

Summary of Issues raised in Submissions on Draft EIS and Responses to those Issues

Proposed Replacement of the Kareeya-Innisfail High Voltage Transmission Line

POWERLINK QUEENSLAND

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Director

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Copy Number

1.0	INTRODUCTION	4
2.0	ELECTRICITY SUPPLY ISSUES	1
2.1	ELECTRICITY DEMAND	1
2.2	SECURITY OF SUPPLY	3
2.3	WIDER GRID	4
2.4	NEW ALTERNATIVES	6
2.5	ROUTE SELECTION	11
2.6	PRECISE POSITION	14
2.7	ENGINEERING/COSTING	15
2.8	CLIMATE CHANGE	22
3.0	SOCIAL AND ECONOMIC ISSUES	23
3.1	HEALTH RISKS AND SAFETY	23
3.2	SOCIAL	29
3.3	TRADITIONAL OWNERS/CULTURAL HERITAGE	29
3.4	ENVIRONMENTAL	32
3.5	ISSUES RELATING TO BOTH OPTIONS	38
3.6	COASTAL OPTION	42
3.7	WEEDS AND PATHOGENS	50
3.8	DISRUPTION TO FARMING	56
3.9	CONSTRUCTION ISSUES	59
3.10	TULLY AERODROME	61
3.11	SOCIAL/ECONOMIC ISSUES	66
3.12	PROPERTY VALUES AND SALES	72
3.13	LEGAL ISSUES/LIABILITY	76
3.14	COMPENSATION	77
3.15	LIFESTYLE/QUALITY OF LIFE	80
3.16	VISUAL IMPACTS	81
3.17	TOURISM AND ATTRACTIVENESS OF AREA	83
3.18	INLAND OPTION	85
3.19	OPPORTUNITY COST	87
4.0	ASSESSMENT PROCESS ISSUES	91
4.1	CONSULTATION	91
4.2	BIAS/IMPROPER INTERESTS	98
4.3	ISSUES NOT ADDRESSED	104
4.4	ESD	105
4.5	REGULATORY ENVIRONMENT	109
4.6	PROCESS AND TIMING	120
4.7	METHODOLOGY	121
4.8	FEEDBACK ON DOCUMENT	130
4.9	OPINIONS	137

1.0 INTRODUCTION

The information presented below consists of a compilation of submissions received on the Draft Environmental Impact Statement - Proposed Replacement of the Kareeya-Innisfail High Voltage Transmission Line and responses to the issues raised therein. Additional commentary on these issues can be found throughout Parts A to D of this document. All material received from the public, regulatory agencies and interest groups has been included in this compilation. Concerns raised in letters and photocopied statements that did not meet the formal requirements to be valid submissions were also included. The requirements of a valid submission are that full name and address details be provided and the submission be signed and dated.

To ensure that every issue raised in each submission was properly considered, the submissions were entered into a database. Each point or issue raised was entered into a separate box and assigned to the most appropriate category. The categories were created based on the themes within the submissions and new categories were added whenever they were needed. This compilation is a summary of all the points and issues that were raised for each category. The original submission from which particular points were drawn is indicated in this compilation by the reference numbers in the text. In some cases, the same point was made in a number of submissions and in this case, only a few reference numbers are provided. Where multiple reference numbers are provided for a given point, they are listed in ascending order and the text used in the compilation may have been derived from any or all of those submissions.

Whilst the majority of points and issues presented are real, some of the points or issues presented are exaggerated or based on an incorrect knowledge of some aspects of the project. However all points and issues raised have been treated as valid for the purpose of this compilation. The reason for including all issues regardless of their apparent validity are as follows:

- prevents accusation of improper or selective use of submissions;
- people will be able to locate the points and issues they have raised and see that they have been acknowledged and how they have been addressed; and
- inclusion of all issues means that this compilation will effectively present the worst case scenario that would be associated with the proposed transmission line.

Basing planning and design processes on a worst case scenario helps to ensure that all impacts will be adequately addressed, whenever there is potential for these issues to be addressed.

Generally, the text used in the compilation is the close approximation of the actual words used in submissions. Unfortunately, on many occasions, the wordings used in submissions failed to clearly state the issue or provide enough detail to allow the reader to understand how and when the issue arises. In these cases we have taken the liberty of rewording the issue and providing extra details or context to make the issue clearer. This was possible by drawing on previous consultation with the same individuals, where the issues were raised.

2.0 ELECTRICITY SUPPLY ISSUES

2.1 ELECTRICITY DEMAND

- 2.1.1 One submission predicted that energy consumption would fall due to a range of initiatives by State and Federal Governments to reduce consumption⁹. A number of other submissions^{30,32,45,78} did not consider that the building of infrastructure with greater capacity was adequately justified as no 'load growth curves' had been provided, despite this being requested in the Terms of Reference. Similarly, no figures on what could be achieved by demand side management were provided.
- Substantial population growth will continue to occur in Far North Queensland and electricity demand will rise, as identified in Powerlink's Annual Planning Statement (refer Section 2.1). As the existing Kareeya-Innisfail transmission line is presently very close to its capacity, it needs to be replaced with a new line of greater capacity to accommodate any future scenario. The greater capacity is needed to maintain security of supply to Innisfail and Cairns in the event of a failure along the Ross - Chalumbin - Cairns line.

Figures on demand side management (DSM) would be difficult to produce as it depends on the sum of actions taken by thousands of individuals and organisations. Basic issues with DSM include a lack of motivation on the part of most individuals and organisations to adopt DSM measures (for example FNQ has a high transient population that would be hard to involve in DSM). Other measures such as energy efficient housing standards are just beginning to emerge and are unlikely to have a significant impact for a number of years.

2.1.2 It was suggested⁷⁶ that the Draft EIS did not take into account the increase in power generation from sugar mills and the decreased demand from mine closures in its electricity demand calculations.

Some of the sugar mill co-generation schemes are on hold due as a result of the poor financial condition of a number of the mills. Development of this power source also depends on continued enthusiasm on the part of power generation companies and a number of other factors, which cannot be guaranteed. Even with co-generation, transmission lines would be required to supply power during that part of the year when mills are not operating.

The closed mines (Red Dome and Kidston) sourced their power from the Turkinje and Ross substations and would therefore have a limited effect on electricity demand on the coastal part of the network of which the existing Kareeya-Innisfail line is part.

The key issue in transmission line network design is not matching capacity of the supply with demand, it is about being able to maintain security of supply to all load centres in the event of failure of parts of the network. Even if the existing lines can supply current and near future demand, additional or upgraded lines may be required to ensure security of supply in the event of failure of parts of the existing network.

2.2 SECURITY OF SUPPLY

- 2.2.1 It was suggested that the coastal option might result in the transmission line being more exposed to cyclones, lightning strike and other weather related failures^{1,63,81}. Others preferred the coastal option, as it would potentially provided a more secure supply to intermediate destinations such as Mission Beach²⁰.
- The strength of all transmission line componentry, such as towers and insulators and tower foundations are rigorously tested in a test facility before being accepted for use in real transmission lines. Additionally Powerlink have decades of experience with thousands of kilometres of transmission lines that have endured the full spectrum of weather conditions. Newer lines are equipped with overhead earthwires designed to intercept lightning and conduct it safely to ground. Significant weather or cyclone related failures are of low probability. Over the past 40 years there have been approximately 5 weather related power failures, primarily because of failure of tower footings. Improvements in tower and footing design would further reduce the probability of weather related failure.
- 2.2.2 The potential for a lengthy power outages during the construction period in Innisfail warranted a more thorough investigation according to a few submissions^{39,45}. As the coastal option would allow the existing Kareeya-Innisfail Transmission line to keep operating during the construction period, the potential for lengthy power outages is much reduced and is strong reason to prefer the coastal option^{55,60}. Supporters⁷⁶ of the inland option refer to a low probability of transmission line outages if the inland option proceeds, quoted in their submission as 3% in the first year of construction, 8 % in the second, with an 80% probability that the interruption
- There is a significantly greater risk of lengthy power interruptions (days) if the inland option is selected as one of the two main lines into FNQ would have to be removed to allow this option to proceed. If lengthy outages were to occur, they would be the result of unforeseen circumstances or hypothetical events (plane crashes in Cairns-Innisfail line etc.), and is quite difficult to state how long power supplies could be disrupted or the probability of such events. The predicted risks of outages reported opposite are based on an assumption that the source of the outage does not cause sufficient damage to infrastructure to render a line inoperable. With the coastal option, the potential impact of unforeseen events could probably be managed without loss of supply to Innisfail or Cairns.

will be less than 1 minute.

Powerlink is very aware of the social and economic disruption caused by prolonged power outages and they expend a great deal of effort in contingency planning for such events.

- 2.2.3 The risk of landslides impacting on the inland option was identified as a potentially significant factor²⁶ on the security of supply. The probable effect of landslides would be to destroy the access road and this may make it very difficult to access faults that occur along the line, although damage to towers would also be a possibility.
- 2.2.4 Some strong feelings were expressed about the reliability of the current supply⁸⁵. Powerlink have a very strong obligation to provide a continuous, high quality electricity supply to its customers and would be heavily penalised if it failed to do so. Reliability of power supply depends on both the high voltage transmission grid and the local distribution network, which can be prone to weather related outages.
- 2.2.5 The potential contribution of the 275 kV to the security of supply to Innisfail could have been presented more clearly⁴⁵. A coastal 275 kV line to Cairns would enable a percentage of FNQ to be supplied with power in the event of a failure on the transmission line between Townsville and Cairns that lies to the west of the Great Dividing Range.

2.3 WIDER GRID

Opportunities with Coastal Alignment

- 2.3.1 A coastal alignment running just west of South Johnstone Mill would allow the mill to provide power to the grid¹⁴. This is one of the design goals of the coastal option.

Local Requirements

- 2.3.2 It appears that the 275 kV line would be of little or no benefit to people in the Innisfail area as it is intended to service the Cairns area, which is already amply supplied with 275 kV power²⁵. Does the coastal option provide any benefit to consumers in the Innisfail region?
- A 275 kV line on the new transmission line would improve reliability of the HV supply to the Far North, including the Innisfail-Tully area as it would allow the 132 kV line to be energised from both Townsville and Cairns.
- 2.3.3 No discussion was provided on the impact the proposed project would make on the availability of power to intermediate destinations along the coast, including El Arish and Mission Beach^{10,45}. Could these centres grow to a point where they would be better serviced by a local substation, rather than the substations at Innisfail or Tully¹⁵?
- The proposed transmission line would allow intermediate bulk supply substations to be established to service the towns between Tully and Innisfail. This would undoubtedly increase capacity and improve the reliability of supply to such places as El Arish and Mission Beach.

Information about Wider Grid

- 2.3.4 Several submissions requested that the relationship between the proposed project and the design/future design of the North Queensland grid be explicitly presented^{39,40,91}. What other transmission lines in the North Queensland grid will need to be upgraded as a result of the proposed Kareeya-Innisfail replacement line? Why does the link between Kareeya and Innisfail need replacing first? Two submissions explicitly asked about the upgrade timetable for the Cairns-Innisfail transmission line^{81,45}.
- Within 5 years, the coastal transmission line between Innisfail and Cairns will need to be replaced with a new line of the same standard as the proposed Kareeya-Innisfail replacement line. The Kareeya-Innisfail line is in the worst condition, hence the urgency to have it replaced. Studies are well advanced into the replacement of the lines south of Tully.

Project Justification

- 2.3.5 More information on the size and capacity of the proposed transmission line is needed, particularly to assist in the justification of the proposed project^{45,100}. The 132 kV circuit of the proposed line will be able to supply approximately 200 MW of power and the 275 kV circuit, approximately 800 MW. This compares to a 2002 peak demand of 310 MW in FNQ{ XE "peak demand of XX MW in FNQ" }.
- 2.3.6 A few submissions suspected that part of the financial motive for preferring the coastal route was the potential for privatisation of Powerlink^{22,51}. It might not be possible to privatise the line if it runs over public land in the form of the Wet Tropics World Heritage Area. The current regulatory framework would not encourage the privatisation of Powerlink as it is considered to be a natural monopoly. Some private facilities such as Skyrail are operated within the Wet Tropics World Heritage Area, so location of a transmission line with the WTWHA would not be a key issue in the privatisation debate. There has been no serious debate regarding privatisation of the Queensland electricity industry. Any move to privatisation would be done in a strict regulatory framework.

2.4 NEW ALTERNATIVES

Topic Definition

- 2.4.1 Some submissions suggested that other alternatives existed, which were not investigated in either the Corridor Selection Report or the Draft Environmental Impact Assessment. These suggestions are presented under this heading.

Alternative Corridors

- 2.4.2 It was questioned if there were any alternatives other than the coastal and the inland routes that were presented in the Draft EIS that could be looked into. Routes to the west of the Great Dividing Range or alternative routes though the Wet Tropics World Heritage area could and should also be considered. In particular, to demonstrate that there are no 'prudent and feasible alternatives' to construction of a new line along the existing Kareeya-Innisfail alignment, it would be necessary to eliminate these potential options¹⁰⁰.
- There is an existing line between Townsville and Cairns that lies to the west of the Great Dividing Range. This part of the transmission line has already reached full development in some sections and there is no room within existing easements for additional transmission lines. Furthermore any new lines to the west of the Great Dividing Range or the Wet Tropics World Heritage Area would have to supply the coast via either the Chalumbin-Kareeya-Tully link or via the Turkinje-Cairns link. There are no other practical routes from west of the WTWHA to the coast where a new link could be established. As only two links between the coast and a line west of the WTWHA are available, a line along the coast would still be required to transmit power along the coast.
- The alternative of supplying Innisfail only from Cairns and Tully only from Ross and Kareeya is rejected. Not having a transmission line between Tully and Innisfail or Kareeya and Innisfail would leave Innisfail dependent on a single line from Cairns and vulnerable to extended power outages.
- 2.4.3 Could advancing the second 275 kV line into Cairns (via Chalumbin and Turkinje) change the requirements for a new line between Tully and Innisfail? Innisfail could then be supplied by an improved Cairns-Innisfail line⁸⁸.
- The Kareeya Innisfail line needs to be replaced now because of its deteriorated condition. Security of supply would suffer if Innisfail was only fed by one line from Cairns.

Alternative Technologies

2.4.4 Could a boxed concrete (above ground) transmission line be constructed adjacent to the railway?⁷⁴ A similar suggestion was to place an underground transmission line along the railway corridor^{19,61}. This option has some disadvantages. Whereas a conventional overhead transmission line will last for approximately 50 years without a great deal of maintenance, a boxed concrete line is likely to incur much higher maintenance requirements. In particular, the concrete boxes are frequently damaged by people and climatic conditions. An additional issues is the very limited space is available for such an option. It would pass very close to a number of residences. Above ground cables are extremely expensive (possibly more than a direct underground line) particularly when considering a 275kV line.

In most cases it would be safer and more cost effective to simply bury the conductors, in which case the transmission line would be an underground transmission line. A discussion of the relative cost and technical merit of an underground transmission line is included in Annexures 3 and 7 of the EIS.

2.4.5 Could demand side management practices change the growth projections for electricity demand to the point where alternative 'more sustainable' generation and transmission technologies could provide sufficient power for the region?⁷⁸

A new transmission line is required within five years at the latest as the reliability of the existing line will continue to deteriorate. The technology and regulatory framework that would enable demand side management to be an effective solution would not be able to provide sufficient power savings within this time period. Refer Section 2.1 above.

Modern sustainable power generation philosophies are based on the idea of exporting power that is surplus to ones own requirements for sale to other consumers. This avoids the need for sustainable power producers to maintain large and expensive battery banks. When power producers do not have sufficient power, they can buy power back off the grid. Transmission lines provide essential links between power rich and power poor areas and can facilitate the development of sustainable power systems.

Whilst the desirability of moving to increased local and sustainable power generation is recognised, this issue has little relevance to the proposed project. No matter what else, the existing line needs to be replaced on account of its age. Increasing the diameter of the conductors and the number of circuits from one to two will have very little effect on the level of environmental and social impacts associated with the new replacement line. Furthermore, increasing the capacity of the line does not reduce the potential for adoption of demand side management initiatives or local or sustainable power generation.

Alternative Construction Scenarios

- 2.4.6 Could the new line be built along the existing Kareeya-Innisfail alignment by removing the existing line in stages so that the new line can be constructed and then splicing the new line into the old line during the wet season to provide a second feed into Innisfail at the most vulnerable time of the year?⁸¹
- This is effectively what is proposed for the Inland Option. The existing line would be retained for the first year with the sections of new line constructed beside the existing line. In the next dry season the existing line would be dismantled and the remaining sections of the new line built along the alignment of the existing line. This would however result in an increased risk of possible outages in Innisfail over one to two dry seasons. Please refer to Annexure 3 for details.
- 2.4.7 Has replacement of the existing Kareeya-Innisfail line with a new line that uses standard towers been considered and where the current vegetation management practices would be continued?⁸¹
- Maintaining a cleared corridor through the WTWHA section of the inland option has been rejected as it would not satisfy the requirements of the Wet Tropics Management Plan. It would also result in much higher ongoing costs over the life of the transmission line due to ongoing requirements for tree regrowth control within the cleared easement.
- 2.4.8 It was also asked why the Kareeya-Innisfail line cannot be refurbished when the rest of the Townsville to Cairns line has been refurbished with new conductors, insulators and footings⁹¹.
- No conductors have been replaced. Insulators have been replaced approximately twice over the life of a line. Footings are replaced or repaired only as required. At the present rate of deterioration, rusting of the towers of the existing Kareeya-Innisfail line, it will reach a point within a few years where the towers will be unsafe to climb. Every part of the existing line is coming to the end of its reliable service life.

Other

- 2.4.9 The Terms of Reference required that all potential route options and technologies, including the do nothing option be investigated and reported, and it appears that this requirement has not been met. The Draft EIS investigated and reported all options that have been identified as potential contenders by the Corridor Selection Study, Powerlink, State Government regulators and by members of the public.

2.5 ROUTE SELECTION

This topic concerns the selection of an appropriate study corridor through the landscape. Another topic, 'precise placement' presents questions about the exact location of the alignment within specific properties. Wider Grid and 'new Alternatives are related topics.

General

- 2.5.1 The question was raised, "why is it assumed that the same routes would be used for different engineering options [for example underground/above ground]⁴⁵?" This is not the case. The costing for the underground coastal route was based on an alignment generally following a more direct route between Tully and Innisfail, whereas costing for the overhead options were based on an alignment similar to the preferred preliminary alignment presented in the Draft EIS.

2.5.2 Another submission¹⁰³ stated that "consolidated infrastructure corridors would increase efficiency and localise impacts, so variations on this theme should be explored further".

The chief issues with this philosophy are:

- The Bruce Highway and Railway are likely to be duplicated or realigned over time, particularly in hilly sections (Smiths Gap) and this creates difficulties in placing a transmission line near transport infrastructure.
- Many houses are located beside the highway and railway and numerous deviations around the houses would be required.
- The railway easement is narrow and tower foot prints would extend significantly onto adjoining private land.
- Placement of a transmission line adjacent to either the railway or highway would impose tremendous visual impacts on travellers, which has been raised as a significant concern of opponents of the coastal option
- This can only be achieved where "infrastructure corridors" are planned well in advance.

2.5.3 Others considered that powerline upgrades should be confined to existing or pre-existing easements⁷⁶. It is claimed that there is some measure of support for this concept in the Johnstone Shire's State of the Shire Report and other similar regional reports.

Certainly, easements should be created that can permanently accommodate transmission line infrastructure. Despite the above, if a new line was constructed along the inland route, it would be better if the new line could follow a new alignment as this would allow impacts on residents of the East Palmerston area to be reduced. As there are no legally registered easements in the National Park and State Forest areas of the existing Kareeya-Innisfail transmission line (they were not established when the line was constructed), this should be possible.

- 2.5.4 It was also asked if a coastal route has so many advantages, why then was not a transmission line constructed along the coast 50 years ago instead of constructing the existing Kareeya-Innisfail⁸¹ through the mountains.
- When the existing line was constructed, the electricity grid was much more limited than today. As the main power station was located at Kareeya and the main load centre was Innisfail, a transmission line linking them was constructed along the shortest route. Also, at that time it was assumed that continuing forestry activity in the Walter Hill Range would provide a road network that could be used to access the line at low cost to the transmission provider.

