NSW GOVERNMENT
Department of Planning

MAJOR PROJECT ASSESSMENT
Silverton Wind Farm Developments Pty Ltd

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

April 2009

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EXECUTIVE SUMMARY

Silverton Wind Farm Developments Pty Ltd (the Proponent) proposes to construct and operate up to 598 wind turbines with generating capacities ranging between 1.75 to 3 megawatts each and associated infrastructure in two stages, where the Proponent is seeking Concept Plan Approval for the entire proposal and Project Approval for Stage 1. Accordingly, the project could generate approximately more than 1,500 megawatts of renewable energy. The Project is subject to Part 3A of the *Environmental Planning and Assessment Act 1979*, by virtue of clause 24 (a) in Schedule 1 of the *State Environmental Planning Policy (Major Projects) 2005* and therefore the Minister for Planning is the approval authority. The Minister for Planning has declared, under the *Environmental Planning and Assessment Act 1979*, electricity generation facilities with a capacity to generate at least 250 megawatts to be critical infrastructure projects. The project is therefore a critical infrastructure project.

Stage 1 of the project involves the construction of the first 282 wind turbines, including a transmission switchyard and a 24 kilometre transmission line connecting the transmission switchyard with TransGrid's existing Broken Hill substation. Stage 2 of the project involves the construction of up to 316 wind turbines, including expansion of the transmission switchyard and a 305 kilometre transmission line, connecting the transmission switchyard with SP-Ausnet's existing Red Cliffs substation in Victoria. Additional infrastructure to be constructed as part of the project will include up to seven onsite substations to convert voltages for connection with the transmission switchyard, electrical connections between wind turbines and site substations, onsite control and maintenance buildings and temporary construction infrastructure.

The Proponent initially proposed to construct and operate 120 turbines as part of Stage 1 of the project and detailed environmental studies for those first 120 turbines were included in its Environmental Assessment. However, after its submission of the Environmental Assessment, the Stage 1 development envelope was expanded to include areas surrounding the original Stage 1 area and areas to the north, termed Stage 1b and 1c. This was as a result of investigations highlighting that the electrical connection capacity into the substation at Broken Hill was greater than first anticipated.

On 19 January 2009, the Proponent submitted its Preferred Project Report and Submissions Report for the project, including responses to issues raised in submissions received during the public exhibition of the Environmental Assessment. The main changes to the exhibited Environmental Assessment is the elevation from Concept Approval to Project Approval for a further 162 wind turbine locations (Stage 2 to Stage 1) and associated infrastructure based on completing detailed biodiversity and archaeology assessments in these areas. There is a minor alteration to the site boundary to reduce the area of the wind farm site and some changes to internally sited wind turbine locations but not electrical infrastructure placement.

The construction of Stage 1 would be in phases to allow for civil and electrical engineering with up to approximately 95 wind turbines in each phased group. The first turbines will be located in the Stage 1a area, however turbines in the Stage 1a, 1b or 1c areas may be built in any configuration and the final phased construction will be determined by electrical connection and staged financing.

The Proposal would promote renewable energy generation and thereby limit greenhouse gas emissions associated with energy production. This is consistent with Federal and State Government promotion of renewable energy, including the Commonwealth Government's National Greenhouse Strategy, the existing Mandatory Renewable Energy Target (MRET) and the planned expanded national Renewable Energy Target (RET) to ensure 20 per cent of Australia's electricity supply comes from renewable energy by 2020. The project has an estimated capital investment value of $2.2 billion. It will employ 700 people over the total five year construction period and 120 people during operation of the proposal.

During the exhibition of the Environmental Assessment, the Department received a total of 25 submissions from the public and Government agencies. Of the public submissions three support the proposal, six did not state a clear position and three objected. The main issues identified in these submissions related to visual and landscape impacts, biodiversity, justification of the proposal, human amenity and socio-economic impact, particularly tourism and the public consultation process described by the Proponent. Of the submissions from government agencies, Broken Hill City Council supported the proposal however none of the other submissions stated an explicit position

but identified a number of key issues for further consideration and information including noise and vibration impacts, ecological impacts, hydrological impacts, traffic impacts and accessibility. The Proponent's Preferred Project and Submissions Report addressed the issues raised in the submissions on the Project and the Proponent subsequently formed further commitments for the construction, operation and decommissioning stages of the project.

With regards to visual impacts of the proposed wind farm site, those receptors with a view distance of 1 to 4 kilometres, wind turbines will generally dominate the landscape in which the wind turbine is situated. There are 19 locations determined to have a medium visual impact from the Project (Stage 1 and 2), of which 14 are residential locations and thus the view period would be long term. The average view distance from these 14 residential receptors to the wind farm site is 3.76 kilometres, with the shortest view distance being 2.2 kilometres and the longest view distance being 4.8 kilometres. The Project will dominate the landscape for all these receptor locations. Therefore the Department has recommended that the Proponent be required to, at the request of any owners of residential dwellings or businesses with views of a turbine(s) located within six kilometres of their dwellings, provide and bear the full cost of landscaping treatments to visually screen these dwellings.

In addition to this, the Department recommends that the Proponent be required to ensure all residents, business owners or public authority, whose dwelling, business or public area respectively, may be subject to moderate to high visual impact, is consulted regarding impact minimisation measures, and the outcomes of this consultation process are used to inform the required Design and Landscaping Plan. The Department notes that due to the elevated views of the turbines at receptor locations, vegetation screening may only partially screen the view of these turbines rather than completing concealing the view. However such screening would enable the majority of the wind turbine structure, such as the tower, to be less visible after the implementation of visual screening methods. The nacelle and blades would not be able to be completed concealed however the Department recommends that the wind turbine structures be painted matt off-white or grey and the blades must be finished with a surface treatment that minimises any potential for glare or reflection. Therefore the wind farm site would have the ability to visually accommodate this Project from most sensitive receptors.

With regards to potential impacts to exploration, mining and mineral resources, the Department notes that the Project may impede mineral exploration activities in close proximity to the surface infrastructure such as turbines and substations. Although no mineral deposits have been discovered in the proposed wind farm site to date, there is potential for a discovery of an economic mineral resource. Therefore the Department has recommended a range of requirements that the Proponent must adhere to, to ensure an effective and substantial consultation process occurs between the Proponent, exploration licence holders and the Department of Primary Industries (Minerals Resources).

The Department finds that the Project provides an opportunity to promote the local tourism industry surrounding the Project area and provide benefits to the community. In particular the Silverton Village is located within the Unincorporated area, on the Barrier Ranges, and contains limited facilities and services for the public. Therefore the Department has recommended, as part of the Concept Approval for the project, that the Proponent be required to prepare and submit for the approval of the Director-General, a Community Enhancement Program to fund (or provide in kind) community infrastructure and services in the locality of the project. This Program must be submitted to the Director-General prior to the commencement of construction of the project. The Proponent must establish a fund for the purposes of implementing the Community Enhancement Program.

The Department has also recommended specific conditions to address the other issues raised in the assessment process:

- noise impacts – specific conditions to limit hours of construction to acceptable times unless a noise agreement has been formed between the receptor and Proponent and a requirement to prepare a revised operational noise assessment to mitigate amenity noise impacts;
- biodiversity impacts – specific conditions to avoid the clearance of significant vegetation, minimise construction impacts and manage biodiversity during operation;
- air impacts – specific conditions to mitigate dust impacts during construction;
- non-indigenous heritage – specific strategies to manage unexpected finds;
- Aboriginal heritage – specific requirement to ensure no disturbance to the Aboriginal objects SU152/L2 (stone procurement artefact) and SU231/L2 (stone arrangement) occurs during the life of the project, as

these locales have been identified in the Environmental Assessment to warrant total exclusion of impacts and the implementation of a strategy of conservation; and

- Country Energy's Assets - specific requirements to avoid interference with and damage to Country Energy's assets from the construction of the Project.

The Department finds that provided the Proponent implements all its nominated environmental commitments, its recommended impact avoidance and minimisation measures contained in the Environmental Assessment and the Department's recommended conditions, the impacts associated with the construction and operation of the Project can be minimised and adequately managed.

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1. BACKGROUND

1.1 Location

The proposed Silverton Wind Farm is located on the elevated ridges of the Barrier Ranges in far western New South Wales (refer to Figure 1). The proposed project area is located approximately 3.5 kilometres north of the township of Silverton and approximately 25 kilometres north-west of the town of Broken Hill. The western site boundary is approximately 20 kilometres from the South Australian border.

Site surface infrastructure (including turbines, tracks, electrical connections and maintenance facilities) is proposed to be concentrated on the Mundi Mundi Range in the southern area of the proposed site and Mount Robe Range in the northern portion of the proposed site. These ranges comprise ridges of up to 300 metres above the level of the surrounding Mundi Mundi Plains. The proposed wind farm is located within the Broken Hill Complex Bioregion. This bioregion is located in the far west of New South Wales, with the eastern portion located within the Murray-Darling Basin.

The proposed development area comprises of two distinct components, being the wind farm itself and associated transmission line corridors. The proposal is to be constructed over two Stages, as follows:

- Stage 1 – construction of the first 282 wind turbines, including a transmission switchyard and a 24 kilometre transmission line connecting the transmission switchyard with TransGrid's existing Broken Hill substation.
- Stage 2 – construction of up to 316 wind turbines, including expansion of the transmission switchyard and a 305 kilometre transmission line connecting the transmission switchyard with SP-Ausnet's existing Red Cliffs substation in Victoria.

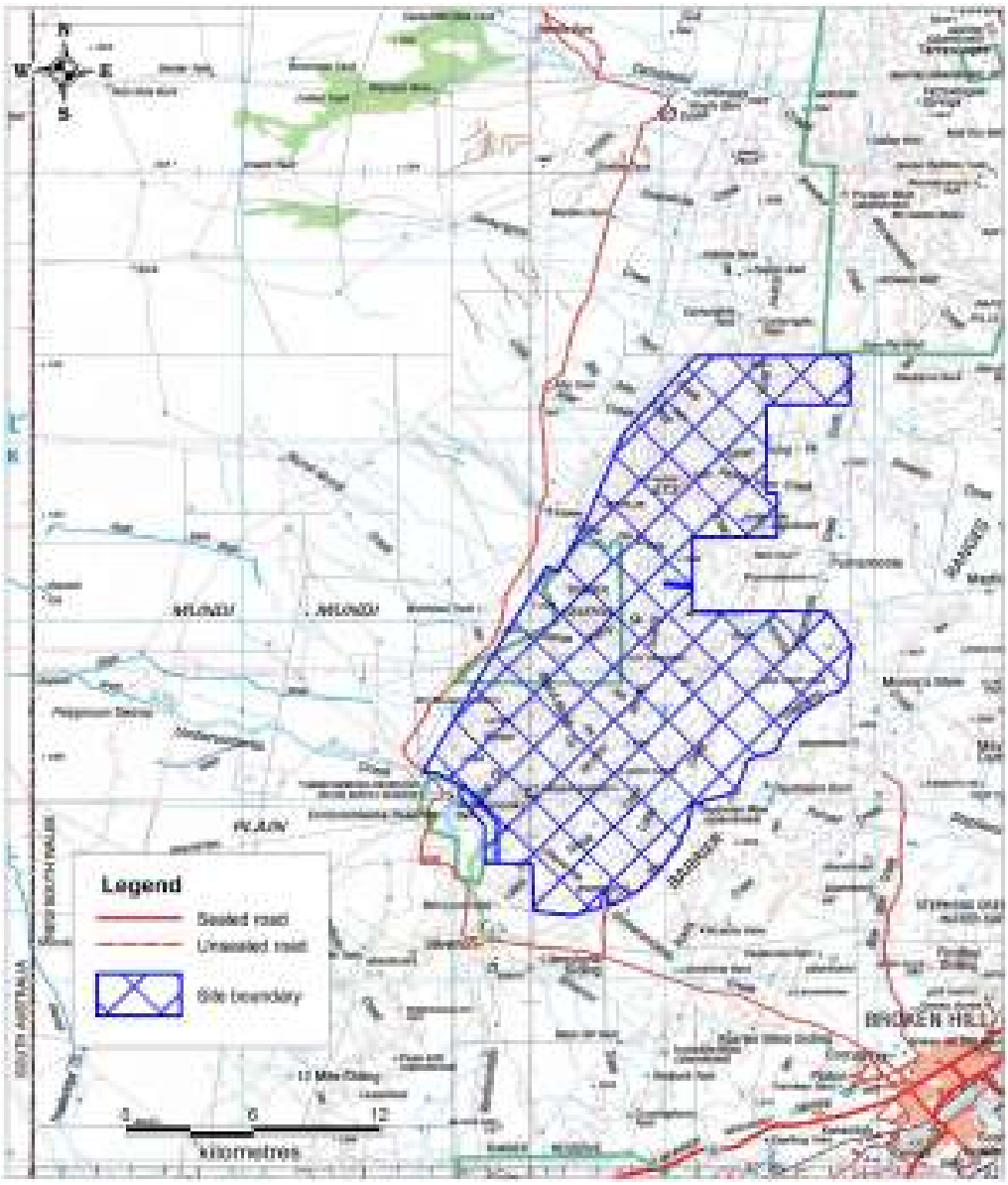


Figure 1: Site Location (reproduced from the Proponent's Environmental Assessment)

1.2 Existing Site

The Silverton Wind Farm site is located within an unincorporated area referred to as "Crown Land" administered by the NSW Department of Lands, Western Division. The Department of Lands acts as landowner on behalf of the Crown. The area of the proposed wind farm is currently managed by four lessees that hold leases issued for grazing by the NSW Department of Lands under the *Western Lands Act 1901*. These lessees currently graze a mixture of sheep and goats within their property boundaries. Other existing site features include a timber reserve located in the western portion of the proposed site and an abandoned mine in the south-eastern area.

The proposed staged 2 electricity transmission infrastructure would be located within the borders of Broken Hill City Council Local Government Area and Wentworth Local Government Area in the south with the remaining section of the transmission line in an unincorporated area. A small section of the transmission route (less than two kilometres) would be located within the Mildura Rural City Council Local Government Area, in Victoria. Separate approval would be sought for works within Victoria. Zoning details of each LGA are provided in Section 3.2 Permissibility of this Report. The transmission line corridor is characterised by a number of farming and grazing properties owned by private land holders.

1.3 Surrounding Land Use

The areas immediately surrounding the Proposed Wind Farm site are characterised by undeveloped, generally flat, grazing lands. Sealed and unsealed roads are located immediately south and west of the proposed site boundaries, respectively.

Silverton is the nearest settlement (approximately 3.5 kilometres south-west), of population 89 (ABS Census 2006) and is predominately a tourist town under administrative control by the NSW State Government. The nearest major town is Broken Hill (approximately 25 kilometres south-east), which is a historical mining town and controlled under the municipality of Broken Hill. Other surrounding land use features are listed below.

- West: an unsealed road, Mundi Mundi Plain, followed by the South Australian border.
- South: Umberumberka Reservoir and dam which includes a water supply reserve, a sealed road, followed by the township of Silverton to the south-west.
- East: Barrier Ranges, an unsealed road, several abandoned mines and the settlement of Purnamoota, with the town of Broken Hill located to the south-east.
- North: undeveloped land containing creeks and dams, and abandoned mines and quarries.

2. PROPOSED DEVELOPMENT

2.1 Project Description

The Proponent proposed to construct and operate up to 598 wind turbines with generating capacities ranging between 1.75 to 3 megawatts (MW) each and associated infrastructure in two stages as follows:

- Stage 1 – construction of the first 282 wind turbines, including a transmission switchyard and a 24 kilometre transmission line connecting the transmission switchyard with TransGrid's existing Broken Hill substation; and
- Stage 2 – construction of the remaining 316 turbines, including expansion of the transmission switchyard and a 305 kilometre transmission line connecting the transmission switchyard with SP-Ausnet's existing Red Cliffs substation in Victoria, via the Buronga substation.

Additional infrastructure to be constructed as part of the project will include:

- up to seven onsite substations to convert voltages for connection with the transmission switchyard;
- electrical connections between wind turbines and site substations using a combination of underground cable and overhead concrete, timber or steel pole power lines;
- onsite control and maintenance buildings; and
- temporary construction infrastructure and internal access tracks.

Each of the 598 wind turbines will comprise of three blades mounted on a tubular steel tower and a generator transformer inside or adjacent to each tower. Selection of the actual turbine model to be used would be conducted via a competitive tender process subsequent to project approval. Minor upgrades to site access via the Silverton Road, Eldee Station Road and Daydream Mine Road would also be undertaken.

2.2 Impression of Proposed Turbines

A visual impact assessment from surrounding receptor locations was conducted as part of the Environmental Assessment and a photographic montage was provided by the Proponent. The impression of the proposed turbines will depend on the following factors:

- The number and type of receivers who view the wind farm such as residents, tourists and motorists.
- The distance between the receiver and the proposed wind farm.
- The duration of time the receiver may view the proposed wind farm from any static or dynamic view location.

The overall potential visual impact of the Proposal at individual receptor locations would result from the potential visibility of the wind farm and the visual absorption capability of the landscape between, and surrounding, the receptor and the wind farm.

Impressions of the proposed turbines are provided in Figures 2 and 3.

Figure 2: Impression of typical wind turbine (82m rotor installed on an 80m tower)

Figure 3: Impression of typical proposed landscape (reproduced from the Proponent's Environmental Assessment) Note: This is a view of the Mundi Mundi Lookout from Receptor Location 8, Visitor (Stage 1 and 2), where the approximate distance from the receptor location and the wind farm site is approximately 3.2 kilometres.

2.3 Project Development

An Environmental Assessment was submitted to the Department in August 2008 and outlined the original project description. This Environmental Assessment was publicly exhibited as part of the approval process, as detailed in Section 3.4 of this report.

After submission of the Environmental Assessment, the Stage 1 development envelope was expanded to include areas surrounding the original Stage 1 area and areas to the north, termed Stage 1b and 1c. This was as a result of investigations highlighting that the electrical connection capacity at the Broken Hill substation was greater than first understood.

he substation at Broken Hill was greater than first anticipated.

A Preferred Project and Submissions Report was submitted to the Department on 19 January 2009. The main changes to the exhibited project were as follows:

- minor alteration to the site boundary and some internally sited wind turbine locations but not electrical infrastructure placement;
- elevation from Concept Approval to Project Approval for a further 162 wind turbine locations (Stage 2 to Stage 1) and associated infrastructure based on completing detailed biodiversity and archaeology assessments in these areas;
- approval sought to construct a temporary water pipeline subject to the grant of all necessary licences and permits; and
- transmission and access easements required to connect sections of the site together and to the surrounding road network.

The Proponent is seeking Project Approval for the Stage 1 construction and operation of works and Concept Approval for all Stage 2 construction and operational works including the transmission line from Broken Hill to Red Cliffs.

The construction of Stage 1 would be in phases to allow for civil and electrical engineering with up to approximately 95 wind turbines in each phased group. The first turbines will be located in the Stage 1a area, however turbines in the Stage 1a, 1b or 1c areas may be built in any configuration and the final phased construction will be determined by electrical connection and staged financing.

Figure 4 illustrates the proposed location of all wind turbines and associated on-site infrastructure and Table 1 describes the key features of the project.

