IsaLink

HVdc Transmission Project

Initial Advice Statement

January 2008

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List of abbreviations and glossary

CKI	Cheung Kong Infrastructure Holdings Ltd
DEWHA	Australian Government Department of Environment, Water, Heritage and the Arts
EM Plan	Environmental Management Plan
EPA	Environmental Protection Agency
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
HEH	Hong Kong Electric Holdings
HVdc	High Voltage direct current
IAS	Initial Advice Statement
IPA	*Integrated Planning Act 1997*
Km	Kilometres (or 1 thousand metres)
kV	Kilo Volts (or 1 thousand volts)
M	Metres
NEM	National Electricity Market
NES	National environmental significance
RE	Regional Ecosystem
SDPWO Act	*State Development and Public Works Organisation Act 1971*
ToR	Terms of Reference
VMA	*Vegetation Management Act 1999*

1. Introduction

1.1 Project overview

IsaLink Pty Ltd is proposing to construct a high voltage direct current (HVdc) transmission line to connect Queensland's North West Minerals Province (NWMP) to the competitive National Electricity Market (NEM).

Stage 1 of the Project, which this IAS addresses, involves the construction of 1100 km of transmission line to Ernest Henry Mine, a converter station (at or near the mine), a converter station at the connection to National Grid and an upgrade of the existing AC line between Ernest Henry and Mount Isa. Stage 1 is a stand alone project for which a declaration as a 'significant project' under Section 26(1)(a) of the Queensland State Development and Public Works Organisation Act 1971 will be sought and for which referral under the Commonwealth Environment Protection & Biodiversity Conservation Act 1999 will be undertaken.

The line will also have the potential to be extended to serve key economic centres in the Northern Territory. If under Stage 2 the transmission line were to reach Darwin, in the NT, the route length would be approx. 2,700 km in length and would require either one or two converter stations in the NT. Development of Stage 2 of the Project will require a separate impact assessment.

1.2 Project proponent

IsaLink Pty Ltd (IsaLink) is the proponent for the Project supported in this endeavour by Cheung Kong Infrastructure Ltd (CKI) and Hongkong Electric Holdings Ltd (HEH).

CKI and HEH will own a majority share of IsaLink. Both CKI and HEH are members of the Cheung Kong group of companies, and are listed on the Hong Kong Stock Exchange. CKI and HEH are also majority owners of Australian electricity distributors, Powercor, CitiPower and ETSA Utilities.

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1.2.1 Cheung Kong Group

The Cheung Kong Group will be the majority shareholder in IsaLink and has a combined Market Capitalisation of HK$980 billion. The Cheung Kong Group and its subsidiaries have more than A$6 billion invested in Australian infrastructure, much of it in utilities.

Cheung Kong Infrastructure Holdings (CKI) is the infrastructure investment arm of the Cheung Kong Group and is the largest publicly listed infrastructure company in Hong Kong based on a market capitalisation of HK$55 billion. CKI manages over A$33 billion in utility and infrastructure assets globally and has ownership and expertise in electricity, water, gas,

transportation and related businesses. Hong Kong Electric Holdings (HEH) is also part of the Cheung Kong Group. HEH is the holding company of The Hongkong Electric Company, Limited (HEC), Hongkong Electric International Limited (HEI), Associated Technical Services Limited (ATS) and a number of other subsidiaries.

Founded in 1889, HEC is responsible for the generation, transmission and distribution of power to Hong Kong Island and Lamma Island. Today, HEC's power station on Lamma Island has a total installed capacity of 3,755MW, serving more than 550,000 customers with a supply reliability rating of 99.999%, a record since 1997.

1.2.2 Powercor/CitiPower

Powercor Australia and CitiPower are 51% owned by CKI and HEH, which form part of the Cheung Kong Group of companies. The remaining 49% is owned by Spark Infrastructure. Spark Infrastructure began trading on the ASX in December 2005.

Powercor Australia is Victoria's largest electricity distributor, which supplies electricity to regional and rural centres in central and western Victoria, and Melbourne's outer western suburbs. Powercor services more than 662,000 distribution customers, and has three successful non-regulated businesses:

- Network Services, an engineering, design and construction services company
- Powercor IT, an information technology services company
- Customer Services, a customer service business providing services in the contestable market.

CitiPower supplies electricity to approximately 295,000 distribution customers in Melbourne's CBD and inner suburbs. The company's primary role is the management of its 'poles and wires' network, and proudly operates the most reliable electricity network in Australia.

1.2.3 ETSA Utilities

ETSA Utilities is 51% owned by CKI and HEH, which form part of the Cheung Kong Group of companies. The remaining 49% is owned by Spark Infrastructure. Spark Infrastructure began trading on the ASX in December 2005.

ETSA Utilities is the electricity distribution business for the state of South Australia. The primary role of ETSA Utilities is the safe and reliable delivery of electricity from high voltage transmission network connection points to residential and business customers throughout most of the state.

ETSA Utilities supports a network comprising 393 zone substations and 80,103 kilometres of powerlines serving approx 758,000 customers. ETSA Utilities is the fifth largest distributor in the Australian National Electricity Market employing more than 1300 people,

ETSA Utilities also provides construction and maintenance services and asset management services in the competitive electricity market.

1.3 Purpose of this Initial Advice Statement

This document provides the Queensland Government and other stakeholders with initial advice on the proposed Project. It provides an overview of the proposal and preliminary project description along with a brief discussion of the key environmental and socio-economic issues associated with its development. The document also seeks to fulfil the requirements of an Initial Advice Statement (IAS) for the consideration of the Coordinator-General in deciding whether to declare the Project to be a 'significant project' under Section 26(1)(a) of the Queensland State Development and Public Works Organisation Act 1971, for which an Environmental Impact Statement (EIS) is required.

2. The project

2.1 Project description

The IsaLink Project (the Project) involves the construction of a high voltage direct current (HVdc) transmission line from the National Grid, near the east coast of Queensland, to the NWMP (refer Figure 2.1). Depending on customer demand, the Project could supply power to the community and mining operations in Mount Isa district and broader NWMP. It is proposed that the sale and distribution of power from the transmission line will be undertaken by other energy retailers.

A future Stage 2 could provide power to the McArthur River mine and industrial and broader community customers in Darwin and elsewhere in the Northern Territory and is not considered further in this IAS.

The Project aims to deliver reliable electricity supply from a competitive national electricity market (NEM) to these regional locations. The Project will allow for future growth in communities, resource developers and resource operators within these regions. The power demand on IsaLink will be easily accommodated by the planned expansion of supply capacity in Queensland.

A substation would convert HVdc to alternating current (AC) at the Ernest Henry mine. It is proposed to upgrade the existing AC transmission line between Ernest Henry and Mount Isa to enable the transmission of power to Mount Isa, thus removing the need for the development of a further transmission line easement between these two locations. The upgrade to the Ernest Henry – Mt Isa line will be assessed as part of the project.

The line will be supported by a combination of self supporting and steel lattice guyed towers designed to carry sufficient capacity for the economic life of the line. It should be noted that HVdc transmission line structures are typically less visually obtrusive than conventional alternating current transmission towers common around Australia.

