



EXECUTIVE SUMMARY

INTRODUCTION AND KEY RECOMMENDATIONS

This Environmental Impact Statement (EIS) presents an assessment for a proposed 275kV/500kV substation in the vicinity of the Kogan Creek Power Station on the Darling Downs near Chinchilla. This “Western Downs Substation” will initially be operated as a 275,000 volts switchyard and be connected via a new transmission line to the existing transmission line between Kogan Creek Power Station and the Braemar Substation. Following establishment, the substation will then be connected to the proposed Halys Substation in the Tarong region via a new transmission line. This line is proposed to be built on partially vacant easements from the Warra to Halys area. The identification of a suitable corridor/route, and the environmental assessment of the connection between the Western Downs Substation and this vacant easement will be the subject of a separate study.

Powerlink Queensland, a Transmission Network Service Provider, is the Project proponent.

From the detail contained within this EIS, it has been demonstrated that the proposed placement of the substation will provide the least overall impact for all of the issues considered.

PROJECT JUSTIFICATION

Through Powerlink Queensland Planning Studies, it is indicated that electricity use in Southern Queensland has exhibited very strong growth during the past ten years and growth is expected to continue over the next ten years.

The existing transfer capability of Powerlink’s network between Central Queensland and Southern Queensland, as well as between Bulli, South West, and South East Queensland, is described by limit equations which dynamically maximise the transmission capability available to electricity market participants at any time. Notwithstanding this, it has been identified that the required power transfer between the Bulli and South West zones will reach the capability of the existing network from summer 2010/11. These limitations can be addressed incrementally until 2012/13 whereby a major augmentation is required between these two zones. In addition to power transfer limitations, fault level limitations at the Braemar substation are forecast to coincide. These will impose limits on the capability of that facility to meet system and security limits.

Powerlink Queensland is required to develop its network to meet the security and reliability standards of the National Electricity Rules, the *Queensland Electricity Act 1994* and the terms of its transmission licence. Powerlink has undertaken an assessment of options and carried out consultation as required by the National Electricity Rules prior to approving the option which has the lowest net present value cost, in accordance with the Australian Energy Regulator’s regulatory test. Under this assessment, it was found that the option which satisfied the regulatory test involved establishment of Western Downs substation by 2012/13.



LEGISLATION AND APPROVALS

Relevant Federal and State legislation, codes and local government planning provisions potentially triggered by the proposed Project have been discussed. In addition, assessment of the relevant approval process and the possible permits, licences and approvals that may be required are also detailed. The substation development is community infrastructure as defined under the *Sustainable Planning Act 2009* and consequently ministerial designation as 'Community Infrastructure' will be sought.

SUMMARY OF THE DESCRIPTION OF POTENTIAL IMPACTS AND MITIGATION MEASURES

The impact that the proposed Project may have on a range of physical, biological and social environmental factors was analysed and mitigation measures provided, where necessary. The following provides a summary of the main potential impacts and mitigation measures. More detailed mitigation measures have been provided within the EIS and Environmental Management Plan (EMP).

Geology and Soils

The site is located on Kurbarilla sandstone geology and is contained within an ironbark/ bull oak land resource area. All soils on the site are similar from an agronomic and soil chemistry perspective and are characterised by low water holding capacity with increasing salinity and sodicity with depth. Soils are classified as Sodosol (texture contrast soils with a sodic upper B horizon) with the major difference across the site being a varying depth of the surface A horizon (<15cm to 40cm). The site is not classified as Good Quality Agricultural Land. The property is not registered on the Environmental Protection Agency Environmental Management Register or Contaminated Land Register.

The primary issue for the site is the management of the sodic subsoils such that earthworks and construction do not initiate tunnel erosion processes. This will be achieved through firstly applying gypsum to the site before construction begins (soils tests have been conducted and gypsum application rates of 15 t/ha are recommended), and secondly ensure that earthworks are conducted in a manner which limits the exposure of sodic subsoils to water flow where practicable.

Climate and Air Quality

Rainfall in Southern Queensland is considered highly variable and subject to extended periods of drought, followed by intensive rainfall. Maximum temperatures often reach 30°C in the Summer months, and minimum temperatures often fall below 5 °C over Winter. Annual wind data collected by the Dalby Airport weather station indicated that the Project site is typically subjected to prevailing easterly winds for most of the year, with the average wind speed of approximately 12km per hour (BoM, 2009).

The data shows that severe storms (including high winds, hail and inundation with flash flooding) are the most common atypical events for the area. The daily average data collected from the Kogan Creek Whyte monitoring station shows that whilst there were 3 exceedances in ambient guidelines, within the 2008-2009 monitoring period, the objective for PM10 allow for an exceedance on 5 days per annum for environmental values to still be protected.



Due to the rural location of the Project site, dust and odour are not expected to be a significant nuisance to ecologically sensitive areas, or to the neighbouring resident.

