Environmental Assessment for Upgrade and Extension of Electricity Distribution Line along Wolgan Road, Wolgan Valley

21 November 2006

Prepared for:
Clifton Coney Group on behalf of Emirates (Hotels) Australia Pty Limited.

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21 November 2006

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1 INTRODUCTION

HLA Envirosciences Pty Limited (HLA) has been engaged by Clifton Coney Group Pty Limited to undertake an environmental assessment of the potential environmental impacts associated with the upgrade and extension of an existing electricity distribution line from Wolgan Gap to the proposed Emirates resort site within Wolgan Valley, New South Wales (NSW).

The purpose of this EA is to describe the proposed works, review the existing environment, identify the potential impacts of the proposal on the environment and identify mitigation measures to be implemented in order to eliminate or minimise the potential impacts identified.

The proposed works form part of a larger project for which concept approval has been given, involving the development of tourist facility under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). The Minister for Planning is the Approval Authority for development under Part 3A of the Act.

HLA has prepared this EA in accordance with the provisions of Part 3A of the EP&A Act 1979 and the EP&A Regulation (EP&A Regulation) 2000.

1.1 Background

In May 2006, concept approval was obtained for the Conservation Resort project under Part 3A and section 75 o of the EP&A Act. The development involves a low density 'tourist facility' comprising of a range of luxury villas (40 in total), health spa, conference facilities, restaurant, management and staff accommodation and a range of ancillary infrastructure including a sewage treatment plant with effluent re-use and helipad on what is currently a cattle grazing property.

Development of the resort will be located on the eastern, central part of the site, either side of Carnes Creek with separate staff accommodation and maintenance plant located further north on the site on the eastern bank of the Wolgan River. The majority of the remaining site will be used for passive recreation and environmental rehabilitation and conservation.

The project would result in the land being converted from current grazing and agricultural land use into a 'nature conservancy' involving the rehabilitation of the site and managed reintroduction of a range of threatened plant and animal species.

The concept approval outlined the need for future works to provide sufficient electricity to the proposed Emirates resort site.

1.1.1 Location

The proposed Emirates resort site is approximately 1,099 ha in size located within the Wolgan Valley approximately 190 km north-west of Sydney Central Business District, as indicated in **Figure 1**. The site is situated some 35 km north-west of Lithgow and around 3 km south from the town of Newnes within the Lithgow Local Government Area (LGA).

The site for the proposed works is within the road reserve of Wolgan Road from Wolgan Gap to the site of the proposed resort and is shown in **Figure 2.**

1.1.2 Local and Regional Context

Wolgan Valley covers an area of approximately 13,750 ha and stretches up to 28 km long and some 6 km wide from the town of Newnes, a former industrial town in the north-east, and

Wolgan Gap located to the south-west. Surrounding Wolgan Valley to the north and south is the Gardens of Stone National Park and to the east the Wollemi National Park, both of which are part of the Greater Blue Mountain World Heritage Area (GBMWHA). Within the broader area, further west is Wolgan State Forest, and Newnes State Forest is situated further south, both of which also form part of the GBMWHA. Generally the site is separated from surrounding properties by Donkey Mountain and adjoins a rural zoned property to the south-west.

This EA is in relation to the proposed construction and upgrade of an 11 kV electricity distribution line stretching from Wolgan Gap to the proposed Emirates resort site. The proposed works are to take place within the existing road reserve of Wolgan Road.

1.1.3 Previous Studies

The following are previous investigations which have been undertaken in relation to the resort and have been reviewed for the purpose of this EA.

- Australian Bushfire Protection Planners Pty Limited. *Bushfire Management Report for the Emirates Luxury Resort, Wolgan Valley.* August 2005.
- McLaren Traffic Engineering. *Wolgan Road Safety Audit & Traffic Impact Assessment for proposed Emirates Luxury Resort, Wolgan Valley.* October 2005.
- Australian Museum Business Services (AMBS) *Flora and Fauna Impact Assessment Emirates Luxury resort, Wolgan Valley.* October 2005.
- Clifton Coney Group Pty Limited. *Preliminary Groundwater Investigation for proposed Emirates Luxury Resort Wolgan Road, Wolgan Valley.* October 2005.

2 THE PROPOSAL

2.1 Objectives

The objectives of the proposed works include:

- Upgrade of existing electricity distribution line to 11 kV (approximately 3km);
- Extension of existing distribution line (approximately 14km) to the proposed resort site;
- To ensure that clearing is minimised; and
- To ensure that potential impacts associated with the proposed works on the existing environment are minimised.

2.2 Proposed Activities

Currently the existing electricity supply is approximately 14 km south of the site and is operated by Integral Energy. It is proposed to extend the existing supply to the proposed resort site boundary and that the existing powerlines be upgraded to 11 kV. This would not only accommodate the electricity supply required to support the proposed Emirates resort but would also be available for other users within Wolgan Valley. The proposed works would also enable further services such as Telstra cabling.

The upgrade and extension of the existing electricity distribution line is required to service the proposed Emirates resort site. The proposed works will take part within the existing road reserve. Included with the proposed works is the construction of concrete poles at the top of Wolgan Gap within a section of the Ben Bullen Forest.

2.3 Need for the Project

Emirates obtained concept approval from the NSW Minister for Planning in May 2006 for the development of a luxury resort in Wolgan Valley under Part 3A of the EP&A Act. The proposed works involving upgrades and extension of the existing electricity distribution line are required to service the proposed Emirates resort.

2.4 Site Location and Land Use

The primary access to the proposed Emirate's resort site is via Wolgan Road, which is also the route for the construction of the proposed electricity line. Surrounding Wolgan Road are rural properties and bushland which form part of the GBMWHA. The proposed electricity distribution line is to follow Wolgan Road with construction to be within the road reserve where disturbance has previously occurred.

The proposed extension and upgrade of the existing electricity distribution line stretches for approximately 17 km along Wolgan Road, beginning at Wolgan Gap and ending at the proposed resort site.

2.5 Project Description

2.5.1 Proposed Works

The proposed works would be undertaken as follows:

- Generators to be installed at affected premises (6 in total);
- Installation of new power poles along Wolgan Road within the existing road reserve;
- Replacing existing power poles along Wolgan Road;
- Replacing existing two wires with larger conductors and adding a third conductor;
- Delivery of poles to site and dressed (cross arms installed) on the ground;
- In some areas tree trimming and minor vegetation clearing may be required;
- New conductors are strung and energized;
- Excavation of soil;
- Stockpiling of excess soil and material to be used for rehabilitation;
- Rehabilitation of the route; and
- Painting of concrete poles (green) to blend with existing environment.

2.5.2 Equipment and Access

The anticipated construction vehicles and equipment required for the proposed works are listed below:

- Trucks;
- Excavators;
- Water Cart;
- Helicopter;
- Concrete Batch Plant/Mixer trucks;
- Cranes;
- Hand held plant and machinery; and
- Chainsaws.

Where possible, equipment and materials will be sourced from suppliers located within the local or regional area.

Access to the proposed corridor route of the power line is primarily from Wolgan Road.

2.5.3 Stockpiling

Temporary stockpiling for excess soil and materials will be undertaken and used for rehabilitation over disturbed areas. Rehabilitation is to commence as soon as possible once construction is completed.

Excavation work will be undertaken in stages to minimise the quantity of material disturbed at any one time.

Any waste or excess materials associated with the construction works are to be recycled or disposed to an appropriate facility.

2.6 Commencement of Works

The proposed works are expected to commence in April 2007. It is anticipated the proposed works will be completed within three months, subject to favourable conditions.

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3 STATUTORY PLANNING

3.1 Local Matters

3.1.1 Lithgow City Local Environmental Plan 1994

The primary local planning instrument that applies to the road reserve, being the site for the proposed upgrade and extension to the existing electricity distribution line, is the Lithgow City Local Environment Plan (LEP) 1994. The general aims of the LEP are:

(a) to recognise and promote the City of Lithgow as a desirable and viable place in which to live and to visit and invest,

(b) to encourage the proper management, development and conservation of natural resources and the built environment within the City of Lithgow by protecting, enhancing or conserving:

(i) prime crop and pasture land,

(ii) timber, minerals, soil, water quality, stream environment and other natural resources,

(iii) places of significance for nature or heritage conservation,

(iv) places or features of high scenic or recreational value, and

(c) to replace the former local planning controls with a comprehensive local environmental plan to help facilitate growth and development of the City of Lithgow in a manner which is consistent with the aims specified in paragraph (a) and which:

(i) minimises the environmental cost to the community of fragmented and isolated development of rural land which has less than full provision of services,

(ii) facilitates the efficient and effective provision of amenities and services,

(iii) facilitates a range of residential and employment opportunities in accordance with demand,

(iv) facilitates farm adjustments,

(v) ensures that the safety and efficiency of arterial roads is not adversely affected by development on adjacent land,

(vi) minimises the impact of flooding and bushfires,

(vii) encourages the separation of conflicting land uses,

(viii) establishes measures to preserve water quality in the City's streams and waterways, and

(ix) facilitates the protection of the catchment areas within and downstream of the City area in accordance with the principles of total catchment management.

The proposed works for the upgrade and extension of the existing electricity distribution line will be undertaken within the existing road reserve and therefore retain the existing agricultural use of land within the zone. This EA assesses the proposed in terms of its potential effects on soil, water quality, heritage, flora and fauna and surrounding ecosystems. Given the nature and scale of the proposed works, the works are not likely to impact on waterways. Provided that the management and mitigation measures identified in this EA are implemented the proposed works would be properly managed and consistent with the general objectives of the LEP.

Definition of the proposed works

The proposed works involve the upgrade and extension of an existing electricity distribution line from Wolgan Gap to the proposed resort site.

Clause 5 of LEP states that the EP&A Model Provisions 1980 (model provisions) are adopted for the purpose of the plan, except for the definition of:

> *arterial road, map, residential flat building and rural worker's dwelling in clause 4 (1), and clauses 15, 17, 18, 19, 29 and 34.*

The Model Provisions were repealed on 30 September 2005. However, given the provisions of the LEP were made prior to the date of repeal, the Model Provisions remain applicable in this instance.

Part 2 of the Model Provisions provides definitions. A 'public utility undertaking' is defined as:

> *any of the following undertakings carried on or permitted or suffered to be carried on by or by authority of any Government Department or under the authority of or in pursuance of any Commonwealth or State Act:*
>
> *(a) railway, road transport, water transport, air transport, wharf or river undertakings,*
>
> *(b) undertakings for the supply of water, hydraulic power, electricity or gas or the provision of sewerage or drainage services,*
>
> *and a reference to a person carrying on a public utility undertaking shall be construed as including a reference to a council, county council, Government Department, corporation, firm or authority carrying on the undertaking.*

Integral Energy will be undertaking the works, as authorised under the *Energy Services Corporations Act 1995*. As the proposal is for works to be carried out for the primary purpose of the supply of electricity authorised under *the Energy Services Corporations Act 1995* it falls within the definition of a 'public utility undertaking' as defined in the Model Provisions.

Under the Model Provisions a 'utility installation' is defined as:

> *'a building or work used by a public utility undertaking, but does not including a building designed wholly or principally as administrative or business premises or as a showroom'.*

As the proposed project is a 'public utility undertaking and the definition of a utility installation involves 'a building or work used by a public utility undertaking', the proposed also defined as a 'utility installation' under the Model Provisions.