It is expected that the Project will utilise a final corridor which will require a 70 m wide easement for the construction, operation, and maintenance of the line. The Project will accordingly require ongoing maintenance access and will, where possible, use local roads in preference to the establishment of special purpose maintenance roads. It is intended that maintenance of the easement will be contracted to regional businesses, which in turn, will provide skills and employment to communities of regional Queensland.

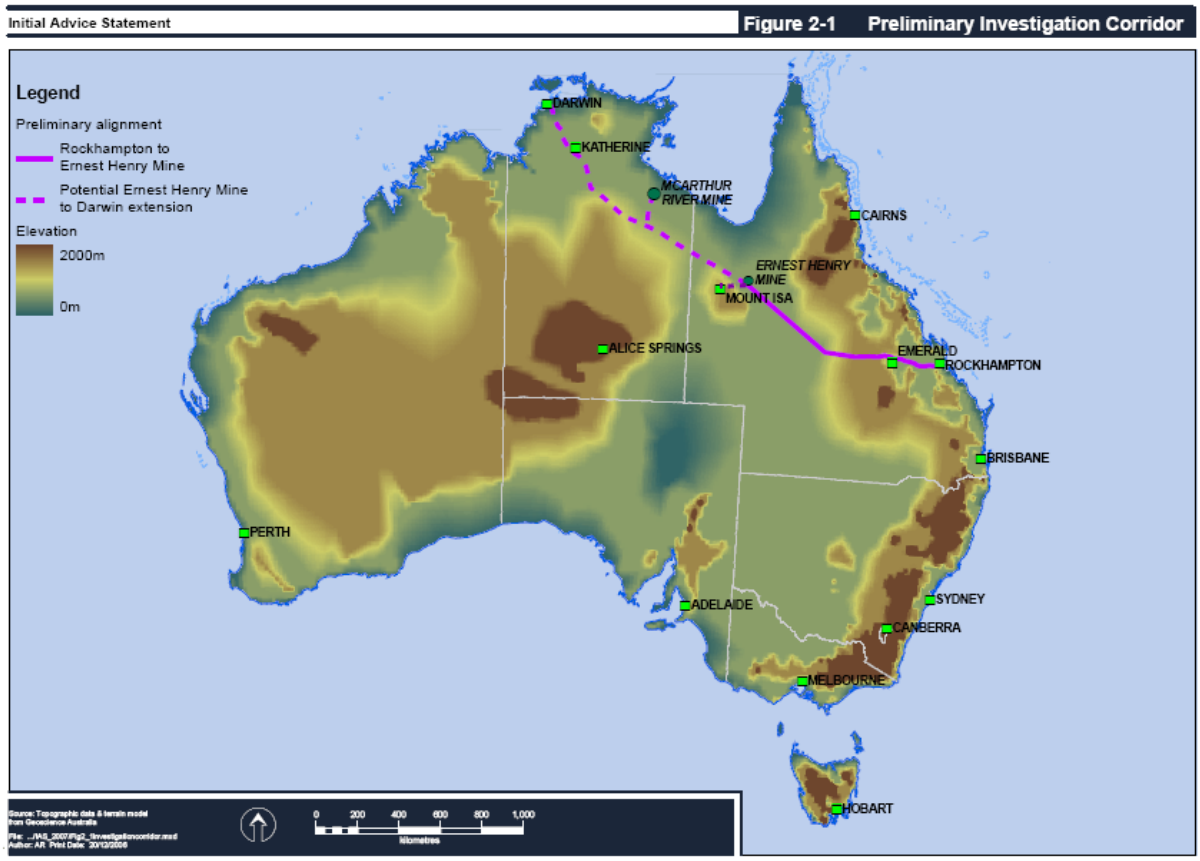


Figure 2-1: Preliminary Investigation Corridor

2.2 Project context and need

2.2.1 Project rationale

From an industry perspective, resource exploration in north-west Queensland has, in some instances and locations, been economically unviable due to the high cost and lack of reliability of electricity being delivered to these regions among other constraints. In part, as a result of this, minerals potential in the North West Minerals Province of Queensland is arguably under explored. Existing mining operation expansions have traditionally had to deal with high delivered energy costs when compared to supplies available within other less remote regions such as South East Queensland. Energy costs typically comprise between 15% and 40% of minerals extraction and processing costs and have a significant impact on present and future viability of resource developments. As such, some remote resource areas have been uneconomic.

In addition to these financial constraints, the supply of energy to these remote regions has not necessarily been reliable. The implication is a supply reliability risk for export customers.

In recent times the buoyant minerals prices on world markets and declining resources in other more accessible areas has reinvigorated regional development interest in the mineral deposits of these remote regions. As such, the Project is currently being assessed to determine its technical, socioeconomic and environmental feasibility.

From a community perspective the Project also offers many benefits. The city of Mount Isa has a population of around 23,000, with its main source of employment being mining and minerals processing activities. With the imminent commencement of a number of significant minerals and minerals processing projects in the region a sustainable population base is projected, it is expected that a steady rise in population will continue.

Mount Isa's local government area comprises approximately 43,010 km^2. It is considered the capital city of the north-west Queensland region. Traditionally the economy of this region has been reliant on the large copper-silver-lead-zinc mine, which was operated by Mount Isa Mines. The mine is the largest single employer in the city, directly employing 22% of the city's workforce compared with some 60% in the 1970's. Now owned and operated by Xstrata, the mine employs approximately 3,000 people and continues to play a large and dominant part of Mount Isa's economy.

Many government, commercial and large corporate organisations are permanently based in Mount Isa and provide a significant number of jobs in the city. As a result of the renewed interest in the area, other major organisations have announced major upgrades. These include Queensland Rail who have pledged more than $150 million over the next ten years to be spent on the Townsville to Mount Isa rail line.

Smaller local companies such as Huddy's Plant Hire recently announced purchases of over $20 million in earthmoving equipment to handle new contracts in the area. With the strengthening metal prices over the past two years, Native Title agreements reaching settlement, and new technologies becoming available, there have been numerous announcements of smaller mines in the area potentially planning to commence or expand their operations, such as with the Lady Annie copper mine. Many of the larger surrounding mines have also announced plans to expand their operations and purchase larger equipment such as the Ernest Henry Mine which trucks its concentrate to the Mount Isa smelter for processing. Recently a number of exploration ventures have also reported positive results such as Roseby, Mount Watson, White Range, E1 North, Great Australia and Monakoff. Some of these resources have potential ore bodies as big as those of the established mines at Mount Isa.

The most significant customer will be Xstrata's operations located at Mount Isa, although other businesses and communities within the supply area would also have access to the electricity supply. Some remote resource-based businesses currently relying on diesel for electricity generation would potentially have the opportunity for connection to the transmission line through regional distribution companies and energy retailers. This opportunity has not previously been available due to infrastructure, cost and capacity constraints.

The ongoing viability of the resources sector in the North West Minerals Province of Queensland is critical to the long term future and well being of Mount Isa and the regional communities it supports. As previously mentioned, a competitive and reliable energy supply is one of the most significant requirements for achieving development stability in this area. The Project will ensure a cost competitive and reliable energy supply that is crucial to the future growth of this resource sector. The existing and future projected electricity load has

increased and will continue to increase to a level that makes grid connection a viable and competitive alternative for consumers in these regions. A business case review by IsaLink was recently completed which demonstrates the viability of the proposal under a wide range of existing and future growth scenarios.

