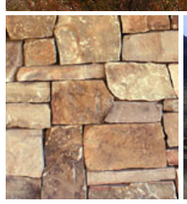
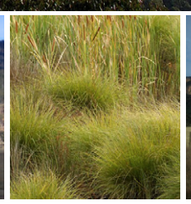
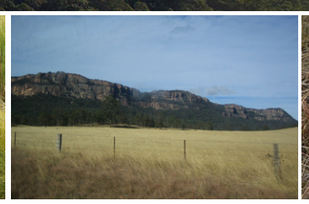
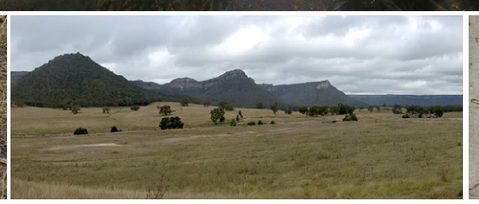
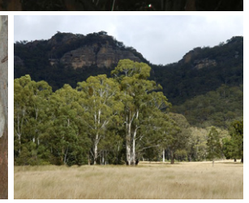
Emirates Luxury Resort | Wolgan Valley

CONCEPT PLAN







urbis JHD

October 2005

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Appendices

Submitted as separate reports:

- Geotechnical Investigation – Douglas Partners
- Flora and Fauna Impact Assessment Report – Australian Museum Business Services

This Concept Plan has been prepared by UrbisJHD, with input from various sub consultants as noted. To the best of our knowledge, the information contained within the Environmental Assessment is neither false nor misleading.

Signed *Date*

Executive Summary

This Concept Plan is submitted on behalf of Emirates Resorts (NSW) to the Minister for Planning for approval under the recently commenced Part 3A of the Environmental Planning and Assessment Act.

It relates to 1,099ha of land in the Wolgan Valley, 35 kilometres north of Lithgow, in an isolated valley surrounded by steep cliffs within various National parks forming part of the Greater Blue Mountains World Heritage Area (GBMWHA).

The project to which the Concept Plan relates is a low density 'tourist facility' comprising 40 very luxurious holiday villas and ancillary health spa, conference, restaurant, helipad and other facilities. It relies upon the separate provision of mains water and electricity supply by the Department of Commerce and Integral Energy respectively, and includes the provision of an on-site sewage treatment plant.

A key aspect of the project is the phasing out of the existing grazing of beef cattle on the site, and the creation of a 'nature conservancy' involving the environmental rehabilitation of the entire site and the managed reintroduction of a range of threatened plant and animal communities.

The aim of the project is to create a natural sanctuary where guests can enjoy absolute luxury, tranquillity and connection with nature. The project has been designed to sit lightly within its environment in a manner that is sympathetic to the very special natural, cultural and scenic values of the valley

The key environmental assessment issues relate to:

- Threatened plant and animal communities
- Bushfire hazard
- Vehicular access
- Cultural heritage
- Water quality (sewage treatment & disposal)
- Utility supply and
- Scenic quality and character

While the project will displace the historic cattle grazing use of the site, and alter its scenic quality, it will provide very significance social, economic and environmental benefits. Specifically, it will:

- Reinstate much of the natural ecology, hydrology and stream morphology of the site.
- Create a sanctuary for locally endemic threatened plants and animals.
- Create a buffer between the GBMWHA and adjacent agricultural uses.
- Create a world class tourist destination that will enhance the international reputation of the Blue Mountains and the State of NSW.
- Provide significant local employment and investment in the local and State economies.
- Recognise the important aboriginal and European heritage values of the valley.

This Environmental Assessment at Section 8 demonstrates that all potential adverse environmental impacts of the project can be suitably mitigated, resulting in significant net social, economic and environmental benefits.

In view of the clear merit of the project, we recommend that the Concept Plan be approved subject to separate approval being obtained for the range of Management Plans and detailed designs required to implement the project.

1 Introduction

1.1 Project Overview

The proposal involves the development of 40 luxurious hotel villas and associated facilities on a 1,099ha cattle grazing property located 35 km north-west of Lithgow in an isolated valley surrounded by steep cliffs and bushland within National Parks comprising part of the Greater Blue Mountains World Heritage Area (GBMWHA).

The various specialist consultants engaged in the preparation of this report, and the input for which they were responsible are:

• **Clifton Coney Group**	*Project Management*
• **Conybeare Morrison**	*Heritage* *Architecture*
• **Context Landscape Design**	*Landscape Architecture*
• **UrbisJHD**	*Urban Planning*
• **Steve Paul & Partners**	*Hydraulic Engineering (including sewage)*
• **Australian Museum Business Services (AMBS)**	*Archaelogy* *Ecology*
• **McLaren Traffic Engineering**	*Roads and Traffic*
• **Australian Bushfire Protection Planners (ABPP)**	*Bushfire Management*
• **Wood & Grieve Engineers**	*Electrical Engineering*
• **Bassett Engineering**	*Acoustic Engineering* *Mechanical Engineering*
• **Taylor Thompson Whitting**	*Civil Engineering* *Structural Engineering*
• **Hard and Forester**	*Surveying*
• **Douglas Partners**	*Geotechnical Engineering*

The report has been compiled by UrbisJHD. The site description, analysis and description of the development has largely been prepared by Conybeare Morrison and Partners with specialist input from the various consultants as relevant to the disciplines identified above. Likewise, the Environmental Assessment of the key environmental issues has been prepared by UrbisJHD with specialist input from the various consultants as relevant to the disciplines identified above. The sections on statutory planning controls and consultation have been prepared by UrbisJHD with advice from the proponent's representative in the various consultations reported.

1.2 Structure of the Concept Plan

The Concept Plan has been devised in response to the Department of Planning Director General Requirements' (DGR) letter of 19 September 2005. The Plan has been prepared to allow DOP, other government authorities and the public to fully comprehend the environmental implications of the proposal. As required by the DGR the plan avoids the duplication of information or information that is not directly relevant to the environmental impact assessment of the proposed development.

The DGR letter identified:

> *"a number of key project-specific issues in consultation with the local council and integrated approval bodies that should form the key focus of the environmental assessment".*

The key project-specific issues raised in the DGR are considered at Section 8 of this report.

Al Maha Resort, Dubai : Prepared by Emirates

AL MAHA AWARDS

World Legacy Award 2004
National Geographic Traveller & Conservation International.

WTM Environmental Recognition Award, World Travel Market, London 2003
Nominated by the reader's of Middle East Travel in recognition of the resort's outstanding environmental activities.

Preservation and Conservation Award 2003
Nominated for the project's contribution to its locality and context; how it met the clients requirements; its contribution to the advancement of ecologically sustainable design; the successful integration of the needs of the clients; the long-term improvement in individual or community well being and contribution to the advancement of architecture.

Best New Gulf Hotel and Best Environmentally-friendly Hotel
in Achieving Excellance Awards awarded by Hotel Intelligence Middle East, 2001.

2 Emirates Resorts and Hotels

The proponent has provided the following overview of their development concept for the site:

"Emirates intends to establish a truly unique Australian resort destination in the Wolgan Valley at the foot of the World Heritage Listed Blue Mountains.

Emirates will create a resort facility of the highest standards that offers guests the opportunity to experience both the rich heritage of the region and the Australian wilderness in a completely natural manner.

Wolgan Valley Resort and Spa will cover only 2% of the 1,099 hectare site, the majority of which will be used to create a wildlife conservation area dedicated to the management of Australia's indigenous fauna and flora. Integral to the success of rehabilitating this 12 kilometre stretch of farmland is to create a protective and feral-free habitat that encourages local wildlife, particularly species that are under immediate threat. Emirates, in collaboration with various environmental groups, will implement land management programs to reverse the negative effects of previous farming activity and uncontrolled wood gathering. The resort will be designed and operated to optimise its environmental sustainability.

Sydney has become an international holiday and business destination. The seclusion of Wolgan has ensured that it has, to date, escaped industrialisation. Under Emirates conservation management, it will remain secluded and visitors to Wolgan Valley Resort and Spa will be limited so as to lessen the environmental impact and to preserve the delicate eco-systems"

The project will follow the same principles and objectives that informed the proponent's development of the Al Maha project in Dubai.

While the Al Maha project is located in a desert ecosystem that is distinctly different from that of Wolgan Valley, the project demonstrates the commitment and capability of the proponent to meaningfully rehabilitate degraded ecosystems and to reintroduce natural processes and viable communties of threatened endemic species.

The development objectives of the proponent for the current project are:

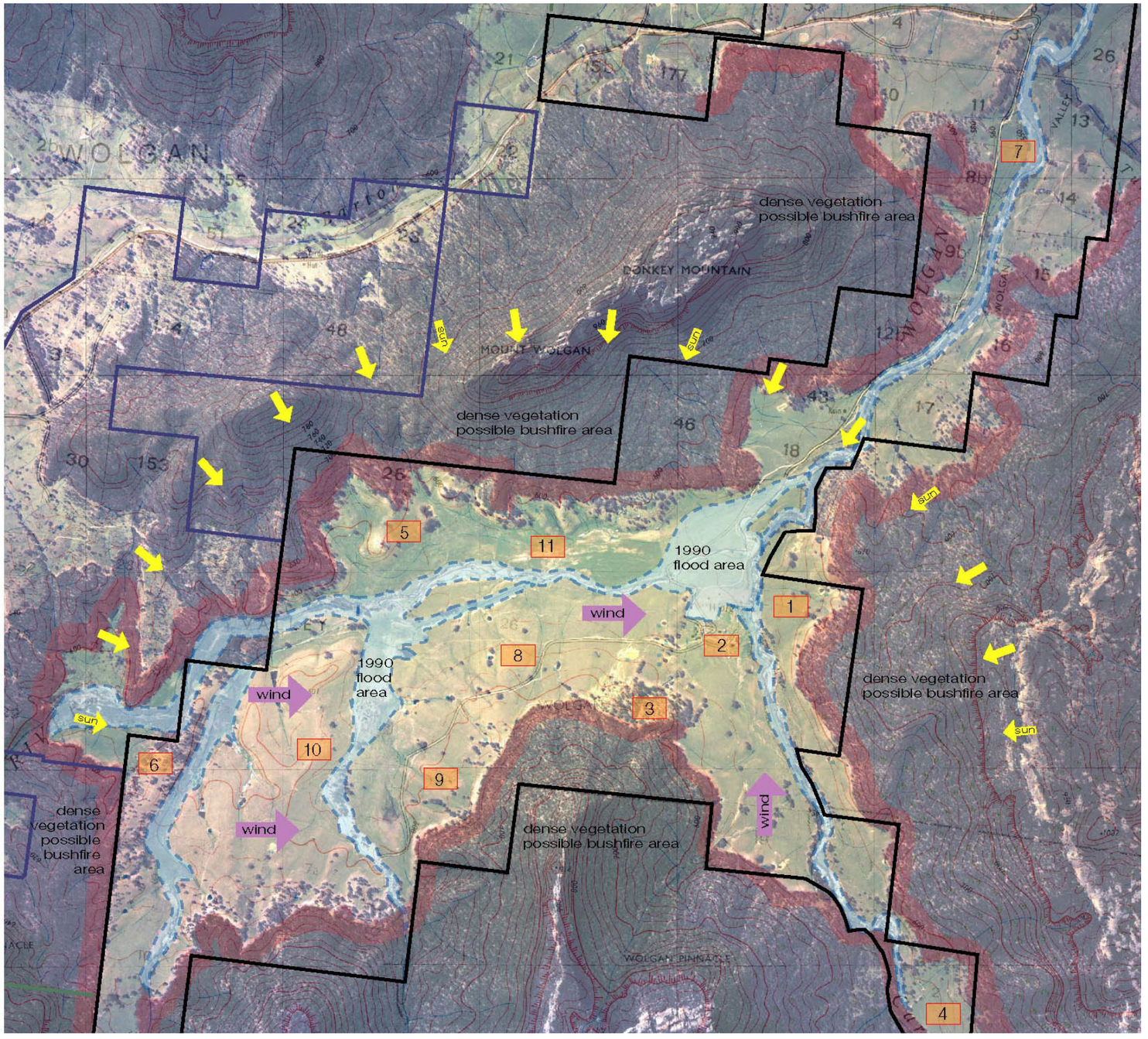
- To create an exclusive and idyllic facility with full security offering an opulent style.
- Development providing harmony and balance with the surrounding conservation areas.
- Design to harmonise with the spectacular surroundings, influenced by traditional architecture and offering informal elegance.
- Design and construction themed on a way of life with traditional artefacts and antiques.
- Individual suites with private pools, fine dining, fine wines, panoramic sky scapes and indigenous flora and fauna in an idyllic setting.
- Provision of a spa, gymnasium and leisure centre with the latest professional fitness equipment.
- Provision of a conference centre and state of the art facilities with exceptional technology standards.
- Provision of natural light with floor to ceiling windows affording uninterrupted vistas from each suite.
- A facility that provides a unique experience of total peace and balance allowing guests to fully relax.
- Absolute guest privacy with generously proportioned individual suites, excellent 24 hour personalised service and a ratio of three staff to every guest suite.

4 Site Analysis

4.1 Site Analysis

Conybeare Morrison undertook a detailed site analysis prior to siting the project within the property. This analysis was informed by a range of specialist reports. The key issues analysed are detailed below.

PRELIMINARY CRITERIA	potential sites 1	2	3	4	5	6	7	8	9	10	11
Views in all directions	●	●	◖	●	●	◖	◖	●	◖	●	●
Water access	●	●		●	◖	●	●	◖		◖	◖
Solar access	●	●	●		◖	◖	◖	●	●	●	◖
Site access	●	●	●		◖		●	◖	◖	◖	◖
Away from bushfire	◖	●			◖		◖	●	◖	●	◖
Protection from winds	●	◖	●	●	◖	●	●				
Minimal visual impact	●	●	◖	●	◖	◖			◖		
Iconic setting	●	●	●	◖					●	●	
Away from flood zone	●	◖	●	●	●			●	●	◖	◖
Sense of place / heritage	●	●									
Preliminary Rating	9.5	9.0	6.0	5.5	5.0	3.5	4.5	5.0	5.0	4.5	3.5



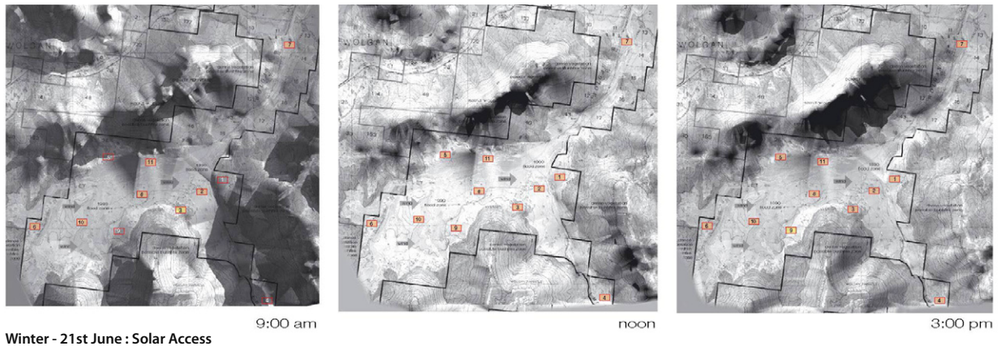
Wind

Prevailing strong winds enter the valley from the west, but are highly influenced by the steep surrounding cliffs that create a complex system of localised eddies.

Sun

The steep surrounding topography, and specifically Donkey Mountain in the north, casts considerable shadows over various parts of the site in winter. The area north of Wolgan River is worst effected in this regard.

The effect of direct sunlight on the enclosing sandstone cliffs throughout the day creates varying and spectacular visual effects, particularly in the early morning and late afternoon.



Winter - 21st June : Solar Access
Winter Shadow Analysis prepared by Conybear Morrison Partners

Topography

While surrounding talus footslopes are very steep, and some steep gullies and heavily eroded banks exist along the watercourses and in the western part of the site, the eastern side of the site has quite gentle slopes.

Site Access

While an existing primitive trail permits access to the south-western side of the site, this relies upon access over adjoining land that is not part of the site, and traverses steep land and wetland areas. The existing driveway access provides direct level access between Wolgan Road and the central valley floor, with only one river crossing.

Existing Buildings

An abandoned slab hut and the current homestead are located on the western side of Carne Creek, just south of the junction with Wolgan River. This creates a historic association between non-indigenous habitation and this part of the site, and suggests that over a century of intimate local knowledge has confirmed this as the part of the site most amenable to human habitation.

However, the heritage value of the slab hut and associated out buildings needs to be sympathetically responded to in terms of building siting and design.

Views into the site

The only views into the site are from Wolgan Road in the vicinity of the existing driveway, from the private property adjoining the south-western corner of the site and from the surrounding sandstone plateaus, some 400-500 metres above.

With regard to the Wolgan Road view, this is a restricted view along a very narrow curved valley, such that no views are available into the main body of the site.

Views from within the site

From within the central valley floor, spectacular views of surrounding cliffs or deeply incised gorges are available in all directions.

River and Riparian Zone

Wolgan River, Carnes Creek and various ephemeral tributaries provide positive amenity and ecological benefits, but create environmental constraints and flooding hazards on various parts of the site. They also constrain vehicular access route options, with a need to minimise vehicle crossing points.

Wetlands

Several degraded wetland areas exist in the western part of the site. While these areas create significant constraints to built development, they create significant opportunities for the reinstatement of diverse ecological communities.

Flooding and Water Table

The one in one hundred year flood level and high water tables in the vicinity of the watercourses on the site generally require building works to be setback from the watercourses.

Bushfire Hazard

The high bushfire risk of surrounding bushland requires all buildings to be set back from surrounding bushland.

4.2 Site Selection

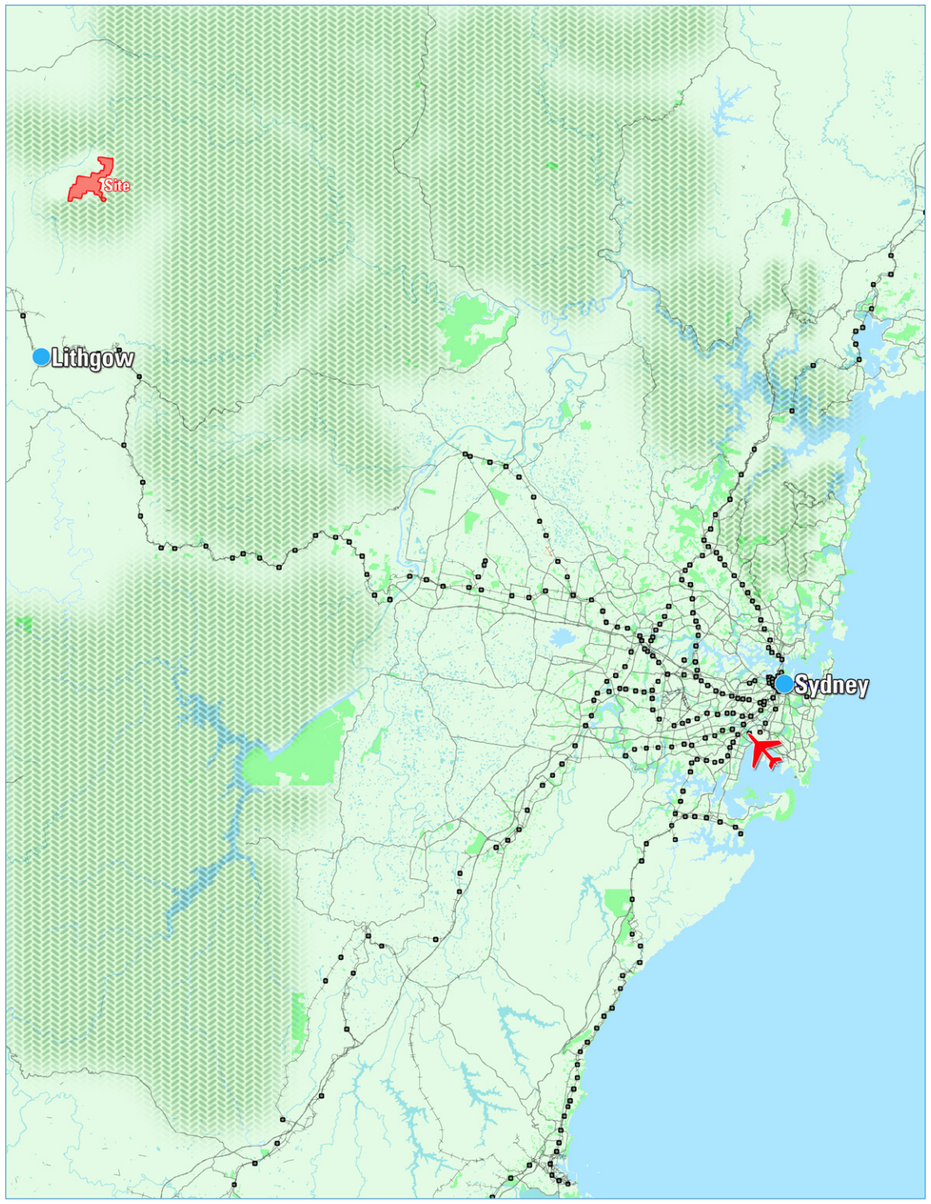
A number of locations were chosen as potential areas to develop the proposed resort. The suitability of each potential site was considered in terms of the above analysis.

Sites one and two were selected as the preferred sites for a range of reasons including access to sunlight and views, accessibility, consistency with the built history of the site and proximity to the amenity of Carnes Creek.

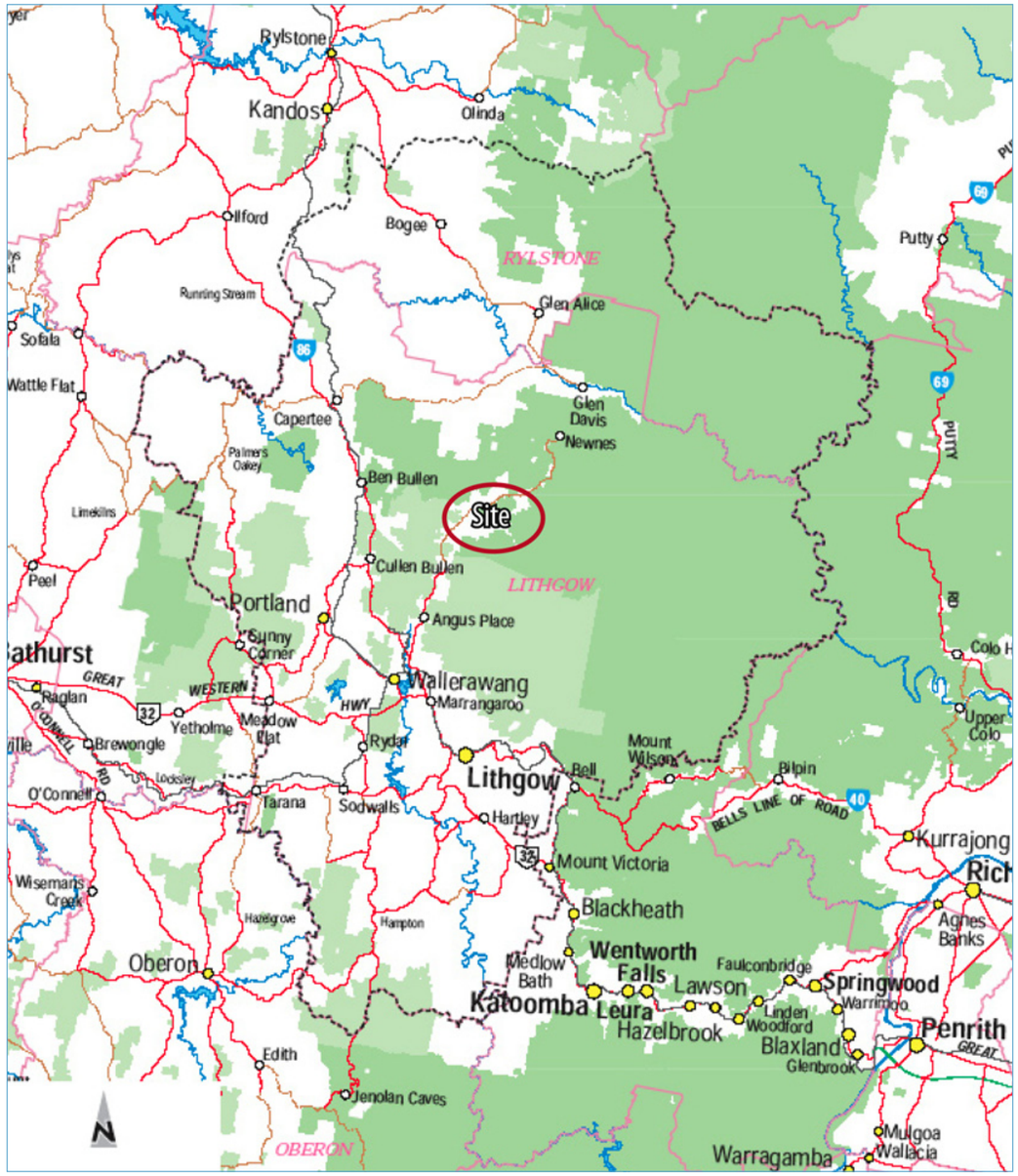
3 The Site

3.1 Regional Context

The site is located approximately 190km, or 3 hours drive north-west of Sydney airport and CBD, within the Lithgow Local Government Area. It lies within a valley to the western escarpment of the Blue Mountains plateau, within the Greater Blue Mountains World Heritage Area.



Sydney Metropolitan Plan : Source - UrbisJHD GIS Data



Regional Context Plan : Source, National Parks and Wildlife Service

Regional Context Aerial Image. Source: Google Earth

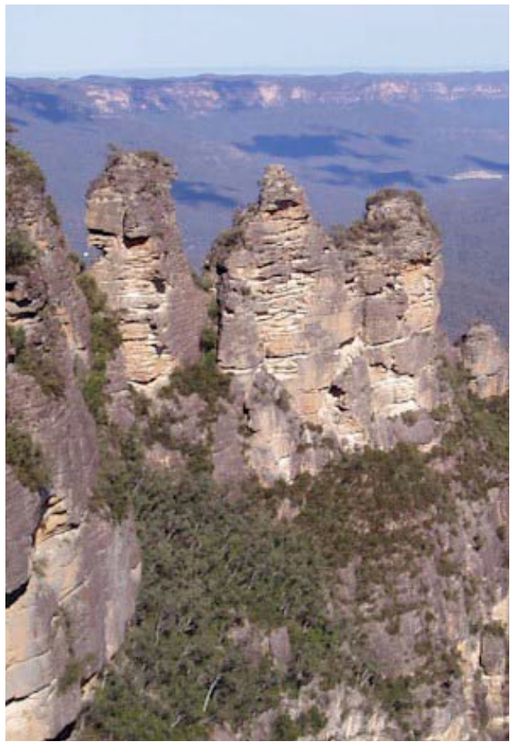
3.2 Local Context

The site is contained in the Wolgan Valley which is approximate 13,750ha in size and up to 28km long and 6km wide, extending from Newnes in the north-east to Wolgan Gap in the south-west. The site is surrounded by spectacular rock outcrops and sheer cliff faces. The site is currently largely cleared, with some scattered Eucalyptus species, and used for grazing.

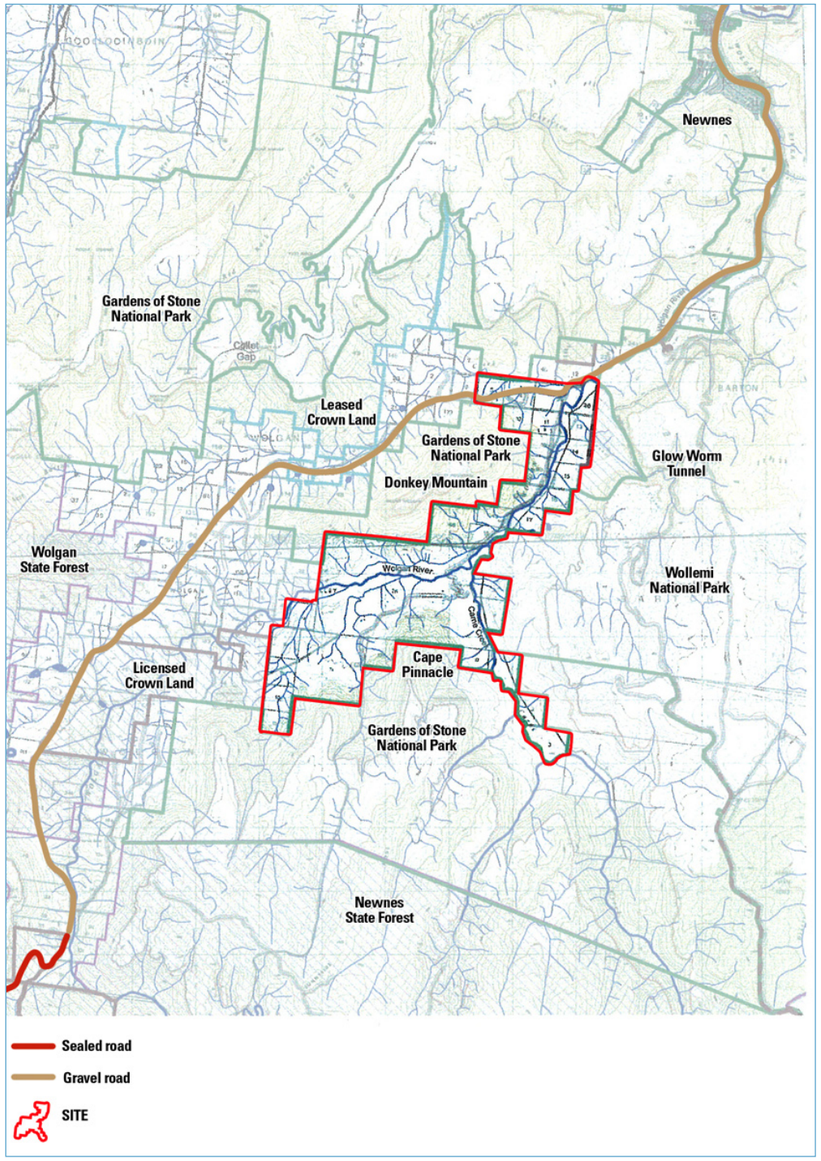
The site is located on the Wolgan Road, 35 kilometres north of Lithgow, and 3 kilometres south of Newnes. It sits between Gardens of Stone National Park to the north and south and Wollemi National Park to the east; both part of The Greater Blue Mountains World Heritage Area. Wolgan State Forest is located further to the west and Newnes State Forest further to the south. Glow Worm Tunnel, Newnes Industrial Ruins, Deep Pass, Blackfellows Hand Rock and Baal Bone Gap are located within the vicinity of the site.

The site is separated from the rest of the Wolgan Valley by Donkey Mountain, but extends to Wolgan Road in the north and an adjoining rural zoned property to the south west.