Zoning

The majority of the proposed works fall within land zoned 1(a) Rural (General) under the LEP. The objective of the zone is to promote the proper management and utilisation of natural resources by:

(a) protecting, enhancing and conserving:

> *(i) rural land, in particular prime crop and pasture land, in a manner which sustains its efficient and effective agricultural production potential,*

(ii) soil, by controlling and locating development in accordance with soil capability,

(iii) forests of existing and potential commercial value for timber production,

(iv) valuable deposits of minerals, coal and extractive materials, by controlling the location of development for other purposes in order to ensure the efficient extraction of those deposits,

(v) trees and other vegetation in environmentally sensitive areas, where the conservation of the vegetation is significant for scenic amenity or natural wildlife habitat or is likely to control land degradation,

(vi) water resources for use in the public interest, preventing the pollution of water supply catchment and major water storages,

(vii) localities of significance for nature conservation, including places with rare plants, wetlands and significant wildlife habitat, and

(viii) items of heritage significance,

(b) preventing the unjustified development of prime crop and pasture land for purposes other than agriculture,

(c) facilitating farm adjustments,

(d) minimising the cost to the community of:

(i) fragmented and isolated development of rural land, and

(ii) providing, extending and maintaining public amenities and services,

(e) providing land for other non-agricultural purposes, in accordance with the need for that development, and

(f) providing for the separation of conflicting land uses.

Prohibited development purposes within this zone comprises boarding houses, bulky goods salesrooms and showrooms, commercial premises, motor showrooms, residential units, and shops (other than general store). All other purposes are permissible therefore the proposed works are permissible under this zone.

As shown in **Figure 3**, a small section of the proposed works falls within land zoned as 1(f) - Rural (Forestry) under the LEP. The objectives of this zone are:

(a) to identify land managed by the Forestry Commission under the Forestry Act 1916,

(b) to preserve existing forests within the City of Lithgow, while allowing compatible development, and

(c) to prevent pollution of water supply catchments and water quality in major water storages.

Within this zone, development for any purpose authorised by the Forestry Commission under the *Forestry Act 1916* is permissible without consent and only development for the purpose of extractive industries, mining, veterinary clinics is permissible with consent.

Clause 35 of the model provisions states that:

Nothing in the local environmental plan shall be construed as restricting or prohibiting or enabling the consent authority to restrict or prohibit:

(a) the carrying out of development of any description specified in Schedule 1,

(b) the use of existing buildings of the Crown by the Crown, or

(c) home occupations carried on in dwelling-houses

Clause 2 of Schedule 1 states:

The carrying out by persons carrying on public utility undertakings, being water, sewerage, drainage, electricity or gas undertakings, of any of the following development, being development required for the purpose of their undertakings, that is to say:

(c) the installation or erection of any plant or other structures or erections by way of addition to or replacement or extension of plant or structures or erections already installed or erected, including the installation in an electrical transmission line of substations, feeder-pillars or transformer housing, but not including the erection of overhead lines for the supply of electricity or pipes above the surface of the ground for the supply of water, or the installation of substations, feeder-pillars or transformer housings of stone, concrete or brickworks,

(d) the provision of overhead service lines in pursuance of any statutory power to provide supply of electricity.

As the proposed works involves the upgrade and extension of overhead lines for the supply of electricity, the proposal is permissible without consent as identified by clause 35 of the Model Provisions.

Special Conditions

Clause 11 of the LEP provides general considerations for development within certain rural zoned areas including 1(a) Rural (General) which must be considered prior to determining a development application. Council must take into consideration the effect that the proposed development would have on:

(a) the present use of the land, and the potential for sustained agricultural production of so much (if any) of the land as is prime crop and pasture land,

(b) vegetation, timber production, land capability and water resources (including the quality of the water, stability of water courses, ground water storage and riparian rights),

(c) the future recovery from known or prospective areas of valuable deposits of minerals, coal, petroleum, sand, gravel or other extractive materials,

(d) the protection of areas of nature conservation significance or of high scenic or recreational value, and of items of heritage significance,

(e) the cost of providing, extending and maintaining public amenities and services,

(f) development on adjoining land and on other land in the locality, including any cumulative impact, and

(g) the future expansion of settlements in the locality.

As the proposed works are a component of a project to be addressed under Part 3A of the EP&A Act, the Minister for Planning is the Approval Authority not Council. As the proposed works are to take place within an existing road reserve it is considered that the proposed works would not change the existing agriculture use of land within the zone. Provided that the management and mitigation measures identified in this EA are implemented the proposed

works would be appropriately managed and are considered to be consistent with the provisions of Clause 11 of the LEP.

3.2 State Planning Matters

3.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act and the EP&A Regulation provide the framework for environmental planning in NSW and include provisions to ensure that proposals that have the potential to impact the environment are subject to detailed assessment, and provide opportunity for public involvement.

As outlined in **Section 1** of this EA, Concept approval was obtained for the proposed Emirates resort project under Part 3A of the EP&A Act. The proposed works form a component of the approved Emirates Concept Plan. As a result the Minister for Planning would be the approval authority for the proposed works.

Under Part 3A, a proponent can seek either a Project approval or a Concept approval. Concept approvals allow the project to be considered on the basis of a Concept Plan with the assessment focussing on the strategic issues. The proponent is able to obtain approval of the Concept Plan prior to undertaking detailed studies of the various components of the project. Further details would subsequently be submitted as part of a Project approval.

The proposed works which are the subject of this EA are part of a modification of Concept approval for the proposed Emirates resort site which requires approval under Part 3A of the Act. As previously mentioned, the Minister of Planning is the Approval Authority for the proposed upgrade and extension works to the existing distribution line.

Section 75B(2) of the EP&A Act defines the type of development to which Part 3A applies and includes:

> *(a) major infrastructure or other development that, in the opinion of the Minister, is of State or regional environmental planning significance.*

Schedule 1 to SEPP (Major Projects) 2005 identifies classes of development which are defined as 'major projects' and includes certain facilities related to tourist, convention and entertainment which employ greater than 100 people. As the proposed works are an ancillary component of the Concept approval for the proposed Emirates resort site which will employ over 100 people the project meets the requirements of a major project in accordance with the provisions of SEPP 2005. The Minister would be the approval authority.

3.3 State Environmental Planning Policies

3.3.1 State Environmental Planning Policy (Major Projects) 2005

State Environmental Planning Policy (Major Projects) 2005 (SEPP 2005) was gazetted on 25 May 2005 and amended on 1 August 2005. It replaces all previous provisions related to former 'State significant development' in planning instruments, directions and declarations.
The primary aim of SEPP 2005 is:

> *'to identify development of economic, social or environmental significance to the State or regions of the State so as to provide a consistent and comprehensive assessment and decision making process for that development'.*

Group 6 of Schedule 1 to SEPP (Major Projects) 2005 identifies classes of development which are defined as 'major projects' and includes certain facilities related to tourist, convention and entertainment that:

(a) has a capital investment value of more than $100 million, or

(b) employs 100 or more people, or

(c) has a capital investment value of more than $5 million and is located in an environmentally sensitive area of State significance.

The proposed works which are the subject of this EA are an ancillary component of a larger project involving the proposed Emirates resort site which will employ 120 people and therefore meets the requirements of a major project in accordance with the provisions of SEPP 2005. Concept approval was approved in May 2006, this EA supports a Modification to the approval in order to supply electricity to the proposed Emirates resort site.

3.3.2 State Environmental Planning Policy 44 – Koala Habitat Protection

SEPP 44 aims to encourage the proper conservation and management of natural vegetation areas that provide habitat for Koalas to ensure that permanent free-living populations will be maintained over their present range.

Lithgow City LGA is listed in Schedule 1 of SEPP 44, which outlines LGA's to which the Policy applies. A flora and fauna assessment undertaken for the proposed works by Cumberland Ecology concluded that the provisions of SEPP 44 does not apply to the site of the proposed works. The full assessment is provided in **Appendix A**.

3.3.3 State Environmental Planning Policy 58 – Protecting Sydney's Water Supply

Under State Environmental Planning Policy 58 – Protecting Sydney's Water Supply (SEPP 58) all new development proposals in the catchments must be assessed for their effect on water quality. The Sydney Catchment Authority (SCA) plays a major role in reviewing development proposals that are a risk to water quality. Regional Environmental Plan (REP) 1 – Drinking Water Catchments which is to commence 1 January 2007 will repeal SEPP 58.

Part 5 of SEPP 58 lists LGAs within the hydrological catchment to which the policy applies and includes Lithgow LGA. Under SEPP 58, development that is listed in Schedule 1 and 2 must not be carried out without consent. The proposed works consist of a public utility undertaking which is not identified in Schedule 1 or 2. Additionally, SEPP58 applies to matters dealt with under Par 4 and Part 5 of the EP&A Act. As the proposal is a matter to which Part 3A applies, SEPP 58 does not apply to the proposal.

3.4 Other Legislation

3.4.1 Roads Act 1993

The *Roads Act 1993* regulates the carrying out of certain activities on public roads, provides classification of roads and establishes procedures for opening and closing public roads.

Section 138 of the *Roads Act 1993* requires consent to be obtained from the appropriate roads authority for the following works:

(a) erect a structure or carry out a work in, on or over a public road, or

(b) dig up or disturb the surface of a public road, or

(c) remove or interfere with a structure, work or tree on a public road, or

(d) connect a road (whether public or private) to a classified road,

The proposed works would be undertaken within the existing road reserve of Wolgan Road. Under Clause 7 of the *Roads Act 1993*, the consent authority for works under Section 138 is Lithgow City Council. As the proposal works fall under Part 3A of the Act concurrence from Council is not required, however consultation with Council would be undertaken prior to construction.

3.4.2 Forestry Act 1916

The *Forestry Act 1916* and the *Forestry Regulation 1999* contain provisions relating to what may and may not be done in forestry areas, the powers of government agencies and the regulation of logging activities.

Clause 31 of the *Forestry Act 1916* relates to the requirement of a permit to occupy or use land and states the following:

(1A) An occupation permit under this Act authorises the holder, subject to the regulations and subject to the conditions and limitations of the permit, to occupy land:

(c) where the permit is in respect of land within a State forest or flora reserve, for any purpose approved by the commission and specified in the permit.

(3) A permit under this section may be granted in respect of land within a State forest or timber reserve or flora reserve, or in respect of any Crown lands other than land held under:

(a) a conditional lease and not reserved from sale,

(b) a conditional purchase lease,

(c) a closer settlement lease, group purchase lease or settlement purchase lease granted under the Closer Settlements Acts, or

(d) a returned soldiers' special holding, being a lease to a discharged soldier granted under section 4 of the Returned Soldiers Settlement Act 1916.

Part of the proposed works involves the replacement and upgrade of the existing electricity line within land that is State Forest. Therefore under Clause 31 of the Forestry Act an Occupation Permit will be required prior to the commencement of construction of the proposed works from ForestsNSW.

3.4.3 Heritage Act 1977 (As Amended 1998)

The purpose of the *Heritage Act 1977* (as amended 1998) is to protect and conserve non-Aboriginal cultural heritage, including scheduled heritage items, sites and relics. The *Heritage Act* is administered by the NSW Heritage Office.

The *Heritage Act* makes provision for a place, building, work, relic, moveable object, precinct, or land to be listed on the State Heritage Register. If an item is the subject of an interim listing, or is listed on the State Heritage Register, a person must obtain approval under section 58 of the *Heritage Act* for the following works or activities:

- demolition of the building or work;
- damaging or despoiling the place, precinct or land, or any part thereof;
- moving, damaging or destroying the relic or moveable object;
- excavating any land for the purpose of exposing or moving the relic;
- carrying out any development in relation to the land on which the building, work or relic is situated, the land that comprises the place, or land within the precinct;
- altering the building, work, relic or moveable object;
- displaying any notice or advertisement on the place, building, work, relic, moveable object or land, or in the precinct;
- damaging or destroying any tree or other vegetation on or remove any tree or other vegetation from the place, precinct or land.

There are no known heritage items of heritage significance under the Heritage Act within the proposed corridor for the electricity distribution line works.

As the proposed works forms a component of a larger project which falls under Part 3A of the EP&A Act, approvals required under Part 4 of the *Heritage Act* do not apply to the project.

3.4.4 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act (NP&W Act) 1974 governs the establishment, preservation and management of national parks, historic sites and certain other areas, and the protection of certain fauna, native plants and Aboriginal relics.

The NP&W Act is relevant to the protection of Aboriginal artefacts and the protection of native flora and fauna. Section 86 of the NP&W Act identifies offences relating to Aboriginal Objects, including distributing land to discover an artefact. Section 87(1) of the NP&W Act requires a permit to be obtained to remove any artefacts, while section 90(2) of the NP&W Act requires consent from the Director-General of Department of Environment and Conservation (DEC) to knowingly destroy, deface or damage a relic or Aboriginal place.