Coastal Option

- 2.5.5 A number of submissions wanted more information on why the preferred preliminary alignment had been located where it had. One submission requested an explanation of the marked deviation around Mena Creek?¹¹ Also in this general area, it was commented that the study corridor appears to be 1-2 km wide and this affords considerable flexibility in the placement of the alignment. The question was raised, when will or when did the further investigations into the optimal placement of the alignment within the corridor occur and will further consultation with landholders within the corridor occur?⁷⁴ It was further suggested that even if there is a preferred final alignment, that the various alternative scenarios within the study corridor still be reported and explained^{77,86}.
- The marked deviation around Mena Creek is really a deviation around the most difficult areas of terrain in the Basilisk Range. Previously it was intended to place the line in a fairly central position running over Mt Warrubullen and along the western flank of the range, however closer investigation revealed very difficult and environmentally sensitive terrain in this location. Deviations around Mt Warrubullen and near the northern end of the Basilisk Range are to avoid such areas.
- Powerlink have not committed to the preliminary preferred alignment of the coastal option or the preliminary revised alignment in the Palmerston area of the inland option. These are just starting points for further investigations. Tower and line positions can be adjusted between tens or even hundreds of metres if there are strong reasons for doing so.

No comments specific to the inland option were received.

2.6 PRECISE POSITION

- 2.6.1 Approximately 9 landowners along the preliminary coastal corridor have requested that Powerlink identify the precise position of the proposed line and towers on their land. All landholders have been informed, mainly at the drop-in information sessions, that it is not possible at this time to indicate the position of these structures. This can only be provided at the detailed design phase after a decision has been made on the corridor. During the detailed design phase, further landholder consultation and surveys of vegetation height, terrain profiles, listed vegetation species etc must be undertaken to facilitate detailed placement of towers.
- 2.6.2 Main Roads expressed an interest in the position of the towers and the line relative to state controlled roads, to ensure that adequate buffer distances exist between roads and towers to provide for potential future road upgrades. They are also interested in ensuring adequate line clearance over roads⁴⁸. These measures are standard practice, however discussions with Main Roads will continue with regard to these aspects.

2.7 ENGINEERING/COSTING

- 2.7.1 The difference in the costs of the coastal and inland options is relatively great and the source and relevance of this difference was questioned. Attention was drawn to comparison table for the inland and coastal options, which does not appear to include the higher compensation costs that would be incurred for the coastal option²⁵. Environmental and social costs as well as economic costs should be recognised in studies of options⁷⁸. Conversely, it was argued that given the overriding importance of cost in the regulatory framework that governs Powerlink, why isn't this point emphasised as a justification for the coastal option.
- Powerlink's cost estimates for both the inland and coastal options were independently checked by qualified engineers (Sinclair Knight Merz), with the outcome showing a high level of correlation. Allowances for landholder compensation was included in these assessments.
- Landholder compensation costs for the inland option would be less than the coastal option, however this was significantly outweighed by the much higher construction and maintenance costs for the inland option.
- 2.7.2 Some submissions requested more detailed costings be supplied for both major route options so that they could verify the total costs for themselves^{22,30}. The projected maintenance costs of each option was also requested²². A different submission²⁵ suggested that the capital cost of the inland option had been "heavily loaded with the costs associated with maintenance", although they did not further elaborate. Similarly it is suggested that the construction difficulty of the inland option has been overplayed, implying that both the construction and maintenance costs estimated for the inland option may prove unreasonably high.
- Maintenance costs for the existing inland route are approximately 4 times as much as the costs for similar lines in less difficult environments. The exact figures are not available due to commercial confidentiality.
- Powerlink has had recent experience constructing a transmission line through the Wet Tropic World Heritage Area (Woree line in 1995{ XE "Woree line in 1995" }) and has the benefit of this experience when it comes to costing the inland option.

- 2.7.3 A few submissions consider that installation of a new transmission line along the Kareeya-Innisfail alignment should have become easier with the superior construction methods that are available today⁸¹. It also seems difficult to believe that the inland option is going to cost twenty million dollars more when a route has already been cleared and the existing line has to be removed anyway.
- Modern equipment certainly has reduced the effort required to construct transmission lines. However for the inland option and environmentally sensitive parts of the coastal option, there are a number of factors which increase construction difficulty or decrease the ability to use heavy machinery including:
- more stringent requirements for quarantine and environmental performance;
 - restricted ability to use conventional large machinery in areas with rugged remote terrain (need 4WD trucks, trucks carry reduced loads etc.);
 - higher quality specifications for modern foundations;
 - greatly increased size of tall towers used to span over forested areas;
 - much larger length of line in forested areas;
 - long sections of single lane access track, which greatly reduces traffic flow, H-road for example; and
 - sites that lack road access such as 4 tower sites on the northern side of Tully Gorge.

2.7.4 One way in which the cost may have been skewed is if costs are transferred to landholders, for example the potential extra liability costs, costs associated with quarantine measures and ensuring proper attention to workplace health and safety measures over numerous properties and opportunity costs. Have or have not these costs been considered in the calculations for the cost of each option.

The potential for the transmission of the costs listed opposite is quite low for the following reasons:

Powerlink has made a commitment to defend landholders who are requested to pay an increased premium on account of liability associated with transmission lines. At the time of writing, there were no known insurance products which incurred an extra charge for public liability associated with transmission lines.

Powerlink assumes responsibility for environmental and safety matters within the easement that are directly related to the construction and operation of transmission lines. This includes removing weeds that appear to have been introduced by during construction or maintenance. It is likely that costs associated with quarantine during the construction phase would be higher for the coastal option than the inland option however the differential would not be significant.

Following construction, quarantine issues should be minimal as most line inspections will be undertaken by helicopter. Vehicle access to towers would only be required infrequently.

2.7.5 The stability of the transmission line in severe cyclonic conditions was questioned^{7,30}, particularly in valley areas where winds can be concentrated. Another specific area of concern is the Liverpool Creek floodplain⁷⁴. Liverpool creek is really a small river and it floods severely where the waters are constricted near the Basilisk Range. One submission²¹ included a photo of a brick council toilet block that had dropped into a great hole in the ground, when flood waters scoured away the ground from around and underneath it.

Powerlink engineers have been made aware of these matters. They accepted that these were valid points and stated that they will ensure that the proposed line will have sufficiently strong towers and foundations for the line to be stable under these conditions as is standard procedure for all lines, particularly in cyclone prone areas. Consideration will be given to the placement of towers on the Liverpool Creek flood plain to ensure the potential for scouring around the towers is minimised.

2.7.6 A number of submissions feel that not all items were properly considered in the costings{ XE "not all items where properly considered in the costings" } of each option. Items that were questioned include:

- Where are the costings for situations on the coastal route where helicopter construction and maintenance would take place?⁷ A detailed breakdown of costs could not be provided for commercial confidentiality reasons, however this was factored into coastal option costings.
- If a section of underground cable is required near Silkwood (and elsewhere), what extra cost would this be at?²² It is not proposed to underground any part of the line for either option.
- Has the cost of any underground section on the future 275kV circuit been included?²² No.
- Have the special measures (tall towers) needed to reduce environmental damage in the Basilisk and Walter Hill Ranges been costed in?²⁵ Yes this has been included in the costings.

- Has the aggregate loss of property value to all of the properties crossed by or close to the line been considered in weighting the options?²⁵ This has been considered within estimates for landholder compensation included in costs for each option
- Has the greater cost of weed control along the coastal option been considered?²⁵ Cost of weed control is likely to be similar for both options. WTMA is likely to impose strict controls on weeds for an inland for both the construction and operation/maintenance phases because of high ecological sensitivity in the World Heritage Area, whereas weed control will be important on a coastal option because of a combination of agricultural impacts and ecological sensitivity in the Basilisk/Walter Hill Range areas.
- Loss of productive land has to be greater than the figures estimated for the coastal option (1.5 to 4 ha), have tractor turning areas been included in addition to tower footprints?^{30,97} The figures were checked a number of times, including responses to such requests at the public drop in days.
- Was the full cost of compensation taken into account including access track maintenance and pest and weed control on farms⁴⁴. Estimates of such factors have been included in the costings.
- Have costs associated with wear and tear on local roads due to construction related traffic been properly considered⁹¹. Estimates of such factors have been included in the costings. Road and track construction and maintenance costs are a significant contributor to inland option costs. Costs for these items are factored into estimates for compensation for both options.

2.7.7 Tower height has been raised as a potential influence on the cost of both options⁶³. For the inland option, there is a perception that large sections of the existing line are above the canopy, even though short towers have been used⁸¹. The implication is that if this is the case, costs could be reduced as short towers could be used by the new transmission line in these locations³⁰. On the coastal option, it is suggested that the number of tall towers is likely to be greater than that originally anticipated and this would lower the cost difference between the coastal and inland options. One submission questions the need to use over-the-canopy towers on the inland option and suggests that an option using conventional towers along the inland route be investigated⁸¹.

The extent of cleared corridor is easily measured from aerial or satellite imagery. Based on highly accurate measurements from an ortho-photographic map only 3 km of the 37 km of easement within the Wet Tropics World Heritage Area was considered to have an intact canopy under the transmission line. The perception from some members of the public that much more of the transmission line is above the canopy probably arises as:

- the cleared easement is concealed in Tully Gorge and some other places; and
- the most visible part of the alignment, where the line climbs from the Cochable Plateau to the top of the Walter Hill Range is where nearly all of the 3 km of over the canopy line is located.

On the coastal route, it was questioned if the use of tall towers has increased since the costings were prepared. The number of tall towers could possibly increase by a few towers (will be recalculated when the final alignment is surveyed). However, the use of tall towers in the Walter Hill and Basilisk Ranges was part of the original costings so the majority of tall towers would have been included in the costings.

Reducing ongoing maintenance cost is one of the main advantages for using tall towers to span over vegetation. Conservation issues aside, using conventional towers in a cleared rainforest corridor may not result in a cost saving over the life of the project and creates ongoing demands on

management.

- 2.7.8 An alternative view of the cost difference between the coastal and inland options is that although the difference between the coastal and inland option stands at approximately twenty million dollars, taken over the 50 year lifespan of the new transmission line, this would amount to an annual cost of approximately \$400 000. This, it is stated, would be money well spent if it avoids causing disruption and stress to people along the proposed coastal route⁸¹.
- 2.7.9 As several factors did not appear to be included in the economic assessments, it was stated that the Draft EIS lacked a comprehensive cost benefit analysis between the two options³⁹.
- Powerlink is required to choose the lowest cost option by the Australian Competition and Consumer Commission and cannot voluntarily choose the inland option.
- There is no accepted methodology for putting a dollar value on many of the social and environmental issues related to the proposed project. Any economic cost benefit analysis performed solely on issues that can be expressed in dollar terms would be incomplete, as it would not be able to provide an overall assessment of all issues. This limitation of cost benefit analysis is significant for this transmission line project as the non-quantifiable issues happen to be the core issues and are quite different for each option, yet they cannot be properly analysed using this methodology.

- 2.7.10 To solve the security of supply issue, it was suggested in one submission that hybrid of the existing Kareeya-Innisfail transmission line and a new line could be created over the wet season in the middle of the construction period when construction works would not be undertaken⁸¹. If the inland route was selected, the existing line would be left intact but de-energised to allow construction work to proceed on adjacent sections of the new line. The existing line would be re-energised during the wet season and then finally de-energised and replaced in the following dry season, assuming average dry seasons conditions prevailed. This schedule of works largely solves the inland option security issue by a method that is effectively the same as the one suggested opposite.

2.8 CLIMATE CHANGE

- 2.8.1 Several submissions^{9,98} made strong statements about the transmission line providing a means to increase energy consumption and thus exacerbate greenhouse impacts. It was pointed out that this issue has not been investigated in the Draft EIS⁷⁸. One submission¹⁰¹ pointed out that the inland option may result in increased transmission losses. Powerlink reacts to increases in demand and does not undertake activities which lead to increased demand. Powerlink does not market energy consuming appliances or sell electricity. The coastal option which runs directly from Tully to Innisfail is much shorter than the existing Tully-Kareeya-Innisfail route and would result in slightly lower transmission losses. Larger conductors and the transmission of electricity at 275 kV would also reduce transmission losses.
- 2.8.2 One submission supported the use of above ground transmission lines as lower transmission losses will mean reduced energy related CO₂ emissions. Noted

3.0 SOCIAL AND ECONOMIC ISSUES

3.1 HEALTH RISKS AND SAFETY

3.1.1 EMF was the most common and controversial issue raised within comments on the Draft EIS.

3.1.2 Those who consider EMF is a definite health hazard refer to various scientific or media view points that support this finding⁹. The long delay in establishing a link between tobacco, Thalidomide and other substances with severe health impacts suggests that scientific inability to establish a clear link between health problems and EMF has to be interpreted cautiously⁸⁸. There is also often a suspicion that the truth about the health implications of EMF is being suppressed or covered up by the electricity industry to avoid the tremendous losses that would be incurred if a firm link was established. The very existence of the concept of Prudent Avoidance, suggests to some that EMF hazard is real²⁴.

It is recognised that a link between EMF and health issues could be found in the future, albeit with a low probability, based on current knowledge, and this is the reason why the Prudent Avoidance policy is implemented on Australian transmission lines.

Care also has to be taken when comparing UK experience with Australian experience as there may be differences between potential EMF project risks.

3.1.3 Some people cannot agree with findings that suggest there is no positive proof of health effects¹. Numerous examples² of cancer clusters and leukaemia that were potentially to be related to EMF were mentioned. References to ongoing court cases involving this issue and to scientific research into health impacts were also made. One submission⁹ (8/8/2002) provides most of the relevant references. It was suggested that existing exposure limits were too high and were out of date.

Powerlink - Awaiting specialist report

3.1.4 Various respondents have recommended that as cancer and leukaemia are the health problems most often associated with EMF, the precautionary principle be applied and the transmission lines located in a manner that resolves this issue. Even a single case of leukaemia is too much⁷. That the UK Government appears to have countenanced this position adds strength to convictions. To quote one submission⁶³, "it should not be with the community to prove the health effects, but rather Powerlink to prove these fields are safe".

Powerlink Best available analysis of various research undertaken on this issue has been reviewed and the position of the power industry remains unchanged, that is it will maintain a policy of prudent avoidance. This means that detailed planning will place the line where exposure to EMF is minimised. With respect to risk the draft EIS noted that the preliminary route for the inland option would result in 6 more houses within 125m and 4 less within 125-250m than the coastal route.

3.1.5 Whilst it is recognised that household appliances also generate EMF, this is said to differ from the transmission line EMF in that people exposed to transmission line EMF could not easily limit their exposure. It is possible to stand away from an operating appliance⁹.

Transmission line EMF will be managed through prudent avoidance, which will maximise distances to residences and other sensitive locations such that residents and farm workers exposure would be well below safe international standards. This rationale was used to develop the preliminary alignments and will be fine tuned at the detailed design phase.

EMF risk in the home is often unknown by the residents and is not confined to appliances. There are other fixed sources such as powerboards and switches and fans which may not be easily avoided and can produce levels at or higher than that experienced at the edges of transmission line easements.

3.1.6 Specific fears were children in the school bus^{2,76} and people in other vehicles that pass under the line³⁹. The section of line that is relatively close to Tully State High School was mentioned as a potential source of radiation^{42,97}. The potential for children to be attracted to and to climb and fall from towers was also raised^{44,53}.

These exposure scenarios are common in industrialised societies for which associated risks have not been scientifically proven as discussed in the Draft EIS. **Additional recent summary** The towers are very hard to climb due to lack of handholds on the lower part of the tower. Barbed wire barriers are also fitted to each tower leg to prevent unauthorised climbing.

- 3.1.7 Farmers are concerned about EMF due to the length of time they will be exposed. Banana farmers and organic farmers⁶³ are in the field nearly every day, as these crops are very labour intensive. Sugarcane farmers^{16,80,91} may make approximately 1000 passes under the line during planting and many passes more during the growing season depending on the length of line over the farm. The harvesting crews can also pass under the line approximately 1000 times during the harvesting of a single farm.
- It is likely that some of these people would be shielded from electric fields as they are inside cabs or roll cages etc. As identified in the Draft EIS, worker exposure under the transmission line will be well under the International intermittent exposure limits.
- 3.1.8 Collisions between farming equipment and towers is also of concern. Factors which increase the possibility of collision are darkness, having to manoeuvre in very tight spaces between towers and drains/creeks/steep banks. Cane harvesting often commences pre-dawn and often finishes after dark. Limited visibility may also occur in thick fogs⁹¹. Where aerial spraying is used near the line, the collision risk would be increased⁴¹. In areas where taller towers are used, they may represent a greater risk than conventional height towers. This situation may occur in foothills where banana farms may be near tall towers that cross over nearby vegetation remnants.
- Towers will be sited in consultation with farmers. This should solve many of the potential problems. Aerial operators have indicated that the transmission lines will represent a much smaller risk than the local low voltage local lines because of their higher visibility. It was recognized however that a combination of topographical features and a transmission line may exacerbate risk and further consultation with operators should occur during the detailed design phase.

- 3.1.9 Electrocutation by direct or indirect contact was also raised as a safety risk as was an increase in lightning strikes^{24,44,53}. Direct contact with conductors can also occur as a result of farming activity. A specifically identified potential risk was the use of bagging machines, which operate at heights above the top of banana trees. Planting of taller banana varieties [not specified] may also increase the risk of electrocution⁵³.
- The new line will have overhead earthwires for intercepting lightning strikes. Towers are earthed ensure that any lightning strikes are conducted safely to ground.
- The transmission line will have a minimum clearance of 11m above ground in cane and banana growing areas. With a 4m minimum separation from any object to the line this allows plant or machinery to 7m which should be more that adequate for tall banana varieties.
- 3.1.10 In the event of contact with a conductor or a conductor being downed, some fear that the safety systems make not function in a way that renders the line safe⁷⁵. It was even stated that the when the current is switched off and on by safety systems, this can induce large surges in telephone lines that run parallel to the transmission line which could injury communications workers (refer sub. 98 for full details)
- Information regarding predicted line faults levels is sent to Telstra once the alignment is finalised. Any predicted problem areas are then dealt with to ensure any induction is kept to acceptable levels.

3.1.11 As a result of the risk of collisions, electrocution and other accidents or health disorders, a number of farmers expressed concern that they could not meet their obligations under the Workplace Health and Safety Act^{53,63}. Queensland Fruit and Vegetable Growers suggested that Powerlink could raise the awareness of safety issues amongst landholders near transmission lines⁶⁷.

Very few cases of tower damage have been recorded. Work Place Health and Safety with respect to property owners and workers has never been a problem with existing lines.

3.1.12 Stress related illness was also reported by a number of submissions^{34,91,92}. Some stating that the uncertainty and helplessness created by the proposed transmission line has affected them and their family members directly.

Stress has been experienced by members of the community on previous transmission line projects. Accordingly, the consultation process for this proposed line was designed to avoid the creation of unnecessary stress in the community. Measures such as a 1800 number were available so that people had access to the EIS team and could directly voice their concerns or as questions. A large amount of effort was put into making information accessible to the public and providing a channel for community concerns to be taken into account.

3.2 SOCIAL

- 3.2.1 Some landholders are planning to construct houses on their farms typically on unused and elevated land at the margins of the farm. These positions are also generally preferred for transmission line tower positions or easements. This has led to a number of situations where the proposed transmission line may result in preferred house sites being lost to landholders⁷. Sometimes the need for a new house occurs as a result of the younger generation taking over the running of a farm when the older generation chooses to retire on the farm. Building on another site on the farm which is away from the proposed transmission line may result in higher costs to the landholder due to a less suitable site having to be selected⁵³.
- These situations will be addressed as far as possible in the detailed design phase, which will lead to the establishment of a final alignment. Powerlink will meet any additional costs incurred by landholders via compensation agreements. The final alignment will be positioned to take into account such issues.

3.3 TRADITIONAL OWNERS/CULTURAL HERITAGE

- 3.3.1 A number of submissions^{45,76} reiterated that a full cultural heritage assessment has not yet been performed and that cultural heritage studies would have to be carried out for either option before the line can be constructed.
- This is correct. To undertake a cultural heritage assessment, a 'centreline' is required along which surveys can be conducted. Should a significant find be made, in most cases the line can then be adjusted to avoid the find if necessary. If the find cannot be avoided, modification to the design can, in most cases, avoid damage to the find. In extreme cases artefacts can be relocated. All native title claims will be identified at the time of easement acquisition and will be dealt with under the Native Title Act.

3.3.2 The Draft EIS does not seem to have identified native title claims or potential claims along the two route options⁴⁵.