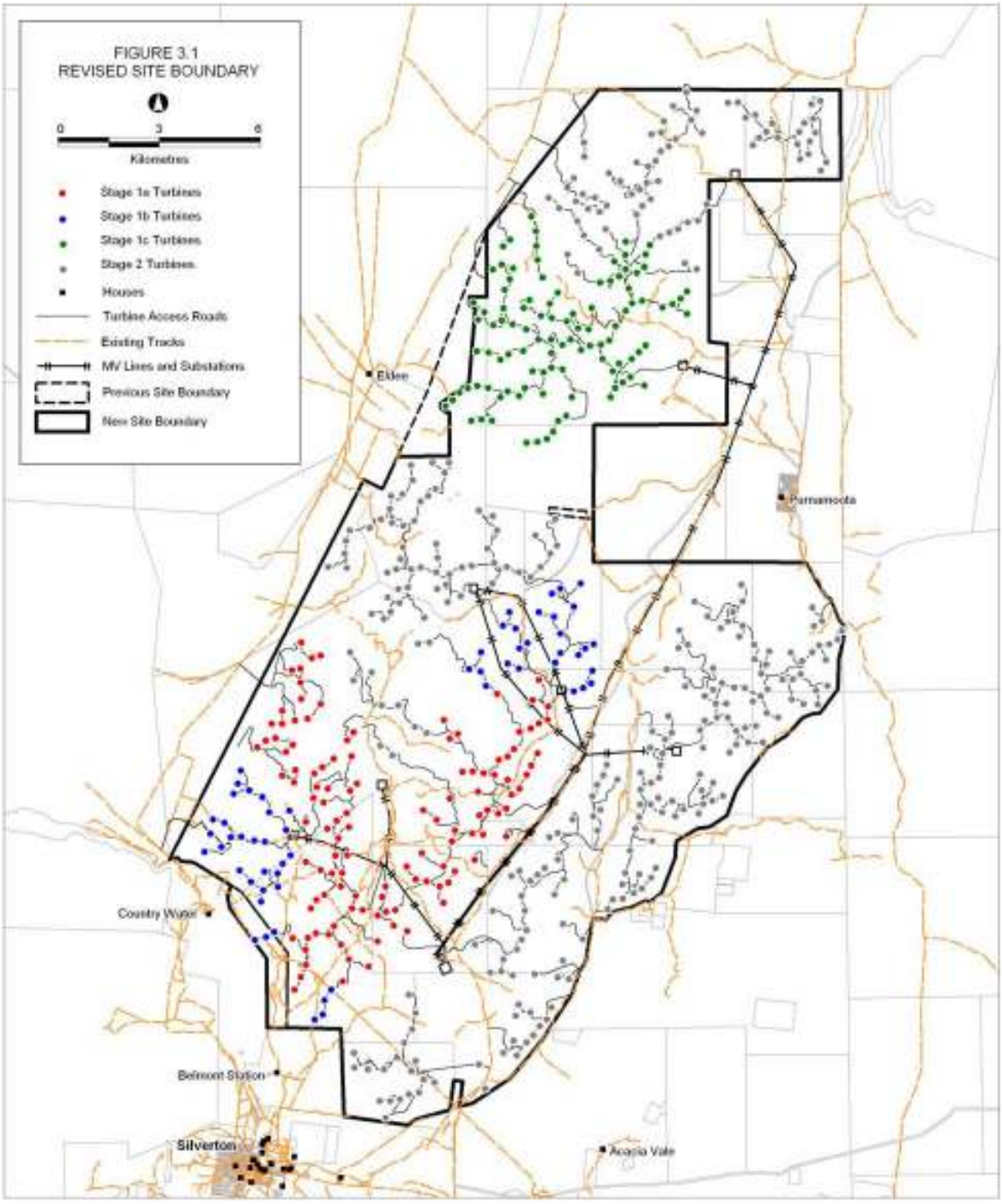


Figure 4: Proposed Wind Farm Site Boundary (reproduced from the Proponent's Environmental Assessment) Note: Stages 1a, 1b and 1c are defined to clarify areas surveyed in 2007 (1a) and 2008 (1b, 1c) field work for biodiversity and archaeology. Biodiversity and archaeology assessments for Stage 2 are yet to be completed by the Proponent.

Table 1: Key Features of the Project

Component	Description
Construction	Construction and installation of the wind turbines on concrete footings using crane lifting and associated road upgrades, surface infrastructure and other site civil works. Rock crushing equipment and portable concrete batching plants will be used.
Operation	Mainly unattended operation, however regular maintenance will be required on an as-needs basis, including repairs. A monitoring program will be implemented to allow fine tuning of the wind farm for optimal performance.
Refurbishment	Replacement and overhaul of individual wind turbines should any fail. The expected life of a wind turbine is 20 to 30 years.
Decommissioning	An individual turbine would be decommissioned if it is not commercially viable to replace it. Upon decommissioning, footings and cable trenches would remain in situ to reduce environmental impact and made safe, all other equipment would be removed from site.

Construction Hours

Given the remote site location, it is proposed that normal construction hours would be waived for this project where construction noise would be inaudible to receptors. The majority of installation work would occur during daylight hours, with the exception of night work where required. Night work is likely to include delivery or erection of turbines where feasible for logistical reasons (for example turbine lifts during lighter wind periods). Also, given the location of the site, it is possible that some workers would operate on a longer shift basis, which would require working weekends.

2.4 Project Need

The Proposal would promote renewable energy generation and thereby limit greenhouse gas emissions associated with energy production which is in line with Federal and State Government promotion of renewable energy, including:

- The Commonwealth Government's National Greenhouse Strategy (NGS), the existing Mandatory Renewable Energy Target (MRET) and the planned expanded national Renewable Energy Target (RET) to ensuring 20 per cent of Australia's electricity supply comes from renewable energy by 2020.
- The NSW Government's commitment to reduction in greenhouse gas emissions and move towards renewable sources in line with Commonwealth policies.
- Increased consumer demand for electricity generated from renewable sources is apparent in the national 'Green Power' accreditation program, which sets environmental and reporting standards for renewable energy products offered by electricity suppliers.

State and Federal Governments' support for wind farms is in line with broader community attitudes towards power generation, greenhouse gas emissions, climate change and renewable energy generation. A number of community surveys are quoted in the Proponent's Environmental Assessment, demonstrating this support.

In addition, the NSW Government has demonstrated its support for large electricity generation projects through the designation of projects in excess of 250MW as Critical Infrastructure under the *Environmental Planning and Assessment Act 1979*.

Other benefits of the proposal include production of approximately 3,500,000 mega-watt hours (MWh) of renewable electricity per annum, sufficient for approximately 437,500 households. The proposal would provide for large savings in water consumption, compared to fossil fuel power stations and reductions in other pollutants (in addition to carbon dioxide emissions) typical of coal-fired power stations including sulphur dioxide, nitrogen oxides and particulates. Furthermore, the proposal would provide benefits to the local community which would include additional employment, flow on trade from the additional employment, benefits from the Community Fund that the Proponent has proposed and local infrastructure improvements for the Silverton region.

3. STATUTORY CONTEXT

3.1 Major Project

The project is declared to be a Major Project under *State Environmental Planning Policy (Major Projects) 2005* because it is a wind power development that has a capital investment value of more than $30 million (Schedule 1 clause 24(a)). The project is therefore subject to Part 3A of the *Environmental Planning and Assessment Act 1979* (the Act) and the Minister for Planning is the approval authority.

The Project is consistent with the aims of the *State Environmental Planning Policy (Infrastructure) 2007,* as it promotes electricity generation that is essential for the growth and prosperity of communities in the State.

3.2 Permissibility

The Silverton Wind Farm site is located within an unincorporated area referred to as "Crown Land" administered by the NSW Department of Lands, Western Division which acts as landowners on behalf of the Crown. Therefore local government instruments are not applicable to works within this area. The area of the proposed wind farm is currently managed by four lessees that hold leases issued for grazing by the NSW Department of Lands under the *Western Lands Act 1901*.

The *Western and Crowns Lands Amendment (Special Purpose Leases) Act 2008* was passed in June 2008 to amend the *Western Lands Act 1901* and the *Crown Lands Act 1989.* The new Act allows the granting of special purpose leases in parallel with the existing grazing leases. The proposed wind farm would be granted a special purpose lease by the Department of Lands and this requires the consent of the existing Lessees, who would receive remuneration from the wind farm operator. Therefore, wind farm tenure would be provided by a special purpose lease, existing grazing leases would continue under the *Western Lands Act 1901* and current land use would remain largely unaffected.

Land to be used within the boundaries of the Broken Hill Local Government Area is zoned 1 (a) General Rural under the Broken Hill Local Environmental Plan 1996. The development of the Stage1 transmission line on land which is covered under this zone would be permissible with development approval.

Land within the Wentworth Local Government Area that would be affected by the Stage 2 transmission line is primarily zoned 1 (a) General Rural Zone under Wentworth Local Environmental Plan 1993. While critical infrastructure projects are not subject to zoning prohibition, it is noted that the development of electricity transmission infrastructure would be permissible with development consent in land zoned 1 (a) General Rural Zone.

A small section of the Stage 2 transmission route (1.3 kilometres) would be located in Victoria, within the Mildura Rural City Council Local Government Area. The proposed works are permissible under the local environmental plans. Separate approval would be sought for works within Victoria. Correspondence confirming permissibility of this aspect of the Proposal under Victorian legislation is provided in the Attachment 2 of the Proponent's Environmental Assessment.

The portable concrete batching plants used during the construction work would require a licence to be issued by the Department of Environment and Climate Change (DECC) (under the *Protection of the Environment Operations Act 1997*), given that the batching plant capacity would exceed the licence threshold of 150 tonnes per day. Licence conditions specified by DECC are likely to include operational protocols and monitoring.

Following a declaration by the Minister for Planning on 27 February 2008, the Proposal would be considered Critical Infrastructure under the *Environmental Planning and Assessment Act 1979*, as it has the capacity to generate in excess of 250 megawatts of power.

3.3 Director-General's Requirements and Adequacy of Environmental Assessment

In accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* reforms, the Environmental Assessment report for this Proposal was preceded by an issues scoping exercise to identify and prioritise issues related to the Proposal.

On 14 and 15 November 2007, a Planning Focus Meeting was held onsite and attended by representatives from the Department, Department of Environment and Climate Change, Department of Lands, Western Catchment Management Authority, Lower Murray-Darling Catchment Management Authority, Department of Primary Industries (Minerals), Country Energy, NSW Roads Traffic Authority, Broken Hill City Council, TransGrid and as well as representatives of the Proponent.

The Major Project Application for the Proposal was lodged with the Department on 24 December 2007. On 23 January 2008 the Minister for Planning authorised the submission of a concept plan and on 13 February 2008 the Director-General's Requirements were issued.

The draft Environmental Assessment submitted to the Department on 14 May 2008 was found to be inadequate by the Department on 20 June 2008. The reasons for the inadequacy are described in Table 2 below.

Table 2 – Key findings of the Department's adequacy assessment (June 2008)

Issue	Requirement to address inadequacy
Project Description	Clear description of the Proposal and inclusion of clear and legible maps of an appropriate scale to allow proper understanding of the Proposal.
Justification	Clear description of the Project justification.
Visual Impact Assessment	Clear potential visual impacts assessment and inclusion of all figures referred to in the Environmental Assessment.
Noise Impact Assessment	Demonstration that the proposed mitigation measures for potential noise impacts are feasible and effective.
Biodiversity	Conclusion on overall and specific biodiversity impacts.
Mineral Exploration	Clear demonstration of the potential impacts on mineral exploration.
Hydrology	Demonstration of the availability and security of water supply.
Heritage	Relevant commitments to a strategy to manage unexpected indigenous and non indigenous heritage finds.
Land Use Impact	Confirmation of impact and compensation for existing grazing land use including the loss/reduction in goat harvesting opportunities.
Traffic Impact Assessment	Maps of the proposal site and access routes in the main document. Conclusions for the construction stage impact assessment in relation to traffic and transport issues.
Socio-economic Impacts	Consideration of the socio-economic consequences of increased construction labour being brought into the area.
Hazard / Risk Impact Assessment	Assessment of hazard/risk impacts including a consideration of aircraft movements in the area and clarification regarding electromagnetic fields.

A revised draft Environmental Assessment was submitted by the Proponent to the Department on 20 August 2008 and deemed to adequately address all of the Director-General's requirements, subject to the minor editorial corrections and updates.

3.4 Exhibition of Environmental Assessment

The Environmental Assessment (dated August 2008) was placed on public exhibition from 1 October to 3 November 2008 at the following locations:

- The Silverton Hotel, Layard Street , Silverton, NSW
- Broken Hill City Council, 240 Blende Street, Broken Hill, NSW
- Wentworth Shire Council, 26-28 Adelaide St, Wentworth, NSW
- Nature Conservation Council, 301 Kent St, Sydney
- Department of Planning Information Centre, 22-33 Bridge St, Sydney.

An electronic copy of the Environmental Assessment was also made available for viewing on the Department's website (www.planning.nsw.gov.au). Three further print copies and additional electronic copies of the Environmental Assessment were made available to the Silverton community during the public exhibition of the Environmental Assessment, through the Silverton Village Committee.

During the exhibition period, submissions were sought from the local community, interested parties and other stakeholders in accordance with Section 75H of the *Environmental Planning and Assessment Act 1979*. The Department accepted submissions up to 21 November 2008.

3.5 Minister's Approval Power

Pursuant to Section 75H and 75I(2)(g) of the *Environmental Planning and Assessment Act 1979*, the Director-General was satisfied that the Environmental Assessment, submitted to the Department in August 2008, had addressed the environmental assessment requirements specified in the Director-General Requirements dated 13 February 2008. A copy of the Environmental Assessment is attached to this report (refer to Appendix D).

Following the exhibition period, the Director-General directed the Proponent to respond to the issues raised in submissions. The Preferred Project and Submissions Report was prepared by the Proponent and submitted to the Department in January 2009 (refer to Appendix C). It was subsequently made publicly available on the Department's website.

The Department has met all its legal obligations so that the Minister can make a determination regarding the project.

4. CONSULTATION AND ISSUES RAISED

4.1 Introduction

The Department received a total of 25 submissions during the public exhibition of the Environmental Assessment. Of the 25 submissions, 12 were from individual members of the public or community groups, nine (9) were from Government agencies and four (4) were from businesses. A summary of the issues raised in these submissions is presented in section 4.2 below.

4.2 Submissions from the Public

The public submissions consisted of three (3) from special interest groups, four (4) from business and nine (9) from local residents. Of these submissions, one (1) supports the proposal, three (3) support the proposal but raise concern regarding specific issues, six (6) did not state a position and six (6) objected to the proposal. Key issues raised in the submissions are summarised below.

1. Geology and hydro-geological setting, including:

- Project area contains significant geology and represents the geological history of the Broken Hill region;
- The Mount Robe Structure is geologically significant including its mineral potential. Mount Robe is the highest altitude point in the area.
- Concern of impact on the area's fragile semi arid skeletal soil environments due to denuding the ridge tops and siltation of the creek eco systems from heavy rain.

2. Visual impact and landscape, including:

- High visual impact as the turbines will ruin the scenery and power lines will compound the effect. Specific turbine locations of high visual impact identified include:
  - Turbines on the spur of hills viewed from the road approaching Silverton;
  - Turbines at the southern end of the proposed layout are visible from a resident's property;
  - View of the front of the Barrier Ranges between Eldee and Willangee as seen from the plains;
  - At Eldee Station – impact on tourists;
  - At Day Dream Mine – impact on authentic historical value.
- Strongly disagree with the overall moderate impact of the wind farm: 'moderate' can be subjective;
- Concern of irreparable damage to the landscape and environment.
- The landscape is currently in drought response;
- Environmental Assessment does not consider the intrinsic value of the landscapes;
- The photomontage does not include tracks which would be most visible from every vantage point and is therefore misleading.

3. Human amenity and socio-economic impact, including:

- The project will effectively destroy the Barrier Ranges and the town of Silverton;
- Impact on tourism in Silverton, Barrier Ranges and Broken Hill: short term 'novelty factor' will increase visitor numbers, but concern of long term dramatic fall in regular visitors. Silverton relies on tourism. Broken Hill has 400 small tourist-related businesses;
- Overseas tourists reported to be in favour of wind farms, however no survey conducted;
- Impact assessment on small businesses not provided in the EA:
- Reduced income flows to some station owners disrupted by the proposal;
- Artistic value of local areas will be lost, which provides incomes for local artists: Retail art business in Silverton would be impacted for 5 years;
- Concern regarding future property value due to loss of aesthetic values in Silverton;
- Tours of the Daydream mine cannot continue: impact on employment and the Broken Hill economy;
- Environmental Assessment overstates the number of jobs generated: most will be short term and most manufacturing will be done outside Broken Hill;
- Employment opportunities should include an apprenticeship scheme for Silverton residents to boost confidence in the project.
- Positive response to Community Fund and benefits offered to the Silverton Community, particularly the Solar Silverton scheme. But the Community Fund must be equitable for all.

4. Access and traffic impacts, including

- Proposed 6 to 12 metre wide access tracks would have major environmental impacts which the archaeology, flora and fauna and hydrological assessments in the Environmental Assessment failed to assess;
- Main site access route should use the Daydream Mine access road, except for construction on the western side of the Ranges, which will be accessed through Silverton;
- Erosion due to construction of tracks circulating the hills will eventually impact creeks, raising concern of siltation in Umberumberka Reservoir;
- The proposed 305 km long transmission line traverses a resident's property;
- Concern of traffic impacts from transporting turbine parts; the access road will be used at times when locals use it most which would impact businesses and live animal crossings. Request most movements are conducted outside tourist access hours of 9.30 a.m. to 3.30pm;
- Traffic on the narrow Silverton Road: there are only three safe places to overtake normally;
- Concerns of potential damage to old buildings located close to the road from heavy vehicles transporting turbines, blades and equipment through the heritage precinct of Silverton;
- Consider an alternate access road from the Silver City Highway along the Limestone Station Western Boundary and the Silverton Common. This only crosses the Silverton Road once and becomes the Daydream Mine Road, which is the proposed primary access road onto Belmont station.

5. Noise impact, including:

- Noise impacts in the Environmental Assessment have been underestimated.

6. Energy and Water Use

- Site accessibility and rugged terrain will result in more energy use to construct the wind farm which will impact the energy savings stated in the Environmental Assessment. The Environmental Assessment omits the carbon cost of construction and overstates the carbon abating benefit;
- Wind does not blow all the time;
- Concern of water use sustainability during construction and impact on agricultural activities;
- Concern on use of Umberumberka Reservoir as the primary source of water for construction work.

7. Contamination

- No containment procedures are provided for toxic chemical runoff. Impact of toxins on soil acidity.

8. Heritage

- No assessment of the culturally significant Aboriginal plants for Bush Tucker and Medicine that only occur in the Barrier Ranges;
- In the area marked as high value vegetation there is evidence of Aboriginal occupation.

9. Flora and Fauna, including:

- Impact of the transmission line on significant vegetation;
- Insufficient detail of mitigation measures for threatened flora and fauna species.

10. Justification and Alternatives in the Environmental Assessment process, including:

- Environmental Assessment does not provide a discussion of alternative sites, such as closer to the railway or closer to the electricity grid connection point;
- Environmental Assessment does not provide a discussion of alternative turbine locations further away from Silverton Village;
- Request a six kilometre buffer from Silverton, instead of the current three kilometres to dispel some noise and visual impacts, necessitating relocation of at least 25 turbines;
- Justification not provided for selecting Silverton over other more viable areas;
- No long term rehabilitation plan provided;
- Alternative proposed transmission line to Red Cliffs could be adjacent to the existing alignment;
- Relocation of the transmission line could avoid impact on significant vegetation, fauna species, and Aboriginal cultural heritage material. Low cost to relocate and may have cost saving attributes;
- Awareness of the benefits of sustainable energy sources.

11. Consultation in the Environmental Assessment process, including:

- Inadequate consultation with the Silverton Village Committee;
- The Proponent should maintain regular contact with the Silverton Village Committee with updates;
- Misleading use of the word perceive(d) when discussing negative concerns in the Environmental Assessment;
- Items have not been modified after consultation, eg no change in accessing site through Silverton;
- The removal of wind turbines to preserve sensitive reptile habitat and endangered vegetation is commendable but the request to remove the turbines from the vicinity of sensitive human habitats has been ignored;
- Different climate and atmospheric patterns occur on the western side of the Barrier Ranges compared to Broken Hill Airport, so a separate Climate and Atmospheric assessment is required;
- No impact assessment on the introduction of a new microclimate created by the mixing of thermal layers by the turbines, greater turbulence and dry soils;
- Discrepancies in the Environmental Assessment regarding vegetation, soil, erosion and water courses in the proposed development areas;
- Insufficient information in the Environmental Assessment to make a valid judgement on the proposal's impacts and benefits;
- The project boundaries identified in the Environmental Assessment are larger than initially discussed and have been presented without community consent.

4.3 Submissions from Government Agencies

The Department received submissions from the Department of Environment and Climate Change, CountryWater, Department of Lands (Western Division), Department of Primary Industries, Department of Water and Energy (Southern Central), the NSW Roads and Traffic Authority, NSW Rural Fire Service, and the Department of Defence. None of the agencies who provided submissions stated an explicit position but identified a number of key issues for further consideration/information including noise and vibration impacts, ecological impacts, hydrological impacts, traffic impacts and accessibility.