An assessment of the impact of the proposed works on Indigenous Archaeology is included in **Appendix B** of this EA and summarised in **Section 6.6**. The assessment identified five (5) sites and one Potential Archaeological Deposit (PAD) within the study area. Provided that the recommended mitigation and management measures are implemented the impact of the proposed works on these items is not likely to be significant.

A permit under section 87 or consent under section 90 is not required for projects assessed under Part 3A of the EP&A Act, and as such the provisions of the NP&W Act do not apply.

3.4.5 Water Act 1912 / Water Management Act 2000

The *Water Act 1912* regulates works which impact on water resources and is to be repealed in the future by the *Water Management Act 2000*. At this stage, the *Water Management Act 2000* only applies to areas affected by Water Sharing Plans (WSPs). There is no such plan in place

for the area to which the site of proposed works is located, therefore the proposed project remains regulated under the provisions of the *Water Act 1912*.

Part 2 of the *Water Act 1912* requires a licence to be obtained for the construction of any work for the purpose of water consumption, irrigation, water supply, drainage or changing the course of a river.

The proposed works do not involve works for the purposes mentioned above and therefore the provisions of the *Water Act 1912* do not apply.

3.4.6 Rivers and Foreshores Improvement Act 1948

The *Rivers and Foreshores Improvement Act 1948* (RFI Act) provides protection for riverside land in NSW. Part 3A of the RFI Act requires anyone proposing to excavate or remove material from "protected land" or do anything likely to interfere with the flow of "protected waters" to first obtain a permit from Department of Natural Resources (DNR).

It is noted that protected land is defined as:

> *(a) land that is the bank, shore or bed of protected waters, or*
>
> *(b) land that is not 40 metres from the top bank or shore of protected waters*
>
> *(measured horizontally from the top of the bank or shore), or*
>
> *(c) material at any time deposited, naturally or otherwise and whether or not in*
>
> *layers, on or under land referred to in paragraph (a) or (b).*

The proposed works are not located within 40 metres of a creek and therefore a under Part 3A of the EP&A Act permit is not required for the project.

3.4.7 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) provides for the conservation of threatened species, populations and ecological communities of animals and plants. This is achieved by the following:

- *conserving biological diversity and promoting ecological sustainable development;*
- *preventing extinction and promote the recovery of threatened species, populations and ecological communities;*
- *protecting critical habitat of threatened species, populations and ecological communities;*
- *eliminating of managing certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities; and*
- *encouraging the conservation of threatened species, populations and ecological communities by the adoption of measures involving co-operative management.*

The TSC Act provides a framework to ensure that the impact of any action affecting threatened species is assessed. Schedule 1 of the TSC Act lists endangered species, populations and ecological communities, Schedule 2 lists vulnerable species and Schedule 3 lists key threatening processes. Part 3 of the TSC Act defines critical habitat.

The impact of the proposal on threatened species is discussed in **Sections 6.2** and **Appendix A** of this EA. The assessment concluded that no threatened species would be adversely affected as a result of the proposed works.

3.4.8 Native Vegetation Conservation Act 1997

The *Native Vegetation Conservation Act 1997* (NVC Act) provides a comprehensive system for conserving and managing native vegetation in NSW. Native vegetation is defined in this Act as any of the following types of indigenous vegetation:

a) *trees,*

b) *understorey plants,*

c) *groundcover,*

d) *plants occurring in a wetland.*

The NVC Act defines groundcover as any type of herbaceous vegetation, but it is only regarded as native vegetation for the purposes of this Act if it occurs in an area where not less than 50 % of the herbaceous vegetation covering the area comprises indigenous species. In determining that percentage, not less than 10 % of the area concerned must be covered with herbaceous vegetation (whether dead or alive).

Section 5 of the NVC Act provides the definition of clearing, which includes activities such as cutting down, felling, thinning, logging or removing vegetation. The definition also includes severing, topping or lopping branches, limbs, stems or trunks of native vegetation.

Section 7 of the NVC Act makes provisions for the Minister to identify land as State Protected Land, for the purposes of the Act. The Guidelines for clearing vegetation under the NVC Act (June 1999, DLWC) advise that State Protected. Land includes the following:

- *land that is generally in excess of 18 degrees slope;*
- *land within or within 20 metres of the bed of a prescribed stream; and*
- *land that is defined as 'environmentally sensitive.'*

Clearing in relation to land identified as State Protected Land includes any vegetation. It is noted however, that any land that is State Protected land ceases to be State Protected Land if the land is identified as regional protected land in accordance with a Regional Vegetation Management Plan (RVMP) or the land otherwise becomes land to which a RVMP applies.

Part 2 of the NVC Act applies the development consent process under Part 4 of the EP&A Act to clearing of native vegetation and clearing protected land. Native vegetation on any land except land to which a RVMP applies, or State Protected Land, must not be cleared except with development consent. In respect of State Protected Land a person must not clear any vegetation except with development consent.

Part 1, section 12 of the NVC Act does however exclude certain types of clearing from the provisions of the Act. Clearing which is or is part of a development within Part 3A of the EP&A Act is excluded under this section therefore the provisions of the NVC Act do not apply to the proposed works.

3.4.9 Native Vegetation Act 2003

The *Native Vegetation Act 2003* (NV Act) was assented to on 11 December 2003 and is intended to replace the NVC Act. Prior to the NV Act commencing, a supporting Regulation is

required to be approved by the Minister. The *draft Native Vegetation Regulation 2004* was placed on public exhibition and the submissions closed on 31 January 2005.

Clause 27 of the draft Regulation includes savings and transitional provisions for development applications made under the EP&A Act prior to the repeal of the former NV Act for any clearing that requires consent under the new Act and that is pending on the commencement of the NV Act. Under these provisions, if an application is made on or after the date of public exhibition of the draft Regulation, the application is to be dealt with and finalised under the NV Act.

The NV Act establishes the following objectives:

a) *to provide for, encourage and promote the management of native vegetation on a regional basis in the social, economic and environmental interests of the State, and*

b) *to prevent broadscale clearing unless it improves or maintains environmental outcomes, and*

c) *to protect native vegetation of high conservation value having regard to its contribution to such matters as water quality, biodiversity, or the prevention of salinity or land degradation, and*

d) *to improve the condition of existing native vegetation, particularly where it has high conservation value, and*

e) *to encourage the revegetation of land, the rehabilitation of land, with appropriate native vegetation,*

In accordance with the principles of ecologically sustainable development.

The NV Act provides a similar definition for native vegetation as that provided in the NVC Act. Part 3 of the NV Act restricts clearing of native vegetation except in accordance with a development consent granted in accordance with the NV Act or a property vegetation plan. However, the Act permits the clearing of vegetation without development consent or a property vegetation plan in the following circumstances:

- *where native vegetation is regrowth, but not protected regrowth, as defined in the NV Act;*
- *where native vegetation is only groundcover if the vegetation comprises less than 50 % of indigenous species of vegetation, and not less than 10 % of the area is covered with vegetation (whether dead or alive).*

Section 25 of the NV Act provides legislative exclusions from the Act for clearing in the following instances applicable to the proposed works:

- *any clearing that is a project under Part 3A of the EP&A Act and for which approval has been granted under that Act.*

Accordingly, the provisions of the NV Act do not apply to the proposed works.

3.5 Regional Matters

There are no Regional Environmental Plans (REPs) relevant to the proposed works.

3.6 Commonwealth Matters

3.6.1 Register of National Estate (RNE)

The RNE is Australia's national inventory of natural and cultural heritage places and includes more than 13,000 places of natural, historic and indigenous significance. Up until recently, the Australian Heritage Commission (AHC) had been responsible for advising the Commonwealth in relation to matters on the National Estate, under the provisions of the *Australian Heritage Commission Act 1975* (AHC Act).

Part IV of the AHC Act required the Australian Heritage Commission to keep an RNE and established procedures for matters to be listed on the RNE.

From 1 January 2004, the AHC Act has been repealed with the recent changes to heritage protection legislation (amendments to the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act* and *Regulation*) and the introduction of the Australian Heritage Council, the responsibilities of which include the keeping of the RNE.

The heritage assessment concluded that there are no heritage items located within close proximity of the proposed works and as a result the proposal is not expected to cause adverse heritage impacts.

3.6.2 Environmental Protection and Biodiversity Conservation (EPBC) Act 1999

The EPBC Act came into effect in July 2000 and requires the approval of the Commonwealth Minister for the Environment and Heritage for actions that may have a significant impact on matters of National Environmental Significance (NES). Approval from the Commonwealth is in addition to any approvals under NSW legislation.

The objects of the EPBC Act are as follows:

(a) *to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance;*

(b) *to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;*

(c) *to promote the conservation of biodiversity;*

(d) *to provide for the protection and conservation of heritage;*

(e) *to promote a co-operative approach to the protection and management of the environment involving governments, the community, landholders and indigenous peoples;*

(f) *to assist in the co-operative implementation of Australia's international environmental responsibilities;*

(g) *to recognize the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and*

(h) *to promote the use of indigenous people's knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.*

Approval under the EPBC Act is triggered by a proposal which has the potential to have a significant impact on a matter of NES or by a proposal which has the potential to have a significant impact on the environment which involves the Commonwealth. The EPBC Act lists eight matters of NES which must be addressed when assessing the impact of a proposal.

The EPBC Act also identifies approval requirements involving Commonwealth land and activities undertaken by Commonwealth agencies. The proposal does not involve Commonwealth land and is not an activity proposed by a Commonwealth agency, and therefore, the relevance of the EPBC Act relates to matters of NES.

Under section 68 of the EPBC Act, a proposal must be referred to the Commonwealth Minister for Environment and Heritage if the applicant believes an approval under the EPBC Act is required. The Commonwealth Minister for the Environment and Heritage would subsequently decide whether the proposal requires approval under the EPBC Act.

An assessment of the proposal in relation to the listed matters of NES is provided below in **Table 1** . A search of the Department of Environment and Heritage (DEH) EPBC Online Database was also undertaken, the results of which are shown in **Appendix C**.

Table 1: Compliance with Commonwealth EPBC Act requirements

Factor	Impact	Comment
environmental impact on World Heritage property?	**Nil**	Although the works would be undertaken in a locality which is adjacent to the "Greater Blue Mountains Area NSW" the minor nature of the works would not have a significant environmental impact on World Heritage property.
environmental impact on National Heritage places?	**Nil**	There would be no environmental impact on National Heritage places as a result of the proposal. No National Heritage Places occur in the vicinity of the Wolgan Valley.
environmental impact on wetlands of international importance?	**Nil**	There would be no environmental impact on wetlands of international importance as a result of the proposal. No wetlands of international importance occur in the vicinity of the Wolgan Valley.
environmental impact on Commonwealth listed threatened species or ecological communities?	**Nil**	Although 23 threatened species were recorded as potentially occurring, the minor nature of the works and the proposed safeguards would ensure that there would be no environmental impact on Commonwealth listed threatened species or ecological communities as a result of the proposal.
environmental impact on Commonwealth listed migratory species?	**Nil**	Although eight migratory species were recorded as potentially occurring, the minor nature of the works and the proposed safeguards ensure that there would be no environmental impact on Commonwealth listed migratory species as a result of the Proposal.

Factor	Impact	Comment
Does any part of the Proposal involve nuclear action?	**Nil**	The proposal does not involve nuclear action.
environmental impact on a Commonwealth Marine area?	**Nil**	There would be no environmental impact on a Commonwealth Marine area as a result of the proposal.
In addition: impact on Commonwealth Land?	**Nil**	There would be no impact on Commonwealth Land as a result of the proposal.

The proposed utility installation is not expected to impact on matters of NES, and as a consequence the EPBC Act is not triggered and referral to, and approval from, the Commonwealth Minister for Environment and Heritage is not required.