3.3.3 Some background information on indigenous cultural history was provided in a number of submissions by non-indigenous landholders along the coastal route^{76,98}. The issues presented include the presence of a bora ground in the Mt Mackay area and the significance of rocky outcrops and particular landforms to aboriginal cosmology and the history of interaction between white settlers and the aboriginal people.

This information will be passed on to the cultural heritage consultants. Because of confidentiality reasons many cultural sites can not be directly referred to in such public reports, however they are identified in the reports which are forwarded to the EPA.

A Cultural Heritage Report was produced in conjunction with the relevant Traditional Owner groups.

- 3.3.4 Four submissions were received from people in relation to cultural heritage issues. These submissions were unanimous in the view that the new transmissions should be constructed along the coastal route. The reasons provided are: Noted
- Inland route would traverse the World Heritage Area that has been recognised for its outstanding values to the world;
 - Traditional owners are trying to get the WHA re-listed for its cultural values;
 - Wet Tropics is recognised by traditional owners as a cultural landscape; and
 - Wet Tropics WHA is the last area where traditional cultural and natural resources are still intact.
- 3.3.5 One of the submissions mentioned that the traditional owners felt pressured to respond to the transmission line proposal in an unreasonably short time frame⁶⁵. There will be additional opportunities for traditional owner input. The date for response to the draft EIS was extended from the typical 4 weeks to 12 weeks to ensure adequate time was available.

3.4 ENVIRONMENTAL

- 3.4.1 A theme, sometimes explicitly stated and other times implicit, is that many people who grew up on both the inland and coastal options remember these areas before they were developed for agriculture. At that time rainforest fauna was common and readily observed and many enjoyed the presence of the wildlife. Development of the area has seen many places that were valued for their environmental attributes converted to other landuses. There is therefore a very strong desire not to concede any more natural areas to development.
- 3.4.2 Some submissions suggest that unequal treatment was given to the assessment of fauna and flora issues of the coastal and inland options and that as a result, a significant bias exists^{42,96}. The source of some of this apparent bias can be traced back to the Terms of Reference in which the environmental considerations for the inland option were far more extensive and specific than for the coastal route⁷⁶.
- Powerlink has a good record on being environmentally sensitive. On other projects that the authors have been involved in, Powerlink have taken extensive measures to reduce impacts on both common plants and animals and for rare and threatened species. These measures are written into environmental work plans that guide maintenance workers to ensure that the measures are not accidentally lost.
- The amount of field work invested in both options was quite similar. Differences in the apparent level of investigation of the two options may be a reflection of other factors. One factor was that the inland options study corridor is highly defined, whereas the coastal study corridor has remained fairly broad and there have been significant recent changes to the preferred preliminary alignment. This difference has lead to the coastal fauna and flora assessments being more generic due to uncertainty over the alignment, particularly in the Basilisk Range. In addition the EA Guidelines specifically requested an assessment of the potential impact on World Heritage values, which only directly occur on the inland option.

3.4.3 The presentation of environmental information within the Draft EIS also drew some criticism⁴⁵ for a number of reasons. The main points raised were:

- valuable information presented in the technical annexures was not carried forward into the main text;
- combined species lists were compiled over large areas, rather than having separate lists for each site surveyed (in effect reducing the resolution of the data);

The Draft EIS was intended to be readable by members of the community who had never previously read an EIS. To facilitate this, the information in the technical annexures was simplified for presentation in the main text, as is usual for such reports. The report had to address a complex range of issues for not one but two potential alignments in adequate detail. It was therefore important to be concise in order to improve readability and comprehension. In most cases it was also indicated that should the readers require more information, that they should refer to the technical annexures which were included in every copy of the EIS.

There is a large time overhead in recording a separate species list for each site as site details and previously seen common species would have to be recorded. This would mean that less time was available for searching for rare species and species that are considered to be of World Heritage value. For this reason it was decided to compile a single species list for each major area and land type.

When the final alignment is being determined, it will be possible to prepare separate species lists for each site of potential impact.

- locations for environmental features discussed in the report were not always specified, which means that a reviewer cannot verify if all areas have been adequately covered;
- potential for impacts on rare and threatened species had not been raised to the level of importance that is required¹⁰⁴; and

As there was and continues to be flexibility in the placement of the final alignment, the environmental information presented in the Draft EIS provides examples of the environmental features that are likely to be encountered by the proposed line and not necessarily the descriptions of the actual features that would be affected. For this reason the presentation of the information has been slightly generalised in some instances.

Some of the rare species we encountered in the field studies appeared to be locally common at most of the sites investigated, for example, the vine *Carronia pedicellata*. This vine could have been incorrectly classified as endangered or the vine benefits from the edge effects and has increased abundance. We reserve the right present opinions based on our first hand experience of these species

Any large structure in a biodiverse environment which contains a relatively large number of rare species will encounter some of these rare species and in all likelihood, it may not be possible to avoid them all. In cases where the rare species are locally common or widely dispersed at low densities, the loss of a few individuals is not likely to be significant. Plants that are concentrated in specialised habitats are the primary conservation concern, for example orchids that live in swamps, and great efforts will be made to avoid damage to these populations. Where other more widespread rare plants exist, efforts will also be made to avoid or preserve them, however a

- the importance of environmental features was not rated on local, regional and national scales.

higher level of risk may be acceptable in these circumstances.

This framework for discussing environmental values is commonly used in EIS reports. It can however be extremely difficult to use in practice. Some reasons for this difficulty are:

- to be able to rate the importance of a feature at local, regional and national scales, one has to know a great deal of information about that sort of feature at local, regional and national scales. This level of information is often not available.
- context is often important, for example an area of vegetation may be suitable cassowary habitat, however if it is isolated and cassowaries cannot reach it, then it may not be cassowary habitat (and therefore not important).
- There is no universal definition of importance. For example some botanists regard populations at the edge of a species geographic range as important and some do not.
- The scale is not necessarily hierarchal. Things can be nationally important but not locally important and vice versa. This makes it hard to evaluate the meaning of the scale. For example migratory birds are nationally important, but probably not locally important.

In short, we have had so much difficulty in trying to put some rigour into this framework that we prefer not to use it.

- 3.4.4 The Wet Tropics Management Authority stated in their response to the Draft EIS, that the identification of likely environmental impacts on World Heritage Values is generally satisfactory. More detailed site specific information will be required once details of the preferred route are identified. This was always the intended result of the EIS process.
- 3.4.5 There is a concern⁷⁶ that the draft ToR requires that any transmission line that enters the World Heritage Area is to result in outcomes that provide a net benefit to the environment, not just no net loss. Is this goal realistic? If such a statement is to be made, it should apply not just to the WHA, but also to the wider environment, recognising that the wider environment includes not only natural values but also man-made values. This standard has been applied to other transmission line projects that have been undertaken with the Wet Tropics World Heritage Area in the past. On previous projects it has been possible to meet this standard. (Upgrade of Chalumbin Substation and new Chalumbin-Springmount line for example)
- Powerlink adopts very high environmental standards along all parts of its transmission line network. On previous transmission line projects in which the C&B Group have been involved, Powerlink has substantially followed all of the recommendations that were made.
- Man-made values such as the scenic integrity of rural landscape and cultural heritage features such as war time training areas, old mines and aboriginal sites are also accorded a high degree of protection.

3.4.6 Some of the supporters⁷⁴ of the inland option claimed that disinformation has been presented on the existing situation along the existing Kareeya-Innisfail line, in particular:

- Perceptions that the 'reconstruction of the present line' would create a clear swathe through the pristine WHA have been allowed to persist; and
- Almost half of the WHA section of the existing line is presently constructed from ridge top to ridge top and is above the canopy.

The EIS clearly states that the existing cleared corridor through the WTWHA would have to be rehabilitated regardless of the option that is selected.

According to the vegetation mapping that was commissioned for the assessment of the inland option, for the existing line only 3 km out of 37 km of the WTWHA section is presently above the canopy.

3.4.7 Another submission⁷⁷ from the same source states that the draft EIS does not address the impacts from 13-20 km of 60 m wide clearings along the coastal option.

Section 13 of the draft EIS clearly indicates Powerlink's intention to use an over the canopy line in all rainforest areas. This will greatly reduce the need for clearing within the easement. It is anticipated (subject to limitations of final design) that clearing will be largely confined to tower sites only, apart from minor access track clearing, where existing tracks do not exist.

3.4.8 It was pointed⁹⁷ out that the potential environmental impacts of stringing a second line in the future had not been discussed in the Draft EIS.

Consideration was being given to stringing both circuits during the initial construction phase when the Draft EIS was released. If the second circuit was strung later, it would be by helicopter stringing. The impacts related to this activity are helicopter noise and some disturbance of access tracks and some areas within the easement where wire spooling equipment would be located.

3.5 ISSUES RELATING TO BOTH OPTIONS

Impact on Conservation Initiatives

- 3.5.1 Johnstone Shire has a special zoning for land, where private owners are encouraged to conserve natural forest. In the Draft EIS, the impact of the proposed transmission line on the viability of this special zoning had not been considered^{45,51}. Reference to the zoning map in the draft EIS reveals that this issue applies to both line options, although the coastal options would be likely to have a greater impact on this zone. A potential mechanism for this impact is, if people who have protected forest areas move away due to the construction of the transmission line. The formerly protected forest area could then be heavily logged/cleared by subsequent landholders¹³.
- 3.5.2 The issue of compensatory habitat was also raised⁵⁰: "if Powerlink routes the transmission line along the coast, they will save tens of millions of dollar - some of these savings should be directed toward funding strategic improvements to the connectivity of lowland rainforest fragments".
- The proposed transmission line will be designed and placed in a manner that interference with wildlife corridors or important areas of habitat is minimised. The intent of the rural conservation zone will be respected.
- The existing inland option will be revegetated or allowed to revegetate and this is a major environmental benefit. If the proposed coastal/inland transmission line significantly weakens any of the main habitat connections on the coastal plain, then there is potential for looking into compensatory habitat or strengthening of alternative corridors. This has been done previously, however it is has to be sufficiently justified and agreement of landholders has to be obtained.

- 3.5.3 Use of the tallest towers was recommended⁵⁰ to reduce impacts on riparian vegetation at creek and river crossings. So was minimisation of the number of towers and access tracks within forest fragments. This was to protect the small areas of remaining lowland rainforest, which are of the 'highest ecological significance'. Fragmentation and isolation of the fragments is seen as a major ecological problem, particularly for its effect on cassowaries.
- Any area that has ecological integrity will be properly assessed and impact mitigation measures taken where there is scope to do so. Considerable effort will be made avoid fragmenting forest areas.

Road Crossings

- 3.5.4 Main Roads⁴⁸ requested that within state-controlled road reserves, where possible significant stands of vegetation be avoided and clearing of native vegetation is kept to a minimum. Where clearing is required, it is recommended that timber is:
- Where the proposed coastal line crosses state-controlled roads, most of the land is already cleared and this situation may not arise. However, if it does arise, Main Roads requests will be complied with.
- mulched and evenly distributed in the cleared area; and/or
 - left evenly distributed for fauna habitat.

Sedimentation Impacts

3.5.5 Both supporters^{22,26} of the coastal and inland options claimed that their non-preferred option would result in increased sediment loads being washed down rivers where it would result on impacts on the Great Barrier Reef. Increased sediment load are of most concern in un-impacted systems. These are systems with fully forested catchments, which have an in-stream fauna and flora assemblage that is not tolerant to increased sediment levels.

Rehabilitation of WTWHA Section

3.5.6 If the inland option was selected, use of over the canopy construction would allow the existing corridor to be rehabilitated so regardless of which option is selected, the existing corridor through the WTWHA will be rehabilitated. This is correct

3.5.7 The importance of active rehabilitation of the existing corridor has been stressed in a few submissions⁵⁰. Weed control, direct planting and direct seeding have all been recommended. Another submission⁴⁵ questions whether the forest would be able to regenerate naturally along the cleared corridor within the WTWHA, given the impact of past logging within the area.

This issue is likely to be a matter of debate. Revegetation is a potential source of impacts in the Wet Tropics World Heritage Area, for example it could facilitate the introduction of nursery weeds, exotic ants, fungal pathogens and native species new to the area. It could also lead to genetic mixing between populations of trees or to large numbers of trees descended from a single parent tree being planted with the result that the strip around the rehabilitated area is swamped with the genes from one tree. The cleared corridor is generally 50 m wide and is surrounded by vibrant healthy rainforest. Normally the forest does not have a problem closing gaps of this size.

The other argument is that the regrowth in the cleared corridor is likely to be dominated by a few species of pioneers (comparable to the forest type that direct seeding creates), rather than the more diverse result that is achieved by direct planting. It could also be argued that planting would reduce the window of opportunity for lantana or giant bramble to dominate the abandoned cleared corridor. Probably, the final rehabilitation solution will be a range of measures. Direct revegetation plantings may be used to break very long sections of corridor into smaller sections to reduce fire risk in the early years.

3.6 COASTAL OPTION

3.6.1 A number of submissions^{2,7} stated that the preliminary preferred coastal route passes through areas of considerable importance to fauna and flora and that these areas have comparable values to the Wet Tropics World Heritage Area. The presence of these values was not fully assessed by the Draft EIS to the point where the position of the preferred preliminary alignment could be assessed or justified on environmental aspects and it is feared that there is no substantial commitment to the detailed further studies that would be required to supply this information⁵⁹. A need for further surveys for rare plants in the Walter Hill and Basilisk Ranges and for mahogany gliders near Mt Mackay and on wildlife in riparian corridors that pass through otherwise cleared country was specifically stated in various submissions. A case was made that these surveys should have been conducted prior to the release of the Draft EIS so that decision makers would have this information available when the selection of the final option was made.

The high value of the rainforests along the coastal option was recognised in the Draft EIS. The goal of the draft EIS was to flag the existence of environmental values that may occur along the final alignment, and this has been done. All areas where rare flora and fauna were known or suspected to occur were flagged and a generalised description of the sensitive flora and fauna provided. For example, some areas were flagged as being strongholds for rare ferns or frogs and the potential for impacts on those life forms was discussed. In most cases, a generalised description of sensitive floras and fauna is all that is needed for comparison of options. To facilitate impact management at a later stage, more specific information will be required and this information will have to be provided by highly targeted searches for significant species once a final alignment has been selected. Adjustments to the proposed line can then be made to reduce impacts on these species.

This process has been successfully used in the past. Just prior to the construction of the new Chalumbin-Springmount transmission line, specific searches were conducted for colonies of northern koalas and magnificent broodfrogs. In this case no individuals of animals were found and construction proceeded without modification. In another case, an old feeding scar from a fluffy glider was found and the line was modified to provide connectivity between the outlier of forest where the scar was found and the main block of forest habitat.

- 3.6.2 Comments related to vegetation on the coastal corridor included that the vegetation remnants on the coastal alignment would be more prone to impacts as a transmission line would have a much greater relative impact on the small remnants along the coast, than the vast tract of forest encountered along the inland option⁷⁶. One review⁴⁵ commented that the Draft EIS did not identify the pandanus and melaleuca communities that exist along the preferred preliminary coastal alignment and was therefore inaccurate in its statement that native vegetation along the preliminary alignment was mixed eucalypt/rainforest communities.
- Remnants are rarely pristine fragments of larger forest, normally, they are semi-degraded patches of forest composed of a reduced diversity of relatively common species. Some apparent remnants are also mature regrowth from clearing that occurred around the turn of the previous century. In general, avoiding impacts on larger areas of forest probably does more for conservation than reducing impacts on fragments that are in semi-degraded condition. This argument would favour selection of the coastal option.
- Powerlink's intention is to avoid causing serious impacts to forest fragments wherever possible. The preferred preliminary alignment has been routed to avoid small valuable remnants as much as possible.
- The location and significance of the pandanus/melaleuca swamp will be thoroughly investigated if it is on the final alignment and the line would be designed accordingly to minimise or eliminate any potential impacts.
- 3.6.3 The importance of the cassowary corridors on the coastal option, Mt. Myrtle part of the Walter Hill Range and between the Basilisk Range and the greater Walter Hill Range that lies to the west, have been highlighted by proposals for National Park acquisition and NHT buyback proposals⁷⁶.
- The importance of these corridors is noted and connectivity along these corridors will not be reduced by the proposed project as the lines will be over the canopy in these sections.

Wildlife Impacts

3.6.4 A few submissions^{10,21} asked about the potential impacts on birds, especially Torres Strait pigeons and other fruit eating pigeons and flying foxes⁶³. No particular reason for concern was detailed, however it is assumed that the risk of fatal collisions with the conductors is the mechanism of impact. A similar issue applies with echo-locating bats⁴⁵, which may have trouble detecting small diameter components (< 12 mm across). It is also suggested by a few submissions^{7,45,51} that more work needs to be done on potential impacts on the 3 cassowary corridors that cross the coastal plain and any large riparian strips that may be used by cassowaries. The potential impact of construction of the line during cassowary breeding season was also raised⁵³ as was the potential impact on the breeding of other native rainforest animals. Potential for increased presence of people and cassowary attacking dogs along the transmission line access tracks was also pointed out⁶⁴.

It is estimated that hundreds of millions of birds die every year through collisions with fixed structures around the world. Birds sometimes fly into powerlines and suffer fatal injuries. In the five years since becoming aware of this issue, the author has only found two bird corpses under powerlines (a black duck and a rose crowned pigeon). It is also known that egrets may have trouble seeing local distribution lines and some locations exist where the birds fatally encounter low voltage lines when flying down to land in wetlands. Transmission lines are probably a very minor cause of mortality to flying animals. With regard to echo-locating bats, the conductors will be approximately 40 mm in diameter, although the overhead earthwires will be approximately 10 mm in diameter.

It is predicted that the transmission line will not greatly change the existing situation with respect to cassowary habitat

3.6.5 Some species of wildlife are listed as World Heritage Values in the nomination of the Wet Tropics of Queensland World Heritage Area. Even though the preferred preliminary coastal alignment does not pass through any part of the WTWHA, the presence of these species is significant and should have been discussed⁴⁵. The wildlife alluded to were the declining frogs and cassowaries.

In the draft EIS some species were listed as having World Heritage Value when they occurred in the WTWHA section on the inland route and were not attributed with that value when they occurred elsewhere. Any species that is considered to have World Heritage Value would have this value regardless of where it occurred. Despite this change, it should still be recognised that differing regulatory systems operate in different areas and being of World Heritage Value may not provide any protection for a particular species outside the WTWHA area.

Potential impacts on Cassowaries and frogs were discussed in the coastal option in the Draft EIS.

3.6.5.1 Feral Animals

3.6.6 The potential for feral animals such as rats and pigs to use transmission line corridors was mentioned in the disruption to farming section. However, the intrusion of feral animals into rainforest areas was also raised⁶², following a discussion on radio by zoologist Miriam Goosem of the ecological impacts along transmission line corridors due to feral animals. It was suggested⁴⁵ that the Draft EIS should have tapped into the linear infrastructure corridor studies that have been conducted at James Cook University (Dr Miriam Goosem).

3.6.5.2

Dr Scott Burnett who conducted and authored the fauna investigations for the Draft EIS, was one of Miriam Goosem's supervisors when she conducted this research, so our assessments were based on a very good knowledge of this research. The authors also investigated other research into the effect of linear infrastructure corridors that had been undertaken at James Cook University. A considerable attempt was made to incorporate the results of that research into the EIS. Unfortunately relatively little of the research was directly applicable to the proposed transmission line.

Basilisk Range-Japoonvale Area

At the southern end of the Basilisk Range is a rainforest habitat The great importance of this tract of forest is recognised and this

connection with the main body of the Wet Tropics World Habitat Area. One submission⁷ states that this connection is due in part to a farmer deliberately leaving a 'band of trees' to link up with the WTWHA. The main habitat corridors in the Basilisk Range-Japoonvale area are South Liverpool Creek, Liverpool Creek, along Bombeeta Creek. The presence of an endangered fern (*Chingia australis*) and an endangered vine (*Carronia pedicelata*) was also recorded on or close to the preferred preliminary corridor⁴⁵ in this area. Two submissions^{61,75} were of the opinion that these corridors would be clear felled if the coastal option proceeded.

area will be subject to searches for significant species prior to the final design stage to ensure that impacts to these species are minimised.

These species would be most likely to be affected if they occurred on tower sites or access track sites. Slight adjustment of positions of these features may be possible to avoid rare plants.