The Project will accordingly support The Queensland Government's Northern Economic Triangle Infrastructure Plan 2007 – 2012 (www.infrastructure.qld.gov.au/infrastructure/net.shtm), to provide competitive energy into north Queensland to facilitate the development of the area."

The Project is expected to offer the following contributions to Queensland, and Australia as a whole:

- increased regional development, which is currently a major focus of Governments within Australia
- increased exploration of mining resources within north-west Queensland
- enhancement of current mining operations in north-western Queensland which could extend economic life of mine and processing plants in this region
- greater networking of electricity supplies improving reliability, efficiency and competition
- reduced dependency on the Carpentaria pipeline allowing gas to be deployed in a more profitable and effective manner
- potential to improve commerciality of minerals processing upstream near the mine thereby easing the second most critical constraint to the NWMP being rail transport infrastructure. Enabling transport of finished metal rather than ore
- potential use of "Dark Fibre" (Optic Fibre cables for control and operation of the line are underutilised) to enhance the broadband capacity within the region and along the line.

It is envisaged that the Project will provide financial benefits to the local community. Electricity costs within the north western Queensland region vary from double to more than three times the equivalent energy costs available within South East Queensland. Connection to the NEM ensures a competitively priced supply from the large number of alternative suppliers active in the national market.

2.2.2 Socioeconomic benefits

The Project is expected to offer benefits to the local communities including increased employment both directly and indirectly. The long term viability of such important regional centres depends on a range of infrastructure and services, one of the most important being electricity. An economic and reliable electricity supply will encourage long term investment in the expansion of resource development such as mines and minerals processing ventures.

By delivering competitive grid power to north-west Queensland, the Project also has the potential to reduce the amount of government community service obligation payments to the region.

It is expected that a capital expenditure of between A$800 million and A$1.5 billion will occur over the life of the line depending on the configuration adopted and the centres to be served. Construction and operation of the Project will result in increased employment in order to construct the line, substations and various associated infrastructure. The line will also

require regular ongoing maintenance involving upkeep of the infrastructure itself, as well as indirect maintenance such as vegetation management under the lines and access track maintenance.

The estimated workforce numbers required for the Project leading up to and during construction is expected to be in the order of 300 people spread out along the alignment and is subject to construction crew availability.

Indirect employment will also occur as a result of increased electricity supply to the remote regions in north western Queensland, which in turn will benefit the regional economy. New businesses such as development of mining exploration areas and industries to support these developments may commence if they are able to access minerals and competitively priced electricity.

2.2.3 Market analysis

Existing electricity supplies are delivered to customers in Mount Isa by a 325 MW multi unit power station at Mica Creek. The Mica Creek Power Station is currently owned and operated by CS Energy, a Queensland Government Owned Corporation. Fuel gas is transported from southern Queensland gas fields. Existing gas supply contracts for the Mica Creek Power Station will expire around 2013, which therefore allow alternative and lower cost electricity supply options to be considered.

There is every indication that with potential competitive energy supplies, electricity consumption could increase given that more mining projects will pass financial hurdles and unconnected miners will see advantage. (Energy costs represent 15% to 40% of operating costs) Modelling indicates that the Project has satisfactory economic returns based on existing and committed loads. It is anticipated that with sustained mineral export and projected favourable mineral commodity prices (Australian Financial Review 5 July 2007) there will be opportunities for increased mining activity in the region.

The Mica Creek Power Station and Xstrata Power Station will be required to support the HVdc Transmission line providing network strength and backup so support services to these assets will continue to be required.

2.3 Route selection

This section deals with the methodology that was adopted to undertake preliminary selection of potentially suitable corridor(s) for the Project.

2.3.1 Study area and constraints

An initial study alignment of approximately 2,535 km in length between Central Queensland and Darwin was provided by IsaLink. Refinement of this corridor has been undertaken to a length of 2,735 km taking into account key environmental and social constraints (identified in Section 2.3.2). The current preferred corridor as previously shown in Figure 2-1 is based on a preliminary constraints assessment. The current Project route to Ernest Henry is likely to be more tightly defined as constraints are considered further during the environmental assessment of the Project. It should be noted that the preliminary connection point was selected near Stanwell, however several alternative connection points are possible within

the Central Queensland region and will be further considered in the next stage of the Project study.

A number of constraints specified by IsaLink, included:

- the corridor to commence within the Central Queensland Network at a point giving optimal network strength and providing economic connection
- the corridor to pass through Ernest Henry (where an existing transmission line will be upgraded and used to supply power to Mount Isa and the region).

2.3.2 Keys assessment criteria

Key assessment criteria for identifying potential suitable transmission corridor option(s) were also identified to be used as a basis for minimising impacts to the social, physical, cultural and biological environment. The nominated criteria were:

- the length of the corridor
- degree of social impact such as proximity to nearby towns, residences, public amenities
- tenure and land use
- ecological impacts to individual species, communities or habitats of local, State or Commonwealth significance.
- the number of towers that will be required for the chosen alignment
- minimising crossings of major roads and watercourses as well as areas of high topographic relief.

2.3.3 Evaluation process

The following processes were followed to determine potential corridor options for the Project:

- desktop review of existing information and mapping was undertaken for the entire alignment including review of database searches for tenure, ecology and planning etc
- a series of meetings were held with both Queensland and Northern Territory government agencies
- a number of client meetings were held to refine the alignment and to ensure all IsaLink's requirements had been considered appropriately. An optimisation process of the initial corridor was conducted via a workshopping exercise with specialist consultants representing social, cultural, biological, physical, values of the alignment as well as the technical aspects of the proposed development. Optimisation was conducted using GIS tools
- modelling using PLS CADD software packages was undertaken to determine the number of towers required for the proposed development and a corresponding preliminary tower placement study using a 2 km corridor (Tabaie and Reynolds, 2006).

A desktop ecology study was also undertaken using a 5 km width corridor (i.e. 2.5 km either side of the proposed centreline). It should be noted that no field assessment of the corridor alignment has been undertaken to validate the desktop research to date. This will occur as part of the next stage of works when the corridor will be refined to a preferred route alignment prior to undertaking an environmental assessment (Gough, 2006). Given the

ability to realign transmission towers to avoid sensitive areas a study corridor of up to 25-30km could be considered, depending on the findings during the next stage of the Project (refer Appendix A).

2.4 Proposed infrastructure

Features of the proposed development are:

- transmission line
- substations/converter stations
- easements
- access tracks.

2.4.1 Transmission line

The transmission line consists of supporting structures between which are suspended conductors which transmit the electricity. Two additional earthwires are strung above the conductors, between the peaks of the structures to provide shielding from lightning strikes. One of these earthwires will include optical fibres for communication purposes to allow for instantaneous control of line and converter station equipment along the length of the line.