3.7 Conclusion

The EA has been prepared pursuant to the provisions of the EP&A Act and the Environmental Planning Instruments (EPIs) created under the EP&A Act, together with the relevant NSW environmental legislation. The EA has also taken into account the Commonwealth EPBC Act 1999.

The proposed upgrade and extensions of the existing electricity distribution line is a component of a project involving the development of a tourist facility, defined as a major project under Part 3A of the EP&A Act and Regulation. As a major project, the Minister of Planning is the Approval Authority.

The proposed utility installation is permissible under the provisions of the Lithgow LEP 1994.

An Occupation Permit under the *Forestry Act 1916* would be required from ForestsNSW as part of the proposed works is located within Ben Bullen State Forest.

Approval from the Commonwealth Minister for Environment and Heritage is not required.

4 CONSULTATION

Consultation was undertaken with the following relevant agencies and stakeholders in regard to the proposed upgrade of the electricity distribution line within the Wolgan Valley. These agencies and stakeholders were provided with the opportunity to comment on the proposed works and to highlight potential issues. **Table 2** below lists the agencies and stakeholders that were invited to comment and a summary of the responses received

Consultation with Integral Energy and Forests NSW was initially undertaken with regard to the proposed electricity distribution line works being undertaken under Part 5 of the EP&A Act. Subsequent consultation was undertaken on confirmation of the assessment being undertaken under Part 3A of the EP&A Act.

Table 2: Agencies and Stakeholder Responses

Agency / Stakeholder	Comments Received
NSW Department of Natural Resources (DNR) • Marwan El Chamy	• No specific requirements were required for the assessment of the electricity distribution line upgrade • DNR indicated that the proposed level of assessment is adequate for DNR requirements
NSW Department of Environment and Conservation (DEC) • Richard Whyte • Bob Conroy (NPWS)	• No specific requirements were required for the assessment of the electricity distribution line upgrade • DEC provided additional contacts for consultation in regard to National Parks and Wildlife Services (NPWS) issues • NPWS agreed with the proposed level of assessment proposed by HLA and the requirements for indigenous heritage and flora and fauna assessments
Lithgow City Council (LCC) • Gary Wallace	• No specific requirements were required for the assessment of the electricity distribution line upgrade • LCC indicated that the proposed level of assessment is adequate for LCC requirements
Integral Energy • John Wallace	• The assessment should include flora and fauna, Indigenous and European heritage • A visual assessment should also be included • Concrete poles for the 1.3 km span should be painted green to minimise visual intrusion • No additional requirements were advised through subsequent consultation

Agency / Stakeholder	Comments Received
Forests NSW • Stephanie Hutchinson	• The assessment should include details of flora, fauna and indigenous heritage assessment within proposed clearing areas • Clearing should be minimised • Site selection should be undertaken carefully to minimise impacts • Appropriate permits and approval should be obtained • Sites should be rehabilitated on completion of works including all tracks • No additional requirements were advised through subsequent consultation

5 DESIGN CONSIDERATIONS

5.1 Options Considered

5.1.1 Option 1 – Do Nothing

This option would not meet the objectives of the proposal and would result in the proposed Emirates resort site having no access to electricity supply. This would not be sufficient for the operation of the proposed Emirates resort site. Therefore, this option was considered as unacceptable.

5.1.2 Option 2 – On site Generation

This option would involve the generation of electricity on site through processes such as fuel powered generators. This option would have a high operational cost and would not fit within the overall design philosophy for the proposed Emirates resort site which is planned to operate under an environmental focus. Therefore, this option was considered as unacceptable.

5.1.3 Option 3 – Extension of the Existing Power Supply

This option would involve the extension of the existing electricity distribution line to the proposed Emirates resort site boundary (approximately 14 km) and the upgrade of the lines to 11 kV to accommodate the increase in electricity demand within the valley.

The extension works would be confined to the existing Wolgan Road reserve with the upgrade of the existing power poles (where required) and installation of additional poles and lines along the Wolgan Road. The power supply would be available to residents along the Wolgan Road and would provide opportunity for further services such as Telstra cabling.

This option has been chosen as the preferred option as it meets the requirements of the proposal objectives and is considered to be an environmental "fit" with the objectives of the proposed Emirates resort site operational plan.

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6 ENVIRONMENTAL ASSESSMENT

6.1 Soils and Geology

6.1.1 Existing Environment

Geology within the Wolgan Valley primarily comprises of the Berry Formation of the Shoalhaven Group of Permian age. This formation comprises sandstone shale and conglomerate bands overlying rock of Middle Devonian and Lower Carboniferous ages. Higher elevations of the valley are underlain by basalt units of the Illawarra Coal Measures comprising inter-bedded shale, sandstone, conglomerate, chert, coal and torbanite seams. Surrounding the Wolgan Valley extensive mine workings have impacted the geology of the area. Mines exist within the Lithgow, Angus Place and Wallerawang areas.

Douglas Partners (2005) identified groundwater in the Wolgan Valley to be characterised by fresh groundwater in elevated areas comprising of the Narrabeen Group sandstones and brackish groundwater within the underlying Illawarra Coal Measures and Shoalhaven Group rocks.

Several soils landscapes exist within the Wolgan Valley including:

- Long Swamp;
- Cullen Bullen;
- Wollangambe;
- Glen Alice;
- Hassans Walls;
- Coco; and
- Wolgan River.

Locations, limitations and characteristics of each landscape are provided in **Appendix D**.

Site specifically, the soils within the locality have been altered through road construction, utility installations, mining, rural development and extensive grazing practices in post European times. The proposed areas to be disturbed for the activities detailed in this EA are largely restricted to the road reserve, and therefore, have been subject to previous disturbance such as grading, excavation, compaction and clearing. Areas outside the road reserve to be impacted include a utility easement and a small section of bushland (up to 40 m linear length).

Limitations of soil landscapes within the Wolgan Valley and at Wolgan Gap should be considered in the construction methodology for the electricity distribution line. Factors within the Wolgan Valley include localised salinity, localised non-cohesive soils and high water erosion while factors at Wolgan Gap include mass movement hazard, severe foundation hazard and extreme water hazard.

6.1.2 Impact Assessment

The installation of additional power poles and power lines would result in the disturbance of soils along the Wolgan Road extending from Wolgan Gap to the proposed Emirates resort site

boundary. It is anticipated that 128 poles will need to be installed along the length of roadway. This disturbance would be limited in area up to approximately 10 m^2 at each pole location, due to disturbance required for equipment, machinery and drilling into soils and substrate for installation of power poles.

Potential impacts associated with this disturbance would include increased erosion and sedimentation potential and stockpiling of small quantities of soil, prior to reuse or removal. The location of the power poles is within the existing road reserve which has been previously disturbed through roadway construction and fence installations; therefore, it is not anticipated that the proposed disturbance would have a significant impact on the soils or geology within the proposed works site.

Mitigation measures identified below would be implemented to reduce the likelihood of impacts on the soils and geology within the proposed works site.

6.1.3 Mitigation Measures

To minimise the potential risks and ensure the protection of the environment, the following safeguard measures have been identified for the proposed activities.

- Erosion and sedimentation control would be implemented and maintained throughout construction;
- Excavation and clearing works would be kept to a minimum, particularly at the Wolgan Gap site;
- Stockpile areas would be kept to a minimum within the existing road reserve with soils reinstated as soon as practical after excavation;
- Excavated soils would be reinstated prior to the end of the day's works. Stockpiled material would not remain onsite outside of work hours; and
- In the event of heavy rainfall periods, excavation works would be suspended.

6.1.4 Conclusion

It is not anticipated that the installation of additional power poles or the upgrade of the existing power line would result in adverse impacts to the proposed works site given the effective implementation of mitigation measures detailed above. Potential disturbances are limited to a small area immediately surrounding each pole location. Consideration of soil limitations for the valley floor and Wolgan Gap areas prior to construction would enable targeting of specific erosion and foundation hazards and appropriate control measures.

6.2 Flora and Fauna

Cumberland Ecology was engaged to undertake a flora and fauna assessments for the construction of the 11 kV electricity distribution line for the Emirates Wolgan Valley Resort. The assessment included site field surveys which were conducted over two days on 24 and 25 October 2006. The Flora and Fauna Impact Assessment report by Cumberland Ecology is provided in **Appendix A**. A summary of the assessment is provided in this section.

The objectives of the flora and fauna assessment were:

- To describe vegetation communities on the subject site;
- To describe fauna habitats on the subject site;

- To assess the likelihood that threatened flora and fauna could occur on the subject site; and
- To formally assess the impacts of the proposed development as required under Section of the *EP*&A Act and determine the need for a Species Impact Statement (SIS).

6.2.1 Existing Environment

Flora

The distribution pole located at Wolgan Gap on the edge of the sandstone plateau is in an area that has been largely cleared, containing regenerating native species from the adjoining bushland. Species include: *Cassinia arcuata, Poa sieberiana, Podolobium ilicifolium* (Native Holly), *Hakea dactyloides, Patersonia sericea* (Purple Flag) and *Lomandra multiflora* (Manyflowered Mat-rush).

Adjoining bushland contains similar species with a canopy of *Eucalyptus sparsifolia* (Stringybark), *Eucalyptus mannifera* (Brittle Gum), *Eucalyptus dives* and *Allocasuarina littoralis* (Black She-oak). Exotic species are rare at the site, limited to a few ground cover species.

The first two distribution pole locations in the valley floor are located on stony rises with silty sandy soil. Vegetation has previously been largely cleared from the vicinity of the distribution towers with minor regeneration and some plants up to three metres in height. Species included: *Cassinia arcuata, Podolobium ilicifolium, Acacia buxifolia, Lissanthe strigosa* (Peach Heath), *Bursaria spinosa* (Blackthorn) and *Lomandra spp.*

The surrounding forest comprises *Eucalyptus punctata* (Grey Gum) *Eucalyptus melliodora* (Yellow Box)-*Eucalyptus blakelyi* (Blakelys Red Gum) open forest and woodland.

No threatened species were recorded in the existing electricity distribution corridor.

Vegetation in the vicinity of the proposed extension area for the electricity distribution line has been largely cleared in the road reserve, although numerous scattered mature trees are present. The land adjoining the road reserve contains bushland in several locations, separated by exotic and native pasture (**Figure 4**). These areas comprise variants of Talus-slope Woodland (Benson & Keith, 1990).

Some sections of Talus-slope Woodland share features with the endangered ecological community (EEC): White Box - Yellow Box - Blakelys Red Gum Grassy Woodland, however the present community was concluded to be a variant of Talus-slope Woodland. Canopy species included: *Eucalyptus melliodora, Eucalyptus fibrosa* (Broad-leaved Ironbark), *Eucalyptus eugenioides* (Thin-leaved Stringybark), *Eucalyptus punctata* (Grey Gum), *Eucalyptus rossii* and *Eucalyptus blakelyi. Eucalyptus albens* (White Box) was recorded in the widest section of the valley, west of the proposed resort property gate.

Fauna

Vegetation within the Wolgan Valley consists of largely native species that have regrown since extensive clearing mid last century for farmland. Consequently, much of the electricity distribution corridor and directly adjoining areas are either devoid of native vegetation, particularly in locations where agricultural land borders the road corridor, or have limited vegetation structure.

For ease of description the electricity distribution line corridor was split into sections commencing from the proposed resort site boundary and finishing at Wolgan Gap. Habitat features of these sections are shown in **Figure 4**.

- Section 1 (mainly cleared agricultural land immediately after the resort site gate)

Potential habitat for native fauna is minimal in this section as the majority of native vegetation has been cleared in and adjoining the road reserve. Some small bird species may forage in the pasture area. No threatened species have potential habitat in this section.

- Section 2 (open woodland adjoining the road verge)

Canopy trees in this area offer some small hollows for nesting of small birds and microbats, however connectivity to tracts of woodland is poor as these areas are within agricultural properties. Flowering Eucalypts occur in this area including Yellow-box and some White-box. The understorey is sparse but generally contains all strata.

- Section 3 (curved section of road)

A small number of larger Eucalypts occur on the southern side of the road as does a small drainage line, which was dry at the time of survey.

