



**Planning &
Environment**

**STATE SIGNIFICANT
DEVELOPMENT ASSESSMENT
Wilpinjong Extension Project
(SSD 6764)**



Secretary's Environmental Assessment Report
Section 89E of the
Environmental Planning and Assessment Act 1979
November 2016

Cover Photo:
Wilpinjong Coal Mine
Environmental Impact Statement 2016

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EXECUTIVE SUMMARY

Wilpinjong Coal Pty Ltd (WCPL), a wholly owned subsidiary of Peabody Energy Australia Pty Limited, owns and operates the Wilpinjong Coal Mine, an existing open cut coal mine located approximately 40 kilometres (km) northwest of Mudgee, near the village of Wollar. The project site is located in the Mid-Western Regional local government area.

The Wilpinjong mine has now been operating continuously for more than 10 years following its approval by the Minister for Planning in February 2006, and currently employs approximately 550 people. Along with the Ulan and Moolarben coal mines, Wilpinjong forms part of a large and well-established coal mining complex which produces around 20% of NSW's coal.

The current approval allows WCPL to extract up to 16 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal and transport up to 12.6 Mtpa of product coal to domestic and export markets by rail. Approximately 70% of the coal produced at the mine is supplied to AGL Macquarie for power generation at the Bayswater and Liddell power stations in the Hunter Valley.

Without further approval, mining under the current approval will cease in early 2027. Over the next 10 years, production at the mine would average around 7 Mtpa (a reduction of almost 6 Mtpa from current levels), and the number of employees would steadily decline from 550 to around 150.

While this decline was forecast under the original approval, WCPL has identified an opportunity to extract an additional 95 Mt of ROM coal from land adjacent to its existing mining operations.

Approval to access this coal would allow WCPL to maintain the current production and employment levels, maximise the volume of coal available for export, continue to use its existing plant and equipment, and deliver the other economic benefits of mining over a significantly longer period than would otherwise be the case under the existing approval.

Wilpinjong Extension Project

WCPL is seeking approval for an extension to its existing operations (known as the 'Wilpinjong Extension Project') which would allow mining to continue until 2033. The project comprises:

- the development of a new open cut pit to the east of existing operations;
- extensions to various existing open cut pits;
- a minor increase in coal production from 12.6 to 13 Mtpa;
- continued use of existing coal processing and surface infrastructure; and
- an extension to the life of the mine by 7 years (i.e. from 2026 to 2033).

The project also involves the development of a range of ancillary infrastructure, including further realignment of Ulan-Wollar Road, relocation of a 330 kV transmission line, and construction of additional surface infrastructure to support mining operations.

The project would not increase the rate of extraction at the mine, which would remain at 16 Mtpa of ROM coal. However, there would be an increase in peak operational employment numbers from 550 to 625, and also a temporary increase of around 100 people during the first 18 months of construction and development.

The project has a capital investment value of around \$172.5 million (present value), and would generate around \$190 million in royalties for the NSW Government.

The project is declared to be State Significant Development (SSD), and the Minister for Planning is the consent authority for the development under the *Environmental Planning and Assessment Act 1979*. However, the development application falls within the Minister's delegation to the NSW Planning Assessment Commission (Commission) dated 14 September 2011, because there were more than 25 public submissions in the nature of objections. Consequently, the Commission must determine the application.

On 20 October 2016, the Minister for Planning asked the the Commission to review the project, and hold public hearings during the review. In its terms of reference, the Minister has asked the Commission to:

- consider the Environmental Impact Statement (EIS) for the project, all issues raised in public and agency submissions, and any other information provided on the project during the course of the review;
- assess the merits of the project as a whole having regard to all relevant NSW Government policies, paying particular attention to the impacts of the project on Wollar Village; and if necessary recommend appropriate measures to avoid, minimise, and/or manage significant impacts of the project.

Once the Department receives the Commission's review report, the Department will finalise its assessment of the merits of the project, having regard to any recommendations of the Commission, and refer the application back to the Commission for determination.

WCPL also needs to obtain an approval from the Commonwealth Minister for the Environment and Energy under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to potential impacts on threatened species and water resources. The assessment process under the EP&A Act has been accredited under a bilateral agreement with the Commonwealth Government. Under this agreement, the assessment of both State and Commonwealth matters has been integrated into a single assessment process.

Consultation

The Department publicly exhibited the EIS for the project from 27 January until 10 March 2016. The Department received 752 submissions, including 11 from public authorities, 30 from special interest groups and organisations, and 711 from individuals.

Of the 741 submissions from special interest groups and the general public, 633 objected, 105 supported, and 3 submissions made comments on the project.