Mitigation measures for reducing dust emissions during both the construction and operational phases include reducing the length of unsealed tracks, use of recycled water during construction on high traffic areas and application of mulch on exposed areas during construction.

Hydrology

The site falls within the Condamine- Balonne River Catchment and is located 2.5km west of Kogan Creek, which flows northwards into the Condamine River below the junction with Cooranga Creek. Historic observations and stream gauge data show that flooding is not an issue for the site. There are no permanent watercourses on the project site. The site is flat with poorly defined drainage lines. There are four small surface storage dams in the vicinity of the site. There are no wetlands identified on the site or any adjoining land. The site is not subject to flood risk from the Condamine River or its tributaries. Groundwater is estimated to be moderately deep (>10m) associated with a regional groundwater system. The site would not be expected to be at risk of groundwater rise or salinity.

Levelling of the site will be conducted in a fashion as to maintain sheet flow of water across the site with the aim of minimising flow concentration.

Fire

Bushfire hazard on the Project site is deemed to be low to medium and the prevailing fire regimes are unlikely to be significantly altered due to the Project. The most probable time for a fire to occur is during construction, however the risk of such an event occurring during this phase of the development is considered low. Mitigation measures such as preparation of a Bushfire Management Plan and use of fire resilient materials during construction where possible, are proposed.

Waste Management

The likely wastes that are to be generated during the construction and operational phases of the Project are outlined and include solid and liquid waste sources. The majority of the wastes for the Project will be from the construction of the new substation. Waste production during the operational phase of the Project will be minimal in comparison and associated with scheduled maintenance activities of the substation facility and easements. Mitigation measures to reduce the risk and potential impact from waste sources are provided.

Flora and Fauna

Flora

An ecological assessment was conducted for the proposed Project site and consisted of a review of relevant literature and field surveys. Existing land uses both on the Project site and within the broader study area have resulted in a disturbance to the vegetation communities on the site. Despite this, there is a significant patch of mapped remnant regional ecosystem (RE) on the Project site. This remnant woodland covers approximately half of the proposed substation site and is mapped as a single polygon containing two REs (RE11.5.1 and 11.5.20). This vegetation is listed as Not of Concern under the *Vegetation Management Act*. In addition to this mapped



RE on the Project site, five vegetation communities were also recorded during field investigations. These vegetation communities range from disturbed date palm plantations to Eucalyptus woodlands.

No legislatively significant flora species (i.e. listed under Commonwealth or State legislation) were encountered on the Project site. Of the ten significant species determined by database searches to potentially inhabit the general Project locality, four are considered possible inhabitants based on the availability of potential habitat. Of these species, *Philotheca sporadica* has been recorded within the broader landscape surrounding the Project site. Three listed plant species (weeds) declared under the *Land Protection (Pest and Stock Route Management) Act 2002* were identified on the Project site during the field survey.

The proposed Project will result in the clearing of approximately 40 ha of vegetation including approximately 30.5 ha of mapped 'not of concern' Regional Ecosystems. This clearing will also result in the loss of potential habitat for the vulnerable *Philotheca sporadica*.

Mitigation measures to address potential impacts on fauna include preparation of a Vegetation Management Plan, temporary fencing constructed around areas of vegetation to be retained and washdown facilities provided to minimise weed spread through vehicular movement.

Fauna

Historical landuse and disturbance of vegetation coupled with naturally occurring variances within the vegetation on the Project site have resulted in a mosaic of different habitat types occurring. The majority of the site is well vegetated and therefore provides habitat for a range of fauna species. Patches of vegetation appear to have been disturbed through historical clearing and while these areas lack the diversity and structure of the majority of the community, fallen timber commonly occurs that provides additional habitat for snakes, skinks and small mammals. The fauna species recorded on the Project site included species which are generally considered to be common however several honeyeater species which are known Eucalypt specialists were also recorded. The more modified habitats across the Project site were preferable habitat for generalist species such as Noisy Miners, Crested Pigeons and Willie-wagtails.

No rare or threatened species were recorded on the Project site during the field survey however nineteen rare or threatened species (four reptiles, eleven birds, three mammals and one fish) are considered as possible inhabitants within the general Project locality. Suitable habitat for these species also occurs throughout the area and broader region.

A number of pest species either occur or are likely to occur on the Project site due to the disturbed conditions both on site and in the broader locality. Three introduced fauna species were identified on the site during the site assessment. It is highly likely that several other pest species also inhabit the site.

Potential impacts of the proposed Project in relation to fauna include loss of habitat, disturbance to fauna habitat during clearing, injury to fauna during clearing/maintenance works, disruption to habitat connectivity and potential fauna mortality due to collision with conductors.



Mitigation measures to address potential impacts on fauna include staged clearing, spotter/catcher presence during clearing, restricted speed limits and rehabilitation of disturbed areas that are outside of the substation footprint.