- Section 4 (mostly cleared verge past curved section of road)

This section consists of pastoral land with scattered young regrowth trees.

- Section 5 (where existing poles will be used – within State Forest)

This area contains mature trees and a more intact understorey than the other sections.

6.2.2 Survey

The assessment was based on the proposed electricity distribution corridor; including existing and proposed extension sections within Ben Bullen State Forest and Wolgan Road verge.

An inspection of the corridor was undertaken in order to determine the nature and condition of the vegetation present and whether any threatened flora occurred in the area that was likely to be affected by the proposed development. The inspection comprised traversing the corridor, with detailed inspection or survey being done in locations of possible significance.

In conjunction with the flora survey, a fauna habitat assessment was conducted along the entire route for potential fauna habitat where threatened species could be present. Habitat was assessed for important indicators of suitability, including known species of feeding trees and shrubs and occurrence of such features as wetlands, creeks, tree hollows and fallen logs.

6.2.3 Conservation Significance

No plant community recorded in or adjacent to the proposed electricity distribution line corridor is listed as threatened under the TSC Act or EPBC Act.

Flora

One specimen of *Persoonia marginata* (Clandulla Geebung) was recorded on the road margin, approximately 11.6 km west of the gate into the proposed resort property. *Persoonia marginata* is listed under Schedule 2 of the TSC Act as being "vulnerable". This specimen was located on the southern side, less than one metre from the road pavement.

No other species listed by Briggs & Leigh (1995) or Benson & Keith (1990) as being significant for conservation were observed in the study area.

Fauna
A large number of threatened species of fauna occur in the locality, however, only a small subset have potential habitat within the impact zones, as described in Table 3.1 of the detailed assessment, which is provided in **Appendix A**.

6.2.4 Impact Assessment

The vegetation in the location of the proposed electricity distribution line has been largely cleared within the road reserve with scattered mature trees occurring in numerous locations. The land adjoining the road reserve contained bushland in several areas, separated by exotic and native pasture. It would be necessary to remove or trim numerous trees adjacent to the road reserve to provide adequate separation between the overhead cable and nearby vegetation. In most locations pasture occurs on the opposite side of the road to bushland in which case relocation of the electricity line to the cleared side of the roadway would eliminate the need for vegetation removal or trimming and avoid any impact to that bushland. Large individual remnant trees occur in some sections of pasture and should be avoided where possible.

Figure 5 provides an indication of the preferred roadside location for the proposed extension of the electricity distribution line. The figure depicts locations where sensitive vegetation structure can be avoided through relocation of the line to the opposite side of the Wolgan Road.

Fauna habitat values in the electricity distribution line corridor are limited, particularly along the valley floor. Clearing of woodland in this area is likely to be minimal, and is not expected to greatly reduce habitat areas for any threatened fauna species which may occasionally utilise roadside vegetation. A small number of mature Eucalypts with hollows will be cleared in these sections which provide potential roosting habitat for microbats but none of the hollows are large enough to provide nesting habitat.

The lower slopes and part of the valley floor below Wolgan Gap provide extensive fauna habitats with less disturbance than the rest of the electricity distribution corridor on the valley floor. Clearing in these sections will be limited to within the existing road reserve, where trimming occurs for present maintenance. The two pole locations have previously been cleared for the establishment and maintenance of the existing poles.

6.2.5 Mitigation Measures

The following mitigation measures have been identified:

- The electrical distribution line would follow the existing road reserve as much as possible;
- Any vegetation removal or trimming should be minimised wherever possible;
- All bushland and individual large trees should be retained in the final route where possible;
- Any loss of trees should compensated for by replacement with suitable species in other appropriate locations;
- A pre-construction inspection should be made of the specific locations of power-poles to ensure minimal impact on bushland and potential fauna habitat tree will be achieved;

- Consideration should be given to the relocation of power poles, as detailed in **Figure 5**;
- A fauna protection protocol should be prepared, and all works staff should be briefed on the potential risks to fauna and the requirement to follow other environmental protection protocols; and
- During vegetation clearance, felling of trees should be supervised by an authorised wildlife rescue expert or ecological consultant.

6.2.6 Conclusion

The impact on native flora in the electricity distribution line corridor is expected to be minor and would be minimised through the implementation of mitigation measures detailed above.

No EECs were identified in the impact zones, and only one individual plant of a threatened species; *Persoonia marginata* (Clandulla Geebung) was recorded at the edge of Wolgan Road.

Fauna habitats at the road's edge are limited in most places along the proposed electricity distribution corridor, and the use of existing poles in the upper section of the line should ensure that vegetation which is part of more extensive tracts of woodland, within Ben Bullen State Forest, will remain no more disturbed than is currently required for maintenance.

No significant impacts on species or ecological communities listed on the TSC Act or the EPBC Act have been predicated in terms of the assessments of Significance, as provided in **Appendix B** of the Flora and Fauna Assessment (Cumberland Ecology 2006). No SIS or referral to the Commonwealth Department of the Environment and Heritage is required to further assess these species.

6.3 Landscape and Visual Amenity

6.3.1 Visual Nature of the Surrounding Environment

The landscape of the Blue Mountains generally consists of plateaux, steep slopes, cliffs, valleys and contains numerous creeks and tributaries within a relatively dense bushland setting. The proposed works involving the upgrade and extension of the existing electricity power line between Wolgan Gap and the proposed resort site would be located within the existing road reserve of Wolgan Road. Due to the topography of the area, Wolgan Road traverses winding, narrow and steep conditions particularly on its decent into the valley. The topography of the valley floor is generally gently undulating.

From Wolgan Gap the road descends through predominately bushland into the valley. Along the valley floor, much of the vegetation has been cleared for agricultural and rural residential development. Within the actual road reserve the land has been subject to previous disturbance from the construction of the road and other infrastructure, such as fences however there are pockets of remnant and modified vegetation remaining.

Land uses within the area include:

- Conservation areas including State Forest and National Parks which form part of the GBMWHA;
- Agriculture primarily livestock grazing and rural residential development;
- Mining activities;

- Tourism; and
- Infrastructure.

Landscape character of the site
Adjacent to Wolgan Road land uses are predominately rural / rural residential and undeveloped bush. There are approximately 15 rural residential properties located along Wolgan Road.

The proposed works would be undertaken within the existing road reserve of Wolgan Road. Wolgan Road runs between Linsdale and the proposed Emirates resort site. The topography of the road reserve varies between steep, flat and gently undulating. The proposed upgrade to the 11 kV electricity line involves:

- upgrading the existing two lines with a larger conductor and the addition of a third conductor for a length of approximately 3 km; and
- the installation of new poles or the replacement of existing poles, between the existing line and the site of the proposed Emirates resort. The extension of the electricity power line to the proposed resort site totals a distance of approximately 14km.

The proposed works cover approximately 17 km in total length between Wolgan Gap and the proposed Emirates resort site.

For ease of description the landscape of Wolgan Road has been divided into three sections as identified in **Table 3** below.

Table 3: Landscape Character along Wolgan Road

Location	Landscape Character
Wolgan Gap and decent into valley	Typified by bush
Valley floor	Rural residential and farming areas
Area leading to proposed resort site	Land is increasingly cleared

The proposed site for works within the road reserve has experienced significant disturbance as a result of road construction and other infrastructure development. The landscape character of the road reserve, and therefore the site has been significantly altered due to disturbances from grading, excavation, compaction and clearing, associated with the construction of the road and other installations such as fences.

Visual Receptors
Given the remoteness of Wolgan Road, and therefore the proposed site for works, the visual receptors for the proposed electricity distribution line would include:

- Motorists travelling along Wolgan Road;
- Residents and their visitors; and
- Guests, staff and visitors associated with the proposed Emirates resort once operational.

6.3.2 Assessment Methodology

The potential for the proposal to impact upon the visual environment would be dependant on the visibility of the activities involved in the site preparation and construction of the proposed

electricity distribution line and the impact of the final structure on the environment. The Visual Absorption Capacity of the landscape within the road reserve affects the extent to which the proposal would impact upon the landscape.

Visibility
Visibility is a measure of the degree to which the construction activities and the final structure may be visible from the surrounding area, the relative number of viewers, the period of the view, the proximity of the view and the type of view. The following assumptions were made in undertaking an assessment of the visibility of the proposal:

- If the number of people who may see the proposal is low then the visual impact is lower than if a large number of people would view the proposal;
- The further away a viewer is would limit the impact the proposal would have on the viewer; and
- If part of the proposal is not visible from a particular location then the potential visual impact is considered to be zero.

It is also noted that atmospheric factors can affect the level of visibility of a feature in the landscape.

Visual Absorption Capacity
Visual Absorption Capacity has been defined as:

> *An estimation of the capacity of the landscape to absorb developments without its character being significantly changed or its scenic quality reduced (Gosford City Council, Development Control Plan No.89, Scenic Quality, Nov.1996).*

Visual Absorption Capacity is for the most part dependent on the landform and vegetation cover in the immediate area. For example, it is usually considered that coastal areas have a low Visual Absorption Capacity due to their potential for water views, and flat or gently undulating open forest generally has a higher capacity to visually absorb development than steeper cleared ridges or slopes.

Another element to be considered is the level of visual contrast between the existing components of the landscape and the proposed new project. For example, if an area is undeveloped then the capability of the area to visually absorb a prominent development is lower than an area that already contains similar forms of development.

6.3.3 Visibility Assessment

HLA undertook a field inspection of the proposed route for the electricity line upgrade and extension and its current surrounds on 24 October 2006 to determine the visual catchment of the area and viewpoints from which the proposed electricity line and associated construction activities would potentially be visible.

The visibility assessment relates to the proposed components described previously in **Section 6:3.4**. **Table** 4 below provides the results of the visual assessment.

Table 4: Level of Visibility

Viewpoint No.	Location	Category of Viewer	Likely Period of View	Level of Visibility	Viewpoint Sensitivity
Proposed Electricity Line Upgrade					
V1 (Plate 1)	Wolgan Road	Motorists travelling along Wolgan Road	Variable, depending on speed of vehicles	Intermittent – obstructed views due to topography and shielding by vegetation	L
V2 (Plate 2 – view of existing poles from Wolgan Road)	Wolgan Gap	Motorists travelling along Wolgan Road	Limited due to topography, mainly visible on approach to Wolgan Gap. Short term intermittent periods of view.	The larger replacement poles would be visible from a greater distance, increasing visibility. The addition of a third conductor to the existing line would have minimal impact to visual amenity	L - additional wire M - larger poles
V3 (Plates 3)	Foot of Wolgan Gap (looking up to Wolgan Gap)	Motorists travelling South out of the valley	Variable, depending on speed of vehicles	Limited views obscured by topography and bushland	L
Proposed Electricity Line Extension					
V4 (Plates 4)	Wolgan Road	Motorists travelling along Wolgan Road	Variable, depending on speed of vehicles	Would vary – poles would be more visible along valley floor and in cleared areas, and less visible on steeper slopes and areas surrounded by bushland	L - M
V5	Rural residential properties along Wolgan Road	Residents and visitors to property and employees in agricultural activities	Residents may have periods of extended views	Variable – some views would be limited due to existing vegetation.	L - M

Viewpoint No.	Location	Category of Viewer	Likely Period of View	Level of Visibility	Viewpoint Sensitivity
V6 (Plate 5)	Proposed Emirates Resort Site	Guests, visitors, staff and management	May be extended periods of views	Variable – some views would be obstructed due to vegetation	L - M

6.3.4 Assessment of Impacts

Visual Absorption Capacity

As discussed in **Section 6.3.2** the Visual Absorption Capacity of the proposal can be considered to be the level of visual contrast between the proposed electricity structure and the context in which it is placed. The topography of the road reserve, where the electricity line would be located varies between undulating, steep slopes and flat land, which has undergone previous disturbance due to existing infrastructure. Bordering the road reserve is bushland or cleared rural land. Therefore, the capacity of the area to visually absorb the proposed works varies depending on the location of the pole in terms of the surrounding land use. The capacity of the area to absorb the proposed works when surrounded by bushland is much higher then it is when located in cleared areas. The visual impact of the electricity powerline on the decent into the valley once constructed would be limited to relatively few viewpoints. The visual impact of the new electricity line along the valley floor in clear areas would be more noticeable.

