Yelgun Upgrade, State Highway No. 10 – Pacific Highway

Lorraine Cairnes, Fathom Consulting

August 2002

1 THE DOCUMENTS

The documents reviewed were:

1. Letter headed "Pacific Highway Upgrade, Brunswick Heads" dated 29th October 2001 from Peter Parker (Environmental Consultants Pty Ltd, Broken Head, NSW) addressed to Denise Greenaway of Ocean Shores Urban Association, Ocean Shores, NSW 2843.
2. Report prepared by Gwen Harden, Botanist, titled *"Report on the Significance of Lowland Rainforest on Floodplain Brunswick Heads Nature Reserve"*, July 2002 (two-page report with one-page summary and one-page attachment).

2 INTRODUCTION

I have reviewed the documents by Gwen Harden and Peter Parker and have also reviewed the evaluation by Peter Hitchcock (Old Cassowary Consulting),

The issues raised by the documents have been commented on in detail in the accompanying report prepared by Peter Hitchcock, and I concur with his conclusions and recommendations.

3 COMMENTS

Parker Letter

Three main issues were raised in the Parker letter.

1. *Ecological issues*: The Parker document does not raise any new ecological issues that have not already been considered in the extended process of the environmental impact assessment. His concern is the high number of threatened species and species richness on the preferred route. All of the possible routes had impacts on threatened plant species, and evaluation of the conservation of species, communities and habitats in a regional sense was required to obtain a clear differentiation of the ecological impacts of the two routes A2 and ***VA2***.
2. *Planning process*: The Parker document's additional comments on claimed deficiencies on the planning process in that it failed to select a route that would have minimal impact on mangrove and wetland communities. These issues were examined in detail in various reports, during the complex environmental impact assessment process. The process was found to have been appropriate and adequate by the State Government agencies responsible for them.

3. *Excision of section of Brunswick Heads Nature Reserve*: The Parker document's is critical that the NPWS has allowed the de-gazettal of a part of the Brunswick Heads Nature Reserve and states that this is an "*extraordinary measure, especially when a plausible alternative route exists".* However, he does not acknowledge that the ***VA2*** route would also have had extensive and direct impacts on the Nature Reserve, nor that the ***VA2*** route would also affect other areas of high natural heritage significance.

Harden Report

1. The Harden report provides relevant new information in respect of the A2 route, being the occurrence of plants of *Grevillea hilliana,* a gazetted endangered species, plus three additional vulnerable species: *Tinospora tinosporoides* (Arrow-head Vine); *Syzygium hodgkinsoniae* (Red Lilly Pilly); and *Syzygium moorei* (Coolamon).

   This information reinforces the high conservation significance of the small triangular area of Lowland Rainforest on Floodplain on and adjacent to the A2 route, however, this significance has already been recognized in the environmental impact assessment process. The new knowledge should be taken into account in protection of this area of Lowland Rainforest on Floodplain in the Brunswick Heads Nature Reserve.

2. Although options or requirements for protection of the area of Lowland Rainforest on Floodplain on and adjacent to the A2 route are not addressed in the Harden report, the key issues for conserving the values of this area, including the individual endangered and vulnerable plants are maintaining the existing hydrology and drainage, avoiding changes to soil, and preventing direct impacts and intrusions into the area by humans and machinery during construction.

3. Harden's report does not assess the relative impacts of the two route options in terms of conservation significance, and hence the relative values of, and impacts on, the Davidson's Plum precinct on route ***VA2*** and the Lowland Rainforest on Floodplain precinct on the A2 route. Clearly, both are important for conservation of endangered species, and as communities.

4. The Harden report does not address of the wider ecological issues related to conservation of the regional ecological values, including conservation of species, communities and habitats of fauna as well as flora. It is these issues that were identified in my previous Independent Review and clearly differentiate the impacts of the two routes A2 and ***VA2***.

5. The Harden report questions whether the area noted in the Connell Wagner Report as Lowland Rainforest on Floodplain on the ***VA2*** is, in fact, on floodplain alluvium. If this is correct (a field assessment would be needed to confirm this), the net effect is to reduce slightly the significance of the ecological impact of route ***VA2***. However, other very important conservation values on the ***VA2*** route remain critically important for this route, and in the overall consideration and comparison of the two routes.

6. Hitchcock's review identifies two 'critical nodes' in the debate about the two route options; one is inside Brunswick Heads Nature Reserve (the Lowland Rainforest on Alluvium precinct adjacent to the Pacific

Highway) and one is outside the Nature Reserve (the Davidsons Plum precinct on the ***VA2*** route). Given the demonstrated high conservation value of both of these precincts, their future protection would be required, regardless of the route selected.

7. The formal protection of the Lowland Rainforest on Floodplain area on the A2 route places responsibilities and obligations for the RTA under the Threatened Species Conservation Act and the National Parks and Wildlife Act. These responsibilities should be specifically managed for a site of this significance, and a site-specific environmental management plan and mandatory induction of all workers who would be employed in this area would be appropriate.

4 CONCLUSIONS

From review of the two documents, I conclude that:

1. The issues raised in the Parker letter do not materially add to or change the decisions that have been made about preference for the A2 Route as the preferred route in the Brunswick Heads to Yelgun Upgrade, State Highway No. 10 – Pacific Highway.
2. The matters raised in the Harden Report add to the knowledge about species present in the Lowland Rainforest on Floodplain in the Brunswick Heads Nature Reserve, and reinforce the already-recognised high conservation significance of this area. The new knowledge does not change the overall conclusions about A2 as the preferred route in the Brunswick Heads to Yelgun Upgrade, State Highway No. 10 – Pacific Highway.
3. The additional knowledge in the Harden report reinforces the need for very careful management of the construction in this vicinity of the area of Lowland Rainforest on Floodplain in the Brunswick Heads Nature Reserve. A site-specific environmental management plan and mandatory induction of all workers who would be employed in this area would be appropriate.
4. The Harden report also does not address the relative impacts of the two routes under consideration in terms of regional conservation issues; in my view, the matters raised in her report do not change the conclusions about the regional ecological issues for conservation that are the primary differentiators for the impacts of the two routes A2 and ***VA2***.
5. The matters raised in the Harden report do not change the validity of the conclusions about the regional ecological issues for conservation that are the differentiators for the impacts of the two routes A2 and ***VA2***.

Lorraine Cairnes
Sydney
August 2002

Review of reports by G. Harden and P. Parker

Brunswick Heads to Yelgun Upgrade, State Highway No. 10 – Pacific Highway

Peter Hitchcock
OLD CASSOWARY CONSULTING
Cairns, Australia
August 2002

Contents

The Brief

- Review the reports by Gwen Harden (June 2002) and Peter Parker (October 2001) for the Highway Action Coalition
- Review these reports by reference to the conclusions of the Independent Report prepared by Fathom Consulting in November 2001.
- Refer to the parts of the Connell Wagner report on the Brunswick Heads to Yelgun Upgrade, State Highway No. 10 – Pacific Highway for technical references that are relevant to the appraisal.
- Based on strategic evaluation of the above, comment on the extent to which the issues raised are valid and relevant to the question of making a decision about the route in terms of the ecological aspects

Part 1
REVIEW OF REPORT BY P. PARKER

Introduction

The author was provided with a copy of a letter dated 29th October 2001 by Peter Parker of Environmental Consultants Pty Ltd, Broken Head, NSW. The letter was titled "Pacific Highway Upgrade, Brunswick Heads", was addressed to Denise Greenaway of Ocean Shores Urban Association, Ocean Shores, NSW 2843

Review of Identified Issues

There are three specific issues raised by Peter Parker that directly relate to assessment of impact of route options A2 and VA2. The three points, quoted below in bold italics, were analysed and comment provided on each.

Issue 1 - Milky mangrove (*Excoecaria agollocha*)

> ***"…my survey for the RTA in 1992 of riparian vegetation of the Brunswick River identified and area of Milky Mangrove forest which warranted protection. I articulated this requirement in my report and was satisfied that the proposed route avoided this area. However, after walking along the VA2, it was apparent that your proposal would not impact on Milky Mangroves and would have minimal impact on mangrove and wetlands communities. It was clearly apparent during my view that the VA2 route should have been selected for investigation by the RTA."***

Analysis of Issue Raised

The above comments are somewhat puzzling and care is needed to understand just what point is being made. However, the logical conclusion arising from my interpretation is that neither route A2 nor route VA2 impact on "Milky Mangrove". That leaves something of a non-sequiter to ponder as to the purpose of the statement, given that there appears to be no issue.

The final sentence might previously have been a valid comment but is not now relevant, as VA2 was subsequently investigated by RTA.

The milky mangrove as a species and as a plant community is widespread and not uncommon. Milky mangrove occurs frequently as a fringing community associated with other mangrove species and communities. Its southern limit extends well south of Brunswick Heads, to the author's knowledge, to at least Watson Taylor Lake on the Camden Haven River. At best, the milky mangrove on the Brunswick River would have local conservation significance.

Conclusions re Issue 1 - Milky Mangroves

The brief commentary on milky mangroves provided by Peter Parker has no material bearing nor does it provide any basis for changing the existing official assessment of the two routes.

Issue 2 - Species Richness

"….the EIS under-reported the extent, in terms of species-richness and density, of threatened species impacted by the construction of "A2" route within the Brunswick Heads Nature Reserve. This is a significant oversight as the planning decisions based on the EIS are made in good faith and are difficult to retreat from."

Analysis of Issue Raised

It is apparent that supplementary information provided by Harden (June 2002) has added to the "species richness and density" of threatened species within the ***"... the small triangular area of lowland rainforest on alluvium to the west of the Pacific Highway..."*** (referred to elsewhere in this report as the 'LROA precinct'). The issue of whether these species are directly impacted by the construction of A2 warrants closer analysis than this statement suggests.

As indicated elsewhere in this report, the apparent oversight in the Connell Wagner report resulting in 'under reporting' of at least one threatened species needs to be seen in terms of the relative timing of both analysis for the report and the gazettal of *Grevillea hilliana* as an endangered species, both occurring in July 2001.

Conclusions on Issue 2 - 'Under Reporting'

The Connell Wagner report - and as a consequence, the Independent Review report – under-reported the threatened species in the LROA precinct on the A2 route. The updated information, to which Botanist Harden has now alerted the process, can be factored into the design process. (See review of Harden Report). However, the now-corrected 'under reporting' would have been unlikely to have had any material impact on the route selection process.

Issue 3 - Revocation of part of Brunswick Heads Nature Reserve:

"….the removal of an area gazetted under the National Parks and Wildlife Act, 1974, namely part of the Brunswick Heads Nature Reserve, for the purposes of a highway appears to be an extraordinary measure, especially when a plausible alternative route exists."