Comments made by each agency are summarised below.

- The ***Department of Environment and Climate Change*** (DECC) supports the proposal subject to its proposed amendments to the draft Statements of Commitments being made and provides recommended conditions. It raises a number of issues relating to the use of South Australian noise criteria and the scope of the noise assessment in relation to selection of the turbine and ultimate layout and in relation to operating hours. It recommends that a Construction Noise Management Plan is prepared. Other issues raised include remuneration of land holders, blasting and vibration, support and recommendations in relation to the goat management plan and vegetation plan and general support for the cultural heritage assessment. It supports the potential expansion in Stage 2 but requires additional impact assessment prior to final approval of Stage 2.

- ***CountryWater*** (CW) expressed concern regarding any damage to its assets and infrastructure by the proposal because the Environmental Assessment is ambiguous as to whether the site boundaries, easements and turbine locations incorporate CW's land, in particular the Umberumberka Dam. It raises concern in relation to hydrology impacts including water extraction and consumption and water quality impacts and groundwater impacts, particularly during rock blasting and excavation. An erosion management plan is required to be implemented. Other issues raised include noise impacts and the turbine locations.

- The ***Department of Lands (Western Region)*** did not oppose the proposal but raised specific issues which include land tenure maps and details, potential noise, vibration and traffic impacts due to sand and gravel requirements, biodiversity impact assessment (specifically the significance of Umberumberka Dam, rehabilitation of native vegetation and shortcomings in bat assessment), chemical spill procedure and dust control. The Department of Lands considers sedimentation and erosion control to be the main environmental issues and requires management plans. Other issues raised include requirement for a Stage 2 Heritage assessment, access track dimensions, site monitoring program, the location of construction facilities, and consideration of microwaves impacting on fauna, human health and safety. The Department of Lands also provides specific conditions to be applied to the project in its response to the Preferred Project and Submissions Report.

- The ***Department of Primary Industries*** (DPI) raises specific issues in relation to the mineral potential of the project area. A detailed assessment of the mineral prospectivity of the site and an assessment of possible future mining in the project area was not conducted nor included in the Environmental Assessment. The area still available for this purpose and the use of buffers for surface infrastructure should be stated. The likely impact of the project on the existing rights of exploration title holders under the *Mining Act 1992* is also required. These issues are identified in recommended conditions by DPI.

- The ***Department of Water and Energy*** (DWE) acknowledges that the main water sources are administered by CountryWater and alternate water supplies will not be required during the construction. DWE states that groundwater impacts have not been adequately addressed and as a condition of approval requests that a detailed geotechnical investigation is conducted. DWE also states that waterway crossings have not been fully defined. A recommended condition of approval is submission of a Surface Water Management Plan containing proposed waterway crossing designs.

- The ***NSW Roads and Traffic Authority*** (RTA) does not object to the proposal but states that significant generation of traffic will occur. The RTA raises the issues of transport of components (oversize and over mass loads) which it clearly states should be minimised, the requirement for a traffic management plan during construction and decommissioning and further general requirements such as a Road Pavement Management Plan, obligation for funding to repair the Silverton Road if required and installation of appropriate road signage.

- The ***NSW Rural Fire Service*** raises no concerns or specific issues in relation to bushfire matters for the proposed development.

- The ***Department of Defence*** raised no specific concerns with the proposed development.

4.4 Submissions from Local Government

One submission was received from Broken Hill City Council.

Broken Hill City Council supports approval of the project subject to incorporation of the following matters in the determination of the project:

- Visual impact assessment– the overall visual impact assessment of Site 46 (Living Desert Sculpture Park) is understated on the basis of high visitor numbers and sensitivity. Site 46 was not included in the photomontages in relation to transmission lines visual impacts. Also, develop and implement mitigation measures at the 21 receptor locations that were assessed to be of high or medium visual impact.
- Socio-economic impact (tourism) – install tourist viewing locations and information signs in key locations to enhance the tourism experience of the wind farm.
- Transport and access impacts – road maintenance agreements should be established with Council for use of local roads that are under the control of Council.

4.5 Preferred Project and Submissions Report

On review of the issues identified in submissions, the Department required the Proponent to formally address each of the issues raised in those submissions. The Proponent prepared a Preferred Project and Submissions Report in January 2009. This Report had a dual purpose:

- To redefine the Stage 1 area which is the subject of a project approval request, based on further detailed studies (on electricity capacity, biodiversity and archaeology) that have been conducted since preparation of the Environmental Assessment;
- To consider and respond to the issues raised in the submissions to the Environmental Assessment. As part of this process, the Proponent made specific comment in relation to each issue identified.

The Preferred Project is the Proposal described in the exhibited Environmental Assessment, and amended in the Preferred Project and Submissions Report (January 2009) as follows:

- A minor alteration to the boundary of the site and some internally sited wind turbine locations but not electrical infrastructure placement;
- An elevation from Concept Approval to Project Approval for a further 162 wind turbine locations and associated infrastructure following detailed biodiversity and archaeology in the development envelope surrounding these areas;
- Approval to construct a temporary water pipeline subject to the grant of all necessary licences and permits;
- Transmission and access easements required to connect sections of the site together and to the surrounding road network;
- Consent to subdivide the land within the Special Purpose Lease which will be created.

The Preferred Project is therefore as described in Section 2.1 of this report. As stated in the Preferred Project and Submissions Report, the Proponent is seeking Project approval for the construction and operation of the revised, expanded works associated with Stage 1 of the proposed development and concept approval for all construction and operational works associated with Stage 2.

The Proponent's responses to submissions is provided in Section 8 of the Preferred Project and Submissions Report January 2009. To facilitate the Proponent's responses, the issues raised in submissions have been grouped as follows:

- *Environmental Impacts* - Landscape and Visual Impact, Noise, Biodiversity, Hydrology (Water, Water Quality and Water Table Impacts), Geology and Soils, Traffic and Transport, Indigenous and Non-indigenous Heritage
- *Socio-economic Impacts* – Economic, Land Value, Mineral Exploration Impacts, Communication Impacts, Community Well Being, Tourism Impacts, Film and Art Impacts
- *Safety Impacts* - Aircraft Hazard Impacts, Electromagnetic Fields, Health and Safety, Physical Impacts

4.6 Government Agencies Review of the Submissions Report

The Department provided the opportunity for Government agencies and local Councils to comment on the Submissions Report. The Department of Environment and Climate Change, Department of Lands, Department of Primary Industries (Minerals), Department of Water and Energy and the Roads and Traffic Authority provided further comment to the Department.

The Department of Environment and Climate Change continued it support for the project and provided a number of amendments to the Statements of Commitments and recommendations for the Department to consider as recommended conditions. These are discussed within Section 5 of this report.

The Department of Lands has no specific concerns with the level of detail provided in the Preferred Project and Submissions Report but concern is raised that the majority of submissions were overlooked or not considered and sufficient new information was not provided by the Proponent to close off the issues raised, including the issues of land tenure, sand and gravel requirements, biodiversity and specifically bat impact assessment, hydrology, heritage, access tracks and roads, site monitoring, construction facilities, and potential microwave impacts on fauna, human health and safety.

The Department of Primary Industries (Minerals) indicated that its request for a detailed report on the geology and mineral prospectively has not been met in the Preferred Project and Submissions Report. Recommendations are provided to cover the shortcomings.

The Department of Water and Energy indicated an insufficient assessment of groundwater impacts and insufficient information regarding waterway crossings in the Preferred Project and Submissions Report. Recommendations are made to adequately cover both issues and additional information is required to be presented to the Department of Water and Energy for endorsement prior to construction.

The Roads and Traffic Authority provided amendments to the Statement of Commitments in relation to traffic, access, heavy vehicles' use of roads and the potential requirement for construction of additional hard stand areas for passing of vehicles and turning circles.

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

After consideration of the Environmental Assessment, submissions, Preferred Project and Submissions Report and the Government agency response to the Preferred Project and Submissions Report, the Department has identified the following key environmental issues associated with the proposal:

- Noise impacts (Construction and Operation);
- Visual impacts and associated socio-economic impacts;
- Biodiversity Impacts;
- Land-use (mineral exploration) conflicts; and
- Tourism Impacts.

5.1.1 Noise Impacts – Wind Turbine Generators (Construction and Operation)

Issue

The Proponent assessed the potential for construction and operational noise impacts of the project to sensitive receptors. The assessment detailed potential impacts as a result of the entire project (both stage 1 and stage 2). The Department has assessed both construction and operational noise below.

Construction

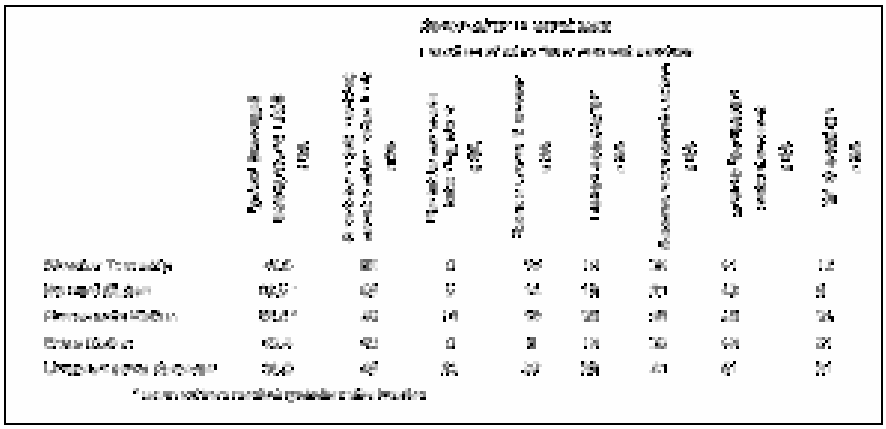
The construction stage would be approximately 18 months for Stage 1, with civil works expected to span 12 months. Stage 2 construction activities are likely to span approximately three to four years, which may extend directly after Stage 1 or be some period after. The Proponent states that due to the very large area of the wind farm site, intensive works will be located within a distance of potential impact for each surrounding receiver for only relatively short (less than six months) and intermittent periods of time. Thus the Proponent considers it would be appropriate for construction noise levels up to 10dB(A) above background noise levels to be considered acceptable for short-term intensive civil works that are anticipated to produce high noise levels.

Computer-generated noise models of typical construction scenarios were developed, which included all anticipated mobile equipment for the activity operating simultaneously at full load. Four worst case areas of works were selected:

- the southern area of the site, closest to Silverton and Belmont Station;
- the northwest area, nearest Eldee Station;
- the central west of the site, nearest to Umberumberka Reservoir; and
- the eastern area of the site, closest to Purnamoota Station.

Table 3 below illustrates the results of the noise modelling.

Table 3 – Noise Modelling Results (reproduced from the Proponent's Environmental Assessment)



It can be seen from Table 3 that the predicted worse-case construction noise impacts are below the existing typical daytime background noise level in most instances. However the Proponent states that some nearby receivers are anticipated to receive elevated construction noise levels when turbine foundation civil works, specifically rock breakers, are located nearby. The Proponent further states that given the anticipated short period of localised works, minor increases in noise levels will be manageable.

It has been stated that some limited amount of night-time construction activity may be required, specifically the erection of wind turbine generators during periods of light wind. This activity involves the same amount of mobile equipment compared to others such as access road establishment, trenching or foundation establishment. The predicted 'worse case' position noise level for the erection of wind turbine generators (WTGs) in the township of Silverton is 12 dB(A) and at Belmont Station, Purnamoota Station, Eldee Station and Umberumberka Reservoir it is 6 dB(A), 24 dB(A), 21 dB(A) and 21 dB(A) respectively. All of these predicted noise levels are significantly below the existing ambient background noise level. It is therefore unlikely that the activity would be audible or cause an impact in this instance.

As part of the civil works, infrequent blasting may be required to clear obstacles and prepare the foundations for the wind turbine generators. The proposed wind farm site is a greenfield site, where no previous blast monitoring has been performed and thus no specific site protocol exists. Thus the Proponent explains it has adopted a site protocol derived from measurement data at different sites to give an indicative result. The potential blasting impact is found to be acceptable. With a maximum instantaneous charge (MIC) of up to 2000 kilograms, the air blast overpressure is anticipated to be below the acceptable level of 115 dB Linear for all existing residences. A more typical MIC value of 11 kilograms would yield an air blast overpressure of approximately 105 dB Linear.

Construction traffic would be generated throughout the construction period, however the volume and type of traffic generated will be dependent upon the construction activities being conducted. For the purposes of assessing potential construction traffic impacts on noise, typical volumes expected during peak construction activity have been used by the Proponent. The NSW Government's Environmental Criteria for Road Traffic Noise (ECRTN) day time (7am to 10pm) criteria are:

- collector road (i.e. Silverton Road), $L_{Aeq(1\ hour)}$ = 60dB(A)
- local road (i.e. Daydream Mine Road), $L_{Aeq(1\ hour)}$ = 55dB(A)

The Proponent states that in all construction cases, the increase in existing noise levels due to traffic arising from the development should not be more than 2dB(A). Decisions on the final road routes to the site entrance would be the subject of negotiations between the haulage contractor and the road authorities, however it is anticipated that the main site access will be along Silverton Road from Broken Hill, with a turnoff to the site along Daydream Mine Road, some 5 kilometres before the township of Silverton. This route would account for 95 per cent of site access requirements with only limited requirements for project traffic to continue through Silverton. The maximum daily rate of traffic at any point in the project's road network during construction would likely be 250 vehicles per day.

Night-time deliveries (scheduled out of hours) of equipment would be necessitated to ensure safe passage of heavy vehicle convoys. Night-time traffic has the potential to cause sleep disturbance to residential receivers along the route. The Proponent states that this is likely to be limited to Broken Hill, as there are no receivers along Silverton Road or Daydream Mine Road that would be adversely affected. The potential maximum noise levels at a residence about 10 metres from the road as a result of a heavy vehicle pass-by would be in the range of 45dB(A) to 80dB(A). The Proponent anticipates that night-time background noise levels along the affected routes could be as low as 30dB(A) to 40dB(A) and as such maximum noise levels from pass-bys may have the potential for sleep disturbance. However the Proponent states that the Barrier Highway is already a significant route (approximately 820 vehicles per day) and it is unlikely that project related night-time traffic would cause any greater impact than vehicles already using the route. The Proponent states that it would form specific mitigatory and management measures prior to construction and these will be included in the Construction Environmental Management Plan.

The Proponent states that project related construction traffic through Broken Hill is unlikely to cause increases in the existing traffic noise level in excess of 2 dB(A). The Proponent has also proposed to notify affected public where night-convoys are scheduled and restrict the use of exhaust and engine brakes in built up areas. To

ensure Belmont Station, Purnamoota Station, Eldee Station and other receptor areas that have a potential to be affected by such activities, the Department requires the Proponent to detail its consideration of measures to be employed to ensure traffic volume, acoustic and amenity impacts along the heavy vehicle routes are minimised. This information must be provided in the Traffic Management Protocol, which is required to be included in the Construction Environmental Management Plan and submitted for the approval of the Director-General, prior to the commencement of construction.

Operation

The Proponent predicted and assessed noise levels from the wind turbine generators against relevant criteria prescribed by the South Australian Environment Protection Authority's *Wind Farms – Environmental Noise Guidelines*, 2003 (SA EPA Guideline) and World Health Organisation goals where appropriate.

The SA EPA Noise Guidelines for new wind farms recommends that predicted equivalent noise level ($L_{Aeq,10\ min}$) adjusted for tonality in accordance with the guidelines, should not exceed 35 dB(A) or the background noise level by more than 5dB(A), whichever is greater. A 5dB(A) penalty should be applied to the measured noise level if an 'authorised officer' determines that tonality should be assessed in a way acceptable to the EPA.

A limited number of dwellings surround the proposed site with the majority located to the south of the site in the township of Silverton. There are 26 dwellings within 10 kilometres of a proposed wind turbine. The predicted noise levels have been presented for the MM92 turbine model for Stage 1 and the Final Stage and for the Vestas V90 model. The Proponent states that it is likely that the MM92 turbine model would be used. The operation of the wind farm site using the MM92 turbine model (all 598 wind turbines), is predicted to comply with all relevant noise criteria, SA EPA Guideline and World Health Organisation limits, at all respective receivers. However if the Vestas V90 model is used, exceedances of the SA Guidelines criteria would occur at many receiver locations. However the Proponent has not discussed in detail this potential for exceedance of the noise criteria by the Vestas V90 model, nor has it proposed any mitigation measures to manage these potential exceedances.

<u>Issues Raised in Submissions</u>

- CountryWater stated that although the predicted worse case construction noise impacts for most receivers are below the existing typical daytime background level, some nearby receivers are anticipated to receive elevated construction levels. It also noted that as the noise assessment results vary with different turbines, it requires further noise modelling and acoustic assessment be undertaken on the specific turbine selected for construction and the final layout. It also seeks to be consulted by the Department and the Proponent and requests that a condition be imposed for noise level restrictions.
- A public submission (owner of a tourist outlet in Silverton) suggested the removal of some turbines at prime scenic locations. This will reduce noise impact for the Silverton residents.
- The Silverton Village Committee suggested that the southern boundary of the wind farm site be moved 6 kilometres from Silverton. As with visual impact, this would also greatly reduce any noise problems residences of Silverton may have.
- Another public submission stated that the Environmental Assessment underestimated the impacts from noise and that it is concerned about low frequency vibrations produced by wind turbines and the potential to cause severe health problems. It further stated that the proposal would create noise impacts from heavy machinery at all hours of the day and night and this will cause a detrimental impact to the lifestyle of residents.
- Exceedances of the SA guidelines criteria were noted by the Department of Environment and Climate Change for the Vestas V90 at many receiver locations. It stated that it would not endorse any exceedance of the SA guideline criteria and thus recommends to the Department that limits be formulated on specific scenarios. The Department of Environment and Climate Change also stated that the noise assessment does not discuss the potential exceedance of the criteria by the V90 turbine model. Therefore it recommends that the Proponent receive conditional approval that requires demonstration of compliance prior to construction.

Consideration

Construction Noise

The Proponent's assessment predicts construction noise levels from various construction activities and compared the predictions against a criterion of background plus 10 dB(A) (due to the geographical spread of the wind farm, the Proponent's noise assessment anticipates that receivers will be exposed to construction noise levels for less than six months before construction activities move to another location). Noise generated from turbine foundation establishment has the potential to be 3 dB(A) above the existing background noise level at Eldee Station and Umberumberka Reservoir. The Proponent has stated that as the localised works are anticipated to be of short duration and it would form specific noise reduction and management measures prior to construction, this exceedance is acceptable. Eldee station is a homestead residence, surrounded by working sheds and a newly built accommodation wing. In this section of the report, Umberumberka Reservoir is referred to as the residence located nearby the reservoir, where the caretaker who operates the Umberumberka Reservoir pumping station lives.

During its review of the Preferred Project and Submissions Report, Country Energy reiterated to the Department its concerns about the noise impacts of the proposal on the residence it owns and which is occupied by its employees (resident at Umberumberka Reservoir). The Department notes that Country Energy requires further noise impact assessment to be conducted and certain noise level restrictions be imposed to ensure this residence is not adversely impacted by noise generated from the project.

As Eldee station and Umberumberka Reservoir may in a worst case scenario, potentially experience high noise level impacts, the Department has recommended that the Proponent be required to prepare a Construction and Traffic Noise Management Plan, as part of the Construction Environmental Management Plan. This sub-plan would detail all the feasible measures to mitigate potential noise impacts and would ensure these measures are implemented. As part of the plan, the Proponent must include relevant auditing and reporting requirements to ensure that residential and sensitive receptors do not experience adverse construction noise impacts. It should be noted that the greatest increase in traffic volumes as a consequence of the project will be on Silverton Road, with current traffic set to more than double during peak construction period. However this road is isolated and a single receiver has the potential to be affected along the road. The Proponent would develop and detail measures to avoid adverse noise impact to this receptor in the Construction and Traffic Noise Management Plan.