Construction

The proposed route for the electricity power line is located within an existing road reserve which has been subject to previous disturbance where vegetation has been modified or cleared. The construction works would involve the movement of construction and earth moving vehicles within the road reserve, excavation of earth, removal of vegetation and tress, removal of existing poles, upgrade of existing powerlines and the installation of new poles. A variety of vehicles and equipment would be required throughout the duration of the construction phase as described in **Section 2.5.2**.

Construction works would be visible primarily from motorists travelling along Wolgan Road and from rural-residential properties, identified as V1 - V4 in **Table 4** . It is expected that the majority of residents would have some direct and continual views of the proposed works. In some areas, existing vegetation near the road or surrounding the property would assist in screening the proposed works. The visual impact from Wolgan Road and the rural residences would be higher during construction activities. On steeper slopes road users would have intermitted views of construction activities due to topography and surrounding bushland. As construction would be completed in stages, visual impacts with construction activities would be limited to small sections of the road at different periods of time; therefore the impact on residents would vary. As the construction period for each section of the road is temporary and short in duration, visual impacts during construction are expected to be minor and negligible.

Operation

The proposed upgrade would result in a minor increase in visibility as the replacement poles would be taller than the existing infrastructure and therefore may be visible from a further distance. However, the upgrade is not considered likely to significantly increase the current visibility of the existing electricity distribution line. Visual impacts associated with the installation of a larger and additional conductor to the existing line would also be minor and insignificant. For road users the lines and conductors are not located at eye level, and the size and colour would generally absorb into the surrounding environment.

The extension of the existing electricity distribution line is primarily within the road reserve and located within a rural setting. The extension is not likely to significantly impact the visual amenity of the area.

Residents, visitors, agricultural employees as well as guests, visitors, staff and management may have continual periods of view of the proposed extended electricity line once the resort is in operation. This visibility would vary in areas where existing vegetation provides some level of screening.

Overall, the upgrade and construction the proposed electricity line is not expected to create significant visual impacts to receivers in the surrounding areas.

6.3.5 Mitigation Measures

The visual impact of the construction and operation of the proposed works would be further reduced by the implementation of the following mitigation measures.

- New poles are to be painted green to provide further absorption of the poles into the existing environment;
- Construction is to be carried out in stages, construction activities limited to one section of the road reserve at a time;
- Where possible, vegetation removal would be minimised during construction and maintenance clearing;
- Any existing vegetation screening would be maintained; and
- Dust control measures and monitoring of emissions would be undertaken during the construction period;

6.3.6 Conclusion

The visual impact of the proposed electricity line would be greater along the valley floor in cleared areas than on steeper slopes in areas surrounded by bushland.

The receivers which may be impacted include:

- Motorists travelling along Wolgan Road;
- Residents and visitors; and
- Guest, visitors, staff and management of the proposed Emirates resort.

The upgrade would have a minor increase in the level of visibility compared to the existing infrastructure. Similarly the extension of the electricity line would have more of an impact, but is considered consistent with the existing infrastructure and the mitigation measures proposed have been designed to minimise the impact.

Overall, the proposed upgrade and extension of the electricity distribution line is not expected to significantly impact the visual amenity of the area.

6.4 Indigenous Heritage

6.4.1 Introduction

This section summaries an Aboriginal heritage assessment undertaken by HLA-Envirosciences Pty Limited (HLA) for a proposed electricity line easement in the Wolgan Valley on behalf of Emirates Hotels Australia Pty Ltd (Emirates). The full report is provided in **Appendix B**.

The survey was undertaken to assess the impact on Aboriginal archaeological sites of the placement of power poles for the carriage of overhead powerlines from the head of Wolgan Valley (from The Gap) to the entry point onto the proposed Emirates resort site. The proposed electricity line largely follows the existing road easement on either side of Wolgan Road. The survey was carried out by two HLA archaeologists on 2 and 3 November 2006. Representatives of the Bathurst Local Aboriginal Land Council and Wiradjuri Nation assisted in the survey on 3 November 2006.

6.4.2 Prehistory – Human Occupation

The antiquity of Aboriginal occupation of the Wolgan Valley has yet to be ascertained. However, archaeological research in the Blue Mountains region shows habitation extending back to at least the terminal Pleistocene, 12-13,000 years ago (Birmingham 1966; Stockton and Holland 1974, 1979). A similar timeframe could be expected for the Wolgan Valley.

Only limited archaeology has been undertaken in this part of the Blue Mountains. Australian Museum Business Services (AMBS) (2006: 7) summarises five archaeological surveys undertaken in the region since 1981 (Brayshaw 1981, 1983; Gorecki 1982/83; Gollan 1983; McIntyre 1990), which have resulted in the identification of at least 99 sites and 55 PADs. A search of the Department of Environment and Conservation's Aboriginal Heritage Information Management System database (AHIMS)[1] on 30 October 2006 revealed 28 Aboriginal sites within the immediate vicinity of the Wolgan Valley (**Figure 6**) although none are located on the valley floor itself.

In relation to the current study, the most relevant and recent work has been that of AMBS, which carried out a four day survey for Emirates in 2005 (AMBS, 2006). This involved a survey of the entire proposed project site using a mixture of pedestrian and vehicle survey methods. Twelve sites and three PADs were identified, with one extensive PAD and site discovered near the intersection of Wolgan River and Tunnel Creek, at the entrance to the Emirates property. The site consists of several hundred stone artefacts of tuff, silcrete, quartzite, and chert covering an area of approximately 50 m by 200 m (AMBS, 2006: 20). This location marks the northern terminus of the survey discussed in the report presented here.

The limited archaeology thus far done in the Wolgan Valley region demonstrates that a potential exists for a high site density, at least in some parts of the valley floor. The predictions of site location made in the AMBS report (AMBS 2006: 9), drawn from previous studies, include the presence of "major site complexes" at the head of valleys and at the junction of major watercourse, where there is relatively easy access from ridgetops. The survey presented in this EA offered an opportunity to test this predicted Aboriginal occupation pattern by examining a roughly linear transect from the top of the valley to the low lying northern end, where extensive sites were found by AMBS.

[1] Note that further sites may have been added to the AHIMS database after the time of accession, and in the absence of groundtruthing no guarantee can be given to the accuracy of the site locations depicted.

6.4.3 Archaeological Survey

The archaeological survey consisted of traversing by foot easements either side of Wolgan Road. The length of surveyed road easement extended from beneath The Gap in the south-west to the northern end of the transect, at the entry location into the Emirates property, a distance of approximately 14 km. The survey was undertaken over two days, on 2 November 2006 by HLA, and on 3 November 2006 included representatives of the Aboriginal communities.

6.4.4 Consultation

Aboriginal consultation for this project was facilitated by the project manager for the Emirates resort, Clifton Coney Group. On 15 November 2005, Clifton Coney Group and Emirates held an Aboriginal consultation meeting in Lithgow to discuss all aspects of the overall project, including heritage surveys. This was attended by representatives of Wiradjuri Nation, the Greater Lithgow Aboriginal and Torres Strait Islander Corporation, and a number of Indigenous people culturally connected with the area. The Bathurst Local Aboriginal Land Council was unable to attend and sent its apologies. The Bathurst Local Aboriginal Land Council, in a written statement, and Wiradjuri Nation representatives indicated (as set out in the minutes of the meeting) that their organisations wished to be included in any future archaeological site investigations.

Prior to initiating the survey presented in this report, HLA, on the basis of information supplied by Clifton Coney Group, contacted Richard Peters (Bathurst Local Aboriginal Land Council) to invite his participation in the survey. Mr Peters stated that, due to prior commitments, he could not take part until 3 November, but gave an assurance that the survey could begin on 2 November as planned. However, phone communication with Wendy Lewis, a Wiradjuri Nation elder, achieved an agreement that Gail Radcliffe (of the Wiradjuri Nation) would participate in the survey on 3 November.

6.4.5 Field Survey Methodology

The field survey consisted of an approximately 5 m wide easement on either side of the road. The survey was conducted in 2 – 3 km segments as backtracking was required to return to the vehicle before moving on to another segment. Inspection was also made of the land at the base of a power pole at the bottom of The Gap some 20 m back from the road, where a new pole is planned.

According to the AHIMS register no sites were previously recorded along Wolgan Road, so all identified sites were regarded as a new discovery. Location was recorded using a Garman eTrex GPS (AGD 84), meaning an error of between approximately 4 m and 8 m in spatial accuracy must be expected. The following notes were taken for each site:

- GPS coordinates and description of location;
- Site extent, measured by pacing and orientating using compass;
- Site context (section, disturbed verge, erosion feature, etc);
- Artefact description (approximate size or size range of artefacts, type, lithology as estimated by eye observation of grain and colour); and
- Digital photography (location of photograph through GPS coordinates orientation of photograph by compass bearing).

Survey coverage was high for much of the transect. Vegetation in the road easements was either non-existent or of low grasses. However, in two places – the far southern end of the road

and the narrow gap between the northern uplands and Donkey Mountain – dense woodland nearly came down to the road reserve. Here the ground surface was obscured by leaf litter, branches, etc. Another factor that impacted on site visibility, is that recent and ongoing grading was evident not only along Wolgan Road but also up to 3 m into the road reserve in some places. This would have two potential effects – the intrusion of road ballast into possible archaeological material, and the burying and other disturbance of any archaeological deposits along the roadside.

6.4.6 Identified Sites

The survey identified five sites and one PAD. These were clustered in two localities, both where Wolgan Road bisects high rugged terrain and low lying rolling valley floor (**Figure 7**). The sites are described below.

Site 1

Isolated Find. Coordinates: 236193E 6318787N[2]
Grey fine-grained mudstone core. The piece exhibits multidirectional negative flake scars. There is no evidence of a blade technology or core preparation. This piece is visible in association with road gravel and leaf litter on the northern edge of Wolgan Road, near a set of stockyards. There has clearly been a good deal of disturbance to this area from both sheetwash erosion across the road from the higher southern side, and from road maintenance (grading). This artefact is at the western end of PAD 1A, described below.

Site 2

Isolated Find. Coordinates: 235816E 6318824N
Red/brown fine-grained silcrete rock. This is a single flake with pronounced bulb and visible platform. It exhibits no evidence of retouch. It is in a disturbed context on the road verge, which has been subjected to heavy grading.

Site 3

[2] As outlined above, all co-ordinates are presented in AGD 84 format.

Isolated Find. Coordinates: 235566E 6318898N
Light brown fine-grained chert flaked piece. This piece can best be classified as a flaked piece as it has no obvious bulb, platform, ringcrack or other diagnostic conchoidal flake feature. As with Site 2, it is in disturbed road gravel on the northern verge of Wolgan Road.

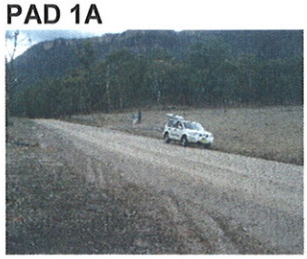
Site 4


Artefact Scatter. Coordinates: 233597E 6316909N
Artefact scatter consisting of a range of rock types, predominantly chert, quartz and silcrete. One of the most prominent artefacts is a hammerstone (pictured) with clear percussion marks at one end. Also present are a number of very small (approx 20 mm long) ridge blade flakes, including one with backing retouch. Some pieces have transverse fractures. The visible artefact scatter extends across 5 m x 10 m on the western verge above Wolgan Road, on a high point near a bend in the road. To the immediate south-east appears to be a creekline running toward Wolgan River. No topsoil is present and the artefacts rest on B Horizon. The number of counted surface artefacts is 13, but more are likely to be present.