The Site



The Three Sisters, Katoomba

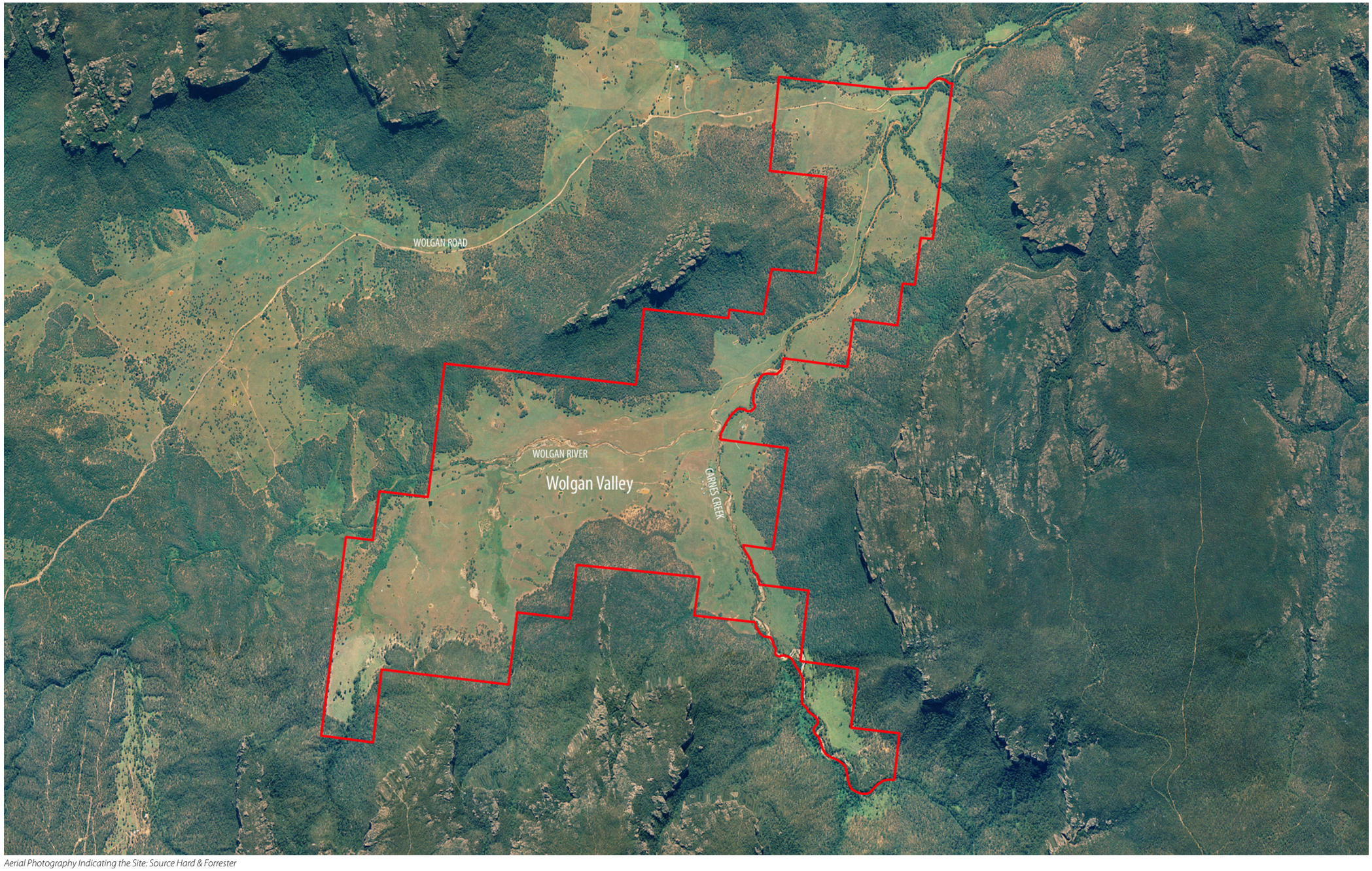


Local Context Plan: Source, National Parks and Wildlife Service

Site Description

The site has an area of 1,099ha and is legally described as:

- Lots 4, 5, 6A, 7A, 8A, 8B, 9A, 9B, 10, 10A, 11,11B, 12B, 12C, 18, 19, 26, 43, 46 in DP 751666
- Lots 1 in DP 726429
- Lots 4, 5, 13, 14, 15, 16, 17, 26 in DP751624
- Lots 1, 2, 3 in DP 751634

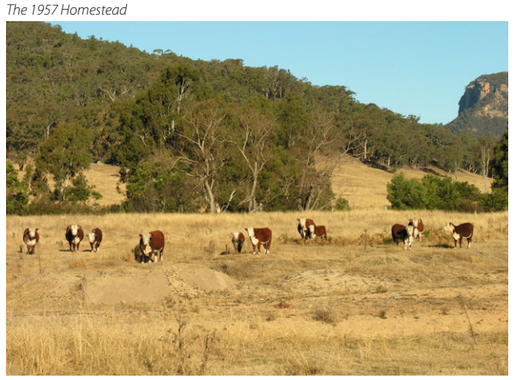


Aerial Photography Indicating the Site: Source Hard & Forrester

The 1874 Homestead on the Site

The 1957 Homestead

Slab house



Existing Cattle Grazing

Wattle and Daub Hut

3.3 Topography

The site comprises a gently sloping valley floor traversed by the Wolgan River and a tributary known as Carnes Creek, both of which exhibit significant bank erosion. Immediately adjacent to all sides of the site are steep, heavily vegetated talus footslopes to the steep sandstone cliffs of the western escarpment of the Blue Mountains plateau.

Typical scenic qualities of the valley include massive vertical sandstone cliffs that provide a dramatic contrast to the bushland on the footslopes and pasture on the valley floor. A detailed survey of the site prepared by Hard and Forester Surveyors is included at *Appendix 1*.

The elevation within the site ranges from about RL 550 AHD in the bed of the Wolgan River at the north eastern corner to approximately RL 760 on the southern flanks of Mount Wolgan.

The impressive, isolated flat-topped mesa of Donkey Mountain (960m) to the northwest of the site is complimented to the south by the outcrops of Sunnyside Ridge, including the Wolgan Pinnacle (1006m) and Cape Pinnacle (709m) to the west by cape Horn (1020m), and to the east by an un-named ridge (1004m), creating an enclosed valley experience with extended views terminated by vegetated slopes and sandstone outcrops.

3.4 Extractive Resources

The Department of Primary Industries (Mineral Resources) has confirmed that there are no coal resources on the site as it is below the coal measures and the coal which underlies the adjacent plateau and escarpment is within the Gardens of Stone National Park and therefore could not be mined.

3.5 Existing Improvements

The property has been used for cattle grazing since the early nineteenth century. While surrounded by remnant native vegetation, only individual and interspersed clusters of trees set among grazing pasture exist on the site, mainly along the Wolgan River and Carnes Creek.

A very small wattle and daub hut of unknown age is located approximately halfway along the driveway into the site. This building is in a very poor state of repair.

A slab-house homestead and associated outbuildings remain on the site. However, the homestead and associated buildings are in a very poor state of repair, not having been inhabited since the mid 1950s. A circa 1957 house is located quite close to the abandoned homestead. This is the current homestead occupied by the present owners of the land, who still use the site as an active beef cattle grazing property.

Numerous fences, gates, dams and other agricultural structures are located across the site, and a range of agricultural outbuildings are scattered around the vicinity of the slab house and the homesteads. Several of these are dilapidated and disused.

3.6 Development on Surrounding Land

The site is located between Gardens of Stone National Park to the north and south and Wollemi National Park to the east; both of which form part of The Greater Blue Mountains World Heritage area. Wolgan State Forest is located further to the west and Newnes State Forest further to the south.

Donkey Mountain separates the site from the rest of the valley, which is predominantly occupied by grazing properties.

The site adjoins Wolgan Road in the north. Adjacent properties are zoned rural and used predominantly for grazing purposes. They accommodate homesteads on the northern side of Wolgan Road and west of the site's entry road. In the south west, the site adjoins a former grazing property owned by Mr Stammer. However, grazing activity has ceased and the site is being returned to a quasi-natural condition by Australian Ecosystem Foundation Inc. All other adjoining land is located within National parks.

In addition to natural attractions, which attract bushwalkers, rock climbers and campers, several cultural attractions exist in the valley, including:

- Black Fellows Hand Rock – an aboriginal art site.
- Baal Bone Gap – a picnic area and lookout.
- Deep Pass – a camping site with aboriginal art.
- Newnes – hotel, camp ground and mining ruins.
- Disused Newnes railway line.
- Glow worm tunnel – a disused railway tunnel just north of the site that is now inhabited by glow worms.

3.7 Climatic Conditions

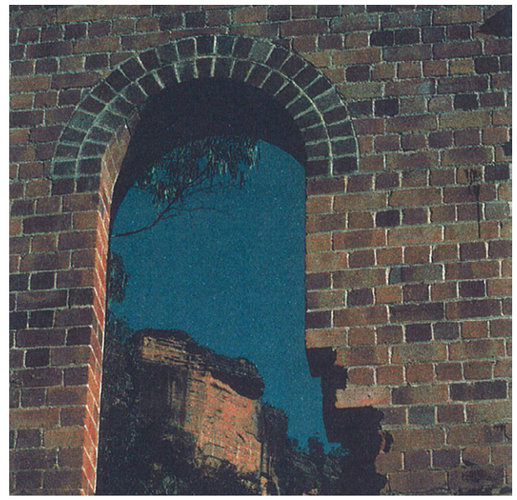
1938 to 2002 climatic records from the Bureau of Meteorology measured at Newnes Forest Centre state that the average temperatures for January (being the hottest month) range from 10 to 23 degrees and that July, the coldest month, has temperatures ranging from 9 to - 0.8 degrees.

The average annual rainfall and pan evaporation for Wolgan Valley site is estimated to be approximately 640 mm/yr and 1453 mm/yr respectively as obtained from the Queensland Department of Natural Resources. This data compares well with other nearby weather stations with the exception of Newnes Forest Weather Station, which has recorded an average annual rainfall in the order of 1,140 mm/yr. This weather station is located approximately 30 km to the north of the resort site and is higher in altitude, which may explain its relatively elevated rainfall.

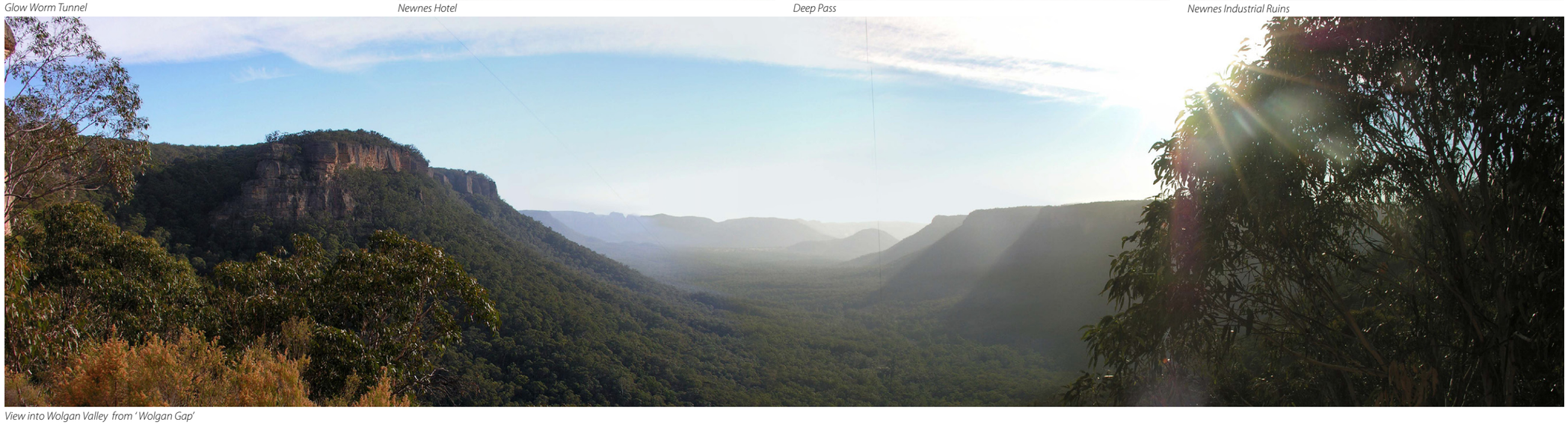
Glow Worm Tunnel

Newnes Hotel

Deep Pass



Newnes Industrial Ruins



View into Wolgan Valley from 'Wolgan Gap'

5 Statutory Planning Considerations

The following statutory planning considerations are relevant to the proposed development.

5.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) establishes a process for assessing the environmental impact of activities and developments where 'matters of national environmental significance' may be affected. Under the Act any action which "has, will have, or is likely to have a significant impact on a matter of national environmental significance" is defined as a "controlled action", and requires approval from the Minister for the Environment.

The matters of "*national environmental significance*" listed under the EPBC Act of potential relevance to the site are:

- nationally listed threatened species (eg. Regent Honeyeater, Tiger Quoll);
- nationally listed migratory species; and
- World Heritage Areas (the Greater Blue Mountains World Heritage Area).

The remaining "matters of national environmental significance" listed under the EPBC Act are not of relevance to the study area given that:

- no threatened ecological communities currently listed pursuant to the EPBC Act are present or will be impacted by the proposed development;
- there are no Ramsar wetlands nor any Commonwealth marine environments in the vicinity; and
- the proposed development does not involve "nuclear actions".

5.2 Environmental Planning and Assessment Act 1979

Approval of this Concept Plan is sought under the Environmental Planning and Assessment Act 1979 (the Act).

5.2.1 Concept Approval of Major Development

Part 3A the Act came into force on 1 August 2005. Part 3A established new assessment procedures for various forms of 'major development' of state or regional significance. Such significance can be established in a number of ways, including being a form of development listed at Schedule 2 of State Environmental Planning Policy (Major Projects), which includes.

> *17 – Tourist, convention and entertainment facilities of Schedule 1)*
>
> *Development for the purpose of **tourist related facilities**, major convention and exhibition facilities or multi-use entertainment facilities 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*
> (our emphasis)

The proposed development clearly conforms to this definition, and DOP has confirmed in writing that the development constitutes a 'major project' for which the Minister for Planning is the Consent Authority, and to which Part 3A of the Act applies.

Essentially, the concept approval process provides for the Minister to undertake a co-ordinated whole of government assessment of the merits of the concept of a project of significance to the state, and to establish procedures for the subsequent approval of detailed aspects of the project.

On the proponents request, the Director General provided Environmental Assessment Requirements for the project of 19 September 2005. This concept plan has been prepared in accordance with the matters outlined in those requirements.

5.2.2 Designated Development (EIS)

At an early stage of the process, it was thought that an EIS would be required for the proposed development, as various aspects of the development had the potential to conform to the descriptions of 'designated development' listed at Schedule 3 of the EP&A Regulation 2000,

With regard to designated **Aircraft Facilities**, the proposed helipad will have only four movements per week and is more than one kilometre from any dwelling not associated with the development. It is therefore not designated development. Furthermore, the helipad will be used only for access to the resort and is therefore ancillary to, and subsumed within the dominant 'tourist facility' use.

With regard to designated **Artificial Waterbodies**, the proposed artificial waterbody will not have an aggregate surface area of more than 0.5ha and is therefore not designated development. It is also an ancillary aspect of the landscaping of the overall dominant tourist facility use.

With regard to designated **Sewerage Systems or Works**, the proposed sewage treatment plant will have a processing capacity of, and will treat and release more than 20 persons equivalent, but is not located in the floodplain or any of the locations listed at subclause or 3. It is therefore not designated development, and in any event is ancillary to, and subsumed within the dominant 'tourist facility' use.

DOP has since advised that it is of the opinion that the proposal is not designated development and that the proposed sewage treatment plant is ancillary to the proposed development as a tourist facility. Accordingly, an Environmental Impact Statement is not required. In any event, the 'EIS' or 'designated development' provisions of Part 4 of the Act do not apply to major development, which is now determined under Part 3A.

5.3 State Environmental Planning Policy No. 11

SEPP 11 aims to ensure that the Roads and Traffic Authority is made aware of and is given an opportunity to make representations in respect of certain types of development referred to in Schedule 1 or 2 of the SEPP. The following are included in the Schedules to SEPP 11:

- *Schedule 2: (h) tourist facilities, recreation facilities, showgrounds or sportsgrounds, in each case having accommodation for 50 or more motor vehicles or the enlargement or extension of any existing tourist facilities, recreation facilities, showgrounds or sportsgrounds where that enlargement or extension includes accommodation for 50 or more motor vehicles.*

The project does not trigger these criteria.

5.4 State Environmental Planning Policy 44 - Koala Habitat Protection

SEPP 44 encourages the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free-living populations will be maintained over their present range. Local councils cannot approve development in an area affected by the policy without an investigation of core koala habitat.

While Lithgow is listed as a Local Government Area of which the policy applies, the flora and fauna surveys undertaken by AMBS (submitted as a separate report) found that while tree species that could potentially support koalas do occur, no evidence of koalas was recorded on or near the site.

5.5 State Environmental Planning Policy 55 – Remediation of Land

SEPP 55 provides that land must not be developed if it is unsuitable for a proposed use because it is contaminated by former use/s. If the land is unsuitable, remediation must take place before the land is developed.

Phase 1 investigations undertaken by Douglas Partners (submitted as a separate report) found that the site has been used for pastoral purposes since at least the 1870s. On the basis of these findings, Douglas Partners identified several areas of environmental concern (AEC). However all of the identified AEC are small discrete areas of potential agricultural contamination located within or adjacent to the farm house and farm compound area. All of the AEC's can be remediated to accommodate the proposed use without any significant removal of vegetation or landform modification.

5.6 Lithgow City Local Environmental Plan 1994

Lithgow City Local Environmental Plan 1994 (LCLEP 1994) is the comprehensive Local Environmental Plan for the City of Lithgow. The aims of LCLEP 1994 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 **fragmented and isolated development of rural land** of 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.*
(our emphasis)

The site is located within a 1(a) Rural (General) zone under the provisions of the Lithgow City Local Environmental Plan 1994 (LCLEP 1994).

The objectives of this zone are (inter alia) to protect, enhance and conserve rural land, soil, timber production forests, extractive material deposits, vegetation in environmentally sensitive areas, water resources, localities of significance for nature conservation value and items of heritage significance.

The objectives of the zone also seek to prevent the unjustified development of prime crop and pasture land for purposes other than agriculture and provide for the separation of conflicting land uses.

Agriculture, bushfire hazard reduction, forestry and home based child care are all permissible without development consent in the 1(a) Rural (General) zone. Boarding houses; bulky goods salesrooms and showrooms; commercial premises; motor showrooms; residential units and shops are all prohibited. All other development is permissible with development consent.

LCLEP 1994 adopts the Environmental Planning and Assessment Model Provisions 1980, which includes the following definition of 'tourist facilities':

*"tourist facilities means an establishment providing for **holiday accommodation or recreation** and may include a boat shed, boat landing facilities, camping ground, caravan park, holiday cabins, hotel, house boat, marina, motel, playground, refreshment room, water sport facilities or a club used in conjunction with any such activities".*
(our emphasis)

Tourist Facilities are permissible with development consent.

- Clause 11 – General considerations for development in rural lands.

Before determining a development application relating to land within Zone No 1 (a) or 1 (c), the Consent Authority 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**.*
(our emphasis)

- Clause 28 – Environmentally sensitive land

The Map to LCLEP 1994 identifies environmentally sensitive land by way of hatching. Neither the site, nor any adjoining land is so hatched.

- Clause 30 – Land subject to bushfire hazards.

The Council must not consent to the erection of a building on land which, in the opinion of the Council, is subject to bushfire hazards unless:

(a) *adequate provision is made for access for fire fighting vehicles,*

(b) *adequate safeguards are adopted in the form of **fire breaks, reserves and fire radiation zones**, and*

(c) *adequate **water supplies are available for fire fighting purposes**.*
(our emphasis)

- Clause 37 – Contaminated Land.

Notwithstanding any other provision of this Plan, the Council may consent to development of land that the Environment Protection Authority has advised the Council is contaminated or potentially contaminated only if the development includes measures to deal with the remediation of the land. Council has not advised that the Environment Protection Authority has informed it of any contamination.

- Part 4 - Heritage

The heritage objectives of Part 4 of LCLEP 1994 are:

"(a) to conserve the environmental heritage of the City of Lithgow,

(b) to better integrate heritage conservation into the planning and development control processes,

(c) to provide for public involvement in matters relating to the conservation of the area's environmental heritage, and

(d) to ensure that new development is undertaken in a manner that is sympathetic to, and does not detract from, the heritage significance of heritage items and their settings, as well as streetscapes and landscapes and the distinctive character that they impart to the City of Lithgow".

Schedule 1 of LCLEP 1994 identifies the following heritage items in the area of Newnes and Wallerawang and Wolgan Valley:

- Wolgan Valley – Coke Ovens
- Wolgan Valley – Village
- Wolgan Valley – Associated Works
- Wolgan Valley – Wolgan Valley Railway
- Wolgan Valley – Shale-Oil Refinery Group
- Wolgan Road – Wolgan Valley Station

The National Trust report 'Wolgan Valley' (1977) describes the these items as:

- The Coke Ovens form part of the former Newnes Industrial site.
- The Village listing relates to the village of Newnes.
- It is not clear what the 'Associated Works' relate to, however it is assumed they relate to the former Newnes railway, village and mining area.
- The Wolgan Valley Railway relates to the remnants of the old rail line from Newnes Junction in the south to Newnes in the north, including the remnant railway siding at Newnes.
- The Shale Oil Refinery Group forms part of the former Newnes Industrial site.

Council have provided a heritage inventory sheet for the 'Original Wolgan Valley' and advised that this relates to the listing of 'Wolgan Road – Wolgan Valley Station' in LCLEP 1994. The inventory sheet describes the building as:

> *"Large slab cottage of about six rooms, date 1874 on stone chimney, main part vertical slabs. "drawing room" with bay window at northern end is of horizontal slabs. Condition poor, kitchen has collapsed. Original grant to Walker of Wallerawang, bought 1923 from grand-daughter Hazel and Loveday Barton by E.B. Webb & Sons. Inhabited until 1957, is not past shoring up. Two rooms flagged. Numerous slab sheds".*

The inventory sheet states the following reasons for listing:

> *"First substantial homestead in Wolgan Valley, unusually large for a slab house. Associated with Walker family of Wallerawang and Marrangaroo".*

Pursuant to Clause 40, The Council must not grant consent to development on land in the vicinity of a heritage item unless it has made an assessment of the effect the carrying out of that development will have on the heritage significance of the item and its setting.

Clause 42 – Archaeology

Pursuant to Clause 42, The Council may grant consent to development on a known potential archaeological site:

(b) that is the location of a relic or an Aboriginal place, within the meaning of the *National Parks and Wildlife Act 1974* , only if the Council has notified the Director-General of National Parks and Wildlife of its intention to do so and the Council has taken into consideration any comments received from the Director-General within 28 days after the notice was sent.

5.7 Other NSW Legislation

5.7.1 Integrated Approval Legislation

Under Part 3A, Clause 75U of the Environmental Planing and Assessment Amendment (Infrastructure and Other Planning Reform) Act 2005 No 43, certain approvals and legislation do not apply. These include, as relevant to the proposal:

(b) a permit under section 201, 205 or 219 of the Fisheries Management Act 1994,

(c) an approval under Part 4, or an excavation permit under section 139, of the Heritage Act 1977,

(d) a permit under section 87 or a consent under section 90 of the National Parks and Wildlife Act 1974,

(e) an authorisation referred to in section 12 of the Native Vegetation Act 2003 (or under any Act to be repealed by that Act) to clear native vegetation,

(f) a permit under Part 3A of the Rivers and Foreshores Improvement Act 1948,

(g) a bush fire safety authority under section 100B of the Rural Fires Act 1997,

(h) a water use approval under section 89, a water management work approval under section 90 or an activity approval under section 91 of the Water Management Act 2000.

(2) Division 8 of Part 6 of the Heritage Act 1977 does not apply to prevent or interfere with the carrying out of an approved project.

Approvals that must be obtained under Clause 75V are:

(1) An authorisation of the following kind cannot be refused if it is necessary for carrying out an approved project and is to be substantially consistent with the approval under this Part:

(e) an environment protection licence under Chapter 3 of the Protection of the Environment Operations Act 1997 (for any of the purposes referred to in section 43 of that Act),

(f) a consent under section 138 of the Roads Act 1993.

However, the Department of Environment and Conservation has confirmed in writing (as part of the DG requirements) that the proposal is not scheduled within the meaning of the Protection of the Environment Operations Act 1997 for the proposed sewage treatment system and the helicopter landing facility.

Section 138 approval will be required for any works identified as being required on Wolgan Road.

5.7.2 Other Relevant Legislation

- *Soil Conservation Act* 1938

The Act provides for the conservation of soil and farm water resources and for the mitigation of erosion within NSW. Any land use activity that disturbs a vegetative ground cover creates an erosion hazard, which requires measures to minimise environmental degradation.

- *Threatened Species Conservation Act* 1995

The TSC Act modified the EP&A Act by including a requirement to determine "whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats" by taking into account the eight part tests of Section 5A when considering a Development Application. If it is determined that a development proposal is "likely" to have a "significant effect on threatened species, populations or ecological communities, or their habitats", pursuant to s.5A of the EP&A Act a Species Impact Statement (SIS) is required.

Schedule 1 and 2 of the Act lists threatened and vulnerable species.

Australian Museum Business Services (AMBS) were engaged to prepare a flora and fauna impact assessment examining the ecological characteristics of the project area and existing ecosystems on and around the site (submitted as a separate report). The following threatened species were recorded in the study area:

Mammals:

- *Yellow-bellied Glider – Petaurus australis*

Birds:

- *Glossy Black Cockatoo – Calyptorhynchus lathami*
- *Powerful Owl – Ninox strenua*
- *Sooty Owl – Tyto tenebricosa*
- *Brown Treecreeper – Climacteris picumnus*
- *Speckled Warbler – Chthonicola sagittata*
- *Diamond Firetail Finch – Stagonopleura guttata*
- *Gang Gang Cockatoo – Callocephalon fimbriatum* (currently under a preliminary determination for listing as a threatened species)

The following additional threatened fauna species have been recorded in the locality, some of which may potentially occur on site on occasion or on surrounding slopes

Invertebrates:

- *Giant Dragonfly – Petalura gigantea*
- *The Bathurst Copper Butterfly – Paralucia spinifera*

Herpetofauna:

- *Red-crowned Toadlet – Pseudophryne australis*
- *Blue Mountains Water skink – Eulamprus leuraensis*
- *Broad-headed Snake – Hoplocephalus bungaroides*
- *Rosenberg's Goanna – Varanus rosenbergi*

Birds:

- *Swift Parrot – Lathamus discolor*
- *Regent Honeyeater – Xanthomyza phrygia*
- *Brush-tailed Rock-wallaby – Petrogale penicillata*
- *Square-tailed Kite – Lophoictinia isura*
- *Turquoise Parrot – Neophema pulchella*
- *Barking Owl – Ninox connivens*
- *Painted Honeyeater – Grantiella picta*
- *Black-chinned Honeyeater (eastern subsp) – Melithreptus gularis gularis*
- *Hooded Robin – Melanodryas cucullata*
- *Grey-crowned Babbler (eastern subsp) – Pomatostomus temporalis temporalis*

Mammals:

- *Spotted-tailed Quoll – Dasyurus maculatus*
- *Koala – Phascolarctos cinereus*
- *Squirrel Glider – Petaurus norfolcensis*
- *Large-eared Pied Bat – Chalinolobus dwyeri*
- *Eastern False Pipistrelle – Falsistrellus tasmaniensis*
- *Eastern Bent-wing Bat – Miniopterus schreibersii oceanenis*
- *Greater Broad-nosed Bat – Scoteanax rueppellii*

- *Fisheries Management Act 1994*

The *Fisheries Management Act 1994* (FM Act) aims to conserve, develop and share the fishery resources of the state for the benefit of present and future generations. The Act, which is administered by NSW Fisheries, incorporates the principles of the TSC Act regarding the assessment of significance of impacts on threatened species and their habitat with respect to aquatic species.

5.8 Other Relevant NSW Policies and Guidelines

Other policies and guidelines relevant to the proposal and considered as part of this SEE include:

- Draft Plan of Management Gardens of Stone National Park
- Plan of Management for the Greater Blue Mountains World Heritage Area
- Planning for Bushfire Protection – Planning NSW
- EIS Guideline – Sewerage Systems
- EIS Guideline – Irrigation of Sewage Effluent
- Catchment Management Plan for the Lower Hawkesbury Nepean River
- NSW State Rivers and Estuaries Policy
- NSW Fisheries (1999) Policy and Guidelines – Aquatic Habitat Management and Fish Conservation
- Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings.
- Fish Habitat Protection Plan No. 1
- Managing Urban Stormwater: Soils and Construction 2004
- RTA's Guide to Traffic Generating Developments
- AUSTROADS Road Safety Audit
- RTA's Policy for Signposting of Resorts and Tourist Facilities
- Environmental Assessment Guidelines Cultural Heritage
- Environmental Assessment Guidelines Flora and Fauna
- Environmental Criteria for Road Traffic Noise (EPA)
- Assessment, Classification and Management of Liquid Waste (DEC)
- AirServices Australia Environmental Principles for Minimising the Impact of Aircraft Noise
- CASA Guidelines for the establishment of and use of helicopter landing sites

6 Consultation

Given the initial possibility for various components of the development to trigger the 'designated development' and Environmental Impact Assessment (EIS) provisions of the EP&A Act, a Planning Focus Meeting (PFM) was convened by DOP at Lithgow Council on 17 June 2005. The PFM was attended by:

- Department of Planning (DOP)
- Department of Environment and Conservation (DEC)
- Lithgow Council
- NSW Fire Brigade
- Rural Fire Service
- Department of Commerce
- Department of State and Regional Development
- Department of Tourism
- Department of Infrastructure, Planning and Natural Resources (Water)
- Roads and Traffic Authority
- Fish River Water Supply

Separate consultation has occurred with:

- Integral Energy
- NSW Heritage Office
- NSW Rural Fire Service
- Bathurst Aboriginal Land Council
- A range of State and Commonwealth Government Ministers
- Capertree Valley Environment Group

Regular meeting have been conducted over several months with the Department of Planning and the NSW Department of State and Regional Development. With specific regard to the bodies required to be consulted pursuant to the DGR, we note:

- Commonwealth Department of Environment and Heritage (DEH)

  The Concept Plan is being submitted to DEH as part of a formal referral under the Environmental Protection and Biodiversity Conservation Act (EPBC) concurrently with lodgement with the Minister for Planning.

- NSW Department of Environment and Conservation (DEC)

  Following the Planning Focus Meeting, the DEC provided extensive correspondence identifying all key issues of concern for them. This correspondence has been taken into consideration in the preparation of the Concept Plan and Environmental Assessment.

- NSW Roads and Traffic Authority (RTA)

  McLaren Traffic Engineering consulted with the RTA by telephone in the preparation of the Traffic Report.

- NSW Rural Fire Service (RFS)

  Representatives of UrbisJHD, Context and ABPP met with the RFS on 18 August 2005.

- NSW Heritage Office

  UrbisJHD and CCG met with the Heritage Office and DOP on 27 July. Various email correspondence and telephone calls were subsequently exchanged between Stuart Reed of the Heritage Office and Conybeare Morrison. The Heritage Office will be consulted further during the preparation of the Conservation Management Plan.

- Council of The City of Lithgow

  The proponent met with various representatives of Lithgow Council on 13 September 2005

- Local Aboriginal Community

  The proponent and AMBS have had various preliminary discussions with representatives of the the Bathurst Aboriginal Land Council (BALC). The BALC will be consulted further during detailed aboriginal archaeological investigations.

- Local Residents

  The proponent met with a group of Wolgan Valley residents to discuss the project on 13 September 2005.

6.1 Responses of authorities/bodies consulted

DOP requested the various bodies invited to attend the PFM to provide written advice of their requirements for an EIS. Responses received by DOP were incorporated into the Director General's Envirtonmental Assessment Requirements issued on 19 September 2005.

In summary, the Director General has required that the concept plan address:

- Protection of the Environment Operations Act 1997
- Roads Act 1993
- Rural Fires Act 1997 Water Management Act 2000.
- Suitability of the site
- Water Quality
- Flora and Fauna
- Fire and Emergencies
- Traffic and Transport
- Heritage
- Soil Quality
- Noise Impacts
- Visual Impacts
- Utilities
- Helicopter Operations
- Waste Management
- Ecological Sustainability
- Conservation Management Plan
- Consultation

- Statutory Planning
  - *State Environmental Planning Policy No. 11 - Traffic Generating Development*
  - *State Environmental Planning Policy No. 44 - Koala Habitat Protection*
  - *State Environmental Planning Policy No. 55 -Remediation of Land*
  - *Lithgow Local Environmental Plan 1994,*
  - *Daft Plan of Management Gardens of Stone National Park*
  - *Plan of Management for the Greater Blue Mountains World Heritage Area.*

On Site Planning Focus Meeting 17 June 2005

7 The Concept Plan

The project is a tourist resort comprising 40 luxurious hotel villas and associated facilities, including a restaurant, day spa and conference facilities. The resort itself will be located on the eastern central part of the site adjacent to both banks of Carnes Creek, in the general vicinity of the existing slab house and homestead. Separate manager's accommodation will be located further to the north on the eastern bank of Wolgan River, with ancillary staff accommodation and maintenance plant, with the vast majority of the site used for passive recreation and environmental rehabilitation.

Pursuant to Section 75M of the recently gazetted Part 3A of the EP&A Act, the Minister may authorise or require the proponent to submit a concept plan for a project. On 7 September 2005, the Minister authorised that the project may seek a concept approval as outlined in the DGRs dated 19 September 2005.

The concept plan is to:

(a) outline the scope of the project and any development options, and

(b) set out any proposal for the staged implementation of the project, and

(c) contain any other matter required by the Director-General.

A detailed description of the project is not required.

The project comprises:

- 40 detached luxury villas.
- Main reception building comprising administration, gift shop, lounges, library, restaurant, bar and conference rooms.
- Spa building comprising gym, change rooms, spa, sauna, pools and various treatment rooms.
- Manager's Accommodation (8 people) and helipad.
- Staff Accommodation (120 people) and maintenance facilities.
- Ancillary road, utility and on-site sewage treatment and disposal works.
- Landscape works.
- Environmental conservation works.
- Retention of the existing slab house and wattle and daub hut.

All ancillary facilities such as the restaurant, conference facility and helipad will be provided for the exclusive use of guests and staff. No facilities will be available for use by people not staying at the resort.

The Concept Plan seeks approval for the following aspects of the project:

- Demolition of the 1957 homestead.
- Indicative building siting and road layout.
- Indicative architectural thematics and styles.
- Landscape concept plan.
- Sewage treatment plant location and concept design.
- Use as a tourist facility, including temporary accommodation and ancillary facilities for the exclusive use of resort guests.
- Environmental rehabilitation works across the site.
- A maximum number of 40 villas, with an average floor area of 115m^2 each.
- A maximum of 8,645m^2 floor area of ancillary facilities, including a day spa, restaurant, bar, lounge, reception, administrative offices, indoor swimming pool and conference rooms.
- Staff accommodation and associated facilities for up to 128 staff.