Blasting and Vibration

As part of the civil works, blasting may be required to clear obstacles and prepare the foundations for the wind turbines. The Proponent, as required by the Department of Environment and Climate Change, has committed to satisfy the guidelines contained in the document *Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990). These guidelines set out the blasting and vibration limitations to ensure human comfort and the structural integrity of buildings are not adversely impacted from the blasting activities.

The Department recommends a condition of approval that ensures airblast overpressure does not exceed 115 dB(Lin Peak). However of the total number of blasts over a 12 month period, a 5 per cent exceedance is allowed. The absolute maximum permitted is a 120 dB(Lin Peak) airblast overpressure. The Department has also recommended ground vibration from blasting does not exceed specific criteria (peak particle velocity criteria of 5mm per second). These blasting limitations are derived from the above ANZECC 1990 guideline and are set well below levels known to cause structural damage and have been formed to minimise the likelihood of any type of structural damage to occur as a result of blasting.

The closest anticipated distance between blasting and residences would be approximately 1600 metres, which is the Umberumberka Reservoir. At this distance the predicted maximum instantaneous charge (MIC) of up to 2000 kilograms is likely to produce am airbalst overpressure below the acceptable level of 115 dB Linear. As noted by the Proponent, typically an MIC of up to 50 to 100 kilograms is sufficient for blasts with a typical hole size and spacing and overburden. Apart from the employee residence, the underground pipeline that currently supplies water from the Umberumberka Reservoir and associated dam facilities, are assets of Country Energy, which must be protected from ground vibrations and rock fly (blasting impacts).

Apart from blasting limitations, the Department has also recommended a suite of requirements relating to notification and consultation that the Proponent must adhere to prior to and during blasting activities. Firstly the Proponent must notify potentially affected landowners of each blasting event prior to it occurring, including details of time and location of the event and providing a contact for enquiries and complaints. Secondly the Proponent must, prior to any blasting event which is to be conducted in the vicinity of Country Energy's assets, consult with Country Energy to describe the blasting activity and any steps taken to manage the risks from the operations to Country Energy's assets. Furthermore, to avoid damage to Country Energy's assets, the Proponent must determine, in consultation and to the satisfaction of Country Energy, a minimum blasting clearance distance from the assets and any monitoring requirements of the blasting sites. Lastly the Department recommends that the Proponent be required to consult with the Dam Safety Committee and comply with the requirements of the *Dams Safety Act 1978*.

The Department is satisfied that the anticipated blasting would meet all human comfort limits and building damage assessment criteria.

Operational Noise

Wind Turbine Generators

The Proponent identified receivers within 10 kilometres of the wind farm, including residential receivers who will have turbines on their portion of land. According to the SA guidelines, the sensitive receivers are essentially those not associated with the wind farm, that have been determined to be potentially impacted by noise from the wind farm. As stated by the Department of Environment and Climate Change, it is not clear whether the farmers associated with the project will receive remuneration for turbines on their portion of land given it is Crown Land and whether they would like these turbines on their land. Therefore these residences have been included in the noise assessment.

The Proponent identified 26 sensitive receivers. The Department of Environment and Climate Change noted that the process for identifying relevant receivers substantially satisfies the intent of the SA guidelines and is therefore considered acceptable by the Department of Environment and Climate Change.

The assessment of the MM92 model found that 23 receptors would experience operational noise levels below the existing background noise level and the remaining three locations (SL2 Eldee Station, SL6 Umberumberka Reservoir, and SL9 Belmont Station) would experience noise levels above the background level, but this would be below the criteria (i.e. background plus 5 dB(A)). Therefore the assessment found that predicted operational noise levels comply with the criteria.

The Proponent, upon receiving advice from the Department of Environment and Climate Change, also predicted the noise levels that would be generated by the 'noisier' turbine model (Vestas V90) in graphical format. There is potential for the operational noise level to exceed the noise criteria at Umberumberka Reservoir and Belmont Station, by approximately 7 dB(A). The Proponent states that it would implement mitigation measures if this turbine model were to be used to ensure that the operation of the project is compliant with the noise criteria at any sensitive receptors, including Umberumberka Reservoir and Belmont Station.

The Department of Environment and Climate Change stated that it would not endorse any exceedance of the SA guideline criteria and thus recommended limits be formulated using an approach based on the criteria. This means that where predicted noise levels are below 35 dB(A), a limit of 35 dB(A) should apply. Where predicted noise levels are above 35 dB(A) but below the criteria, a limit should be set based on the predicted noise level. Where predicted noise levels exceed the criteria, a limit should be set at the criteria and approval should not be granted without a commitment by the Proponent to satisfy the limit or without a negotiated agreement in place that includes compensation for noise affectation. The Department notes that its recommended conditions for operational noise take into account the Department of Environment and Climate Change's advice. The Proponent must prepare and submit a revised Noise Assessment to the Director-General prior to commissioning of the wind turbines. The Proponent must assess and demonstrate in this assessment that the conclusions drawn in the Environmental Assessment, which state that regardless of the turbine model used, the noise criteria will be complied with.

The Department has recommended a condition which requires the Proponent to ensure the equivalent noise level ($L_{Aeq(10\ minute)}$) from the project does not exceed 35 dB(A) or the existing background noise level ($L_{A90\ (10\text{-}minute)}$) at the integer wind speed at 10 metres height at the wind farm site by more than 5 dB(A) (whichever is the greater). This means the project must comply with the SA Noise Guidelines.

For the 23 out of the 26 locations which are predicted to experience operational noise levels (MM92 model) within the noise criteria, the limit of 35 dB(A) will apply to the project. For the three locations that are predicted to experience noise levels above the existing background but below the criteria, the Proponent is required to ensure that the equivalent noise level from the project at each of these locations does not exceed the pre-existing background noise level by more than 5 dB(A), in accordance with the SA guidelines. This means that the maximum allowable noise level is 40 dB(A) at SL2 Eldee Station, SL6 Umberumberka Reservoir, and SL9 Belmont Station, which are predicted to experience a noise level of 37.9 dB(A), 39.6 dB(A) and 36.3 dB(A) respectively. It should be noted that these recommended conditions apply to any turbine model selected. However, as there is potential for exceedances of the noise criteria at some receptors, the Department has recommended a condition of approval which allows this exceedance to occur, so long as a negotiated noise agreement is in place between the Proponent and the respective owners of those residences with respect to noise impacts and/or limits. If an agreement cannot be reached, the Proponent must implement measures to ensure there will be no exceedance.

The Proponent is yet to finalise the exact positioning of the turbines and confirm the turbine model. In recognition of this, the Department recommends that the Proponent be required to prepare a revised Noise Assessment for the final turbine model and layout selected, which must be submitted to the Director-General prior to commissioning of the wind turbines. The Department requires that this revised assessment must include the noise predictions of the final turbine model layout selected at each of the receiver locations. This required assessment will need to demonstrate consistency with the predictions made in the Environmental Assessment and the ability of final turbine model and layout to meet the noise criteria stated in the recommended conditions (discussed above). Where the new noise predictions are found to be below the recommended criteria, then these revised predictions will become the new limit. The Proponent has also committed to complete this revised noise assessment prior to construction, based on the final turbine layout and turbine selection.

The Department is satisfied that the noise levels generated during construction, including on-site concrete batching plants, rock crusher and blasting, would comply with the appropriate limits. The Department is also satisfied that the potential for noise impacts to occur as a result of project operation can be mitigated or minimised and the recommendations for managing operational noise are consistent with an approach of maintaining the background/current noise level or ensuring noise generated is less than the background. Where an exceedance is predicted, the affected receptor must be agreeable or the Proponent has to alter its operation of the project.

5.1.2 Noise (Construction and Operation) – Transmission lines

Issue

Construction of Site to Broken Hill Transmission Line Stage 1

The stage 1 transmission line is required between the site and Broken Hill. There are three areas where residential receptors are located in close proximity to the 24 kilometre transmission line route. The closest resident is approximately less than 1.3 kilometres from the transmission line. The second closest resident is located approximately 2 kilometres from the transmission line and the third receptor is located 3 kilometres from the transmission line. The Proponent would ensure the placement of the transmission line would avoid existing houses. Therefore construction noise can be managed and the noise impacts to these receptors are negligible.

Construction of Stage 2 transmission line

The current route for the proposed transmission line Stage 2 of the proposal, between Broken Hill, Buronga and Red Cliffs, runs adjacent to the current transmission line easement. The Proponent states that the transmission line routes run through predominantly grazing and farming land in both the unincorporated area of the State and the Wentworth Shire Council.

The Proponent states that the Stage 2 transmission line crosses the Silver City Highway at a number of locations, however is predominately located within farming and grazing land. The Proponent explains that although there

are a number of potential receivers, these receivers are predominately farming homesteads that are not located in the near vicinity of the power line route. The Proponent also states that the route is proposed to replicate the current transmission line to minimise the potential impacts associated with the construction and operation of the proposed transmission, including avoiding areas close to sensitive receptors.

The Proponent states that the construction of the transmission line route would be completed using similar machines and methods to those used for the proposed turbine site and considers that due to the dynamic nature of the construction of the line, any impacts as a results of its construction would be limited and manageable.

Consideration of construction noise generated by transmission lines

The Proponent has stated that as the construction of the transmission line would be intermittent in nature and of short duration, any potential noise impact to receptors would be manageable. The Proponent has committed to minimise construction noise generated by all components of the project (including the 24 kilometre transmission line) by employing noise reduction strategies to ensure the recommendations of the NSW Environmental Noise Control Manual are met. Such strategies may include re-scheduling of noisy activities, improved vehicle noise control and reduced work times. It also committed to use effective exhaust mufflers and compressor silencers on machinery and respond to noise complaints in a timely manner during construction.

However as recommended by the Department of Environment and Climate Change, the Department finds that it is necessary to ensure all potential noise impacts can either be minimised or managed. Therefore the Department recommends that for Stage 1 of the project (282 wind turbines and 24 kilometre transmission line from wind farm site to Broken Hill) the Proponent be required to prepare a construction noise management plan and all feasible and reasonable mitigation measures be implemented to minimise potential noise impacts during construction of stage 1.

As the Proponent is seeking Concept Approval for the stage 2 transmission line, the Department finds that it is not necessary at this point in time, to identify all the closest receptors surrounding the line that may potentially be impacted by noise. However the Department has recommended, as part of the Concept Instrument, that the Proponent be required to submit an alignment sheet for the transmission line, identifying the corridor and demonstrating the avoidance and/or minimisation of all adverse environmental impacts. The purpose of this alignment sheet is to ensure that irrespective of the Proponent using the current transmission line easement, no significant noise or other environmental impacts will occur as a result of the proposed transmission line. As the Environment Assessment suggests no adverse noise impact will occur as a result of the construction and operation of this transmission line, this approach is consistent with the Environmental Assessment.

<u>Operation – Stage 1 and 2 transmission lines</u>

The noise generated by the transmission line once operational is referred to as corona noise. This occurs when air is electrically broken down into charged particles, caused by the electrical field at the surface of the conductors, which results in an audible noise, similar to the sound of crackling or hissing. Corona noise generally occurs in humid conditions, as provided by fog or rain, which is uncommon in the generally arid Western NSW region where the project is to be located.

At a distance of 30 metres along the ground from the transmission line, a Leq noise level of approximately 44 dB(A) was measured by the Proponent. At a distance of 100 metres, the corona noise was calculated to be approximately 39 dB(A). Assuming a RBL value of 30 dB(A), the minimum intrusive criteria as determined by the NSW Industrial Noise Policy would be 35 dB(A). The proposed 220kV line is likely to generate less corona noise than that measured of a 500 kV line. A 500 kV line was tested by the Proponent. The Proponent thus conservatively estimated that the minimum criteria level of 35 dB(A) would be complied with at a distance of 240 metres.

The Proponent states that the proposed route for Stage 1 transmission lines from the wind farm to Broken Hill and then in Stage 2 from Broken Hill to Red Cliffs will traverse largely remote and sparsely inhabited land. The Proponent states that sufficient buffer distances will render the occasional corona noise inaudible at residential receivers.

Consideration of operational noise - Stage 1 and 2 transmission lines
The proposed Stage 1 transmission line has no residences within 240 metres of the proposed route. The proposed Stage 2 power line to Red Cliffs follows the route of the existing 220 kV transmission line. The Proponent states that there is only one house known to be close to the existing power line route and states that sufficient buffer distances will be incorporated into the final design to ensure corona noise is inaudible at residential receivers.

The Department acknowledges that as the Stage 2 transmission line will follow the existing transmission line route, most residential receivers surrounding the proposed route would not be susceptible to noise generated by the project and appropriate buffer distances will be incorporated to minimise noise from the transmission lines. The Department recommends, as part of the Concept Approval Instrument for stage 2 of the project (316 wind turbines and 300 kilometre transmission line from Broken Hill to Red Cliffs), that the Proponent be required to prepare an updated Noise Impact Assessment. It is important for the Proponent to prepare an updated Noise Assessment for Stage 2, for two reasons. Firstly the time that may pass between the Minister's determination of this Project and Concept Application (for Stage1 and Stage 2 respectively) and the Proponent's lodgement of a Project Application for Stage 2 works, may be significant and therefore the Stage 2 site characteristics, such as number of residences, may differ from the time of the Concept Application. Secondly, the Proponent has not prepared a detailed noise impact assessment for the 300 kilometre transmission line and therefore this information must be prepared by the Proponent and assessed by the Department at the time the Stage 2 Project Application is lodged with the Department. The Department notes that there may be no sensitive receptors immediately impacted by the Stage 2 transmission line, however this must be substantiated by such a noise assessment, which clearly identifies all potentially affected receptors and includes mitigation measures that would be implemented by the Proponent to minimise the potential for noise impact to the identified receptors.

5.2 Visual Impacts

Issue
The Proponent assessed the potential visual impacts of the project including the Silverton Wind Farm, transmission lines and associated infrastructure to sensitive receptors including residents, visitors, tourists and motorists.

Nine landscape units were identified by the Proponent surrounding the proposed project area in all directions and assessed for scale, visual amenity and visual absorption capability. The landscape character surrounding the project area was determined to be as follows:

- Overall moderate visual amenity, with some tourist areas of high visual amenity (Mundi Mundi lookout and the Sculpture Park)
- Overall moderate visual absorption capability. Slight increase was determined around areas of more concentrated modifications such as the urban areas of Broken Hill and Silverton. Low visual absorption capability was assessed at the Mundi Mundi Plain and Robe Ranges.

Construction
Visual impact during construction would be temporary during the approximate 18 month Stage 1 construction period. Stage 2 construction activities are likely to span approximately three to four years, which may extend directly after Stage 1 or be some period after. Sources of visual impact during construction and decommissioning work was identified as including large and heavy vehicles, road works on specified access roads, dust generation, and onsite turbine assembly.

The construction of access tracks for use during both the construction and operation phases of the proposed wind farm would also potentially impact visual amenity. The Environmental Assessment states that construction of access tracks has been planned in consultation with key stakeholders and has been designed to minimise potential visual impact of these tracks. Most of the impacts are considered to be temporary.

Operation
Potential visual impacts to receivers during the operational phase of the wind farm at 55 view locations was assessed including residences, public lookouts, film locations, tourist facilities, recreational area and road corridors. The Environmental Assessment considers that the potential visual impact could be both a positive or

negative impact depending on the receiver. All 598 turbines would not be visible from any one location due to the distance and topography across the site.

The Department notes that the Proponent's visual assessment contained in the Environmental Assessment was based on stage 1 comprising of 120 WTGs and Stage 2 comprising of 478 WTGs. The Proponent's Preferred Project Report (part of Submissions Report, January 2009) proposed an additional 162 turbines to be included as part of stage 1, thus stage 1 now comprises of 282 wind turbines.

Pursuant to Section 75H of the Act, the Department required the Proponent to respond to issues raised in the submissions in a Submissions Report. At this time, the Department also noted that the photomontages provided in the Environmental Assessment did not represent views of the areas where a medium to high visual impact was predicted to occur. Therefore the Department required the Proponent to include photomontages for these views. For comparative reasons, Figure 5 below shows the receptors surrounding the wind farm site and the stage 1 (now stage 1 a) turbine locations and Figure 6 shows the locations of all turbines (Stage 1 a, b and c and Stage 2). It can be seen from these two figures that receptors 2, 2a, 6, 8, 10, 11, 14, 17, 19, 20, 21, 22, 27, 28, 29, 30, 32, 33 and 34 would now experience a greater impact from the Preferred Stage 1 proposal, compared to the initial 120 stage 1 wind turbine generators. Table 4 also notes those receptors that would experience a medium to high visual impact.

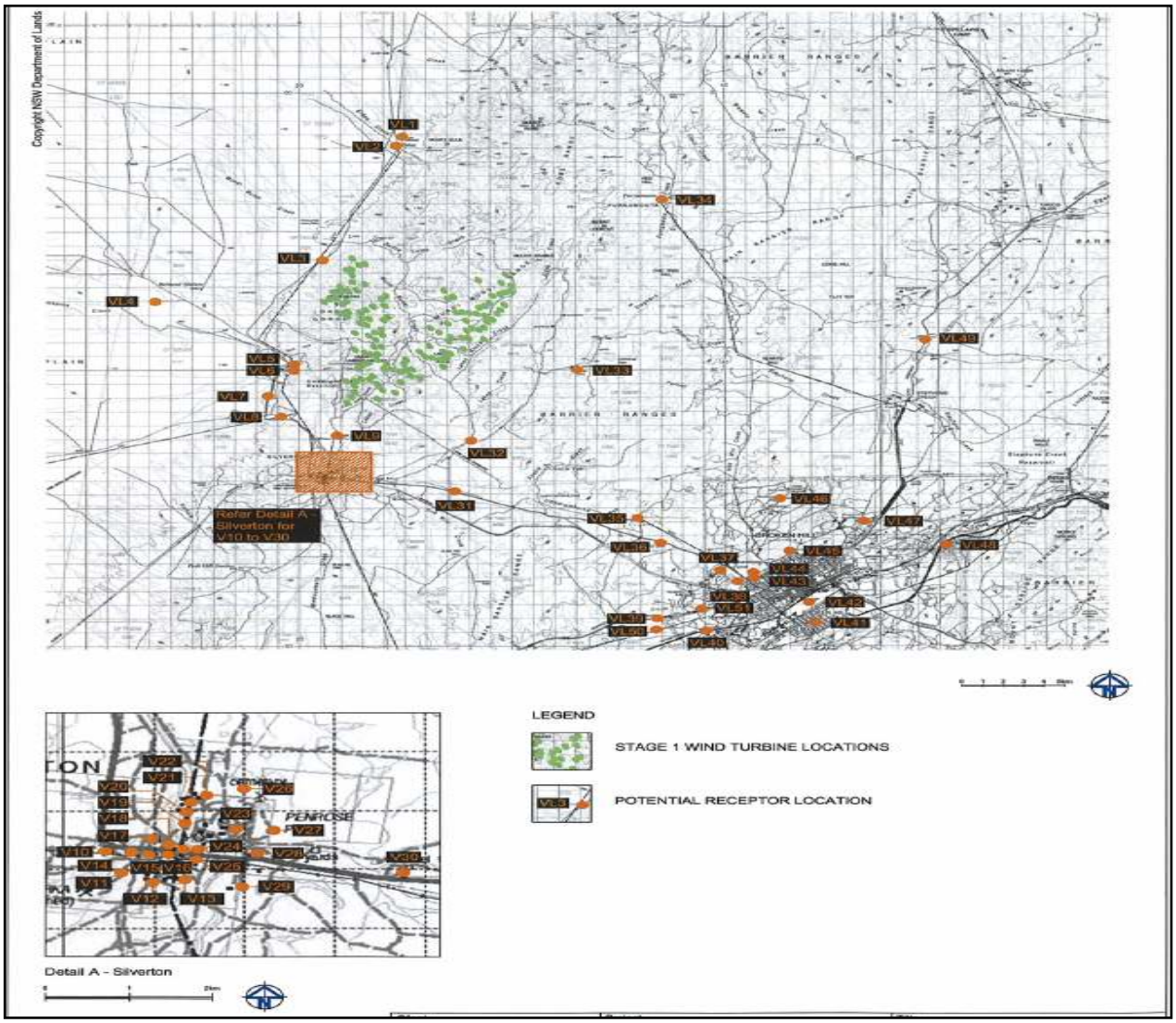


Figure 5: Previously Proposed Stage 1 Turbine Locations and Surrounding Receptors (reproduced from the Proponent's Environmental Assessment)