Site 5


Artefact Scatter. Coordinates: 233687E 6317131N to 233762E 6317250N
Artefact scatter of chert, silcrete and quartz flaked pieces. Items include shatter and flakes with percussion bulbs. The proportion of quartz pieces appears to be greater in the southern end of the site. No retouched pieces or blade-like pieces were observed, providing a contrast with the nearby Site 4. Approximately 20 pieces were observed in this scatter, which extended in a 1-2 m band for 20 m along the eastern verge of Wolgan Road. Many more flaked pieces are likely to lie in this site, which has clearly been disturbed by road construction and subsequent maintenance. Flaked pieces are inter-mixed with road gravel and rest on an eroded B Horizon. None are in primary depositional context.

PAD 1A



PAD. Coordinates: 236193E 6318787N to 236240E 6318784N
This area has been identified as a PAD on the basis of a combination of the following:

- Presence of a core (Site 1);
- Presence of numerous pieces of non-flaked fine-grained sedimentary rock (silcrete and possibly chert) eroding from an area of scouring on the southern side of the road verge (pictured, where the vehicle is parked);
- Local information on the discovery of numerous flaked artefacts in this area, including retouched blades; and
- Proximity, but at higher elevation, to former wetland in alluvial area to the north

This PAD encompasses both sides of Wolgan Road and lies near a stockyard and abandoned corrugated iron hut, both adjacent to the road. The area has been subjected to erosion and disturbance. As well as stone, pieces of plastic, concrete and glass were evident eroding out of the area of scouring on the southern road verge. Nevertheless, the possibility remains that intact deposits may remain, especially a few metres back from the road easement where the grassland cover is more consolidated.

6.4.7 Significance Assessment

Scientific Significance

Usually archaeologists describe sites in terms of their relative scientific value, i.e. their ability to address timely and specific questions about the past. Sites may be assessed in terms of research potential, representativeness, and rarity. Archaeological sites, when examined within this framework, can be classed as possessing low significance, medium significance, or high significance. Highly significant sites are those that are exceptionally uncommon, or so well preserved that they hold the potential to address important questions about the human past. Sites of low significance may be extremely common across a landscape, or may be so disturbed or compromised that they hold little prospect of answering any questions about the past.

For the Wolgan Valley sites, comprehensive assessment of scientific significance is problematic as this region has had little archaeological research. The extent or depth of the archaeological resource is not known making comparative judgements on relative site significance difficult. In this dearth of information, classing all sites as equally significant until proven otherwise may theoretically be an option, but would hardly allow the formulation of practical management solutions. Rather, it is necessary to work with the available information, limited as it may be.

For this reason, the assessment of archaeological research potential needs to be the prime driver of significance assessment and a major indicator of research potential will be the physical integrity of the site within its surrounding environment, as compromised sites will possess limited research potential. From the survey data it is clear that all recorded sites have been disturbed to a greater or lesser degree, perhaps inevitable given their proximity to the main transport route along Wolgan Valley. Nevertheless it is possible to make relative judgements on the potential of each site, in terms of high, medium and low scientific (i.e. research potential) significance as follows.

- *High*: Site 4 - This site exhibits the greatest range of artefact types, on a variety of lithic materials. There is a potential for intact deposits westward of the disturbed area of the site;
- *Medium*: Site 1, Site 5 and PAD 1A - Site 5 displays a potentially high density of flaked artefacts, and possibly intact deposits further east of the road easement. Site 1 and PAD 1A are in the same locality, one that holds the promise of representing a prime occupation position; and
- *Low*: Site 2 and Site 3 - These two artefact finds are in disturbed contexts on the verge of Wolgan Road, holding little promise of research potential.

Cultural Significance
This pertains to the cultural significance present-day Aboriginal communities ascribe to their heritage objects and places. Generally, communities aim to protect and conserve for future generations as much of their heritage as possible. Social significance may rest outside the realm of archaeology and include dimensions which archaeologists are unable to assess, such as deeply embedded spiritual and cultural ties to land, landscape and group and family history.

6.4.8 Potential Impacts

It is understood that the proposed electricity line will not involve the excavation of trenches through the Wolgan Road easement as the line will be strung between electricity poles. Consequently, major impacts will consist of the excavation of holes for the poles. Machinery required for the transport of drilling equipment and construction materials will, with the exception of the erection of two to three poles off-road in the southwestern part of the transect, utilise the existing Wolgan Road. There will be no requirement for major construction of access roads.

For most of the length of the electricity line transect, no archaeological evidence was identified. No impacts to archaeological sites are anticipated here. Assuming the interval between pylons is at least 10 m, it may be a straightforward matter to strategically place pylons to avoid recorded sites. Recommendations for management of the archaeological sites are set out below.

6.4.9 Mitigations Measures

Scenario 1: Avoidance of recorded archaeological sites.
This is the preferred management option. Nevertheless, even if adopted it is suggested that this option may require heritage management action, in the form of the following:

- **Safeguard 1.1**: Monitoring should be undertaken by an appropriate Aboriginal representative(s) during the excavation of any electricity pylon holes within 100 m either side of the area encompassing Site 1 and PAD 1A, and within 100 m either side of the areas encompassing Site 4 and Site 5. If artefactual material is discovered, consideration should be given to either re-locating the pole, or undertaking further subsurface investigation by a qualified professional prior to further impacts in that area. All artefactual material uncovered should be investigated, collected, and subsequent discussions held with the communities as to its eventual location.

This mitigation measures is identified in light of the high to medium significance of these sites, and the acknowledgment that there is a possibility of the presence of subsurface material in these areas.

Scenario 2: Disturbance to any or all of Sites 1, 2, 3 and PAD 1A.
The following mitigation measures are identified:

- **Safeguard 2.1**: Sites 1 and / or 2 and / or 3 should be recorded and collected in consultation with the Aboriginal communities prior to the proposed development occurring. Discussions with the proponent and the Aboriginal communities should be undertaken prior to the collection, to identify an appropriate "keeping place" for the artefacts associated with Sites 1, 2, and 3; and
- **Safeguard 2.2**: Test excavation of PAD 1A by professional archaeologists, with assistance provided by Aboriginal community representatives.

Scenario 3: Disturbance to Site 4.
Given the high scientific significance given to this locality, the following mitigation measures are identified:

- **Safeguard 3.1**: Archaeological recording of the surface distribution of artefacts. Discussions with the proponent and the Aboriginal communities should be undertaken prior to the collection, to identify an appropriate "keeping place" for all artefacts recovered; and
- **Safeguard 3.2**: Test excavation of Site 4 by professional archaeologists, with assistance provided by Aboriginal community representatives.

Scenario 4: Disturbance to Site 5.
Given the significance of this locality, the following mitigation measures are identified:

- **Safeguard 4.1**: Site 5 should be recorded and collected in consultation with the Aboriginal communities prior to the proposed project occurring. Discussions with the proponent and the Aboriginal communities should be undertaken prior to the collection, to identify an appropriate "keeping place" for recovered artefacts; and
- **Safeguard 4.2**: Test excavation of Site 5 by professional archaeologists, with assistance provided by Aboriginal community representatives.

6.4.10 Conclusion

The archaeological assessment undertaken recorded five sites and one PAD within the transect of the proposed Emirates electricity line. Three of these were considered to be of medium to high scientific significance. Due to the absence of previously archaeological research in the region, it is difficult to accurately assess the cultural significance of these sites and the PAD. As a result, ongoing consultation with Aboriginal community member will be undertaken to ascertain this measure of significance.

Whilst these sites were recorded within the vicinity of the proposed electricity line, the proposed locations of power poles will generally avoid these recorded sites. However, if the detailed design of the electricity line is not able to avoid these sites, the alternative mitigation measures outlined in **Section 6.4.9** will be implemented in order to minimise potential impacts.

6.5 Social and Economic

6.5.1 Existing Environment

Tourism within the general region is a thriving industry. Attractions within the vicinity of the proposed Emirates resort site include the Glow Worm Tunnel, Newnes Industrial Ruins, Deep Pass, Blackfellows Hand Rock and Baal Bone Gap. The area is also popular for camping and bushwalking, particularly over weekend and holiday periods. This results in an influx of people from outside the region, including international visitors. In addition to tourism, there are a number of agricultural industries in the area, primarily livestock grazing, and smaller enterprises servicing niche markets.

Wolgan Road services urban residences near the town of Lidsdale, collieries and the Council tip. Within the project area, there are 20 rural properties along Wolgan Road, 15 of which are permanent residences.

6.5.2 Potential Impacts

Development of the proposed electricity distribution line has the potential to impact on the social environment of the area in relation to:

- noise impacts;
- increased traffic; and
- impacts to the visual amenity of the area.

As discussed previously, the majority of the impacts associated with the proposal would occur during the construction period. Traffic and noise impacts are described in **Section 6.6 and 6.8** respectively, and were found to be minor, and limited to the construction period. As such, the impacts are temporary in nature. Additionally, mitigation measures identified in the relevant sections of this EA have been designed to further minimise potential impacts.

The visual impact of the proposed works is dependent on the location of the receivers and the level of visibility of the construction activities, as well as the final structure of the proposed electricity distribution line in relation to these receivers. Impacts to visual amenity would occur during both construction and operation and would primarily affect the views of residents, motorists and guests to the area. Much of the impact would be reduced by the dense vegetation and topography of the area, which would effectively screen the distribution line and poles from potential viewers. Mitigation measures have also been identified (**Section 6.3.5**) to further reduce the impact to sensitive receivers.

Benefits of the proposed upgrade and extension in respect of the social and economic environment include:

- The power supply would become available to residents within Wolgan Valley and would enable additional services including Telstra cabling to be developed;
- The proposed electricity distribution line would generate employment opportunities during the construction phases. Whenever possible, employees would be sourced from the local and regional area;
- Where possible much of the goods and services used, such as earthmoving and excavation equipment, construction materials and transport services would be sourced locally; and
- Development of the electricity distribution line would service the proposed Emirates Resort site, which would contribute to employment and indirect spending in the local and NSW economy, and attract high value tourism.

6.5.3 Mitigation Measures

Mitigation measures in relation to potential noise, traffic and visual impacts are described in **Section 7**. No further specific safeguards are considered necessary in respect of the social and economic environment.

6.5.4 Conclusion

The social and economic benefits of the proposed works to the local and regional area are significant. Management measures have been identified for both the construction and operation phases to minimise potential impacts from additional traffic and noise.

6.6 Traffic and Transport

6.6.1 Existing Environment

Wolgan Road is a local collector road servicing a small number of residents at Lidsdale, collieries, the Council waste facility, rural properties and campground in the National Parks. In some sections, Wolgan Road is tar sealed, however from approximately Wolgan Gap to Newnes and beyond is unsealed and generally considered in a poor state of repair. There are road safety concerns particularly on the decent into the valley where the road experiences narrow and winding conditions. Lithgow Council is the responsible authority for the road.

The road provides direct access to some 20 rural land properties, 15 of which are permanent residents. Increases in traffic occur over weekend and holiday periods as a result of attractions within the area and camper activity. The traffic report by McLaren Traffic Engineering (McLaren 2005) estimated the Annual Average Daily Traffic (AADT) flow to vary between 72 and 90 vehicles per day at certain sections of the road, influenced by seasonal variations and associated activities.

6.6.2 Impact Assessment

The proposed works are to take place largely within the road reserve of Wolgan Road which is the primary access to the proposed Emirates resort site. Potential traffic impacts related to the proposed works is related to construction traffic and the potential for this traffic to increase risks associated with travelling along Wolgan Road, particularly on the descent into the valley through Wolgan Gap.

As indicated in the Statement of Commitments for the proposed Emirates Luxury Resort, April 2006 (SOC) upgrades to Wolgan Road will be undertaken as part of resort construction and will be designed in accordance with:

- AUSTROADS Road Safety Audit;
- RTA's Policy for signposting of Resorts and Tourist Facilities; and
- Wollemi National Park Plan of Management.

The SOC also state that Emirates will make an equitable contribution towards upgrade works on Wolgan Road in relation to damage caused by construction traffic and increased maintenance work attributable to additional traffic generated by the development.

It is expected that the proposed road improvements to Wolgan Road would be implemented prior to construction of the electricity line. Construction traffic associated with the proposed works is expected to be minimal and no significant traffic impact is expected.