An indicative HVDC bi-pole suspension tower is shown in Figure 2-2. The distance between structures (span) and height of towers are determined by the topography, land use and ground clearance requirements. The span is generally in the range of 400–500 m and typical tower heights range between 40 and 60 m. The latter is also dependant on the type of conductor used.

The location of, and distance between, towers is inherently flexible and is adjusted to account for terrain and sensitive areas that need to be avoided. Requirements for minimum clearance between energised conductors and various types of obstacles for the Project will meet the requirements specified by the State legislative requirements.

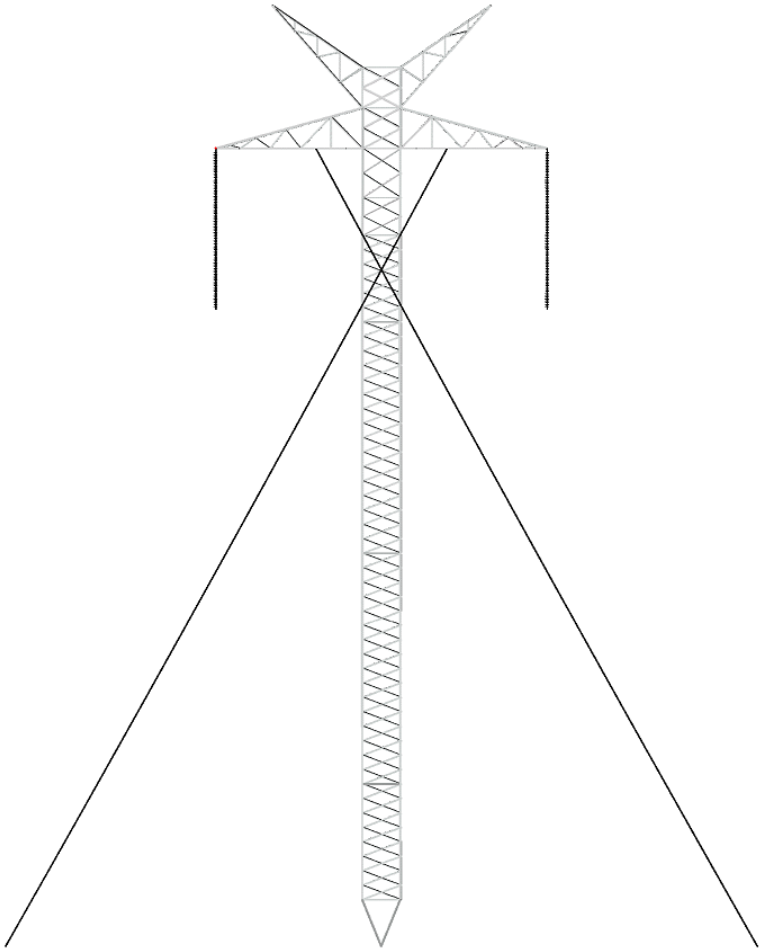


Figure 2-2: Schematic diagram of an indicative HVdc bi-pole suspension tower

2.4.2 Converter substations

Converter substations to convert HVdc power to alternating current or alternating current power to HVdc will be required at each supply and offtake point. For this Project, one converter substation will therefore be required at:

- Connection point within the Central Queensland Network giving optimal network strength and providing economical connection
- Ernest Henry for the offtake to Mount Isa for community and business use.

A photograph of a typical converter station is provided in Figure 2-3.

Figure 2-3: Photograph of a typical converter station

2.4.3 Easements

An easement for the placement of the transmission line will be sought by IsaLink in accordance with relevant legislation in Queensland. The easement will allow the nominated subsidiary to build, maintain and operate the transmission line. The size and type of line will determine the electrical clearance between the high voltage conductors and any object or structure adjacent to the line, under all conditions.

Operation of an easement for the Project will allow the transmission line to be built and operated on existing property while property owners retain ownership of the land. A compensation agreement, assessed by professional valuers, will be put in place at the time of easement acquisition for the encumbrance that the easement represents on that land. Restrictions will be placed on activities permitted on the proposed easement to ensure that the safety of the public is maintained, and the line can operate reliably.

Prior to acquiring the easement, investigations will be conducted by helicopter where possible to minimise the need for land access. Where required, access to land will be negotiated with landowners.

Sufficient vegetation will be cleared from the easement only to ensure that under all conditions, the required safe clearances from the conductors are maintained. Easement clearing will be the minimum necessary to maintain required clearances and will be undertaken using appropriate methods to minimise unnecessary damage and reduce the possibility of creating erosion.

2.4.4 Access tracks for construction and maintenance

Vehicular access to each transmission tower structure site will be required for construction purposes and for ongoing maintenance purposes. Impact will be minimised wherever possible by utilising existing public and private tracks, or by constructing new tracks in specified areas that ensures the least disturbance to the existing topography and vegetation.

2.5 Construction

Activities involved in the construction of the proposed transmission line include:

- a profile survey which locates the structure centres within the designated easement
- soil strata core drilling at selected tower sites
- construction of access tracks
- vegetation clearing for tower placement and access tracks and laydown areas
- installation of structure foundations and structure erection
- conductor and return wire erection (stringing)
- easement restoration / rehabilitation.

Activities involved in the construction of the proposed converter substations include:

- selection of an appropriate converter station site at the offtake point at Ernest Henry which minimises impact
- selected soil strata core drilling at sites
- site preparation for construction and vegetation clearance where required
- installation of structure foundations for buildings and transformers within the switchyard
- structure erection
- conductor and return wire and fiberoptic cable stringing
- converter station and transformer installation and commissioning.

Where sensitive vegetation is present, vegetation will be circumnavigated or tower heights increased, and aerial stringing will be used, to minimise or avoid disturbance.

The transmission line is intended to be constructed in three immediately sequential stages with the with the first stage of being about 1100 km to Earnest Henry. Construction duration will be dependent on seasonal weather conditions (i.e. avoiding work in monsoonal rain season) and a number of construction crews engaged simultaneously.

2.6 Operation and maintenance

Operation and maintenance of substations will be undertaken by transmission line staff. Operation of transmission lines is a highly automated process and will be expected to be contracted to an existing transmission or distribution system operator within Queensland, and handled from within an existing system control centre for coordinated operation with the NEM grid system.

Maintenance of the transmission line will be generally limited to periodic inspections by the transmission line staff. This typically occurs twice each year, or for breakdown maintenance as required. Maintenance of the access tracks will be carried out as necessary to maintain trafficability for light four-wheel drive vehicles to service the line and converter stations.

Regrowth control will also be undertaken on the easement as necessary to maintain safe electrical clearances between the conductors and vegetation.

2.7 Decommissioning details

The design life of a converter substation is typically in excess of 40 years. After that time, it would be reasonable to expect that replacement/refurbishment work would occur to bring the equipment to the required level of performance and reliability. Accordingly, it would not be anticipated that the substations would be decommissioned in the foreseeable future.

The transmission line will also have a design life of approximately 40 years. It would be reasonable to expect that maintenance and refurbishment work would extend the life of the transmission line well beyond 40 years. Decommissioning of the line, when required, would involve the deconstruction and removal of the line.

2.8 Project schedule

The environmental approvals process is anticipated to commence in early 2008 with Project approvals being obtained in July 2010. It is anticipated the environmental assessment would be submitted for formal public comment and government review in July 2009.