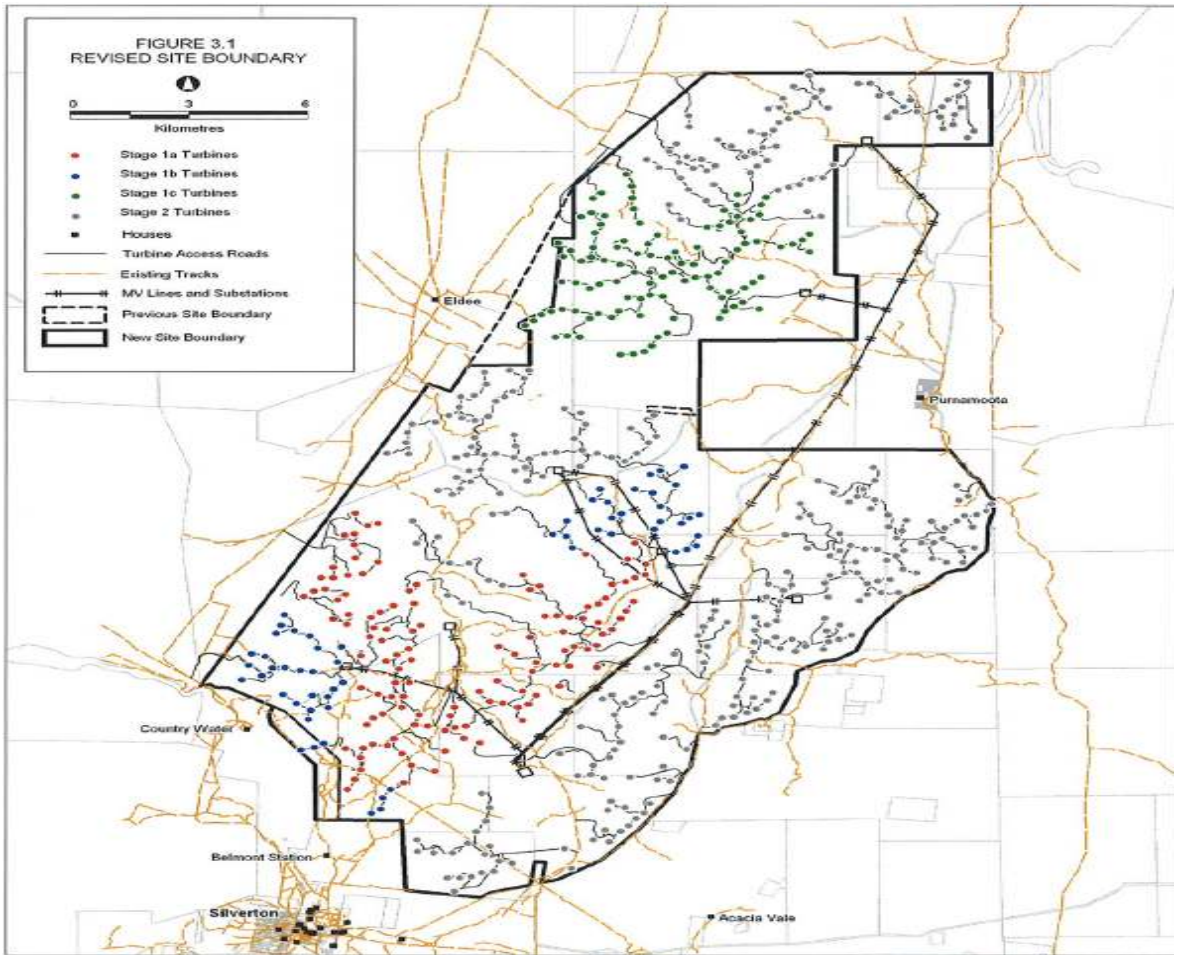


Figure 6: Revised Stage 1 Preferred Project (reproduced from the Proponent's Preferred Project Report)

Table 4: Summary of Surrounding Receptors with Potential to Experience Medium to High Visual Impact

Potential Receptor Location	Potential Receptor Type	Previous Stage 1 Visual Impact	Stage 2 Visual Impact (stage 1 &2)	Preferred Project Visual Impact (Preferred Stage 1)
2	Residents, employees & guests	Nil	High	High
2a	Employees & visitor	Low	Medium	Medium
6	Residential	Low	Low	Low
8	Visitor	Low	Medium	Medium
10	Residential	Low	Medium	Medium
11	Residential	Low	Medium	Medium
12	Residential & galleries	Medium	Medium	Medium
13	Residential & galleries	Medium	Medium	Medium
14	Residential	Low	Medium	Medium
17	Residence & artist studio	Low	Medium	Medium
19	Residential	Low	Medium	Medium
20	Residential	Low	Medium	Medium
21	Residential	Low	Medium	Medium
22	Residential	Low	Medium	Medium
27	Residential	Medium	High	High
28	Residential	Low	Medium	Medium
29	Residential	Low	Medium	Medium
30	Residential visitors	Low	Medium	Medium
32	Motorist	Low	Medium	Medium
33	Visitor & staff	Low	Medium	Medium
34	Residential	Nil	Medium	Medium
Potential receptor locations after number 34 have a Low/Nil visual impact. Note: Shaded blue = receptor locations in Silverton Village Shaded green – receptor locations within Eldee Station Property				

A medium to high level visual impact has been defined as where a view distance between the receptor and a wind turbine generator is up to 6 kilometres, and where the duration of the view is moderate (30 to 120 minutes) to long term (more than 2 hours, i.e. permanent).

Of the 55 receptor locations, the Environmental Assessment concluded that for the combined Stages 1 and 2:

- Eight locations have a NIL visual impact
- 26 locations have a low visual impact
- 19 locations have a medium visual impact
- Two locations have a high visual impact, being a homestead to the west of the Mundi Mundi Range (screening provided due to rising landforms, however short distance and direct views of turbines along the western potion of the wind farm) and residential area located to the east of Penrose Park (limited existing screening opportunities).

For the preferred stage 1 alone, the level of impact to receptors presented in the Environmental Assessment has now changed to a higher impact to that originally found. This means that 19 receptor locations will now experience a medium impact and two receptors will experience a high level impact. This means that these 19 receptor locations will now experience the same level of impact for Stage 1 of the Project and Stage 2 (stage 1 and 2 combined) of the Project.

The Proponent has concluded that locations 10, 11, 19, 20, 21, 22 and 27 all describe a North to North East facing view of the southern portion of the Mundi Mundi Range. Photomontage 1 below depicts the likely view from these locations. Locations 14, 17, 29 and 30 all describe a North facing view of the southern portion of the Mundi Mundi Range, they are all medium visual impact, where location number 17 has been identified to give the best

visual assessment judged on its location in relation to the turbines that will be included in the Preferred Project (refer to Photomontage 2). Locations 12 and 13 are close to each other and located in the southern portion of Silverton, photomontage 3 depicts the view of the turbines from both receptors (properties). Two versions of the view from each location have been prepared by the Proponent – one has the 282 wind turbines of the Preferred Project and the second shows all wind turbines (598) of the entire project (stage 1 and Stage 2). It must be noted that that the turbines are not clearly visible in the photomontages presented in this report. The large scale Panoramic Photomontages supplied by the Proponent, as part of the Environmental Assessment and the Submissions Report and Preferred Project Report, must be viewed in conjunction with this report.

Location 2 is the Eldee Station Homestead, which is predicted to experience a high visual impact from the Preferred Stage 1. Photomontage 4 shows this view location with the 598 turbines.

Photomontage 1 – Representing views from receptor locations 10, 11, 19, 20, 21, 22 and 27 in Figure 5 (reproduced from the Proponent's Preferred Project Report)

Photomontage 2 – Representing Views from locations 14, 17, 29 and 30 in Figure 5 (reproduced from the Proponent's Preferred Project Report)

Photomontage 3 – Representing views from receptor locations 12 and 13 in Figure 5 (reproduced from the Proponent's Preferred Project Report)

Photomontage 4 – Representing view from receptor location 2 in Figure 5 (reproduced from the Proponent's Environmental Assessment)

Lighting

The visual impact of lighting at substations, turbines and control and ancillary buildings has been assessed at potential receptors including residents, motorists and visitors, including the Mundi Mundi Lookout and the Sculpture Park. Three key conclusions were made in the Environmental Assessment:

- Safety lighting is likely to be more noticeable from exterior areas of residences rather than from inside residences due to the use of internal lights at night and drawing of curtains.
- Whilst safety lighting will be visible to motorists, principally travelling northwest to west along the Silverton Road, the duration of visibility would tend to be very short and partially screened by undulating landforms.
- Night time lighting is unlikely to significantly visually impact most receptors, including residential receptor locations.

Stage 1 Transmission Line

Visual impact assessment of the Stage 1 transmission line between the wind farm and Broken Hill assessed eleven receptor locations including residences, visitors at tourist facilities, motorists and rail passengers. Construction visual impact of the transmission line would be temporary and mitigation measures are proposed.

During operation of the Stage 1 transmission line, all eleven receptor locations situated in close proximity of this line, have a low visual impact. Approximately 22 kilometres of the Stage 1 220kV transmission line will not be directly visible from receptor locations around Silverton or from the Silverton Road. The transmission line visibility will increase as the line approaches and crosses over road corridors, including Silverton Road and the Barrier Highway, although the duration of view from motor vehicles travelling along these roads is likely to be very short term and the resulting visual impact low.

Stage 2 Transmission Line

The Stage 2 transmission line visual assessment has been based on the alignment of the existing transmission line. The Stage 2 transmission line route from Broken Hill to Red Cliffs (Victoria) is subject to detailed electrical design and approvals from regulatory bodies. The main visible components will include pylons, insulators, and conductors. The cumulative visual impact of the Stage 2 transmission line will depend on the final alignment and the type of structures (pylons or poles) to be installed.

The existing transmission line from Broken Hill to Red Cliffs is approximately 293 kilometres long and extends in a general south to south east direction following the Silver City Highway between Broken Hill and Buronga.

Potential receptors include residents, motorists and tourists and recreational users. Other significant crossing locations, travelling south from Broken Hill include:

- The Darling River
- The Murray River
- Kings Billabong Nature Reserve (managed by Parks Victoria).

The cumulative impact on the landscape character resulting from the construction of the additional transmission line is likely to be low. Stockpiles and potential dust generation from construction activities may potentially impact on visual amenity. The majority of views towards the existing transmission line from the Silver City and Sturt Highways are distant and indirect. Due to the dynamic and sequential progressive nature of the transmission line construction, potential impacts to visual amenity are considered to be low and from many areas negligible.

Visual impact on residential views, motorists and recreational users at specific receptor locations were assessed. The cumulative impact of the additional transmission line was determined not to be significant at the five groups of residential locations. The majority of views of the Stage 2 transmission line were determined to be distant and indirect. One rest area on the Silver City Highway, 200 kilometres south of Broken Hill, has a potential view (3 kilometres) west towards the Stage 2 transmission line. The transmission line converges towards the highway and crosses at several locations and also crosses a number of minor roads and access tracks over private property and farms.

The Stage 2 transmission line is likely to pass through the Kings Billabong Nature Reserve in Victoria. Most recreational uses in this reserve are located 3 to 4 kilometres from the transmission line corridor, depending on its final alignment. Tree cover in the Murray River floodplain would provide screening in this area. The Environmental Assessment states that the majority of the Stage 2 transmission line would be located through undeveloped rural landscape areas with low population densities.

Issues Raised in Submissions

- One public submission states that the landscape is captivating and placement of the turbines will destroy the inherent beauty of the land.
- Several public submissions expressed concern that the turbines will ruin the scenery and power lines will compound the effect.
- One public submission states that placement of the proposed transmission line will disturb their uninterrupted views and quiet enjoyment of lands and will also impact anyone crossing Silverton Road. Better placement of the transmission line will reduce visual impact.
- Broken Hill Council stated that the visual impact assessment of "low" at the Living Desert Sculpture Park is underestimated based on visitor numbers and the sensitivity of the area. Further, no photomontages were provided for the transmission line at this location.
- Two public submissions suggest the wind farm be moved northwards to create a 6 kilometre buffer from Silverton to reduce the visual impact from local properties and proximity of the turbines.

Consideration

Wind Turbine Site – construction

The Proponent has committed to the implementation of a range of mitigation measures to ensure minimal disturbance to visual amenity to nearby residences occurs during construction. The Proponent has committed to design and construct site control room and facilities buildings sympathetically with the nature of the locality, minimise activities that may require night time lighting and use low intensity lighting where required and locate substations to minimise views from public roads and residences. The Proponent has also committed to minimise the view of civil earth works by rehabilitating any site access track not required during the operation of the wind farm at the completion of the construction phase, enforcing protocols to control and minimise fugitive dust emissions, restricting the height of stockpiles to minimise visibility from outside the site, minimising cut and fill for site tracks and stabilising disturbed ground as soon as possible after construction.

The Department finds that these commitments are adequate to ensure visual impact to nearby residences are minimised and managed appropriately.

Wind Turbines Site – operation

From the 55 receptors surrounding receptor locations, 19 locations will experience a medium visual impact, of which 15 are residential receptor locations. Two of the 55 receptor locations will experience a high visual impact, both of which are residential type receptor locations.

The receptor locations 2 and 27, which have been determined to have a high visual impact, are a homestead to the west of the Mundi Mundi Range (receptor location 2) and residential dwellings located to the east of Penrose Park (receptor location 27). Although each receptor location may experience a high visual impact, the Proponent has stated that neither receptor will experience views toward all the Stage 1 and Stage 2 turbines, with the majority of turbines screened by the rising landform along the east and west edge of the ranges.

The residential dwellings (receptor location 27) to the east of Penrose Park have limited screening opportunities and are likely to have direct views toward a number of turbines. The closest view distance to any of the turbines at this receptor location is 2.9 kilometres and the period of view would be long term, as the receptor is residential.

Similarly, the homestead, including visitor accommodation, to the west of the Mundi Mundi Range (receptor 2) will experience short distance and direct views toward a number of turbines located along the west portion of the wind farm site (stage 1 and stage 2). This can be seen in Photomontage 4, with the closest view distance to any of the turbines at this receptor location being approximately 2 kilometres.

There are 19 locations determined to have a medium visual impact from Stage 1 (and Stage 2), of which 14 are residential locations and thus the view period would be long term. The average view distance from these 14 residential receptors to the wind farm site is 3.76 kilometres, with the shortest view distance being 2.2 kilometres and the longest view distance being 4.8 kilometres. The Environmental Assessment found that with a view distance of 1 to 4 kilometres, wind turbines will generally dominate the landscape in which the wind turbine is situated. The Department finds that the proposal will dominate the landscape for all the receptors determined to have a medium to high impact. Due to the elevated views of the turbines, any vegetation screening may only partially screen the view of these turbines rather than completing concealing the view. For example, the tower may be less visible after the implementation of visual screening methods, however the nacelle and blades would not be able to be completed concealed.

The Department has recommended that the Proponent be required to, at the request of any owners of residential dwellings or businesses with views of a turbine(s) located within six kilometres of their dwellings, provide and bear the full cost of landscaping treatments to visually screen these dwellings. To ensure these requests are submitted in a timely manner, the Department recommends that such requests may be made in writing by the owner of the dwelling or business within six months from the commencement of operation of the project, and landscaping treatments agreed between the owner of the dwelling and the Proponent be implemented and completed within 12 months of such an agreement. In addition to this, the Department recommends that the Proponent be required to ensure all residents, business owners or public authority, whose dwelling, business or public area respectively, may be subject to moderate to high visual impact, is consulted regarding impact minimisation measures, and the outcomes of this consultation process are used to inform the required Design and Landscaping Plan.

The preparation and implementation of a Design and Landscaping Plan, as part of the required Construction Environmental Management Plan, has been recommended by the Department. This is to ensure the Department has adequate information regarding the screening measures at residences situated in close proximity to the project and along roadsides to screen potential moderate to significant (high) views of the project. The Department requires the Plan to be prepared by a qualified landscape architect and where relevant meet the requirements of Council and the Roads and Traffic Authority. To ensure detailed and relevant information is provided in this Plan, the Department requires the Plan to include design treatments for the wind turbines, substations and ancillary infrastructure, detailing landscape and built elements, lighting, a schedule of species to be used in landscaping, timing and progressive implementation of landscape works and the procedures to monitor and maintain the landscaped areas.

The Department notes that the Proponent has also committed to rehabilitate disturbed areas, where appropriate, in consultation with landholders and offer screening, through planting of vegetation, at dwellings categorised as having moderate to high visual impact.

Stage 1 Transmission Line – Wind Farm Site to Broken Hill – Construction

The construction of the transmission line may have potential to impact on visual amenity, however the Proponent has committed to minimise views of civil works and infrastructure by locating the transmission lines where practical, to follow the corridor of the existing transmission lines and enforce protocols to control and minimise fugitive dust emissions.

Stage 1 Transmission Line – Wind Farm Site to Broken Hill – Operation

The closest resident to the transmission line is located off the Barrier Highway (receptor no.51), where the distance to the transmission would be less than 1 kilometre. The Department has recommended that the Proponent be required to ensure that all residents, business owners or public authority, whose dwelling, business or public area respectively, may be subject to moderate to high visual impacts, is consulted regarding impact minimisation measures and the outcomes of this consultation process must be used to inform the Design and Landscaping Plan. As receptor no. 51 has a view distance within 6 kilometres of the project and the period of view would be moderate to long term, this requirement would apply to this receptor. The Design and Landscaping would be included as part of the Construction Environmental Management Plan (CEMP). The CEMP would require the approval of the Director-General prior to construction works commencing.

The Department finds that from the detailed design process, the Proponent would be in a position to determine the exact distance between the transmission line and receptors upon confirming the final layout and placement of project elements. Thereby, the Design and Landscaping Plan would be able to include detailed information of the level of visual impact that would occur to receptors as a result of the project's operation and the subsequent mitigatory and management measures.

Stage 2 Transmission Line – Construction

The Proponent states that generally it is considered that the cumulative impact resulting from the construction of the transmission line is unlikely to be significant for the majority of residences that currently view the existing transmission line. Stockpiles and potential dust generation have the potential to impact on visual amenity. However the Proponent has found, based on its preliminary assessment, that the majority of views are distant and indirect and due to the dynamic and sequential progressive nature of the transmission line construction, potential impacts to visual amenity are considered to be low and from many areas negligible.

The Proponent however has for both Stage 1 and Stage 2 proposed transmission lines, committed to the objectives of minimising views of civil earth works and infrastructure.

Stage 2 Transmission Line – Operation

For the purposes of the Concept Application for Stage 2 of the project, the Proponent considered residential views in a number of discrete groups relative to their position in the landscape along the existing transmission line route. It was found that that due to the existing transmission line, the cumulative impact from the proposed transmission line to the residential areas, would unlikely be significant.

However as the Proponent's assessment for the Stage 2 transmission line was only preliminary in nature, the Department recommends, as part of the Concept Approval, the Proponent be required to provide a complete Visual Impact Assessment of the proposed Stage 2 transmission line and associated substations, focusing on visual impacts on residences, motorists and rail passengers during the operational stage of the transmission line. The Department finds that this recommendation is adequate to ensure that the Proponent, upon submitting a Project Application for Stage 2, would have considered all potential visual impacts and relevant measures to either avoid impacts from occurring, or measures to minimise such an impact. Upon receiving such information, the Department would be able to conduct a complete visual assessment for Stage 2.

As the final transmission line route has not yet been finalised, and the Proponent's preliminary visual assessment is based on the assumption that the proposed transmission line will duplicate the existing transmission line, the Department has recommended as part of the Concept Approval, that the Proponent submit an alignment sheet

for the transmission line. This will identify the final corridor and demonstrate the avoidance and/or minimisation of all adverse environmental impacts, which includes visual impacts.

5.3 Mineral Exploration Impacts

Issue

The mineral potential and impact on exploration due to the proposed wind farm has been assessed by the Proponent. The proposed wind farm is located in the Proterozoic Curnamona Craton, represented by the Broken Hill and Euriowie Blocks. The cratonic units consist of strongly deformed and metamorphosed sedimentary and igneous rocks termed the Willyama Supergroup.