Land Use

Current and future land use was obtained through observation, consultation and literature research. The Project site encompasses two land parcels owned by one landholder. The site has historically been predominantly used as a grazing enterprise with a small date plantation also present near the existing house. All grazing stock are currently removed from the site. Apart from an existing house, the study site also has four farm dams and remnants of an irrigation system at the date palm plantation. Boundary fences are also in place.

The study area is located within the municipal boundaries of Western Downs Regional Council. On 15th March 2008, Western Downs Regional Council was formed with the amalgamation of Wambo, Dalby Town, Chinchilla, Murilla, Tara and Taroom Shire. Prior to the amalgamation the study area was situated within Chinchilla Shire. The study area is subject to the *Chinchilla Shire Planning Scheme*.

The Project site is zoned 'Rural' under the Chinchilla Planning Scheme, and does not have any other planning restrictions. There are no specific development provisions that relate to the establishment of a substation, the proposal is unlikely to conflict with the Strategic Directions of the Planning Scheme. Furthermore, the proposal is not considered to compromise the purpose of the *Rural Zone*.

Socio-economic Environment

Key demographic characteristics of the Western Downs Regional Council are described as are existing land use activities within the broader study area.

As the existing landholders are a corporation involved in similar Public Utility activities to what is proposed at the Project site, the current landholders are not anticipated to experience any negative impacts due to the proposed substation development at the Project site. There is currently little social value associated with the Project site, therefore the development of a substation will have no social impact on how the site functions. In addition, the community profile of the surrounding area is not anticipated to be impacted by the development of a substation on the Project site.

As the Project site is vacant, with no existing agricultural or industrial uses, it currently has no economic value contributing to the community, and therefore the development of a substation will have no negative economic impact on how the site functions.

This increase in economic activity that will be established at the Project site will benefit the surrounding community in the region by generating additional employment opportunities and enhancing the overall economic capacity of the Western Downs region. This has the potential to generate indirect community benefits through the additional economic contribution to the region.



Noise and Vibration

The acoustic environment in which the substation is proposed to be situated is currently dominated by the noise of the existing Kogan Creek Power Station (approximately 1.5km to the north-east). Due to the magnitude of the power station, its associated noise is expected to be significant in comparison to the expected noise emanating from the proposed substation. One noise sensitive receptor (dwelling) has been identified from aerial photography and regional investigations. The residential dwelling exists approximately 400m to the immediate west of the proposed substation on the adjacent property.

Noise associated with the Project would mainly arise as a result of the construction phase and would generally be associated with heavy vehicle movements and general construction noise. During maintenance, potential noise sources will include vehicle routine inspections, repairs and vegetation and erosion management activities. Due to the large separation distance, and proposed construction works being carried out during less noise sensitive hours, there is a low potential for noise impacts to occur during the construction phase.

A number of mitigation measures including effective mufflers for trucks and machinery and keeping the public informed of construction and maintenance schedules have been recommended to minimise the potential noise impact of the proposed Project.

EMF

Electric and magnetic fields (EMF) occur in nature, in all living things and as a consequence of anthropogenic sources. Electric fields are caused by voltages (volts) and can be found near any electrical appliance that is switched on at the power outlet. Magnetic fields are caused by the flow of energy (current) through a conductor.

The transmission of electricity via the proposed Project will generate electric and magnetic fields which may raise public health concerns. The recommended exposure levels set by the Australian Government's Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and the National Health and Medical Research Council (Australia) have been outlined within the EIS along with the predicted EMF levels for the area immediately surrounding the proposed substation.

Whilst it is impossible to model EMF levels from substation sources due to the variability in a number of aspects such as operational and equipment layouts, current flows, local topography and vegetation cover, it is indicated that the EMF levels from the proposed substation will be well within the EMF limits outlined within the ARPANSA 'Draft Radiation Protection Standard: Exposure Limits for Electric and Magnetic Fields' and the NHMRC 'Interim guidelines on limits of exposure to 50/60 Hz electric and magnetic fields'. Moreover, the EMF levels at the closest receptor will be below levels normally found around typical household appliances.

Landscape Character and Visual Amenity

The landscape of the region is characterised by distinctive elements including very low density and generally small scale of development; long straight rural roads with open or filtered views of the rural landscape; the meandering Condamine River, associated floodplains and riparian vegetation; open flat or undulating rural plains with a patchwork of agricultural uses; rolling grazing land and vegetated foothills; and dry eucalypt woodland. The existing house located 400m to the west of the proposed substation location may be impacted.



A large portion of the existing woodland vegetation on the northern portion of the site will be cleared to construct the proposed substation. However, due to the generally flat topography of the region, the scale of the substation development in comparison to the adjacent power station and the screening of the site by existing native vegetation, the proposed substation will have no significant impact on the landscape character of the region and only limited impact upon the landscape character of the local area in the short term.