Analysis of Issue Raised

Mr. Parker appears not to recognize that the "plausible alternative route" (presumably VA2) also passes through part of the Brunswick Heads Nature Reserve. His statement appears therefore to be based on a misunderstanding.

Conclusions on Issue 3 – Revocation of part of Brunswick Heads Nature Reserve

The comments by Parker regarding the revocation of part of Brunswick Heads Nature Reserve do not in any way materially discriminate between the two route options and do not provide any valid case for changing the official assessment of the two routes now under consideration.

Summary Conclusions on Issues Raised by P. Parker

Parker's introductory comments focus on his concern for threatened species and on species richness.

Two of the three specific issues raised by Parker fail to provide any basis for discriminating between the two route options under consideration. Those points therefore provide no basis for changing the official position on the relative impacts on threatened species of the two route options.

The third specific issue, that of "species richness", confirms the species richness further elaborated by Harden. Harden claims a total of 120 species present in the LROA precinct, an undoubtedly high species count for such a small area.

Parker's comments simply reinforce the recognized high conservation value of the LROA precinct but, unlike Harden's report, is lacking in any specific data.

Part 2
REVIEW OF HARDEN REPORT

Introduction

The report reviewed was a two-page report with a one-page summary and one-page attachment, prepared by Botanist Gwen Harden and titled ***"Report on the Significance of Lowland Rainforest on Floodplain Brunswick Heads Nature Reserve"***, July 2002.

Review of Identified Issues

The following numbered points are re-statements of the four dot-point statements in Harden's Summary. Comments are provided on each point and followed by a general commentary and conclusions.

Issue 1 - "The most significant and diverse plant community in the Brunswick Head Nature Reserve is the small triangular area of lowland rainforest on alluvium to the west of the Pacific Highway and in the A2 corridor."

Analysis of Issue

The *"small triangular area of lowland rainforest on alluvium"* referred to by Harden has been interpreted to be that area mapped as *"Lowland Rainforest on floodplain"* shown on Figures 2 and 4 in the Connell and Wagner report. Although Figure 2 suggests that the mapped lowland rainforest is not in fact in the Brunswick Heads Nature Reserve, it has been confirmed with RTA that the area is in fact in the nature reserve.

The 'small triangular area' on alluvium – the LROA precinct - contains important plant species, including some listed as 'endangered' under the Threatened Species Conservation Act. There can be no doubt that the small area contains important and listed species and plant communities.

Issue 2 - "It has a very rich mix of over 120 species some of which have been gazetted as endangered or vulnerable under the Threatened Species Conservation Act."

Analysis of Issue

This represents a re-statement of the significance already recognized in the planning process. The addition of *Grevillea hilliana* to the species list and a more comprehensive species list generally reinforces that significance rating.

Issue 3 - "The White Yiel Yiel (Grevillea hilliana) was gazetted on 13th July 2001 as an endangered species but omitted by the RTA's commissioned Connell Wagner Report, October* 2001/ Lorraine Cairnes Independent Review in November 2001." *

Connell Wagner refers to
"Additional flora surveys of the VA2 option were undertaken in July 2001 in order to determine the presence of any newly listed threatened flora species and other threatened flora species occurring along this route option. The findings of the post EIS flora surveys of route A2 were examined for any species that have been added to the TSC Act since completion of the EIS." (6.3.1 on Page 27) *G. hilliana* was gazetted on 13th July 2001.

Analysis of Issue

These date references suggest that the review for listed species by Connell Wagner was within days of the gazettal of *G. hilliana* as a threatened species, and could reasonably explain why the species did not appear in the Connell Wagner report of October 2001. Connell Wagner had apparently updated the information on threatened species and communities as at early July 2001.

The important consideration is that Harden has now alerted the process to the existence of relevant new information that can and should be factored into the decision-making process.

Harden has not been very specific about the location of the *G. hilliana* specimens on the A2 route, stating *"Six tagged plants (as well as several untagged plants) were observed on the proposed A2 route. Grevillea hilliana is at its southern limit in the Brunswick Heads Nature Reserve, with a (sic) several fine specimens in the Lowland Rainforest on Floodplain and the Brunswick Heads Nature Reserve is the only conservation area in New South Wales in which this species is known to be conserved"*. Whilst she refers to "several fine specimens" occurring in the LROA precinct, the location of the other specimens is not indicated. As *G. hilliana* is not a species limited to alluvium, the other specimens may be located elsewhere on the A2 route. *G. hilliana* is known to occur elsewhere in Brunswick Heads Nature Reserve east of the Pacific Highway.

Issue 4 - "The highly significant area of Lowland Rainforest on Floodplain on the A2 route is unique and should be conserved at all costs."

Analysis of Issue

This is an emphatic re-statement of the significance that Harden assigns to the small area of 'Lowland Rainforest on Floodplain'.

Route *VA2*
Harden questions that *"the community in Smoky Valley of Bangalow Palm with emergent Paperbark (Community 1c. in Figure 4 of the (Connell Wagner) Report" on the VA2 route should be designated as endangered community as it does not appear to be on "floodplain"."* Harden then states more definitively that *"it is not on floodplain"* but does not indicate if this was based on field inspection or map interpretation. Given the location of the community referred to, Harden's claim is probably correct, as it is unlikely

that a true alluvial floodplain occurs so high up the catchment. Nevertheless, small alluvial terraces can occur in such situations. In the interests of accuracy it would be desirable to determine the accuracy of the claim either by establishing that Harden based her claim on field observation or by obtaining independent field observation.

Assuming for the present that Harden's claim is correct, the net effect is to slightly reduce the significance of the ecological impact of route ***VA2***. However, other very important conservation values on the route remain critically important.

Route A2
The main contribution of Harden's report in respect of Route A2, is new information on the occurrence of *Grevillea hilliana,* a gazetted endangered species, plus three additional vulnerable species viz.

Tinospora tinosporoides (Arrow-head Vine)
Syzygium hodgkinsoniae (Red Lilly Pilly)
Syzygium moorei (Coolamon)

The combined affect of this information is to reinforce the already recognized high conservation significance of the LROA precinct (*"small triangular area of lowland rainforest on alluvium")* on and adjacent to the A2 route.

Route VA2 vs Route A2
Harden's report provides a small but significant change in the relative ecological impacts of the two routes, reinforcing the ecological significance of the *"small triangular area of lowland rainforest on alluvium"* opposite Rajah Road and probably slightly reducing the significance of the values, and hence impact, of route ***VA2*** - subject to field confirmation.

Importantly, Harden has made no direct attempt to weigh up the **relative** conservation significance of the two route options and hence the relative values and relative impacts on the Davidson's Plum precinct on route VA2 and the LROA precinct on the A2 route. My review confirms that both are important for the conservation of threatened species, including species gazetted as endangered under the TSC Act.

Summary Conclusions on Issues Raised in Harden's Report

Whilst Harden's report makes a significant new contribution to the knowledge and value base for the debate over the relative merits of the two highway route options, none of that contribution provides a basis for a decisive change in route preference based on ecological impacts alone. Both routes will have a detrimental ecological impact. In effect, each route runs through or impinges on a critically important ecological node – the Davidson's Plum precinct on VA2 and the LROA precinct on A2.

If the choice of road routes is limited to A2 and VA2, the task remains one of planning and designing minimization of ecological impact on the route otherwise selected.

Part 3
REVIEW OF CONCLUSIONS OF THE INDEPENDENT REPORT PREPARED BY FATHOM CONSULTING IN NOVEMBER 2001

The four conclusions reached in the Independent Report prepared by Fathom Consulting are quoted below (bold italic) and comment made on the current validity of each.

"1. A major highway is likely to have permanent ecological impacts in addition to the direct loss of individuals of threatened species of flora and fauna. Much of the debate comparing the A2 route with the VA2 route has tended to focus in individuals of threatened species. It is the ecosystem impacts that must be primarily considered; otherwise the habitats in which the species can continue to survive would not be sustained. Ecosystem processes, which are the interactions of living and non-living elements, are complex and have evolved over very long periods of time. If impacts can be avoided or minimised, there is a far better chance that they would continue to support all of the biodiversity (known and unrecorded) that depend on them. On this basis, the A2 route is preferred to the VA2 route."

This statement is a sound 'in-principle' statement in respect of the impacts likely to extend beyond the actual footprint of a highway. The preferred focus on the ecosystem impacts is an appropriate conclusion, at least in respect of species of which are not highly restricted in terms of habitat requirements. For example, if any of the endangered species represented by individuals in the LROA precinct are strictly confined to this habitat, the individual specimens deserve greater consideration in terms of conservation.

"2. The conclusions of the Connell Wagner report's ecological assessment (*Chapter *6) are endorsed. They have been reached by appropriate and thorough assessment methodology and there is equivalent information for comparison of the two routes A2 and VA2."

Comment: The apparent oversight in the Connell Wagner report of the *Grevillea hilliana* as an endangered species appears to arise from the analysis being undertaken at about the ***same*** time (mid July) as the gazettal of the species as endangered although the report was not released until October.

I concur with the Independent Review report but also point out that botanical surveys are a difficult task in any lowland rainforest and therefore are never likely to be fully comprehensive.

"3. The VA2 route, which has been developed by Connell Wagner's work, makes a number of improvements on the previous routes proposed through this general corridor, including the Highway Action Coalition's option VA2. The proposal appears to have minimised or mitigated the impacts to the greatest practicable extent. However, despite these efforts, the adverse impacts of the VA2 route, were it to be constructed, would cause long term degradation of the region's biodiversity, and its overall ecological impacts would be greater than those the approved A2 route."

Comment: This conclusion is fully endorsed. Notwithstanding new information being available in respect of the lowland rainforest on route A2, I consider that route A2 remains the best overall route in terms of long-term ecological impact. Notwithstanding, the higher value now being placed on the Lowland Rainforest on Alluvium (LROA) precinct deserves greater attention to design detail to minimize detrimental impact on this precinct and the species within. Design must not only minimize the direct impact of the footprint but minimize the edge effect and at least explore opportunities for **enhancement** of the values of the LROA.

"4. The main reasons for this conclusion are because of the extent and nature of the VA2 route's impacts on:

- ***The Brunswick Heads Nature Reserve;***
- ***The riparian corridor of the Brunswick River;***
- ***Native vegetation communities of high conservation value;***
- ***The most important existing stand of Davidson's Plum; and***
- ***Ecosystem and ecological processes, particularly edge impacts, fragmentation of habitat and loss of connectivity of threatened species populations than those of the approved A2 route."***

Comment: After factoring in the updated information provided by Harden, the reasons given for the conclusions reached by the independent review report remain valid. Notwithstanding, Harden's report demonstrates the need for an even greater effort to minimize the impact on the LROA precinct.