7.1 Design Philosophy

7.1.1 Design Objectives

Conybeare Morrison's design response for the site is to achieve an internationally recognised, high quality, environmentally sustainable luxury tourist development that attains world best practices. The specific objectives to achieve this goal are:

- Showcases best practices for reducing ecological impacts by hospitality operations.
- Creates a unique place with a distinctive Australian identity.
- Blends harmoniously with the natural environment while highlighting historically relevant rural architecture.
- Demonstrates architecture that is timeless and will be appreciated now and in the future.
- Sets the standard for luxury accommodation world-wide.
- Induces memorable experiences for the guests.
- Makes a positive impact on the visitors and the surrounding community.
- Contributes to the local and regional economy.
- Sustains and enhances the environment through sound methods of habit preservation, pest management and the use of plant materials that require less irrigation.
- Maximises the amount of open space.
- Integrates existing key physical, and landscape elements and reinforces them within the context of the new site layout.
- Incorporate some parts of the remnants of the heritage in the interpretation of the site.
- Control sediment and erosion through appropriate grading to channel flow through natural filtration systems away from sensitive bodies of water.
- Manage stormwater so that it may be recycled where possible for reuse on the site and treated where required prior to re-entering watercourses.

The resort will be similar to the successful Emirates Al Maha resort in Dubai which captures the essence of the environment and is designed to blend in with the landscape.

The design philosophy is to focus on the tourist experience and their activities and create a nature sensitive, aesthetically pleasing built environment that enhances the user experience. The nature-based resort will be made up of villas dispersed into small precincts in a functional but non-hierarchical pattern. Each villa precinct will be designed to respond to its immediate natural surroundings. The main buildings will create a small village that is easily accessible by staff and visitors. The nature-based activities in the resort will focus on concern for the local ecology. Nature is respected for its restorative qualities. The human experience will be designed to work in harmony with both the natural and built environment.

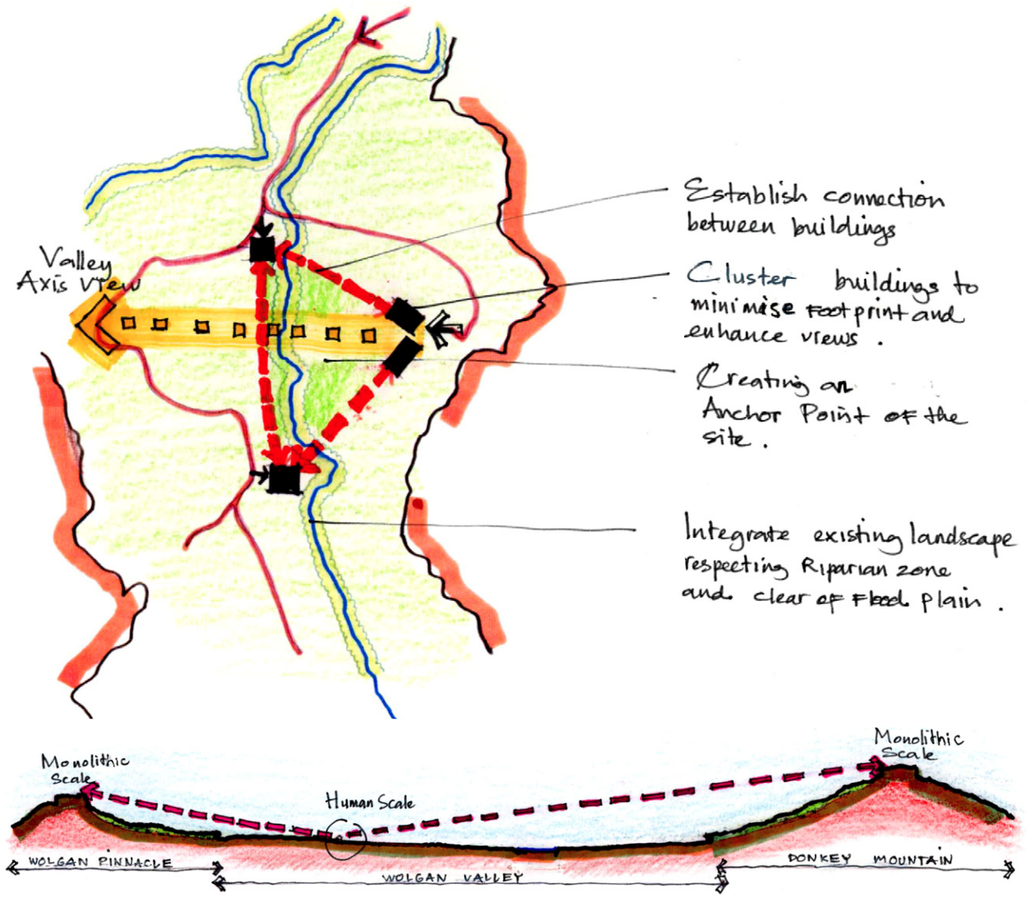
Designing an exclusive resort presents an opportunity to allow a reconnection of human needs to the natural systems upon which all life is based. To achieve this objective for a tourism-related area, the design of the development will embrace the primary senses. Sight, hearing, smell, taste, and touch will be incorporated into the visitor experience to enhance understanding of the environment's uniqueness. To be healing, visitors must experience an obvious connection with the natural and cultural context of the surroundings so as to appreciate their intrinsic value and to understand how the environment is nurtured and sustained within the resort.

The project will meet the needs of the users while blending in with the environment thus providing a much-needed balance between environmental and economical sustainability.

7.1.2 Design Principles

The following design principles have been adopted by the project architect:

- An exclusive and idyllic resort facility set within a dedicated conservation area, with absolute guest privacy, full security and personalised service 24 hours a day.
- The facility to provide a unique experience of total peace, solitude and contact with nature, allowing guests to fully relax.
- The design and operation is based on the ability to provide excellence in service and guest satisfaction, with a ratio of three staff to every guest suite.
- The luxurious individual suites are set in an idyllic Australian bush setting, each utilising natural lighting with floor to ceiling windows affording uninterrupted vistas from each suite. They will also feature private pools, fine dining, exquisite wines and an intimate connection with flora and fauna.
- A number of on site and off site activities which complement the environment.
- Purpose and thoughtful design to harmonise with spectacular surroundings, influenced by traditional architecture and offering informal elegance.



Rural Character of the site

- Cluster the development into small groups thereby reducing the overall footprint and creating a rural village feel
- Reflect the rural character of the site in the building architecture and materials and finishes
- Use site management practices that encourage local fauna to inhabit the site e.g. kangaroos etc.

The Resort Precinct

- Utilise the Al Mara resort model as a general guiding design principle
- Provide architecture that has a rustic contemporary Australian feel
- Establish landmarks and detailing to identify each resort precinct
- Provide adequate bushfire control measures and incorporate Asset Protection Zones
- The development to contain a number of commitments that exceed the minimum requirements for sustainable development. Leading edge sustainable development practices will be employed throughout the development.

The Environment

- Retain and conserve existing mature remnant trees and vegetation
- Re-establish endemic vegetation communities in appropriate locations
- Restore riparian zones with appropriate revegetation and creek bank stabilisation
- Control erosion through revegetation and innovative erosion control methods
- Preserve and restore habitat areas for the different types of fauna on the site
- Encourage fauna activity within the site and resort through the planting of fauna habitat and food trees and vegetation
- Install water sensitive urban design strategies to manage, treat and recycle storm water
- Re-use the resort's waste products through the installation of state-of-the-art sewerage treatment facilities
- Create management plans for feral animal and weed control, pasture and vegetation management, and wildlife protection and control

Site Access and Movement

- Augment vegetation to Wolgan Road to announce arrival at a significant location
- Frame views by select roadside plantings
- Roads should reflect a rural character and the use of coloured aggregates should be explored in the road surface material. Generally, swales will be used on the site where conditions permit
- Traffic and location signage will be minimised wherever possible. Alternative design responses will be used, such as the use of special pavements, landscaping and adjustment of road widths at key intersections. Speed control devices such as 'Cattle Grids' and raised thresholds at key crossing points will be considered. Where signage is unavoidable, it will be well designed, integrated and form a suite or family of signs, to establish a hierarchy.

Health and Wellness

- Based on the Al Maha resort philosophy, provide an environment that allows guests to truly relax and be close to nature
- Consider the role of 'wellness' as a philosophy of the site, to include mind, body and spirit.

Heritage

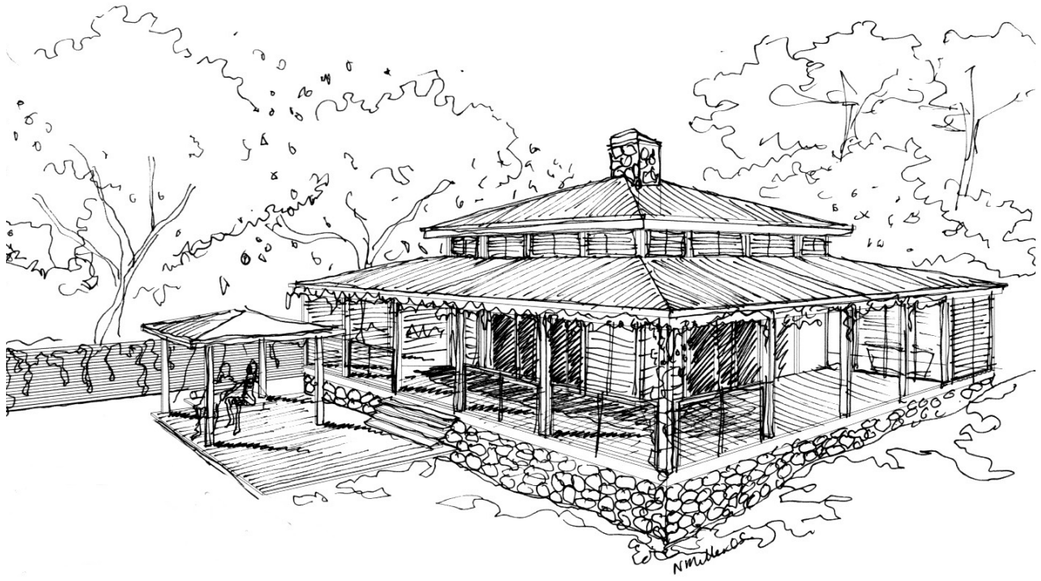
- The landscaping to compliment the history of the site and help in the interpretation process
- Significant sites could be linked by trails that include interpretation and way-finding signage.

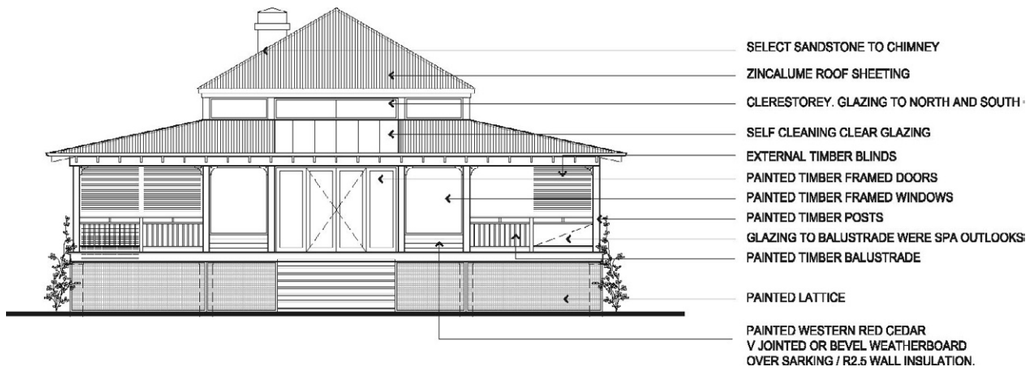
7.2 The Proposed Use

The project comprises a 'nature conservancy resort' involving environmental rehabilitation of the site and the provision of tourist accommodation and associated facilities, including a restaurant, bar, conference/ meeting facilities and health spa.

While the principal attraction of the resort will be the peaceful contemplation and absorption of the natural environment, activities to be conducted in association with the resort will include bushwalking, heritage/archaeology/ecology interpretation, rock climbing/abseiling, jogging/cycling and guided trips to surrounding natural and cultural attractions, e.g. glow worm tunnel, Baal Bone Point, Newnes Ruins etc.

The facilities of the site will be available only to guests staying in the resort. No facilities will be available for day visitors. However, it is envisaged that the environmental rehabilitation area in the western part of the site will be available for day inspection without entering the resort complex.





7.3 The Proposed Buildings

The proposed resort accommodation and facilities will comprise:

Villas
Total gross floor area: 4,530 m²

- 35 Standard Suites (1 bed), each of 93m²
- 3 Royal Suites (2 bed), each of175 m²
- 2 Owner's Suites (3 bed), each of 375m²

Main Building
Maximum gross floor area: 3,868m²

- Reception
- Activities office
- Administration Offices
- Gift Shop
- 2 Lounges
- Library with billiards
- Restaurant - Seating for 90 and private dining for 30
- Bar – with external seating for 90
- Banquet Area
- Boardroom
- Conference rooms
- Kitchen
- Buffet area
- Business Centre
- Limited to a total of 80 delegates and those staying in the resort only

Housekeeping units
Maximum gross floor area: each 45m²

- 4 small units
- Storage of linen and other supplies

Spa Complex
Maximum gross floor area: 1,006m²

- Food/beverage area
- Weight/cardio equipment room
- Changing rooms
- Spa, Sauna, Steam Room and Cold Plunge Pool
- Hydrotherapy room
- Rasool room
- 4 single treatment rooms w/shower
- 2 double treatment rooms w/shower
- Indoor/Outdoor 25m lap pool and relaxation pool
- Pool Deck and covered outdoor area

Staff Accommodation and maintenance
Maximum gross floor area: staff – 2,326m² and maintenance – 913m²

- Accommodation for 128 staff in a combination of single, double and quad rooms.
- Kitchen and Dining facilities
- 2 Lounges
- Laundry
- Pool and Courtyard (BBQ and recreation area)
- Workshops
- Vehicle wash bay (drive through)
- Vehicle, buggy, firetruck and equipment storage
- Nursery
- Helipad
- Parking

7.4 Building siting

The development precincts were selected partly to follow the historical pattern of settlement on the site which has utilised an area that benefits from proximity to the watercourses, cleared land, good solar access, commanding views of the valley and some protection from the winds down the valley.

The main development precinct entails the main reception building, villas and spa facilities and are centred around Carnes Creek. All buildings are located outside the proposed 50m riparian corridors along either side of the creeklines and required bushfire asset protection zones.

The main building is located to the east of the creek and provides commanding views along the main valley and beyond. The villas are arranged in a linear arrangement predominately following the creekline to maximise ambience and amenity. The siting of each villa also attempts to minimise the presence of adjoining villas through landscape screening integrated with the large sandstone boulders interspersed between the villas.

The design of the villas is clustered in one area so that the farthest villa is located approximately 5 minutes away by foot and 2 minutes by buggy from the main building.

Interspersed with the villas are small housekeeping units provided in various locations to service the villas. These small structures house linen, toiletries and the like and will be designed to blend in with the rest of the larger buildings on the site.

The spa complex is located on the western bank of Carnes Creek in an open area adjacent to Carnes Creek to optimise access to the microclimate and the visual and aural amenity of the creek and the historic character of the slab house and curtilage.

The managers and staff accommodation, helipad, and maintenace facilities are all loacted slightly north of the resort in an isolated pocket of cleared land accessed via a bridge over Carnes Creek. This location is conveniently proximate to, but visually and acoustically removed from the main resort. It is also screened from view from Wolgan Road and surrounding properties

PROJECT SITE AREAS:

site 1 - 198 acres / 80 hectares
(800m x 1000m)

site 2 - 37 acres / 15 hectares
(500m x 300m)

Total: 235 acres / 95 hectares

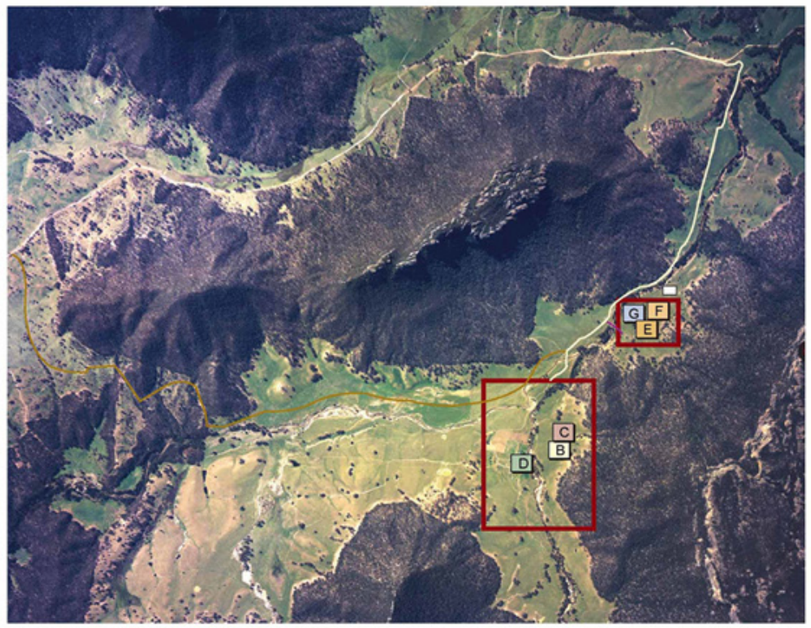
	Buildings	m2
A	Villas	4530
B	Main Building	2922
C	Conf. Centre	946
D	Spa	1006
E	Manager's Accom.	1043
F	Staff Accom.	2183
G	Maintenance	913
H	Housekeeping Units	45

* LOCATIONS FOR BUILDINGS DO NOT REPRESENT ACTUAL FOOTPRINTS

LEGEND

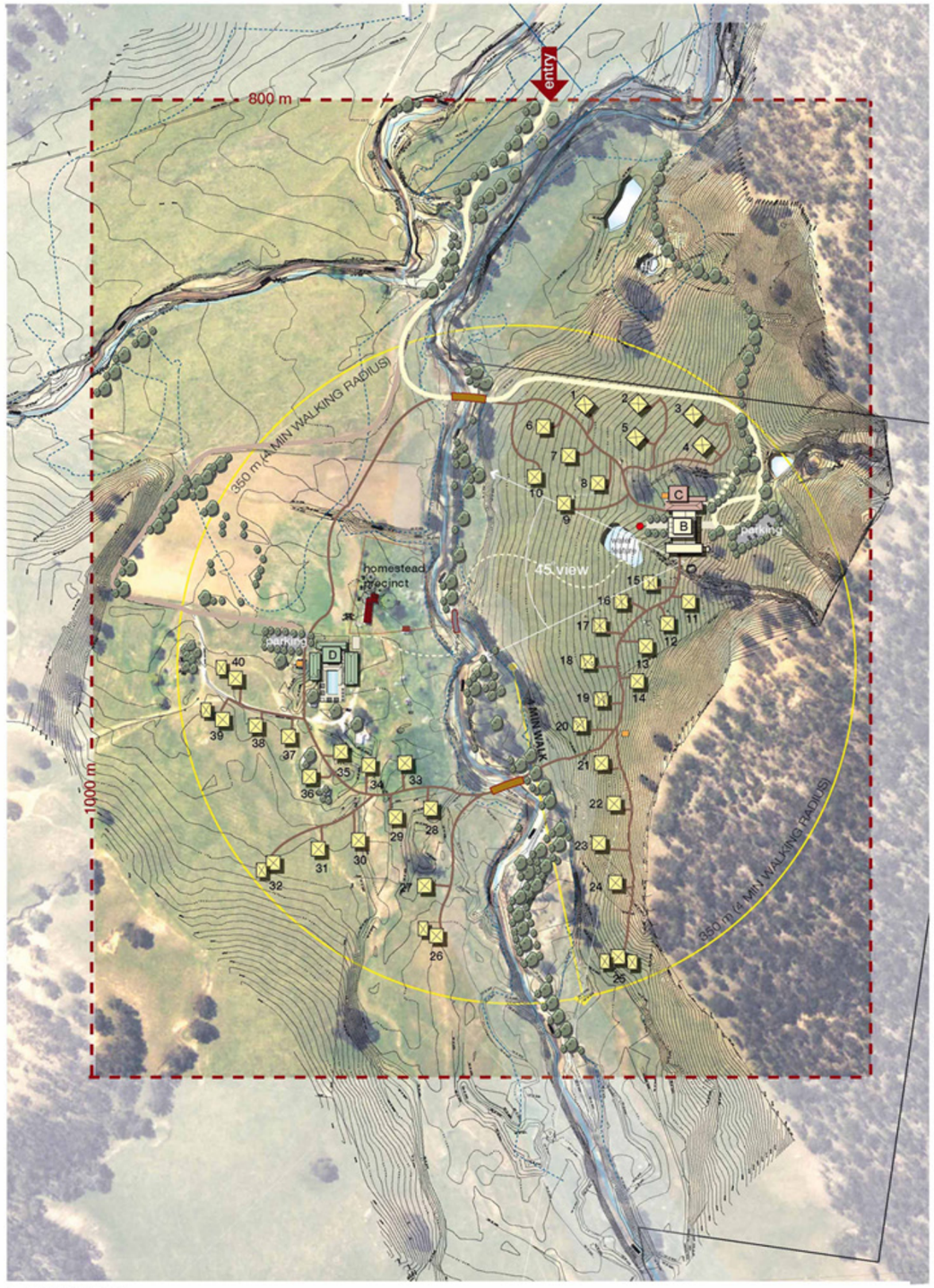
- project site boundary
- standard villa
- royal villa
- owners villa
- housekeeping unit
- pedestrian / buggy paths
- guest entry road
- service road
- helicopter pad
- sewer treatment plant
- vehicular/buggy crossing
- solar panel field
- emergency access road to be determined
- fire trail
- main view from villas
- 60-100 m bushfire setback
- 50 m riparian corridor

2 - STAFF AND MANAGERS' ACCOMODATION AND MAINTENANCE FACILITIES SITE



AERIAL KEY PLAN scale: 1:20000 @ A1

0 400m 800 m 1600m



1- RESORT SITE

Building Site Plan: Prepared by Conybeare Morrison Partners

7.5 Architectural design and thematics

7.5.1 Exterior Materials and Structures

The palette of exterior materials have been chosen to blend with the materials found on the site including local stone, rustic timber. Glazing will be selected to promote energy efficiency and steel will be used that has a high recycled content value.

7.5.2 Interior Design Statement

The aim is to create interiors that have a strong sense of environment and give guests a uniquely Australian experience. To achieve this, the resort will use indigenous materials and draw from the colours of nature. The central theme of the scheme will be a range of custom designed and crafted furniture, inspired by nature.

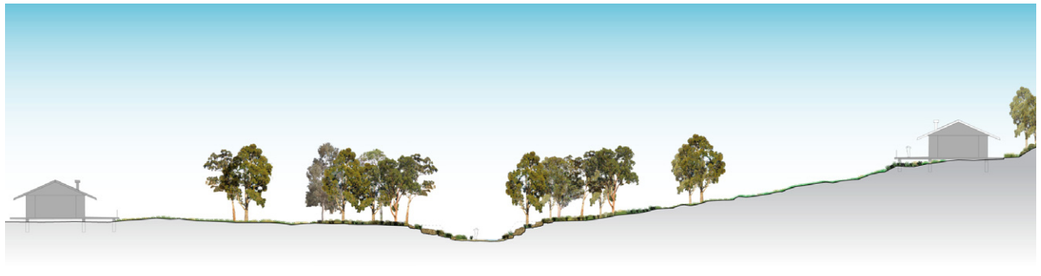
The artwork throughout the guestrooms and public areas will be a combination of original paintings, sculptures and photography and will create a series of work which tell the 'natural' story of the area, including subtle references to relevant Aboriginal culture. The art will be an important part of the scheme.

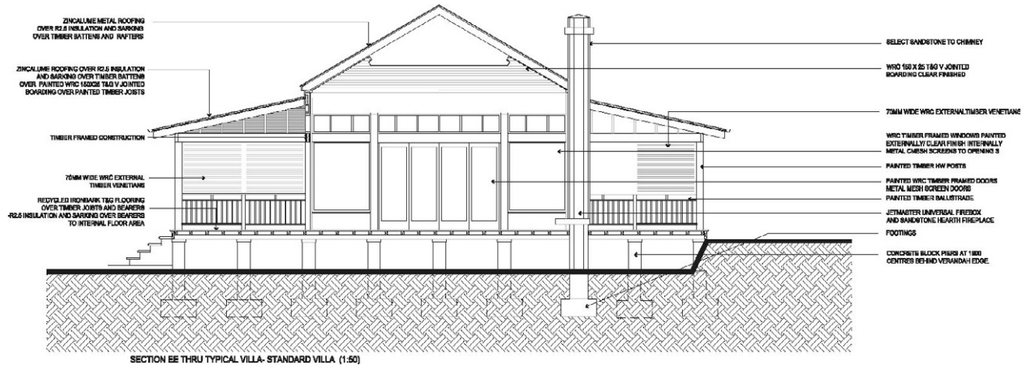
The intent is to create a new Australian interior which draws heavily on the Australian rural heritage. The interiors will have a timeless feel in line with the luxury traveller's expectations and to set a new standard for Australian hospitality.

Floors and walls will have a natural feel with an extensive use of indigenous timbers and stone, luxurious, hand tufted rugs, innovative ambient lighting and well crafted furniture.

An emphasis on high quality materials and impeccable design is imperative to create a six-star experience for guests. The interiors must cater for extreme climate changes and offer both a cosy, winter retreat and an open, summer resort. Close attention will be paid to space planning with an emphasis on the relationship between the architecture and the interiors and the flow of outdoor and indoor spaces.

Above all, The resort guest will be given a real sense of place whilst relaxing in the most luxurious and welcoming surroundings.





SECTION EE THRU TYPICAL VILLA- STANDARD VILLA (1:50)

7.6 Landscaping

A landscape strategy for the site has been prepared by Context Landscape Design, including landscape plans and management policies.

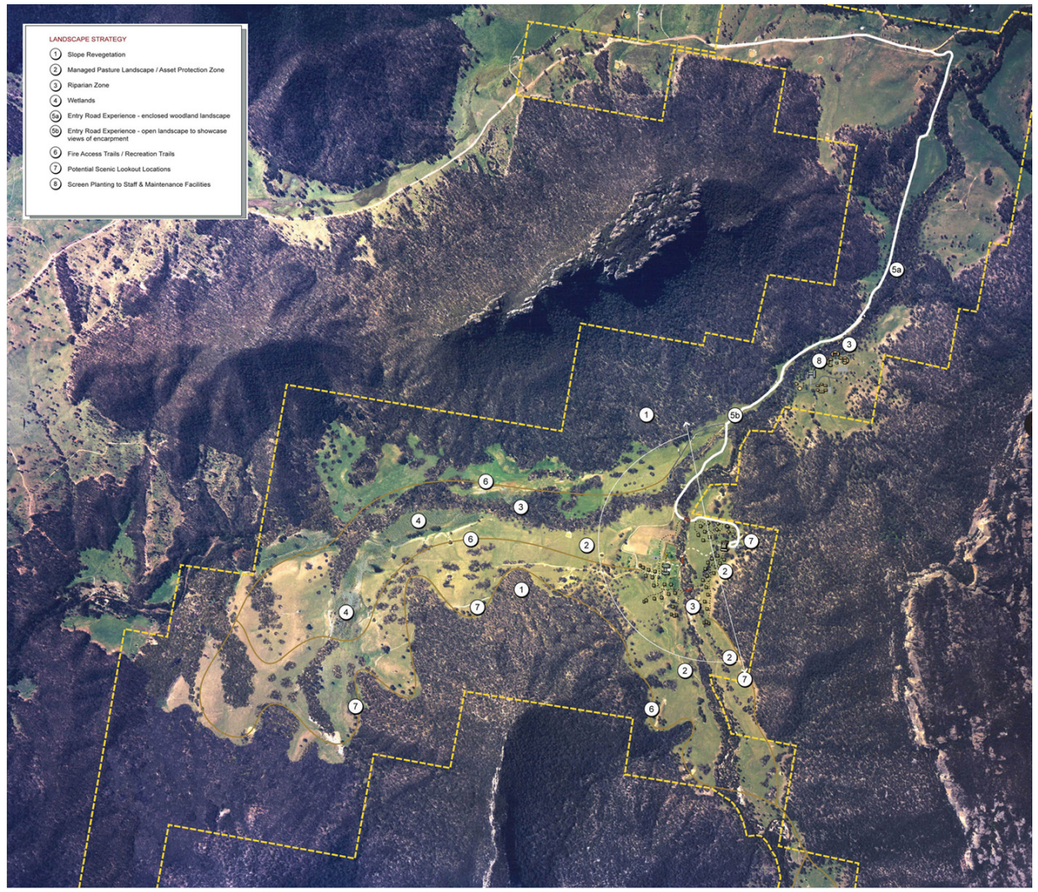
The landscape vision for the project is to create a natural landscape that blends with the site's natural processes and highlights the exceptional landscape features and views of the Wolgan Valley. The design will accentuate the scenic and passive recreational qualities of the site and provide contrast between the agricultural foreground and wilderness background, the flat valley and vertical cliffs, and the cleared pasture and natural vegetation. The different landscape characteristics of the site will be moulded into a seamless landscape, managed as a number of integrated precincts. The precincts will include cleared cultural landscapes and managed ecological landscapes to conserve the site's vegetation communities, wildlife and habitats.

The landscape objectives for the site can be divided into site-wide objectives for the redevelopment of the site from a cleared, farm landscape into an ecological, resort landscape and guest experience objectives to provide an interesting and practical landscape for the enjoyment of guests, visitors and staff.

7.6.1 Landscape Objectives

Site-wide Objectives

- Respond to the 'Heroic Landscape' of the site through the creation of a 'Tamed Wilderness' foreground and 'World Heritage Wilderness' backdrop.
- Protect and conserve the natural environment through the preservation and rehabilitation of riparian zones, habitats and vegetation communities.
- Maximise axial and panoramic views through the site.
- Respond to and develop clear interpretation of the cultural landscape of the heritage homestead and cleared pasture farmland.
- Incorporate adequate bushfire control measures and provide Asset Protection Zones.
- Incorporate ecological, hydrological, stormwater and erosion control management measures within a seamless landscape.
- Create a sustainable landscape that responds to natural processes.



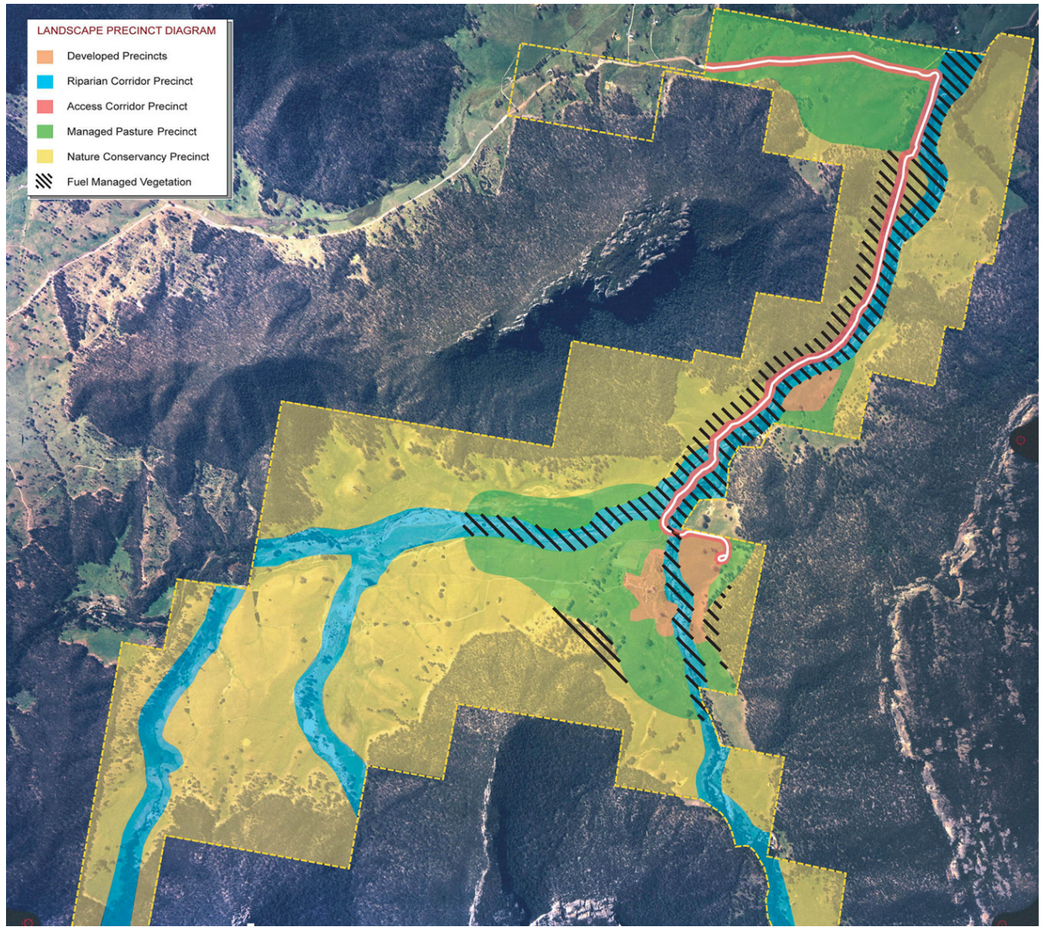
Site Wide Landscape Strategy

Guest Experience Objectives

- Create a Guest Experience that is unique to Australia and highlights the site's landscape, environment, wildlife and cultural heritage.
- Provide a natural landscape setting through which the guests can experience the wilderness of the site.
- Create a sense of isolation, containment and protection through landscape screening and planting.
- Increase knowledge of the Australian environment and wildlife through provision and interpretation of natural landscapes, vegetation and wildlife.
- Create a range of landscape experiences, maximising the potential of the site's mountains, valleys, wetlands, creeks, flats, slopes, open pasture and sky.
- Provide walking trails, lookouts and viewing areas in appropriate locations.