3.6.6.1 Bulldozing of Forest in Basilisk Range

The bulldozing of tracks into the Basilisk Range was raised in a few submissions⁷⁴, the main point being that alleged unlawful works that were conducted without approvals on Unallocated State Lands and despite media alerts about a cyclone and without any kind of responsible environmental management. This resulted in the Stewarts Creek system running red with eroded sediment.

This was a case of contractor error. Powerlink had to rehabilitate the damaged forest at considerable expense. Increased supervision will be applied in future to minimise the chances of other failures of environmental responsibilities.

One respondent²⁷ was disgusted that pre-emptive work on the re-alignment had commenced before approvals had been received.

The clearing that occurred was required to allow the differential GPS to get a clear signal from the sky, so that a preliminary route could be documented. The site was not pre-emptively cleared to facilitate construction.

Walter Hill Range and Environs

The section of the Walter Hill Range that runs from the Mission Beach hinterland through to the Walter Hill Range Complex to the west of the Tully Valley was identified in several submissions as having considerable natural values. Forest continuity in this area has to some extent been compromised by the presence of the Bruce Highway and the North Coast Railway to the west, and one submission⁴⁵ questioned whether the transmission line would add a third significant break to the forest. Some of the residents in this area⁶³ pointed out that they own considerable areas of intact natural environment and that this helps to maintain the main ecological/genetic corridor between the mountains and the coast and that they do not want a transmission line going through these important natural areas. The pandanus swamp on the southern side of the range was mentioned specifically.

If the coastal option is selected, the proposed transmission line will cross over the Walter Hill Range by skipping from ridge to ridge. Nearly all of the sheltered lowland forest will be protected from any impacts. The ridges are less significant as they mainly support wattle/eucalypt forest as a result of cyclones in the past. As nearly all of the existing forest will remain intact, the transmission will not create a third significant break in the forest.

The pandanus swamp vegetation may not be on the preliminary preferred alignment as the alignment closely follows the road to the communications facility. If the swamp is on the alignment, it is likely that the line could be built to span over any sensitive vegetation.

Acid Sulfate Soils

3.6.7 The potential for acid sulfate soils was raised with respect to the lower lying areas of the coastal option⁸⁶, as it appears that these soils may be more widespread and at higher altitudes than previously thought. An article was recently published in Australian Canegrower, which raised awareness of this issue with the cane growing community.

The likelihood of Potential Acid Sulfate Soils (PASS) being encountered is considered to be negligible and even if found would have little implication for the proposed project. The only process that may expose this soil is boring for foundations. As the quantity of PASS brought to the surface during boring would be fairly small, it could be easily managed.

Inland Option

3.6.8 Supporters of the inland option stated that if a new transmission line were to be constructed to 'Skyrail' like standards, then the inland option would have low environmental impact^{34,76}. Some submissions demanded proof of the environmental impacts that have been caused by the existing inland line of the almost 50 years that it has been operating²².

It would be better to compare the inland option with the existing Chalumbin to Woree transmission line, which passes through the WTWHA than with Skyrail. Most of the towers for Skyrail were constructed by helicopter, and there were no vehicle access tracks to tower sites. The Skyrail construction technique is extremely expensive, and has a significantly higher safety risk and would not be used for the new line. Instead the existing track network would be used to gain site access. Upgrading of the track network and use of the track by heavy vehicles would result in significantly higher environmental impacts than were experienced during the construction of Skyrail.

To construct a transmission line in the WTWHA, proof or strong evidence would be required that environmental impacts have not been occurring. This position is the converse of the issue raised in some of the submissions and is referred to as the precautionary principle. The precautionary principle is used when there is risk of irreversible impacts and where science has a very limited ability to state what these impacts are likely to be or how significant they would be.

The opposing view was that the ongoing maintenance related impacts in the WTWHA would be significant if the inland option was constructed. Furthermore, eventually, the newly constructed inland option would have to be replaced and this would result in further impacts.

If the inland option is selected, then it is likely that future replacements of the line would also follow this alignment. The implications are that there would be permanent low level disturbance of the WTWHA due to ongoing track maintenance and occasional heavy disturbance during decommissioning of the

line and construction of a new line.

Comparison of Options

3.6.9 The following table appeared in a number of submissions⁷⁶ from Power to the People Action Group members. Unfortunately the origin of the numbers is not clear, which makes responding to the figures difficult. It is clear however that PPAG believe that the coastal option would included clear felling of the corridor, whereas the Draft EIS states that over the canopy construction would be used almost exclusively, particularly in high value rainforest areas. This would restrict clearing to only the tower bases and buffer areas and some access tracks.

Environmental Impact	Coastal Option	Inland Option
Length of line through the rainforest	12-13 km	36 km
Area required for the line and bases	78-120 ha	3.6 ha
Area of clearing	6 ha	0.1 ha
Area of natural Vegetation	57 000 ha	900 000 ha
Distance of edge of clearing	26-40 km	7.2 km
Percentage of natural vegetation cleared	0.816 %	0.0004%
Area of land to be cleared	78-120 ha	Less than 2 ha
Disconnectivity for Fauna	very high	Low
Area of land dissected	78-120 km	Nil
Area of land endangered or of concern status	up to 19 ha	Zone C

3.7 WEEDS AND PATHOGENS

Major Pests

3.7.1 Weeds named as being of concern along the proposed transmission line include *Chromolaena* (formerly Siam weed), *Senna obtusifolia* (sicklepod) and *Hymenachne* (a ponded pasture grass). Major pests, *Chromolaena* and race 2 Panama disease (which affects bananas) were reported as occurring along the proposed coastal corridor, or in nearby areas. One submission¹¹ reported that negligence by electricity contractors has led to the introduction and spread of the *Chromolaena* weed throughout the lower reaches of the Johnstone Shire. Control of these pests is generally very difficult and costly, particularly where access is limited. Effective quarantine for these weeds and pests may be difficult to achieve along the line, if they are present in areas traversed by or adjacent to the line¹⁰. Main Roads suggested that the discussion of weeds and pathogens should be expanded to include red fire ants, which are a devastating pest from South America.

A survey of the alignment will have to be made for these organisms and any infestations in and immediately adjacent to the easement would have to be destroyed prior to the commencement of construction. If it is feared that banana disease may be spread along the easement, **DF to comment**

It is acknowledged that *Chromolaena* control is protracted and difficult and that the large numbers of windborne seeds produced by this species allow it to spread rapidly over large distances. Powerlink would be responsible for making sure that no part of the easement of access track network is infested with *Chromolaena* plants. This will require regular inspections before, during and after construction.

One point that was not made in the draft EIS, is that if a weed such as *Chromolaena* was dispersed along the inland option, the weed would be able to spread throughout the catchment of the Tully and South Johnstone by following rivers. When the rivers enter farming land, the weeds would colonise and dominate large areas of river bank and disturbed land. This type of dispersal would be enormously costly or impossible to control. A number of weeds which are present in the tablelands have spread to the coast via this route, including *Turbina corymbosa*, *Impatiens* and *Praxelis*.

Level of Threat

3.7.2 Some submissions²² considered that the weed and pathogen threat had not been comprehensively investigated, given the potential to impact agricultural businesses and the natural environment. Other submissions considered that weed and pathogen coverage was in general adequate, but not inclusive of all potential weeds or pathogens that are relevant to the region. For example more could have been said about cane diseases. Some of the weeds and pathogen issues alluded to were potential issues, rather than existing or known issues. A point made in one submission²⁵ was that allowances have to be made to control weeds and pathogens that may arrive in the future as well as those that are known at present. All pest dispersal mechanisms have to be taken into account, not just the dispersal mechanisms of existing pests.

Powerlink is responsible for ensuring that all equipment used by its staff and contractors is clean when it enters the Tully-Innisfail region. It is also responsible for ensuring that any sections of the line that have known issues are treated as contaminated areas and effective quarantine measures instituted to prevent movement of pest organisms from these areas.

The limitation on being able to prevent future weed and pest introductions is that the majority of the traffic such as tourist traffic or non-Powerlink contractors in the area are not required to engage in weed and pathogen quarantine practices. It is unknown if such controls are placed on cane harvesting and planting contractors.

Quarantine

3.7.3 Concerns have been raised regarding the potential for introduction or spread of weeds and pathogens along the transmission line due to maintenance of access tracks and failure to use appropriate quarantine or washdown procedures^{12,22}. A related issue was the certification of vehicles and equipment as clean before entry to farms^{34,91}. In the event that weeds did arise in association with transmission line works, Powerlink's liability for the control of these weeds was also questioned. Furthermore, it was suggested that quarantine measures may not effectively prevent the spread of some types of weed, particularly *Chromolaena*¹⁰. Powerlink will perform several follow up inspections of the easement to locate and destroy any weed infestations of species that appear to be new to the local area or which are subject to effective control in surrounding lands. Powerlink is responsible for the weeds it introduces or that it allows to increase. However, control of weeds will be the responsibility of the landholder, if the weeds regularly occurred in the area or where new weeds are subsequently introduced for reasons that are not related to Powerlink.

Aerial Spraying

3.7.4 With some agricultural crops such as fruit trees, fungal pathogens are already a significant issue. Without ongoing regular control of these pathogens, the productivity of the orchards would be severely reduced^{31,53,83}. In these cases, the main impact of the proposed transmission line was stated to be interference with existing pathogen control activities, rather than the introduction of new pathogens.

The main soil borne disease of concern is Panama Disease of bananas. QDPI have identified the extent of Panama Disease and the preferred coastal alignment does not traverse any of these areas. As this mapping will be subject to review, Powerlink will keep in regular contact with QDPI. Should there be a requirement to enter any infected farms for construction or maintenance purposes, QDPI approved decontamination procedures will be adopted for all Powerlink and contractor machinery and personnel.

Similarly, BSES and QDPI will be regularly consulted in relation to soil borne diseases of other crops and appropriate quarantine/ decontamination procedures put in place as required.

- 3.7.5 Loss of access to aerial spraying on account of transmission lines is also a concern to some farmers³¹. During very wet conditions, aerial spraying is used to reduce damage farm tracks by vehicles and enable access to areas not be able to reached under adverse conditions such as flooding or bogginess. Some of the submissions referred to having to aeriually spray twice a month for Black Sigatoka (a banana disease) ²⁶. It was noted that even if the transmission line was located beside a farm rather than on it, it may still restrict the use of aerial spraying, particularly where larger than normal towers are used such as through rainforest areas⁸¹.
- Local aerial operators have not expressed this level of concern to the authors and have generally indicated that they are not overly concerned about high voltage lines because of their higher visibility to pilots as opposed to local distribution lines. To further increase visibility in some situations, the operators suggested placement of markers(large orange plastic balls) on the conductors. Powerlink would have further discussions with the operators during the detailed design phase to minimise or eliminate such conflicts. Should a situation arise where a paddock or part of a paddock could not be aeriually sprayed safely, appropriate grower compensation would be provided.

On-going Weed Management

- 3.7.6 A few submissions⁵³ stated that cleared corridors associated with transmission lines provide a 'vehicle' for the dispersal of weeds, grasses, rats and feral pigs. Increases in minor weeds and naturalised pests can also impact on farms.
- In most cases cropping can continue underneath the transmission line with the result that little ground will be available for weeds, grasses and rat habitat. Pigs have the capacity to move through dense vegetation and are not dependent on tracks for dispersal or access to crops.

- 3.7.7 One of the most contentious issues was the requirement of landholders along the line to control weeds that grow within the easement⁷³. Landholders^{30, 88} fear that in a hot, very wet climate where growth rates are very high and the growing season long, that the compensation will be insufficient to cover the number of weed control treatments that have to be conducted each year. Does the compensation include the cost of chemicals?³⁷
- Powerlink's position is that the compensation paid to landholders factors in an allowance for weed management, including chemicals and labour, for the operational life of the line (~50 years).

Organic Farming

- 3.7.8 Two submissions^{63,97} raised the issue of weed control near organic farms. Conventional use of herbicides around towers and maintenance tracks and for tree control under the transmission line may be incompatible with organic farming requirements. Chemical usage in close proximity to organic farms may result in problems with certifying crops and livestock as organic.¹³
- Powerlink would offer appropriate compensation should organic weed control procedures be necessary around towers.

3.8 DISRUPTION TO FARMING

Loss of Land and Adjusting Farm Layouts around Line

3.8.1 Some farmers⁷ with smaller farms expressed concern at losing any land to a transmission line as smaller farms are only marginally economic. A related concern was having to rearrange farms to fit in around the transmission line. The adjustments may include reshaping headlands or changing row direction which would result in increased harvesting costs and soil erosion^{31,32}. Farms on hilly or dissected land are relatively constrained with respect to farm layout, and towers can disproportionately increase difficulties in these areas³⁴. Other potential impacts relate to the increased difficulty of using large machinery in close proximity to a transmission line⁶⁹ and increased costs due to loss of time spent manoeuvring around towers⁹¹. Submission 88 included an extensive analysis of this issue. Some submissions expressed a view that the amount of land that will be affected by the transmission line has been underestimated³⁹.

As discussed in Section 13.8.3 of the Draft EIS, the presence of a transmission line will not precluded the growing of the main crops for the region (viz sugar, bananas) as evidenced by the existence of these crops under lines throughout north Queensland, albeit with varying levels of husbandry impacts and inconveniences. Loss of agricultural lands will therefore be mainly confined to tower positions. This is the basis on which the area of affected land was calculated. It is acknowledged by Powerlink that there may be isolated incidences where a line would result in more significant impacts and where this could not be eliminated or minimised through final alignment planning, this would be factored into compensation agreements.

3.8.2 Some farmers who have small farms, have concerns that a transmission line with a tower in a small field may result in the field becoming unworkable. Loss of a field may in turn potentially result in the loss of economic viability of the whole farm^{72,91}. Powerlink will make every effort to avoid such a situation during the detailed alignment design process, which will involve extensive discussions with landowners. Any remaining impacts will be factored into land owner compensation agreements.

Farm Operations

3.8.3 Some concerns were raised about the potential impacts of line clearance. One aquaculture farmer¹⁷ objected to the line on the basis that he wanted to put up high poles for [bird] nets. Two submissions mentioned that the presence of a transmission line may create added difficulties for pre-harvest burning of cane. It was also claimed that it will be difficult to find workers willing to work within the magnetic field daily. Another submission⁴⁴ claimed that the presence of a line would interfere with the irrigation of crops, details were not provided. As point out in Section 13.8.3.3 of the draft EIS, a minimum line clearance of 4m is required to all objects and as the line would have a minimum ground clearance of 11m, this would allow structures up to 7m underneath at the lowest point in the line sag. Higher structures may be allowed at higher points in the sag. As identified in Section 3.16 above, clearance/ landuse incompatibilities would be minimised through detailed final alignment planning and factored into compensation arrangements.

Pre-harvest burning of cane does not represent “best practise” and is being phased out with exception of a harvest prior to plough out/replant. Notwithstanding this, techniques are available to carry out this practice with care.

Under tree sprinklers and drippers are unlikely to be incompatible with a transmission line, however movement of solid set piping would require extreme care. As tall overhead and water cannon irrigators would be incompatible, this may represent an agricultural restriction, which if not resolvable with alternative irrigation methods, would be factored into the

compensation agreement.

It may also be possible to increase tower heights to provide additional clearance for such activities where necessary.

- 3.8.4 The representative for Bundaberg Sugar Northern Region, expressed concern about the effect of transmission lines on sugar locomotive communication equipment⁷³. Cane trains make use of both GPS and radio to manage scheduling. Experience with operating next to transmission lines is that noise created by the lines is sufficient to render communications equipment useless in some areas. The preferred coastal option traverses much of the area travelled by the locomotives, especially near Japoonvale, Mena Creek and west of South Johnstone Mill. If the proposed line results in locomotives 'running blind', this would be unacceptable under workplace health and safety.
- Once the alignment is finalised, the effect on the communications system will be ascertained in consultation with Bundaberg Sugar. Additional radio repeaters or other solutions will be installed if necessary.

3.9 CONSTRUCTION ISSUES

3.9.1 The Draft EIS does not outline the standards that are in place to prevent loss of chemical and physical fertility through mass movement and erosion⁸⁸.

Sediment and erosion controls will be specified in the Environmental Management Plan (EMP) and Environmental Work Plans for the project. As a final alignment has not been selected, these plans have not yet been prepared. However the Draft EIS did contain a draft EMP which provides an example of the way issues will be dealt with.

3.9.2 Clarification of the role of helicopters in the construction of the inland route was requested, as it was not obvious why helicopters may be needed when heavy vehicle access would be available to each site³⁰.

Most of the machinery and materials required to construct tall towers is either too heavy to be transported by available helicopters or is at the limit of helicopter lifting capacity. For this reason helicopter construction is avoided wherever possible. Helicopters are expected to be predominantly used for stringing of conductors along the coastal option, however a small number of towers may have to be built using helicopters where ground access is not possible. If the inland option is selected, helicopters would be used to facilitate the construction of a small number of towers for which road access would not be able to be constructed or where the necessary large cranes could not be used, in addition to stringing. Helicopters would also be used to fly in concrete where track access was not possible.

Helicopter based construction techniques also have the disadvantages of cost, safety regulations and environmental impacts such as noise and vegetation damage.

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| 3.9.3 Farms may be impacted during the construction period by destruction of current crop, disruption of farming activity and destruction of headlands (impacts related to having to change farm design?) ³¹ . Construction during wet weather is likely to have much higher impacts. | Disruption to farming during construction of the line is factored into compensation. Construction is planned for the dry season, however it is acknowledged that rainfall is likely and some wet weather construction will take place. Following construction, any damage to the ground will be rectified. |
| 3.9.4 Main Roads pointed out a potential connection between poor sediment control on construction sites and flood damage to roads ⁴⁸ . Certainly it is recognised that heavy sediments and vegetation debris, can block creeks and create local flooding. Such impacts could potentially affect some farms, one farmer in particular reporting log jams on the river flats ⁵³ . | Sediment control and management of debris that could destroy structures downstream during floods are required on all transmission line construction projects. These issues will be addressed for this project. |
| 3.9.5 Construction noise was mentioned by a number of submissions ⁹¹ , as being a potential source of nuisance. "Don't assume that all rural areas are dominated by the sounds of farming machinery, some areas are quiet." | Transmission line construction is fairly rapid and prolonged noise impacts will not occur. The machinery used in construction is also equipment such as trucks, cranes and drilling equipment which are not particularly noisy. |

3.10 TULLY AERODROME

Skydiving

3.10.1 Tully aerodrome is located within Cardwell Shire and is owned by the shire. The aerodrome has been developed into one of the largest skydiving centres in Australia since the mid 1960's. Currently 3 parachuting organisation use Tully Aerodrome and between them they may have up to 40 aircraft movements a day. The three organisations lodged a joint submission⁷¹ stating their concerns. General aviation is not very active at Tully Aerodrome and there were no submissions from non-skydiving aviators.

Noted

- 3.10.2 Prevailing winds come from the south east, meaning that 98% of the time, aircraft will have to take off toward the alignment of the preferred coastal option. Despite complying with CASA specifications, the proposed transmission line could still present a safety hazard to aircraft in the event on engine failure on take off. There have been at least 3 fixed wing, engine failure incidents resulting in emergency landings off the southern end of the runway in the past 12 years. A scenario is described where a relatively inexperienced pilot (normal situation) with a heavily laden plane experiences engine failure on take off and follows the established practice of landing straight ahead, and is forced to make a decision on whether to go over or under the transmission line that crosses the coastal plain just south of the airstrip. A separate submission⁵² from a skydiving company stated that skydiving could end at Tully Aerodrome if a heavily loaded aircraft was compromised on take-off.
- As discussed in the draft EIA, the preliminary coastal alignment would not contravene the Civil Aviation Safety Authority Guidelines for a Category 1 or 2 airstrip, however it is acknowledged that the line section that crosses the Bruce Highway would represent an additional hazard, in the event of a power failure on take off. Powerlink is currently considering possible modifications or alternatives to alleviate this concern. Ongoing consultation with the CSC and the Parachuting Industry will occur after the selection of the chosen route.
- 3.10.3 Another factor in deciding whether the transmission line would pose a significant threat to aviation is the prevailing weather in Tully. Tully is in a very wet area and cloud base is frequently quite low, which forces pilots to approach the airstrip at a lower than normal angle.
- Refer above

3.10.4 Additionally the safety of the parachutists has to be considered. Tully is a training area and student jumpers are subject of much of the concern. First time jumpers who are learning to control their parachutes traditionally require a large landing area and plenty of open space free of hazards, should they wander off from the intended landing area. The location of the preferred preliminary alignment is of concern as it would place the proposed transmission line parallel to the aerodrome and landing areas. Risks to jumpers also occur as the exit point is above the proposed transmission line. Jumpers exit the aircraft directly over the preferred preliminary alignment to allow the prevailing winds to assist them to fly back toward the landing area. In an emergency situation, such as a chute malfunction, the presence of the proposed transmission line could be a safety hazard. Refer above.