The existing woodland vegetation to the north and east of the proposed substation site will be retained and along with the position of the existing Kogan Power Station, the site cannot be seen from the Warrego Highway. There are no local viewpoints from which the site is visible. The visual impact of the proposed substation development will be minimal on a regional scale.

Any impact the proposed substation will have on the local landscape character will be minimal in comparison to the existing Kogan Creek Power Station. Natural revegetation of buffers to the south and west of the site, will aid in ensuring that the permanent facility will have no long-term visual impacts regionally and will have no significant long-term visual impacts locally.

Mitigation measures proposed to help reduce visual impacts from the proposed Project include encouraging natural revegetation of buffers and ensuring the removal of existing woodland vegetation outside of the immediate construction site area is minimised.

Transport Infrastructure and Traffic

The area adjacent to the proposed substation comprises a number of State controlled roads under the management of the Department of Transport and Main Roads (DTMR) and local authority roads under the management of the recently formed Western Downs Regional Council.

A light increase of traffic volumes on the roads adjacent to the substation is expected to occur during the construction phase given the necessary transport of materials, equipment and personnel. Traffic during the operational phase will be minimal except where major works are required.

It is anticipated that the construction vehicles will use the Warrego Highway and Banana Bridge Road to access the site from both the eastern (Toowoomba / Dalby) and western sides (Chinchilla). Some construction vehicles are likely to carry “oversize” loads, which can cause some safety issues for other road users. Vehicle movements related to the maintenance and inspections of the substation are expected to be very low, particularly when compared to those that will potentially occur during the construction phase.

It is proposed that the anticipated route to be used by construction vehicles must be inspected prior to the commencement of the construction works. The access to the substation site must be cleared of any obstacles or constraints and the pavement must be in good condition to ensure that access to the site can be achieved even under periods of wet weather.



Non-Indigenous Cultural Heritage

Whilst the region surrounding Warra has numerous sites and places of cultural heritage significance, there is an absence of significant sites in the vicinity of the substation. The Project is not expected to impact upon areas or objects of social importance or cultural significance. With consideration of the broader context of the area surrounding the Project site (i.e. Kogan Creek Power Station), the proposed development is not expected to have a negative impact on the lifestyle of local residents, or on the appeal of places frequently visited within the region. The likely presence of remnants of cultural heritage has not been dismissed, however.

The impact of the proposed development on matters of cultural significance is expected to be negligible. However, if during construction, historic relics are discovered, work should cease until an appropriately qualified heritage assessor has been afforded the opportunity to assess any objects of possible heritage value, *in situ*.

Powerlink have conducted a separate internal assessment of Aboriginal Cultural Heritage.

Greenhouse Gas Emissions

Greenhouse gas emissions to be generated as a result of this project are considered. Scope 1 emissions (e.g. fuel use) associated with the project total 1,172t CO₂^e. Scope 3 emissions (e.g. embedded energy in construction materials) associated with the project total 1,357t CO₂^e. Mitigation measures to help minimise greenhouse gas impacts as a result of this project include management strategies for site preparation, material selections and transport, plant and equipment and auxiliary emissions.

Environmental Management Plan

An EMP has been prepared to prevent or minimise potential environmental impacts identified by the EIS. Environmental management strategies for the Project's potential impacts, including control measures and responsible persons, are included in the EMP.

Environmental Cost-Benefit Summary

An environmental cost-benefit summary has been undertaken for the Project. Short and long-term costs and benefits have been examined including:

- Decreased land use impact;
- High conservation areas affected;
- Greenhouse gas emissions; and
- Employment and economic capacity.

The development of a substation on the Project site is considered to have minimal short term and long term environmental impacts both on the Project site itself and within the surrounding area.

The short term economic benefit related to the proposed substation facility will be an estimated 20 to 30 construction related jobs at the Project site. The long term economic benefits will be potentially additional employment related to the ongoing maintenance and operation of the substation facility and an increase in the overall economic value of the region as a result of the operation and industry output of the substation facility.



Summary and Recommendations

A broad range of physical, biological and social environmental factors have been considered by this EIS. Overall it is concluded that while the Project may result in localised impacts on some of the factors investigated, the need for the Project has been adequately demonstrated and all feasible alternatives have been explored. In addition, where relevant, potential issues have been identified, quantified and mitigation measures have been developed/recommended for consideration or adoption during the detailed design phase of the Project. An EMP has also been prepared to prevent or minimise the potential for environmental harm.

Provided Powerlink Queensland follows the recommendations contained within this EIS and associated EMP and continues to work with the community and other stakeholder to further mitigate impacts, there does not appear to be any physical, social or environmental issues that would prevent this Project from being recommended to the Minister for the Department of Employment, Economic Development and Innovation for designation.