7.6.2 Landscape Precincts

The site has been divided into five landscape precincts based on the landscape character, use and environment of each precinct.



Landscape Precincts: Prepared by Context

Precinct 1 Development Precinct

This precinct includes two distinct areas on which buildings are proposed. Each subprecinct will be a built environment within a managed landscape.

The resort itself consists of 40 individual guest villas connected by a series of pathways, located either side of Carnes Creek. The Main Building and Spa Complex provide amenities for the guests.

Staff accommodation, plant and maintenace facilities are located within easy access to the resort site in a discrete pocket to the north.

Objectives

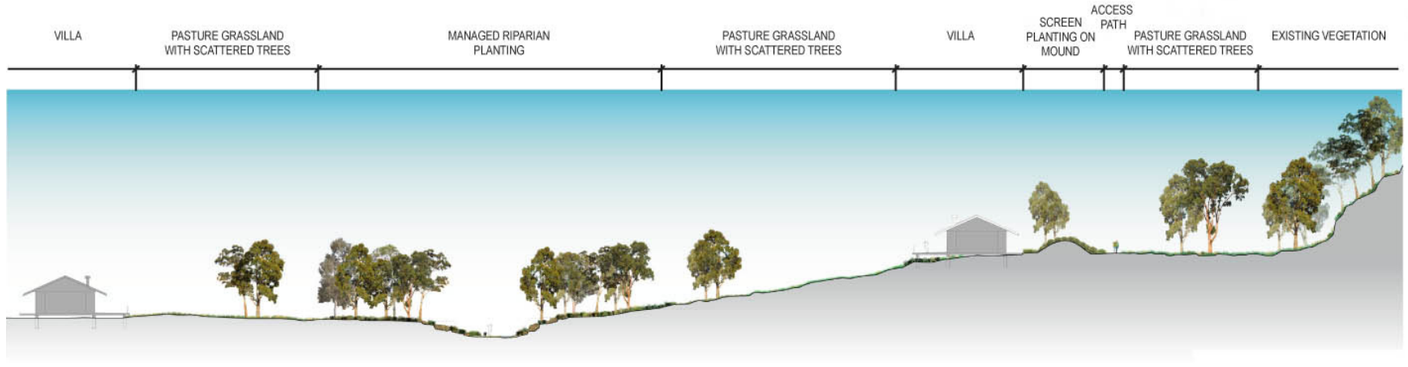
- Create a peaceful and idyllic resort atmosphere characterised by engagement with nature, Carnes Creek and the spirit of the valley.
- Maintain an open, pasture landscape with views from the precinct to surrounding escarpments.
- Provide privacy screening between villas and facilities.
- Encourage native fauna to inhabit the resort precinct.
- Minimise bushfire hazard, including the provision of bushfire Asset Protection Zones and bushfire fighting measures.
- Recognise the location of the slab house as the focus of original activity on the site.
- Design all buildings to reflect the colours and textures of the existing environment to minimise their visual impact on the landscape.

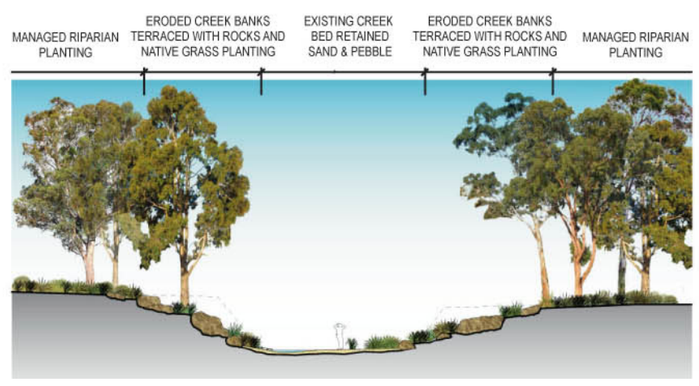
Precinct 2 Riparian Corridor Precinct

This will be all parts of the site within 50 metres of each bank of any watercourse on the site. The main watercourses are Wolgan River and Carnes Creek, both of which are experiencing significant erosion due to the clearing of vegetation and grazing by cattle.

The creekline ecology of Wolgan River and Carnes Creek will be improved through creek stabilisation measures to control erosion and the re-establishment of endemic riparian vegetation to a minimum 50 metres from the top of bank. Species will include: *Eucalyptus viminalis, Casuarina cunninghamiana, Angophora floribunda* and *Eucalyptus bridgesiana.*

The riparian zones will create continuous wildlife corridors through the site. Access across the riparian zones will be limited to key locations to provide maintenance and fire access around the site and guest access around the Resort Precinct.





Riparian Zone Sections: Prepared by Context

Objectives

- Restore stream beds, creek banks, water quality, water flow and ecology of the creeks and river.
- Control and manage creekbank erosion
- Preserve and restore habitat areas through the creation of wildlife corridors along the watercourses
- Permit only low impact, passive recreational access.
- Provide a minimum number of structured vehicular crossings that minimise impacts upon riparian morphology and ecology.

Precinct 3 Access Corridor Precinct

This is the narrow valley/corridor between the main resort complex and Wolgan Road, including a significant length of Riparian Corridor Precinct (Wolgan River).

The main entry road will provide vehicle access to the main building and the resort precinct generally.

An entry road experience will be created by responding to the site's topography and views by creating an open corridor with an enclosed landscape. An enclosed landscape experience is created as the road follows the Wolgan River riparian zone, with dense vegetation on either side. The vegetation is reduced as the road reaches the resort site, and views to the Wolgan Pinnacle are achieved.

The main entry road will provide safe access during potential bushfire emergencies and will be designed and maintained to the standards required by the Rural Fire Service. The vegetation adjacent to the road will be managed to reduce the build-up of fuel.

Objectives

- Create a memorable entry experience through sensitive response to the site's topography and vegetation patterns to open views to the surrounding sandstone escarpments.
- Create an intimate, enclosed woodland access corridor adjacent the riparian corridor prior to the entry to the resort.
- Actively manage bushfire hazard along this ingress/egress corridor.
- Locate resort ancillary facilities in a discreet, well screened pocket along the corridor.

Precinct 4 Managed Pasture Precinct

This is generally the eastern half of the main valley floor incorporating, excluding Precincts 1, 2 and 3. It will recognise the site's former use as an agricultural landscape, whilst managing bushfire risk and maintaining views to the surrounding escarpments. The existing pasture landscape will be retained and managed to act as asset protection zone, encourage wildlife grazing and maintain view corridors to key site features.

The pasture landscape with its existing, remnant, scattered trees will be supplemented with clumps of new tree planting around the site. The pasture landscape will be managed by mechanical slashing to maintain reduced fuel loads and limit continuous tree canopies for bushfire protection. Fire trails will provide access through the landscape and to wildlife viewing areas.

Landscape Principle Diagram: Prepared by Context

Objectives

- Maintain the existing rural pasture landscape that characterises grazing properties within the Wolgan Valley.
- Create a substantial bushfire fuel-reduced precinct within which refuge can be sought in a bushfire.
- Accommodate outdoor recreation uses.
- Maintain escarpment views from within the valley floor.
- Incorporate an area for the managed disposal of treated effluent by subsoil irrigation.

Precinct 5 Nature Conservancy Precinct

This is generally the western half of the site and most of the land on the eastern side of Carnes Creek and the Wolgan River. The precinct identifies the existing and proposed 'wilderness' portion of the site. It includes the foothills of the site and significant wetland areas.

Objectives

- Create a nature conservancy that protects/reintroduces endemic vegetation communities and habitats.
- Rehabilitate hydrological and ecological processes.
- Incorporate trails for bushfire fighting and fuel load management.
- Permit only minimal impact recreation/interpretation access.

7.6.3 Site-wide Landscape Strategy

The site wide landscape strategy responds to the precincts developed above; the constraints imposed by bushfire and flood hazards; and the desire to preserve and re-instate natural ecological processes on the site.

The site wide landscape strategy proposal is the first step in the longterm process of reconfiguration of the existing cleared, cultural landscape into a managed, ecological landscape that provides habitat and preserves wildlife and vegetation communities.

The key features of the site wide landscape strategy are as follows:

Slope Revegetation

The foothills of the escarpments will be revegetated to:

- Reinstate the Low Open Forest endemic vegetation communities;
- Soften the fenceline clearing that has occurred; and
- Improve habitat provision for wildlife.

The slope revegetation will transition from the Low Open Forest vegetation into the cleared, managed pasture of the valley floor through the planting of scattered clumps of trees to create a natural, soft edge.

Fire trails, provided and maintained along the edge of the slope revegetation, will also provide access for maintenance staff and guests to experience the wilderness of the site and access lookouts and viewing areas.

Wetlands

Existing wetlands located along Wolgan River will be maintained and enhanced into birdlife sanctuaries, complimented by the riparian zone revegetation discussed above. Fire trails will provide access to these areas for bird watching and other recreational pursuits.

Fire Access Trails

Fire access trails will be provided around the site to:

- Allow guests to experience the site and access lookouts and viewing areas;
- Provide maintenance/management access around the site; and
- Maintain access for bushfire personnel.

The trails will be designed and maintained to the standards required by the Rural Fire Service, with materials that reflect the character of farm access tracks.

Viewing Areas and Lookouts

Informal viewing areas and lookouts will be identified around the site to allow guests to experience the landscape. The identified locations will receive little modification other than access provided, with temporary facilities brought in as required.

Staff and Maintenance Facility Screening

Indigenous vegetation and cultural landscape plantings will be used around the staff and maintenance facility compound to create a rural farm landscape character. Recreational facilities will be provided within the compound for staff leisure time.

7.6.4 Resort Landscape Strategy

The resort landscape will be designed to integrate the villas and buildings into the surrounding landscape. Its form responds to the objective to create a 'Tamed Wilderness' foreground against the 'World Heritage Wilderness' backdrop. A simple, flowing landscape ties the buildings and pathways into a continuous landscape style that looks into the 'Heroic Landscape' beyond.

The key features of the resort landscape strategy are as follows:

Resort Planting

A balance will be achieved in the resort landscape to maximise views to the surrounding escarpments and the use of planting to provide privacy and microclimatic benefits to the villas.

Localised mounding and filtered screen planting between the villas and service zones will provide privacy and seclusion for the guests whilst allowing views to the escarpments beyond. The planting will also integrate the development into the surrounding landscape when viewed from a far.

A mix of scattered, clear-stemmed indigenous trees and ornamental native low to medium shrub and groundcover species will be planted in flowing lines. The flows of planting will follow the villas and pathways to create a peaceful and idyllic resort landscape. Plant colours, textures and types will develop themes through the resort landscape to create interest along the journey and legibility in the landscape. Suggested plant species include: Eucalyptus mannifera, Eucalyptus blakelyi (Blakely's Red Gum), Callistemon 'Dawson River', Correa reflexa, Davesia ulicifolia, Dianella revoluta Dillwynia acicularis, Dodonaea triquetra, Grevillea 'Superb', Indigofera australis, Lomandra longifolia, Pennisetum 'Nafray', Persoonia linearis, and Prosanthera ovalifolia.

Although the plant species will be chosen for their low water requirements, the resort planting will be irrigated by treated waste water when required.

Villas on Slope Lands Strategy

Heritage Homestead Compound

The existing, degraded cultural landscape features of the heritage homestead (ie the slab house) will be interpreted with new plantings of appropriate species. The design of this landscape will be undertaken following the preparation of a Conservation Management Plan for the compound.

Viewing Areas / Gathering Spaces

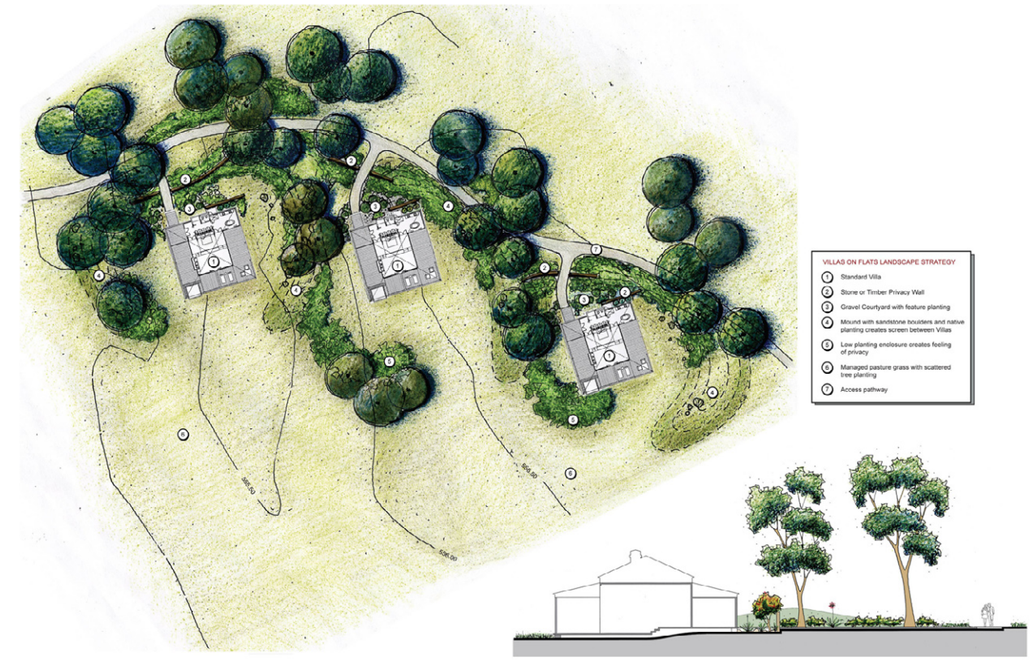
Informal gathering spaces and viewing areas will be identified around the resort to allow guests to experience the landscape setting. The identified locations will receive little modification with most facilities brought in as required.

Wilderness / Wildlife Experience – an Educational Landscape

The landscape strategy for the project will educate guests on the natural processes that exist within the Wolgan Valley and the Blue Mountains World Heritage area. The revegetation of the foothills and riparian zones will identify the ecological communities, habitats and structures that existed prior to clearing, whilst the managed pasture landscape and heritage homestead compound will identify the cultural landscape that existed when the site was farmed.

The management and design of the landscape will encourage wildlife to inhabit the site by providing habitat and food species appropriate to the endemic fauna. The design will provide opportunities for wildlife to inhabit locations close to the resort and to maximise guest exposure.

Bush food species may also be planted around the resort to identify original food sources of the local indigenous people.



Villas on Flat Lands Strategy

Creek Revegetation and Restoration

The Carnes Creek ecology and habitat will be improved through the creation of a managed riparian landscape. The eroded banks will be replaced with terraced rock banks and logs to reduce the erosion and slowly build-up the creek bed. The terracing of the creek banks will also reduce the safety concerns of the high, steep banks and allow informal access to the creek bed.

The revegetation of Carnes Creek near the resort site will use riparian species endemic to the creekline. The revegetation will be managed as either clumps of trees and native grass understorey to allow views and manage fuel loads or full stratum vegetation to provide screening when suitable asset protection zones are provided.

Only low impact, passive recreational access will be provided to the creek bed to take advantage of the natural features such as creek beaches. Temporary facilities such as seating will be brought in as required. Structured vehicular crossings will be limited to key locations that have minimal impact upon riparian morphology and ecology.

7.7 Access and Circulation

Access to the site will be provided by motor vehicle via Wolgan Road, with very limited helicopter access.

7.7.1 Helipad

The helipad is located north of the manager's accommodation away from surrounding properties. It will accommodate a maximum of four movements per week, and will be a pick up/set down only facility. That is, helicopters will not be permanently stored at the helipad, and the only fuel storage will be the existing Rural Fire Service storage, which is maintained for use by the RFS during bushfires. No recreational helicopter flights are proposed.

The flight path is intended to follow Wolgan Road and then the Great Western Highway into the Sydney Metropolitan Area, such that it will only pass over developed areas, minimising potential impacts upon wilderness areas. The final route will be confirmed with the Civil Aviation Safety Authority (CASA) and NPWS.

7.7.2 Main Access Road

The main access road is located on the crest of a gentle hill on Wolgan Road. The entry location has good sight lines in both directions along Wolgan Road. The entrance will be a low-key, remote controlled (video/ voice recognition), typical farm gateway. This point of 'entry' or 'gateway' creates an uderststated sense of arrival as the visitor is led gradually into the site joining up with the existing Wolgan Creek farm access road.

7.7.5 Buggy Paths

A paved buggy path system connects all buildings on the site and minimises impact on the surrounding environment. Recharging facilities are incorporated into each housekeeping unit.

7.7.6 Fire/Emergency Circuit

The resort is ringed by a gravel/grass emergency vehicle circuit. The fire hydrant ring main will be designed as an integral component including bridges over Carnes Creek.

7.7.7 River Crossings

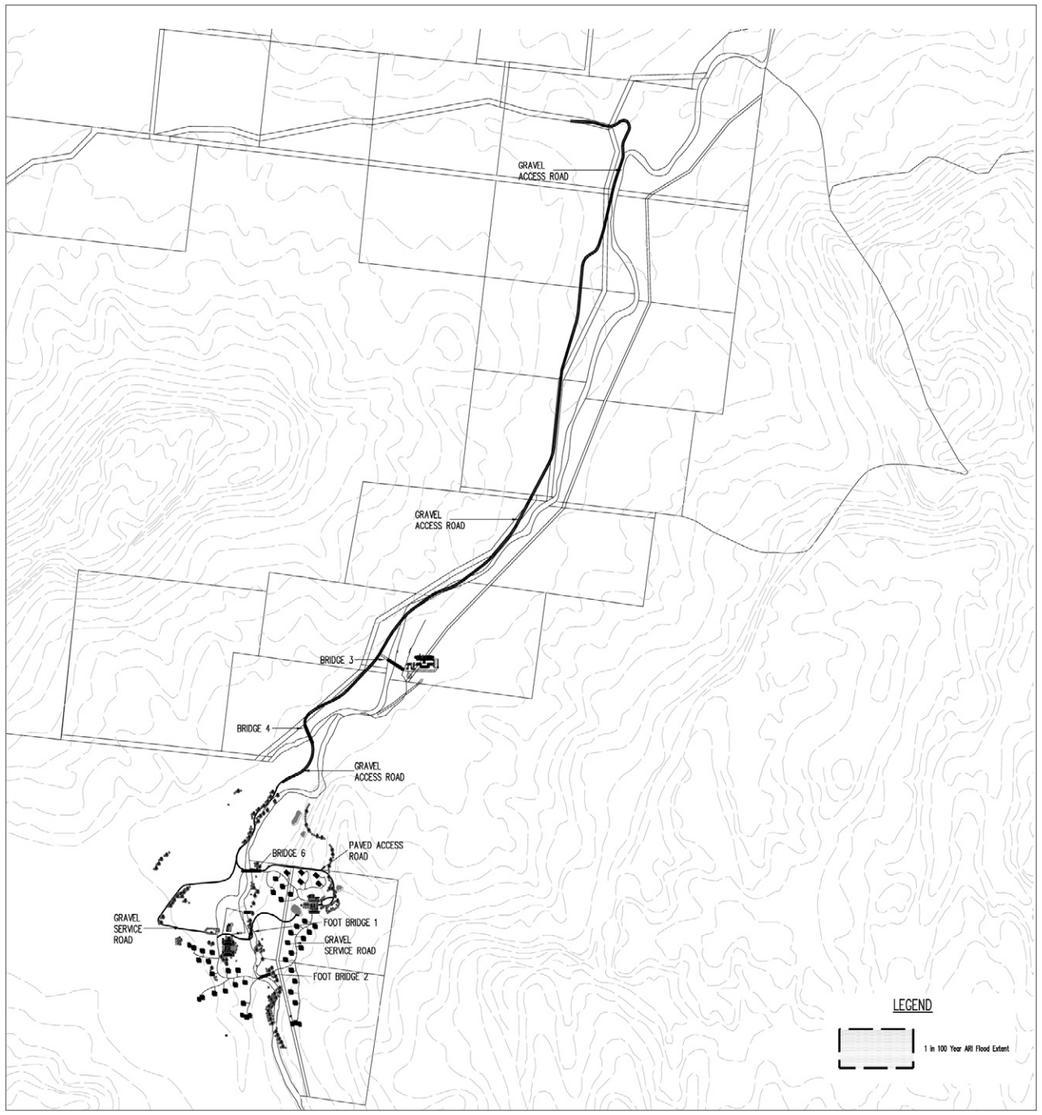
The internal access roads predominately follow the Wolgan River and have been designed to minimise the number of river crossings and to be located above the 100 year flood event wherever practical. Five vehicular river crossings and two pedestrian footbridges are however required along the road and path network to enable safe vehicle movements and pedestrian crossings over the river beds. The three vehicular crossing structures will comprise the installation of concrete piers and precast concrete deck structures, with the under side of the bridge deck set at or above the level of the 2 year flood event. With a total width of 4.0 metres (shared zone nominally comprising a 3 metre vehicular / pedestrian carriageway and a 1.0 metre safety barrier zone), the crossings will provide two way pedestrian and buggy movement. While service and delivery vehicles will not be able to pass on the crossings, all crossings will be designed with clear lines of site and waiting bays at either abutment to allow service vehicles to give way to oncoming vehicles.

This river crossing design has been selected to balance the following considerations:

- visual impact
- physical disturbance associated with the structures
- fish and aquatic fauna movement
- obstruction of flood waters
- emergency egress

Sections of the river crossings are provided as part of the civil drawings in Appendix 10.

While these crossings will be submerged during flood events greater than the two year event, higher level, 1.5 metre wide, lightweight pedestrian crossings are proposed adjacent to bridge crossings 4 and 6. These structures will be located with a walking deck located 0.5 metres above the 100 year flood level and will be accessible to people of all levels of mobility. If all river crossings become submerged in a flood event, the pedestrian crossings will provide access for all guests to a point where the site can be exited by roads above the 1 in 100 year level.



Proposed Roads and Bridges: Prepared by TTW

7.8 Early Works

The project will require separate approval for the design and construction of all buildings, works, structures and landscaping. It is intended that an 'early works package' will be submitted for approval to undertake various site preparation works while the detailed design of other aspects of the project (such as architectural design) are resolved. Such approval is envisaged to relate to 'early works' such as:

- Demolition.
- The main internal access road.
- Bridges.
- Earth works.
- In-ground services.
- Creek restoration works in the main resort precinct.
- Waste water treatment plant.

8 Environmental Assessment

The key planning issues identified in the DGR's letter of 19 September 2005 are considered below.

8.1 Lithgow City Local Environmental Plan 1994

The proposed development comprises holiday accommodation and ancillary recreation activities and facilities. Component facilities such as the conference rooms, spa, restaurant, bar, helipad and sewage treatment plant are all proposed in conjunction with and ancillary to the dominant purpose of holiday accommodation, and will only be available to guests of the resort. The proposed development, and all its component parts therefore conforms to the definition of 'tourist facilities' contained in the Environmental Planning and Assessment Model Provisions 1980, which are permissible with development consent in the 1(a) Rural (General) zone).

The specific provisions of Clauses 9, 11, 28, 30, 31, 37 and 39 are all addressed under separate specific issue based headings.

8.2 Suitability of the site

The site is located at the interface of World Heritage listed National Parks and adjacent agricultural land. This location is well suited for the proposed development, as it allows it to act as a buffer between the natural attributes of the World Heritage Area and potential conflicts with the values and activities of adjacent agricultural uses.

The incorporation of very low density resort accommodation on a small fraction of the site provides an ongoing funding mechanism to actively manage ecological systems on the rest of the site, such that the site can absorb and actively manage the impacts of adjacent agricultural uses (i.e. weeds, feral animals, livestock impacts etc.), while allowing the natural habitats of the World Heritage Area to encroach back into the site.

The significant natural, scenic, cultural, aboriginal and European cultural heritage values of the site provide an idyllic amenity for low impact tourism use, which in turn provides a financial incentive and funding mechanism for the active conservation of these values.

Being cut off from surrounding agricultural use by Donkey Mountain, the site is isolated from potential conflicts with agricultural uses on nearby properties.

8.3 Water Cycle Management

The proposed water cycle management is detailed in the Water and Wastewater Plan prepared by Steve Paul and Partners (*see Appendix 2*).

Environmental management of the waste water is an important part of the project. A detailed Environmental Management Plan (SBEMP) for the wastewater will be developed during the detailed design stage of the project. This Plan will incorporate mechanisms for continuous improvement to ensure that wastewater management systems remain up to date and respond to any potential impacts that may be identified during the monitoring process. The Water and Wastewater Plan, however, has identified some preliminary environmental impacts and mitigation measures and monitoring procedures. The potential environment impacts of surface water, ground water, soil, vegetation, public health, odour, noise and aesthetics have been given preliminary considerations but will be further investigated in the SBEMP.

The overall water and wastewater management objectives for the proposal include:

- Ensure no direct discharge of effluent to natural water bodies
- Protect ground and surface waters, soil systems and natural vegetation from potential impacts of wastewater disposal
- Ensure all water used on site is of appropriate quality for its intended use
- Minimise the demand placed on the town water supply system by maximizing the use of rainwater and recycled water
- Minimise energy consumption of the scheme as a whole and in particular in wastewater treatment processes
- Ensure there are no odour impacts on resort guests
- Minimise the aesthetic impacts of the system.

8.3.1 Water Demand

Potable water

Mechanisms to manage the water demand include the use of a minimum AAA rated potable water fixtures such as showers, basins, kitchen sinks in accordance with the Water Efficiency Labelling Scheme. All toilet flush tanks in the guest villas and staff and manager's accommodation rooms will be 4.5/3 AAAA rated. Waterless urinals will be installed in high trafficked guest and staff facilities. Landscaping has been designed using native vegetation with minimal water demand and all landscape irrigation will utilise treated effluent from the resort. The breakdown of estimated water demand for the building water, guest villas, main building, conference centre, spa, staff accommodation and other facilities are detailed in the Water and Wastewater Plan, which results in an overall average daily water demand for the expected population of the resort, including staff accommodation, of 47.5kL per day. However, to accommodate potential operational changes or future additions, assumed water demand has been increased by 20% for planning purposes, resulting in a planned water demand of 55kL/day.

Fire fighting

A combined fire hydrant/sprinkler system including an 850kL storage tank is proposed in accordance with the Bushfire Management Plan prepared by ABPP (see Section 8.5). This tank will provide 100% water requirements for both bushfire hydrant and building fire sprinkler protection. The fire storage tank is sized to allow the tank to be filled by the Fish River town main supply over a 24 hour period and exceeds Australian Standards. As well as complying with Australian Standards, it is proposed to have an additional 400,000 litre allowance in the tank. The additional 400,000 litres can be utilised for bushfire fighting while still maintaining the required water storage for building fire fighting.

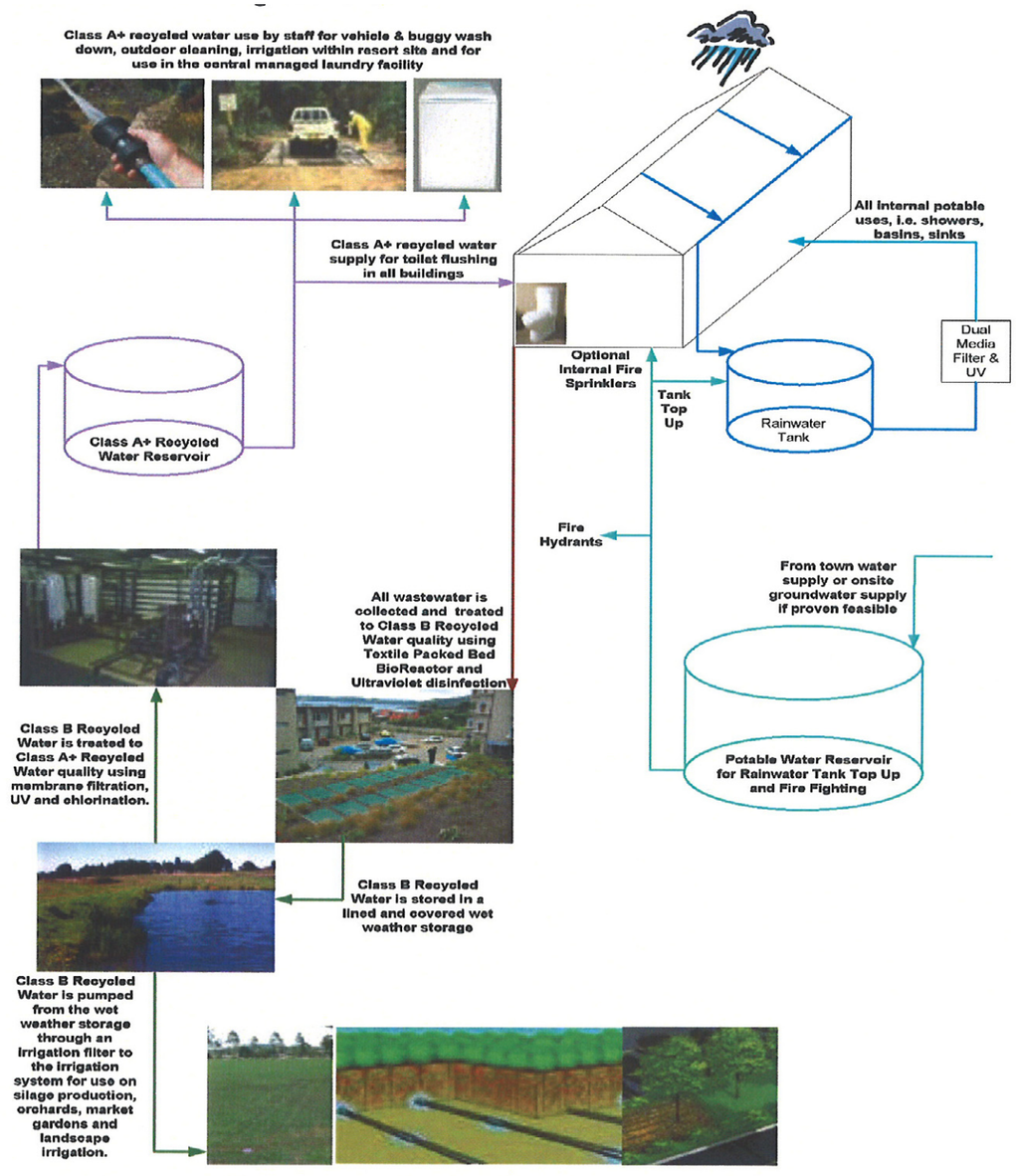
If the town water supply is cut off during a fire event then the tanks will be filled by utilising bore water.

Water Feature/Pond

A water feature/pond of less than 0.5 hectares in size will be located to the west of the main administration building on the eastern side of Carnes Creek. Water in the pond will be recirculated using a pumping system. In dry weather, the pond is proposed to be topped up by town water (or preferably with bore water is feasible) to offset evaporation.

8.3.2 Water Supply

The proposed integrated water supply scheme is detailed in the Water and Wastewater plan, and involves a total of 250kL of potable water storage tanks. This volume allows for 5 days water supply (49kL/day) in the event of an interrupted town water supply in dry weather. Fish River Water Supply Scheme will be used as the main potable water supply source for the development, supplemented by the utilisation of rainwater harvesting techniques or alternate onsite groundwater supply (if this is found to be feasible) to minimise the proposed filtration systems required. Recycled effluent will be used for toilet flushing, landscape irrigation and other acceptable uses.



Water - Cycle Management: Prepared by Douglas Partners

Rainwater

Large buildings will have individual water tanks, while villas will be grouped into clusters that share a tank.

A reticulation system will be provided from the roofs of each building served to the storage tank and back to the buildings it serves, with a central boost pump to pressurize the system. Each tank will be provided with a pressurized dual media filtration with sand and activated carbon and UV disinfection system in accordance with the *Commonwealth Government Enhealth Guideline* (2004).

Water quality control will be provided via proper design and preventative maintenance programs including ensuring roof catchment areas are clean, of suitable materials and sealed tanks. The rainwater harvesting system will follow pre-treatment and additional water treatment measures.

The rainwater harvesting system is expected to achieve around 70% reliability on an average annual basis. In periods of insufficient rainfall, the potable water storage tanks will be topped up from the town water supply and bore water if found to be feasible.