3.10.5 Based on the above concerns, the parachuting organisations have stated their preferences for resolving the issue; Refer above

1. Inland route
2. Coastal route with approximately 5 km of underground from the highway until past the aerodrome
3. Complete relocation of the airport and facilities to a location closer to Mission Beach
4. Coastal route with line beyond overshoot area undergrounded and the section of the line that runs parallel to the airstrip moved back toward Mt. Mackay.

3.10.6 Skydiving at Tully generates 3-4 million dollars⁵² revenue annually, which contributes to the local economy. Recently an investment of \$95 000 was made to upgrade the facilities at Tully Aerodrome and there is some concern about the future of this investment due to the proposed transmission line. Noted

- 3.10.7 A number of other individuals also raised potential issues in relation to Tully Aerodrome. One³⁰ raised the possibility of the line reducing the ability of large military or emergency aircraft to use the airstrip. There was also a general concern that a transmission line could prevent future expansion of the airport^{30,59}. As stated in the draft EIS, the Defence Force has advised that they occasionally use the strip for training purposes and would be satisfied, providing that the proposed powerline allows the strip to comply with CASA guidelines.
- 3.10.8 One of the landholders²⁹ adjacent to the aerodrome pointed out that Energex had undergrounded a section of line in SE Queensland to allow for hang gliding at Mount Tamborine. Noted, however the voltage of the line is unknown. Undergrounding of a 275 kV line is significantly more expensive than lower voltages.
- 3.10.9 The Department of Emergency Services has stated that the proposed alignment does not pose a significant threat to its helicopter rescue service operations. noted.

3.11 SOCIAL/ECONOMIC ISSUES

3.11.1 Some people are likely to move away from the area as a result of the proposed coastal transmission line and this will further economically and socially depress the area¹. In the smaller townships, each time a single family moves away, the whole town suffers⁹² [less custom for local businesses, fewer children to keep schools open, etc.] People have moved to this part of the country to avoid issues like noise, crime and contamination (EMF, Henshaw effect) and the imposition of a transmission line will destroy the environment that these people have sought out⁴. Farms will lose workers² as people would be reluctant to work beneath transmission lines. Retired farmers may also choose not to retire on their former farms, if transmission lines come too close³².

It is possible that a few people may move away from the line. In many cases this would be unnecessary, as the line will be relatively far away from the residences and there will be plenty of opportunity to hide the transmission line from view by tree plantings or other landscape alterations. People should be able to continue to enjoy the natural and scenic environment as most properties can be adjusted toward areas and views which are not impacted by the transmission line. When the transmission line blends into the landscape with age, it will become all but invisible to most people.

Examples of where transmission lines would be expected to degrade the special environmental character of an area include Tully Gorge, Barron Gorge and the Springmount to Turkinje line. However, in these locations, transmission lines do not significantly impact on the scenic values of these areas. Despite the relatively large amount of transmission infrastructure in Tully Gorge and Barron Gorge, few people notice transmission lines when they visit the gorges. The Turkinje line was recently constructed over a high mountain range near Mareeba and was highly visible when new, as it towered above short eucalypt woodlands. Initially, this transmission line was shiny and was minor but annoying feature in an otherwise continuous forest vista. However since the line has greyed, it has become difficult to see.

- 3.11.2 Landholders who rent out houses for income, may find that they have trouble attracting or keeping tenants, or that they have to decrease the rental fee on account of the proposed transmission line, where the line runs close to the rental property². For some landholders, their land is their superannuation fund and any loss of property value will reduce the finance available to them in the future³⁵. One respondent neatly summed up all of the above when he said, "People do not want to live near transmission lines".
- Great efforts have been made to keep the line as far away from houses as possible and only a few houses will be within 125 m and even fewer within 250 m of the transmission line. These separations are significantly greater than between transmission lines and homes in many other parts of Queensland.
- Whilst it is certainly true that many people may have an aversion to transmission lines, a significant proportion of people and perhaps even the majority do not seem to share this view. In many areas, suburban development has proceeded along pre-existing transmission line easements and people chose to live in allotments adjacent to the lines. Some of these areas are relatively expensive areas (Cityview in Cairns) and houses of considerable worth are being established near the transmission lines, despite alternative transmission line free areas being available.
- 3.11.3 If the volume of tourist traffic decreases, due to loss of scenic attractiveness along the preferred coastal alignment, then this could also impact on farm viability, as many farming household also partially depend on jobs in the tourism industry²⁵.
- Visual impacts to transport corridors have been minimised as far as possible. There is no evidence to suggest that the transmission line that runs approximately parallel to the Bruce Highway for most of the distance between Cairns and Townsville has any effect on tourism. Areas south of Tully with HV lines also rely on Tourism for their livelihood.

- 3.11.4 Some submitters^{16,105} question the social equity of the proposed transmission line, where the broader public provides substantial benefit and landholders along the line bear the burden of the impacts. It was suggested¹⁸ that higher electricity charges could provide money to allow the use of best practice technology [and the inland option] to prevent landholders being exposed to these impacts.
- Powerlink is proposing best practise technology for both options. There are no combinations of tower design, line positions or circuit design that would reduce impacts to a lower level.
- 3.11.5 Another question with a moral dimension is that people who live near the existing line choose to do so, however if the new line is placed on the coastal route, then the new line will be imposed on people against their will. Another submission raises the ethical issue of involuntary exposure to EMF, particularly for children as they do not have a choice in where they live in relation to transmission lines^{76,98}.
- The impact assessment process regards all people as equal and attempts to reduce impacts on all.

3.11.6 The cost of opposing Powerlink's proposed relocation of the transmission line to the coastal corridor has been considerable for many landholders^{2,42,98}. Costs include money, travel time and work time forgone. There will be no compensation for any of these costs, unless the transmission line is constructed on the inland route. Similarly difficult to appreciate is the cost to people in terms of stress and social disruption caused by the proposed (and later, the post-construction) transmission line^{22,44,91}. It was suggested that some of the stress was related there not being enough information to keep people in the picture⁴².

All of the feed back provided has been considered and numerous small design changes have been made to the preliminary coastal option and in conjunction with information which will be made available in future, discussions with affected property owners will be used to finalise the alignment.

3.11.7 Perhaps the most serious potential consequence of the proposed line along the coast, is if it were to result in some farms diversifying out of cane and causing the extent of land under cane to fall under 'critical mass'. This would impact on the viability of out-sourcing and contracting and potentially, the viability of the South Johnstone Mill⁷³.

Every effort will be made to reduce the potential affects of the line on farm viability and the situation where the mill is driven below critical mass is not expected to arise. Additionally, there may be some positive aspects to the sugar industry if the coastal option is selected. If the transmission line passed in close proximity to the South Johnstone Mill, this would provide potential for co-generation and electricity sales, which could strengthen the viability of the mill. Compensation paid for the acquisition of easements may also help some farmers remain viable.

As there is little cane along the inland option, there is less potential for both positive or negative impacts on the sugar industry.

3.11.8 An interesting opinion²⁵ was that the extent of studies by Powerlink thus far in an effort to minimise disadvantages suggests that potential socio-economic aspects should have been investigated in much more detail before the EIS was prepared. Furthermore it was suggested that as there are going to be socio-economic impacts, these should be quantified.

In addition to the investigations on social aspects that were included in the Draft EIS, the social aspects have been investigated by Dr. Mark Fenton, a leading professional in the social impacts assessment field. This investigation took place following the release of the draft EIS and was independently presented to the public for comment. The final report from this study will be incorporated into the final EIS and will be available to the decision maker to facilitate the selection of the final option. The decision maker also has the option of requesting further information on social matters or of imposing conditions on Powerlink with respect to social issues. Social issues are one of the key issues in the assessment.

- 3.11.9 Opportunities for the local economy, through the hire of local contractors and labour have not been stated⁴⁵. The impact of the project work force on local communities also needs to be assessed further.
- 3.11.10 It was also asked "what relevant social information exists in relation to those households and residences in proximity to the alignment"⁴⁵? Similarly, it was asked whether the proposal was cross-referenced against the community well-being principles in Local Government Planning Schemes³⁹. The extent to which the proposed options comply with social sustainability policies in the Far North Queensland Regional Plans is not clear.
- 3.11.11 A theme that was repeated in a number of submissions⁸¹ was that farmers and farms are of great value as they generate export income that benefits all Australians. However, this value is not recognised by the Draft EIS in the same way that World Heritage Values have been.
- Construction workforces required for similar projects to either the inland or coastal options require a maximum of between 140 and 150 employees and in general these workforces have in the past consisted of between 20% and 50% of local or regional content. Overall it is estimated that the direct expenditure within the local community would be between \$3-\$5 million which would include direct expenditure on salaries, wages and other supplies and consumables.
- A Summary Social Impact Assessment is included in Annexure The regional plan does not clearly enunciate social sustainability policies which are of relevance to this project. One of the plan visions for infrastructure provision is that "Due consideration has been given to protection of the environment, long term ecological sustainability and community lifestyles". The draft EIS clearly addresses these issues.
- Farming under HV transmission lines throughout North Queensland (including Bananas and cane) clearly demonstrates that the project would not result in any significant loss in agricultural production. It is acknowledged that a number of cultural inefficiencies may result however this can be factored into compensation payments. Instances where the preliminary coastal alignment might preclude a current form of agricultural production would be negligible. It is difficult to consider potential for growth of other incompatible crops such as agroforestry and taller tropical fruit species that are not currently in production.

3.12 PROPERTY VALUES AND SALES

This is a large and complex area that overlaps many fields including socio-economic effects, visual amenity and health. Community responses indicate a belief that the presence of transmission lines will reduce the value of the land parcels on or near the line and may also impact upon the value of land parcels with views encompassing the transmission line. The affected area of significantly reduced property value is considered to extend out to a few hundred metres from the transmission line⁴. A number of respondents consider that the proposed transmission line will reduce their property values in the order of 30% or by tens of thousands of dollars.

3.12.1 Most of the respondents do not agree with the evidence presented in the Draft EIS that property value impacts are only short term and that in the long term, the property values near transmission lines are comparable with surrounding properties. Personal anecdotes were presented to demonstrate the level difficulty in selling properties near transmission lines^{40,47} and research was identified which showed that property impacts were greater than shown in the Draft EIS²⁵. The issue of property devaluation on properties adjacent to the line was raised as these properties will not be eligible for compensation as they are considered to be unaffected⁹¹.

Applicable laws do not cater for such compensation to be provided to landholders not directly affected by a transmission line.

- 3.12.2 The local community recognises and values the existing environment and view the areas' natural beauty as an economic advantage. A large proportion of responses indicated that the perceived loss of natural beauty would reduce both the demand and sale prices of any impacted property.
- 3.12.3 Many people in the area are considering selling land or subdividing. Transmission lines are seen to limit subdivision potential due to obstruction, visual considerations and community concerns regarding health effects from electromagnetic fields⁴. This potential impact may be particularly severe where the marketing of the land is dependent on lifestyle appeal or scenic vistas^{34,63}. There has been a strong suggestion that the proposed transmission line has already impacted upon some efforts to sell land along the proposed coastal route⁹⁶.
- There is no evidence to suggest that this is an across the board trend. As pointed out in the EIS many factors contribute to the valuation of a property. Where it is clear that a property valuation will be materially affected, compensation will be paid.
- The coastal and inland line options pass through land that is identified as rural on the shire strategic plans. A rural designation severely reduces the chances of a successful subdivision application and the opportunity to subdivide may not exist for many of the blocks of land traversed. Where this is the case, the argument presented opposite will not arise.
- Depending on the flexibility of the landholders in areas where lifestyle matters are of particular concern, additional attention will be paid to reducing impacts in these areas. These details will appear on the Environmental Work Plans and typically prescribe such things as positions of access tracks and where screening vegetation must be maintained. The goal would be to fit the new line into the landscape without significantly changing the character of the landscape.
- A few instances have occurred where the uncertainty over the precise position of the coastal alignment has interfered with efforts to sell land. This uncertainty can only come to an end when a new line has been constructed.

External market factors such as the depression in the cane industry are also relevant when assessing valuations and saleability of rural properties

3.12.4 Agricultural sectors are mostly concerned with the placement of transmission lines as a reduction to the functionality of their properties. Loss in functionality may include the addition of obstacles and the fragmentation of larger blocks. Obstructions caused by transmission line placement may cause difficulties and challenges to current farming techniques and prevent diversification into tree crops or crops that require regular aerial spraying. A reduction in the size and variety of crops able to be grown on farming land could reduce resale demand and sale price.

All potential impacts on farming land are taken seriously and are minimised as much as possible. The location of the final alignment, line design and placement of towers are conducted in consultation with affected property owners.

3.12.5 Many submissions state that their concern for preserving the value of their children's inheritance^{53,63,91} or retirement investment⁸⁰. Others see the value in their land as an asset that they will have to sell in the event of loss of viability in the sugar and other agricultural industries³¹. With such a great deal at stake, there is a degree of apprehension and stress with regard to any loss of value or the nature and acceptability of any compensation package.

Powerlink acknowledges the need for payment of adequate compensation.

- 3.12.6 Concerns exist that transmission lines will reduce the landholders ability to borrow against their land capital reduce property value due to devaluation of the land caused by the transmission lines. A further perceived injury is that the reduction in property value has not been matched by a corresponding decrease in property rates⁸². The unimproved valuation of rural properties can be reduced under some circumstances commensurate with the amount of loss of agricultural production created, which in the case of cane and banana production, would be limited to the area lost to tower footprints only.
- 3.12.7 A small number of submissions have suggested that more local research is needed to investigate short and long-term impacts on property values/sales within a similar setting. Attempts have been made to undertake such research in the past, however it has always proven very difficult due to insufficient sample size for statistical accuracy. To detect the effect of a transmission line on property values, two very similar communities, one with and one without a transmission line are needed, and the number of sales over a year within each community would have to be approximately 50, before a scientifically valid result could be calculated. Finding situations which meet the above criteria has defeated previous attempts to conduct such research in Australia.

3.13 LEGAL ISSUES/LIABILITY

- 3.13.1 Most of the discussion on this topic centred on the potential for insurance claims or liability suites related to accidents or EMF induced health problems that could potentially arise as a result of transmission lines over properties. Specific concerns^{7,44,88} are that insurance premiums will rise, particularly if successful legal action for damages have been undertaken⁶⁹. If insurance premiums were to rise, would Powerlink reimburse landholders for the extra costs. Would there be any guarantees of indemnity from litigation⁷². Powerlink have guaranteed that they will contest any rise in insurance premium related to the presence of a transmission line on a property.
- 3.13.2 Other concerns include reduction in the ability to control access to and landuse within easements and the lack of ability to seek redress against Powerlink if required. Specific questions include: A transmission line easement can only be used for purpose directly related to the provision of electrical infrastructure. The prohibition on controlling easements for other purposes is stated in the Acquisition of Lands Act 1967.
- Can the easement documentation be altered in a way that prevents farming within the easement?³⁰ Refusal of access to a lawfully acquired easement would constitute a civil offence.
 - If we refuse entry, what measures will you take to gain access?²² Any grievances that have not been resolved through direct discussions with Powerlink can be taken up through normal legal channels.
 - Does refusal of access constitute a criminal offence?
 - Has a proper judicial body been set up to hear landholders grievances?
 - Who would fund an appeal should there be matters related to construction or on-going problems. Powerlink will attend to all construction related matters.

3.14 COMPENSATION

- 3.14.1 Powerlink was challenged to agree that if evidence became available that EMF causes health problems at levels to which neighbouring residences are exposed, will it remove the line or purchase the properties along the route²².
- 3.14.2 If changes have been to be made to farm design to accommodate the proposed transmission line, will compensation be paid for these changes to farms²¹? Clarification on whether repair or damage to farms during the construction period is compensated was also asked for²⁵.
- If the matter arises, it will be a matter for government policy to address.
- Compensation will factor in any changes to farm design that are required as a result of the construction of the transmission line. Compensation will be payable to any farms that are not actually within the easement where farming changes are made in response to the transmission line (if changes of this nature occur eg. inability to utilise aerial spraying).

- 3.14.3 That no description of how the purchase price for easements is calculated was noted²⁵. It was suggested to Powerlink that the low maintenance costs of the coastal option are due to farmers looking after the upkeep of maintenance tracks to the infrastructure over many years. Compensation provided to landholders along existing lines was said to bear no resemblance to the actual costs of maintaining that level of track infrastructure and maintaining the areas around the towers in weed free condition^{47,105}. Availability of compensation for cost impacts due to the loss of aerial spraying or harvesting efficiency from time lost to manoeuvring around towers were also questioned^{25,34,88}. It was asked what items are covered by compensation and what are the landholders rights to compensation⁴⁴.
- 3.14.4 Compensation for weed management was raised as an issue³⁴ of particular concern. As the stretch between Tully and Innisfail has the highest rainfall in Australia and a long warm growing season, weed control is virtually year round. Cane farms are also quite intolerant of the presence of weeds, due to the use of weedy area by cane rats.
- To the greatest degree possible, new tracks through farms are minimised. This reduces the amount of new track deliberately. Existing tracks are used wherever practicable. Any damage to these during construction will be rectified. Ongoing maintenance for these tracks will be minimal (one ground inspection per year by 4WD) as the majority of maintenance inspections will be carried out by helicopter. Costs for spraying and other cultural inefficiencies around towers will be factored into the compensation.
- Appropriate compensation will be built into compensation payments.

- 3.14.5 As there is no formal means for compensating the increase for the loss of visual amenity, it was suggested that Powerlink might offer to the local community to fund the construction or repair of community or tourist facilities²⁵. The lack of compensation for visual amenity is probably most acute on properties which are not crossed by the line but which are immediately adjacent to the line. Powerlink does fund various community projects to offset the impacts of the line on local communities. This scheme is run through local Councils, who assist in the identification of suitable community projects.
- 3.14.6 An example of a failed, but apparently legitimate request for compensation was provided where a potential house site was abandoned to provide a route for a transmission line (not stated where or who the constructing authority was). When the house was built at a new location, a longer electricity supply was required compared with the original location and owner was not compensated for the increase in cost for connecting to the grid⁴⁰. Additional costs associated with the relocation of a house site will be covered by Powerlink.
- 3.14.7 It was asked if loss of property value was compensated⁴¹. Another submission requested that their property be purchased so that they may relocate to another similar area without transmission lines. As identified in Section 3.10 above, long term depression of property values on the alignment has not been confirmed in areas where this has been studied. The impact on property values is influenced by many factors, and where a definitive reduction can be demonstrated, appropriate compensation will be paid. Powerlink will look at this on a case by case basis and where serious impacts on lifestyle or valuation are unavoidable, other arrangements may be negotiated.

3.15 LIFESTYLE/QUALITY OF LIFE

3.15.1 A few submissions⁵⁹ stated that lifestyle choices are increasingly the main drivers of wealth in the Cardwell and Johnstone Shires. A statistic sourced from a 1994 survey conducted for the FNQ2010 Regional Planning Project⁹⁸, indicated that the second and third most common reasons for moving to the area were lifestyle and climate/environment respectively (employment was the most common response).

The quality of life issue is recognised and a determined effort has been made to place the proposed transmission line in the least offensive alignment. Both the coastal and inland alignments have deviations to avoid dwellings or small properties that would be greatly impacted by the presence of a transmission line.

3.15.2 Responses from people who have moved to the area for lifestyle reasons include:

The preliminary coastal alignment is likely to impact lifestyle and amenity uses in two localities. These are limited to the crossing of the Walter Hill Range on the coastal option, and possibly a small area in the Basilisk Range area. No such losses have been identified for the inland route, however, this is probably due to the less vocal community in that area, rather than a difference in the landscape.

- "Many people have purchased property and chosen this place to live because of its rural and natural environment. It was seen as a nice clean country to farm, work and bring up children"^{2,96}.
- "The beauty of the mountains and its surroundings were a big factor in our decision to build and farm here"^{41,72}.
- "The coastal option represents a loss of lifestyle and creative work environment...I would no longer wish to live on my property"^{35,43}.