As described in the Environmental Assessment, the Broken Hill deposit is one of the world's largest natural accumulations of base metals. Mining of lead, silver and zinc is conducted however exploration for other desirable commodities has not been conducted to a large extent despite the proven high prospectivity. According to the information contained in the Environmental Assessment, there are three current exploration leases over the proposed wind farm site, due to expire by September 2009. However as noted by the Department of Primary Industries, such exploration leases tend to be renewed and therefore the implications of the project to these leases should be considered by the Department.

Construction

The main impact posed by the construction and decommissioning phases of the proposal is the sterilisation of the mineral resource and inhibition of active and future exploration activities. The Environmental Assessment states that the construction phase is a relatively short time frame. The Environmental Assessment does not address any exploration licence applications currently in progress. These are highlighted in submissions received.

Operation

The Environmental Assessment states that the direct footprint of wind farm infrastructure is only three per cent of the total site area. Therefore it is possible to co-operate with mining exploration activities in the area and the Proponent would not prevent access except for safety, structural, operational or engineering limitations. Therefore, the wind farm may impede mineral exploration activities in close proximity to the surface infrastructure such as turbines and substations. The Environmental Assessment does not state a clear position on the potential impact of the proposed wind farm on future mining activities, stating that future mining may be possible depending on the nature and type of mine (for example underground mining) and otherwise the resource can be extracted after the decommissioning period.

Transmission Line Route

Potential impacts on mineral exploration along the transmission line route (site to Broken Hill and site to Red Cliffs) are based on the 50 – 100 metre easement required and safety considerations as mining would not be feasible directly under the power lines. A total of 14 exploration licences exist along the route, all due to expire by late 2009. The submissions received on this issue are limited to the wind farm area. None relate to the transmission line itself.

Issues Raised in Submissions

- One public submission (a mining company) confirms the very large and high grade of the Broken Hill mineralisation and the large monetary value involved. It has exploration licence applications in process with the Department of Primary Industries which would be impacted by the wind farm proposal. It states that new exploration methodologies formed in recent years indicate a real chance of finding a significant mineral deposit on the wind farm site and the company intends to establish this. States that co-existence of the wind farm and mining operations must be considered in the Department's recommended conditions.
- One public submission emphasises the geological significance of the proposed wind farm area and large potential for exploration activities using new technology.
- One public submission highlights concern regarding sterilisation of the mineral resource and exploration activities. It is suggested that the proposed area is geologically unsuitable for wind farms and an alternative Broken Hill location should be sought.
- The Department of Primary Industries (Minerals) raises strong objection to the potential impacts to mineral exploration and states that the Environmental Assessment and Preferred Project and Submissions Report do

not adequately address this issue. A full detailed assessment and consultation with all mining stakeholders including Exploration Licence holders, is requested. It has confirmed that the proposed wind farm area has very high mineral prospectivity which is of state significance. The Proponent needs to address how it will co-operate with mineral explorers to minimise land use conflict.

Consideration

The proposal will not result in the sterilisation of the entire wind farm site for mineral exploration. As stated by the Proponent, exploration activities would still be possible across a majority of the wind farm site. The only limitation to invasive exploration methods will be in close proximity to the placement of infrastructure, i.e. turbines and powerlines, as a result of operational, engineering and safety considerations. To minimise areas subject to exploration restrictions in the vicinity of wind farm infrastructure and to minimise conflicts, the Proponent has committed to liaise with current mineral lease holders and provide a final turbine and infrastructure layout to these leaseholders, prior to the construction stage of the project. The Proponent has also committed to provide a point of contact to the current mineral lease holders during the construction, operation and decommissioning stages of the project. The key objective from these two commitments is to minimise conflict between the project and mineral exploration.

Although no mineral deposits have been discovered in the proposed wind farm site to date, there is potential for such a discovery of an economic mineral resource. Therefore the Department has recommended a range of requirements that the Proponent must adhere to, to ensure an effective and substantial consultation process occurs between the Proponent, exploration licence holders and the Department of Primary Industries (Minerals Resources). Firstly, the Department recommends that prior to construction, the Proponent must liaise with the Department of Primary Industries - Minerals Resources to assist in obtaining information of all current exploration licence holders, including applications lodged with itself for new and renewal of expired exploration licences and potential mining leases. This recommendation ensures that the Proponent would be aware of, and be able to consider, all those parties that may potentially be affected by the location of the wind farm site and transmission line corridors. Secondly, prior to construction, the Proponent must ensure an effective consultation process with relevant titleholders and companies of exploration and mining licences to negotiate measures to be applied during construction and operation of the project, including determination of buffer distances of the project components, so as to minimise the potential for any sterilisation of resources on the tenements and future resource exploration and extraction activities. In order to ensure this consultation process is carried out in a timely and sequential manner, the Department also recommends that Proponent must, within six months of the Minister's project approval, update the Department of Primary Industries - Minerals Resources of the progress of the consultation process identified above, and provide subsequent updates at maximum of six months from the date of providing the initial update.

The above requirements of identifying buffer distances and undertaking a complete consultation process is consistent with Department of Primary Industries – Mineral Resources' recommendations that the Proponent must provide such details of buffers to accurately quantify the potential restrictions on access to areas of exploration and to minimise conflicts and to provide maximum access to areas with higher mineral prospects.

The Department of Primary Industries – Mineral Resources, upon reviewing the Proponent's Submissions Report, also recommended to the Department that the Proponent must be required to complete a detailed assessment of the geology and prospectivity of the project area. The Department found that such a requirement would be impractical for the Proponent as it would not be consistent with the scope of the proposal and would not be a justified imposition on the Proponent. The Proponent also strongly disagreed with such a potential recommendation for the same reasons.

The Department's recommendations discussed above would ensure the project incurs minimal impact to the potential for exploration of mineral resources, allowing the co-existence of the project and mineral exploration to be achieved. It would also ensure those affected from the placement of project components would have adequate opportunity to liaise with the Proponent to negotiate the implementation of measures that will maximise mineral exploration potential and minimise sterilisation and access constraints.

5.4 Biodiversity Impacts – Stage 1

Issue

Stage 1 - Construction

Table 5 below shows the total amount of vegetation to be cleared as a result of direct construction impacts. This includes the wind farm site, 24 kilometre transmission line corridor and all associated infrastructure. It can be seen from the Table 5 that for stage 1 a, approximately 82.63 hectares of native vegetation would be cleared. Approximately 8.75 hectares could be rehabilitated after the construction stage of the project. Approximately 60.87 hectares could be rehabilitated after the life of the project. However 13 hectares of vegetation would be permanently impacted. For stage 1 b and c, approximately 132 hectares of native vegetation would be cleared, approximately 11 hectares could be rehabilitated after the construction stage and 97.368 hectares could be rehabilitated after the life of the project.

Table 5: Approximation of Stage 1 vegetation clearing (Stage 1a, b and c)

Vegetation Type	Stage 1 a clearance (hectares)	Stage 1 b and c clearance (hectares)	Total Stage 1 (a, b and c)	Rehabilitation potential (hectares)	Permanently Impacted
Mulga – Dead Finish	58.85	109.2	168.05	**159.67** (56.17 stage 1a + 103.15 stage 1 b and c)	**8.77** (2.68 stage 1 a + 6.09 stage b and c)
Prickly Wattle shrubland	0.65	2.37	3.02	**3** (0.63 stage 1a + 2.37 stage 1 b and c)	**0.02** (0.02 stage 1a)
Bluebush shrubland	18.79	0	18.79	**1.68** (1.68 stage 1a)	**10.36** (10.36 stage 1a)
River Red Gum Open Woodland	0.54	18.32	18.86	**0.86** (0.54 stage 1a + 0.32 stage 1 b and c)	**18** (18 stage 1 b and c)
River Red Gum of rocky creeks	0.55	0	0.55	**0.55**	0
Porcupine Grass – sparse woodland	1.31	0	1.31	**1.31**	**0**
Black Bluebush	0	1.52	1.52	**1.52**	**0**
Black Oak Woodland	0	0.023	0.023	**0**	**0.023**
Undescribed Vegetation Community 1	0	0.9025	0.9025	**0.88**	**0.0225**
Undescribed Vegetation Community 2	0	0.128	0.128	**0.128**	0
TOTAL	**80.69**	**132.46**	Total clearance = **213.15**	Total Area could be Rehabilitated = **169.598**	Total Permanently lost = **37.1955**

There were no threatened plant species or Endangered Ecological Communities (EEC) detected within areas that would be affected by the stage 1 component of the project. However the Porcupine Grass –Red Mallee – Gum Coolibah hummock grassland/low sparse woodland has been nominated for EEC listing, as it is the only known location of the community within New South Wales. No turbines would be located within this community and the area of this community proposed to be cleared for the access tracks onsite (0.81 hectares) and the underground power line cabling onsite (0.5 hectares) would be rehabilitated after the life of the project. The Proponent has committed to procure an appropriately qualified ecologist to assist in locating tracks, cabling routes and other infrastructure so as to minimise the impact on threatened species and the Porcupine Grass - Red Mallee – Gum Coolibah hummock grassland identified in the project site.

The two undescribed vegetation communities (Mulga/Red Mallee Shrubland on Rocky Slopes of the Barrier Range Community and Chenopod – Red Mallee Woodland/Shrubland on Gravely Lower slopes Community) have been identified as areas of high biodiversity value. This is because both these communities represent unusual occurrences of Red Mallee, as this species generally occurs in red aeolian sand, and its presence on rocky ridges in the study area is significant. The Proponent has stated that it would supply the details of these two communities to the Royal Botanic Gardens. An existing access road flanks these two communities along the proposed transmission line easement, which will require widening to permit access. However beyond these specific works, these areas of vegetation would not be used for the project. The Proponent has committed to strategically place infrastructure to avoid areas of high biodiversity value where possible. Beyond use required for the construction of the transmission line and road widening of the existing track, the Proponent has committed to protect these two undescribed communities from other impacts, including use for materials/equipment laydown.

The Tawny Rock Dragon, a reptile listed as endangered under the *Threatened Species Conservation Act 1995*, was recorded in several locations within the wind farm development envelope, during targeted surveying by the Proponent. Prior to the Proponent's surveying, this species was known only from two locations in NSW. This species is restricted to rock outcrops in ranges and gorges however this species is absent from suitable habitat in other parts of its range in NSW and its genetic makeup could be different to those species found in South Australia. Therefore its distribution is highly restricted and fragmented. The Proponent finds that this species is potentially threatened from disruption of habitat by introduced herbivores. For example, grazing of vegetation on and adjacent to rock outcrops by feral goats and rabbits, particularly during periods of drought.

As the project may constitute a loss of habitat for this highly restricted species, the Proponent has committed to avoid identified Tawny Rock Dragon hotspots during construction. People, equipment, infrastructure or materials would not impact directly or indirectly on any mapped hotspots of the Preferred Project Report (Map 3-4 and 3-5). For example, where track construction flanks hotspots, no spoil or sedimentation from these activities are permitted to enter the hotspot.

Operation

The operation of the wind turbines has the potential to impact on birds and bats utilising aerial habitat within the blade-sweep zone, which are birds and micro-chiropteran bats. Other terrestrial fauna may be affected by turbine noise and blade flicker. There are two types of risks posed by the operation of the turbines, where one is the collision with wind turbines ('blade-strike'), which refers to mortality caused by the direct collision with turbine blades and by birds being swept down by the wake behind a turbine blade. The other risk is referred to as 'avoidance' behaviour, caused by the presence of the turbines and associated infrastructure. Depending on where the turbines are located, this may affect foraging patterns, nesting, roosting or movements of animals around the project site.

The Proponent completed a qualitative risk assessment for birds and bats, combining assessments of likelihood and consequences, to produce a final risk assessment of low, moderate or high risk for selected species. Table 6 below shows the overall impact risk for birds and bats, where the assessment focused on bird groups which have been shown to be at particular risk in studies at other wind farms (raptors, waterbirds, migratory species), as well as rare, threatened or protected birds and bats with potential to be present in the project's study area. The table below lists the animals in order of decreasing risk to a local population.

Table 6: Overall impact risk for birds and bats - blade-strike and avoidance impacts (reproduced from the Proponent's Environmental Assessment)

Species	Risk to individuals at site	Risk to population
Wedge-tailed Eagle	Moderate	Moderate-high
Brown Falcon	Moderate	Moderate
Diamond Firetail	Low	Moderate
Parrots: Superb Parrot, Turquoise Parrot, Scarlet-chested Parrot, Night Parrot	Low	Moderate
Pink Cockatoo	Low	Moderate
Ducks: Blue-billed Duck, Freckled Duck	Low	Moderate
Owls: Barking Owl, Masked Owl, Grass Owl, Barn Owl	Low-moderate	Low-moderate
Bats: Yellow-bellied Sheathtail-bat, Inland Forest Bat, Little Pied Bat	Low	Low-moderate
Australian Hobby	Moderate	Low
Spotted Harrier	Moderate	Low
White-throated Needle-tail	Low-moderate	Low
Australian Kestrel	Low-moderate	Low
Peregrine Falcon	Low-moderate	Low
Tawny Frogmouth	Low	Low
Painted Snipe, Latham's Snipe	Low	Low
Egrets: Cattle Egret, Great Egret	Low	Low

No species were rated as high risk however the most at risk were determined to be the Wedge-tail Eagle and the Brown Falcon. Both of these species are present on the proposed project site. The Proponent states that these two species have preferred resources within the development envelope and occur at low density in the landscape and would represent excellent species to model the specific impacts of the proposal post construction.

Apart from strategically placing and designing proposed infrastructure to minimise impacts, the Proponent has committed to design and implement an adaptive management monitoring program during the operation of the project, to document bird and bat mortalities, remove carcasses and assess the effectiveness of controls. If the results of assessment demonstrate that further mitigation is required, further turbine ridge habitat modification and enhancement of off-site habitats would be undertaken. The Proponent has also committed to preparing and implementing a goat management plan across vegetation in the Stage 1 area, to minimise the degradation that heavy goat grazing is causing across many areas of the site and to preserve habitat for fauna.

Issues Raised in Submissions

- The Department of Environment and Climate Change recommended amendments to the Statement of Commitments to ensure an appropriately qualified ecologist is used to assist in ensuring minimal impact occurs to vegetation, and the Goat Management Plan and the Vegetation Plans proposed by the Proponent be developed with input from relevant agencies, including the Department. It also recommended that turbines not be situated in areas likely to be frequented by birds susceptible to bird strike.
- The Department of Lands raised concerns regarding the intensiveness of bat surveys, specifically whether the harp trapping effort was sufficient to complement the anabat data collected. It stated that the risk analysis applied was not specifically suited for bats, rather birds only, as bats use a different form of spatial location (pulses of sound rather than eyesight). This means that bats may be less able to detect the sweep of the turbine blade making them more vulnerable to the impact of the blade. It also stated that fox and rabbit control may be required (apart from proposed goat control) and suggested that reseeding and planting methods should be used to manage the disturbance of soils onsite.
- A public submission stated concern that some vegetation communities and cryptograms were not assessed by the Proponent.

Consideration

Construction

The Proponent's Submissions Report and Preferred Project Report proposed additional areas to be included as part of Stage 1 (stage 1b and stage 1c). Due to the additional areas, there is potential for direct impact to vegetation communities of restricted distribution (the two undescribed communities and Porcupine Grass – Red Mallee – Gum Coolibah Hummock Grassland) and the habitat for the endangered Tawny Rock Dragon may also be impacted. Also the final location for the placement of the wind turbines and associated access tracks are yet to be determined by the Proponent, meaning the actual impact from the construction of the project may be greater than, or less than, the potential impact conveyed in the Proponent's Environmental Assessment. For these reasons, the Department has recommended a suite of requirements that the Proponent must adhere to ensure impacts to flora and fauna are avoided at the first instance, these are listed below.

- Maximising the use of existing cleared areas for on-site facilities and the proposed transmission line.
- Placing turbines away from raptor nest trees and where possible.
- Limiting the amount of native vegetation clearing to the minimal extent practicable and avoiding areas of standing dead trees and woody debris. Where removal of vegetation cannot be avoided, it must be placed adjacent to the impacted areas to retain refuge areas, stabilise soils and aid in vegetation rehabilitation.
- Ensuring stockpiles (such as gravel and topsoil) are stored in areas that are of less than ten percent slope and free of mature trees and not placed in areas where they may be blown or washed into drainage lines.
- Must aim to avoid and where avoidance is not possible, minimise, the clearance of the high biodiversity value vegetation communities identified in Map set 6 of the Biodiversity Addendum, contained in the Proponent's submissions Report and Preferred Project Report.

The Department has also recommended certain requirements that should apply to minimise and manage impacts where avoidance is impractical due to site constraints, these are listed below.

- Preparation of the Vegetation Management Plan for the entire development envelope that the Proponent has committed to, in conjunction with the Goat Management Plan, that the Proponent has also committed to, to ensure any additional threats and subsequent management actions are identified.
- Aim to avoid any impact to the Porcupine Grass – Red Mallee – Gum Coolibah Hummock Grassland community and where impact cannot be avoided, implement, in consultation with the Department of Environment and Climate Change, measures to minimise such an impact.
- Where practical, carry out all revegetation works using indigenous native plants and seed which are sourced locally.
- Preparation and implementation of a Flora and Fauna Management Plan, which must form part of the required Construction Environmental Management Plan (CEMP) for the project, to outline measures to protect and minimise loss of native vegetation and native fauna and be developed in consultation with the Department of Environment and Climate Change and the relevant Catchment Management Authority. The Plan must include:
  - Maps that identify areas that would be cleared and methods to manage impacts on flora and fauna and their habitat, which may be directly or indirectly affected by the project.
  - A strategy to manage weeds, since encouragement of weed generation as a result of ground disturbance may pose serious threats to the already restricted distribution of the vegetation found in and surrounding the project site.
  - Details of rehabilitation of cleared areas. This information is important for the Department to understand and assess whether the Proponent's view that the majority of vegetation proposed to be cleared could and would be rehabilitated (approximately 169.6 hectares) is accurate. Such details must include four key components:
    1) description of the objectives of the rehabilitation works and areas to be rehabilitated;
    2) consideration of the biodiversity management measures or activities identified in its Environmental Assessment;
    3) identification of both the short and long term rehabilitation measures and possible alternatives should these measures be unsuccessful; and
    4) a timeline to achieve the implementation of the rehabilitation measures.
  - A program for reporting on the effectiveness of terrestrial flora and fauna management and rehabilitation measures. Where management and rehabilitation methods are found to be ineffective, they must be reviewed by the Proponent.

A large area of the Mulga – Dead Finish, Bluebush Shrubland and River Red Gum Open Woodland communities would be cleared as a result of the project and although most of the Mulga – Dead Finish community could be rehabilitated, 8.77 hectares would be permanently impacted. Only 1.68 hectares of the Bluebush Shrubland and 0.86 hectares of the River Red Gum Open Woodland could be rehabilitated respectively.

In the Study Area, the Mulga – Dead Finish community occurs on skeletal or shallow, stony soils, which occur on the steep slopes, hillcrests, mid-slopes and terraced flats of elevated landscapes. Much of the wind-scape region, which will be impacted by turbines, is within this vegetation community. The Mulga – Dead Finish community is predicted to become a threatened community if regeneration of key species does not occur. However the Proponent has found that most of this vegetation occurring on the project site is highly degraded. Dieback of Mulga is common across the site and a lack of regeneration of these species suggests a long-period of degradation to this community, likely to be caused by timber cutting and grazing by feral goats and rabbits.

The Bluebush Shrubland community is dominant along the proposed powerline route towards Broken Hill and in the vicinity of the proposed substation, where red or brown clays or red loams occur. This community may, without effective management of all pastoral leases across western NSW of grazing and feral herbivores, become threatened over the long term. The River Red Gum Open Woodland community, within the Study Area occurs along major drainage lines such as Umberumberka Creek and Lakes Creek. The understorey is sparse in this community and many areas appear to be heavily grazed either by domestic stock and/or feral animals. This community is relatively common and undisturbed in the landscape and previous studies illustrate that this community is well represented in protected areas and is not threatened by clearing. However, the Proponent found that changes to hydrological regimes, overgrazing by stock and localised weed infestations are the major threats to this vegetation community.