Part 4
GENERAL REVIEW COMMENTS

Introduction

The process of selection of route options for any major linear form infrastructure such as roads and powerlines must take many different community and environmental values into account. Environmental values in the form of what is called natural heritage must be identified, impacts on those values defined and value judgments made. Assessments of natural heritage values are often addressed in an ad hoc manner, leading to confusion and frustration on the part of those who champion particular aspects of the natural heritage.

In recent years there has been progress towards developing a more systematic approach to the identification of natural heritage values. The author has participated in the development of a set of criteria to provide one such systematic approach to the identification of natural heritage values. A copy of the latest form of "Natural Heritage Criteria" (Mackey, Nix and Hitchcock 2001) is at Appendix 1 of this report.

Another common problem in weighing up development options is assigning relative values to the various natural heritage values identified, even when using a systematic approach.

The key element in assessing the **relative value** of items of natural heritage is their **context**.

One of the difficulties in attempting to make an informed and holistic decision on an issue such as posed by the competing highway route options in the Brunswick River locality is having a comprehensive understanding of the **context** of the natural heritage values and hence the relative impacts of the proposed development. That comprehensive context is far from complete and in reality would be difficult to acquire. For example, based on current knowledge, the only natural occurrence of *Grevillea hilliana* in NSW that is protected is in the Brunswick Heads Nature Reserve. The level of detail for its occurrence in the vicinity of A2 is now high but the level of searching and knowledge elsewhere, including elsewhere in the nature reserve, appears to be of a much lower order.

Some important contextual considerations have been overlooked or ignored by both Parker and Harden in providing their statements to OSUA. For example, Harden has argued the protection of the LROA 'at all cost' but has failed to put the values of the LROA into the context of the resultant impact on the Davidson Plum precinct. Similarly, the location of other *Grevillea hilliana* in Brunswick Heads Nature Reserve has not been addressed as a context for the specimens located in the LROA precinct.

Decisions on impact of the route options must therefore be made on an incomplete knowledge base but nevertheless be based on principles that recognize these realities. The limits of knowledge can be taken into account by application of the Precautionary Principle.

Identification of Natural Heritage Values

Faced with a determination in respect of just two route options, it is important that all relevant values and impacts be appropriately considered. The brief of this review is limited to the ecological aspects of the process. The primary 'ecological' considerations to be addressed in decision-making are most appropriately based upon an established set of natural heritage criteria. The following extract from the Mackey, Nix and Hitchcock (2001) classification provides an insight into some of the natural heritage values that may be appropriate in the case of Brunswick Heads.

4.0 BIODIVERSITY
4.1 Species, populations or ecosystems - representative examples
4.2 Species, populations or ecosystems - rare, threatened or endangered
4.3 Species, populations or ecosystems - endemic
4.4 Species, populations or ecosystems - other outstanding scientific or conservation value.

5.0 NATURAL INTEGRITY
5.1 Terrestrial ecosystems - high degree of natural integrity
5.2 River corridor ecosystems - high degree of natural integrity
5.3 Wetland ecosystems - high degree of natural integrity
5.4 Coastal and marine ecosystems - high degree of natural integrity

6.0 ON-GOING NATURAL PROCESSES
6.1 Areas of sufficient size, natural integrity and other essential elements to allow or maintain significant on-going ecological, life support, and evolutionary processes
6.2 Areas of sufficient size, natural integrity and other essential elements to allow or maintain significant on-going geophysical evolutionary processes

7.0 CONTRIBUTION TO KNOWLEDGE
7.1 Geomorphic or physiographic features, ecosystems, plant and animal communities or natural processes or phenomena - significant contribution to understanding of natural history.
7.2 Geomorphic or physiographic features, ecosystems, plant and animal communities or natural processes significant contribution for direct educational value.

Much of the current debate to which the Harden and Parker supplementary submissions are directed are limited to Criteria 4.2 values:

"Species, populations or ecosystems - rare, threatened or endangered".

However, most of the other criteria quoted above are relevant and deserve to be considered concurrent with that of 'rare, threatened or endangered' species, not withstanding that the threatened species may appear to be pre-eminent.

Decision Making Process

In making decisions in respect of threatened species it is essential that such decisions are not limited to a simplistic presence/absence and impacted/not impacted approach. The conservation of threatened species should not be and cannot be limited to the simple, short-term approach of avoidance of impact on individuals. Indeed, with this case in point, location of the highway route so as to avoid the direct impact/destruction of individual tree specimens is neither a guarantee of the survival of the individuals nor of the species. As expressed in the final determination by the Scientific Committee in respect of *Grevillea hilliana*, "*…….is likely to become extinct in nature in NSW unless the circumstances and factors threatening its survival or evolutionary development cease to operate*".

Irrespective of what decision is made on the highway route, all of those species in the locality which have been formally recognized as being an "Endangered species" under the Threatened Species Conservation Act will necessitate active intervention to provide any assurances about their survival. Such intervention is the legal responsibility of the National Parks and Wildlife Service. If for any reason such intervention is not forthcoming, the mere avoidance of impacts by the highway on known individuals of endangered species cannot guarantee survival of the species in the locality.

It follows that the best interests of the endangered species in the Brunswick Heads locality will be served by an effective partnership, especially between the RTA and the National Parks and Wildlife Service. Unilateral decision-making by any of the players, RTA, NPWS and landholders is to be avoided.

Summary Comments on Relevance and Validity of Harden and Parker Contributions to Ecological Aspects of Decision Making on Route Options

The contributions by Harden and Parker, in particular the specific information provided by Harden, make a significant contribution to the knowledge base regarding the ecological values and hence impact assessment of the two route options under consideration.

- The high conservation value of the gazetted endangered species, Davidson's Plum *Davidsonia jerseyana* precinct on and adjacent to route VA2 has been previously recognized. Contributions by Harden do not contribute anything further to the knowledge base on the ecological significance of this precinct. It remains a precinct of high conservation value (endangered species, vulnerable species, habitat corridor, river corridor) and is an 'ecologically critical node' (ECN) on route VA2.

- Harden questions the accuracy of vegetation mapping, and hence conservation significance of one precinct on the VA2 route. However, this can only be verified by field inspection. Notwithstanding the outcome of verification, the Davidson's Plum precinct remains as the 'ecologically critical node' on the VA2 route.

- Harden makes important contributions to the knowledge base for the ecological values associated with the Lowland Rainforest On Alluvium (LROA) precinct on or adjacent to route A2. The update information further reinforces the high conservation value (endangered species, vulnerable species, endangered community) of the precinct. It is an 'ecologically critical node'(ECN) on route A2.

- The key threatened species in the LROA precinct 2) the two gazetted endangered species now known to occur in the LROA viz:
  Grevillea hilliana
  Randia moorei

- *Grevillea hilliana* is not limited to lowland rainforest on alluvium. Indeed, the NSW Scientific Committee describes the habitat as "subtropical rainforest, often on basic igneous substrates." This means that *Grevillea hilliana* is not limited to this highly restricted habitat type and can be expected to grow in other less restricted habitats. *Grevillea hilliana* is more common in Queensland where it is not listed as threatened.

- The critically important endangered species on the VA2 route is the Davidson Plum *Davidsonia jerseyana* and on the A2 route, the *Grevillea hilliana* and *Randia moorei*. None of these species is restricted to the habitat types in which they are encountered on the two routes. It follows that both could be expected to be found in a range of habitats, including elsewhere in the Brunswick Heads Nature Reserve.

- The overall combined contribution by Harden and Parker is to enhance and reinforce the high conservation value of the LROA precinct on the A2 route and possibly reduce the ecological significance of part of the VA2 route. However, the result is that there remains one ecologically critical node (ECN), on and adjacent to each of the two routes.

- Route VA2 transects the Davidson's Plum precinct ECN and route A2 directly impacts the eastern margin of the LROA precinct ECN. Therefore, the adoption of either route must be contingent on impact minimization down to the design level.

- Each of the ECN contains endangered species and each has additional conservation values that are valid in the route selection process and should also be taken into account in the design process.

- Route VA2 traverses lands additional to the Davidson's Plum ECN that are of conservation significance. These were recognized in the Connell Wagner report and reiterated in the Independent Report. They are an entirely valid consideration in the route selection process.

- **Given that both route options include an ECN, other ecological factors can, should and were taken into account in the route selection process. The ecological factors addressed in both the Connell Wagner report and reiterated in the Independent Review Report are considered appropriate**

and relevant. Application of those factors strongly supports the adoption of route A2, subject to rigorous minimization of impact on the LROA precinct ECN.

- It can be argued that the loss of individuals of an endangered species should take precedence over other conservation considerations; some would say 'at any cost'. In this instance, loss of individuals of endangered species has been forecast for both routes, at least within the ECN sections of each route. The A2 route appears to offer the best prospect of minimizing the loss of individuals, if not avoiding the loss of any individuals. Loss of individuals of Davidson's Plum on route VA2 would be unavoidable.

- It can be argued that the ECNs for each route can be ranked equal in terms of species conservation significance. If the additional ecological values (such as wildlife corridor, minimization of habitat loss, river corridor) associated with that ECN are factored in, adoption of route A2 is strongly favoured. If design/redesign can eliminate or strictly limit impact on the Lowland Rainforest on Alluvium precinct then A2 is reinforced as having by far the lowest overall ecological impact of the two route options.

- Notwithstanding the lower overall ecological impact of route A2, there is an obligation for RTA to minimize the direct and indirect impacts of route A2 on the high conservation value Lowland Rainforest on Alluvium. The possibility of reducing the footprint of the relevant section of highway on the LROA precinct/ECN to as close to zero as possible should be seriously studied. Possible actions should be investigated to enhance the ecological integrity of the LROA; a guiding principle should be to maximise retention of the natural hydrological regime and minimise contaminants from road and urban runoff entering the LROA precinct.

- An additional consideration in route selection is that of net loss of usable habitat. Route A2 would represent a significantly lower net loss of wildlife habitat than construction on route VA2. VA2 in effect represents a duplication of a major road corridor whereas A2 represents an amplification of an existing corridor. This consideration favors route A2.

- Another important ecological consideration is the configuration and connectivity of native habitat when comparing the two options. A2 represents a 'hard' eastern boundary to extensive regional remnant forest habitat, further defining and separating the urban environment of Ocean Shores from potentially valuable wildlife habitat to the west. Route VA2 would effectively transect and divide extensive wildlife habitat, reducing its value for sustainable wildlife. This consideration strongly favors route A2.

GENERAL SUMMARY

The additional material and commentary provided by Harden and Parker make a significant contribution to the knowledge base for assessment of the relative natural heritage conservation value, and hence impacts, for each of the two route options. However, analysis of that information, whilst slightly changing the relative ecological value of the two route corridors, does not significantly change the ecologically critical node on each route. The net result is that when assessed at the endangered species level, each route option impacts on an ecologically critical node containing endangered species. This presents a fine balance between the acceptability of the two options.