As areas that are highly desirable for lifestyle uses are relatively scarce, these areas would be avoided due to their environmental and social sensitivity if there were other possibilities. Unfortunately localities that afford a lifestyle experience are mostly in hilly areas or near creeks and this constrains possible transmission line alignments to the point where there may be fewer opportunities to minimise impacts on lifestyle values.

See also Environmental Section

3.16 VISUAL IMPACTS

Coastal Route

- 3.16.1 The towers will detract enormously from the visual appeal of the area, both to tourists and to residents. The first impression of the Wet Tropics region is gained in the Tully area. Particular areas of concern for visual impacts include Tully area where the line will be visible from both the Bruce Highway and from many residences in Tully which have views of Mt Mackay³⁰. Other specific locations of concern⁷⁴ include the Walter Lever Estate area, the Japoonvale-Mena Creek loop, which is an important tourist road, and the Tully-Mission Beach Road crossing. Visual impacts from the line will be even higher following cane harvesting when fields are bare.
- The average distance of the preferred preliminary corridor from the Bruce Highway is quite large. Additionally, creeks with tall riparian vegetation are quite common in these areas and provide a relatively high degree of visual screening. Even in the gateway areas, the transmission line is not expected to be visually intrusive. Where the line crosses the road at Tully, it crosses the road near a light industrial area and not a scenic vista.
- The photos for the visual simulations were taken standing on the roof of a 4WD to ensure that the view would be similar to the view seen when the cane was small.

Inland Route

- 3.16.2 Removal of the existing Kareeya-Innisfail line would enhance the value of the proposed canopy walkway near Crawford's Lookout and the World Heritage rainforest¹⁴. Any new line on an inland route would cross through a large number of private properties. It is not true that the inland route only runs through the World Heritage Area⁹³.
- Removal of the existing inland line would make a minor improvement to the drive up the Palmerston. Residences that have been constructed in the vicinity of that line would also benefit from improved views. See table for comparison between coastal and inland options, and existing line for differences between alignments.

Other Comments

- 3.16.3 The Main Roads department expressed a general view that it considers the aesthetics within the World Heritage area and other natural environments to be important. The aesthetics of the region is one of the fundamental concerns that lead to the selection of the proposed alignments.
- 3.16.4 The proposed towers will be much larger than the existing towers and more obtrusive than the towers on the existing line³⁴. For many areas this would be true, however new towers when greyed with age are quite unobtrusive. In some cases, the new towers can be less visually obtrusive than the smaller existing towers, as the taller towers allow for much more effective use of screening vegetation and there are less of them. This effect however only occurs in some place when the observer is quite close to the easement.
- 3.16.5 Insufficient attention has been given to measures that could be used to reduce the visual impacts of the line, for example, through the use of non-reflective coatings⁵⁹. The light grey colour of aged galvanised towers is the optimal colour for hiding towers against most backgrounds. The Japanese paint their towers with a non-reflective paint which is mid-grey, however this increases visual impacts as the darker towers stand out against the sky.
- 3.16.6 The visual simulations of the [coastal] transmission line do not show the cleared 60 m wide swathe beneath the transmission line⁶³. There would be no cleared 60 m swathe under the transmission line. The vast majority of the line through rainforest country will be via over the canopy lines and towers.

3.16.7 A number of strong feelings were also expressed by people who have a strong affinity for the natural and rural character of the landscape. A few submissions stated that visual impacts related to the establishment of a transmission line in their area would permanently impact on their enjoyment of the area and potentially, their ability to conduct their livelihoods (artists, eco-tourism ventures). Fully understood. The challenge for Powerlink and its consultants is to find the route and line design that is least offensive. Some of these issues can probably be solved and it is likely that the finished line will not be as offensive as some people expect.

3.17 TOURISM AND ATTRACTIVENESS OF AREA

Coastal Option

3.17.1 Some submissions^{8,94,97} expressed a view that the preferred coastal route would lead to high visual impacts in the Tully/Feluga Valley, considered by many to be the gateway to the wet topics region. Of particular concern^{8,30} was the area near Mount Mackay, where the proposed transmission line is confined by local topography to an alignment that is relatively close to the Bruce Highway. Part of the attractiveness of this area lies in an absence infrastructure spanning the landscape - as it does in parts of southern Australia. The potential impact on the Great Green Way, a name applied to the Bruce Highway between Cairns and Townsville, was also mentioned a number of times^{94,95,98}. The line has been positioned as far away from the highway and the towns of the Tully/Feluga Valley as possible. This has greatly reduced the potential for visual impacts. Visual simulations have been provided for these areas and they appear to show that the line will be a relatively distant feature that does not dominate the landscape. The effect of the line on experience of visitors travelling on either the North Coast Railway or the Great Green Way will be minimal.

- 3.17.2 Another road that was named was Innisfail-Japoon Road, which passes through Mena Creek⁴⁴. This road is a tourist loop which meanders around the Basilisk Range and services the well known attraction of Paronella Park. Some respondents living in elevated positions on Pin Gin Hill expressed concern about the potential for visual impacts from coastal transmission line on the vista of the Basilisk Range^{34,41}. Visual impacts experienced from these roads will be limited to small sections. From most parts of these roads, a transmission line would not be clearly visible or visible at all. Additionally the visibility of the line will vary according to the direction of travel with the line being less visible to northbound traffic on Innisfail-Japoon Rd and to traffic climbing Pin Gin Hill due to the geometry of the landscape. The transmission line may be prominent to travellers going in the reverse direction particularly at the small section of Innisfail Japoon Road that points toward the preliminary preferred alignment near Miscovitch Creek. Travellers descending from Pin Gin Hill in the vicinity of Friels Road will also see a prominent section of transmission line where the line advances over an expanse of sugarcane toward the road. There is appears to be no capacity to reduce impacts in these areas.
- 3.17.3 It was stated that some skydivers come to Tully/Mission Beach so that they can skydive one of the most beautiful parts of Australia and view the scenery from above. A transmission line will not significantly affect the natural character of the region when seen from above.

3.18 INLAND OPTION

- 3.18.1 A new transmission line along an inland route would be visible from and potentially detract from the proposed Crawfords Lookout rainforest canopy boardwalk which is currently in the late planning phase^{14,47}. Part of the concept of the boardwalk is that developed areas or man made structures should not be visible from the canopy level parts of the walkway.
- It was not possible to determine the visibility of a new transmission line from the proposed canopy boardwalk as this would require precise plans of the walkway, the geometry of the canopy and the heights and positions of towers. Despite the above, it would be unlikely that the transmission line would be visible from the proposed boardwalk as a central theme of the concept of the boardwalk is for it to be located such that no part of any developed landscape can be seen. However, as it remains a possibility, the two projects should consider the potential for unwanted impacts. An inland transmission line would be visible from the car park and interpretive centre of the proposed canopy boardwalk.
- 3.18.2 One submission⁸¹ pointed out that if the inland option is selected, then the H-Road would need to be upgraded and this might later provide tourist access to the World Heritage Area.
- This is unlikely for a number of reasons. Some potential reasons include public liability issues, lack of a clear destination, increased damage and maintenance requirements to the road and the presence of a small *Phytophthora* outbreak in this area.

Other Comments

- 3.18.3 A survey of tourism on the Tully River was reported⁷⁶. The Tully River is paralleled on both sides by transmission lines. The result of the survey was that tourists did not notice the line and considered that a natural experience was being delivered. As the road is narrow and lined with vegetation, it is difficult to see the lines even though they are very close to the road. The Tully River is also the principle visual focus of the trip and this draws attention away from the hills where the lines are located. Additionally, the alignment of the line is such that at no time is it possible to clearly see a cleared corridor from the road. This provides an example of how impacts can be reduced to a low level if the implementation of the line is correct.
- 3.18.4 Tourism bodies were consulted during the preparation of the Draft EIS and were invited to lodge submissions, however no submissions were received. -

See also Lifestyle/Quality of Life and Environment Topics.

3.19 OPPORTUNITY COST

3.19.1 Due to the on-going crisis in the sugarcane industry, a large number of farmers are actively considering diversification into other landuses. Some people within the area consider that the crisis in sugar is permanent and that the economic base of the area will have to shift away from sugar. Some properties¹¹ have undeveloped forested land which needs to be made economically viable. New developments within the region should not preclude development of new industries that presently do not exist with the region (eg. bamboo) or which are at an embryonic stage.

Bamboo and forestry within the easement would be incompatible with a transmission line, however most other agricultural products can be produced beneath or immediately beside transmission lines. Lower growing fruit trees and nuts may be compatible.

3.19.2 Bananas are the simplest alternative to sugarcane, however other crops, foliage/flowers, bush tucker, aquaculture and eco-tourism are also often seen as alternatives to cane. Construction of a line across a property may make it difficult to diversify into the production of certified organic bananas² due to EMF herbicide use associated with line maintenance. One submission explained that certified organic bananas are potentially much more profitable/viable than non-organic bananas, as they can be marketed in a separate category from the cheap bananas of the developing world^{11,12}. Another farmer⁹⁷ stated that he was considering moving into bananas, however loss of access to aerial spraying/fertilising would effectively prevent this change in landuse.

A special case may exist for boutique farms where the produce is sold to the public at the farms, as may be the case for bush tucker. These enterprises depend on the attractiveness of their settings to sell their products. Extra effort will be made to adjust the proposed transmission line to reduce conflict with areas that have been identified as boutique farming areas.

The Australian Quarantine Inspection Service (AQIS), which is the Federal Government agency charged with overseeing the organic industry, advises that there is no apparent justification for organic certification concerns from a National Standard perspective with respect to EMF or presence of HV lines. Similarly the major certifying agency, the Biological Farmers Association's standard does not implicitly exclude areas under or adjacent to HV transmission lines.

- 3.19.3 Fruit trees, including lychees, rambutan and possibly a range of other trees from durian to avocado are being planted on a number of properties. As fruit trees are taller than cane, line clearance is a concern, and it is feared that land within the easement may be lost to fruit production due to insufficient clearance^{53,63}.
- As identified in Section 13.8.3.3 of the draft EIS, growth of taller growing tropical fruit species such as lychee, rambutan and durians may be restricted under the transmission lines when the crops approach a mature height. Restrictions in placement of flying fox netting structures may also apply at this stage. For other species that are pruned to a lower height, and during the earlier cropping phase of the above species, this restriction is less likely. The resolution of this issue would be included in compensation arrangements on a case by case basis. Conductors can be raised over existing orchards to provide additional clearance, however this would not be implemented as a contingency measure, so definitive proof for intended orchards would have to be provided by potential orchardists.
- 3.19.4 A submission⁴² by a resident of the Tully area suggested that the cost savings of the coastal route would be largely offset by lost business to the skydiving industry which is particularly active in Tully.
- The potential for Tully to lose skydiving business depends on the position of the line near the aerodrome. As this is such an important issue, it will require considerable investigation into means for reducing impacts.

- 3.19.5 One submission¹⁶ speculated that the future of their land may be in production of beautiful rainforest timber and from the carbon credits that would apply to timber production. The implication being that a transmission line running through a property would interfere with a landholder's ability to undertake this land use. Despite a number of government initiatives to promote private production of rainforest timber, there is no indication that a viable industry will form anytime soon. Lack of farmer interest, no returns on investment for at least three decades, low prices, and lack of ability to guarantee supply to major timber users are key issues. At present, there is also no opportunity for making money from carbon credits as no markets have yet been established.
- 3.19.6 A number of landholders are attempting to move to ecotourism¹¹ or farm stays⁶¹. Opportunity costs could be significant to these ventures if the properties are close to the line or actually crossed by the line. Holiday houses and tourism ventures are particularly sensitive to visual impacts. Negotiations aimed at limiting impacts on potential ecotourism and farm stay areas will continue.
- 3.19.7 One submission⁹⁸ questioned whether landholders will be compensated for opportunity costs such as those listed above. Compensation would not be forthcoming unless the easement crossed the property and it could be proved that the proposed use could have actually been undertaken and was not prevented by the town plan or other government policies. Furthermore, it would be necessary to prove that the proposed use would be less profitable due to the presence of the transmission line. It would be matter for the court to decide. As the alignments for both options have been selected to avoid land identified as having development potential according to local government plans, this issue should not arise.

4.0 ASSESSMENT PROCESS ISSUES

4.1 CONSULTATION

- 4.1.1 A number of landholders claimed that they were not properly consulted^{35,98} or that people they knew of were not contacted/consulted⁵³. The consultation program undertaken was extensive including direct mail outs, newspaper advertisements, 1800 call in offers, 5 "drop in" days for face to face discussions, industry and local landholder and other stakeholder briefings. In addition submissions were requested and received from interest groups and landholders. It appears that all landholders along the preferred preliminary alignment have now been successfully contacted and submissions have been received from the landholders [53 and 96] who had previously not received correspondence.
- 4.1.2 Many stakeholders^{35,32} feel that the consultation process had not adequately captured their point of view. In a larger sense, many of the comments made seem to imply that landholders thought that the project is going to be pushed through anyway and that the consultation was only information dissemination, rather than a forum for negotiation on areas of concern^{87,91}. This response appears to arise in part due to only one coastal option being presented in a fully detailed manner in the EIS, thus giving the appearance that this will be where the line will go, if/when the coastal option is selected¹⁰². The purpose of the drop-in sessions was to provide an accurate as possible indication of what the transmission line options would look like. Naturally in towns along the coastal option, the discussion centred on the coastal option. This may have given the appearance that only one option was seriously being considered. The intent was to provide people with an opportunity to provide specific comments on the proposal. Due to the public perception (limited only) that the consultation process was flawed, a additional phase was commissioned using Dr. Mark Fenton. The results of this phase are presented in this final EIS.

4.1.3 Specific examples of the failure to capture community concerns are said to include lack of attention to items that were included in the revised ToR at the request of the Power to the People Action Group⁷⁴. One submission⁸⁸ was made by an agricultural adviser, who was not consulted during the preparation of the Draft EIS.

There was no bias against items added to the ToR by the Power to the People Action Group. If a legitimate issue was raised, it was investigated. However, the levels to which potential issues were investigated depended on a number of factors including relevance, significance and scientific tractability. It is possible that some of the issues were not discussed in detail for the above reasons. However, it was not clearly indicated in the submission which items were apparently not properly investigated and we therefore cannot respond specifically.

The final TOR was produced by an independent consultant based on all submissions received.

4.1.4 Some of the submissions stated that Powerlink representatives have shown a lack of empathy to landholders² and this left them with little confidence in the consultation process. Compounding this situation were lengthy silences on Powerlink's part, that left landholders wondering what was going on. Maps were said to have been few and far between in the early days. Landholders of ethnic origin who do not have strong english language ability were also said to be disadvantaged⁶³. Acknowledged. The community polarised on this issue very rapidly and this certainly made all subsequent consultation more difficult. Sources of frustration included the difficulty of educating the public about the complex design and regulatory limitations of the new line. Conversely, some landholders had difficulty in demonstrating the significance of potential impacts of a new line on their economic future and living environment. Adding to this situation is the considerable uncertainty about the future viability of the agricultural mainstays of the region. Many landholders actively looking for alternative income streams from their properties or being particularly wary of relatively minor losses of land or agricultural efficiency.

Despite the way the consultation process was perceived by some/many landholders, all of the landholder concerns have been taken on board. The lengthy silences were a result of not discussing matters until adequate research had been conducted and the alignment options progressed from a speculative stage to the relatively solid preliminary stage that was presented in the Draft EIS. This was essential.

Where language issues arose, interpreters were provided by Powerlink. In most cases, people of ethnic backgrounds seemed to be able to communicate reasonably well in english. We also consider that the high quality maps and illustrations provided in the draft, reduced the requirement for people to read the text to get an accurate idea of the proposals.

4.1.5 Avenues for consultation were criticised for various reasons. With regard to drop-in days, advertisements were too small and were in the wrong newspapers⁷. The computer based 3d maps and other graphic presentations were also criticised as being poor⁷ or inaccurate. The extension of the dead line for submissions to 12 weeks was said to have not been disclosed to the public⁷⁴. Some people who are not computer literate claimed it was too hard to obtain a paper copy of the EIS⁴².

4.1.6 The scope of the consultation process was also questioned¹²; 'why didn't it involve the wider community, not just landholders along the preferred coastal alignment'.

The project has had a high degree of coverage in local papers over the last three years. People have always had access to Powerlink and C&B Group during this period. It would have been relatively difficult for anyone in the area not to have become aware of the EIS process. However, we received very little community interest other than from people who were along the preferred preliminary alignment.

Maps, illustrations and 3d maps were state of the art technology. Each of these products could be zoomed in to 1000% to allow close inspection of places and objects, whilst remaining clear.

Approximately 30 paper copies were lodged with local libraries and interest groups. On the two occasions that paper copies were requested, they were supplied.

The wider community has always had opportunity to contact Powerlink or its consultants about their concerns. The drop in days were open for all to attend, similarly the draft EIS was available to all. In addition industry bodies were individually consulted and each made submissions on behalf of their members.

Letters were sent to landholders within the coastal study corridor who were not on the preferred preliminary alignment to keep them informed. These were not always appreciated. Care has to be taken when involving the wider community as this can needlessly create confusion and concern in the community. For this reason, more detailed consultation was targeted on those

most likely to be affected.

- 4.1.7 For some landholders along the preferred coastal alignment, an issue was not knowing the exact location of the preferred alignment and thus having difficulty in providing a specific response²¹. The purpose of the Draft EIS was to confirm which factors would be important in determining the final alignment. For this reason, only an indicative preferred preliminary alignment could be provided.
- 4.1.8 A criticism of the Draft EIS was that it did not define the rights of landholders or the avenues that they had for objecting²¹. Should a matter arise between a landholder and Powerlink that cannot be resolved, the matter could be taken to the civil court.

- 4.1.9 Public consultation that was reported in the Draft EIS did not include details of consultations with individual property owners because of confidentiality concerns. This was taken by one submission as non-disclosure of important information. A similar issue was raised in another submission⁸⁸, which quoted from the Senate Reference Committee investigation into Eastlink. The section quoted was about the apparent practice of Powerlink of holding discussions with individual property owners to negotiate offers, etc. This is said to have placed individual property owners at a disadvantage as they were ignorant of what had been said to neighbouring property owners and the offers made to other landowners. It appears that the core issue is that the lack of transparency in this manner leads some people to suspect that Powerlink may be swayed by the protests of more persuasive landholders into realigning the lines onto other properties.
- A number of people felt that due to the emotive situation surrounding the proposed transmission line, they could not express their true opinions in public. All opinions received have been reported in the Draft EIS, although in the interest of community harmony, the origins of some of the opinions expressed during preliminary consultation were not reported. It is imperative that discussions with individual property owners be treated as confidential. If owners feel the need to know what was discussed with their neighbours, it should be brought up directly with the neighbour.
- Consultation on the Draft EIS in the form of officially received submissions will be reproduced in full for attachment to the final EIS.

- 4.1.10 In a number of submissions^{42,59}, there were calls for the use of a more formal consultation process based on the use of sub-sampling of the community to ensure that all potentially affected groups had been reached. Groups identified in the census would form the basis of the sub-sampling methodology. The other key tool of a formal consultation process would be the use of community reference groups. The purpose of these groups, which would include community members selected to reflect the range of interests in the community, would be to assist develop weightings for subject areas that can later be fed into quantitative models to help select the best transmission line option. It was suggested that this part of the impact assessment be independently audited³⁹.
- All of these methods are sampling techniques to ensure that all sectors of the community have a chance to express their views. Furthermore, these methods mainly help to capture the views of members of the wider community who are not directly affected. In the case of the proposed transmission line, all landholders along the preferred preliminary transmission line have been contacted so the process would not improve the degree of contact with the most affected people.
- It is acknowledged however that the methods could have merit when used at the concept stage of transmission line projects. In this case, it would have been difficult to use this process as some community polarisation had already occurred and it would have been difficult for community reference groups operate in such an environment.
- 4.1.11 It was asked whether the submissions received on the Draft EIS will be forwarded in their entirety to Environment Australia and the Queensland Government²³.
- All submissions received on the Draft EIS will be forwarded to Environment Australia and the Queensland Government. All have been scanned and are available on CD.

4.2 BIAS/IMPROPER INTERESTS

- 4.2.1 A serious accusation was pointed at Powerlink by a few submissions. The accusation was that Powerlink had deliberately reduced maintenance to the existing line and allowed it to become run down to create a need for building a new transmission line.
- The two factors that limit the life of the existing line is the rusting of the foundation and the erosion of the galvanised coating of the towers. Galvanised coatings last for approximately 50 year before they erode to the point where the towers rust rapidly. Some experiments were conducted that involved painting over the galvanised coating, however these did not prove successful at slowing the aging process. The existing line is mounted on steel 'baskets' filled with earth. Rusting of these steel foundations is difficult to control as they are underground and inaccessible. Regular maintenance has been carried out in recent years to keep the line in service as long as possible.