3. Existing environment, assessment of potential impacts, and impact mitigation

3.1 Overview

The aim of this section is to:

- provide an overview of the existing environmental and social values of the proposed HVdc corridor
- identify the potential interactions between the proposed Project and environmental values
- provide a preliminary assessment of the potential for environmental impacts that could result from the proposed Project
- provide an outline of the proposed methods for detailed assessment, where necessary, and for the development of impact mitigation measures.

The potential environmental and social issues relating to the proposed Project are grouped as follows:

- biophysical environment– geology, landforms and soils; water resources; ecology; noise and air
- land use and tenure – state and local government boundaries; population centres; land use; real property; tenure and native title
- social environment – cultural heritage; transport infrastructure; visual amenity; social amenity; hazard and risk.

Issues are addressed from both a Queensland perspective and where applicable, a Commonwealth perspective, such as matters of National Environmental Significant (NES) .

3.2 Project setting

3.2.1 Overview

The proposed Project traverses lands administered by all tiers of government (local, state and federal), and numerous land tenure types, and land uses.

3.2.2 Commonwealth setting

The current preferred corridor does not intersect large areas of Commonwealth owned land. A detailed search of land tenures will be carried out as part of the environmental assessment to confirm that this is the case.

3.2.3 Queensland setting

The corridor traverses 19 government areas, each of which is administered by a local government authority with separate planning schemes and local laws.

3.3 Biophysical environment

3.3.1 Geology, landforms, and soils

Existing geology, landforms and soils

A preliminary desktop assessment of the geology, landform and soils has been carried out along the HVdc corridor. This information is sourced from geological mapping of Queensland. The proposed transmission corridor will traverse a variety of landforms from channel and floodplains to undulating regions to mountainous areas. Local geology varies from alluvium and colluviums with flat sand plains and sediments, to ferruginous soils, to black soils generally all underlying weathered in-situ strata.

Assessment of potential impacts

The installation of the transmission line will require clearing vegetation for a 70 m wide corridor, and establishment of construction vehicle access tracks. Localised and small scale excavations will also be required for the foundations of the transmission towers.

In general, vegetation that infringes on, or has the potential to grow into the required safety zone in the vicinity of the transmission lines will be cleared. Mid story and lower story vegetation will be retained wherever possible to provide soil cover and habitat. At waterway crossings, vegetation would generally be left intact, or trimmed to maintain riparian vegetation for bank stability. Construction vehicle access tracks will be cleared of all vegetation to provide access to cranes, trucks, and other construction equipment.

The disturbance and removal of soil cover would result in the potential for soil erosion and subsequently, sediment related impacts if not appropriately managed. A more detailed assessment of erosion potential will be carried out as part of the environmental assessment to determine the risk of soil erosion and the need for erosion and sediment control measures for the construction and maintenance aspects of the proposed Project. This assessment will consider issues such as:

- erosion of soils traversed by the corridor
- slope, groundcover, potential for stormwater runoff (area upslope of the corridor) and proximity of drainage lines
- rainfall intensity.

Excavations for tower foundations and the access road are generally small scale, and are not expected to result in slip or mass movement impacts. However, the potential for these impacts will be examined for steeper sections of the proposed corridor as part of the geotechnical studies.

Impact mitigation measures

Erosion and sediment controls will be required during the installation of the towers and establishment of the construction vehicle access roads where necessary. Existing roads will be utilised wherever possible. Where construction vehicle access roads are required, disturbed soil surfaces will be stabilised to prevent erosion and sediment related impacts. The maintenance vehicle access track will also be stabilised to prevent erosion potential while providing for maintenance access to the towers.

3.3.2 Water resources

Precipitation

The corridor traverses three major seasonal rainfall zones as defined by the Bureau of Meteorology (2005):

- summer dominant – marked wet summer and dry winter (the lower edge of this zone runs north-west of Longreach to Mount Isa)
- summer – wet summer and low winter rainfall (in central and southern Queensland)
- arid – low rainfall (to the west of Longreach).

Average annual rainfall varies significantly across the study area. The average annual rainfall exceeds 1,000 mm per annum at Rockhampton/Gladstone but is less than 400 mm per annum in the vicinity of Longreach and Mount Isa (Bureau of Meteorology (2005).

Existing surface and groundwater resources

The proposed transmission line corridor traverses numerous waterways and lies within close proximity to a number of lakes and wetlands. In general, the corridor has been aligned to avoid large surface water bodies.

The corridor traverses parts of the Great Artesian Basin, including intake areas and the basin itself. However, the proposed Project is unlikely to have any significant interactions with the use, quality or recharge of the groundwater system.

Assessment of potential impacts

The development of corridor options and the selection of the preferred corridor and selection of the preferred alignment has generally avoided lakes or water bodies. Additionally, the transmission line would span waterways, and would generally avoid the need for installation of towers within, or in close proximity to waterways.

Construction access tracks may need to traverse smaller or ephemeral drainage lines, but will generally avoid waterways where practicable. The construction of access roads across waterways may also result in the potential for bank and bed erosion, and subsequently, erosion and sediment related impacts if not appropriately managed.

The disturbance of ground cover and exposure of soils has the potential to result in soil erosion and sediment related effects on surface water quality such as elevated suspended solids, nutrients and turbidity loads. The increased loads could affect the overall health of waterways and surface water resources, as well as aquatic and riparian ecology downstream of the areas of disturbance if not appropriately managed.

Impact mitigation measures

Erosion and sediment management plans will be developed for the proposed Project. Erosion and sediment controls will be implemented prior to and during construction and maintained until the disturbed areas have been stabilised. Where construction and maintenance access tracks traverse waterways, design and construction measures will be implemented to minimise disturbance to the beds and banks of the waterways. Maintenance access tracks will be located to minimise the crossing of waterways and utilise existing waterway crossings (bridges, culverts, and causeways) wherever possible.

3.3.3 Ecology

Existing ecological values

A preliminary desktop based ecological assessment was prepared to assist in the development of the corridor. The results of the desktop assessment are summarised in accordance with database sources and status of protection for the Commonwealth and Queensland. Desktop searches were undertaken using the following information sources:

- Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA), Protected Matters Search Tool, on-line database
- Records of the Queensland Museum
- Queensland Herbarium
- Queensland Parks and Wildlife Service WILDNET database
- Birds Australia database.

Commonwealth

Desktop assessment identified the following:

- The DEWHA Protected Matters On-line database search tool identified 42 species of flora and fauna listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as potentially occurring, or having habitat that potentially occurs, within the study area.
- The DEWHA Protected Matters On-line database search tool identified three endangered ecological communities within the subject area, namely:
  - Bluegrass (*Dichanthium* spp.) dominant grasslands of the Brigalow Belt Bioregions (north and south)
  - Brigalow (*Acacia harpophylla* dominant and co-dominant)
  - Semi-evergreen vine thickets of the Brigalow Belt (north and south) and Nandewar Bioregions.