Mains water supply

The nearest potable water supply is located at Baal Bone Point approximately 6 kilometres to the west of the site. The water supply is operated under the Fish River Water Supply Scheme administered by Sydney Water.

The Department of Commerce has been engaged by the proponent to prepare an options report for the provision of a water supply pipeline to the site. The pipeline was sized to a maximum daily flow of 1 ML/day, or 11.6 L/s, to supply the following peak day water demands:

- Potable Water 150 kL;
- Fire sprinkle system 550 kL; and
- Fire hydrants 300 kL.

The majority of the capacity provided in the pipeline is for fire fighting flows to meet the requirement of filling the fire storage tanks within a 24 hour period. During normal site operation, i.e. when fire flows are not being provided, the total water demand of the site is expected to be only 52 kL/day. At an average total demand of 52 kL/day, detention time in this pipeline will be around 4-5 days, and could be in the order of 8 -12 days following the implementation of water reuse and recycling strategies at the resort. Such long detention times may result in a decline in water quality and it is likely that additional treatment will be required at the resort. Water quality would also be expected to vary between seasons as changes in temperature and pipeline flow will impact on water quality.

The type of water treatment processes likely to be required are:

- Activated carbon adsorption to remove bad tastes, odours and colour; and
- Chlorination to provide residual disinfection. "Point of use" ultraviolet irradiation could be used as an alternative disinfection process to avoid chemical use onsite.

The main advantage of the town water supply system it is that is a reliable supply with service guarantees during normal operating conditions. The resort will however be subject to water restrictions whenever they are imposed by the water authority. It is also likely that supply reliability during bush fires will be low due to large demands on the system, hence it may not be possible to fill the fire tanks within 24hours under these conditions. Bore water supply is therefore currently being investigated to back up fire fighting water supply.

Effluent reuse

Treated effluent will be reused in toilets, laundry and irrigation purposes, with demand for the Class A+ recycled water estimated to be approximately 10KL/day or 18% of the total water demands for the site.

Groundwater

Previous studies of the local area indicate that the groundwater is typically brackish over most of the site but marginal within the valley floor of the Wolgan River (Western Branch) upstream from the proposed resort site. An evaluation of potential groundwater sources in the area was undertaken by Douglas Partners and assessed as being brackish. It is also noted that a disused bore on the site was abandoned due to high salinity. However, preliminary geotechnical test pit investigations revealed various results, some indicating that water may be in the acceptable range for drinking.

Bore water may be used on site should the water volume and quality be deemed suitable once investigations are completed. In order to achieve the requirement to fill fire fighting tanks within 24hrs a yield of approximately 10 litre/second is required.

Free groundwater was encountered in several test pits during excavation while collapsing conditions at some alluvial sites precluded observation of any water table. Groundwater observations and water quality measurements have been recorded and form part of the Douglas Partners report and include the depths of groundwater across the test pits ranging from 1.8m to 5.1m.

8.3.3 Sewage generation

Sewage Hydraulic Loads

The Water and Wastewater Plan estimates that the resort will generate approx 9ML/year of wastewater that will require treatment and management on site in a sustainable manner. This equates to a peak daily sewage generation of approximately 57 kL/d and an average daily generation of around 49kL/day, based upon an occupancy rate of 80% for resort guests and 100% staff/maintenance facilities. A detailed breakdown of the pollutant loads and wastewater management is contained in the Water Wastewater Plan.

Sewage Pollutant Loads

Pollutant loads have been estimated for the project based on the following per capita pollutant loading rate assumptions, which were adapted from VIC EPA (1997), US EPA (2002) and SA Health (1995):

- Biochemical Oxygen Demand (BOD)
  - *30 g/guest/day for guests in villas*
  - *40 g/guest/day for guests meals at the restaurant*
  - *10 g/guest/day for guests bar use*
  - *20 g/guest/day for guests spa use*
  - *15 g/guest/day for conference centre*
  - *40 g/staff/day in staff accommodation*
  - *15 g/staff/day in resort*
  - *9 g/staff/day for laundry*
  - *15 g/horse/day in stable wash down water following pre-treatment*
  - *2 g/buggy/day in wash down water following pre-treatment.*

BOD loads were totalled and converted to an equivalent load using 70 g BOD/EP/day. From this assumed "equivalent population", the following per EP loading rates were used for other pollutants:

- Total Nitrogen, 15 g/EP/day.
- Total Phosphorus, 2 g/EP/day
- Total Suspended Solids, 70 g/EP/day

The ultimate peak day BOD load is approximately 21 kg BOD/day. The pollutant concentrations however are within the range typically expected for domestic wastewater.

8.3.4 Waste water treatment

Collection

Wastewater collection will be via a reticulated sewerage system. The system shall comprise a gravity house drainage system for collection of wastewater within each building, discharging to a pumping chamber located adjacent to each building. Once the wastewater reaches a predetermined level in the chamber, the pump will activate and discharge the waste water to the wastewater treatment plant.

The proposal also includes a trade waste drainage system for the restaurant comprising a 100mm trade waste drain gravitating to a 2000 litre grease trap located as close as practical to the building. This shall be maintained and cleaned in accordance with Lithgow Council regulations and grease removed from site and disposed of at an authorized recycling centre.

Treatment

A wastewater treatment plant will be constructed that can reliably achieve the effluent quality requirements of *NWQMS Use of Reclaimed Water Guidelines (2000)* and the *NSW Health Interim Guidance for Greywater and Sewage Recycling in Multi Unit Dwellings and Commercial Premises (2004)*.

The most suitable process for this site has been determined to be a Textile Packed Bed Reactor with UV disinfection to produce irrigation quality Class B Recycled Water.

A portion of this water will be given tertiary treatment and triple disinfection to produce Class A+ Recycled Water using membrane microfiltration, UV disinfection and residual chlorination. A conceptual process description is provided in the Water and Wastewater Management Report.

Effluent Management

It is proposed to use Class A+ Recycled Water for the following non-potable uses:

- Toilet flushing in all buildings;
- Vehicle wash down water;
- Outdoor watering and cleaning; and
- Central managed laundry facility.

The demand for recycled water from these uses has been estimated to be around 10 kL/day which is approximately 18% of the total wastewater generated at the resort.

Wastewater that is generated in surplus of these demands will be used for subsurface irrigation of landscaped areas and grass lands. Water used for subsurface irrigation is required to achieve a Class B Recycled Water quality.

It is possible to treat all wastewater at the resort to a Class A+ standard; however the types of treatment processes required to achieve this, i.e. membrane filtration, chlorine and UV, consume relatively large amounts of energy and treatment process chemicals.

For this reason only a portion of the wastewater produced onsite will be treated to Class A+ recycled water quality, and the remainder will be treated to Class B recycled water quality suitable for sub surface irrigation.

Effluent Irrigation System

The preferred management strategy for surplus effluent that can not be reused as Class A+ recycled water within the resort is land irrigation. This strategy will provide a number of benefits to the scheme including:

- Effluent is not discharged directly to water bodies;
- Reduced potential for water quality impacts on the Wolgan River;
- Reduced potential for ecological impacts on the Wolgan River ecosystem;
- The effluent irrigation area has a natural capacity to assimilate and absorb nutrients and other pollutants, hence full advanced nutrient removal at the WWTP is not required, which means;
- Reduced consumption of energy in the treatment process;
- Reduced consumption of treatment process chemicals;
- Reduced WWTP complexity, with reduced operation and maintenance requirements;
- More realistic and achievable effluent quality for the site considering there will be a 'package' type WWTP being operated by resort staff;
- Reduced need to import fertilisers to the site, which in turn need to be sourced, manufactured and transported to the site.

The effluent irrigation system has been designed to apply effluent at low loading rates to ensure the irrigation area does not become overloaded from either a hydraulic or pollutant loading perspective.

This was determined by modelling of the effluent irrigation system using MEDLI (Model for Effluent Disposal by Land Irrigation) to determine the size of the effluent irrigation area and wet weather storage required for sustainable effluent irrigation.

The underlying assumptions used in the MEDLI modelling were:

- Ultimate average daily irrigation water flow: 40.7 kL/day plus 10% allowance for wet weather infiltration (4 kL/d) = 45 kL/day;
- Temperate pasture crop;
- Sand soil type;
- Derived daily meteorological data from QLD Department of Natural Resources and Mines for Wolgan Valley at location 33.150 South, 150.250 East; and
- Simulation period: 1/1/1954 – 31/12/2004, 50 years.

Hydraulic Loading – Irrigation area and wet weather storage

The MEDLI model was used to determine the irrigation area and wet weather storage required for sustainable irrigation.

The minimum storage/maximum area combination is approximately 2.2 ML storage with a 9 hectare irrigation area. This corresponds to approximately 49 days storage and a hydraulic loading rate of approximately 1.8 ML/ha/yr. Minimum storage is determined in MEDLI by the maximum consecutive days where irrigation is not possible due to elevated soil moisture conditions.

The maximum storage/minimum area combination is approximately 10 ML storage with a 3.9 hectare irrigation area. This corresponds to approximately 222 days storage and a hydraulic loading rate of approximately 4.2 ML/ha/yr. Minimum area is estimated as being the point where an increase in storage size does not result in a reduction in irrigation area. From a nutrient loading perspective however, smaller irrigation areas have higher pollutant loading rates.

Irrigated effluent pollutant loads

An assessment of pollutant loadings for all irrigation area / storage combinations shown in Figure 6 was undertaken using MEDLI to identify the minimum irrigation area required to avoid excessive accumulation or export of pollutants from the site.

The assessment was undertaken with the following assumed effluent quality:

Total Nitrogen – 15 mg/L

Total Phosphorus – 10 mg/L

Total Dissolved Solids – 1000 mg/L

Pollutant loading objectives for the effluent irrigation system are provided in the Water and Waste Management Plan. The nutrient loading output from MEDLI for each of the irrigation areas is assessed and shows that the crop is removing more nitrogen than is being applied in effluent. It was also shown that the phosphorus applied in effluent is always in excess of what can be absorbed by vegetation, which is typical for most effluent irrigation schemes.

Phosphorus accumulation rates in soil are however low, and considering the remaining phosphorus adsorption capacity in the top 150 mm of soil is around 2300 kg P/ha (Douglas Partners, 2005), all areas provide in excess of 130 years of phosphorus retention.

The nutrient loading rates on all irrigation areas shown in Table 10 are considered sustainable as accumulation of phosphorous and export of nitrate from the site has been modelled to be low.

Considering there is no shortage of area available on the site, it is proposed to use the larger area of 6 hectares with a 4 ML wet weather storage. This corresponds to a loading rate of 2.7 ML/ha/yr and about 90 days storage.

Effluent Irrigation Area

The resort site has been divided into a number of precincts with separate management objectives and targets. The proposed precincts are discussed at Section 7.6 and summarised below in terms of their relationship with effluent irrigation practices:

- *Precinct 1: Managed Resort Area and Asset Protection Zones;*
  Some minor irrigation of landscaped areas using Class A+ recycled water within resort zone.
- *Precinct 2: Managed Open Park Land;*
  The main 6 hectare effluent irrigation area will be located within this precinct and to the north of the resort development area near Wolgan Road.
- *Precinct 3: Riparian Corridors 50 metres either side of top of bank of water course;*
  No effluent irrigation will occur within this precinct.
- *Precinct 4: Nature Conservancy; and*
  No effluent irrigation will occur within this precinct.
- *Precinct 5: Main Site Access Corridor.*
  Some minor effluent irrigation may occur within this precinct.

All effluent irrigation areas will comply with the following set back and buffering requirements:

- *Water Courses and Riparian Zones:*
  No effluent irrigation within the 50 metres of top of bank of water courses.
- *Topography:*
  Effluent will only be irrigated on slopes less than 15% to minimise potential for slope instability, surface runoff and soil erosion. However, surface runoff and erosion are not a significant issue where subsurface irrigation is used.
- *Groundwater:*
  Only areas with a minimum depth to groundwater of 0.6 metres will be irrigated, to maintain unsaturated soil conditions below the irrigation area.
- *Flooding Levels:*
  Irrigation areas will be located above the 100 year ARI flood line.
- *Soils:*
  Areas containing significant rocky outcrops will not be irrigated. Specific areas of highly sodic soils will not be irrigated with recycled water following more detailed soil testing of actual irrigation area.

There are a number of potential options available for the 6 hectare effluent irrigation area, which could solely include or be a combination of:

- Pasture production for on or off site cattle and horse feed;
- Fruit orchard to supplement resort food requirements;
- Vegetable garden to supplement resort food requirements;
- Vineyard; and
- Managed grass and parkland areas for visual amenity.

Class B recycled water would be suitable for pasture, orchard, vineyard and grass land irrigation; while Class A+ recycled water would be required for vegetable garden irrigation.

The current proposal is for subsurface irrigation of managed open grass and parklands, however the potential to incorporate any or all of the above land uses into the resort architecture will be analysed at a later stage.

The preferred irrigation area will be situated within precinct 2. More detailed soil and site assessment will be carried out to identify the optimum location for the 6-hectare irrigation area to ensure all environmental impacts are minimised in line with the above requirements.

8.3.5 Ground water impacts

The proposed excavations for the residential and service structures within the resort area generally will not intersect the long-term groundwater level and therefore not result in changes to the overall groundwater regime of the site. Sub-soil drainage measures will be required to control transient groundwater rise during and following significant rainfall events. The effects of such drains on the groundwater table will be limited to only small areas and over only short periods following the rainfall events.

The effects of potential bore water extraction upon ground water flows/levels is being considered in the current feasibility analysis that is being undertaken.

Existing Vegetation Communities

8.4 Flora and Fauna

Australian Museum Business Services (AMBS) were engaged to prepare a flora and fauna impact assessment examining the ecological characteristics of the project area and existing ecosystems on and around the site (*report submitted separately*).

8.4.1 Flora

Native Plant Species

A total of 191 native plant species have been recorded in the study area. Most of the native plant species recorded in the study area are associated with the woodland on the lower slopes fringing the study area and along the Wolgan River and Carnes Creek. Some wetland plant species occur along the creek lines and around farm dams, although identification is difficult given heavy grazing.

Introduced Species

43 introduced plant species were recorded in the study area. Eight plant species listed as noxious weeds in the Lithgow Local Government Area under the NSW Noxious Weeds Act 1993 were recorded in the study area, as described below.

- *Eragrostis curvula* (W3) was recorded in the valley and on the site for servants' quarters, but is not common.
- *Rubus fruticosus* species aggregate (W3) occurs throughout the site, although there is evidence of past control of larger patches. This species mainly occurs as small, isolated plants along vegetation margins, apart from the extensive, dense stands in the drainage line within the area maintained by AES.
- *Carduus nutans ssp. nutans* (W3) and *Onopordum acanthium* subsp. *acanthium*. (W3). These species were recorded as a few isolated occurrences in the valley. All individuals were dead, although it could not be confirmed whether they had been sprayed, or had reached the end of their life cycle.
- *Rosa rubiginosa* (W3) occurs throughout the site, mainly near forest edges.
- *Raphanus raphanistrum* (W2) occurs in some paddocks, although not in large numbers.
- *Salix fragilis and S. babylonica* (W4g) occur along some sections of the banks of Carne Creek, and also along the far wetland.

One additional noxious species, *Nassella trichotoma* (W3), was not recorded in the study area during the field investigations, but is considered a potential invader.

Vegetation Types Recorded

Five vegetation types were identified in the study area:

- Talus-slope woodland: occurs along most sections of lower slopes;
- Talus-slope open-forest: occurs on some sections of upper slopes;
- Montane gully forest: is not well-defined but generally occurs as a gradient with Talus Slope Open-forest;
- Cox's River swamps (sedgeland), occurs along the main drainage lines in the south-west of the study area;
- Tablelands Grassy Woodlands Complex: occurs as remnant stands on low rises within the valley, and on the river banks, especially at the northern end of the valley as well as on both sides of the road to Newnes.

Modified open grassland of exotic and native grasses with scattered trees occurs throughout the valley floor.

All of the native vegetation within the study area, including the vegetated lower slopes, sedge wetlands and riparian vegetation, has been substantially modified as a result of clearing and grazing of livestock and weed invasion. Riparian vegetation along the Wolgan River and Carnes Creek occurs in disjunct linear stands and sections of the River at the northern end of the valley have undermined banks and trees with exposed roots. Nine noxious weed species and a variety of introduced grass species occur within the study area. Many of these species, in particular introduced grasses, are currently being kept in check by grazing and there is evidence of active control of some species in some areas.

Talus Slope Woodland

This vegetation type occurs along most sections of lower slopes, although floristics vary according to factors such as aspect and altitude. *Eucalyptus racemosa* subsp. *rossii, E. macrorhyncha* and *E. polyanthemos* are consistent on all slopes, with *Angophora floribunda* occurring on north and west-facing lower slopes and *E. blakeleyi* and *E. albens* occurring on east-facing slopes. On mid-slopes, *E. punctata* and *E. melliodora* are common on west and east-facing slopes and *Brachychiton populneus* and *Callitris endlicheri* on north and south-facing slopes. On some sections of upper slopes, especially those facing east or south *E. cypellocarpa*, *E. eugenioides, E. punctata, E. albens* and *E. (?) tereticornis* occur in Open-forest.

Ironbark species are noticeably lacking from these vegetation stands, although *E. fibrosa* and *E. crebra* are listed as occurring within this vegetation type by Benson & Keith (1990).

Shrub species include *Allocasuarina verticillata, Allocasuarina littoralis, Dodonaea viscosa subsp. angustissima, Dodonaea multijuga, Acacia obtusifolia, Acacia falciformis, Lissanthe strigosa, Indigofera australis* and *Breynia oblongifolia*. *Pteridium esculentum* is the most common fern, with *Adiantum aethiopicum, Doodia aspera* and *Pellaea falcata* occurring near sandstone boulders. *Pyrrosia rupestris* grows on some boulders. Herbs and sedges such as *Lomandra longifolia, Dichondra repens* and *Ajuga australis* are generally heavily grazed.

Talus-Slope Open-Forest

On some sections of upper slopes, especially those facing east or south, *E. cypellocarpa, E. eugenioides, E. punctata, E. albens and E. (?) tereticornis* occur. *Acacia falciformis, Breynia oblongifolia, Indigofera australis, Persoonia linearis, Leptomeria acida* and *Leucopogon muticus* are common shrub species. *Ajuga australis, Lomandra* spp., *Gahnia* spp. and *Pellaea falcata* occur as ground-covers.

Montane Gully Forest

This vegetation type is not usually well-defined, and generally occurs as a gradient with Talus Slope Open-forest. *E. cypellocarpa, E. dalrympleana , E, eugenioides* and *E. punctata* are common, with *E. fastigata* and *E. oreades* mainly restricted to upper sections of gullies. Areas of this vegetation type occur on east-facing and north and south-facing slopes.

Shrub and ground-cover species include *Acacia buxifolia, Acacia verniciflua, Podolobium ilicifolium, Gahnia* sp. (heavily grazed), *Hardenbergia violacea, Pratia pedunculata, Stellaria pungens, Clematis aristata* and *Acaena novae-zelandiae.*

Cox's River Swamps (Sedgeland)

This vegetation type occurs along the main drainage lines in south-west part of the study area. The vegetation is generally heavily grazed and disturbed by animal traffic, hence identification of many herbs, especially grasses is difficult. Common species include *Carex fascicularis, C. gaudichadiana* and *Rumex brownii*. Occasional species include *Poa labillardieri, Typha orientalis, Phragmites australis* and *Philydrum lanuginosum*. Weed species include *Rubus fruticosus, Salix (?) fragilis* and one individual of *Pinus (?) pinaster*.

Tablelands Grassy Woodland Complex

This vegetation type occurs as remnant stands on low rises within the valley, as well as on both sides of the road to Newnes. *Eucalyptus mannifera* and *E. dives* occur in the area around the farm-houses, while *Eucalyptus racemosa subsp. rossii, E. macrorhyncha* and *E. polyanthemos* are common at the north end of the valley. *E. viminalis, Casuarina cunninghamiana, Angophora floribunda* and *E. bridgesiana* are common on the river banks, especially at the northern end of the valley. Shrub species include *Hakea salicifolia, Callistemon citrinus, Acacia filicifolia* and *Acacia implexa*. *Leptospermum polygalifolium subsp. transmontanum* is the most commonly occurring species along creeklines.

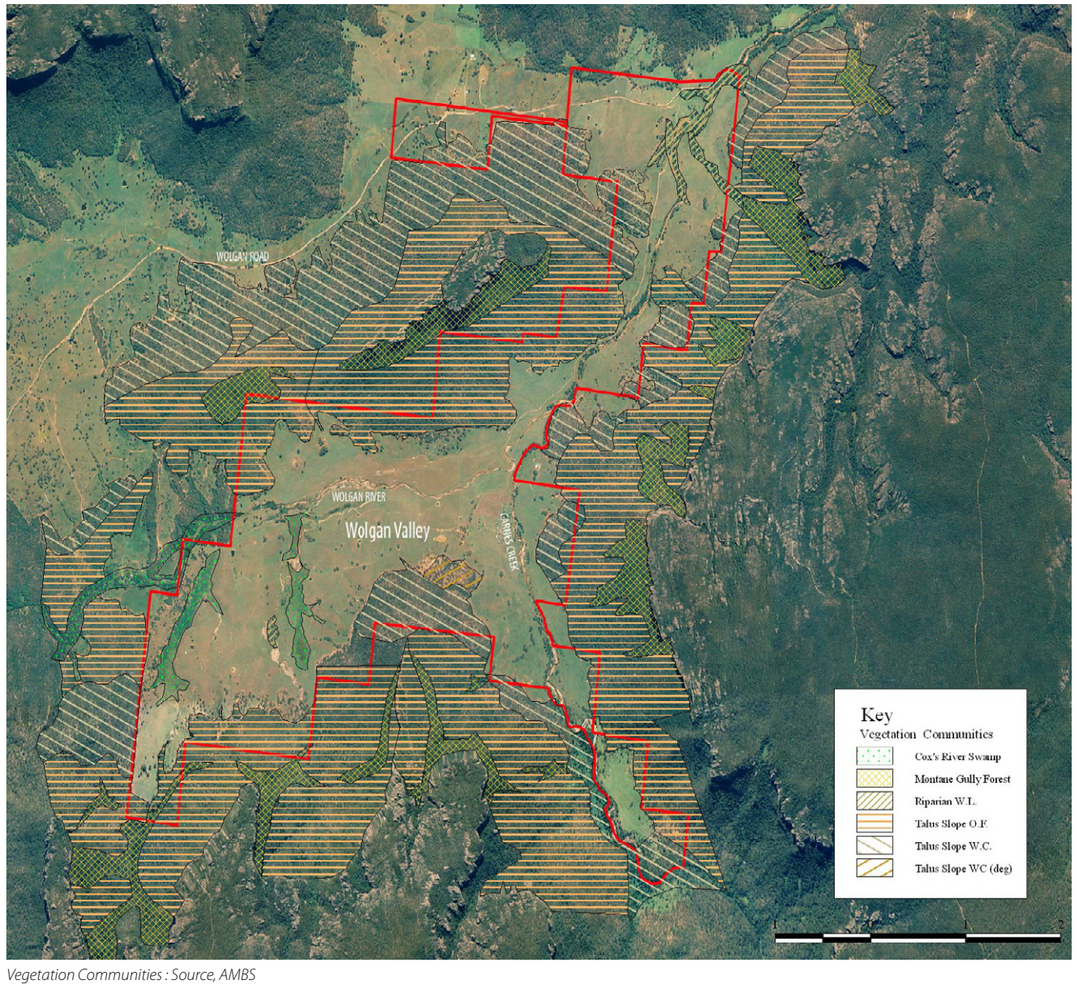
Threatened Species and Endangered Ecological Communities

No threatened plant species listed under the TSC Act or EPBC Act or rare or threatened Australian plant species listed by Briggs & Leigh (1996) were recorded in the study area during the targeted threatened plant surveys carried out in August 2005.

Sixteen threatened plant species are listed on the NPWS Wildlife Atlas as occurring within the locality of the study area. It is possible that some of these species occur within vegetated stands on escarpment slopes and have either been overlooked, or were not visible because of grazing. Once cattle and horses are excluded from all foothills and escarpment vegetation, it is likely that a larger number of additional native plant species will become evident.

One species, *Eucalyptus cannonii*, is noted on the NPWS Wildlife Atlas as having previously been recorded in the study area. Stringybarks are uncommon on the valley floor, where development may take place and no specimens of *Eucalyptus cannonii* were recorded despite the inspection of all Stringybarks surveyed for the "...angular buds and larger fruits....with short pedicels..." which distinguishes this species from *E. macrorhyncha*. (NSW NPWS 2000).

None of the vegetation types recorded in the study area are listed as endangered ecological communities under the TSC Act or as threatened ecological communities listed under the EPBC Act. The native vegetation types present are extensively distributed in the locality and region and are well represented in the surrounding National Parks.



Vegetation Communities : Source, AMBS

8.4.2 Fauna habitats

Overview

The plant communities within the study area and on surrounding lands provide habitat for a wide range of fauna species, including those reliant on woodland/forest, riparian/wetland and open grassland habitats. The large and continuous tracts of open forest vegetation fringing the study area provide habitat for a large variety of fauna species, including those species which require high structural and floristic diversity and old growth elements (eg. tree-hollows). The vegetation is contiguous with that within the Gardens of Stone and Wollemi NPs which contribute to extensive tracts of vegetation and fauna habitat within the Blue Mountains World Heritage area.

The open grassland/pasture consisting of introduced and native grasses and the ecotone formed with the fringing wooded slopes provides foraging habitat for ground foraging species and edge specialists, including macropods, wombats, and some bird and reptile species. Scattered canopy trees within the open grassland area provide foraging, nesting and perching habitat for larger bird species.

Riparian habitats and low-lying wetlands, despite their modified and degraded nature, also provide habitat for a range of fauna, including frogs, birds and mammals (notably wombats). Small farm dams have been heavily impacted by grazing stock but provide some limited aquatic habitat in the study area.

Aquatic, Riparian and Wetland Habitats

Carnes Creek and the Wolgan River traverse the centre of the main two arms of the Wolgan Valley. Both have been highly modified as a result of vegetation clearing, erosion and grazing. Structured riparian vegetation is restricted to the northern half of the Wolgan River, north of the Homestead and is mostly absent from the western portion with the exception of several small isolated stands of regenerating trees. Carnes Creek has a treed overstorey and understorey elements for most of it's length, and is in best condition in the far southeast of the study area.

The creek and river are heavily eroded and have a heavy load of sediment. The undermined banks are very unstable and appear to be eroding continually. In some northern sections of the Wolgan River banks are particularly undermined exposing the low level soil profile and the roots of large riparian trees. Cattle and wombats are compounding the erosion problem, with bank disturbance as a result of hard-hoofed stock and burrowing activities apparently exacerbating the extent of bank 'wash-outs' in high water events. The lower reaches of the Wolgan River are particularly bad and evidence of large 'wash-outs' was present in some areas.

These changes are apparently the result of floods in the 1990's (Andrew Wood pers comm). The heavy loads of sediment may preclude the presence of some species, including the Platypus, which was present in most areas of the water way in the past but has not been observed in more recent times (A. Wood *pers comm*).

During the field investigations both the river and creek were flowing. A number of still ponds (or Billabongs) were also evident. Little macro-invertebrate life was observed in these waterway. In sections, particularly in the upper reaches of Carnes Creek and lower sections (north-east) of the Wolgan River suitable woody debris and fallen submerged timber provided fish habitat. No fish were observed during the surveys, however, dedicated fish surveys were not conducted in these waterways as part of Concept Plan investigations. Weirs and other constructed damming structures down stream may also be impacting on the local fish abundance and diversity.

Farm dams in the study area were heavily impacted by cattle (including grazing and trampling) and support only limited fringing freshwater wetland plant communities (eg. rush and sedge species). Low-lying wetland areas, particularly the 'Back swamp' (Western Wolgan River lowlands), provide refuge and foraging habitat for a variety of wetland and terrestrial species in the form of dense sedge growth. However, this habitat has also been modified as a result of grazing and weed invasion. The lowland sedgeland along the western boundary with a neighbouring property was the most heavily modified and weed infested of the wetland areas.

Boundary woodland and forest

The wooded lower slopes surrounding the site provide foraging habitat for a diverse array of insectivorous bird species (eg. the Fan-tailed Cuckoo, Spotted Pardalote and Black-faced Cuckoo-shrike) and for microchiropteran bats that prey upon insects above, within and below the canopy and along the ecotone between forest stands and open pasture areas. These areas also provide habitat for nectarivorous bird species (eg. the Red Wattle Bird and Honeyeaters), however, there appeared to be a lack of winter flowering Eucalypts which may limit the suitability of these areas for some specialist species (i.e. Regent Honeyeater).

A favoured food tree species of the threatened Glossy Black Cockatoo (Allocasuarina spp) occurs uncommonly in the mid-storey of the woodland communities in most areas but did occur in larger stands in the south-west corner.

Mature trees support hollows of various sizes, which would cater for a range of hollow dependant species. Tree-hollows are an important shelter and nesting resource for many native bird and mammal species (eg. parrots, forest owls, gliders, possums and microchiropteran bats). Large tree-hollows present in mature trees and stags in woodland and forest nearer to the escarpments could provide potential nesting habitat for forest owls (such as the Powerful and Sooty Owls which were recorded on site), although no evidence of hollow occupancy by these species was detected.

Cattle currently graze throughout the wooded areas of the study area. As a result, the shrub layer is largely absent from many of the woodland stands, or where present, commonly comprises dense monotypic stands of native plants, limiting the diversity of foraging substrates and resources for native fauna species. Where present, the understorey provides protection and foraging and nesting sites for small cryptic bird species (such as fairy-wrens, thornbills and robins).

Groundcover is also variable within the woodland and forest stands and is again dependent on the level of past and ongoing grazing pressure. Heavily grazed areas where the groundcover is almost absent and there are patches of bare earth provide very limited shelter or foraging habitat for native species. Other areas which support dense swards of grass provide some foraging habitat for larger terrestrial mammals (eg. the Swamp Wallaby), ground-feeding birds and reptiles and amphibians. However, the groundcover did contain other elements of fauna habitat such as, accumulations of leaf and bark litter, woody debris (eg. fallen logs and rocks) which are critical habitat determinants for many ground-dwelling fauna species (such as small terrestrial mammal species, ground nesting birds and reptiles).

Open Grassland and improved pastures

The majority of the site has been cleared of native vegetation. The cleared grassland areas lack the structural and floristic diversity to provide specific shelter, foraging and breeding resources for many native mammal species and for many bird, reptile and amphibian species. The sparse and open nature of the grassland portions of the site favours common generalist species which are capable of utilising open ground for foraging and common disturbance-tolerant species which are ubiquitous in modified habitats. Many of the bird species recorded in such habitats in the study area utilise the open grassland areas for foraging but are reliant on nearby native woodland and forest communities for roosting and nesting (eg raptors and parrots).

The grassland areas of the site provide foraging habitat for a variety of open ground-foraging bird species (such as the Galah and Australian Magpie) and for the Masked Lapwing, which forages and nests on the ground. Aerial forages (such as Welcome Swallows) also hawk for insects over the open areas and the White-faced Heron and Egrets were observed foraging in tall grass in moist depressions and around dams. The ecotone created between the wooded slopes and open pasture areas provides habitat for edge-specialists, including Brown Treecreeper and Diamond Firetail. Larger terrestrial mammal species, such as the Common Wallaroo, Eastern Grey Kangaroo and Red-necked Wallaby may also shelter in the ecotone between woodland and open grassland areas in the site and utilise the open pasture for grazing, particularly at night. The ecotone environs together with the undulating topography with steep sandy banks make the site very suitable for Wombats. Many active burrows occurred across the site in the open grassy areas and treed surrounds.

Fauna Recorded

A total of 120 vertebrate fauna species, comprising 20 mammals (including 8 introduced species and excluding microbats), 96 birds (including 2 introduced species), one reptile and three frogs have been recorded in the study area. While the ANABAT results have not yet been analysed three microchiropteran bat species have been confirmed to occur on site and it is likely that several other microchiropteran bats previously located in the locality also occur given the habitats present.

Conditions during the fauna survey in August were not ideal for the detection of those species that are not active during the colder months of the year, including microchiropteran bats, reptiles and frogs. Whilst the days were generally mild and sunny, temperatures dropped considerably overnight. Heavy frosts occurred each morning of the survey. A greater diversity of fauna species would be likely recorded during field investigations conducted in warmer months (late spring and summer).

Seven threatened vertebrate fauna species listed under the Schedules of the NSW *Threatened Species Conservation Act 1995* (TSC Act), including one arboreal mammal and six bird species (Table 1) and have been recorded within the study area or in immediately adjoining habitats during the fauna investigations. The Gang Gang Cockatoo, which is under Preliminary determination for listing as a vulnerable species, was also recorded.