It is legitimate and appropriate under the circumstances to take into account other ecological or natural heritage values associated with each route. This was the case of the Connell Wagner route selection process and elaborated on and endorsed by the Independent Report and is endorsed by this review.

Factoring in of the significant and important ecological values relating to each of the two route options results in a strong preference for Route A2, subject to the RTA making every reasonable effort to minimize, if not eliminate, direct and indirect impacts on the LROA precinct. Indeed, there may be an opportunity to enhance the value of that LROA precinct from a conservation viewpoint by strictly limiting existing edge effects.

Notwithstanding the significant contribution of information by Harden and Parker, analysis of that material and re-application of the previous route selection process would again strongly favor Route A2.

RECOMMENDATIONS

1. **Clarification of Mapped Land Formation:** The small mapped area of Lowland Rainforest on Floodplain mapped by Connell Wagner as being on the Smoky Valley section of route VA2 should be field checked to establish if in fact it is on alluvial floodplain. Harden has drawn attention to the likelihood that it is not on alluvial floodplain. If this is to be pursued further, it may be desirable to check this by field inspection.

2. **Attention to Design Detail:** Given the confirmed high conservation value of the LROA precinct on and adjacent to A2 route option, the value of which has been reinforced by updated information from Botanist Harden, it is recommended that RTA make every effort to minimize the direct and indirect impacts of the highway upgrade on this precinct. Design should not only attempt to minimise direct footprint impact but also maximise retention of the natural hydrological regime and minimise contaminants from road and urban runoff entering the LROA precinct.

3. **Conservation Action:** Given that avoidance of impact on individuals of endangered species is not a guarantee for conservation of the species, it is recommended that the design to avoid or minimize direct impact of route A2 on individuals of endangered species be coordinated with development of a recovery plan by the National Parks and Wildlife Service for the already identified endangered species and endangered community.

4. **Protection Action:** Given that the Davidson's Plum precinct on and adjacent to the VA2 route, and possibly also the LROA precinct on and adjacent to A2 route, are not within Brunswick Heads Nature Reserve, there is a need for the NSW National Parks and Wildlife Service to urgently investigate the tenure, ownership and protection needs of these areas of confirmed high conservation value containing endangered and vulnerable species.

Peter Hitchcock
OLD CASSOWARY CONSULTING
Cairns, Australia
August 2002

Appendix 1

"Natural Heritage Criteria"
Mackey, Nix and Hitchcock 2001

Attachment 2

NATURAL HERITAGE CRITERIA

1.0 GEO-EVOLUTION

1.1 Geological features – outstanding or representative

1.2 Geomorphological and landform features - outstanding or representative

2.0 GEODIVERSITY

2.1 Geological and geomorphological features or processes - outstanding or representative examples

2.2 Geological and geomorphological features or processes - rare or threatened

3.0 BIO-EVOLUTION

3.1 Palaeobotanical and palaeozoological (fossil records) - outstanding or representative

3.2 Plants and animal species or communities which are evidence of Earth's biological evolutionary history - outstanding or representative

4.0 BIODIVERSITY

4.1 Species, populations or ecosystems - representative examples

4.2 Species, populations or ecosystems - rare, threatened or endangered

4.3 Species, populations or ecosystems - endemic

4.4 Species, populations or ecosystems - other outstanding scientific or conservation value.

5.0 NATURAL INTEGRITY

5.1 Terrestrial ecosystems - high degree of natural integrity

5.2 River corridor ecosystems - high degree of natural integrity

5.3 Wetland ecosystems - high degree of natural integrity

5.4 Coastal and marine ecosystems - high degree of natural integrity

6.0 ON-GOING NATURAL PROCESSES

6.1 Areas of sufficient size, natural integrity and other essential elements to allow or maintain significant on-going ecological, life support, and evolutionary processes

6.2 Areas of sufficient size, natural integrity and other essential elements to allow or maintain significant on-going geophysical evolutionary processes

7.0 CONTRIBUTION TO KNOWLEDGE

7.1 Geomorphic or physiographic features, ecosystems, plant and animal communities or natural processes or phenomena - significant contribution to understanding of natural history.

7.2 Geomorphic or physiographic features, ecosystems, plant and animal communities or natural processes significant contribution for direct educational value.

8.0 AESTHETICS

8.1 Natural phenomena - superlative.

8.2 Natural beauty - exceptional

Mackey, Nix and Hitchcock (2001)

Mackey, B.G., Nix H. and Hitchcock, P. (2001) *The Natural Heritage Significance of Cape York Peninsula*, A report to the Government of Queensland, ANUTECH Canberra. ISBN 0-7315-3336-4

Appendix 4 Correspondence with Government Authorities

BJ-I-1626

BJ-I-2626

planningnsw

Henry Deane Building
20 Lee Street Sydney NSW 2000
GPO Box 3927 Sydney NSW 2001
T 02 9762 8000
www.planning.nsw.gov.au

Facsimile

To	Peter Borrelli RTA, Grafton	Reference	G96/00354
From	Jan Parsons	Facsimile number	02 8640 1001
Date	30 January 2003	Total number of pages	2

Dear Peter,

Re: Pacific Highway - Brunswick Heads to Yelgun Modifications

Following on-going review of the EIA document I'd appreciate clarification of the following:

1. The RTA has committed to a construction buffer of 1-3m. How will this buffer be enforced/controlled/implemented during construction. In particular the one metre buffer ~~within~~ adjoining the lowland rainforest community?

2. The EIA makes no assessment of the significance of *Grevillea hilliana*. The species The EIS/REF fails to indicate the significance of the effects of the project on this species. Sixteen individuals of this species have been identified in the Lowland Rainforest community adjacent to the approved project. The 4 individuals that would not be affected directly could experience indirect affects, particularly loss of habitat. Similarly, the 10 individuals that occur outside the road reserve are within 25 metres of the approved project and could be affected due to competition from weeds or changes to microclimate (ie. edge effects).

   To determine the significance of the project's effects a Section 5A test of significance (eight part test) should be completed. A copy of this should be provided to the Department.

3. The flora and fauna assessment makes no assessment of "ancillary works, including fencing". Given the proximity of many threatened species to the road corridor how is it proposed to ensure that the effects of fencing do not increase the project's effects on threatened species?

4. The area between the STP access road and the main road (Figure 8.1e) appears too small to support habitat for the threatened species *Acacia bakeri*. It is considered that all these plants would be potentially lost during or shortly after construction, thus increasing the net impact to that of the approved project. How will this impact be mitigated?

5. There appears to have been no test of significance of the project on the ecological community "Lowland Rainforest on Floodplain in the NSW North Coast Bioregion". A total area of 0.1 ha of this community would be cleared as a result of the modifications. The indirect impacts on this community are not discussed adequately, including edge effects and fragmentation. It is clear that the Lowland Rainforest will experience edge effects, however the area affected, given even a conservative 16 metre affect, is not quantified.

   To determine the significance of the project's effects a Section 5A test of significance (eight part test) should be completed. A copy of this should be provided to the Department.

planningnsw

Henry Deane Building
20 Lee Street Sydney NSW 2000
GPO Box 3927 Sydney NSW 2001
T 02 9762 8000
www.planning.nsw.gov.au

What does the phrase "a strict management protocol would be developed and implemented in this area to ensure that construction activities would not impact on this ecological community" (page 132 of EIA) mean practically?

6. The NPWS concurrence report for the original project advises that, based on survey work, degradation of habitat may extend up to 200m from the edge of the Pacific Highway. On what basis are the far lesser figures discussed on page 131 of the EIA (4-16m) introduced? This is of significance as edge effects may significantly effect many species (including the *Grevillea hilliana*) and the Lowland Rainforest ecological community. The Section 5A tests of significance for these should consider edge effects.

Please call me if you have any questions about these queries.

Regards,

Jan Parsons

Jan Parsons
Manager
Major Infrastructure Assessment
Direct 61 2 9762 8107
Email jan.parsons@planning.nsw.gov.au

PM65180.09 PB:PB – Document Ref: BY-O-1690
Project Management Services, Grafton
Mr. Peter Borrelli (02) 6640 1022
peter_borrelli@rta.nsw.gov.au

FILE COPY

19/2/03

The Manager, Major Infrastructure Assessment
PlanningNSW
GPO Box 3927
SYDNEY NSW 2001

Attention: ***Mr. Jan Parsons***

STATE HIGHWAY NO 10 - PACIFIC HIGHWAY. BYRON SHIRE COUNCIL. BRUNSWICK HEADS TO YELGUN UPGRADE, 42.12KM TO 50.80KM NORTH OF BALLINA.
ENVIRONMENTAL IMPACT ASSESSMENT OF MODIFIED DESIGN - CLARIFICATIONS

Dear Sir

I refer to your facsimile of 30 January 2003 requesting clarification of a number of queries raised as part of the PlanningNSW review of the EIA document.

The RTA has reviewed the queries and as requested the following responses are provided following your numbering system. It would appear that most of the issues raised relate to an apparent confusion between the environmental assessment provided for the approved project and the modified alternative design.

1. The commitment to construction buffers as covered in the EIA has been carried forward from that outlined in Section 7.3 – Brunswick to Yelgun Upgrade, of Working Paper No. 7 Flora and Fauna Assessment for the approved project. The construction buffer would be implemented through the Construction EMP, specifically the Flora and Fauna Management Plan. The buffer would be visibly demarcated in sensitive areas such as the Lowland Floodplain Rainforest, by clearly visible fencing to ensure that construction personnel would be able to readily identify the limits to their working areas. All personnel would be educated / trained to raise awareness of the buffer zone, to identify what is required and to ensure that all staff are aware of their obligation to work adjacent to (inside of) the buffer, and the consequences for failing to do so. Regular monitoring of the buffer zone would be undertaken to ensure compliance, together with formal auditing and reporting through the Construction EMP.
2. It should be noted that the EIA addresses only the changes between the approved design and the proposed modifications. All other aspects of the design have already been assessed in the original EIS (SKM 1998). The footprint of the modified alternative design in the vicinity of the *Grevillea hilliana* plants is unchanged from the footprint of the approved project. Consequently the impact to this species is the same as that for the approved project (with the exception of the reduction in impact on two plants resulting from the imposition of a 1m wide construction buffer). As the impact on this species was considered in the original approval and is unchanged it is therefore considered that further assessment and a Section 5A test of significance is not required.
3. The ancillary works required for the modified alternative design would be the same as those required for the approved design and therefore are expected to result in no impacts additional to those considered in the original approval. Fencing would be erected using sensitive work

methods (access on foot rather than in vehicles, hand-augering of post holes, avoiding direct impacts on tagged threatened species, where possible avoiding / minimising clearing in sensitive areas etc) in locations where threatened plant species are present. Details of required work methods will be included under the CEMP / Flora and Fauna Management Plan.