- 4.2.2 A general conclusion is that the Draft EIS is weighed mostly towards acceptance of the coastal option, principally because of the priority given to WTWHA values rather than community values and concerns^{25,30,91}. Similar comments were that the level of scientific detail on the Kareeya-Innisfail option is much greater than for the coastal route and therefore biases the process¹¹. The impacts on farming have been summarised in a few paragraphs, compared with the [relatively voluminous] attention given to relatively minor ecological effects of the various route options²⁴. Some considered that the potential environmental impacts on the WTWHA had been overstated, for example claiming that the existing line is located in a cleared swathe, when most of it is really above the existing canopy⁹⁴.
- A detailed assessment of World Heritage Values was required to progress the inland option as a genuine alternative to the coastal option. For the inland option to be selected, it would have to be demonstrated that the World Heritage Values along the proposed route had been properly identified and that the project could be conducted in such a way that protects those values. Furthermore, it is a requirement that the worst case scenario for potential impacts in World Heritage Areas be presented, according the 'precautionary principle'.
- The section on potential impacts on farming was relatively light, but nonetheless comprehensive. The farming issues which were not complex issues unlike ecological concerns, could be discussed concisely. Following feedback from many of the farmers along the potential alignments, issues that may impact on farmers will be further highlighted in this final IES document.

- 4.2.3 A few of submissions stated that as Powerlink has a very clear preference for a coastal route, which was clear at the outset of the EIS process, it is questionable that the Draft EIS can represent an unbiased, impartial, objective and comprehensive review of the both options^{12,39}. There was also some suspicion that as Powerlink paid for the EIS, it got the outcome it desired⁹⁴.
- Biased work is vulnerable to being discredited and potentially rendered ineffective for the purposes of obtaining the necessary approvals. This is the worst possible outcome for both the proponent and any consultants who participated in the preparation of the work. An impact assessment must be impartial, independent and comprehensive to be acceptable to government regulators.

If Powerlink is required to choose the least cost option, then hasn't the decision in effect been already made?⁴⁰ One submission⁷² was of the understanding that if the proposed transmission line was completely new, it would be paid for by the State Government, however, if the proposed line is an upgrade, then it will have to be funded out of Powerlink's revenue. That would provide Powerlink with a powerful incentive to favour the coastal option. A similar claim⁴⁰ was the structure of performance bonuses paid to Powerlink executives, favour route option which results in the highest budget surplus - the coastal route.

Powerlink has the power to decide if the other regulators who have the power to decide choose not to do so, for example, the regulators may force Powerlink to decide by stating that either option would be acceptable if certain conditions were met.

Irrespective of whether the line is rebuilt on an inland or coastal alignment, Powerlink will receive income from this asset. Money is made available for both new and refurbishment projects.

- 4.2.4 A statement by a Powerlink representative was interpreted in the following manner⁴⁰: there is a set allowance for per kilometre for each category of line construction, as the coastal route would be cheaper, Powerlink would be able to make a surplus (ie. profit) if the coastal route was selected. Powerlink is confined by the electricity code to provide the lowest cost option.
- 4.2.5 The principle that any party with a vested interest should not take part in the decision making process may be violated as both Powerlink and the Wet Tropics Management Authority have the power to make a decision on which option proceeds⁴⁰. Both Powerlink and the Wet Tropics Management Authority would have to make a decision in accordance with the legislation that governs them. This does not constitute a vested interest in the normal meaning of the term.
- 4.2.6 According to one respondent, the Draft EIS has to be seen as a biased document principally because some of the authors past associations with government and conservation organisations in north Queensland and also including a possible vested interest in the outcome of the decision²¹. Another submission⁷⁴ referred to commitment from Powerlink to the WTMA in 1995 to remove the existing Kareeya-Innisfail transmission line from the WTWHA. The fellow in question was selected because he is one of the most experienced consultation specialists in the area. He had recently participated in the consultation process for the Marlin Coast electricity supply and was otherwise very familiar with the issue of the Wet Tropics region. No specific examples of bias or the copy of the commitment were provided.

- 4.2.7 One submission²⁵ considered that the Net Present Value calculations which were used to compare the total cost of options were biased, as they were based on engineering estimates of capital and operation costs only and did not include allowances for environmental and socio-economic costs.
- 4.2.8 Some submissions⁴², expressed a view, that the design of the proposed transmission line may be selected to enhance the value of the network, so that it is a more attractive prospect for privatisation - particularly to overseas interests.
- An estimate of all costs related to affected landholders was factored into the comparison. Compensation is calculated on a formula that included factors such as loss of property values, ongoing maintenance costs, loss of crops during construction and many other socioeconomic factors. These estimates were done to acceptable levels of accuracy but sufficiently accurate for comparison purposes.
- Under the current regulatory system, privatisation of Powerlink would not be considered in view of Powerlink's natural monopoly position in the electricity grid.

- 4.2.9 Numerous complaints about the conduct of Powerlink and its sub-contractors were submitted. The following text taken from the PPAG submission provides some insight into this issue. 'Within days of first being informed of the proposal to build a transmission line by letter, landholders were visited by two Powerlink representatives. Whilst landholders were still getting over the shock, Powerlink coerced landholders agreement to sign their access documents. The Power to the People Action Group (PPAG) was formed at this time following landholder alarm over the proposed transmission line. At no time was justification for the relocation of existing infrastructure provided, nor advice as to what evidence was placed before the regulator to justify investigation of the proposal. Affected landholders/PPAG were not provided with the original Terms of Reference (Sept 1999)⁷⁴.'
- 4.2.10 Many landholders are deeply worried that their comments will go astray and anecdotal evidence during recent weeks suggest that most residents were concerned that their support for reconstruction of the pre-existing alignment through 35 km of State Forest/WTWHHA would not be forwarded to the Federal Minister for the Environment⁷⁴.
- This matter has been investigated and no evidence of the alleged unsatisfactory behaviour was uncovered. Property owners were asked to sign permission forms to carry out various studies and surveys, but Powerlink strongly defends the claim that any form of coercion was used. The initial meetings were carried to inform property owners about the project and were intended to be only the first of such meetings.
- All of the original submissions were scanned and will be included in electronic form in full with this document. Cross references between this document and the original submissions will allow the minister or his representative to quickly refer to the original submission.

4.3 ISSUES NOT ADDRESSED

Impacts on Crops

- 4.3.1 One submission²¹ points out that the Draft EIS did not investigate the potential effects of transmission lines on bees and friendly insects. The economic future of the lands along the coastal route may lie in the introduction of new crops that need insects for pollination²¹. If insects are affected, this could result in a large economic impact over the life of the line.
- Sugar and banana crops do not need pollination. Some other potential crops are bat pollinated or moth pollinated including paw paw. The only bee pollinated crops that are likely to be grown in the area would be melons, pumpkin and some tree crops.
- Some impacts on bee hives under transmission lines have been reported, however the impacts were apparently related to the use of metallic frames within the hive. Use of non-metallic frames or placement of the hives further from the line solved the problem. Behavioural effects on bees due to EMF appear to be absent or minimal. (reference: National Research Council. 1997. An evaluation of the U.S. Navy's extremely low frequency communications system ecological monitoring program. National Academy Press, Washington, D.C.) Many honey producers deliberately place their hives in power easements.
- 4.3.2 Another submission⁷⁶ also referred to a mysterious suppression of growth of organic corn underneath transmission lines.
- The submission did not show that non-transmission line factors such as soil compaction or residual herbicide had been ruled out. Without additional information, this report can only be considered anecdotal.

4.4 ESD

- 4.4.1 The Draft EIS did not show a complete understanding of, or application of Environmentally Sustainable Development. Ensuring local economic and social sustainability requires studies into the effects of the proposed line on social infrastructure, including health, housing, public safety, family support, education, community development, culture and recreation, legal and public safety and community transport³⁹. Whilst the social issues that may have been impacted by such a project were addressed, further Social Impact Assessment work has since been undertaken and is presented in this final EIS document.

Traditional Owners and Cultural Heritage

- 4.4.2 Native title claims or potential native title claims are not identified along either the inland or the coastal routes³⁹. In general, although there has been some consultation with traditional owners, however some cultural heritage issues have not been raised and adequately dealt with¹⁰⁰. It is noted that Powerlink plan to undertake further consultation and cultural heritage investigations when details of the preferred route become available. Native title issues will be dealt with once the final alignment is known and easement surveys have been completed. Extensive traditional owner consultation has been carried out and detailed Cultural heritage surveys will be undertaken once the final alignment option is known.

Workforce

- 4.4.3 The Draft EIS provides a limited amount of information about the project workforce. More information should be provided on the following; staging and timing of construction during the project, likely workforce numbers, including peak numbers, the profile of the likely workforce eg. gender and age variables. Also, any new jobs that may be created and the type and duration of employment opportunities available and the availability of these jobs to local residents. Where will the workforce be housed? Additional details in relation to these issues is provided within the final EIS.
- 4.4.4 Forecasts of traffic movement due to the workforce should be improved for the inland option³⁹. Noted

Future Works

- 4.4.5 The Draft EIS does not seem to adequately cover the impacts concerning the future 275 kV line to be strung at a latter date⁶⁷. The 275 kV line will be strung at the same time as the 132 kV line due to safety issues and security of supply.

Unused Information Resources

- 4.4.6 The research being done at James Cook University and the Rainforest Cooperative Research Centre does not appear to have been included in the Draft EIS⁷⁵. Publications and reports from James Cook University were consulted and thoroughly processed and the relevant information included in the Draft EIS. Unfortunately, the research at JCU generally answered questions that were not relevant to the current project.
- 4.4.7 Draft EIS does not appear to have considered the compulsory (NRM) local government pest management plans⁸⁸. The pest management plans for both Johnstone and Cardwell Shires were consulted. Information from the plans contributed to the discussion on weed potential weed impacts.
- 4.4.8 Far North Queensland Regional Plan seems to have been only referred to in a superficial manner. There are many points that can and should be made about the plan and its implications for the proposed project⁴⁵. This plan provides strategic and generic guidance only and therefore it was discussed at this level.

- 4.4.9 Other information resources that were mentioned by submissions as not being considered in the preparation of the Draft EIS include:
- Nature-based recreation audit of Johnstone Shire.
 - Cassowary habitat mapping at Johnstone Shire.
 - Cardwell/Hinchinbrook Coastal Management Plan
- The habitat mapping for Johnstone Shire does not provide any new information or highlight any issues that have not been discussed for other reasons within the draft EIS. This mapping became available after completion of the draft EIS. The draft Cardwell/Hinchinbrook Coastal Management Plan was reviewed as part of the draft EIS, however given the strategic nature of the plan, specific assessments were not able to be provided. The implications for strategies relating to tourism promotion, visual amenity and other aspects of environmental protection were addressed in considerable detail.

Other

- 4.4.10 Potential impacts on recreational activities on the coastal lowlands has not been assessed⁷⁶.
- Use of local streams such as Liverpool Creek and Stewart Creek for canoeing and swimming were the only recreational activities that were specifically mentioned. These activities would not be affected.
- 4.4.11 There is no discussion in the Draft EIS on farm disruption and safety issues that would be likely during construction⁹¹.
- The draft EIS addressed aspects of potential farm disruption such as aerial spraying, harvesting, netting, tree crop heights (Sections 8.7.2,13.8.3, Annexure 12).Refer sections 3.6, 3.16 above.
- 4.4.12 A few submissions also considered that not enough information had been supplied to support alternatives other than the two main options presented in the Draft EIS^{90,97}.
- An alternative alignment was included in the major Power to the People Action Group. This alternative is discussed in the 'New Alternatives Section". No other potential alternative alignments were described in the submissions.

4.5 REGULATORY ENVIRONMENT

EMF

- 4.5.1 Energex Queensland were subject to a court ruling limiting exposure to magnetic fields to 4 milligauss at a new substation proposed for Logan, near Brisbane. This would seem to provide a new definition for Prudent Avoidance⁹. Whilst other submissions did not refer to any particular level of electric or magnetic fields, there was a feeling that the proposed transmission line did not comply with the prudent avoidance principle that has been adopted by the Australian electricity supply industry²⁵. One submission⁸⁸ pointed out that it might not be possible to apply this principle in practice in relation to farmers, as they cannot prudently avoid working under transmission lines.
- Prudent avoidance relates to “living’ and regular ‘working’ environments (houses, schools etc). The preliminary coastal alignment complies with this avoidance.
- There is no new scientific justification for a 4 milligauss standard.

Local Government

- 4.5.2 The Shire Plans place development restrictions on some zones, and it offends some stakeholders⁷⁶ that Powerlink does not seem to be bound by these restrictions. An example from Cardwell Shire of a prohibition on the building of structures that can be seen from outside the property was provided for an area where the use of tall (visible) towers is likely⁶³.
- Powerlink designs transmission lines according to a design manual that they have developed over a number of years to minimise impacts. This code is quite comprehensive and provides details on how to reduce impacts in a great variety of situations. The central tenet of the code is making transmission lines as unobtrusive as possible and many examples are provided on how visual impacts can be reduced. So although the transmission line is not bound by shire plans, it is designed according to a code that honours most of the same principles.

- 4.5.3 Under the proposed changes to the Johnstone Shire Town Plan, some proposed/current business ventures¹¹ would qualify as a "sensitive receptor." The JS Town Plan is likely to be adopted about Sept 2003 - after finalisation. If the proposed change is included in the final plan, the implication of being a sensitive receptor is that code assessment of the proposal would be required if the proposal (transmission line) is less than 300 m away from the sensitive receptor. As the proposed line will be deemed community infrastructure, the line will be exempt from assessment under shire assessment codes.
- 4.5.4 Johnstone Shire Council suggested that the proposal should be dealt with under the Integrated Development Approval System with council and assessment manager⁵¹, to facilitate more community involvement in the process. This would not be possible as the preliminary coastal route spans two shires (Johnstone and Cardwell). The inland option passes through four shires, Johnstone, Cardwell, Herberton and Eacham Shires. The ministerial designation exemption in the IP Act is designed for such community infrastructure projects that span more than one shire, however the Minister must consider local planning schemes in the decision making process.

Electricity Market

4.5.5 The conservation movement had serious objections with the regulatory framework that governs the range of options that were considered in the Draft EIS. According to the thinking of Cairns and Far Northern Environment Centre (CAFNEC) and the North Queensland Conservation Council (NQCC)⁷⁸, the regulatory framework that governs the electricity industry has resulted in the development of a relatively polluting and wasteful energy industry. The existing framework furthermore makes it hard to apply holistic measures to improve the environmental performance of the electricity supply system. Specific comments were:

This topic is beyond the scope of the EIS and should be raised in other forums.

- the use of averaged transmission losses fails to properly account for the higher transmission losses and environment impacts on long distance transmission lines; and
- fragmentation of the electricity supply industry into 4 sectors (generators, transmitters, distributors and retailers) has meant that demand management has become harder to achieve.

4.5.6 CAFNEC and the NQCC support the following reforms to the National Electricity Market (NEM):

This issue also seems to be outside of the scope of this EIS and should be addressed in another forum.

- Full environmental and social costs to be factored in

the price of electricity in the NEM;

- Improving the reliability of supply by using demand management to promote energy efficiency and distributed supply;
- Increasing energy efficiency to lower end-use energy costs in areas with high electricity costs;
- Analysis of opportunities in demand management, compared with whole-of-system supply costs from existing electrical industry.

- 4.5.7 Improving the efficiency of the region's energy systems and reducing the region's per capita demand are also stated goals in the Far North Regional Plan³⁹. The use of larger conductors and higher voltages (275 kV circuit) will result in small gains in the efficiency of the transmission network.
- 4.5.8 Another submission asks for the technical and environmental constraints of the NEM code to be explained⁴⁵. Information on the National Electricity Market is available on the Internet. Use a search engine to find "National Electricity Market"

Wet Tropics World Heritage Area

4.5.9 A certain amount of angst was directed toward the Wet Tropics Management Authority due to the powers it could exercise to influence the option that is selected⁸⁸. Statements made in submissions include, "the WTMA has a view and it should be considered, however the final decision cannot be left just to that body⁴⁰". Also, "we see scattered throughout the draft EIS, evidence of the influence of WTMA, for example, 'Other potential alignments though the Wet Tropics World Heritage Area have been ruled out by WTMA on the grounds of unacceptable levels of impact.'" Although one submission⁴⁵ states that WTMA cannot rule out any options - they can only provide advice on the interpretation of the Act.

The Wet Tropics Management Authority (the Authority) has a statutory role to assess any application to construct a powerline anywhere within the WTWHA. Powerlink have applied to the Authority for a permit to construct a powerline in the WHA on an alignment generally adjacent to the existing 132kv line. The Authority has asked for additional information to allow consideration of that permit application. The information request is for more details about the preferred alignment, about prudent and feasible alternatives and more specific information about the likely environmental impacts related to construction.

The Authority has no official position on the proposed replacement transmission line other than to ensure that the statutory requirements set out under the *Wet Tropics Management Plan 1998* (the Plan) are met to ensure a proper decision is made on the application.

Once Powerlink has produced a Final EIS which meets the Terms of Reference, the Authority will undertake an assessment of the likely impacts based on the principles and criteria for deciding permit applications which are set out in the Plan. Once that assessment has been completed by Authority staff, the Authority's Board will decide the application, either issuing a permit (with conditions) or refusing the permit. In making a decision the Authority must state the reasons for the decision and inform the applicant, in this case Powerlink, of review and appeal provisions.

4.5.10 There are also some variations on the interpretation of two key WTMA policies:

- allowable uses of zone C; and
- "no net loss".

Reference⁷⁴ is made to former Federal Senator Richardson's press statements to gain public support for initial World Heritage listing of the Wet Tropics, which included an assurance that existing water, road and electricity infrastructure would remain within the WTWHA if that is where they were. These existing transmission lines are located in Zone C. This view arises in part as some people⁸¹ see the construction of a new line along the existing Kareeya-Innisfail alignment as continuation of an existing lawful use that it should not be viewed as a new infrastructure project. If this were the case, then EPBC Act assessment would not be required either.

4.5.11 If the inland route is selected and the existing cleared corridor is revegetated as is proposed for this option, then that should not satisfy the 'no net loss requirement'. If it does not quite meet the standard of 'no net loss', would compensatory habitat in some other area be able to make up the amount by which the inland option would fall short of 'no net loss'.

Significant upgrades to infrastructure are not considered a continuation of an existing lawful use. A number of highway upgrades have recently been undertaken or proposed within the WTWHA and these have all had to apply for a permit to conduct works within the WTWHA. The proposed transmission line is being treated in a manner that is consistent with this policy.

The standard required in the ToR is a 'net benefit' to the Wet Tropics World Heritage Area and this relates to rehabilitation of existing impacts and improvements in the integrity of the WHA. This is a higher standard than 'no net loss'. The term 'net benefit' has not been defined specifically with respect to this project and it is therefore difficult to determine what needs to be done to reach this standard. Rehabilitation of the cleared corridor would be mandatory, however creating benefits to outweigh vegetation clearing for new tower sites and track

upgrades would become a key issue.

Permits

- 4.5.12 Another regulatory mechanism that may result in transmission lines being placed over farms is the current NRM policy that will only place public utilities over forestry reserves when all available freehold/leasehold options are exhausted⁸⁸. This issue will probably not be encountered as all forestry reserves are avoided by the proposed options. The closest forestry reserve to the preferred preliminary alignment that is not part of the WTWHA is on the Basilisk Range and this reserve has been skirted to avoid areas of very difficult terrain.
- 4.5.13 A number of regulatory agencies and interest groups provided reminders of relevant rules and regulations that must be complied with. Main Roads reminds Powerlink that approval is required for access tracks that join onto state controlled roads. Approvals required by other departments include approvals under the Water Resources Act for works in waterways, approvals under the Lands Act or Vegetation Management Act for clearing of native vegetation that it protected under the relevant Act⁸⁴. As the Department of Natural Resources and Mines has responsibility for enforcing weed control, they have requested a pre-construction weed survey to ensure weeds are not spread from existing infestations into weed free areas. Queensland Fruit and Vegetable Growers are concerned about electrocution risk and requested that line heights and safety clearance be in accordance with the National Guidelines for Safe Approach Distances to Electrical Apparatus. The laws and approvals section will be updated where require to emphasise the points raised by the regulatory authorities.