The Department recognises that no threatened plant species or Endangered Ecological Communities (EECs) were found within areas that would be affected by Stage 1 works and the composition and structure of those vegetation communities that would be impacted has been modified as a result of grazing by stock (including goats) and altered fire regimes. The Department finds that the preparation and implementation of the Goat Management Plan in conjunction with the Vegetation Management Plan will ensure that minimum impact occurs to those communities where clearing would occur. The Department agrees with the Proponent that the Goat Management Plan will reduce the existing impacts of goats on sensitive vegetation on the site. For example, the area of vegetation to be removed as a consequence of the development of the stage 1 area (213.15 hectares) of the wind farm would be offset by the implementation of a goat management program over the stage one area site (4,918.4 hectares). This would ensure that the Department's statutory requirements to improve or maintain the environmental values of the site are achieved.

The Department finds that the proposed construction impacts as a result of the Stage 1 works can be effectively minimised and managed by the implementation of the Proponent's statement of commitments and the Department's recommended requirements.

Operation

The Department recognises that bird and bat strike is the key potential impact on biodiversity from the operation of the proposal. The Proponent has addressed the potential impacts and will implement an adaptive management monitoring program, and if required implement further actions to minimise the impact. The Proponent provided details of a typical monitoring program for bird and bat strike management in its Environmental Assessment. The Department notes that the Department of Environment and Climate Change supports this approach and has also advised the Department that other actions should be implemented to reduce the potential for such strikes. The Department has further consulted with Department of Environment and Climate Change and as a result, the Department recommends a requirement that the Proponent must place turbine locations at a minimum of 200 metres away from trees containing stick nests that are likely to be used by raptors.

Although the Proponent has committed to designing and implementing an adaptive management monitoring program to reduce the potential for bird and bat mortalities, the Department finds that there is insufficient information for it to be certain that the proposed monitoring program would be designed in such a manner to adequately reduce such impact. Therefore the Department recommends that prior to the commencement of

construction, the Proponent must prepare and submit for the approval of the Director-General, a Bird and Bat Adaptive Management Program, which takes account of bird/ bat monitoring methods identified in the current editions of AusWEA *Best Practice Guidelines for the Implementation of Wind Energy Projects in Australia* and *Wind Farm and Birds: Interim Standards for Risk Assessment*. The Program must be implemented by a suitably qualified expert, approved by the Director-General.

The Department requires that this Program must incorporate monitoring and a decision matrix that clearly sets out how the Proponent will respond to the outcomes of monitoring. The Department has included several requirements that the Proponent must adhere to in preparing this Program, where one of the key components is for the Proponent to identify 'the at risk' bird and bat groups for this project, such as the Wedge-tailed eagle, the Brown falcon, the Barking Owl and the Yellow-bellied sheathtail-bat, and include monthly mortality assessments and periodic local population censuses and bird utilisation surveys.

Although the Proponent's assessment addressed potential impacts of the project to birds and bats, it does not detail mitigation measures for blade strike. Therefore another requirement as part of the Bird and Bat Adaptive Management Program is for the Proponent to identify the potential mitigation measures and implementation strategies in order to reduce impacts on birds and bats. The Department notes that such mitigation measures could include minimising the availability of raptor perches, swift carcass removal, pest control including rabbits, use of deterrents, and sector management, which includes switching off turbines that are predicted to or have had an unacceptable impact on bird and bat mortality at certain times.

Another key component of the Program is that the Proponent must submit periodic reports on an annual basis to the Director-General, from the commencement of operation of the project. These reports must be prepared within two months of the end of the respective reporting period and must identify matters that need to be addressed in relation to the outcomes of monitoring, the application of the decision making framework, the need for mitigation measures and progress with implementation of such measures, and their success. The Department of Land's concern regarding the methodology for the proposed Bat and Bird Adaptive Management Program has been addressed by the Department's recommended suite of components that the Proponent must include, as part of the Program.

The Proponent is also required to submit an Operation Environmental Management Plan (OEMP) for the approval of the Director-General prior to the commencement of operation of the project. This would detail the specific consideration of relevant measures to address any requirements in the Environmental Assessment documents and detail the overall environmental policies and principles to be applied to the project's operation. As part of the OEMP, the Proponent must include a Rehabilitation and Ecology Management Protocol to detail measures to mitigate and manage impacts on native ecology during the operation of the project. The Department requires the Plan to be developed by a suitably qualified person experienced in arid area rehabilitation and meet the reasonable requirements of the Department of Lands and the Department of Environment and Climate Change. The Department recognises that apart from potential bird and bat mortalities discussed above, managing weed infestation and fauna habitats are the other key issues relating to the operation of the project. Therefore the Department has identfied key issues that must be included as part of the Operation Environmental Management Plan:

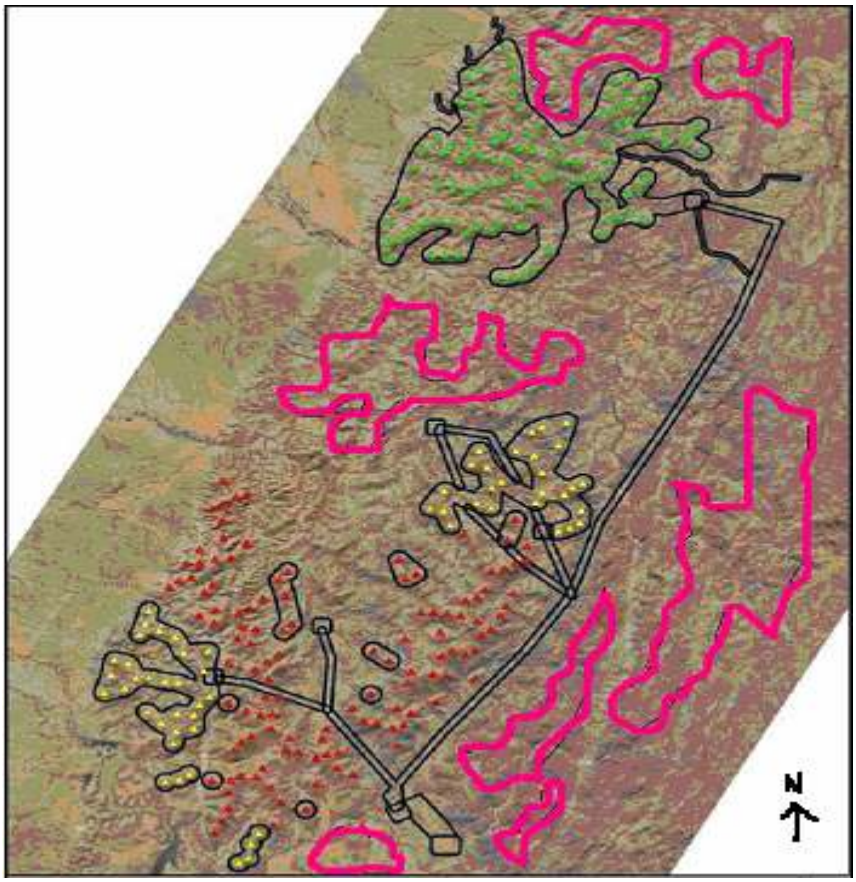
i. a detailed description of measures, including a monitoring program, to be undertaken to control the occurrence of weeds and pests on-site and in adjacent areas, including run-off areas and any creeks that receive run-off; and
ii. a program, including a description of techniques for managing and monitoring existing habitat for native fauna which is affected by the project (turbines and transmission line from turbine site to Broken Hill).
iii. A summarised description of the rehabilitation to be undertaken at the site including locations for planting; and
iv. A program for the removal of weeds introduced or spread as a result of the development at the site.

The Department finds that the potential impacts to biodiversity as a result of the operation of the project, particularly the wind turbines, can be avoided through adequate monitoring, minimised through the implementation of specific mitigation measures and managed through appropriate reporting procedures and ongoing liaison between the Proponent, the Department of Environment and Climate Change, the Department of Lands and the Department.

5.5 Biodiversity Impacts - Stage 2

For the Stage 2 component of the project, for which the Proponent is seeking a Concept Approval, a Biodiversity Constraints Technical Report was prepared that covered the Stage 2 site area and transmission line corridor between Broken Hill and Red Cliffs. Figure 7 below shows the areas where the remaining 316 turbines would be located (concept approval).

Vegetation communities in the Stage 2 study area and habitat type equivalent to those occurring in the Stage 1 area were identified and mapped using high-resolution orthophotos and ArcView GIS. The Proponent has explained that an assumption of this approach was that key vegetation communities at Stage 2 would be similar to those recorded in Stage 1, an assumption supported by its site visits to Mount Robe. Field validation of vegetation mapping covering the proposed transmission easement from Broken Hill to Red Cliffs was undertaken, recording the vegetation communities within a 100 metre corridor either side of the existing easement. No targeted threatened flora surveys were conducted however incidental sightings of threatened species and fauna habitat were recorded. The Biodiversity Constraints Report provides key constraints and recommended strategies to manage these constraints.



Red triangles = Proposed Stage 1a turbines
Yellow triangles = Proposed Stage 1b turbines
Green triangles = Proposed Stage 1c turbines
Pink boundary = estimated area for Stage 2 turbines

Figure 7: Identification of Stage 2 Wind Turbine Areas

Wind Farm Site

Based on the Proponent's aerial photo interpretation and site visits to the Stage 2 area, it has been determined that the vegetation communities present within the Stage 1 turbine envelope are also present within the broader area of Stage 2. The results of detailed surveying in the Stage 1 area have provided an understanding of key flora and fauna constraints for the entire turbine envelope. However additional vegetation communities may occur and a field assessment must be performed to identify additional vegetation communities on site.

It is likely that the vegetation community Porcupine Grass – Red Mallee – Gum Coolibah hummock grassland / low sparse woodland will place some constraint on the location of infrastructure. It is has been mapped from aerial imagery by the Proponent and will require ground validation in a more detailed assessment which considers the condition of this vegetation. Similarly, the Endangered Ecological Community *Acacia loderi Shrublands*, may occur within the Stage 2 envelope and will require field surveys and a more detailed assessment. The Proponent states that based on available information, these areas are not likely to be extensive on site and are therefore considered to be a manageable constraint. Pending additional assessment, potential mitigation measures for Endangered Ecological Communities and other native vegetation on site may include pegging or otherwise delineating the boundaries of the Endangered Ecological Communities and avoiding direct and indirect impacts in these areas. Another mitigation measure would be to treat weed infestations in areas that would be disturbed by works prior to commencing works.

Transmission Line (Site to Red Cliffs)

Vegetation mapping was undertaken by the Proponent of the proposed transmission line easement, which involved a preliminary field assessment. No targeted vegetation surveys were conducted along the easement for threatened flora and no fauna surveys were performed.

Vegetation along the route includes agricultural land (semi-cleared, cropped land with scattered blackbox remnants, irrigated cropping for vineyards and charcoal farms consisting of cleared and regrowth mallee plants) and native vegetation. The Proponent identified 23 native vegetation communities and one undescribed vegetation community along the transmission easement, which includes NSW and Victoria.

Of these communities, the *Acacia loderi* shrublands is classified as an Endangered Ecological Community under the NSW *Threatened Species Conservation Act 1995*. It was identified at a number of locations along the existing power line and covers approximately 1.8 per cent of the total power line length. Approximately more than 18 hectares of this community was found in the Study Area (proposed power line area) and the majority was in moderate to poor condition.

The Slender Cypress Pine Woodland was noted along sandy rises and is referable to the Sandhill Pine Woodland Preliminary Determination Endangered Ecological Community of the Riverina, Murray-Darling Depression and NSW Southern Slopes Bioregions. The Scientific Committee, established by the *Threatened Species Conservation Act 1995*, has made a Preliminary Determination to support a proposal to list the Sandhill Pine Woodland community as an EEC on Part 3 of Schedule 1 of the *Threatened Species Conservation Act 1995*. The majority of the remnants of the Slender Cypress Pine Woodland found in the Study Area are in poor condition and the presence of several stumps indicates that this community has been subjected to logging in the past.

The Blackbox – Lignum Woodland of the inner floodplains, the Prickly Wattle Shrubland and the Sugarwood Open Woodland noted along the existing power line are vulnerable based on the present distribution and their lack of representation in protected areas. These communities are currently not listed under the *Threatened Species Conservation Act 1995* or the *Environment Protection and Biodiversity Conservation Act 1999*.

Two weeds declared noxious under the *Noxious Weeds Act 1993* were recorded within the Study Area, African Boxthorn and Mesquite. African Boxthorn is listed under Class 4 for Broken Hill LGA, Wentworth LGA and the Western Division. The control objective for Class 4 weeds is to minimise the negative impact of those plants on the economy, community or environment of New South Wales. Mesquite is listed under Class 2 for these same areas and is recognised as a weed of national significance. The control objective for Class 2 weeds is to eradicate the plant from the land and keep the land free of the plant.

Approximately 1.3 kilometres of the proposed power line would occur within the Robinvale Plains Bioregion of Victoria. The existing power line crosses through the King's Billabong Wildlife Reserve which is a conservation reserve managed by Parks Victoria and the Department of Sustainability and Environment. Three Ecological Vegetation Classes were identified along this section of the power line, the Riverine Chenopod Woodland, the Lignum Swamp Community and the Grassy Riverine Forest Community. The Bioregional Conservation Status, according to the Department of Sustainability and Environment (Victoria), which is based on pre-European extent, current extent and representation in protected areas, classes the Riverine Chenopod Woodland and the Grassy Riverine Forest Community as Depleted and the Lignum Swamp Community as Vulnerable. No noxious weeds were found in the Victorian section of the route.

The Proponent has identified specific mitigation measures which are listed below, that pending detailed investigations, may be feasible.

- Pegging or otherwise delineating the boundaries of the Endangered Ecological Communities and avoiding or minimising direct and indirect impacts in these areas. This may require the repositioning of power line footings or minor alterations to the route to avoid these vegetation communities.
- Design solutions. These may include investigating if the height of the power line structure over Endangered Ecological Communities is sufficient to allow minimal impact on these communities.
- In sensitive areas, easement vegetation maintenance protocols may be required to ensure that the ongoing maintenance of the power line easement has minimal impact on the integrity of the vegetation in the easement.
- Offsetting the clearing required for the power line route may be required. In NSW, this is usually done on a 'like for like' basis. That is, the amount of vegetation in each vegetation community to be cleared needs to be reflected in the areas deemed to be offset areas.

The Proponent also states that there would be benefits from restricting grazing to the Endangered Ecological Communities in good condition. If such a measure could be incorporated into the proposal, this would represent an opportunity to offset other environmental impacts.

Issues Raised in Submissions

- A public submission asked when a complete vegetation study would be carried out for the entire project area.
- The Department of Environment and Climate Change found that the Proponent's Constraint Study is a detailed account of the potential impacts of Stage 2 of the proposal however it requires additional assessment to be undertaken in regards to biodiversity impacts prior to the Proponent seeking Project Approval for Stage 2.

Consideration

Both the Department and the Department of Environment and Climate Change finds that the Proponent has adequately described the potential biodiversity constraints for the wind turbine envelope and the proposed transmission line. The Department also finds that detailed survey work and vegetation mapping is required to ensure that the vegetation communities within the turbine envelope are correctly described and subsequently the potential impacts are evaluated. Such detailed assessment will also ensure that any additional species or communities, in particular threatened species and communities that occur in the area are detected and assessed.

The Department of Environment and Climate Change stated to the Department that it has particular concerns with regard to the duplication of the existing power line and the impacts this will have on native vegetation including the two Endangered Ecological Communities (*Acacia loderi* shrublands and Sandhill Pine Woodland), at least one threatened plant (*Santalum murrayanum*, common name Bitter Quandong) and potentially a number of areas that have previously been established as reserves for biodiversity conservation. It noted that further work may reveal additional threatened plants along this route, and further investigation may reveal more communities and may provide more details on the threatened communities.

The Department requires the Proponent to prepare a quantitative biodiversity assessment for the Stage 2 wind turbine and transmission line development areas, so the Department can acquire a complete understanding of the potential impacts that the Stage 2 project may have on flora and fauna. The Department therefore recommends a requirement to be included in the Concept Approval for Stage 2, that the Proponent must complete a project level Flora and Fauna Assessment, which must include field survey work informed by its Biodiversity Constraints Technical Report desktop assessment, and evaluate all threatened and endangered

species of plant and animal that have the potential to be adversely impacted by the project. Furthermore, as the Department is not certain that the Proponent would follow the existing transmission line route for the proposed Stage 2 transmission line, the Department recommends a requirement in the Concept Approval, that the Proponent be required to prepare a alignment sheet for the transmission line which identifies the final corridor and demonstrates that all adverse environmental impacts (including biodiversity) have either been avoided or minimised. The Flora and Fauna Assessment required by the Department should illustrate where impacts have been avoided and where such avoidance is not practical, the measures to minimise and manage such impacts. The Proponent, upon completing this required assessment (and other assessments) would submit a Project Application to the Department, seeking Project Approval for Stage 2.

5.6 Socio-economic Impacts

The historic township Silverton, a former mining settlement, is the nearest settlement to the proposed project. The southern extent of the Stage 1 component of the project area is located approximately 3.5 kilometres north of Silverton. The town is accessed via a sealed road approximately 23 kilometres to the north west of Broken Hill. The municipality in Silverton was formed in 1886 but was subsequently taken off the NSW register in 1899, leaving the NSW State Government in administrative control of the town. This means there is no Council jurisdiction in Silverton. With the discovery of the Broken Hill ore body, the majority of the residents of Silverton relocated to Broken Hill. According to the Australian Bureau of Statistics Census (2006), today Silverton has a population of 89 and is predominately a tourist town. It features art galleries, eateries and a number of other tourist attractions including the Silverton Hotel.

The Proponent's Environmental Assessment found that a large number of tourists visit the Silverton and Broken Hill area every year. The Proponent's Assessment referred to a Pilot Visitor Destination Report that was prepared in 2006 by TNS Consultants for Tourism Research Australia. Tourism Australia is an Australian Government Statutory Authority, which promotes Australia as an international tourism destination, and which Tourism Research Australia is a business unit of it. The Proponent noted in its assessment that Tourism NSW reported that 418,000 domestic overnight travellers visited outback NSW, of which it is expected that 75 per cent (313,500) visited Broken Hill during the year ending June 2006. The key findings from the Visitor Destination Report is that 95 per cent of visitors stay overnight and 76 per cent of visitors visit for holiday and leisure purposes. Two other key findings are that the nature/outback type experience is a key draw card for visitation and the towns most likely to be visited included Silverton, Cobar, Wilcannia and Peterborough.

The report also indicated that the five primary reasons for tourists to visit Broken Hill include:

- To visit Broken Hill
- To experience the scenery
- There's a variety of things to do and see
- To experience the wide open spaces
- To explore the history and heritage

There are a number of different tourist activities on offer in the Silverton/Broken Hill area including Historic Silverton (the town of Silverton), visiting heritage building and sites, art galleries and museums, the sculpture park, the Living Desert Reserve and general sightseeing (including the Mundi Mundi Lookout).

Eldee Station, to the north-west of the proposed wind farm site, runs tours of historic sites and geological phenomenon within the wind farm site area. The owners of Eldee Station also capitalise on nature-based tourism, providing accommodation and recreational activities.

Construction Impacts – Wind Farm Site (Stage 1 and 2 wind turbines and Stage 1 transmission line)
Construction traffic is the key factor associated with potential impacts on the tourist industry. During the construction of the wind farm, access would be gained mainly by the Daydream Mine Road via Silverton Road for the southern portion of the wind farm site. Impacts to the township of Silverton are likely to include loss of visual aesthetic, increased traffic and associated noise and dust. Construction traffic for the northern section of the wind farm site will access the site via Nine Mile Road from Broken Hill to Purnamoota Station or via Silver City Highway and Stephens Creek Road to Purnamoota Station. This can be seen from Figure 8 below.