Queensland

Desktop assessment identified the following:

- the proposed transmission corridor lies in close proximity to Kettle State Forest, Taunton National Park (scientific), Crystal Creek State Forest and Llandillo State Forest
- the proposed transmission corridor traverses 11 ‘of concern’ and ‘endangered’ mapped Regional Ecosystems
- several small patches of essential habitat for endangered, vulnerable and rare species, have been recorded to occur within the corridor
- a number of threatened flora and fauna species listed under the Queensland *Nature Conservation Act 1992* are documented to potentially occur within the study area.

Assessment of potential impacts

The construction and maintenance of the transmission line may require the trimming or removal of vegetation for:

- construction of the towers
- fire protection
- access roads.

The actual mount of vegetation clearing required is dependent on terrain, vegetation type and significance.

In non-sensitive areas, the most effective and efficient clearing method for large scale clearing is by bulldozer, often fitted with a 'tree spear' to push over larger trees. Timber of commercial value or suitable for other uses such as fence posts is recovered at this stage. Vegetation would be felled towards the centre of the easement, broken down and left as fauna habitat unless the property owner requires its removal. In these situations, the material is often mulched on site and used for landscaping or easement revegetation.

In sensitive areas, such as urban areas, steep or erosion prone terrain, near watercourses, or other environmentally sensitive areas, alternative methods of clearing may be appropriate. These techniques are more labour intensive and time consuming than mechanical means but have significantly less environmental impact. In steep terrain, trees may be cut above ground level, felled along the contour and allowed to decompose naturally or mulched. A similar technique may be applied near watercourses except fallen timber is removed from the area to prevent obstruction to stream flow. Lower vegetation is retained along road corridors where practicable.

Impact mitigation measures

The proposed transmission alignment has been developed where possible to avoid state forests, national parks or other conservation areas, as well as areas of ecological significance. Within the preferred corridor, the impact assessments surveys carried out for the environmental assessment will identify any remaining areas of ecological sensitivity. Mitigation measures to minimise disturbance to these areas will be developed and tailored to the environmental needs of the localised area.

3.4 Land use and tenure

3.4.1 Land use

Existing land uses

Existing land uses along the corridor are likely to include:

- agricultural
- mining
- urban / suburban (approaching Darwin)
- transport and utility infrastructure

- environmental reserve
- crown reserve.

Commonwealth land has been avoided by the proposed corridor shown in Figure 2-1. The environmental assessment will categorise and map land use types along the proposed corridor.

Consistency with existing land use

In general, the proposed transmission line will be consistent with the following existing land uses:

- agricultural
- mining
- transport and utility infrastructure
- environmental reserve
- crown reserve.

The potential for incompatibility between existing land uses and the proposed transmission line will be examined in the environmental assessment, and where necessary, modifications to the alignment, design, or impact mitigation measures, would be implemented to alleviate any potential incompatibilities.

Restrictions on future land use

Once constructed, the transmission line could impact some future land uses, and detailed considerations will be undertaken during the environmental assessment process to determine whether proposed land uses would be compatible.

3.4.2 Tenure and native title

Existing real property interests and tenures

The proposed corridor traverses a range of property tenures, which can be broadly grouped as follows:

- private (freehold) property
- crown land
- pastoral leases
- native title
- easements, covenants and rights of way.

A detailed analysis of the various property tenures along the corridor will be presented in the environmental assessment.

Assessment of potential impacts on real property interests

As previously stated, it is proposed that an easement of approximately 70 m width will be acquired for the length of the transmission line. An easement for the final alignment will be sought.

The implementation of the proposed transmission line could result in a range of potential impacts on existing real property interests:

- devaluation of surrounding property values
- restriction on future development potential
- changes to operational ability and capacity of land use.

Native Title

A study is being undertaken for the Project and study findings will be presented in the environmental assessment.

3.5 Social environment

3.5.1 Population centres

Existing population centres

In general, the HVdc corridor has been developed and refined to avoid directly impacting existing population centres. The proposed corridor, however, lies within 20 km of the following population centres in Queensland:

- Stanwell
- Duaringa
- Blackwater
- Emerald
- Ruby Vale.

Mount Isa should not be impacted as the existing transmission line operating between Ernest Henry Mine and Mount Isa is proposed to be upgraded to meet the increased demands and no new transmission line easement is expected to be required. There is also likely to be a number of smaller settlements and stations within the corridor, or within close proximity to the corridor which will be identified during the environmental assessment.

Assessment of potential impacts

The initial HVdc corridor has been refined to avoid known population centres. Detailed investigations will be carried out as part of the process that will refine the corridor to a final route alignment which will aim to identify and avoid settlements and station residences.

The construction of the proposed Project is likely to require the workforce to be spread along the alignment for a limited duration, and this arrangement is not expected to apply any accommodation pressures to the existing settlements and population centres. Similarly, the operation of the proposed Project would not significantly impact on affect population centres along the proposed alignment.

Impact mitigation measures

The proposed route alignment selection process will aim to avoid existing population centres, settlements and stations along the corridor. This would prevent the potential for any adverse interactions between the proposed Project and the population of these locations.

3.5.2 Noise

Ambient noise environment

The ambient noise environment along the corridor is likely to be typical of rural or undeveloped areas, with low background noise levels, and noise sources dominated by road, rail and air transport.

Assessment of potential impacts

Given the proximity of the transmission corridor to towns and settlements, the short duration of construction works at any one point and the limited use of earthworks and other heavy equipment, noise impacts are not anticipated to be a significant issue for the majority of the corridor. Construction works in the metropolitan areas of Mount Isa (if the upgrading of the existing transmission line is not possible i.e. a new easement would be required) may be in closer proximity to sensitive receivers, and may require more detailed assessment to determine the need for noise impact mitigation measures.

Construction noise will be the subject of a detailed assessment following confirmation of the alignment of the transmission line, and design of the transmission line and towers.

Impact mitigation measures

Although noise impacts will be temporary and transient in nature, noise impact mitigation measures may be required for construction works. Operational noise emissions may result from maintenance activities but are not expected to be significant.

3.5.3 Air quality

Construction works

The construction of the transmission line access roads could result in localised elevated levels of particulates in the general vicinity of the Project in the short term. However, due to the generally large distances between construction works and receptors, air quality impacts are unlikely to be a significant issue. Use of the existing infrastructure easements operating between Ernest Henry Mine and Mount Isa will assist in minimising air quality impacts.

Greenhouse gasses

The impedance offered by the transmission lines results in transmission losses, which equate to the consumption of electrical power. The design of the transmission line will generally seek to minimise transmission losses, however, given the distance of transmission, losses would be inevitable and not insignificant.

The environmental assessment will present the greenhouse implications of the transmission line, and provide comparative analysis with other potential electricity supply options.

3.5.4 Transport infrastructure, traffic and access

Road access

The construction of the transmission line requires the delivery of a substantial amount of equipment and materials along the corridor, together with travel to and from work sites by construction personnel. This would impose an increased volume of car and heavy goods vehicle traffic on the existing road network. While this is unlikely to be a significant issue on main roads, there is the potential for construction traffic to result in some damage to local roads, and private access roads.

A study will be carried out as part of the environmental assessment process to determine access to the corridor for construction. It will consider issues such as road transport infrastructure capacity, arranging access to private roads, pre and post construction condition surveys and a process to determine the requirement for road restoration where required.