4. The construction contractor would be required to take all reasonable measures to ensure that the two *Acacia bakeri* plants were not damaged during the construction process, and that the habitat in the area (which would measure approximately 40m by 5m) would be conserved. Table 8.6 of the EIA details that the approved design would have impacted 45 *Acacia bakeri* plants, while the modified alternative design would prevent the loss of the two plants detailed above, resulting in a net reduction in impact of two plants. Although all reasonable measures would be taken to protect the plants, should they be lost as a result of the habitat being too small to support them there would be no overall change in impact to this species when compared to the approved design. Whilst it is noted that this issue has not been raised by National Parks and Wildlife Service (NPWS), should detail design and further review by NPWS indicate that the plants would be lost, the RTA would mitigate the impact on this species. Consideration would be given to the possibility translocating the two species. This would be further considered / assessed as part of the NPWS Concurrence Condition No. 8 requirement for the preparation of a report detailing the feasibility of translocating threatened flora plants that may be destroyed during construction. This condition also requires that if it is not feasible to translocate individual plants, then propagation of a representative selection of these individual plants by methods such as seed, cutting or marcot shall be undertaken. This would be done in an appropriate nearby area with a more suitable buffer. This work would be done by a suitably qualified and experienced ecologist in consultation with NPWS. Revegetation on the North Coast with acacia's has been found to be very successful.

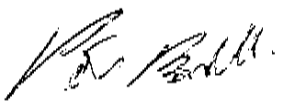
5. The footprint of the modified alternative design in the vicinity of the lowland rainforest community is unchanged from the footprint of the approved project in this area. Consequently the impact to this community is exactly the same as that for the approved project (0.1ha). It should be noted that the imposition of the 1m wide construction buffer in this area was designed to reduce potential impacts as far as practicable. As the impact on this species was considered in the original approval and is unchanged it is therefore considered that further assessment and a Section 5A test of significance is not required

   The strict management protocol cited on page 132 of the EIA would consist of the implementation of all appropriate environmental control and mitigation measures as identified in the EIA, the original EIS, NPWS Concurrence Conditions, and other documents relating to the project. This would include the demarcation of the outer edge of the construction buffer, education and training for the construction personnel, tool-box talks related specifically to the importance of the rainforest habitat for those personnel working very close to it, plus monitoring, auditing and reporting on the implementation of the control measures through the CEMP. The management protocol would be clearly detailed in the CEMP.

6. The lower figures on the potential extent of the edge effect on the lowland rainforest (detailed on page 131 of the EIS) were introduced to address community concerns that a 200m wide edge effect zone would be created by the upgrade. The literature cited reported on an investigation of vegetation dynamics across the edge of remnant rainforest and reported that the width of the edge zones varied from 4-16m, in contrast to the 50-200m often cited by NPWS. Regardless of the extent of the edge effect the modified alternative design would not increase the impact of the upgrade over that of the already approved design.

If you or your staff require any additional information, or wish to discuss these matters further please feel free to contact me on (02) 6640 1022.

Yours faithfully



Peter Borrelli
Senior Project Manager, Strategic Projects
19 February 2003

[F:\TYPING2\BRUNYELG\EIA REPRESENTATIONS\EIAREPSQUERIESNO1PNSW.DOC]

BY-I-2536

BSC File No. 237986D x 10.2002.641.1 . =366551
Contact Officer: Geoff Smyth / Chris Pratt

10 January 2002

Mr Peter Borrelli
NSW Roads and Traffic Authority
PO Box 576
GRAFTON 2460

Dear Mr Borrelli

Development Application No. 10.2002.641.1
Proposed Brunswick Heads To Yelgun Pacific Highway Upgrade - Sepp 14 Wetlands 62 And 65

Byron Shire Council has engaged the services of Mr Geoff Smyth of Smyth Maher and Associates Pty Ltd, Coffs Harbour to assess the Development Application for the above project.

As a result of the public exhibition of the Development Application and associated Environmental Impact Statement some 324 submissions were received. The majority of these submissions support the response from the Ocean Shores Community Association.

The submission from the Ocean Shores Community Association raises many issues and not all may, be relevant to Councils role in determining the Development Application. Notwithstanding Councils role, all issues will need to be addressed by the relevant determining authority. Enclosed is a copy of the submissions received for your attention.

It would be appreciated if you could provide a response to the issues raised to assist with Council's determination. It would seem appropriate that all issues raised be addressed in one response whether or not directly related to the wetlands. In this way each determining authority and those who made public submissions can be made aware of the response to each issue raised.

Your urgent attention to this matter would be appreciated. If you would like to discuss this matter please contact me on (02) 6652 4490.

Yours sincerely

Chris Pratt
Director
Local Approvals and Compliance Services

Submission by Ocean Shores Community Association dated 22 December 2002 (#365002)

ALL COMMUNICATIONS TO BE ADDRESSED TO THE GENERAL MANAGER
PO Box 219 Mullumbimby New South Wales 2482
Tel (02) 6626 7000 DX 20007 Mullumbimby
Fax (02) 6684 3018 Email: council@byron.nsw.gov.au www.byron.nsw.gov.au
ABN 14 472 131 473

PM65180.07 PB:PB – Document Ref: BY-O-1617
Project Management Services, Grafton
Mr. Peter Borrelli (02) 6640 1022
peter_borrelli@rta.nsw.gov.au

FILE COPY

The General Manager
Byron Shire Council
P O Box 219
MULLUMBIMBY NSW 2482

Attention: ***Mr. Chris Pratt***

STATE HIGHWAY NO 10 - PACIFIC HIGHWAY. BYRON SHIRE COUNCIL. BRUNSWICK HEADS TO YELGUN UPGRADE, 42.12KM TO 50.80KM NORTH OF BALLINA.
MODIFICATIONS TO APPROVED PROJECT – ENVIRONMENTAL IMPACT ASSESSMENT – CONSIDERATION OF SUBMISSIONS

Dear Sir

I refer to your letter (Ref. 237986D x 10.2002.641.1 /#366551) of 10 January 2002 providing the Roads and Traffic Authority (RTA) with a copy of a submission received in response to the public exhibition of the RTA's Development Application No. 10.2002.641.1 for works in SEPP14 wetlands 62 and 65.

Your request for a response to the issues raised within the submission received by Council and suggestion that all issues raised be addressed in the one response is noted. The RTA does not agree to provide a single written response to the issues raised. The submission was provided to Council in relation to the RTA's Development Application and it is Council's responsibility to consider the Development Application. The RTA would be pleased to provide advice to assist Council in its consideration and accordingly proposes to do so in relation to those matters in the submission related to the Development Application. For reasons noted below, this may not however be before the end of February 2003. The submission was not provided to the RTA in relation to Part 5 and accordingly the RTA does not propose to provide a formal response in that regard. The RTA will follow usual practice in relation to Part 4 / Part 5 matters and will include in its Part 5 consideration of the likely environmental impacts of the modified proposal any relevant issues raised in the submission.

As a result of the RTA's public exhibition of the Environmental Impact Assessment of the Modifications to the Approved Project, fifty seven (57) submissions were received. Matters raised in any submission which are relevant to either Council's or the RTA's assessment roles under Part 4 / Part 5 of the EP&A Act need to be considered by Council and / or the RTA as appropriate. Accordingly, enclosed is a copy of the submissions received by the RTA. The RTA is currently considering these submissions, and given the number received and the time required to properly consider them, this is not expected to be complete before the end of February 2003.

Should you wish to discuss this matter, please feel free to contact me directly on 02 6640 1022.

Yours faithfully

P Borrelli
Senior Project Manager, Strategic Projects
24 January 2003

PM65180.04.45

BSC File No. 237986D x 10.2002.641.1 #371168.
Contact Officer: Geoff Smyth
BY-I-2704

11 February, 2003

13 FEB
C31245
P. Borrelli

NSW Roads and Traffic Authority
PO Box 576
GRAFTON 2460

Attention Mr Peter Borrelli

Dear Sir,

Re: Development Application No. 10.2002.641.1
Property Description: Road Reserve, Pacific E Highway BRUNSWICK HEADS 2483
Proposal: Brunswick Heads to Yelgun Pacific Highway Upgrade SEPP 14 Wetlands 62 and 65

Reference is made to Councils previous letter requesting your comments on the submission prepared by the Ocean Shores Community Association. It is understood you require more specific identification of the issues of concern rather than a general reference to the whole submission.

The specific matters of concern are listed as follows:

1. It is claimed that sound barriers up to 7.5m high may be needed along the new road. The concern is for the visual impact of the height of the bridge approaches and sound barriers in the wetland areas.
2. It is claimed that the bridge approaches will alter flood behaviour and may have a detrimental impact on the wetlands and surrounding areas.
3. The wetlands are claimed to be known and potential habitat for the Mitchell Rainforest Snail in a draft NPWS Recovery Plan. The fieldwork in the EIS is claimed to be undertaken during dry daylight periods which is not the recommended period for the snail and therefore the results are in doubt.
4. Flora consultants have identified the lowland rainforest on floodplain as a unique and diverse rainforest remnant where road construction will have a high impact on threatened plant species.
5. An archaeological assessment has identified probable Aboriginal grave sites in wetland 62 which were not identified in the EIS.
6. Many endangered and vulnerable plants have been identified in wetland 62 which were not recorded in the EIS. More detailed mapping of the area may be necessary.

ALL COMMUNICATIONS TO BE ADDRESSED TO THE GENERAL MANAGER
PO Box 219 Mullumbimby New South Wales 2482
Tel (02) 6626 7000 DX 20007 Mullumbimby
Fax (02) 6684 3018 Email: council@byron.nsw.gov.au www.byron.nsw.gov.au
ABN 14 472 131 473

In order for Council to make a decision on the issues raised it will be necessary for comments to be obtained from the National Parks and Wildlife Service as the recognised authority in aboriginal and flora matters. Your response may also help to clarify these matters and as such your response is invited.

Yours sincerely

Chris Pratt
Director
Local Approvals and Compliance Services

PM65180.07 PB:PB – Document Ref: BY-O-1701
Project Management Services, Grafton
Mr. Peter Borrelli (02) 6640 1022
peter_borrelli@rta.nsw.gov.au

FILE COPY

21/2/03
9:53 am

The General Manager
Byron Shire Council
P O Box 219
MULLUMBIMBY NSW 2482

Attention: Mr. Chris Pratt

STATE HIGHWAY NO 10 - PACIFIC HIGHWAY. BYRON SHIRE COUNCIL. BRUNSWICK HEADS TO YELGUN UPGRADE, 42.12KM TO 50.80KM NORTH OF BALLINA.
MODIFICATIONS TO APPROVED PROJECT – ENVIRONMENTAL IMPACT ASSESSMENT – CLARIFICATION OF SPECIFIC ISSUES

Dear Sir

I refer to your letter (Ref. 237986D x 10.2002.641.1 #371168) of 11 February 2003 requesting clarification of a number of specific issues raised as part of Byron Shire Council's consideration of the RTA's Development Application No. 10.2002.641.1 for works in SEPP14 wetlands 62 and 65.