Of the threatened fauna recorded, only the Brown Treecreeper, Diamond Firetail and Speckled Warbler are likely to occur or were seen in the proposed development precincts. These species rely on the ecotone environment between forest and grassland, preferring open understoreys to forage. The Diamond Firetail was observed in open paddocks foraging on grass seed with other species of Finch. While the other threatened fauna recorded, including the large Forest owls, Yellow-bellied Glider and Glossy Black Cockatoo rely on the more structured treed environs with suitable mature senescent trees with hollows for roosting. The Powerful Owl may also use larger caves to roost in, which were present along the cliff lines of the escarpment.

Some of these species are highly mobile and occupy large home ranges (eg Powerful Owl, Glossy Black Cockatoo and Yellow-bellied Glider) and are likely to forage widely in areas of suitable habitat throughout the locality where resources exist. For the Yellow-bellied Glider, mature forest with flowering or sap producing Eucalypts and Acacias are required and for the Cockatoos mature heavy fruiting tress are required from which seed can be foraged. These elements are only present in the surrounding woodland and forest and not in the open cleared areas of the site. It is unlikely that the proposed development will remove the forest/woodland elements that these species require.

It is possible that a number of additional threatened fauna species previously recorded within the locality (within 10km) may also potentially occur in the study area on occasion given the habitats present (Table 2). Most of these species would be reliant on forest and woodland habitat for shelter and refuge but may also utilise the more open grassland habitats of the study area for foraging purposes.

Table 1: Threatened species recorded in the study area or in adjoining habitats.

Species Name	Status	Record & Habitat Use
Mammals		
Yellow-bellied Glider *Petaurus australis*	V	Upper reaches of Carnes Creek and notches were recorded on DEC land near Area D.
Birds		
Glossy Black Cockatoo *Calyptorhynchus lathami*	V	Far south-west corner and the Upper reaches of Carnes Creek
Powerful Owl *Ninox strenua*	V	Upper reaches of Carnes Creek and near by the junctions of Carnes Creek and the Wolgan River in the wooded area toward WNP
Sooty Owl *Tyto tenebricosa*	V	Upper reaches of Carnes Creek
Brown Treecreeper *Climacteris picumnus*	V	Woodland ecotone along the eastern edge of the proposed Development footprint, within the proposed access saddle, in the proposed compensatory lands X and Z as well as woodlands at the eastern tip of the proposed Visitors centre property.
Speckled Warbler *Chthonicola sagittata*	V	In the ecotone in the Western pasturelands, and was also recorded at the eastern tip of the proposed Visitors centre property. The upper reaches of the Wolgan River therefore seem to be the main area of occupation of this species in the locale
Diamond Firetail Finch *Stagonopleura guttata*	V	Observed in the proposed staff accommodation area, the front paddock or the beginning of the proposed access road, Upper reaches of Carnes Creek, around the homestead and the eastern pasture and also proposed Visitors centre property.
Gang Gang Cockatoo *Callocephalon fimbriatum*	PV	On the ridges above the proposed staff accommodation area, in the proposed Compensatory habitat areas X and Z.

Wombat

Spoted Tail Quoll

Koala

Gang Gang Cockatoos

Table 2: Additional threatened species which may potentially occur on site (based on DEC Atlas of Wildlife database records, 2005).

Species Name	Status	Likelihood of Occurrence
Invertebrates		
Giant Dragonfly *Petalura gigantea*	E1	Potential to occur in the western part of site – back swamp – however, this area is heavily impacted by cattle and does not constitute preferred habitat.
The Bathurst Copper Butterfly *Paralucia spinifera*	E1	Unlikely: critical habitat component Bursaria spinosa subsp. spinosa does not appear to occur in the study area.
Herpetofauna		
Red-crowned Toadlet *Pseudophryne australis*	V	Unlikely within study area; More likely in upper reaches of 3-4th order streams – sandstone and leaf litter.
Blue Mountains Water skink *Eulamprus leuraensis*	E1	Not likely – no suitable hanging swamp habitat within study area.
Broad-headed Snake *Hoplocephalus bungaroides*	E1	Unlikely within study area; likely on ridges during summer and just below escarpment in winter months
Rosenberg's Goanna *Varanus rosenbergi*	V	Likely – in woodlands and forest surrounding site but unlikely in the cleared pastures of the study area
Birds		
Swift Parrot *Lathamus discolor*	E1	Possible – in woodlands and forest surrounding site during winter months, although few winter flowering Eucalypts were recorded in the study area
Regent Honeyeater *Xanthomyza phrygia*	E1	Likely – in woodlands and forest surrounding site. However, although few winter flowering Eucalypts were recorded in the study area.
Brush-tailed Rock-wallaby *Petrogale penicillata*	E1	Potentially occurring in the escarpment areas but unlikely to occur in the study area
Square-tailed Kite *Lophoictinia isura*	V	Likely – across the site, but would mostly rely on the forest and woodland canopies to foraging for nestings etc.
Turquoise Parrot *Neophema pulchella*	V	Likely – study area comprises suitable habitat.
Barking Owl *Ninox connivens*	V	Likely – in woodlands and forest surrounding site
Painted Honeyeater *Grantiella picta*	V	Likely – in woodlands and forest surrounding site
Black-chinned Honeyeater (eastern subsp) *Melithreptus gularis gularis*	V	Likely – in woodlands and forest surrounding site
Hooded Robin *Melanodryas cucullata*	V	Likely – in woodlands and forest surrounding site
Grey-crowned Babbler (eastern subsp) *Pomatostomus temporalis temporalis*	V	Likely – in woodlands and forest surrounding site
Mammals		
Spotted-tailed Quoll *Dasyurus maculatus*	V	Likely – in woodlands and forest surrounding site. Has been seen within the study area (A Wood pers comm) and is most likely to occur in the upper reaches of Carnes Creek and in the south-east corner of the site.
Koala *Phascolarctos cinereus*	V	No evidence of Koalas was recorded on or nearby the site; may potentially occur based on presence of suitable food tree species.
Squirrel Glider *Petaurus norfolcensis*	V	Likely – in woodlands and forest surrounding site
Large-eared Pied Bat *Chalinolobus dwyeri*	V	Likely – Caves and old mine adits in the area would provide suitable roosting habitat for this species. Foraging would occur along the creeks and Wolgan River as well as below the canopy of the surrounding woodlands and forest.
Eastern False Pipistrelle *Falsistrellus tasmaniensis*	V	Likely – in woodlands and forest surrounding site. Large mature Eucalypts with suitable hollows provide roosting habitat and foraging occurring within or just below continuous canopy.
Eastern Bent-wing Bat *Miniopterus schreibersii oceanenis*	V	Likely – in woodlands and forest surrounding site. Suitable roosting caves also found nearby site on sandstone outcrops and in the cliffs of the escarpment. Foraging occurs above the canopy and in open grassy areas.
Greater Broad-nosed Bat *Scoteanax rueppellii*	V	Likely –woodlands and forest surrounding site provide foraging habitat and tree-hollows for roosting; also may occasionally utilise old buildings as roost sites. This species generally utilises ecotone environs foraging along woodland edges and trees lining creeks.

Dedicated aquatic surveys were not undertaken for the Concept Plan stage. However, no threatened fish species of state or national conservation significance have been previously recorded in the locality and none are likely to occur given known distributions and the habitats in the study area.

No bird species listed under International Migratory Bird Agreements were recorded in the study area. The study area is not considered to provide critical habitat for these species or for other 'migratory' species listed under the EPBC Act given the nature of the habitats present.

8.4.3 Impacts & Impact Mitigation

The proposed Concept Plan for the Emirates Resort, including the component Landscape Strategy incorporates a strong focus on conservation and enhancement of the natural environment. The potential adverse impacts of the proposed development within the study area on flora and fauna and their habitats will also be reduced to a large extent by the incorporation of impact mitigation and environmental management measures into the proposed Concept Plan and the Landscape Strategy for the study area.

Specific mitigation and management measures have been incorporated into the proposed concept design as part of an iterative process to minimise impacts on the natural environment within and surrounding the study area, and in particular to reduce potential impacts on threatened species and their habitats. These key mitigation measures are aimed primarily at minimising the total area of habitat loss, managing and rehabilitating native vegetation and riparian habitats, enhancing habitat connectivity and minimising habitat modification and degradation.

The potential impacts of the proposed development on native biota and their habitats will involve those associated with the construction phase of the resort facilities and infrastructure (eg. habitat loss and modification etc.) and those possibly associated with the longer term operational phase of the resort (increased human access, lights and noise, ongoing habitat degradation).

Whilst there will still be some adverse impacts imposed upon some elements of the natural environment as a result of the proposed development, these impacts are not expected to impose a significant impact on the native biota of the study area, including threatened species and their habitats.

Vegetation Loss and Modification

The proposed development precinct occupies only a very small proportion of the study area and the majority of the remainder of the study area will be managed for conservation. In addition, the requirement for vegetation removal has been kept to a minimum by the careful placement of resort facilities and infrastructure in existing cleared areas within the identified development precincts. Whilst some modification of adjoining or proximate areas of native vegetation may be modified to achieve required fuel loads in identified bushfire asset protection zones (APZs) the level of fuel management activities proposed are not expected to substantially affect these areas.

Vegetation Retention, Protection, Rehabilitation and Management

The majority of the study area, including representative stands of all of the vegetation types and habitats that occur, will be retained within a nature conservation precinct and rehabilitated through active management. In addition, the river and creekline, which currently exist in a highly degraded condition, are to be rehabilitated.

Protection of Retained Vegetation

A range of measures will be implemented to protect areas of retained vegetation and fauna habitats in the study area, in particular in the vicinity of the development precincts and access corridor. Measures to be implemented include:

- the identification of large hollow-bearing trees for retention where possible
- fencing of vegetation which is to be retained in close proximity to development areas, prior to clearing or construction activities, to avoid damage from uncontrolled or accidental access;
- care to avoid mechanical damage to retained trees, and to protect against the compaction of soil or stockpiling around trees
- instruction of contractors regarding limits of vegetation clearing;
- the parking of vehicles and machinery and the location of stockpile sites in existing cleared areas and not within 50m of a waterway.

Habitat Trees

Significant habitat trees (eg. large hollow-bearing specimens) will be incorporated into the development design where possible. Such trees will be marked and protected from disturbance as described above. Hollow-bearing trees within the proposed development footprint or in immediately adjacent areas that are likely to be disturbed or removed during construction activities will be flagged for identification and carefully felled during clearing activities to minimise the potential for injury to fauna that may be occupying the tree and to preserve the tree intact. Portions of hollow-bearing trees removed from the construction area should be retained and either placed in adjacent bushland as hollow logs, or tied into large trees in adjacent woodland to provide shelter and nest sites for arboreal mammals, reptiles and birds. Large logs will also be removed from the proposed disturbance areas during clearing and placed in adjacent retained vegetation to maintain resources for native fauna.

Weed Control and Management

Protocols will be implemented to prevent the spread of weeds within the study area as a result of activities associated with the construction activities.

Weed management will involve:

- the destruction of weed material removed from construction areas;
- minimising areas disturbed during construction;
- washing down vehicles and equipment between construction areas in particular following clearing activities in weed infested areas;
- the use of shredded native plant material removed from the site as a mulch and groundcover on disturbed soil surfaces to reduce the potential for weed establishment; and
- seeding of exposed soil stockpiles with a nursery crop to reduce the potential for weed infestation.

A detailed weed management plan will be prepared which outlines appropriate weed control measures within the study area as outlined above, and also include protocols for the:

- removal and control of weeds in proposed vegetation rehabilitation areas; and
- review of non-endemic species to be used in replanting in landscaped areas to ensure they are not invasive;

Landscaping and Rehabilitation

The proposed landscape strategy will aim to conserve and enhance the existing modified habitats within the study area adding to the overall biodiversity value of the site.

Landscaping and rehabilitation works will involve:

- use of locally sourced native plant species representative of the existing vegetation types within the study area in landscaped areas and for rehabilitation of disturbed retained vegetation;
- selection of known food trees to provide supplementary foraging habitat for threatened fauna species known to occur in the study area and locality, including Allocasuarina spp. for the Glossy Black-Cockatoo and a variety of Eucalypts of relevance for the Koala and in particular winter-flowering species for nectar-feeding birds;
- the collection of native seeds within the study area (or immediate vicinity) by a qualified bush regenerator prior to clearing for use in the revegetation of disturbed areas;
- use of collected seeds in direct seeding or propagation of tubestock for planting;
- the use of shredded native plant material removed from the study area as a mulch and groundcover on disturbed areas. This approach will reduce sediment discharge, limit weed invasion, and retain seed stock for the regeneration of local native species;
- topsoil from vegetated areas within development areas will be removed and stockpiled for application to proposed landscaped areas, thus retaining the natural seed bank from the site and assisting in the regeneration of local plant species.

Protection and Rehabilitation of Creeklines and Riparian & Aquatic Habitats

The main watercourses within the study area are both currently experiencing substantial erosion as a result of cattle grazing, clearing of vegetation and flooding events. Proposed management of the creek lines includes terracing to stabilise the creek banks and re-establishment of riparian vegetation to a minimum width of 40 metres from the top of the bank on either side to provide habitat resources and wildlife corridors. Only low impact, passive recreational access will be permitted in these areas to limit disturbance to ecological communities and native fauna.

The proposed stabilisation works are likely to have an adverse impact on individual wombats that currently utilise active burrows along Carnes Creek. However, Wombats appear to utilise the entire study area, as evidenced by the extensive distribution of active burrows, and disturbance to burrows in this location is unlikely to have a substantial impact on the local population.

There is also the potential for proposed river crossings to impact on the creeklines and riparian habitats and to obstruct fish passage if constructed inappropriately. To reduce the potential for adverse impacts on the creekline ecology, river crossings have been carefully located to reduce riparian vegetation clearance and constructed in accordance with NSW Fisheries Fish Passage Requirements for Waterways (NSW Fisheries 2003) to have minimal disturbance and to facilitate fish passage. Disturbed areas surrounding bridge construction sites will be revegetated to ensure bank stabilisation, enhance connectivity and wildlife corridors and provide supplementary habitat for native fauna.

A detailed soil and water management plan will be developed prior to the commencement of construction activities to control sediment and pollutant discharge from construction areas into adjoining vegetation and creeklines. Appropriate measures for the ongoing control and treatment of run-off from the completed access roads will also be required to minimise adverse impacts on retained adjoining terrestrial and aquatic habitats as a result of discharges containing sediment, chemical pollutants and weed propagules. The following measures will be implemented:

- the collection and direction of stormwater run-off from potentially contaminated sites to sedimentation ponds. In particular, run-off will be directed away from retained native vegetation;
- the stabilisation of exposed soil surfaces (eg. through sterile grass seeding, erosion control meshing, or mulching using vegetative material removed from the study area);
- the use of erosion and sediment control measures to collect sediment and to reduce flow velocities; and
- regular monitoring and maintenance of all erosion and sediment control structures throughout the construction and operational phases of the development to ensure their effective function.

Lights and Noise

The effects of lights and noise will effectively be confined to the development precincts and immediately adjoining areas.

Noise impacts would differ during the construction and operational phases of the development. For example, noise will be varied in type and intensity during the construction of the resort facilities and infrastructure but be more low-level and irregular once the resort is operational. It is considered unlikely that noise associated with the development will have a substantial impact on native fauna. It is possible that some fauna may be disturbed and move from areas of habitat adjoining development areas as a result of noise during the proposed construction stage, although such impacts are not likely to be far-reaching.

Light is not anticipated to impose a significant impact on habitats adjoining or proximate to the development precincts. Low intensity lights will be used and designed so as to avoid spill into adjoining areas of native vegetation. The introduction of artificial light may also attract some species, such as birds and bats that feed on insects, into the development precincts at night.

Wood and Grieve have prepared lighting design objectives for the development in Section 8.10 that will minimise light spillage into the atmosphere whilst still allowing the safe movement of guests and staff.

Existing Grazing and Watercourse Conditions

Vegetation Management Plan

Retained vegetation within the study area will be the subject of a detailed Vegetation Management Plan (VMP) which will be prepared following approval of the proposed concept Master Plan and prior to the initiation of development activities. The VMP will provide details of:

- specific measures and protocols for the protection and retention of native vegetation;
- a detailed weed management and control program;
- details of appropriate plant species and planting densities to be utilised and the extent of vegetation types to be created; and
- a monitoring program with performance criteria and measures for restitution of damage or supplementary plantings, if necessary.

Management of Introduced Species

A large number of feral fauna species, including rabbits, foxes, and wild goats, pigs, dogs and cats, occur throughout the study area and surrounding woodland areas. Species, such as goats, pigs and rabbits, are having an obvious detrimental impact on the native vegetation communities present as a result of grazing, foraging and digging. It is likely that the introduced predators (eg. cats, dogs and foxes) are having an adverse impact on the local native fauna species.

A Feral Species Management Plan is to be prepared to address the control and management of these species. Management of herbivorous species will be particularly crucial to the success of the proposed vegetation rehabilitation and landscaping works within the study area.

Significance of Likely Impacts on Threatened Fauna

The significance of likely impacts of future development on threatened species or their habitats recorded in the study area has been assessed according to s.5A of the EPA Act (the '8-part test'). The assessments indicate that future development in the study area as proposed under the Concept Master Plan and Landscape Strategy is unlikely to impose "a significant effect" on the threatened fauna species recorded or considered of potential relevance to the study area. Consequently, a Species Impact Statement is not required for these species with respect to future development of the site.

None of the threatened fish species, aquatic macroinvertebrate species or endangered populations currently listed pursuant to the Fisheries Management Act are of relevance to the aquatic habitats in the study area. The proposed development is not considered likely to impose a significant impact on any of these species, populations or their habitats.

A detailed assessment of the criteria outlined in the EPBC Act Administrative Guidelines with respect to Matters of National Environmental Significance of relevance to the study area (ie. nationally listed threatened and migratory species and World Heritage Areas) has not been conducted. However, on the basis of the field investigations and the significance assessments undertaken pursuant to State legislation, it is considered unlikely that the Project will impose a significant impact on listed threatened species or migratory species which may occur in the study area.

The criteria for the assessment of World Heritage Properties pursuant to the Administrative Guidelines of the EPBC Act have been considered on a preliminary basis with respect to the likelihood or otherwise of the proposed Emirates Resort imposing "a significant effect" on the adjoining Greater Blue Mountains World Heritage Area (GBMWHA).

The Concept Plan and Landscape Strategy for the project includes a commitment to the preparation and implementation of environmental management plans to reduce the potential for degradation or damage to the world heritage values of the surrounding GBMWHA. Management plans of relevance include:

- Ecological Rehabilitation and Management Plan
- Fauna Management Plans for native fauna and in particular threatened fauna species known or likely to occur on site
- Feral fauna Management Plan
- Weed Management Plan
- Bushfire Hazard/Control Management Plan
- Erosion and Sedimentation Control Plan

The proposed project is considered unlikely to impose "a significant effect" on the adjoining Greater Blue Mountains World Heritage Area GBMWHA provided that the above Environmental Management Plans and Strategies are prepared and implemented.

The remaining "matters of national environmental significance" listed pursuant to the EPBC Act are not of relevance to the study site.

Conservation Outcome

It is considered that the adverse impacts of future development within the study area will be adequately offset by the retention and management of the majority of the study area for conservation purposes and the substantial contribution to vegetation rehabilitation and habitat creation and enhancement proposed under the Concept Plan and Landscape Strategy. The proposed Landscape Strategy has the potential to result in a net increase in the total area of some vegetation types and to enhance the condition and connectivity of retained woodland communities and riparian habitats, improving their likely viability over the longer term and hence making a positive contribution to the conservation of biodiversity within the study area and the wider locality.

Management Issues of Relevance for Identified Precincts

A number of management plans will be developed for the site to manage the identified key or relevant issues including the phasing out of cattle and reduction in grazing, noxious weed control, erosion control, feral animal control and wildlife management. The following Management Plans will be prepared for separate approval:

- A Fauna Management Plan for native or threatened species recorded in the study area (eg. Wombat)
- A Fauna Management Plan for all threatened species recorded on site or which may be potentially occurring on the site
- A Fauna Management Plan for feral species
- A Management Plan for noxious weed species
- An Ecological Rehabilitation and Management Plan
  - *Revegetation (Nature Conservancy Precinct)*
  - *Watercourse Stabilisation (Riparian Precinct)*
  - *Vegetation Management (Pasture/Parkland Precinct)*

8.5 Fire and Emergencies

8.5.1 Bushfire Hazard

Australian Bushfire Protection Planning (ABPP) have prepared a Bushfire Management Report (*see Appendix 3*). The report notes that the lower slopes of the surrounding escarpments are vegetated in Low Open Forest, which has been identified as bushfire prone land.

Natural fires have long been part of the landscape within the valley and adjoining areas of National Park. A combination of inherently flammable vegetation, dry summers, periodic drought and lightning ignitions, have resulted in fires of small and large size, of high and low intensity impacting the native and introduced vegetation within the Wolgan Valley and within the native vegetation on the higher landforms above the valley. Many of the native species are fire-adapted ecosystems with recurrent bushfires having shaped the condition of the existing plant communities.

The Wolgan Valley and surrounding areas of National Parks has a history of severe damaging bushfires with the whole of the valley being impacted during the 1956 fire season and the northern portion of the valley experiencing bushfires in 2003. The major bushfires that burnt through much of the state during the 1968 and 1994 bushfire seasons impacted the Wollemi, Yengo and Blue Mountains National Parks

Severe fires within the surrounding landscape will burn out large areas of land, travel long distances, threaten homes, lives and other assets and be uncontrollable until the weather moderates. The majority of the area burnt and most damage (including loss of life) occur over a relatively short time. These relatively rare but severe events cause more than 95% of the damage and loss to people, property and assets. Bad or severe fires are not necessarily large scale fires.

The fire season in the area corresponds with the summer months' high temperatures and low rainfall, and can occur from September to April with a proclaimed bushfire danger period from October to March. There is significant variability from year to year. Fire seasons may be serious in three out of every 15 years, but this can vary considerably.

In summary, the Bushfire Management Report concludes that:

- Major bushfires have occurred in the Wolgan Valley and surrounding areas in 1956, 1994 and 2003.
- The topography and landform of the valley predisposes the valley to impacts of fires burning under northerly, north-westerly, westerly and south-westerly wind influences.
- The slope of the valley and the ridgelines/ gullies will influence the spread of fire from the northwest, west and south west and result in sporadic fire runs.
- The overall Fuel Hazard for the unmanaged Low Open Forest vegetation within the valley is Extreme therefore there is an extreme risk of damaging bushfires impacting future development in the valley, unless bushfire mitigation measures are maintained.

In view of these conclusions, the report notes the following key issues:

- The Wolgan Valley forms a "sunken valley" below a deeply eroded plateau formation which terminates in vertical cliff lines that form the eastern, southern, western and north western perimeter of the valley. Vehicular access into the valley is via a narrow, in most parts, single lane road that is cut into the south western cliff line of the valley rim.
- This access road traverses extensive areas of bushfire prone Low Open Forest vegetation both on the plateau above the valley, on the cliff line and into the south western portion of the valley floor. Future bushfires occurring in the unmanaged Low Open Forest vegetation within the Wolgan Valley and within the adjoining National Parks/private land will generate an extreme level of risk to motorists using the road.
- The topography and vegetation of the surrounding plateau areas will continue to generate extreme fire events that will either directly impact the valley by causing localized spot fire ignition from flying embers or enveloping the valley in smoke for long periods. Local spot fire ignitions from remote fires (up to >30 kilometres from the valley rim), lightning strike ignitions, arson, or accidental ignitions within the valley will be driven by hot, dry north, north westerly, westerly and south westerly winds to impact the vegetation/development on the valley floor.
- Local topographic features such as Mount Wolgan and Donkey Mountain and the narrow valleys will introduce wind turbulence and influence the fire behaviour and rate of spread of wild fires throughout the valley.
- A suite of bushfire protection measures are considered necessary to reduce the level of bushfire risk to the patrons, staff and visitors to the Wolgan Valley Emirates Resort. These risk mitigation strategies are detailed below.

8.5.2 Bushfire Management

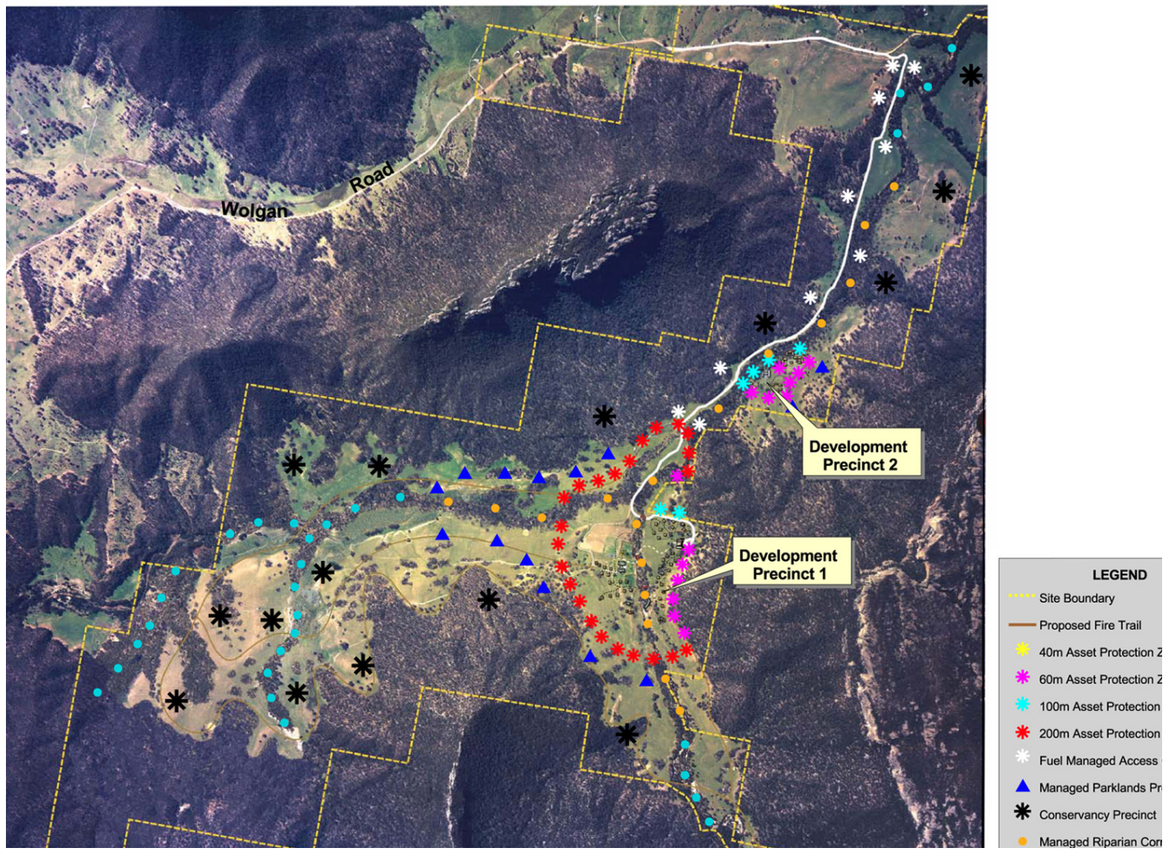
The proposed development falls under the NSW Rural Fire Service jurisdiction for fire fighting operations.

The City of Lithgow has a Bush fire risk management plan as required by the Rural Fires Act. The Bush Fire Risk Management involves identifying the level of risk posed by bush fires to assets and establishing strategies to protect these assets from the adverse effects of bush fires. The purpose of bush fire risk management is to protect the community and its values from the adverse affects of wildfire. The outcome sought is to achieve better integration of community preparedness and prevention strategies as key elements of bush fire management.

The Bush Fire Risk Management Plan for Lithgow identifies the level of bush fire risk across the City and establishes strategies, which the responsible land managers (including private land owners) will implement to manage the bush fire risks identified. The implementation of the Bushfire plan is the responsibility of the owners or occupiers of the land which the bush fire risk is situated.

In the case of private property, the Rural Fires Act also imposes an additional requirement on Lithgow Council to ensure that the owners or occupiers of private property have taken the required steps to reduce bush fire hazards on their properties, and to take action where this has not occurred, through the issue of notices to remove bush fire hazards under Section 66 of the Rural Fires Act.

The Rural Fire Service (RFS) considers the site to have significant bush fire issues and has been identified as bush fire prone land. The RFS advises that the proposed development must meet the requirements of Planning for Bush Fire Protection 2001 (PBP), specifically standards regarding setbacks (for special protection development), provision of water supply, access, supply of services, fuel management on the site, relocation/ evacuation planning for the occupants.



Bushfire Protection Strategies: Prepared by ABPP

In responding to the DGR's letter and the PBP, Australian Bushfire Protection Planners (ABPP) have prepared a Bushfire Management Plan that provides an assessment of the potential level of bushfire threat to the future development and recommendations on the implementation of Asset Protection Zones, the provision of water supplies, building construction standards, access requirements, evacuation, provision of resources and fuel management protocols necessary to mitigate the potential bushfire threat to persons, property and the environment and provides a suite of strategies designed to provide the level of protection commensurate with the future use of the development.

The Bushfire Management Report proposes the following strategies for managing potential bushfire risk:

- Provision of asset protection zones relevant to the various development precinct zones.
- Provision of managed parkland to the development precinct containing the villas, conference centre, main building and spa.
- Provision of managed access corridor to main entry road.
- Water supplies for fire fighting operations – The resort's supply of potable water can not be guaranteed for fire fighting operations during periods of peak demand. Therefore, a 850,000 litre static water supply storage tank is proposed to be provided to supply the internal building sprinkler system and a hydrant system throughout the immediate development precincts containing the villas, conference centre, main building, spa, manager's residence, staff accommodation and maintenance areas. A hydrant supply point is proposed to be provided adjacent to the Helipad for the filling of Bambi Buckets for aerial water bombing operations.
- Access provisions – construction of the property access roads and fire trails to comply with Planning for Bushfire Protection 2001 and is described in detail in the ABPP report.
- Building construction standards (Design and Materials) – Class 1 buildings to be constructed to reduce the risk of ignition from bushfire front passes and Class 2 or 3 buildings constructed to provide a resistance to bushfires in order to reduce danger to life and minimise the risk of the loss of the buildings for all those buildings in a designated bushfire prone area.
- Fuel (hazard) management addressed at each development precinct area.
- Evacuation management – An evacuation plan will be prepared to ensure the safe and proper evacuation of guests, staff and visitors from the site during major fire events.
- Fire Fighting resources – the development proposal to include a fully equipped fire station with equipment including a Category 1 Rural Fire Service tanker, a Category 7 Rural Fire Service tanker, personal protective equipment including Positive Pressure Breathing Apparatus and structural fire fighting clothing and radios including hand held portable radios.
- Helicopter support facilities - Fire fighting operations within the valley rely heavily on the provision of aerial support using National Park & Wildlife Service and private helicopters. To enable these operations to continue, fuel reserves should be stored in a bunded weather proof area adjacent to the helipad.
- Liaison with the National Parks and Wildlife Service for joint fire management /fire operations – establish a memorandum of understanding between the resort and NP&WS.
- Fire breaks - Strategic Fire Breaks to be provided to the perimeters of the site (where practicable) to provide fuel management and fire operations compartments and Fire access trails to Rural Fire Service standards shall be established within the fire breaks.
- Strategic fire advantage zones - SFAZ shall be established within the Nature Conservancy Precinct to provide fuel management compartments.
- Biodiversity conservation - Fuel management/hazard reduction burning within Nature Conservancy Precinct and the retained vegetation corridors within the site will be planned to minimise the negative impact of fire on biodiversity and the natural ecosystems.
- Liaison with local emergency services - The Resort Management shall establish a protocol with the Local Emergency Management Committee (LEMC) and the Lithgow Bushfire Fire Management Committee (LBFMC) to foster cooperative emergency management/fire management within the site.

8.6 Traffic and Transport

McLaren Traffic Engineering has prepared a Traffic & Parking Impacts Report for the project and a Road Safety Audit of the existing travel route from the Castlereagh Highway to the site along Wolgan Road (submitted separately).

Existing road and traffic conditions

The report notes that Wolgan Road provides direct access to some twenty rural acreage properties in the Wolgan Valley, and that there is also weekend and holiday camper traffic activity associated with local attractions, particularly at Newnes.

The Traffic Report includes the results of traffic 'tube' counts undertaken along Wolgan Road over a two week period, which indicate that:

- In the order of 50 to 80 predominantly light vehicles (up to 3 heavy vehicles) travel along Wolgan Road south of the site on weekdays, increasing to 110 to 130 on the weekend days recorded.
- The peak hour flow along Wolgan Road along the steep decline into the valley is in the order of 5 to 20 vehicles per hour.

The estimated Average Daily Traffic (ADT) flow varies from 72 to 90 vehicles per day along the various sections of Wolgan Road, with seasonal variations associated with weekend campground use in the Newnes area, particularly during spring and autumn long weekends, when approximately 400 campers (100 cars) are reported to use the area.

Road Safety

The Traffic Report includes a Road Safety Audit as requested by the RTA. Traffic accident analysis reported in the audit indicates that between 2000 and 2004 a total of 15 accidents occurred, with a total economic cost of $884,850. The majority of accidents were tow-away (60%), with injury accidents representing 40% and none involving fatalities. However, this accident rate is above the acceptable threshold level, and measures are currently needed to reduce it.