Increased accessibility

The construction of new access roads in some areas may provide increased access to previously less-accessible areas. This can potentially lead to a range of effects, such as:

- trespass on private properties
- unauthorised, dumping, camping and other land inappropriate land use.

While construction of new access tracks will be kept to an absolute minimum and existing tracks used and maintained wherever possible, the above-mentioned impacts will be assessed as part of the environmental assessment process.

Air traffic

The potential for the transmission towers to interfere with flight paths and general proximity to airfields has not yet been assessed. A study will be undertaken as part of the environmental assessment process.

3.5.5 Visual amenity

A number of environmental and social characteristics influence the visual impact of transmission lines on the surrounding community, broadly including landcover, landform and waterform. Characteristics such as relief, topography, vegetation patterns and diversity, the proportion of natural and built landscapes and the presence of waterforms will be considered in determining whether the existing landscape character will be maintained or significantly altered by the proposed development.

Due to the subjectivity and sensitivity of determining the impact of a transmission line on the visual quality and character of a landscape, visual assessment will be undertaken during the environmental assessment process. At this stage, the issue of visual amenity impacts has been minimised through the avoidance of the larger residential centres as previously discussed in Section 3.5.1.

3.5.6 Hazard and risk

Fire

Vegetation will be cleared across the width of the transmission line easement and maintained at a suitable height to reduce the risk of fire from ground earthing.

Electric and magnetic fields

A detailed assessment of the potential exposure to electric and magnetic fields, together with a discussion of scientific research into links between these fields and human health will be presented in the environmental assessment. However it should be noted that HVdc lines have been demonstrated to have minimal electromagnetic emissions impacts as opposed to conventional alternating current lines.

Induction

The potential of induction impacts to nearby infrastructure such as pipelines will be taken into account during the design phase and ongoing management of the transmission line.

3.5.7 Cultural heritage

A variety of Queensland and Commonwealth cultural heritage databases, lists and registers have been searched as part of preliminary investigations for the initial corridor alignment (CQCHM, 2006). These include:

- Queensland Indigenous Cultural Heritage Database (established under provisions of the ACHA): No recorded places intersect with the proposed transmission line corridor; however the search results returned 83 places within a 5 km buffer area. (i.e. 5 km either side of the centre line). The majority of these are located in three main clusters around Stanwell, Blackwater-Comet and the Gemfields (near Anakie, west of Emerald).
- Queensland Heritage Register: One place on the Queensland Heritage Register intersects with the proposed transmission line corridor. This is an old mining town known as the Mount Cuthbert Township and its smelter situated in the North West Minerals Province area. There are no listed indigenous values associated with this place on the detailed listing summary for this site.
- Commonwealth Heritage Lists and Registers: In Queensland the search identified 25 places within a 20 km buffer of the proposed transmission line easement, all from the Register of National Estate (RNE). There are no places on either the Commonwealth Heritage List or the National Heritage List within 10 km of the proposed corridor. No places have been specifically listed for their Indigenous values and all but four places have been listed for historic values.

The alignment has been modified in places since this desktop study was completed to avoid population centres and sensitive ecological areas. Further study will be undertaken to establish heritage values in the outstanding areas of the proposed corridor.

Impact mitigation measures

The route alignment will be optimised to minimise impacts to areas of cultural significance.

4. Approvals process

4.1 Commonwealth approvals

It is anticipated that an assessment of the proposed Project is likely to be required under the EPBC Act. Given the length of the infrastructure corridor (approximately 1100 km), and the potential ecological sensitivity of the land being spanned, it is proposed to refer the Project as a 'controlled action' to the Commonwealth DEWHA. The proposed Project would therefore require the approval of the Commonwealth Minister for the Environment, Water, Heritage and the Arts.

Given that there is a bilateral agreement in place between the state of Queensland and the Commonwealth government, it is anticipated that the Project will be assessed under this agreement using the accredited state process as set out in the Queensland SDPWO Act. This would involve the Coordinator-General preparing an Assessment Report for the consideration of the Commonwealth for a decision on approval of the 'controlled action' under the EPBC Act.

Other Commonwealth legislation with that could apply to the transmission line include:

- *Aboriginal and Torres Strait Islander Act 2005*
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
- *Native Title Act 1993.*

These and other potentially relevant legislation will be considered during the environmental assessment process.

The referral of Stage 1 of the Project will not remove the requirement to refer later stages of the Project as separate distinct entities to be assessed under the criteria of the Act.

4.2 Queensland

IsaLink intends to request the Queensland Government to declare the Project a 'significant project' under Section 26(1)(a) of the SDPWO Act. Therefore, the environmental assessment would be undertaken by the Coordinator-General under that Act. The environmental assessment process set out in the SDPWO Act has been accredited under the EPBC Act.

The Project will also require various State approvals, in particular development approval under the *Integrated Planning Act 1997* (IPA). It is proposed to seek a designation of the land as Community Infrastructure under the provisions of IPA, which would exempt the Project from assessment against the respective local government authorities'' planning schemes. In addition, the Project will require approval for various Environmentally Relevant Activities (ERA's) and other operational works under Schedule 8 of IPA.

Other relevant Queensland legislation that may be applicable to the proposed Project includes:

- *Aboriginal Land Act 1991*
- *Aboriginal Cultural Heritage Act 2003*
- *Environmental Protection Act 1994*
- *Electricity Act 1994*
- *Nature Conservation Act 1992*
- *Queensland Heritage Act 1992*
- *Transport Infrastructure Act 1994*
- *Vegetation Management Act 1999*
- *Water Act 2000.*

The applicability of this legislation will also be considered during the environmental assessment process.

5. Consultation

IsaLink proposes to implement a comprehensive Community Consultation Program (CCP) which will inform communities about the nature of the Project and the construction and operational impacts. Furthermore, the community consultation process will seek input from the community and this information will be taken into account during the process to finalise the route alignment and during preliminary design in order to achieve optimum outcomes for stakeholders.

The preliminary route selection process has already focused on avoiding key residential areas which in turn will assist in minimising impact on the local populations along the entire alignment.

5.1 Purpose

The purpose of the CCP will be to facilitate input from stakeholders by:

- providing them with a clear understanding of the nature of the Project, the potential impact and the timelines
- providing information exchange mechanisms and suitable methods of identifying and responding to their concerns.

The CCP will aim to:

- determine stakeholder views on the proposed transmission Project with a view to achieving the most acceptable outcomes for all
- identify and manage issues that are highlighted by community stakeholders and which may impact upon finalisation of route options
- keep key stakeholders and appropriate agencies informed of Project progress.

5.2 Program

The CCP will be undertaken through a number of key stages including:

- environmental impact assessment stage
- design and pre-construction stage
- construction stage
- post-construction and operation stage.

The key activities and issues of these stages are set out below.

A more detailed approach to community and stakeholder consultation will be developed as part of the environmental assessment process. An overview of the proposed process is outlined below.