The RTA has reviewed your queries and as requested the following responses are provided following your numbering system.

1. Table 7.5 of the EIA document provides an indication of the Target Barrier Height required to achieve the road traffic noise *Base Criteria* for each Noise Catchment Area (NCA), and the Assessed Barrier Height which is the most cost effective barrier height to control noise, but which does not necessarily ensure that the appropriate road traffic noise *Allowance Criteria* would be achieved. Where the assessed Barrier would not reduce the noise levels to achieve the appropriate Allowance Criteria then additional (at residence) treatments would be implemented to ensure that the Allowance Criteria would be achieved. Although Target Barrier Heights of up to 7.5m and Assessed Barrier Heights of up to 6.5m are detailed in Table 7.5, the discussion in Section 7.10.3 following the table states that "*... it is considered that Target Barrier Heights above 4m may not be visually acceptable to the community...*" and "*The final selection of barrier height for each NCA would be based on practicality, further detailed design work and on-going community consultation. The barriers would also need to fit with the appropriate urban design requirements for the project.*"

   Sections 7.10.2 and 7.10.3 of the EIA document indicate that in the vicinity of the Ferry Reserve Caravan Park (i.e. the southern approach to the bridge, adjacent to but not through SEPP 14 Wetland No 65) a road safety barrier would be required and that this could be provided as an extended height (2m) concrete barrier to also provide some noise mitigation (even though the assessment has indicated that none is required at this location). Section 7.10.2 also indicates that a noise barrier would be required between the highway and local service road extending from the north shore of the Brunswick River (Ch 45000) to the north of Rajah Road (Ch 45400). This barrier would therefore be located on the northern approach to the bridge, adjacent to, but not through SEPP 14 Wetland No 62. Table 7.5 indicates that the Assessed Barrier Height for this location would be likely to be 2m to 3.5m, although the final design of all barriers would be subject to further detailed design and consultation with the

community. The visual impact of the barriers in these locations is therefore likely to be minimal, as they would be small components of the overall new infrastructure.

No sound barriers would be located in SEPP14 wetland areas and would not obscure views to the river for adjacent residents. Further information (including artists perspectives Figures 9.1 – 9.4) regarding the visual impact of the proposal and proposed mitigation measures is contained within Chapter 9 (specifically Sections 9.2.2 and 9.5) of the EIA. Of importance, advice from urban design consultants to the RTA contained within the EIA indicates that whilst the highway embankments on the southern bridge approach would be visually prominent, the proposal would incorporate mitigation measures and would significantly reduce visual and landscape impacts with the principal benefits being outlined on Pages 146 and 147 of the EIA.

2. Section 12.2.2 of the EIA document states "*It is considered that this [balanced cantilever bridge with two pier sets] design would be more beneficial to the hydrology of the Brunswick River than the approved design as the flow of the river would be less impeded ...*" and goes on to state "*The alternative design would therefore have a slight net beneficial impact on the hydrology of the Brunswick River. The additional increase in embankment heights on the southern approach to the bridge would not increase the risk of flooding beyond that associated with the approved design and would represent an improvement over the existing situation given that the existing bridge would be demolished.*"

   A comparison of the upstream (U/S) and downstream (D/S) flood levels and flow velocities for a 1-in-100 year flow event in the Brunswick River for both the existing and proposed situations is provided below.

   1 in 100 year flood levels and velocities upstream, downstream and at bridge structures for both existing and proposed conditions.

		Existing			Proposed		
		U/S	At structure	D/S	U/S	At structure	D/S
BRUNSWICK RIVER	v (m/s)	1.0	1.0	1.0	1.0	1.0	1.0
	d (m AHD)	2.59		2.59	2.59		2.59

   On the basis of the analysis reported above, the proposed balanced cantilever bridge design would not affect either the flow velocity or water depth either upstream or downstream of the new Brunswick River Bridge. Consequently, the bridge design and its approaches would not have a detrimental impact on the wetlands and surrounding areas.

3. Section 8.6.2 (page 136) of the EIA document, and Section 4 of the NPWS Recovery Plan for Mitchell's Rainforest Snail (MRS) *Thersites mitchellae* states "*MRS is restricted to lowland subtropical rainforest and swamp sclerophyll forest with a rainforest understorey, typically on alluvial soils with a basaltic influence.*" The claim that the SEPP 14 wetlands (which consist of mangrove communities) are known and potential habitat for this species is incorrect. Whilst Section 4 of the NPWS Recovery Plan does go on to note that "*Most of the sites where the species is known to survive are located on slightly elevated ground on the margins of coastal wetlands.*" all potential MRS habitat along the approved route was surveyed by Dr John Stanisic. Neither the habitat was found to be suitable nor was any evidence of the species found.

   Survey methodology was consistent with the methodology detailed in Appendix 1 *Environmental Impact Assessment Guidelines* of the NPWS *MRS Recovery Plan.* The survey was conducted by Dr John Stanisic, who has 25 years experience in collecting snails professionally for the Australian and Queensland Museums, and whose research papers and reports are referenced in the MRS Recovery Plan. Further, the discovery during the survey of *Fastosarion aquila,* which is a semi-slug with only a residual shell, and which is therefore likely to be even more moisture-sensitive than a large shelled species such as MRS, provides a strong indication that conditions for snail collecting were not unsuitable. In addition, this is confirmed by the fact that the semi-slugs were found in a palm frond high up in the litter zone. Snails need very little moisture to activate them from aestivation (hibernation) brought on by dry conditions and even the limited rainfall prior to the survey would have been sufficient to have brought them out. The results of the survey are therefore not considered to be in doubt.

4. Matters associated with the Lowland Rainforest on Floodplain and the consultants advice referred to have been considered in Chapter 8 of the EIA. It is noted however that the Lowland Rainforest on Floodplain is outside the SEPP 14 wetland boundaries and consequently is not included in the land to which the Development Application applies. This issue will be considered by the RTA in its determination, and will be further considered by PlanningNSW in its assessment of the Part 5 elements of the Modified Alternative Design.

5. Issues of indigenous heritage and the referenced community organised archaeological assessment have been considered in Chapter 13 of the EIA. Section 13.3.1 of the EIA notes the closest site of aboriginal significance to be 15m to the west of the approved road boundary. It is also noted that there is an inconsistency in the description of these features in the referenced archaeological report. Page 9 of the report by Ron Herron initially describes them as *possible* gravesites. Subsequently, on page 14, they are described as *probable* gravesites. No discussion is provided in the Herron report as to the change in terminology. Council should also be aware of the archaeological advice obtained by the RTA for the EIA from Mary Dallas Consulting Archaeologists (MDCA). The area was considered by MDCA to be an unlikely location for Aboriginal burial, being low-lying and likely to retain standing water after storm, flood or wetter periods. Mounded deposits in the area of the site were found to be turkey nests. Council should also be aware of the very heavily disturbed nature of the site where the highway is to be upgraded as depicted in an aerial photograph of 1959 (Ref. Figure 13.1 of the EIA).

   This notwithstanding, the Development Application does not apply to this area. Clause 7 of SEPP 14 identifies the activities to which the policy applies. As indicated in the EIA, the RTA does not propose to undertake any of these activities in this area. It is further noted that SEPP 14 is concerned with the impacts of development on the ecological values of coastal wetlands. Protection of Aboriginal heritage is instead addressed through the relevant provisions of the *National Parks and Wildlife Act 1974*.

6. Section 6.5.1 of the EIA Document states that SEPP 14 Wetland No 62 consists predominantly of Grey Mangrove (*Avicennia marina* var *australasica*) and River Mangrove (*Aegiceras corniculata*) communities. Mangrove communities are not known to provide habitat for, or otherwise support, endangered and / or vulnerable plant species listed under the schedules to the *Threatened Species Conservation Act 1995* or the *Environment Protection and Biodiversity Conservation Act 1999*. If Council has specific relevant information suggesting otherwise, it would be appreciated if Council would forward this information to the RTA to enable further consideration of this matter.

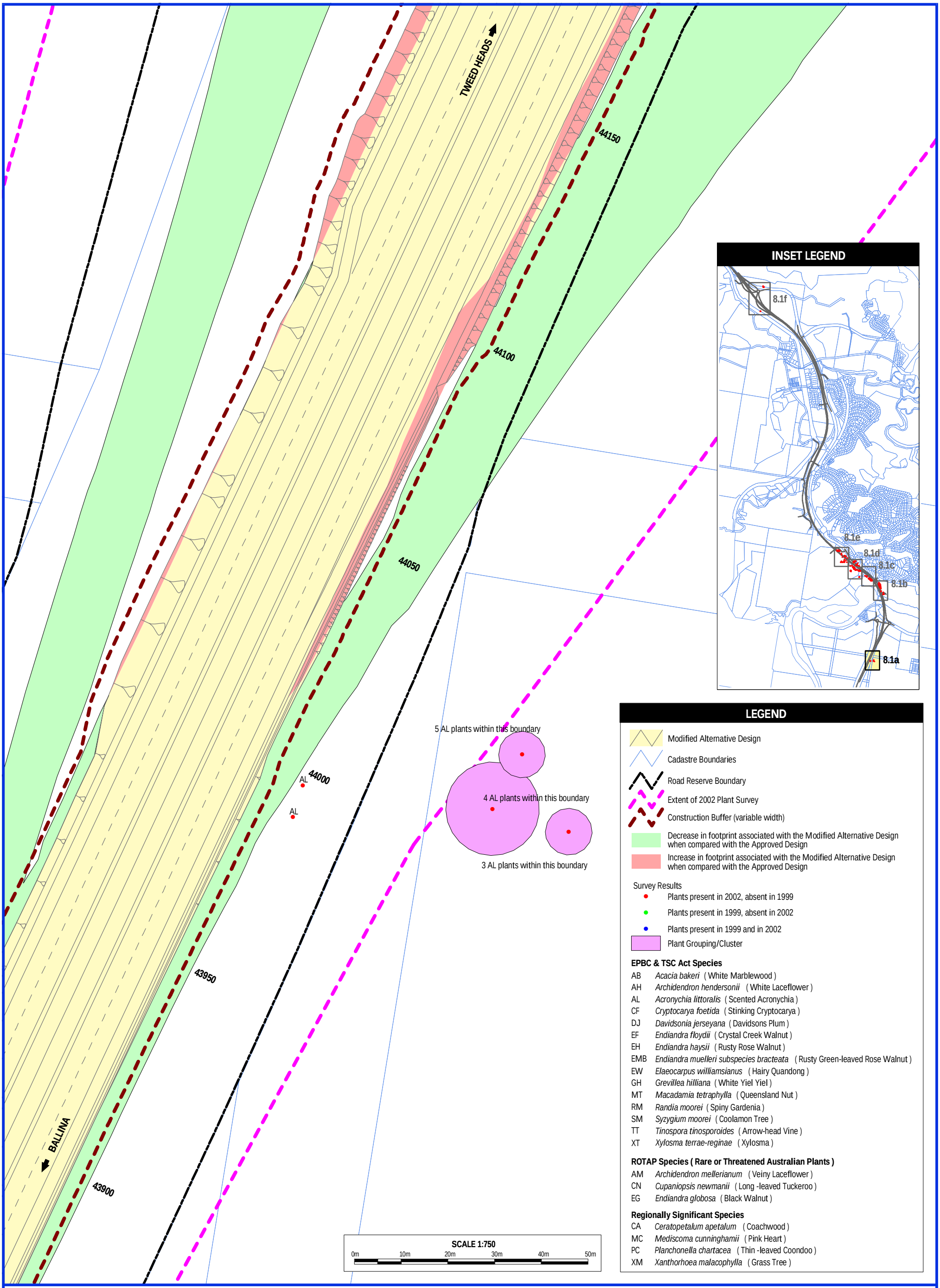
If you or your staff require any additional information, or wish to discuss these matters further, please feel free to contact me directly on 02 6640 1022.