6.6.3 Mitigation Measures

In addition to the Wolgan Road upgrade, the following mitigation measures are identifed to further minimise traffic impacts associated with the proposed works:

- Implement traffic management controls during construction phase;
- Access is to be maintained at all times;
- Signage to advise motorists and the public; and
- Consultation with landowners that are potentially affected along the route.

6.6.4 Conclusion

Upgrade works are currently required to Wolgan Road to improve the general safety condition of the road. The Concept plan addressed this issue and concluded that Emirates would make an equitable contribution for the upgrade works.

The additional construction traffic associated with the proposed upgrade and extension of the electricity distribution line would be minimal. Provided the upgrades are carried out along Wolgan Road and with the implementation of the mitigation measures provided in Section 6.6.3, the proposed works are not expected to result in significant traffic impacts.

6.7 Water Quality

6.7.1 Existing Environment

The Wolgan Valley lies within a catchment area of approximately 18,525 hectares. The current climate conditions have affected water supply within the Wolgan Valley with the area experiencing drought conditions. As a consequence of the drought and mining activities in the region the Wolgan River is currently dry with zero flow.

Water quality testing undertaken within the valley as part of the Emirates resort site assessment has identified surface waters of the Carne Creek as being of generally good quality with some elevated faecal coliform counts due to the livestock populations within the valley. Groundwater was predominantly brackish with some elevated salinity levels and was not considered to be suitable for consumption.

Other factors influencing water quality within the valley include livestock, development practices and mining impacts.

6.7.2 Impact Assessment

The installation of power utilities has the potential to increase sediment loads within drainage lines in the vicinity of the Wolgan Road. Given the small amount of soils to be disturbed and the implementation of erosion and sedimentation controls it is anticipated that the likelihood of this occurrence would be low.

Mitigation measures identified below would be implemented to ameliorate the potential for water quality impacts to occur from the installation of power utilities.

6.7.3 Mitigation Measures

To minimise the potential risks to water quality and ensure the protection of the environment, the following safeguard measures have been identified for the proposed activities.

- Erosion and sedimentation control would be implemented and maintained throughout construction.

6.7.4 Conclusion

The proposed works are not expected to result in adverse impacts on water quality provided the effective implementation of appropriate erosion and sedimentation controls occurs

6.8 Other Environmental Factors

6.8.1 Air Quality & Dust

Potential sources of air pollution associated with the proposed works is related with dust and exhaust emissions from vehicles, plant and equipment during the construction phase. Excavated material will be temporarily stockpiled and is unlikely to be left out for lengthy periods to dry and become airborne given that the entire process is intended to be completed within a short period of time. In the event of high winds, watering of stockpiles will be undertaken in order to suppress the dust. As part of the Wolgan Road is unsealed where works are to be undertaken, dust is likely to be generated from vehicles travelling along Wolgan Road. Construction traffic associated with the proposed works is expected to be minimal and due to the temporary nature of the works, is not expected to create a significant impact.

The likelihood of significant dust impacts occurring is considered low, however to ensure that potential dust and exhaust emissions are minimised the following mitigation measures have been identified:

- Regular wetting of Wolgan Road with a water cart;
- Wetting or covering of exposed soil and stockpiles of materials on dry and windy days to minimise dust generation;
- Covering of materials in trucks to be transported from site;
- Vehicles associated with the proposed works should travel at a reasonable speed limit in order to minimise dust generation;
- Vehicles, machinery and equipment to be maintained in accordance with manufacturers specifications and ensure compliance with Protection of the Environment and Operations Act 1997 (POEO Act);
- Vehicles are to kept in good condition and switched off when not in use in order to minimise exhaust emissions; and
- Waste associated with the proposed works is to be appropriately collected and disposed of. Where possible recycling of waste shall be undertaken.

6.8.2 Noise

The nearest sensitive receivers to the proposed works, being rural residential properties (15 in total), are spread along either side of Wolgan Road. Generally the dwellings are located some 100 m from the road reserve. This distance will assist in limiting potential construction noise impacts on nearby residents.

For the proposed electricity line, noise will be generated by vehicles, equipment and machinery during the construction phase. These impacts will be limited to the construction period, with entire works estimated to be completed within three months. Noise impacts associated with the construction phase of the proposed works will be temporary and are considered insignificant. Nonetheless, the following mitigation measures have been identified in order to ensure noise impacts are further minimised:

- Restricting construction hours to standard work hours: Monday to Friday 7 am – 6 pm, Saturday 8 am – 1 pm, Sunday and Public Holidays – no work;
- Ensuring equipment is fitted with mufflers and silencers;

- Best practice and high quality plant and equipment is used to minimise noise outputs;
- Residents are to be informed of proposed works;
- Prior to the commencement of works, the proposed works shall be advertised in the local press; and
- Prior to works commencing written notice is to be given to potentially affected landowners.

6.8.3 Waste

Emirates would adopt the principles of the NSW Waste Avoidance and Resource Recovery Strategy and the *Waste Avoidance & Resource Recovery Act 2001* (WARR Act).

During construction works, the potential sources of waste include demolition and clearance material, domestic debris, putrescible waste and 'green' waste and hazardous waste. *Demolition and clearance material* would include material such as concrete, electricity cables and possibly small quantities of cleared vegetation. *Domestic debris* would comprise of everyday waste and other material generated by construction workers including human waste collected in portable toilets. *Putrescible waste and 'green' waste* includes waste such as food scraps generated from construction workers. *Hazardous waste* which may include oils and sludges associated with heavy machinery and vehicles. Paint would also be considered a hazardous waste.

The following mitigation measures have been identified to minimise waste and associated impacts:

- All waste management will be in accordance with the principles of the NSW Waste NSW Waste Avoidance and Resource Recovery Strategy and the WARR Act;
- Where possible, recycling and re-use will be undertaken;
- Designated stockpiles, recycling areas, and bins will be used for waste and excess materials; and
- The construction site will be maintained in a clean and tidy state.

6.8.4 Fire Management

The high standard of design and maintenance required to provide the necessary reliability of service of such a major element in the electricity system almost precludes fire risk.

The presence of earthed towers and overhead earthwires will effectively eliminate fires caused by lighting strikes in an area corresponding to the easement area. In the event that lighting strikes, it will strike the earthwires and safety discharge to the earth.

It is possible that bushfires within Wolgan Valley may cause temporary interruptions to the line due to ionisation of hot air carrying bushfire ash over the distribution line.

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7 SUMMARY OF SAFEGUARDS

Table 5 below provides a summary of the safeguards proposed to ameliorate potential impacts of the proposed activities.

Table 5: Safeguards

Potential Issue	Safeguards Identified
Water Quality and Hydrology	• Erosion and sedimentation control would be implemented and maintained throughout construction
Soils and Geology	• Excavation would be kept to a minimum • Stockpiles would be kept to a minimum within the existing road reserve with soils reinstated as soon as practical after excavation • Excavated soils would be reinstated prior to the end of the day's works. Stockpiled material would not remain onsite outside of work hours • In the event of heavy rainfall periods excavation works would be suspended • Erosion and sedimentation control would be implemented and maintained throughout construction
Biodiversity	• The electrical distribution line would follow the existing road reserve as much as possible • Any vegetation removal or trimming should be minimised wherever possible • All bushland and individual large trees should be retained in the final route where possible • Any loss of trees should compensated for by replacement with suitable species in other appropriate locations • A pre-construction inspection should be made of the specific locations of power-poles to ensure minimal impact on bushland and potential fauna habitat tree will be obtained • Consideration should be given to the relocation of some power poles (see **Figure 5**) • A fauna protection protocol should be prepared, and all works staff should be briefed on the potential risks to fauna and the requirement to follow other environmental protection protocols • During vegetation clearance, felling of trees should be supervised by an authorised wildlife rescue expert or ecological consultant

Potential Issue	Safeguards Proposed
Heritage	• Monitoring should be undertaken by an appropriate Aboriginal representative(s) during the excavation of any electricity pylon holes within 100 m either side of the area encompassing Site 1 and PAD 1A, and within 100m either side of the areas encompassing Site 4 and Site 5. If artefactual material is discovered, consideration should be given to either re-locating the pole, or undertaking further subsurface investigation by a qualified professional prior to further impacts in that area. All artefactual material uncovered should be investigated, collected, and subsequent discussions held with the communities as to its eventual location • Sites 1 and / or 2 and / or 3 should be recorded and collected in consultation with the Aboriginal communities prior to the proposed development occurring. Discussions with the proponent and the Aboriginal communities should be undertaken prior to the collection, to identify an appropriate "keeping place" for the artefacts associated with Sites 1, 2, and 3 • Archaeological recording of the surface distribution of artefacts. Discussions with the proponent and the Aboriginal communities should be undertaken prior to the collection, to identify an appropriate "keeping place" for all artefacts recovered • Test excavation of Site 4 by professional archaeologists, with assistance provided by Aboriginal community representatives • Site 5 should be recorded and collected in consultation with the Aboriginal communities prior to the proposed development occurring. Discussions with the proponent and the Aboriginal communities should be undertaken prior to the collection, to identify an appropriate "keeping place" for recovered artefacts • Test excavation of Site 5 by professional archaeologists, with assistance provided by Aboriginal community representatives
Visual Amenity	• New poles are to be painted green to provide further absorption of the poles into the existing environment • Construction is to be carried out in stages, construction activities limited to one section of the road reserve at a time • Where possible, vegetation removal would be minimised during construction and maintenance clearing • Any existing vegetation screening would be maintained • Dust control measures and monitoring of emissions would be undertaken during the construction period

Potential Issue	Safeguards Proposed
Traffic and Transport	• Implement traffic management controls during construction phase • Access is to be maintained at all times • Signage to advise motorists and the public • Consultation with landowners that are potentially affected along the route
Noise	• Restricting construction hours to standard work hours: Monday to Friday 7 am – 6 pm, Saturday 8 am – 1 pm, Sunday and Public Holidays – no work • Ensuring equipment is fitted with mufflers and silencers • Best practice and high quality plant and equipment is used to minimise noise outputs • Residents are to be informed of proposed works • Prior to the commencement of works, the proposed works shall be advertised in the local press • Prior to works commencing written notice is to be given to potentially affected landowners
Air Quality & Dust	• Regular wetting of Wolgan Road with a water cart • Wetting or covering of exposed soil and stockpiles of materials on dry and windy days to minimise dust generation • Covering of materials in trucks to be transported from site • Vehicles associated with the proposed works should travel at a reasonable speed limit in order to minimise dust generation • Vehicles, machinery and equipment to be maintained in accordance with manufacturers specifications and ensure compliance with POEO Act 1997 • Vehicles are to be kept in good condition and switched off when not in use in order to minimise exhaust emissions • Waste associated with the proposed works is to be appropriately collected and disposed of. Where possible recycling of waste shall be undertaken
Social & Economic	• Employees and supplies would be sourced from within the local or regional area where possible
Waste	• All waste management will be in accordance with the principles of the NSW Waste NSW Waste Avoidance and Resource Recovery Strategy and the WARR Act • Where possible, recycling and re-use will be undertaken • Designated stockpiles, recycling areas, and bins • The construction site will be maintained in a clean and tidy state

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8 CONCLUSION

This EA has been prepared under Part 3A of the EP&A Act and provides an evaluation of the likely environmental impacts associated with the proposed upgrade and extension of the existing electricity distribution line from Wolgan Gap to the proposed Emirates resort site.

Assessment and consideration of the environmental impacts associated with the proposed works has concluded that there is the potential for the environment at the proposed site of the proposed works and surrounding areas to experience minor and short term impacts largely limited to the construction phase. Potential environmental impacts include increased erosion and sedimentation potential, flora and fauna, visual, indigenous heritage, traffic, air quality and dust, noise and waste. Mitigation measures have been identified to minimise the extent of these impacts on the environment.

Based on the information presented in this EA, provided that the recommended management and mitigation measures are implemented as identified in **Section 6**, no significant adverse environmental impacts on the environment are expected as a result of the proposed works.

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