- 4.5.14 One submission⁸⁸ suggested that a 'community bond' be placed on Powerlink to ensure sound environmental management. A bond would not be necessary to ensure a high standard of environmental management. Poor environmental management results in a costly project as it results in erosion, weeds and poor community relations. Powerlink is very pro-active in areas of environmental management as this is the best method of keeping costs low over the life of the project.

Other Topics

- 4.5.15 Some respondents referred to other Acts that should have been discussed in the Draft EIS. Some stated that the Walter Hill Range (Mt Myrtle) area was somehow protected under the Coastal Protection and Management Act 1995^{63,96}, or the Cardwell/Hinchinbrook Coastal Management Plan. Another stated that no mention had been made of the Quarantine or Plant Pest Control Acts⁹¹. A search of these Acts and documents will be made and any relevant material added to the final EIS.
- 4.5.16 With respect to the Controlled Action status of the proposed project under the Commonwealth Environmental Protection and Biodiversity Conservation Act, it was commented by one stakeholder⁷⁶ that the triggers were slanted toward World Heritage and EPBC Act triggers that would apply to coastal option were not defined and probably overlooked. The Terms of Reference require a comprehensive study of issues for both options, including all matters that would be potential triggers for the EPBC Act. The draft EIS clearly acknowledges the listed threatened species may be encountered on the coastal option (eg. Sections 25 and 10.3.4.1) and assesses potential impacts of the proposal and lists management/mitigation measures.

Access for Construction and Maintenance

4.5.17 Access tracks to towers and construction sites were of concern to a number of landholders^{22,44}. The location and alignment of the tracks with respect to farm layouts was an issue, especially when towers were located deep within farms. If deep farm drains dissect the farm, then access tracks may have to cross other blocks to avoid the drains and the respondent is concerned that the access track related impacts on these other blocks will not be compensated^{91,97}. A general request was made for details on the location of access tracks onto properties¹¹ that will be used for construction and maintenance. Clarification on whether access be required along the easement (as opposed to just tower positions) is also requested.

Access tracks along the easement are generally not required if lower impact tracks are available. Should a neighbouring property be required for access, an access easement is generally put in place, which entitles the owner to compensation. Access across drains is generally avoided if possible.

- 4.5.18 The issue of who will be responsible for maintaining the tracks and managing environmental/agricultural impacts was also raised. A potential for damage occurring to farms [not specific] was mentioned, if access tracks were used when cane had grown tall and crowded the track³¹. Mechanisms for damage included high rainfall and rate of plant growth. Generally, access tracks should be avoided at all costs, due to associated erosion and weed issues³⁴. Water run-off, soil loss and transport of pesticides into environmentally sensitive areas is also a consideration⁶⁷. Access arrangements will be negotiated with each individual property owner. Maintenance of tracks during construction will also be negotiated with owners. Access for maintenance will be very infrequent. Inspection of tracks will be made bi-annually and any damage/ erosion problems repaired. The line will be inspected twice per year, once from helicopters and once from a 4WD vehicle.
- 4.5.19 Destruction of crops within the easement or access tracks did not appear to be covered in the Draft EIS⁶³. This may occur if the final alignment is decided after crops have been planted or when emergency access is required. Other issues that did not appear to be covered were soil compaction due to heavy machinery and damage [gaps created] to wind breaks due to access tracks. Any damage to crops and fauna will be fully compensated.

- 4.5.20 A particular point of concern was the access tracks required for the Walter Hill Range near Mt, Myrtle. Potential impacts were listed as increase run-off and erosion, disturbance of cassowaries and other fauna, especially during the breeding season. The same submission⁶³ also assumed that the access track would follow the easement, even in areas of rugged terrain and that a cleared corridor would also be used for crossing over rainforest hills on the coastal alignment. There will be no cleared corridor through this area. The line will be predominantly strung over the canopy. Access tracks will not follow the easement, but will use best available topography and in this area, old logging tracks.
- 4.5.21 Main Roads stressed that access tracks entering roads could also result in short and long term traffic hazards, particularly where they are incorrectly located with poor visibility from the road³⁴. This will be negotiated with the Department of Main Roads at the time.

4.6 PROCESS AND TIMING

4.6.1 Key questions relating to process and timing were:

- When will tower locations and conductor heights be known⁴⁵.
- Which surveys have yet to be carried out [cultural heritage, detail botanical surveys etc.] and when will they be carried out.

These details will be known after a decision on the route option and alignment is made. Ground profiles of the centre line will then be determined to facilitate tower design and location. Final tower locations will also be determined after detailed vegetation surveys in such areas.

Cultural Heritage surveys will be carried out once a final alignment has been proposed. Alignment modifications may be necessary as a result of the CH surveys, however this is unlikely. Most archaeological finds can be dealt with through documentation and removal under EPA approval. Further botanical studies will also be carried out once a final alignment has been proposed.

4.6.2 Some confusion exists regarding the process that will take place following the closing of submissions on the Draft EIS. The areas that need to be clarified include:

- Will stakeholders get a chance to comment on the final EIS or on an addendum to the draft EIS that includes responses to submissions?²² No this will not be available.
- Will there be further opportunities for consultation, particularly under the Community Infrastructure Designation process (D. EIS Section 4.2.3)³⁰? The minister calls for public comment as part of the Designation process.
- Has the community lost opportunities for making further submissions when Powerlink applies for approvals under the relevant acts⁷⁶ due to recent changes in these acts.

4.7 METHODOLOGY

The information for this section were derived from reviews of the Draft EIS conducted by Canegrowers, Department of Families, Environment North, Cardwell and Johnstone Shire planners and the Power to the People Action Group. No submissions about methodology were received from individuals or other groups.

Terms of Reference

- 4.7.1 Were the two Terms of Reference combined and what methodology was used to do so?⁷⁶ Under Queensland legislation, the coastal TOR was used to develop the inland TOR. As the inland TOR included all issues it was used for the entire project. Under the Federal EPBC Act, a separate TOR/EIS Guidelines were developed for the whole project which was designed by Environment Australia to be complementary with the State TOR.

Resolution of Data Presented

- 4.7.2 Each farm should have been presented individually in the report together with the potential impacts on the farms assets and operations and the measures adopted to try and minimise those impacts³⁹. The alignment has not been finalised so impacts cannot be known on a property by property basis. EIS's do not get down to this level of assessment.
- 4.7.3 The logic of making up a composite species list [for inland option] was also questioned, as smaller site specific lists provide more information⁴⁵. Site specific lists will be collected as appropriate once an option has been selected
- 4.7.4 One submission⁷⁶ noted that cost-benefit analysis cannot deal with non-quantifiable costs and benefits, which makes it limited in its application. There are no rigorous models available to improve substantially on the environmental cost benefit approach adopted.

Social Impact Assessment

4.7.5 Much of the criticism is part of a general attempt to raise the awareness of the need for social impact assessment techniques with the consultants and engineers that produce Environmental Impact Statements. These groups seem to be more orientated toward the economic and environmental aspects of projects and are seen as relatively inept with the assessment of social environment. Social Impact Assessment in its current state of development is a relatively new field, and its methods and role in the EIS process are not yet widely understood. A Summary Social Impact Assessment has been undertaken and is presented in Annexure .

4.7.6 The Draft EIS came under heavy criticism³⁹ with respect to the methodology used for social impact assessment. The main issues that were identified included: Refer to the Summary Social Impact Assessment in Annexure .

- No structured methods and procedures used for the identification of issues and therefore there was no certainty that the issues of each interest group had been identified;
- Consultation was only a method of data gathering [when it could have been a process which allowed community involvement in the selection of the alignment and tower positions/design]; and
- A lack of case studies and profiles.

- 4.7.7 Demographic information had been assessed at Local Government Area level, however the question was asked³⁹, why hadn't demographic analysis been undertaken on the finer level census collection district data. A recommendation was that a social assessment based on census collection district data be undertaken for both options. Evaluation of the potential social advantages and disadvantages was not adequate. Description of potentially affected population was not adequate, particularly for the inland option. Refer to the Summary Social Impact Assessment in Annexure.

Evaluation of Options

- 4.7.8 The method by which the preferred preliminary alignment was selected was also criticised, the gist of the criticism being that all potential options should have been assessed in exactly the same way and the results lined up side by side so that a direct comparison of options could be undertaken. More formally, this style of assessment is referred to as a multi-criteria decision support system. This style of analysis includes both quantitative and qualitative social indicators. This was the purpose of the Corridor Selection Report. It was a type of multi criteria analysis system that looked at every possible route through the study area. It included a large range of subjects and was quite comprehensive in its treatment of these matters. The result of this process and any other similar multi-criteria analysis is a broad corridor or a number of variations along a broad corridor. It is not possible to progress to a final alignment based on these processes. For that, an EIS process which is more flexible and which has greater ability to deal with specific contexts is required.

- 4.7.9 Some of the options were investigated in the Corridor Selection Report (CSR) that preceded the Draft EIS. The issues^{39,45} with the CSR were:
- Only the results were presented and the input thematic maps were not included;
 - The lack of application of social impact assessment at this early phase means that the reader has to trust thematic layers used to represent the full range of issues; and
 - The CSR style corridor selection process was performed for the coastal option only.
- The thematic layers that form part of the CSR report can be viewed on request. The layers were not included in the Draft EIS as it would have required approximately 40 A3 colour sheets to do so. Furthermore, inclusion of these sheets was not considered necessary as the CSR report was not a critical part of the Draft EIS - it was included for background information only.
- The methodology for the creation of the thematic layers was fully described. If there was an issue with the methodology, then this should be apparent from an analysis of the methodology.
- The coastal option assessment focussed on narrowing down the range of possibilities to a final alignment, whereas the inland option was a re-evaluation of the existing alignment. As the inland option was already at the point where a CSR type process finishes off, undertaking such a process would have been of limited usefulness. Despite the above, some thematic layers similar to those used in the CSR report were used by Powerlink to assist with the delineation of a revised alignment. Special attention was given to the layer showing the distances of buildings from the existing alignment.
- 4.7.10 It was questioned whether the cost benefit analysis included all the relevant costs and whether particular costs had been included was not always clear. Examples of costs that did not appear to have been covered included the cost of revegetating the existing cleared corridor through the rainforest, costs of compensation,
- It is the nature of environmental cost benefit analysis that many parameters are currently unable to be accurately quantified therefore they could only be assessed qualitatively, which can make comparisons difficult. An allowance for landholder compensation was included in the Powerlink costings for both options, however for commercial reasons it was not itemised.

cost of fine tuning alignment to fit in with existing landuse and cost of social mitigation strategies. The cost benefit analysis did not appear to allow direct comparison of both options.

The existing inland corridor would be revegetated under either option, therefore costs for revegetation were not included. It is likely that social mitigation strategies would be more complex for a coastal route, however this would be difficult to quantify.

Environmental Values

4.7.11 The Draft EIS does not indicate whether the environmental values that were identified are important on local, regional or national scales⁴⁵.

see Section 3.4

4.7.12 Most recent vegetation mapping was not presented in the Draft EIS⁴⁵ and the discussion of vegetation values is based on older Webb-Tracey mapping which has no legal status under the Queensland Vegetation Management Act 1999.

The interim Wet Tropics coverage was not officially released until 15 January 2002, which was days before the release of the draft EIS. Despite the use of Webb Tracey mapping, all of the Regional Ecosystems present along the coastal route option were correctly identified and the issues associated with the vegetation types discussed.

4.7.13 Some of the features which can make vegetation significant appear to have been overlooked, these include vegetation that is at the edges of its range, and vegetation of evolutionary significance⁴⁵. In a landscape with a high biodiversity, there will nearly always be species present that are at the edges of their range. Analysing the geographic range of organisms in the draft EIS would have complicated matters without providing much additional insight. Organisms with special habitat requirements and locally restricted organisms are the only organisms for which attention has been focused for geographic reasons.

The analysis of Wet Tropics Values provides a quite comprehensive list of vegetation that is considered to have evolutionary significance. Some of these values also apply to the Walter Hill Range section of the coastal route.

- 4.7.14 The fauna investigation appears to have been generic and does not include all available information on cassowaries⁴⁵. As such it was claimed to be suitable only for route selection studies and not a final EIS. Cassowary issues were covered leading cassowary researchers, Scott Burnett and Francis Crome. Professional ornithologist David James also spent approximately seven field days looking for significant wildlife along the inland option. If there was a storey to be reported, it would have been. The fundamental problem is that there is very little known about cassowary populations along the line. For example, the cassowary population of the Basilisk Range is variously estimated to be from 6-30 birds and the even then there appears to be no convincing basis for these estimates. A preliminary draft of the cassowary habitat map was made available just prior to release of the draft EIS (courtesy of the Qld EPA). However, it basically indicated that all tracts of forest were cassowary habitat and did not identify any hot spots or critical resources. As such, it did not advance understanding beyond what had already been written in the Draft EIS.
- 4.7.15 The names and roles of specialists who have contributed to the investigations present within the Draft EIS should have been provided⁴⁵. This was provided in the draft EIS.

Cultural Values

- 4.7.16 Although the Draft EIS states that a detailed assessment of cultural heritage issues will be done once the route option has been determined, by removing cultural heritage as a constraint at the corridor selection stage, there is no possibility of optimising the route to meet this very important criteria⁵⁹. Although the corridor may have sufficient flexibility to avoid specific cultural heritage objects, aboriginal cultural values include places and associations. That no field work was undertaken was considered unacceptable. This methodology was discussed and agreed with all interested TO groups.

Further Works

- 4.7.17 There is a requirement for further studies of various kinds before a final alignment can be justified, however no firm plan was provided which indicated the plans that were going to be undertaken. Noted

4.8 FEEDBACK ON DOCUMENT

This section contains criticisms of the Draft EIS document itself. It is not intended to cover any real world issues, as these have been discussed in other sections. A related section is bias/improper interests.

Compliance with ToR

- 4.8.1 A few submissions^{76,100} report that the Draft EIS fails to provide a clear, comprehensive and concise set of findings to justify the project proceeding as is required by the ToR. This includes the selection and justification of a preferred option and reasons for rejecting alternatives. The scope of the information present in the Draft EIS was also said to be wanting, as a comprehensive analysis of all prudent and feasible alternatives to the transmission line alignment through the Wet Tropics World Heritage Area was not provided. A comprehensive analysis of all alternatives was presented however as some of these decisions were carried out earlier in the electrical planning process, such as in precursor studies like the Corridor Selection Study, they were not able to be assessed in the same fashion as the preliminary coastal and inland routes.
- 4.8.2 As stated in the ToR a checklist demonstrating compliance with the ToR should have been provided in the Draft EIS¹⁰⁰. This will be provided in the final document.

Information Resources

- 4.8.3 It was strange that the Draft EIS used older broadscale soils mapping, when more recent mapping by CSIRO/DPI is available⁸⁴. To support the discussion on water quality, some water quality data would have been useful⁴⁵. Data available at the time was sourced from the various agencies.
- 4.8.4 A more substantial review of the Far North Queensland Regional Plan was requested in a number of submissions^{45,100}. The FNQ Regional plan section in the final EIS has been expanded.
- 4.8.5 The following information resources should be included in further studies conducted: These dataset have been obtained and relevant information moved to the EIS.
- Nature based recreation audit of Johnstone Shire.
 - Cassowary habitat mapping at Johnstone Shire.
 - Cardwell/Hinchinbrook Management Plan

Information provided in Draft EIS

- 4.8.6 Actual methodology for the construction of the proposed transmission line project should have been used rather than a general description of transmission line construction⁴⁵. Similarly actual tower heights in various places should have been indicated³⁹, particularly maximum and minimum heights. Proposed towers should have been contrasted with existing towers.
- 4.8.7 More information on impacts to aboriginal people, should have been included⁴⁵.
- 4.8.8 Some of the interpretation of environmental impacts within the Draft EIS should have been more cognisant of the precautionary principle, rather than just assuming that species and ecosystems could tolerate the levels of disturbance associated with the proposed project¹⁰⁴. A similar comment was made about the assessment of visual impacts, that the issue will not be resolved by implying that people will become accustomed to decreased levels of visual amenity.
- Construction techniques for transmission lines are quite generic and actual transmission line construction is expected to closely agree with the generic description provided. Actual tower heights will only become available once detailed design has taken place.
- Special procedures are in place to ensure effective consultation with aborigines, however many of these procedures will only come into play once an option has been selected.
- Noted.

4.8.9 The general organisation of information in the Draft EIS was thought by some of the reviewers to be somewhat disorganised and repetitive⁴⁵. It was also stated that some of the material presented was not supported by references to base information¹⁰³. Useful information contained within the technical annexures was sometimes not brought forward for inclusion in the main body of the text⁴⁵ which seemed to run counter to the requirement in the ToR for the Draft EIS to be a stand alone document¹⁰⁴. Inconsistencies in the use of names and abbreviations within the document were also pointed out and it was suggested that more standardisation in this area would have been appropriate.

A number of these matters have been attended to.

- 4.8.10 The Draft EIS also presented information in a manner that prevented side by side comparisons of options, and could benefit from a reorganisation to bring such information into one location¹⁰⁰. A comprehensive analysis of all alternatives was presented however as some of these decisions were carried out earlier in the electrical planning process, such as in precursor studies like the Corridor Selection Study, they were not able to be assessed in the same fashion as the preliminary coastal and inland routes.
- 4.8.11 With respect to the inland/coastal options, it was suggested¹⁰⁰ that the level of information presented for each option should be comparable. Furthermore the information should be presented in one place in the EIS document and should be synthesised into a form that allows for comparison of alternatives (table format if possible). Synthesis of the findings and clear reasons for rejection of alternatives also need to be included. Others have requested that the scope of investigation should ensure that all potential options are fully explored and that cost should not be the sole criterion by which the final decision is made⁷⁶. Refer above
- 4.8.12 The degree to which the Draft EIS complies with the Terms of Reference (ToR) has been questioned by a number of submissions¹⁰⁰. One of the requirements in the ToR is that a checklist be provided, that shows that items in the ToR have been addressed, yet no checklist was provided. This a subjective assessment depending on the agenda of the reader. Noted

- 4.8.13 The Draft EIS should have been a stand alone document that does not require the reader to search out previous or supplementary reports⁴⁵. The authors believe that the draft was a stand alone document, furthermore is considered that the technical annexures were an integral part of the draft EIS and were available without searching.
- 4.8.14 Methodology and names of researchers is often not stated⁴⁵. In most sections of the text this was clearly stated.
- 4.8.15 Valuable information in the technical annexures is often not carried forward for discussion in the main text of the Draft EIS⁴⁵. In the interests of readability and conciseness, this is not always possible.
- 4.8.16 More summaries and interpretation of information presented is required at the ends of major sections. For example, a table comparing the length of line, numbers of towers etc would help to make the argument⁴⁵ [for the preferred option]. Such a table was presented on the conclusion and executive summary sections.
- 4.8.17 A large number of submissions thought that the costing information for the various options were not accurate enough⁴⁵. Costings were audited by an independent party.
- 4.8.18 Many issues are lumped under Quality of Life/Social Issues and this section is given little more than a cursory note in one paragraph³⁹. Refer Summary Social Impact Assessment.

4.8.19 Regarding the fauna section, spectacled flying foxes are listed as Vulnerable under the Environmental Protection and Biodiversity Conservation Act and this should be stated¹⁰³. Waterfall tree frog and the endangered common mist frog should be added to the species list. The Australian lace-lid frog is also classed as endangered, rather than rare. A few of the species listed are probably not present and should be taken off the list. Noted

CSR Report

4.8.20 Individual constraint layers were not provided for the Corridor Selection Report by Hyder, even though these were in the original report⁴⁵. The 'traffic lights' table in the summary of the CSR report does not include figures that allow quantitative comparison of options. These layers were numerous and too cumbersome to present in the draft document. Because of the highly subjective nature of many of the constraints assessed, depending on the agenda of the assessor, a quantitative methodology was not adopted.

Railway Report

4.8.21 It would appear that most of the constraints mentioned in the four pages of text are manageable and may be overcome with appropriate deviations and Queensland Rail cooperation. The senior officer who presented Queensland Rails view should be identified¹⁰³. This section was based on the views of the Department of Transport, not a single officer. The constraints discussed are very significant and not easily overcome.

4.9 OPINIONS

A variety of comments were included in the submissions received from stakeholders. Rather than summarise these, we have decided to include these in full.