A detailed inspection of road conditions identified the following general measures currently required to reduce accident potential:

- Advance curve warning and advisory speed signs at all bends along the corridor.
- Installation of guide posts at spacings compliant with relevant standards.
- Reduced speed zoning – 35km/h recommended on the steep descent into the valley and 50km/h across the valley floor.
- Installation of hazard markers on all exposed trees, tree stumps and fence posts that are located at or near bends in Wolgan Road.

The audit also identifies a range of works required to address specific identified deficiencies. Treatments identified as being of primary priority are:

- Installation of guardrail along the steep embankment on the descent into the valley.
- Installation of traffic signal control for vehicles using the steep descent, to permit only a single directional stream of traffic.
- Installation of a three beam guardrail on either side of the reinforced concrete box culvert at Chainage 10.15.

Treatments of secondary priority include provision of signage (warning & speed zone), reflectors, RPM's, guide posts to improve day and night time delineation, as well as rock and batter stabilisation. The regular regrading of the gravelled road corridor along the Wolgan Valley is also identified as a moderate priority.

Other identified works include repairs to broken pipes / culverts / headwalls as well as repairs to localised gravelled road corridors (associated with corrugation & scouring effects) and localised deterioration of sealed road corridor segments.

Importantly, the Traffic Report identifies that the above works need to be implemented on the basis of existing conditions, regardless of whether the project proceeds or not. That is, the need for the works is generated by the function and existing condition of Wolgan Road, and is unrelated to the traffic volumes and types generated by the project.

Traffic generated by of the project

While on-site parking is proposed for some 40 cars, most guests will arrive by chauffeur driven luxury 4WD from Kingsford Smith Airport, with occaisional VIP guests arriving by helicopter. However helicopter movements will be limited to no more than four per week.

The estimated consequent traffic generation for the construction and operational phases of the project are:

Construction Phase

While final traffic generation will be subject to the detailed Construction Management Plan, for which separate approval will be obtained, the following daily vehicle numbers are predicted for a 40-week work program:

- Delivery trucks (2 to 4 axle medium size) – 2 to 3 on average
- Construction staff 13 by 15 seater minibuses.
- Construction staff 25 private vans/utes.

A total of 80 to 90 vehicle trips per day will therefore be generated in the construction phase.

Operational Phase

The peak generation has been predicted assuming 90% occupancy (i.e. 36 villas occupied) @ 2.5 persons per villa, staying on average 4 days, with 50% villa turnover every 2 days, and 120 staff, with at least 100 staying for 7 to 10 days, with 50% turnover of long stay staff every 3 to 5 days.

On this basis a maximum total of 28 daily vehicle trips and up to 7 peak hour vehicle trips will be generated in the operational phase.

The impact of this additional traffic upon the critical segments of Wolgan Road is shown below.

SCENARIO	DAILY TRAFFIC FLOW (TWO WAY)	PEAK HOUR FLOW (TWO-WAY)
PEAK HOLIDAY PERIOD		
EXISTING	210 to 260	30 to 40
CONSTRUCTION PHASE	300 to 350	50 to 70
OPERATIONAL PHASE	240 to 290	40 to 50
NON-HOLIDAY PERIOD		
EXISTING	<70	<10 to 20
CONSTRUCTION PHASE	<160	<30 to 50
OPERATIONAL PHASE	<100	<20 to 30

Traffic flows through Wolgan Pass *Source: McLaren Traffic Engineering*

SCENARIO	DAILY TRAFFIC FLOW (TWO WAY)	PEAK HOUR FLOW (TWO-WAY)
PEAK HOLIDAY PERIOD		
EXISTING	200 to 250	30 to 40
CONSTRUCTION PHASE	290 to 340	50 to 70
OPERATIONAL PHASE	230 to 280	40 to 50
NON-HOLIDAY PERIOD		
EXISTING	<60	<10 to 20
CONSTRUCTION PHASE	<150	<30 to 50
OPERATIONAL PHASE	<90	<20 to 30

Traffic flows along the valley floor *Source: McLaren Traffic Engineering*

Australian Standards suggest that 30 or more movements in a peak hour (in and out combined) would usually require provision for two vehicles to pass, with a minimum passing width of 5.5 metres. Reduced widths can be provided at lower volume roads, based upon vehicle size characteristics. This 30 vehicle limit is not exceeded except during the construction phase and peak holiday periods.

Relevant guidelines specify that unsealed roads are permissible when the annual average daily traffic (AADT) flow is less than 150 vehicles per day. It is evident that the present unsealed road condition along the Wolgan Valley floor is generally acceptable as the forecast existing plus proposed development daily traffic flow along Wolgan Road will give rise to a traffic flow generally at or below 150 vehicles per day for the operational phase, except during peak holiday periods when daily volumes along the valley floor could rise to just under 300 vehicles per day. The weighted average daily traffic volume would be close to 160 vehicles per day, given that peak holiday traffic days would occur much less frequently than non-holiday traffic days.

Traffic increases in this order will have a minimal impact on the surrounding road network in terms of traffic flow efficiency, road safety and residential amenity. Furthermore, none of the safety improvements identified as being required on Wolgan Road are generated by these traffic increases.

During the construction phase, traffic volumes may increase by about 150 vehicles per day, however, the construction period is for a limited duration, and a Construction Management Plan to lessen the impact of this phase of the project on Wolgan Road and nearby properties will be submitted for separate approval. This plan will detail measures to implement the following objectives:

- Maximise the use of minibus (15 seater) transport of construction staff to and from the site.
- Maximise the use of smaller delivery vehicles, given the condition of the steep and narrow descent along the Wolgan Road corridor into the Valley from the south.
- Implement a temporary traffic light system at the top and bottom of the steep descent into the Wolgan Valley to allow only a one directional stream of traffic along the narrow segment..

In the event that large trucks are required to deliver materials to the site then a controlled trial of the route will be undertaken by a trial vehicle. Whilst the traffic counts conducted appear to suggest that articulated vehicles utilise Wolgan Road, it is anticipated that trucks serving either the construction or operational phases of the proposed development will be limited to 12.5m length large rigid trucks.

8.7 Heritage and archaeology

8.7.1 Aboriginal history

The Wolgan Valley, a National Trust of Australia (NSW) study, dated October 1977 records that the Wolgan Valley lay close to the boundary of the Wiradjuri tribe to the west and the Daruk tribe to the east. The Wolgan Valley and the nearby Capertee Valley appear to have witnessed similar levels of Aboriginal occupation with similar environmental and topographic conditions. The National Trust Report states that the Valley has considerable archaeological potential. It further mentions an Aboriginal site 1km south of the Wolgan Gap that contains hand and bark stencils. This site is readily accessible via a short track from the Wolgan Gap.

Various informal documents suggest that the area has been heavily used by aboriginal people and there is therefore a high probability that currently unknown relics or sites may exist.

8.7.2 Non indigenous history

Grazing

The first European recorded to have discovered Wolgan Valley was Robert Hoddle, during his unsuccessful attempt to find a route from the Bells Line of Road to the Hunter Valley in 1823.

Thereafter, James Walker, a member of a prominent London family established Wallerawang in 1872 and developed grazing lands further west. He also acquired the Wolgan Valley and used it for the safe keeping of young cattle and horses.

The original grant to Walker of Wallerawang was bought in around 1923 from the granddaughter Hazel and Loveday Barton by EB Webb and Sons. The Webb family have occupied the site since that purchase.

A large slab cottage of about six rooms is now partly collapsed and is in poor condition, having been abandoned in the 1950s. The Webb family has continued the grazing activity commenced by James Walker on the site to the present day. The Webb family occupies a house on site constructed circa 1957.

The Williams family was one of the early family's to purchase smaller farms in the Wolgan Valley in 1867. The Williams family consisted of Henry Williams, his wife Christiana Williams and child. His wife died at the age of 37 on 12 November 1879. Henry then left the family property and the valley and settled in Little Hartley. The 1879 grave of Christiana Williams is located approximately 100 metres off Wolgan Road approximately 10km from the top of Wolgan Gap, on land separated from the site by Donkey Mountain.

Mining and Industry

Mining operations in the Wolgan Valley started in 1903, with large scale commercial mining commencing in 1905 by the Commonwealth Oil Corporation (COC). Sir George Newnes, as part of COC, chose a site for a new state of the art complex of mines, retorts and refinery and was given his name.

The success of Newnes' industry was dependent upon a railway line linking the town and refinery to the main western railway line. Henry Deane a chief engineer was engaged by COC to take charge of survey work and construction to get a railway through the harsh terrain. He commenced surveying in 1907 and after 13 months of construction had completed the 50 kilometres of track from Newnes Junction to Newnes.

Simultaneously, a town settlement was decided at Newnes due to it proximity to the western railway line. A road to and from Newnes via Lidsdale had also been constructed in 1897.

The construction of a large scale oil refinery also proceeded industrial works at Newnes, including coal and shale mining as well as brick works. The area contained the largest oil reserves in Australia and several shafts were sunk and adits driven. The works were operated by individuals, companies, receivers and a government body.

Oil shale work in Newnes opened in 1907 and for twenty years of intermittent success the Wolgan Valley sustained larger populations. Labour difficulties and fierce price competition forced the closure of the plant in 1927.

8.7.3 AboriginalArchaeology

Archaeological Significance

The Aboriginal archaelogogy report prepared by AMBS (*Appendix 9*) notes that Wolgan Valley is located in proximity to highly archaeologically significant portions of the greater Blue Mountains and Wollemi National Parks. Excavations in the 1950/1960s of the Capertee Valley near Glen Davis, approximately 20 kilometres to the north helped establish a greater antiquity for Aboriginal culture than had previously existed. The Capertee sites remain important today because they showcase a range of technological changes, which are continually being researched and debated. New archaeological information from the Wolgan Valley would play an important part in increasing our understanding of Australia's cultural heritage because it would be directly comparable with the Capertee information.

The rock-art of the Wollemi region has recently become internationally significant with the discovery of the superb art site known as Eagles Reach. This site is one of the best art sites in Australia and is extremely important to rock-art researchers, Aboriginal community and general public. Recent investigations within the Wollemi during the past four years have re-discovered over 200 art and occupation sites, which have vastly increased our understanding of Aboriginal culture in rugged and remote environments. In this light, several important rock-art sites are also found within 10 kilometres of the Wolgan Valley. Rock shelters in direct proximity to the proposed resort may also contain rock-art, but have as of yet not been investigated. Blackfellows Cave near Wolgan Gap, for example, is covered by handstencils and stencilled boomerangs and axes. Concentrations of rock-art sites are also found in the east near Mount Cameron and Galah Mountain and in the north within the Capertee Valley.

A search was conducted of the Department of Environment and Conservation Aboriginal Heritage Information Management Systems (AHIMS) records registered Aboriginal objects and places. An Aboriginal object is considered to be known if it is registered with AHIMS or it is known to the Aboriginal community or it is located during any investigation of the area. A search of AHIMS and consultation with Bill Allen from Bathurst Aboriginal Land Council regarding the prior history of the site found that the only known registered Aboriginal 'object' or 'place' located on or near the site is Glow Worm Tunnel in the Wollemi National Park, which contains aboriginal art.

Preliminary Archaelogical Assessment - Site Inspection and Findings

Australian Museum Business Services (AMBS) have undertaken a preliminary inspection of the site and their report is contained in Appendix 9. AMBS spent nine hours inspecting the property, primarily concentrating on the proposed development precinct and the proposed driveway route. However, due to the scale of the development, AMBS was able to inspect only 25% of the development precinct and a small portion of the remainder of the property. The findings of this partial site visit include four archaeological sites, all of which are located outside of the currently proposed development precinct. The following sites were identified:

1. **Wolgan Valley-AMBS 01 Easting: 239566 Northing: 6314374**

   This site is located in the southern arm of the property on the eastern side of Carne Creek approximately 1.8 kilometres south of the development precinct and 200 metres northeast of Carne Creek just above the 580 metre contour line. The site is situated in a large eroded area 30 metres north of a small westward flowing tributary. The site consists of one mudstone core. The site was found late in the day and poor lighting may have hampered the identification of further artefacts.

2. **Wolgan Valley-AMBS 02 Easting: 238593 Northing: 6317089**

   This site is located 100 metres north of the development precinct within cleared pasture which is part of the national park. The site is located on a flat elevated terrace just east of a small cluster of trees. The terrace extends some 50-75 metres towards the south. The site is approximately 200 metres east of Carne Creek and on the edge of the 570 metre contour. Artefacts were visible along the heavily eroded northwestern edge of the terrace, near an isolated sandstone boulder. The site consists of six mudstone flakes. Two artefacts were initially identified at this site late in the first day of survey and a follow-up inspection the next day in good light yielded four additional artefacts.

3. **Wolgan Valley-AMBS 03 Easting: 238081 Northing: 6316876**

   This site is at the northern tip of a low hill approximately 150 metres west of the Wolgan homestead. The hill is 100 meters southeast of the Wolgan River and 250 metres west of Carne Creek and is adjacent to the main homestead road. The site consists of three artefacts: one large basalt flake, one bipolar crystalline quartz flake and a heavily patinated mudstone flake. The artefacts were found eroding out of a sandy deposit approximately 565 metres in elevation.

4. **Wolgan Valley-AMBS 04 Easting: 237916 Northing: 6316615**

   This site is an artefact scatter located on the same hill as WV-AMBS 03. The site is situated along the southern side of an access road leading to a stockyard on the western side of the hill. The site consists of one mudstone flake and one bipolar quartz core. The artefacts were found eroding out of the side of the hill where it had been cut by the road at an elevation of 570 metres.

AMBS reported that it is likely that archaeological material exists within the development precinct, but was not visible due to the low effective visibility and the limited amount of time spent investigating the property. However, the results of the preliminary inspection indicate the visible presence of archaeological material on the site and within the adjacent national park. An archaeological synopsis of the property is as follows:

> *Artefacts are visibly present in low densities across the property where significant erosion has exposed the subsurface. It is possible that subsurface artefacts will be located across all portions of the property. The density and distribution of artefacts on the property will vary depending on geomorphic and cultural factors.*

The survey also identified deep stratified deposit at multiple locations across the property. This deposit is principally a combination of alluviums and ranged from 0.5-2.0 metres in depth. Deep deposits of alluvium have the potential to yield artefacts at substantial depths; such artefacts would not be visible during a surface survey. On average it was noted that the artefacts identified during the present survey appeared to emanate from 5 - 6 cm below the surface.

During the inspection it was noted that artefacts were apparent in virtually all significantly eroded areas, outside of the immediate creek line.

No eroded areas of significance were visible within the development precinct.

Further archaeological work is recommended including:

- Consultation and inspection with the Bathurst Local Aboriginal Land Council (BLALC) and other relevant Aboriginal groups is required in order that an Aboriginal heritage assessment of the property be completed; (Warwick Peckham chairman of the BLALC was contacted prior to the survey. Due to the tight timeframe, BLALC was unable to participate in the survey. Warwick has indicated that BLALC would like to participate in all future assessments. A copy of AMBS' initial advice will be forwarded to BLALC).
- In conjunction with Aboriginal community consultation, the proponent should undertake further intensive archaeological survey of the development precinct and targeted survey of the remainder of the property. This step is necessary to establish a more informed understanding of the archaeology of the property and will form the foundation of a predictive model (below);
- Generate a predictive model for the property. This will allow for an informed assessment of the areas of the property which do not currently exhibit archaeological material. For example, a predictive model will be able to ascertain the probability of archaeological material occurring in areas of the development precinct which exhibit a dense coverage of grass (effectively precluding an effective surface survey);
- The outcome of the predictive model will allow management of the identified archaeologically sensitive areas within the final design concept;
- Generate a detailed report outlining the Aboriginal community's views on the potential sociocultural impacts resulting from the development and detailing the potential scientific impacts on the archaeological significance of the property. This report will provide opportunities for conservation and management outcomes across the property.

Site Works

All proposed development areas will be subject to detailed archaeological test excavation to properly assess their scientific significance prior to the commencement of any work. Following the identification of all archaeological sites in the development areas, the siting plan will be revised to avoid the placement of buildings or works in the location of identified sites. In the first instance, every effort will be maintained to conserve the scientific and cultural significance of identified sites. If preservation of identified sites is not warranted or practicable, the sites will be salvaged to ensure that a proper record is obtained, or a Section 90 permit from NPWS may be sought to destroy sites of low scientific or cultural significance.

While any identified or salvaged relics will remain the property of the local Aboriginal people, it is intended to seek arrangements with those people for the display and interpretation of such relics within the development where appropriate.

8.7.4 Non-Aboriginal Archaeology

Should non-Aboriginal archaeological relics be located in proposed development areas during construction it is proposed that no disturbance or excavation of the relic will occur without an Excavation Permit, in accordance with Section 140 of the Heritage Act.

8.7.5 Natural and Cultural landscapes

The environmental rehabilitation of much of the site will reconcile its landscape quality with that of its natural surrounds. Retention of the wattle and daub hut, the slab house, associated out buildings and an associated area of remnant pasture will recognise the non-indigenous cultural heritage of the site and locality.

The adoption of a very low density and low key architectural style will allow the proposed new buildings to sit discreetly within the landscape, such that they will have a minimal visual impact upon the existing natural and cultural landscapes.

8.7.6 Land use history of Wolgan Valley

While the brief period of mining activity in the early 20th century has long since ceased, the original grazing purposes for which the valley was first developed remains. However, in some cases this has become a 'lifestyle' activity supported by significant off-farm income, rather than a financially viable and employment generating occupation in itself. It is also an activity that has resulted in considerable adverse environmental effects associated with land clearing and erosion of the banks of the Wolgan River and Carnes Creek.

While the proposed development will displace the historic grazing use, remnant buildings and pasture areas will maintain a clear reference to it.

Given the proximity of the site to Australia's principal international city, and the GMBWHA, the impact of displacing the existing grazing use must be considered in the context of the broader socioeconomic and environmental benefits of the project.

8.7.7 Remnants of the mining history of Newnes/Wolgan Valley

The mining history of the Wolgan Valley is centred around the former township of Newnes. No remnants of this history are located on the site. While the remnant Newnes railway line passes close to the eastern boundary of the site, no aspect of the proposed development will have any impact upon it.

8.7.8 Conservation Management Plan and Draft Heritage Impact Statement

A Conservation Management Plan is the preliminary stages of preparation by Conybeare Morrison. The following commentary is based upon a preliminary Draft Heritage Impact Statement prepared by Conybeare Morrison.

Natural Heritage – Scenic Qualities

Wolgan Valley, a narrow valley which runs from the south-west to the north-east is about 28km long. The Wolgan River flows through the valley which is mostly enclosed by an almost vertical sandstone escarpment. The entrance to the valley through the Wolgan Gap is sudden and spectacular. After the steep descent into the valley the road winds along the valley floor, often beside the Wolgan River featuring water worn boulders and great river oaks. A considerable portion of the valley floor has been cleared and is used for grazing.

The Wolgan Valley comprises the surrounding natural landscape of the National Parklands. The cultural landscape represents 170 years of pastoral occupation on the site. European settlement brought agricultural and pastoral uses and the landscape changed to vast cleared pastoral grasslands on the lower slopes and creeklines. Remnant stands of native trees in the cleared pastoral areas will be retained.

The scenic quality associated with the extreme contrast between peaceful, protected valley and massive surrounding walls of the escarpment will be retained in future development as proposed in the Concept Plan and is unlikely to reduce that association. Proposed environmental rehabilitation will be combined with retention of the existing associated open pastureland. It is proposed this will balance the ecological values of the Wolgan Valley with the cultural values associated with the current use of the site.

Early settlement of the Wolgan Valley - James Walker

The isolation of the homestead is an important association of the early pastoral settlement. This historic significance should be interpreted for visitors to the proposed resort. It is proposed in the Concept Plan that the wattle and daub hut, located on the site away from the main Homestead Group be retained, stabilised and interpreted to provide an understanding of the isolated nature of the site and the rustic, austere lifestyle of the early settlers.

There is also a Grave Headstone located near the site and will not be affected by development.

NSW State Theme Pastoralism

Historically, the site has accommodated activities associated with the breeding, raising, processing and distribution of livestock for human use. The Concept Plan proposes that the use of the site as a pastoral landscape be interpreted and that the physical pastureland be retained as a cultural landscape element. It is proposed that regular mechanical slashing will be undertaken to assist in the retention of intact pasturelands and thereby allow proposed visitors to appreciate this historic use.

While the proposed development will displace the historic grazing use, remnant buildings and pastureland will be retained and their former use interpreted. Given the proximity to the recently declared GBMWHA, the impact of displacing the existing grazing use must be considered in the context of the broader socio-economic and environmental benefits.

The Homestead Group

The following remain on site:

- The remnant wattle and daub hut will be stabilised and preserved. In view of its size and very fragile condition, no adaptive reuse is envisaged. Essentially the mud brick hut will be preserved as an historic ruin.
- The slab house homestead will be retained within the garden curtilage defined by existing fences. It is envisaged that the slab house homestead will be utilised as a museum, library or the like, depending upon the consistency of functional requirements with its fully considered heritage values and subject to separate approval.
- The 1957 homestead is of little architectural merit and is proposed to be recorded and demolished. However, should further investigation establish that this building should be retained, this would not be precluded by the Concept Plan.

It is thought that the early wattle-and daub single-roomed building was the earliest accommodation on the site. The Homestead Group is strategically located at a T-intersection, the junction of two rivers. The location was possibly chosen because of its vantage point with visual surveillance to what would have been access routes through the valley. The early date of the slab house suggests it to be one of a rare group of intact homestead buildings in NSW possibly dating to the 1820s.

The slab house comprises a six-roomed timber slab-construction set on a stone base, with a shingle roof (covered in corrugated metal sheeting). A verandah is located on the southern elevation facing the river. Stone chimneys are located on the either end of the building. The only visible remnant of the kitchen is the freestanding stone chimney. A later addition, known as a ballroom, is located on the northern end of the building. Exotic plantings, possibly she-oaks, are located in close proximity to the Homestead. The Concept Plan includes retention of the slab house with the possibility of future adaptive re-use for a resort-associated purpose. It is proposed that a Conservation Management Plan be prepared to guide the future management of the Wolgan Homestead Group.

Slab-constructed outbuildings in structurally poor condition are located in close proximity, immediately south of the homestead. Although, not yet identified, the slab-constructed outbuildings possibly include a chicken shed, stables, cold store and privy. While some of these buildings are in a near-ruinous condition the Concept Plan recognises there is an opportunity to possibly conserve and interpret their former use.

Several remnant early cultural plantings of oak and fruit trees are located within the homestead precinct. The preparation of a Wolgan Homestead Group Conservation Management Plan will identify the style and type of cultural plantings on the property and give recommendations for appropriate future plantings.

Currently the Homestead Group is in poor condition. No funding has been put into the maintenance of the buildings and they continue to fall into disrepair. The Concept Plan proposes the retention of the slab house, some associated outbuildings, cultural plantings and a significant percentage of the pasturelands. The stabilization, conservation and adaptive re-use of the Homestead Group would have a positive heritage impact on the place.

Homestead Group Curtilage

While the significance of the place has not as yet been thoroughly assessed the visual connection along the access routes through the valley would be an association of the significance of the place. It is expected that unobstructed vistas from the homestead along the access route of the valley floor would be significant and should be retained. The curtilage assessment would define important views into, within and out of the valley that development needs to consider and respond to. It is recommended that visual connections with the river and primary access routes through the valley should be retained. The Concept Plan has ensured this be the case. A Preliminary "Reduced Heritage Curtilage" for the Homestead Group has been prepared. Conservation of the Homestead Group would occur within this curtilage in accordance with a Conservation Management Plan (currently being prepared). In addition the curtilage study would consider smaller heritage items in the valley and subject land to establishing a curtilage and visual setting to define and protect those items from any proposed development.

The proposed reception and conference centre development is located across the river, opposite the Wolgan Homestead Group. While these are within the visual catchment of the Wolgan Homestead, the distance is sufficient to not impact negatively on the heritage significant Homestead Group. Visitors will be able to appreciate the isolation of the homestead from a relative distance. Care should be taken to ensure the scale of the Proposed Reception does not overwhelm the Homestead Group.

It is proposed a Spa Centre be located close to the homestead. In order to retain significant views and vistas from the homestead to the Wolgan Valley and sandstone escarpment, the Spa was located back from the homestead alignment with a homestead drive separating the two buildings. It is proposed the single-storey Spa conceptually be treated as traditional farm outbuilding pattern, with careful consideration given to bulk, scale, materials and location so that this is "read" in the design intent of the proposed Spa.

Proposed villas will be located outside the Reduced Heritage Curtilage of the Wolgan Homestead Group to reduce the heritage impact of this development. It is proposed that villas be small in scale, low density, vernacular architectural style within an open space setting to reduce their impact on the site as a whole. It is proposed the villas sit within the landscape, minimising the visual impact on the existing natural and cultural landscapes.

Some remnant timber fences remain on the site. Identification of the phase of development has yet to be determined, but consideration is given to retention and interpretation of enclosure and outbuildings and their uses. This would provide evidence of the working nature of the homestead which would further add to its interpretation.

Natural and Cultural Landscapes

The Wolgan Valley comprises the surrounding natural landscape of the National Parklands and the cultural landscape representing the 170 years of pastoral occupation on the site. With European settlement bringing agricultural and pastoral uses, the landscape changed to vast cleared pastoral grasslands on the lower slopes and creeklines. Remnant stands of native trees in the cleared pastoral areas will be retained. It is proposed that the existing balance of pastoral cultural landscape and indigenous vegetation be retained in the concept plan. The retention of this balance would be a positive heritage impact.

Recreational Values of Wolgan Valley

Various sites of cultural interest are located within Wolgan Valley. The applicant proposes to retain and interpret these sites for the benefit of guests of the proposed resort and the public generally. The valley and adjacent National Parks provide a range of recreational camping, hiking, canyoning and similar activities that are accessed via Wolgan Road. The subject site is private land on which such activities do not occur. The proposed development will not limit any existing recreational uses within the valley, or any existing access.

8.7.9 Greater Blue Mountains World Heritage Area

The site is also adjacent to the Greater Blue Mountains World Heritage Area. The heritage significance as described by the Department of Environment and Heritage provides the official values as:

- outstanding examples of on-going evolution as the area provides examples of ecological and biological processes significant in the evolution of Australia's highly diverse ecosystems and communities of plants and animals
- important habitats for conservation of biological diversity (including the eucalypts and eucalyptus-dominated communities)

The area is a complex and scenically impressive array of geological landscapes. As well as the flora and fauna characteristics the area has important cultural associations with indigenous cultures and in the history of western colonisation and development.

As detailed under separate headings, the project has been designed to minimise impacts upon natural systems and processes. The proposed removal of livestock and feral animals, and the use of the majority of the site for environmental rehabilitation will enhance the long term viability of the significant ecological and biological processes of the GBMWHA.

It will extend the potential range of significant species and communities within the GBMWHA, and extension of the natural landscape vegetation across a large part of the site will enhance its natural landscape and scenic character and significance.

The combination of environmental rehabilitation with the retention of all heritage buildings, a remnant area of associated open pasture and any identified archaeological relics will balance the ecological values of the site and its aboriginal and non-indigenous cultural values.

In recognition of the historic association of the proposed development area as the focus of human activity, the resort will be focused around the same precinct, such that the slab house will be an integral part of the resort, rather than an isolated museum or ruin. While substantial areas of the site will be revegetated for ecological rehabilitation purposes, a substantial area of open pasture will be retained around the development area, thereby maintaining the existing scenic character of the valley, and in reference to the historic use of the site for cattle grazing. However, cattle grazing will be progressively phased off the site completely in view of their inconsistency with natural ecological processes. The proposal will extend the potential range of significant species and communities within the GBMWHA and enhance the natural landscape and scenic character and its significance.

The environmental rehabilitation of much of the site will reconcile its landscape quality with that of its natural surrounds. Retention of the existing Wolgan Homestead, associated out buildings and an associated area of remnant pasture land will maintain reference to the non-Indigenous cultural heritage of the place. The project will not prejudice any of the existing scenic values of the Wolgan Valley or Greater Blue Mountains.

8.8 Soil Quality

Douglas Partners have prepared a Geotechnical Investigation Reportfor the site which examines issues of soil quality (submitted as a separate report). The site's soil composition and characteristics are summarised as:

- The site is mainly underlain by alluvial and colluvial deposits which mantle siltstone and sandstone of the Berry Formation. Five soil landscapes are present over most of the site and these are characterised by soils that are typically of very low or low fertility and high to extreme erosion hazard.
- There are no acid sulfate soils or potential recorded on the site.
- Testing indicates that non-saline conditions can be expected in the near-surface soils. Localised very saline conditions can be expected in subsoil in the eastern section of the resort site.
- Permeameter tests and inferred permeability values from laboratory testing indicate that the clayey and silty alluvial and colluvial soils overlying have "poor" drainage characteristics.
- Free groundwater was encountered in several test pits during excavation while collapsing conditions at some alluvial sites precluded observation of any water table. Groundwater observations and water quality measurements have been recorded and form part of the Douglas Partners report and include the depths of groundwater across the test pits ranging from 1.8m to 5.1m.
- A Phase 1 environmental soil assessment indicates that the site had been used primarily for grazing purposes and that potential contamination, if present, will probably be limited to discrete areas, mostly within the farm house and machine shed compounds. The report identifies 14 areas of environmental concern (AEC) that have the potential for contaminants and are limited to areas around the main residence and associated building, storage and machinery sheds, cattle holding yards, domestic garbage tip and a small paddock south of the main house.

Based on the findings of the Phase 1 Environmental Site Assessment and as the land has been zoned to permit commercial/recreational development, it is recommended that investigations comprising intrusive sampling and analysis are carried out, focusing in particular on each of the identified AEC areas to confirm the suitability for the proposed land use.

The main existing limitations to development of the site are considered to be erosion potential of both hillslopes and river banks, together with localised areas of slope instability.

Potential erosion and sedimentation impacts of the proposed works and construction activities, particularly on nearby watercourses have been considered. Accordingly, stormwater concept plan and erosion and sediment control plan are provided with the submission. During the construction phase, works will be phased such that the agents of erosion are minimised at any one time. Necessary measures will be adopted as may be necessary for erosion control, including the following, where applicable:

- Staging: Staging of operations (eg. clearing and stripping)
- Restoration: progressive restoration of disturbed areas
- Drains: temporary drains and catch drains
- Dispersal: diversion and dispersal of concentrated flows to points where the water can pass through the site without damage
- Spreader banks: or other structures to disperse concentrated silt traps
- Construction and maintenance of silt traps to prevent discharge of scoured material to downstream areas
- Temporary grassing: or other treatment to disturbed areas (eg contour ploughing)
- Temporary fencing

Stormwater Management and Erosion Control drawings, prepared by TTW, are included in the civil dawings in *Appendix 10*.

8.9 Noise Impacts

Bassett Acoustics have prepared an Acoustic Assessment of the proposed resort and its associated activities (*see Appendix 5*). The assessment considered:

- Traffic noise generated by the development and internal traffic noise within habitable spaces.
- Environmental noise emission from the mechanical services associated with the development
- Assessment of construction noise and traffic generated by the construction of the development

General recommendations are contained in the report to ensure environmental noise emission from mechanical services and the operation of the development does not exceed the relevant EPA criteria.

The report concludes that standard noise control methods will be sufficient to ensure compliance with the environmental noise criteria at the most affected residential property boundary.

Traffic generated by the development both during construction and operating has been assessed and found to comply with the relevant requirements of the DEC ECRTN. Both the existing and the future maximum predicted traffic flows are comfortably below the traffic noise criteria of 55 dB(A) and 50 dB(A).

Helicopter access to the site will be limited to four flights a week and will follow the main road from Penrith to the site. Four flights a week is considered to be too infrequent to be a significant source of annoyance provided that flights are restricted to daytime only. No recreational flights are proposed.

There are no acoustic site conditions that would preclude the proposed development from complying with the relevant noise criteria. Environmental noise emission from the site will be controlled at all neighbouring residential premises, existing and proposed, by standard noise control techniques.

8.10 Visual Impacts

The visual impacts of the project have been considered by CONTEXT, who have prepared the following assessment.

8.10.1 Existing External Views into the Site

With the majority of the site being an enclosed valley surrounded by sandstone escarpments, views into the site are limited to the area adjacent to Wolgan Road and a small part of the narrow entry gorge.

The views from Wolgan Road adjacent the site are limited by the foothills of Donkey Mountain to the south and the Wollemi National Park sandstone escarpment to the west of the site. The existing riparian vegetation along Wolgan River also limits views into the site.

8.10.2 Existing Internal Views

The views within the site are generally along the main east-west valley and southern north-south valley, terminated by dramatic sandstone escarpments and vegetated foothills of the surrounding National Parks. Key escarpment views are to Donkey Mountain to the north, outcrops of Sunnyside Ridge including Wolgan Pinnacle, Cape Pinnacle to the south, Cape Horn to the west and an un-named ridge of the Wollemi National Park to the east.

The slightly elevated positions on the cleared foothills around the site provide views to the valley landscapes. The cleared landscape of the valleys ensures clear views around the site.