Yours faithfully

P Borrelli
Senior Project Manager, Strategic Projects
21 February 2003

[P:\TYPING\BRUNYELG\EIA REPRESENTATIONS\BYRONCCLEIAQUERIESNO1.DOC]

Appendix 5 Reprinted Figure 8.1a-f from the EIA Document



PACIFIC HIGHWAY UPGRADE
BRUNSWICK HEADS TO YELGUN
EIS/REF

FIGURE 8.1a
CHANGE IN THREATENED FLORA SPECIES IMPACTS BETWEEN APPROVED DESIGN AND MODIFIED ALTERNATIVE DESIGN (SECTION 2)

RAJAH ROAD

TWEED HEADS

45150

45100

45050

45000

44950

Local Service Road

BALLINA

Brunswick Heads Nature Reserve Access Road

17 AB plants within this boundary

LEGEND

- Modified Alternative Design
- Cadastre Boundaries
- Road Reserve Boundary
- Extent of 2002 Plant Survey
- Construction Buffer (variable width)
- Decrease in footprint associated with the Modified Alternative Design when compared with the Approved Design
- Increase in footprint associated with the Modified Alternative Design when compared with the Approved Design

Survey Results

- Plants present in 2002, absent in 1999
- Plants present in 1999, absent in 2002
- Plants present in 1999 and in 2002
- Plant Grouping/Cluster

EPBC & TSC Act Species

AB *Acacia bakeri* (White Marblewood)
AH *Archidendron hendersonii* (White Laceflower)
AL *Acronychia littoralis* (Scented Acronychia)
CF *Cryptocarya foetida* (Stinking Cryptocarya)
DJ *Davidsonia jerseyana* (Davidsons Plum)
EF *Endiandra floydii* (Crystal Creek Walnut)
EH *Endiandra haysii* (Rusty Rose Walnut)
EMB *Endiandra muelleri subspecies bracteata* (Rusty Green-leaved Rose Walnut)
EW *Elaeocarpus williamsianus* (Hairy Quandong)
GH *Grevillea hilliana* (White Yiel Yiel)
MT *Macadamia tetraphylla* (Queensland Nut)
RM *Randia moorei* (Spiny Gardenia)
SM *Syzygium moorei* (Coolamon Tree)
TT *Tinospora tinosporoides* (Arrow-head Vine)
XT *Xylosma terrae-reginae* (Xylosma)

ROTAP Species (Rare or Threatened Australian Plants)

AM *Archidendron mellerianum* (Veiny Laceflower)
CN *Cupaniopsis newmanii* (Long -leaved Tuckeroo)
EG *Endiandra globosa* (Black Walnut)

Regionally Significant Species

CA *Ceratopetalum apetalum* (Coachwood)
MC *Mediscoma cunninghamii* (Pink Heart)
PC *Planchonella chartacea* (Thin -leaved Coondoo)
XM *Xanthorhoea malacophylla* (Grass Tree)

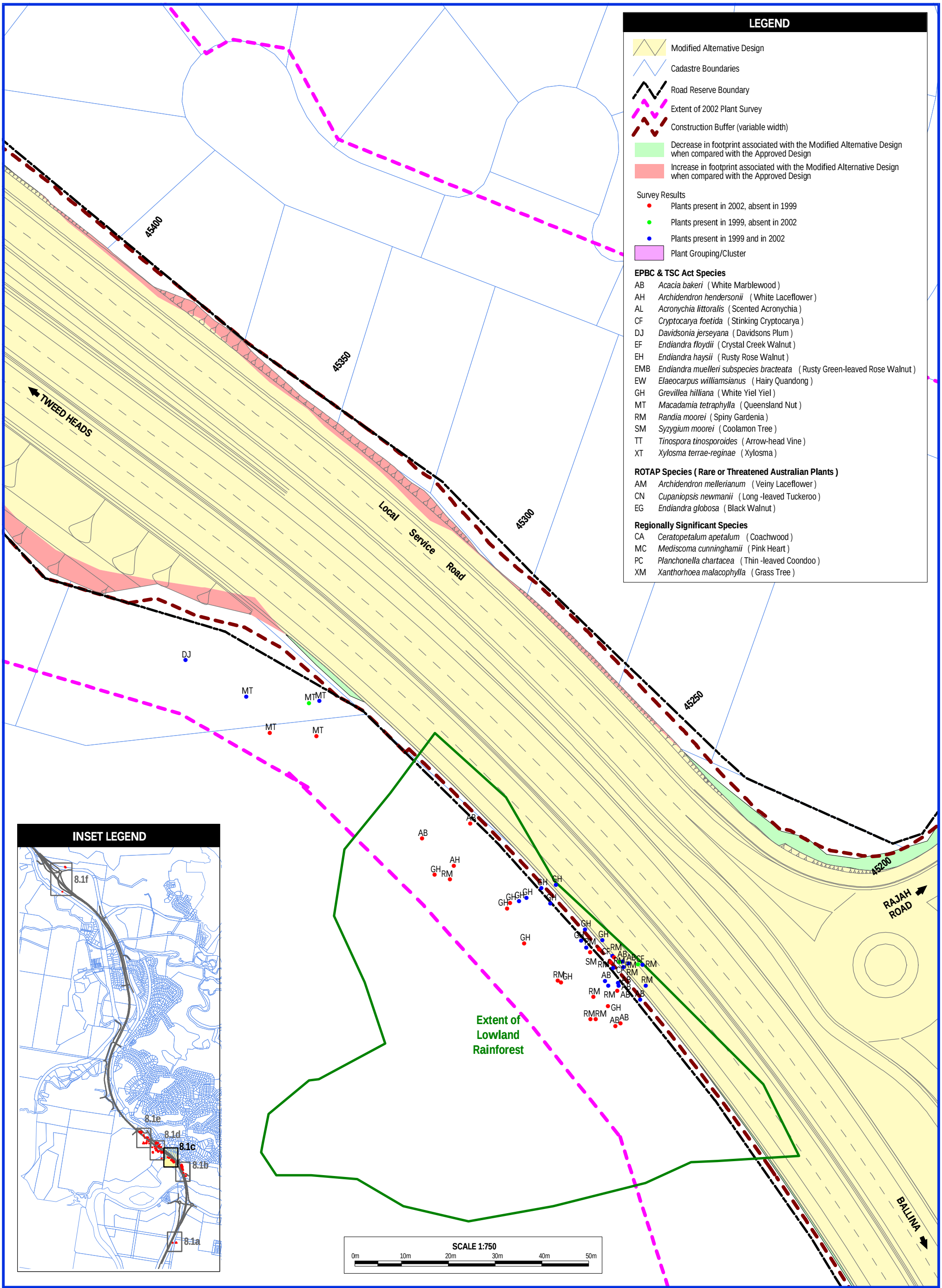
SCALE 1:750
0m 10m 20m 30m 40m 50m

INSET LEGEND

8.1f
8.1e
8.1d
8.1c
8.1b
8.1a

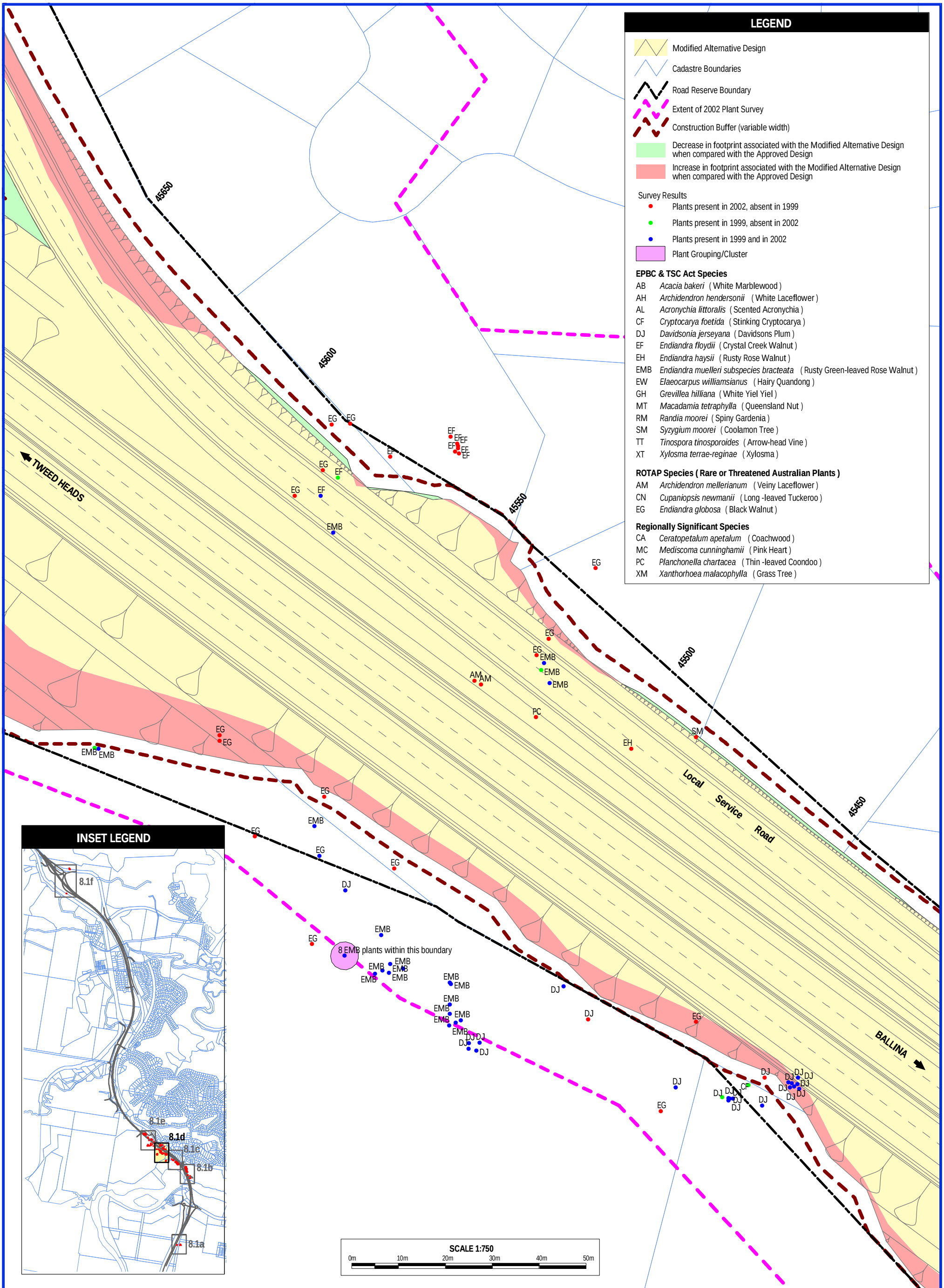
PACIFIC HIGHWAY UPGRADE
BRUNSWICK HEADS TO YELGUN
EIS/REF

FIGURE 8.1b
CHANGE IN THREATENED FLORA SPECIES IMPACTS BETWEEN APPROVED DESIGN AND MODIFIED ALTERNATIVE DESIGN (SECTION 2)