5.2.1 Environmental impact assessment stage

The following activities will be implemented during the environmental impact assessment stage:

- identification of key stakeholders e.g. landowners, relevant community groups such as Chambers of Commerce, Community Cooperatives, government agencies and elected officials (local, state and federal).
- newsletters to landowners, stakeholders and the community
- project website, email, hotline number
- letters and meetings with potentially affected property owners
- environmental assessment exhibition
- project status announcements.

5.2.2 Design and pre-construction stage

The following consultation activities will be carried out during the design and preconstruction stage:

- meetings, discussions and negotiations with potentially affected landowners and stakeholders to determine community related aspects of the design
- arranging for property access
- commence negotiations for acquisition of easements.

5.2.3 Construction stage

The following consultation activities will be carried out during the construction stage:

- ongoing newsletters
- maintenance of other information media (Project hotline, webpage etc)
- newspaper advertisements
- liaison with affected landowners.

5.2.4 Post construction stage

The following consultation activities will be carried out during the post construction stage:

- liaison with affected landowners regarding operations and maintenance.

6. References

Bureau of Meteorology (2005), *Average Annual Rainfall*

Bureau of Meteorology (2005), *Major Seasonal Rainfall Zones of Australia*

Cogger, H.G. (1992). *Reptiles and Amphibians of Australia.* Reed Books.

Coordinator-General (2006) *Competitive Power to North Queensland [webpage]*. Queensland Government. Last updated 20 June 2006, www.coordinatorgeneral.qld.gov.au/infrastructure /regional_minerals.shtm

CQCHM (2006) *Report on Cultural Heritage Issues Powercor HV Transmission Line Stanwell to Darwin*, Central Queensland Cultural Heritage Management,

Environment Australia (1999). *Environment Protection & Biodiversity Conservation Act 1999*. Brisbane.

Environmental Protection Agency (2005) *WildNet. (Database).*

Environmental Protection Agency (2005). *Regional Ecosystem Description Database (REDD). Version 5.0*. Updated December 2005. Database maintained by Queensland Herbarium, Environmental Protection Agency, Brisbane.

Gough, G (2006) *Queensland to Northern Territory HVdc Project: Preliminary Corridor Options Report for the Stage 1 Feasibility Study.* Parsons Brinckerhoff, Brisbane.

Neldner, V.J. and B. A. Wilson et. al. (2001). *Survey and Mapping of Vegetation Communities and Regional Ecosystems of the Brigalow Belt South, Version 3.0*. Queensland Herbarium, Environmental Protection Agency.

Queensland Government Department of Infrastructure 2007: Northern Economic Triangle Infrastructure Plan 2007-2012: August 2007: (http://www.infrastructure.qld.gov.au/library/pdf/net/NET_Infrastructure_Plan_full_version.pdf)

Sattler and Williams (1999). *The Conservation Status of Queensland Bioregional Ecosystems.* Environmental Protection Agency. Brisbane, Qld.

Simpson, K. and N. Day (1999). *Field Guide to the Birds of Australia, Sixth Edition*. Penguin Books Australia. Ringwood: Victoria.

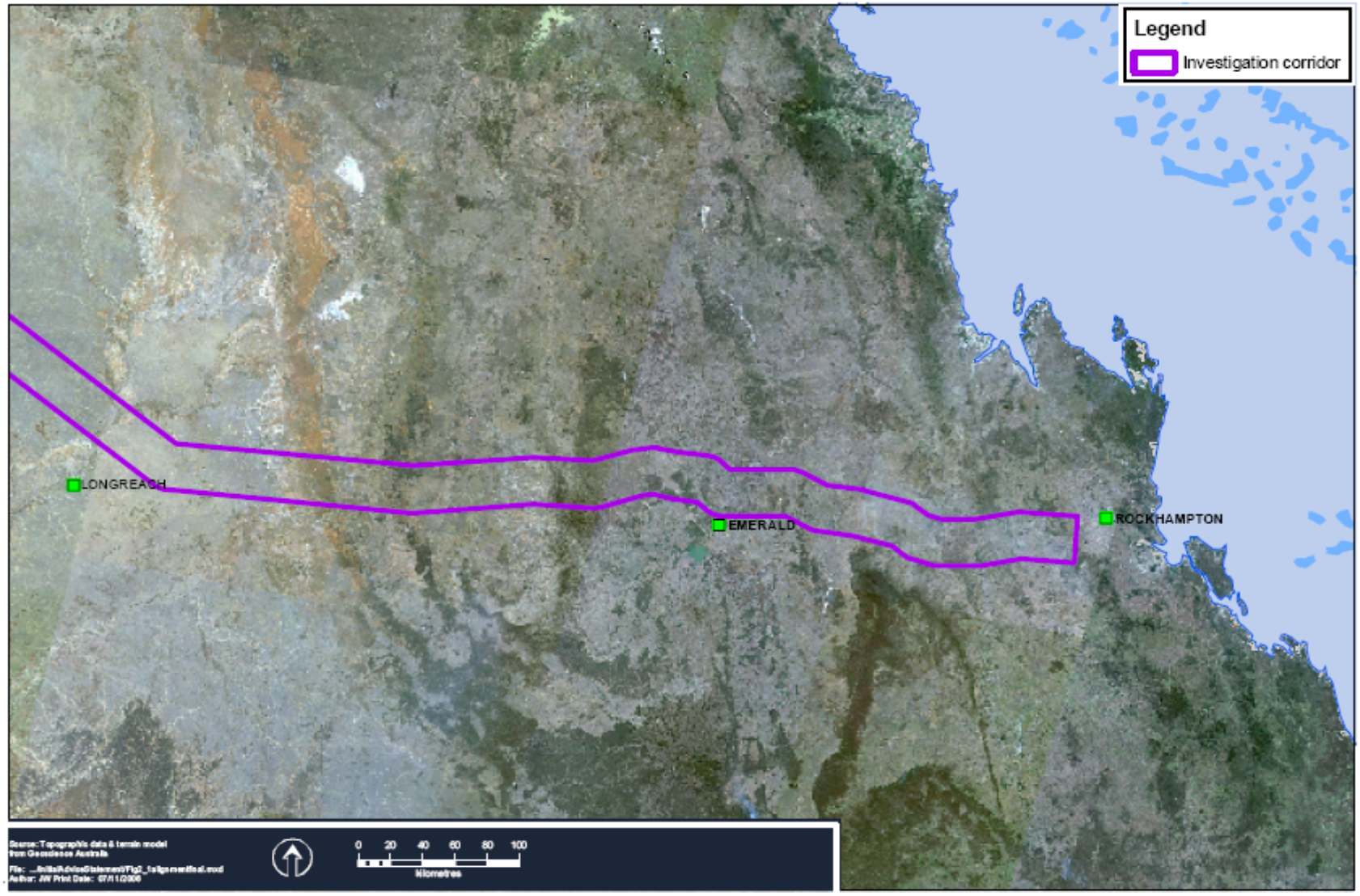
Tabaie, R and Reynolds, C. (2006) *Rockhampton to Darwin 600kV HVdc Transmission Line State 1 Feasibility Study*. PB Power, Brisbane.

Appendix A

Preliminary investigation corridor detail

Initial Advice Statement

Figure A-1 Preliminary Investigation Corridor



Initial Advice Statement **Figure A-2 Preliminary Investigation Corridor**