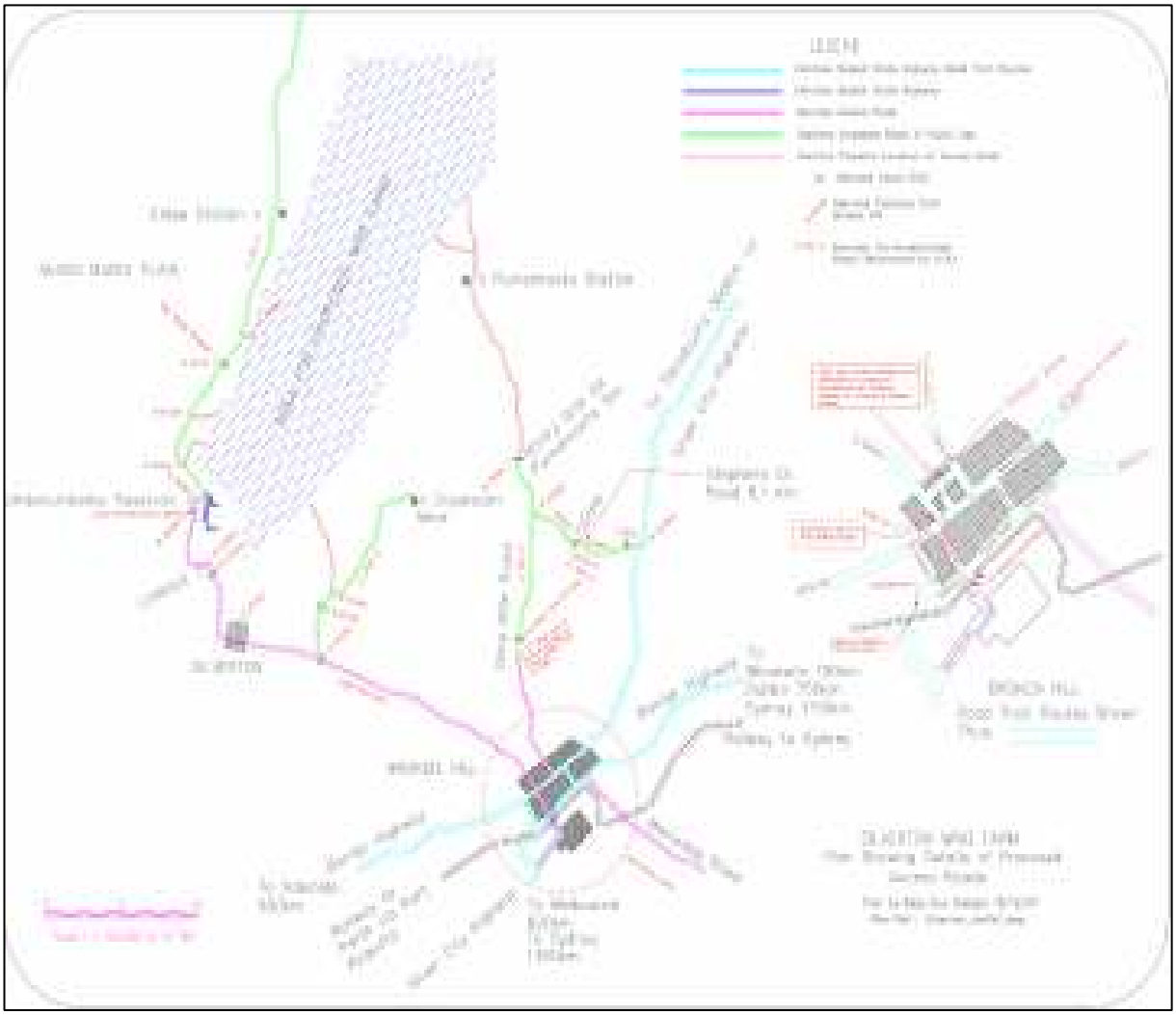


Figure 8: Proposed Access Roads for the Wind Farm Site (reproduced from the Proponent's Environmental Assessment)

The Silverton Road is the primary access to Silverton from Broken Hill. The increase in traffic movements associated with construction and decommissioning works for the project may impact on tourist traffic accessing both Silverton and the Daydream Mine. The Proponent's traffic impact study has revealed that the potential impact of construction traffic is expected to be manageable with the implementation of measures to address safety, however there may be delays to tourist traffic as a result of the safety measures. The construction work may affect the tourist's outback experience and even deter tourists from visiting the area during construction. The Proponent has committed to liaise with the local visitor information centres during the construction of all components of the project (Stage 1 and 2 wind farm site and transmission lines) to ensure that construction and decommissioning timing and haulage routes are known well in advance of works and to the extent practical, coordinated with local events.

The Proponent's assessment found that the maximum daily rate of traffic at any point in the project's road network during the construction phase would likely be in the order of 250 vehicles per day. The maximum vehicles per day figure is added to the existing traffic volumes for the estimation of road capacity and the report shows that all the roads involved have sufficient capacity to accommodate the increased volumes.

However to respond to the potential impacts to tourist traffic (delays) and the potential affect to a tourist's 'outback experience', the Proponent has found that there is an opportunity to promote the construction of the wind farm. A section of the tourism market could be attracted to viewing the construction and several safe vantages are present from the Silverton Road and Mundi Mundi Plains Lookout. The Proponent has committed to provide wind farm promotional information to the local visitor information centres during construction and operation of Stage 1 and Stage 2 and support educational and promotional tours targeting the construction and operation of the wind farm (subject to safety concerns and concerns of landholders being addressed) to minimise disruption on local activities. It has also committed to work with the Silverton Village Committee and involved landholders to allow for the development of the wind farm as a tourist attraction (if this option is desirable to these parties) during the operation of the project, both Stage 1 and Stage 2.

Construction Impacts – Stage 2 Transmission line (site to Red Cliffs)

The Silverton Road connects Broken Hill and Silverton and will therefore experience increased traffic during the development of the wind farm which may impact tourism values of the area. The Silver City Highway is a major arterial road linking Broken Hill to Mildura and Victoria and will therefore similarly experience increased traffic. There are two towns located along the Silver City Highway between Broken Hill and Mildura: Wentworth and Buronga. Both of these towns are located at the southern end of the Silver City Highway. The Silver City Highway provides an access route for tourists travelling north to Broken Hill and beyond and south to Mildura and into western Victoria.

The Proponent states that its traffic impact study indicated that the Silverton Road and Silver City Highway have adequate carrying capacity to accommodate the expected increase in traffic flow as a result of the Proposal, without presenting a major impact to users of the highway. Adverse impacts to tourism would largely be managed by specific mitigation of impacts for visual, noise, traffic and air quality. The Proponent has also committed to co-ordinate construction activities for the transmission line (and all components of the project) with local events.

For the potential visual impact to nearby receivers, the Proponent has committed to a range of mitigatory tasks to minimise views of infrastructure, civil earth works and the wind farm site during the construction and operation of the project (these relate to the wind turbines and transmission lines where appropriate). For construction noise, the Proponent has committed to specific practices during construction of the wind farm site and transmission lines (Stage 1 and 2) to minimise noise. It has also, as discussed in section 5.3 of this report, committed to completing a final noise assessment prior to construction, based on final turbine layout and turbine selection to confirm noise criteria will be met at all identified sensitive noise receivers. It should be noted that where predicted noise levels exceed the criteria, the Proponent will form a negotiated noise agreement which would include compensation for noise affectation.

For minimising the risk to safety and assets during construction, operation and decommissioning of the project (entire proposal), the Proponent has committed to develop and implement a Traffic Management Plan in consultation with roads authorities, which will facilitate the appropriate management of potential traffic impacts. It has also committed to other measures to minimise risk to safety and provide protection to assets assessing the geometric layout of proposed intersections along Silver City highway to ensure adequate turning paths are available to allow for safe turning of oversize loads and construction vehicles. For any intersection deemed to be unsuitable, the Proponent would provide necessary intersection widening in consultation with the Roads and Traffic Authority. The Proponent would also upgrade and seal the initial sections of Daydream Mine Road and Eldee Road and subsequently negotiate with roads authority to place a speed restriction on these roads. To minimise and manage the quality of air during construction, the Proponent has committed to undertake ongoing dust suppression throughout the construction phases of the whole project.

Issues Raised in Submissions

- Five public submissions suggested that the Department change the location of the wind turbines to a region which is not a tourist area and is less obtrusive in the landscape.
- Broken Hill City Council requested that tourism information viewing points be established including tourism signage.
- The Department of Lands found that although the Proponent's Statement of Commitments provide measures to minimise disruption to local activities, insufficient level of commitment has been given to provide tourists with immediate/direct access to wind turbines.
- The Silverton Village Committee stated that the Silverton Community relies heavily on tourism. All businesses in the town are tourism based and the project would negatively impact this.
- One public submission was a petition from a group of Silverton residents, with 13 signatures, which expressed their support for the proposal. They acknowledged that there is potential impact on their community and region in areas of environment, economics, sustainability and tourism. They would like to see a Silverton Community Fund established that reflects the potential impacts, and supports the community of Silverton in ensuring they have the capacity to respond in a productive, heritage responsive ad environmentally sensitive manner to the proposed changes in the Silverton region.

Consideration

The Department notes that unlike potential impacts such as noise and biodiversity, the potential tourism impacts to the areas where the proposal is to be situated (particularly Silverton Village) cannot be clearly quantified. However, the Proponent has addressed those potential environmental impacts (construction noise, traffic impacts, dust and visual amenity) which have the ability to impact tourism. The Department finds that the Proponent's commitments to avoid the significant impacts associated with these environmental issues to receptors and its commitments to minimise and manage those impacts that cannot be avoided will ensure minimal direct disturbance to tourists and the tourism industry surrounding the project area.

The nearest major town to the proposed proposal site is Broken Hill, approximately 25 kilometres southeast of the turbine site. Broken Hill was historically a mining town buoyed by the discovery of the Broken Hill ore body (silver/lead). The economic significance of mining to the area decreased in the later part of the twentieth century. However, tourism and mining continue to be significant contributors to Broken Hill's economy and mining continues to be a major attraction that drives the tourism industry. The Proponent's Environmental Assessment provided an assessment of the potential social and economic impacts on the city of Broken Hill. This includes significant job creation in the construction and operation stages of the project and the flow-on effects for associated industry and local businesses over its predicted 30 year lifespan.

The Department finds that the local community of Silverton and Broken Hill will benefit from this proposal, as the project will provide new jobs and contribute to significant income to landholders and the communities. The Department notes that the Proponent has committed to specific actions to maximise positive impact of the proposal in the local community. The Proponent has committed to liaise with local industry representatives to maximise the use of local contractors and manufacturing facilities in the construction and decommissioning stages of the project. The Proponent has also committed to liaise with Broken Hill City Council and the Department of State and Regional Development to provide information to assist in attracting people to the local area to facilitate meeting the expected demand for human resources for both construction and operation of the proposal. Furthermore, the Proponent has committed to make, where reasonable, available employment opportunities and training for the ongoing operation of the project to local residents.

To provide for a broad community benefit within the local Silverton Community, the Proponent has committed to establish a Community Fund during the operation of both the Stage 1 and Stage 2 wind farm site. The Fund would provide for local environmental benefits and community facilities. The Proponent states that its intent is that these funds are spent on community facilities within the local area (this being within ten kilometres of the wind farm). The Proponent states that funding would be determined on an as needs basis during the life of the wind farm, and would be set aside for specific community projects and initiatives. The Proponent expects that at least $20,000 – $30,000 per annum will be spent in the community, however it does not want to limit itself to that and proposes to fund meaningful projects to the benefit of the community. Funding would not replace existing government funding, however it could be used to support government funding. The Proponent would determine

the structure of the fund and its management in consultation with the local community, and in particular the Silverton Village Committee, the Penrose Park Trust and the Silverton Commons Trust.

The Department recognises that there are parcels of freehold land located in Silverton and surrounding environment that have no planning or building controls, for example development and construction do not require development approval and Building Code of Australia does not apply. In some circumstances, approval from the Western Lands Commissioner under the *Western Lands Act* may be required. As there is no local government in the Silverton area, services and facilities are limited and basic services and facilities are provided by the Department of Lands and the Silverton Village Committee. Therefore the Department has recommended, as part of the Concept Approval for the project, that the Proponent be required to prepare and submit for the approval of the Director-General, a Community Enhancement Program to fund (or provide in kind) community infrastructure and services in the locality of the project. This Program must be submitted to the Director-General prior to the commencement of construction of the project. The Proponent must establish a fund for the purposes of implementing the Community Enhancement Program. In preparing the Program and determining the fund, the Proponent shall consult with the Broken Hill Shire Council, the Wentworth Shire Council and local community representatives (e.g. Silverton Village Committee).

The Department also recommends as part of the Concept Approval, that prior to the commencement of construction of the project, the Proponent must prepare and implement a Community Information Plan which sets out the community communications and consultation processes to be undertaken during construction and operation of the project. The Plan must include but not be limited to:

- procedures to inform the local community of planned investigations and Construction activities, including blasting works;
- procedures to inform the relevant community of Construction traffic routes and any potential disruptions to traffic flows and amenity impacts;
- procedures to consult with local landowners with regard to Construction traffic to ensure the safety of livestock and to limit disruption to livestock movements;
- procedures to inform the community where work has been approved to be undertaken outside the normal Construction hours, in particular noisy activities;
- procedures to inform and consult with those landowners who are eligible for landscaping on their property as consistent with the project approval; and
- procedures to notify relevant landowners of the process available to review potential impacts on radio and television transmission.

The Proponent has recognised in its Environmental Assessment that tourism facilities may be an option to increase the local benefits to the community. The Proponent has stated that experience at other wind farms indicates that tourists and motorists are likely to be interested to find out more about the wind farm. The Proponent states that appropriate information signage would therefore be erected at carefully selected locations.

The Proponent discusses that tourism and visitor facilities could be developed at suitable locations should the community or landowners wish this to happen. Details of the type and location of any facilities would be confirmed in consultation with local residents. Possible locations include the Mundi Mundi Lookout west of Silverton, Eldee homestead as well as various locations along the Daydream Mine Road and the Silverton Road. The Proponent expects that direct access would be provided to tourists to one of the turbines easily accessed from the Day Dream Mine Road. The Proponent states that a turbine close to the public road would provide an 'up-close' experience to tourists without encouraging the public to venture further onto leaseholder land. The nature and location of any interpretive information is to be decided when the turbine to be accessed is identified. The Department's recommended Community Enhancement Program would include this information.

The Department is satisfied that the Proponent's commitments and the Department's recommended requirements would ensure that the Proponent would continue to work with the Silverton Community, other communities and relevant agencies to maximise benefits to Silverton, including those brought by increased tourism, resulting from the proposed Silverton Wind Farm.

5.7 Indigenous Heritage Impacts

The Proponent conducted a detailed assessment of the Aboriginal cultural heritage in the area of the proposed Stage 1 project area. The potential impacts to indigenous heritage impacts relate to the construction stage of the project. No impacts to indigenous heritage would result from the project's operation. The Department of Environment and Climate Change noted to the Department that the assessment conforms to its requirements for cultural heritage assessments. The Proponent's assessment detailed management recommendations for each survey area, which comprised of individual descriptions and recommendations for each of the areas surveyed that comprised of an Aboriginal object. The Proponent has committed to incorporate these recommendations into the Cultural Heritage Management Protocol, which will contain procedures for impact avoidance and mitigation. The Proponent has committed to develop this Plan in consultation with an archaeologist, the local Aboriginal Land Council, local Aboriginal stakeholders and the Department of Environment and Climate Change.

Two locales must not be impacted by the project (SU152/L2 and SU231/L2). The Proponent has committed to implement a conservation strategy to ensure these locales are protected from impacts. The majority of the Aboriginal objects locales found in the project area are of low significance quartz stone artefacts. Therefore these locales do not require active management and unmitigated impact would be appropriate for these locales. The Department of Environment and Climate Change also concurs with this approach. Some locales are of low-moderate archaeological significance. These areas contain potential subsurface deposits, and should be avoided or impacts should be limited in these areas. Therefore the Department has recommended a condition that requires the Proponent to develop and implement mitigation strategies for each of these 74 listed locations that are subject to mitigated impacts (identified in Table 9 of the Archaeology Addendum Report, contained in the Submissions Report and Preferred Project Report). This information must be detailed in the required Construction Environmental Management Plan and be prepared in consultation with the Department of Environment and Climate Change.

In order for the Department to have an understanding of the details of how the environmental performance of the construction works will be monitored with regards to indigenous heritage, and what actions will be taken to address identified adverse environmental impacts, a specific requirement is recommended. This being, the Department requires the Proponent to include measures to minimise and manage impacts to moderate to significant indigenous items and locales in the Construction Environmental Management Plan.

6. CONCLUSIONS AND RECOMMENDATIONS

The Department has assessed the Proponent's Environmental Assessment, Statement of Commitments, submissions received and the Preferred Project and Submissions Report, and is satisfied that the impacts of the Project can be mitigated and/ or managed to ensure an acceptable level of environmental performance.

The Proponent has found that the potential visual experience of individuals residing in proximity to, or visiting the local area of the proposed wind farm site could be either positive or negative, depending on the personal opinions of the viewer. The Proponent has committed to implementing a range of mitigation tasks during the construction and operation phases of the Project for the wind farm site and the proposed transmission lines, to address the potential visual impact to nearby receivers. It has formed these commitments with the objective to minimise views of infrastructure, minimise views of civil earth works and minimise the view of the wind farm site. The Department has also recommended specific requirements which strengthen the Proponent's commitments and ensure those receptors that may experience visual amenity impacts, have the opportunity to consult with the Proponent, for the purposes of minimising such an impact.

Similarly, although the Proponent has committed to liaise with current mineral lease holders, providing a final turbine layout and infrastructure layout, the Department recommends specific requirements for such a consultation process, to minimise and manage conflicts with mineral exploration. The Department requires the Proponent to consider the geology and mineral prospectivity of the project area and identify where conflicts with current or future exploration and mining activities may occur, to inform the determination of the final location of the project components. It also requires the Proponent to liaise with the Department of Primary Industries - Minerals Resources to assist in obtaining information on the location of identified and potential mineral resources, and of all current mining and exploration titles, including applications lodged with itself for new exploration licences and mining leases or for renewal of expired exploration licences and mining leases. The Department also requires the Proponent to negotiate measures to be applied during construction and operation of the Project with the Department of Primary Industries - Mineral Resources and relevant holders of exploration and mining titles, to minimise the potential for impact on access to land for exploration and mining activities and any sterilisation of resources within the project area. This must include the determination of buffer distances for the project. As part of this consultation process, the Department requires the Proponent to aim to resolve any identified potential conflict and aim to maximise access for exploration to areas of higher prospectivity.

The Proponent has committed to specific mitigation tasks to minimise construction noise from the wind farm site and the proposed transmission lines. It has also committed to complete a final noise assessment prior to construction of the Project to ensure the noise criteria will be met at all identified sensitive noise receivers. Where predicted noise levels exceed the criteria identified in the Environmental Assessment, a negotiated noise agreement will be put in place by the Proponent. Therefore should the final noise assessment reveal that there are sensitive receptors that will experience significant operational noise impacts, contrary to the findings illustrated in the Environmental Assessment, those receptors are obligated to receive further noise mitigation measures and be satisfied with the level of the noise exceedance.

The Proponent has also committed to key mitigation tasks during relevant phases of the Project. This is to ensure the loss of biodiversity value is avoided or minimised, the risk of the potential deterioration of water quality, particularly in the Umberumberka Creek Special Area is minimised and the risk to safety and asset protection is minimised (through the development of a Traffic Management Plan). The Proponent's commitments will also ensure that the potential for the loss of heritage items will be minimised and the risk to the creation of aviation hazards is minimised. Additionally, the Proponent's commitments and the Department's recommended conditions would ensure the positive affect the Project may have on the local community is maximised. The Proponent has also committed to prepare and implement an appropriate Health and Safety Management Plan, covering all phases of the Project, to identify hazards associated with construction works, and to prepare appropriate safeguards and responses, including emergency response protocols.

The Department recommends that the Minister for Planning consider the findings and recommendations of this report and grant Concept Approval for the entire Project and grant Project Approval for Stage 1, subject to the recommended conditions.

APPENDIX A – RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX B – STATEMENT OF COMMITMENTS

APPENDIX C – SUBMISSIONS REPORT

APPENDIX D – ENVIRONMENTAL ASSESSMENT