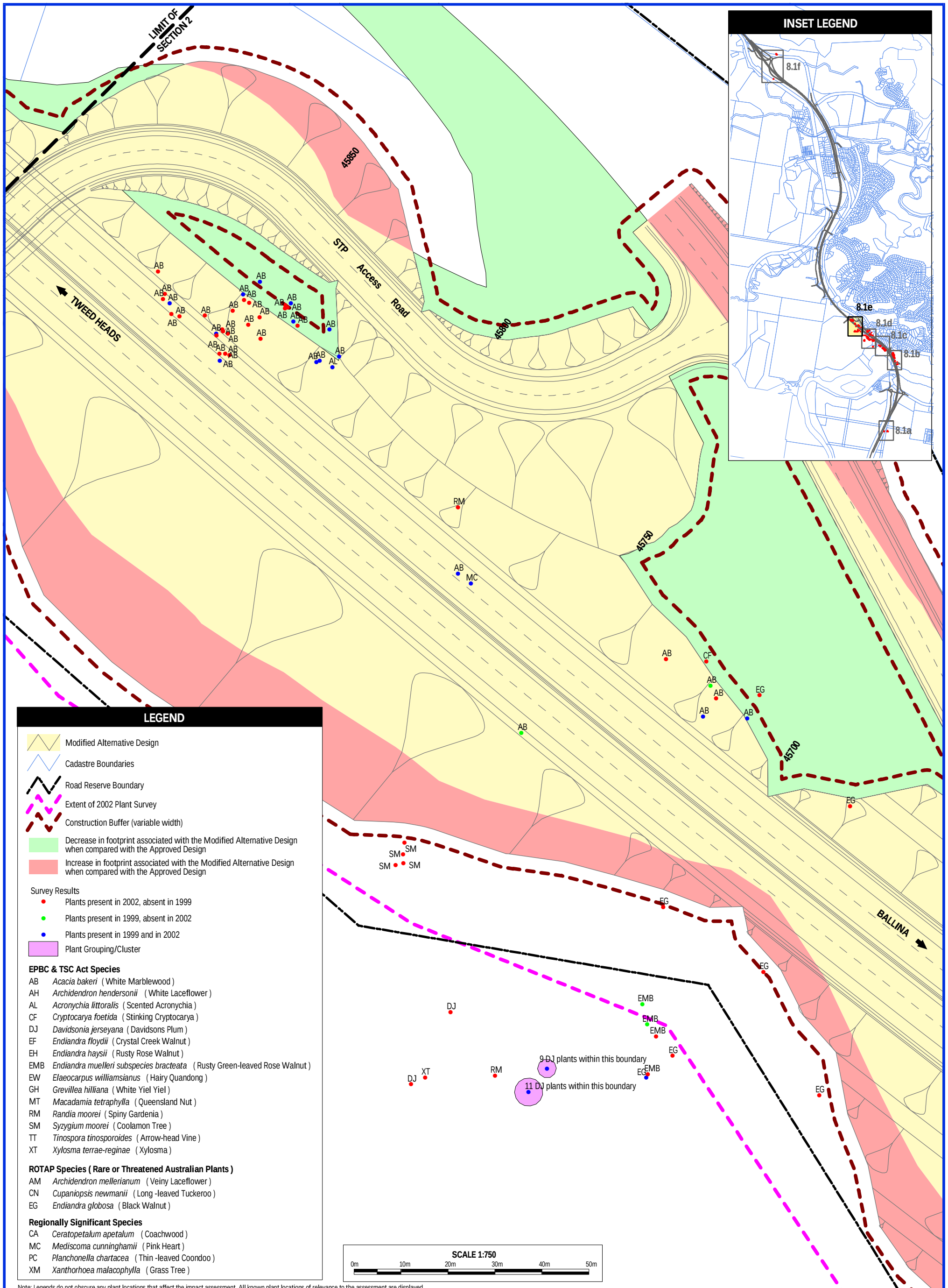
PACIFIC HIGHWAY UPGRADE
BRUNSWICK HEADS TO YELGUN
EIS/REF

FIGURE 8.1c
CHANGE IN THREATENED FLORA SPECIES IMPACTS BETWEEN APPROVED DESIGN AND MODIFIED ALTERNATIVE DESIGN (SECTION 2)



PACIFIC HIGHWAY UPGRADE
BRUNSWICK HEADS TO YELGUN
EIS/REF

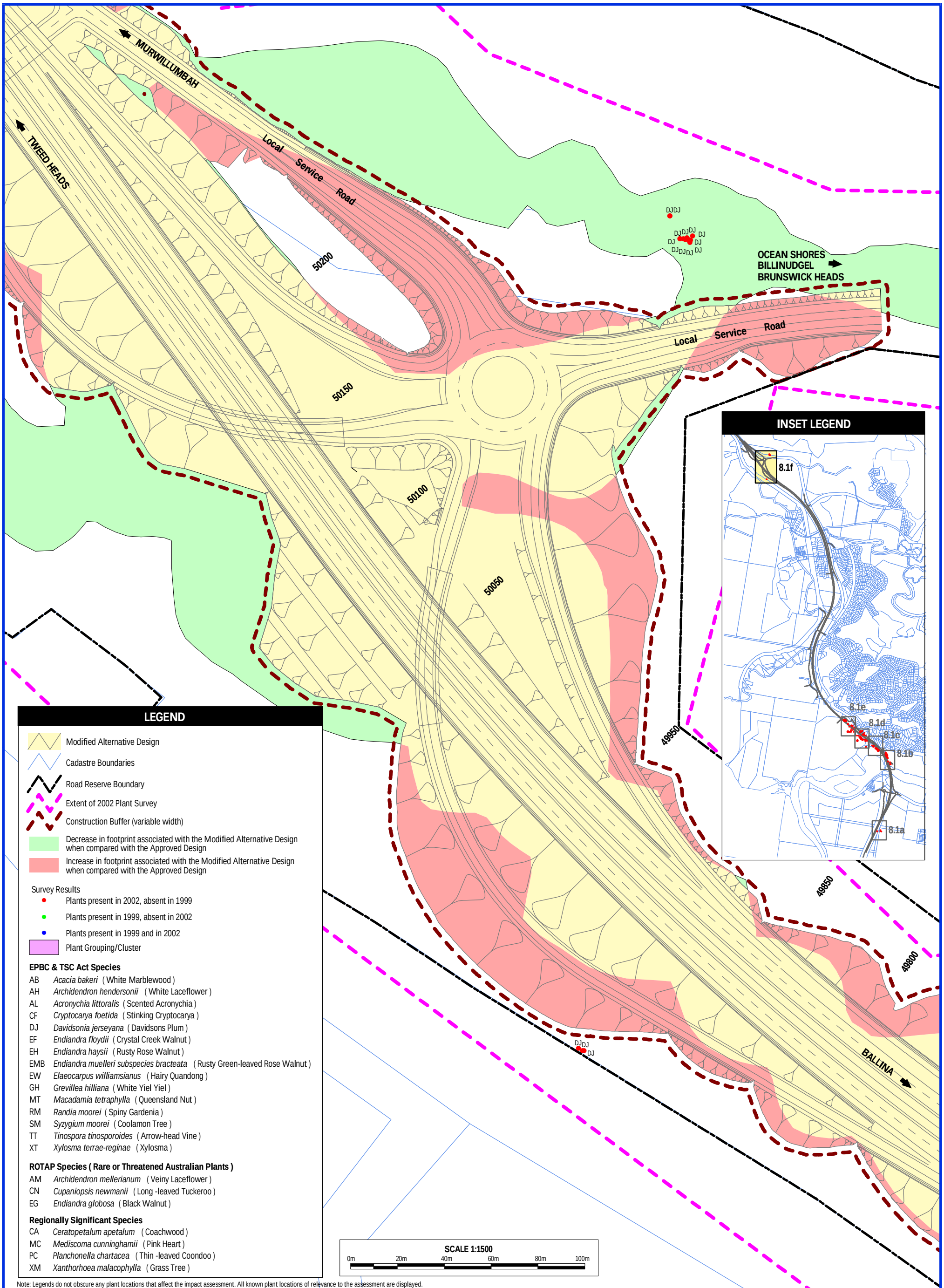
FIGURE 8.1d
CHANGE IN THREATENED FLORA SPECIES IMPACTS BETWEEN APPROVED DESIGN AND MODIFIED ALTERNATIVE DESIGN (SECTION 2)



Note: Legends do not obscure any plant locations that affect the impact assessment. All known plant locations of relevance to the assessment are displayed.

PACIFIC HIGHWAY UPGRADE
BRUNSWICK HEADS TO YELGUN
EIS/REF

FIGURE 8.1e
CHANGE IN THREATENED FLORA SPECIES IMPACTS BETWEEN APPROVED DESIGN AND MODIFIED ALTERNATIVE DESIGN (SECTION 2)



Note: Legends do not obscure any plant locations that affect the impact assessment. All known plant locations of relevance to the assessment are displayed.

PACIFIC HIGHWAY UPGRADE
BRUNSWICK HEADS TO YELGUN
EIS/REF

FIGURE 8.1f
CHANGE IN THREATENED FLORA SPECIES IMPACTS BETWEEN APPROVED DESIGN AND MODIFIED ALTERNATIVE DESIGN (SECTION 5)