Similar to the external views, views out of the site are limited to the area to the north east of the site near Wolgan Road.

8.10.3 Visual Impact

Development on the site will occur in two locations and will consist of a built environment within a managed landscape.

The Resort site comprising scattered low villas have been located to nestle into the slopes of the foothills and valley floor. The spa has been located adjacent to the Creek and existing riparian vegetation to reduce the impact of this larger building. The scattered tree and shrub landscape proposed for the Resort and the riparian revegetation proposed for Carnes Creek will mitigate the visual impact of the resort when viewed from the western side of the main valley. The buildings architecture and materials will be designed to respond to the colours and textures of the site and blend into the surrounding landscape. The Resort will not be visible from outside the site.

The Staff Accommodation, maintenance faciities etc have been located on the eastern side of Wolgan River and will be planted with indigenous trees and shrubs. As the main entry road is on the eastern side of the river, the proposed riparian revegetation to Wolgan River will screen the Manager's Accommodation from guests entering or leaving the site. The building will be viewed by people using the service road, although the plant screening will reduce its visual impact. The Manager's Accommodation will not be visible from outside the site.

8.10.4 Night Lighting

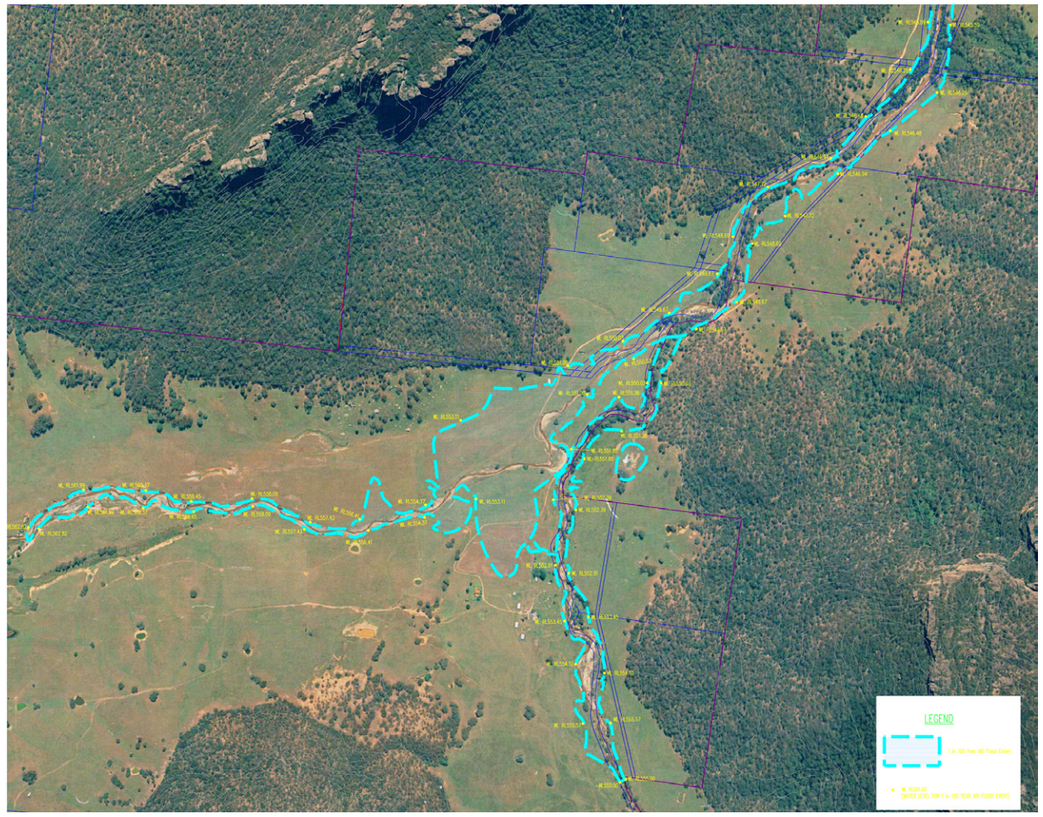
The design of the external lighting in and around the resort development will respect the surrounding wildlife, ecology and landscape character allowing maximum exposure of the night sky. Guests can therefore appreciate the southern hemisphere astrology and wildlife will not be adversely impacted by external lighting and will be encouraged within the site.

The lighting design intent for the development will be to:

- Provide effective levels of light for the safe movement of quests and staff within the accommodation area.
- Minimise the impact of light on surrounding areas.
- Minimise light spillage into the atmosphere.
- Ensure that the night sky view is a feature of the development by controlling all light sources that impact on this experience.
- All lighting will be directed downwards and mounted at low level wherever possible.
- Provide energy efficient lighting system by utilising efficient light sources and lower the lighting levels below the recommended Australian Standards while maintaining safe movement.
- The entrance lighting will be understated while providing a suitable level for security identification.
- The entry roadway leading from the entrance to the resort will not have any lighting.
- The external walkways between the villas and main resort buildings will be mounted at low level.
- Feature and garden lighting will be restrained.

8.11 Flooding and Drainage

The site is characterised by two creek lines, the Wolgan River and Carnes Creek, creating a broad, undulating valley. Carnes Creek joins the Wolgan River, heading in a north easterly direction. The broad valley then closes in a gorge cut out of the sandstone cap. The Wolgan River eventually joins with the Capertee River to drain to the Colo River, part of the Hawkesbury-Nepean Catchment.



1 in 100 Year Flood Level : Prepared by TTW

The current flow in the Wolgan River is artificially high throughout the year because of discharges of mine water from the Springvale Colliery. The Department of Environmental and Conservation has advised that the mine water will be re-directed to the Wallerawang power station for industrial use later this year. Levels of flow in the river will then return to its natural flow.

The Department of Infrastructure, Planning and Natural Resources categorises the watercourses on the site as Category 1 - an Environmental Corridor. Their guidelines provide a minimum width, to achieve this riparian category, of 40 metres along both sides of the watercourses or to the extent of remnant native vegetation, whichever is the widest, plus a 10 metre wide vegetated buffer.

The existing catchment is 18,525 hectares of primarily bushland escarpment which flows through Wolgan River and Carne Creek. The site is affected by the 1 in 100 year flood level. Consequently, the site has areas of localised flooding on either side of the Wolgan River and Carnes Creek with the most affected area of flooding contained upstream of where the two streams meet.

The owners of the property reported that there have been previous major floods events in 1990, 1986 and 1978. The last flood washed away the bridge link from the access road to the existing house site.

The Flood Risk Assessment prepared by Taylor Thomson Whitting (*see Appendix 4*) has investigated the extent of inundation caused by the 1 in 100 year average recurrence interval (ARI) and how such a flood event can safely pass through the development. In the development area of the site however, it is recommended that for buildings and designated egress routes the minimum freeboard above the 1 in 100 year ARI flood level calculated, adopt the following freeboard (mm) levels:

- Building's habitable floor levels – 500mm
- Major and access roads – 300mm
- Bridge decks – 300mm
- Footpaths – 150mm
- Car park entrances – 150mm
- Any non-habitable structures – 150mm

TTW Engineers have undertaken a catchment analysis to determine the flow regime along the creek system. A rainfall model has been prepared for the catchment and analysed to determine the peak discharges for the 2, 5, 10, 20, 50 and 100 year storm events.

The analysis found that the ground levels for the proposed development structures will be above the 1 in 100 year storm event flood levels. An escape path will be provided through the road network from the proposed development to Wolgan Road for storm events up to the 100 year flood.

Overland flow paths will be provided between and around the proposed buildings of the development to ensure nuisance ponding from minor flow path drainage in major storms is minimised.

The Flood Risk Assessment provides the following conclusions and recommendations:

- The proposed development will not restrict flow through the Wolgan Valley property or make the existing flow regime any worse for downstream properties.
- The proposed building layout will not be affected by the 100 year flood event.
- The hydraulics results show that the Q100 is able to be safely conveyed by the Wolgan River and Carne Creek without any impact on the development area.
- In the event of the 1 in 100 year storm the proposed development will be above the 100 year flood levels with freeboard at rages between 0.15m- 0.5m.
- Flood escape routes are provided by the road network for the proposed development to Wolgan Road for the 100 year Flood event.

Stormwater drainage includes all bridges, stormwater culverts, pipe work, and overland flow paths. The stormwater drainage system is designed to protect all buildings and the environment from damage from stormwater and floodwater.

Stormwater drainage outlets and culverts shall be positioned to prevent water ponding outside the building or on roads or paved areas.

The design will, in the event of blockage or other failure of the stormwater system, divert water from building entrances by providing escape over adjoining paved or ground surfaces in the manner of the major/ minor system recommended by "Australian Rainfall and Runoff".

8.12 Electricity, Gas and Telecommunications Utilities

8.12.1 Electricity

Electrical supply is approximately 14 kilometres south of the site and is operated by Integral Energy. Integral Energy has been approached regarding the provision of a permanent electrical supply to the site. A coordination meeting was held on the 24th May with Integral Energy to introduce the project and make contact with the relevant parties.

The provision of electrical supply to the site is achievable by extending the existing overhead line along Wolgan road to the site entrance. A power inquiry / preliminary application has been submitted for a 1.5MVA supply to service the site and Integral Energy are currently assessing the information and will be compiling a proposal for supply in due course. The contact person at Integral Energy who is overseeing this project is Ray Skinner (Tel: 02 9853 6570). Integral Energy will also reticulate power within the site and provide substations in suitable locations.

The main supply cable will be run underground from the site entry point to each of the substations. It is anticipated that there will be pad-mounted type substations positioned at the two main load centres of the development. Integral Energy has confirmed that the supply will be of "rural" quality and its reliability will not be good as the line is a long spur feed off the Lithgow grid system. Due to the anticipated low reliability of supply the development will have gas powered generating sets to provide electricity in the event of supply disruptions.

The application of solar power has been investigated. It was concluded that due to the size of the proposed development and anticipated electrical demand that it is not feasible to have a stand alone solar power system to provide all of the site's electricity needs. A grid connect system is the most feasible option.

The application of electricity or other energy sources are for space heating, water heating and lighting.

The villas, main building, spa building, conference centre, staff accommodation facilities, maintenance facilities and stables will provide a solar hot water system with gas booster. Panels to be located on the roof of the buildings and storage tank located in a plant room or under the villa.

The following active and passive environmental control system shall be considered for each of the different facilities and are discussed further in the Indoor Environmental Control Systems Report prepared by *Bassett Consulting Engineers* (*see Appendix 5*):

- Cavity Floors or Labyrinths
- Solar Chimney
- Geothermal Ground Source Heat Pump
- Mixed Mode System / Air Conditioning & Natural Ventilation
- Mechanical Ventilation to kitchens, toilets and miscellaneous rooms
- Water features to provide passive evaporative cooling
- In-slab hydronic heating and cooling
- Geothermal Heat Pump VS. Gas Heating
- Solar Pool Heating

8.12.2 Geothermal

The proponent is considering the use of geothermal systems. Geothermal air-conditioning and heating systems provide space conditioning. The system works by moving heat from the space to or from the earth to provide cooling or heating. Every geothermal system has three sub-systems:

- *Geothermal heat pump*

  The Geothermal heat pump moves heat between the space and the fluid in the earth connection. The heat pump is typically packaged as a single unit and can be either concealed within a ceiling, under floor or cupboard void. This unit consists of a refrigerant compressor, fluid-to-refrigerant heat exchanger and controls. The Heat pump is generally contained together with the air distribution system.

- Earth connection

  The earth connection transfers heat between the fluid and the earth.

- Air distribution system

The air distribution system is used for delivering heating or cooling to the space.

Each system may also have a desuperheater to supplement the building's water heater to meet a portion of the building's hot water needs in the form of free heating.

The Geothermal Air-Conditioning system comprises of the following equipment:

- Floor or ceiling Mounted Water Source Geothermal Heat Pumps
- Geothermal Water Pipework system within the building
- Geothermal Primary Pumps
- Vertical Ground Loop Heat exchanger with all of the associated vertical ground loop piping

8.12.3 Gas

The site currently does not have gas services available.

Gas supply will be provided by a bulk storage tank located adjacent to the maintenance facility and reticulated to individual resort buildings to supply solar hot water boosting, kitchen cooking, space heating and boosting of the geothermal pool and spa heat exchange systems.

8.12.4 Telecommunications

The site is currently serviced by a landline telephone and is at capacity for the existing residents of the Wolgan Valley. No mobile phone coverage is available in the Valley.

An application for telephone and communications has been submitted to Telstra Country Wide who are currently investigating the options for the site that the Emirates could consider. Standard overhead lines can be extended along Wolgan Road to the site to provide these services. Alternative solutions are also being investigated for future consideration. It is anticipated that the resort will have a satellite telephone in the case of emergencies and if the overhead lines are out of order.

8.13 Helicopter Operations

The proposed helipad is located internally within the site, away from surrounding properties. It will accommodate a maximum of four movements per week, and will be a set down only facility. That is, helicopters will not be permanently stored at the helipad, and the only fuel storage will be the existing Rural Fire Service storage, which is maintained for use during bushfires. The proponent does not propose the use of helicopters for recreational flights.

While the final route is not yet determined, the flight path will be determined after consultation with the relevant authorities, but will avoid flying over the adjoining World Heritage Area and is likely to follow Wolgan Road and the Great Western Highway back to Sydney Airport.

8.14 Waste Management (Solid Waste)

Each villa will be provided with separate receptacles for the disposal of recyclable material (paper, glass, PET and metals), putrescible material and general waste. These receptacles will be collected daily from each villa by resort staff using an electric buggy to transfer the waste and recyclables to the maintenance building, where is will be stored for collection by Council, or a commercial operator, who will dispose of it at a licensed waste disposal/recycling facility.

Commercial waste from the restaurant, spa, conference centre etc will be stored within dedicated storage rooms in each facility respectively and transferred daily to the central waste storage facility in the maintenance building for collection by Council, or a commercial operator, who will dispose of it at a licensed waste disposal/recycling facility.

Specific wastes, such as restaurant grease traps or any skin penetration associated with spa treatments, will be managed and disposed off in strict accordance with Lithgow Council's standard health conditions.

Landscape waste from ongoing maintenance will be mulched and reused for landscaping purposes on-site, wherever practicable and consistent with adopted Bushfire, Landscape and Habitat Management Plans.

8.15 Agricultural potential

Lithgow City LEP 1994 defines prime crop and pasture land as:

> *"Land within an area identified, on a map prepared by or on behalf of the Director-General of the Department of Agriculture deposited in the office of the Council, as Class 1, Class 2 or Class 3 or as land of merit for special agricultural uses, but does not include land which the Director-General has notified the Council in writing is not prime crop and pasture land for the purposes of this Plan".*

The Agricultural Suitability Classification Map for the City of Lithgow was prepared by The Department of Agriculture in July 1983. On a scale of 1 to 5, with 1 being the highest class of agricultural potential, the map identifies the site as predominantly Class 3, with fringing foot slopes as either Class 4 or 5. Class 3 is described as:

> *"Land not suited to continuous cropping or intensive horticulture but with capability for agriculture and well suited to grazing. Can be cultivated for an occasional cash crop or forage crop in conjunction with pasture management"*

While the land is classified as 'Category 3', and therefore technically constitutes 'prime agricultural land', the loss of the agricultural potential of 1,099 ha of marginally 'prime' Category 3 land must be balanced against the broader economic, employment and tourism benefits of the proposed development to Lithgow, and the ecological benefits to the Greater Blue Mountains World Heritage Area. While the proposed development will have an adverse impact upon the agricultural potential of the locality, this is not unreasonable in the context of the significant ecological and economic benefits of the project.

8.16 Recreational Impact

None of the identified recreational attractions of the Wolgan Valley exist on, are or accessed via the site.

The only potential impacts on the recreational values of the valley relate to increased visitation of the specific attractions of the valley (e.g. the Newnes ruins and Glow Worm tunnel) and changes to the scenic quality of the valley enjoyed by bushwalkers and other visitors.

With regard to increased visitation to the specific attractions of the valley, such visitation will be managed by trained guides with a vested interest in conserving and enhancing the physical condition and special ambience of those attractions. With regard to impacts upon the scenic quality of the valley, as discussed at Section 8.10, all proposed works have been designed to blend sympathetically into the existing landscape, and environmental rehabilitation works will enhance the existing scenic qualities of the valley. None of the preposed buildings will be visible from outside the site except from at a considerable distance from the top of the surrounding sandstone plateaus.

8.17 Social and Economic Impact

The proposed development represents a substantial investment that will generate significant local employment and an ongoing contribution to in both the local and State economies. In addition to significant employment in the construction phase, the proposed development will generate ongoing employment in the operation, maintenance and servicing of the resort. Specifically, the resort will generate employment in the following areas:

- Direct employment of hospitality, management and maintenance staff;
- Employment of local aboriginal people as interpreters/guides of the aboriginal culture and ecology of the locality.
- Indirect employment in surrounding businesses providing local produce and contract maintenance services.

The resort will also enhance the international profile of the World Heritage Values of the Greater Blue Mountains, and the perception of the Blue Mountains, Sydney and NSW generally as a world class tourist destination.

In addition to the direct contribution of employment and indirect spending in the local economy, the resort will attract very high value tourism to NSW and the State economy.

Being very high value (i.e. 6 Star), but very low density (almost 40ha per villa), the resort optimises economic benefits to the locality and the State, while minimising direct social impacts upon the local community. Being a relatively self contained retreat isolated from the rest of the valley by Donkey Mountain, the resort will be barely perceptible from the surrounding locality, such that the locality will derive optimum economic and employment benefits, with minimal social impact.

8.18 Future expansion of settlements in the locality

The site is within an isolated and physically constrained valley surrounded on all sides by World Heritage listed National Parks, and separated from Wolgan Road by Donkey Mountain. Being limited to 40 cabins and associated facilities, the proposed resort therefore does not create the potential for future incremental growth of a new settlement, or compromise any existing surrounding settlement.

9 Draft Statement of Commitments

Prior to the commencement of any works, the proponent will be required to obtain separate approval for the design of all proposed buildings, landscape and drainage works, roads and structures. In addition, the proponent commits to prepare the following management plans for subsequent approval and implementation in association with the project.

- **Remediation Action Plan (Contamination)**

Full investigation and testing of areas of environmental concern and preparation of a Remedial Action Plan in accordance with:

– State Environmental Planning Policy 55 - Remediation of Land

– Managing Land Contamination: Planning Guidelines (prepared by Planning NSW and EPA).

- **Ecological Rehabilitation Plan**

A plan of erosion stabilisation works, native revegetation and species management prepared in accordance with:

– NSW Fisheries (1999) Policy and Guidelines – Aquatic Habitat Management and Fish Conservation

– NSW Fisheries Fish Passage Requirements for Waterway Crossings (NSW Fisheries 2003)

– Administrative guidelines of the EPBC Act

– Plans of Management for the Gardens of Stone National Park and the Greater Blue Mountains World Heritage Area (NPWS)

– DIPNR guidelines regarding:

  - *Watercourse and Riparian Area Planning, Assessment and Design (V4 Draft)*
  - *Watercourse & Riparian Zone Rehabilitation Requirements*
  - *How to prepare a Vegetation Management Plan*
  - *Design and Construction of Paths and Cycleways along Watercourses and Riparian Areas (V2)*
  - *How to Collect Native Plant Seed Responsibly (V1)*

– Management actions contained in Final and Draft Recovery Plans for threatened fauna species prepared under the TSC Act (eg Yellow-bellied Glider; Large Forest Owls)

– Any relevant management guidelines for native wildlife prepared by DEC.

Specifically, the plan will include management strategies for the following species:

Mammals:

- Common Wombat *Vombatus ursinus*
- Yellow-bellied Glider *Petaurus australis*
- Spotted-tailed Quoll *Dasyurus maculatus*
- Koala *Phascolarctos cinereus*
- Squirrel Glider *Petaurus norfolcensis*
- Large-eared Pied Bat *Chalinolobus dwyeri*
- Eastern False Pipistrelle *Falsistrellus tasmaniensis*
- Eastern Bent-wing Bat *Miniopterus schreibersii oceanenis*
- Greater Broad-nosed Bat *Scoteanax rueppellii*

Birds:

- Glossy Black Cockatoo *Calyptorhynchus lathami*

- Powerful Owl *Ninox strenua*
- Sooty Owl *Tyto tenebricosa*
- Brown Treecreeper *Climacteris picumnus*
- Speckled Warbler *Chthonicola sagittata*
- Diamond Firetail Finch *Stagonopleura guttata*
- Gang Gang Cockatoo *Callocephalon fimbriatum*
- Swift Parrot *Lathamus discolor*
- Regent Honeyeater *Xanthomyza phrygia*
- Square-tailed Kite *Lophoictinia isura*
- Turquoise Parrot *Neophema pulchella*
- Barking Owl *Ninox connivens*
- Painted Honeyeater *Grantiella picta*
- Black-chinned Honeyeater (eastern subsp) *Melithreptus gularis gularis*
- Hooded Robin *Melanodryas cucullata*
- Grey-crowned Babbler (eastern subsp) *Pomatostomus temporalis temporalis*

Invertebrates:

- Giant Dragonfly *Petalura gigantea*
- The Bathurst Copper Butterfly *Paralucia spinifera*

- **Feral Animal Management Plan**

Preparation of the Feral Animal Management Plan will be undertaken in consultation with NSW Agriculture and the Rural Lands Protection Board, and with DEC and landowners of other neighbouring properties, to ensure a collaborative approach that is likely to result in more effective long-term reductions in local and regional feral animal populations.

The Feral Animal Management Plan will be prepared in accordance with:

- Feral animal management policy and guidelines prepared by NSW Agriculture, the NSW Pest Animal Council and the National Feral Animal Control Programme
- Control guidelines for pest species (eg rabbit, feral pigs, wild dogs) declared under the Rural Lands Protection Act 1998, issued by the Rural Lands Protection Board
- Management guidelines outlined in Threat Abatement Plans for feral animal species attributed Key Threatening Process Status under the TSC Act and the EPBC Act (eg the Red Fox)
- Management guidelines for specific feral animal species listed in Final or Draft Recovery Plans (prepared under the TSC Act) for threatened fauna species of relevance to the site
- DEC regional Pest Management Strategies and feral animal management plans for adjoining National Parks
- Regulations and controls for pesticide use pursuant to the NSW Pesticides Act 1999.

- **Noxious Weed Management Plan**

A management plan will be prepared for noxious weed species including Serrated Tussock, African Love Grass, Blackberry, Nodding Thistle, Scotch Thistle, Sweet Briar, Wild Radish and Willow.

The preparation of the Weed Management Plan will be undertaken in consultation with NSW Agriculture, and with DEC and landowners of other neighbouring properties, to ensure a collaborative approach that is likely to result in more effective long-term reductions in local and regional weed populations.

The Weed Management Plan will be prepared in accordance with:

- The NSW Noxious Weeds Act and prescriptions for management of relevant species on site
- Weed management guidelines prepared by NSW Agriculture
- DEC regional Pest management Strategies
- Existing weed management plans for adjoining National Parks
- Management guidelines for weed species attributed Key Threatening Process status under the TSC Act (eg exotic perennial grasses)
- Weed management guidelines for specific species listed in Recovery Plans for threatened species prepared under the TSC Act
- Regulations and controls for pesticide use pursuant to the NSW Pesticides Act 1999.

- **Water Management Plan**

The Waste Management Plan will be prepared in accordance with:

- NSQMS Use of Reclaimed Water Guidelines (2000)
- NSW Health Interim Guidance for Greywater and Sewage Recycling in Multi unit Dwellings and Commercial Premises (2004)
- NSW EPA Guidelines for Land Irrigation of Effluent (2004)
- EIS Guideline on Irrigation of Sewage Effluent and EIS Guideline on Sewerage Systems (Department of Urban Affairs and Planning, September 1996)
- AS 6400 (2005) –Water Efficient Products – Rating and Labelling

The plan will document baseline conditions and monitor and manage ongoing impacts in relation to stream and ground water flows, water quality and effluent irrigation/disposal. The management plan will comment on other water issues in so far as they directly relate to the wastewater management system for example irrigation system controls to prevent groundwater contamination, and water conservation practises required to ensure the Waste Water Treatment Plant will not become hydraulically overloaded.

- **Bush Fire Hazard Management**

A plan prepared in accordance with the Rural Fire Service guideline: Planning for Bushfire Protection 2001.

- **Emergency Response Plan**

A response plan to protect human safety in event of flood, bushfire or other hazardous natural events, prepared in accordance with the Rural Fire Service guidelines including Planning for Bushfire Protection 2001 and Flood Management Plan in accordance with the recommendations of the Floodplain Management Manual: the Management of Flood Liable Land (January 2001, NSW Govt).

- **Energy and Water Conservation Plan**

A plan providing detail design measures, devices and practices to minimise demand for water and electrical energy consumption.

- **Stormwater Management Plan**

A plan will be prepared providing detail design measures, devices and practices to optimise reuse of roof water and to manage overland flow in a manner that minimises erosion, sediment and pollutant loads

and hydrological impacts. This management plan will manage issues such as stream bank morphology, stormwater drainage and erosion and sediment control and will be prepared in accordance with:

- NSW Health (2004), Australian Rainfall and Runoff
- Managing Urban Stormwater: Soils and Construction 2004
- Commonwealth Government Enhealth Guideline (2004)
- NSQMS Use of Reclaimed Water Guidelines (2000)
- Assessment, Classification and Management of Liquid and Non-liquid Waste (DEC)

Stormwater management will also be in accordance with the general intent of Lithgow Council engineering guidelines.

- **Construction Management Plan**

A plan of construction measures and practices implemented to minimise potential construction impacts such as erosion and sediment transfer, construction traffic, noise and worker safety. The plan will include a formal process for receiving, actioning and recording complaints and other input from the owners/users of surrounding properties. The plan will be prepared with reference to:

- Managing Urban Stormwater: Soils and Construction 2004
- Environmental Criteria for Road Traffic Noise (EPA, 1999)
- RTA's Guide to Traffic Generating Developments
- Work Cover Guidelines
- All guidelines and regulations to the Occupational Health and Safety Act, 2000

The Construction Management Plan will also include traffic measures including:

- detail a temporary traffic signal system to permit only a single directional stream of traffic through Wolgan Pass
- a mini bus service to transport the majority of construction workers between Lithgow and the site
- use 12.5 metre rigid construction delivery vehicles (or smaller) wherever practicable

- **Materials and Produce sourcing**

This document will explain measures taken to optimise the sourcing of locally and sustainably produced building materials and ongoing produce supplies, such as foodstuffs.

- **Archaeological Investigation**

A plan prepared in accordance with Department of Environment and Conservation's Environmental Assessment Guidelines - Cultural Heritage, in consultation with the NPWS and Bathurst Local Aboriginal Land Council.

- **Conservation Management Plan (Heritage)**

A plan prepared in accordance with Department of Environment and Conservation and NSW Heritage Office guidelines including NSW Heritage Manual with specific reference to:

- the wattle and daub hut
- the slab house and associated outbuilding precinct
- the identification and management of potential archaelogical relics
- the site generally

- **Operational Management Plan**

A plan that details the Staff Induction Program, guest activities, hours of deliveries, servicing arrangements, guest transport to the site and other key operational features of the proposed development. In particular, the plan will detail arrangements for all guests driving to the site to be transfered from Lithgow to the site by resort vehicle, with guest vehicles being stored in Lithgow.

- **Wolgan Road Upgrade Plan**

The proponent will contribute to Lithgow Council's implementation of the Wolgan Road upgrade works identified in the Road Safety Audit (see Traffic Report).

- **Waste Management Plan**

A plan will be prepared in accordance with:

- Regional Waste Boards in NSW's Waste Planning Guide for Development Applications – Planning for Less Waste
- EPA Environmental Guidelines - Composting and Related Facilities (2003).

10 Conclusion

The project will reverse the significant environmental degradation of the site that has resulted from almost 180 years of cattle grazing. It will create an idyllic natural environment, and a refuge for the reintroduction of locally threatened species of plants and animals.

The very low density of the development limits potential social and environmental impacts, while the very high quality of the resort will optimise social and economic benefits to the State and local community.

This Concept Plan has been prepared following consultation with a wide range of government agencies and other stakeholders. The following is our summary of the key environmental issues identified by the Director General following that consultation.

Suitability of the Site

The project will create a sensitive buffer between the sensitive ecology of the Greater Blue Mountains World Heritage Area and surrounding agricultural uses.

Soil and Water Quality

The project will employ a wide range of water saving technologies, including extensive use of roof water to minimise demand upon town water supplies. All sewage generated by the development will be treated to a high standard on site. Some 20% of the effluent will then be re-used within the resort, with the remainder being used for subsurface landscape irrigation. There will be no direct discharge of effluent to any watercourse or aquifer. Water quality will also be enhanced by restoration and revegetation of existing eroded watercourses.

While some areas of potential agricultural contamination have been identified on the site, these are all small discrete areas that can be remediated without significant landform modification or removal of trees.

Flora and Fauna

Flora and Fauna surveys have confirmed that a wide range of threatened and potentially threatened species exist on and around the site. However, 'eight-part tests' under Section 5 of the EP&A Act have demonstrated that the project will not have any significant adverse effects on any threatened species, populations or ecological communities, or their habitats. On the contrary, the project will reinstate extensive areas of habitat to support the reintroduction and protection of such species and communities.

Fire and Emergencies

While bushfire poses a significant risk to life and property on the site, a range of measures to mitigate this risk are proposed, including that provision of Asset Protection Zones around the developed area, fuel load management, an 850,000L fire fighting tank, fire trails across the site, building sprinklers, a ring hydrant system around the developed area and a landing facility (with water hydrant) for Rural Fire Service helicopters.

Traffic and Transport

Traffic modelling has confirmed that Wolgan Road is capable of accommodating the additional traffic that will be generated during both the construction and operational phases of the project. While a safety audit has identified numerous safety deficiencies along Wolgan Road, these exist regardless of whether the project occurs. The proponent has proposed a Road Safety Audit and is liaising with Lithgow Council to contribute to its implementations.

Heritage

The existing slab house and earlier mud brick hut will be retained and managed in accordance with a detailed conservation management plan. The proposed landscaping of the site will reinforce the natural scenic qualities of the valley and the adjoining World Heritage Area, while retaining reference to the historic grazing landscape. The siting of the project on the site, recognises earlier settlement patterns and maintains the historic homestead as the focus of activity on the site. The concept plan is sufficiently flexible to appropriately manage any aboriginal on non-aboriginal archaeological relics or sites that may be identified in future investigations.

The project provides an incentive and funding mechanisms for conservation initiatives that are not currently occuring.

Utilities

The project will be supplied with mains water from the Fish River Scheme and electricity from Integral Energy. However, the principle water supply will be obtained by roofwater collection, effluent reuse, and possibly bore water supply. Water demand will be minimised through the use of a range of water saving devices. Electricity demand will be mitigated by the use of solar water heating, the use of tanker supplied gas for hotwater boosting, space heating and cooking and possibly geothermal energy for water and space heating. Sewage will be treated on site and disposed of by re-use and subsurface irrigation. A range of communication options are still under consideration.

Visual Impact

A very low density of buildings, architectural design in sympathy with the natural environment, extensive revegetation/landscaping and retention of remnant open pasture areas will maintain and enhance the natural and cultural scenic qualities of the locality, especially the World Heritage scenic qualities of the adjacent Blue Mountains. Furthermore, the siting of the resort deep within the valley will mean that it will not be visible from any publicly accessible place or adjoining property.

Helicopter Operations

While the project includes a helipad, no helicopter storage, refuelling (other than for bushfire fighting) or recreational flights are proposed. A maximum of four movements per week are proposed, and flight paths will be determined so as not to pass over Wilderness areas.

Noise Impacts

An acoustic study has demonstrated that noise generated by the project will not unreasonably impact upon the surrounding environment.

Waste Management

A detailed waste management plan will be prepared to ensure that waste is minimised, recycling and re-use options are optimised and all waste and recyclable materials are sustainably managed and disposed of in accordance with EPA requirements.

Ecological Sustainability

An extensive range of passive design, demand management and renewable supply measures are incorporated into the project to minimise the consumption, and optimise the sustainability of the supply of water and energy. The local sourcing of produce and services will be optimised.

Consultation

A wide range of government agencies and other stakeholders have been consulted. Input received has informed the preparation of this Concept Plan.

Statutory Planning

The project is permissible with the consent of the Minister, and is not inconsistent with the provisions of any applicable planning instrument.

Summary

While the project will displace the historic cattle grazing use of the site, and alter its scenic quality, it will provide very significance social, economic and environmental benefits. Specifically, it will:

- Reinstate the natural ecology, hydrology and stream morphology of the site.
- Create a sanctuary for locally endemic threatened plants and animals.
- Create a buffer between the GBMWHA and adjacent agricultural uses.
- Create a world class tourist destination that will enhance the international reputation of the Blue Mountains and the State of NSW.
- Provide significant local employment and investment in the local and State economies.
- Recognise the important aboriginal and European heritage values of the valley.
- Incorporate a range of ecologically sustainable development principles and technologies.

Design and environmental investigations to date demonstrate that all potential adverse impacts of the project can be sustainably managed, resulting in significant net social, economic and environmental benefits.