Of the 711 submissions from individuals, 10 were from residents of Wollar Village, 17 were from residents residing in the local area (within 15 km of the project), 211 were from the regional area (up to 50 km from the project) including the regional centres of Mudgee and Gulgong, and 464 were from other locations. Of the 27 submissions from local residents (i.e. within 15 km), 9 supported the project and the remaining 18 objected.

Submissions in support focused on the employment and socio-economic benefits of the project, particularly for the Mudgee area.

Submissions that objected to the project focused on:

- the amenity and social impacts on Wollar Village and the surrounding community;
- increased environmental impacts on biodiversity, water resources and Aboriginal heritage; and
- the overall justification for the mine.

The Department visited the site on several occasions, and held a public meeting in Wollar Village during the exhibition of the project.

The Department also commissioned independent experts to review the assessment of social, noise, air quality and economic impacts of the project.

Assessment

Amenity Impacts

In considering the amenity impacts (noise, blasting, dust) on the local community, it is important to note that almost all the privately-owned land in the vicinity of the project is now owned by mining companies.

The nearest privately-owned residence is located in the village of Wollar, approximately 2 km east of the project.

WCPL has had a long-standing commitment that it would purchase any privately-owned property in the village, and apart from 3 residences and 1 parcel of vacant land, it now owns all the privately-owned properties in the village. The Department understands that WCPL is continuing to negotiate with the remaining landowners in the village, with a view to acquisition or reaching an agreement in regard to the residual impacts of the project.

There are a number of other residences located in the greater Wollar area, although apart from one residence to the northeast, these residences are located several kilometres to the east and south of the project.

The Department's assessment found that the project would comply with applicable air quality and blasting criteria at all privately-owned residences.

However, even with the implementation of all reasonable and feasible mitigation, the assessment found that there would be minor to moderate exceedances (1 to 3 dB(A)) of the 'intrusive' noise criteria of 35 dB(A) at the 3 remaining privately-owned residences in the village and one receiver to the northeast of the project during the evening and night-time.

The Department notes that the predicted noise levels would remain well below the NSW Environment Protection Authority's (EPA's) 'acceptable' night-time noise criteria of 40 dB(A) for a rural area, and hence the Department does not consider the predicted exceedances to be significant.

Nonetheless, the Department has recommended that the remaining residences in the village be afforded voluntary acquisition and additional noise mitigation rights.

This would formalise the current commitment of WCPL, and provide the few remaining residents of the village with the opportunity to leave, and be appropriately compensated for the associated disturbance, should they wish to relocate. If they choose to stay, it would allow suitable noise mitigation to be implemented at their residences to minimise the residual noise impacts of the project.

Social Impacts

As with most mining developments, the project has the potential to result in both positive and negative social impacts. These impacts would be experienced differently by different communities, groups and individuals.

Positive impacts of the project, including those associated with employment, would largely benefit communities residing in the broader region, including Mudgee and Gulgong.

On the other hand, negative impacts would primarily affect the Wollar community including residents in the village and its surrounds, their families and others who feel connected to the village.

Since mining operations commenced at Wilpinjong in 2006, the Wollar community has consistently raised concerns about the negative social impacts of the mine. While the Department acknowledges the concerns of the community about social impacts, and has considered these issues in its assessment, it considers that it is important to place these issues in the context of the current project.

In this regard, while the project would bring the mine closer to the village and has the potential to exacerbate negative social impacts, the Department considers that the most significant social impacts have already occurred as a result of the approval of the original mine in 2006, and there is limited scope to effectively reverse these impacts. The Department also considers that even if the project is not allowed to proceed, the decline in population and associated social impacts is likely to continue.

The Department's assessment shows that the project would be able to comply with the recommended noise, air quality and blasting criteria established by the EPA for a rural area. Hence, a reasonable level of amenity would be maintained in the village for local residents who wish to remain. For those who choose to relocate, they would be able to do so in accordance with the Department's acquisition procedures.

The Department considers that it is important to recognise the significant positive social impacts that would be realised if the project proceeds, including those associated with direct employment of up to

625 people, ongoing contributions to infrastructure and services through contributions to Council, sealing of the last remaining unsealed section of the Ulan-Wollar Road, and the broader social benefits associated with indirect employment in the region.

Biodiversity

The project would disturb around 1,000 hectares of land comprising a mixture of woodland and cleared grazing land on the valley floors between the Goulburn River National Park and the Munghorn Gap Nature Reserve. In total, the project would clear 354 hectares of native woodland vegetation, including 19 hectares of endangered ecological communities and 190 hectares of threatened Regent Honeyeater habitat.

The Department is satisfied that WCPL has avoided impacts on biodiversity as far as practicable, and due to the location of the coal resource there are limited opportunities to further avoid these impacts.

In accordance with the *NSW Biodiversity Offsets Policy for Major Projects*, WCPL proposes to compensate for these impacts through a comprehensive biodiversity offset strategy, incorporating:

- almost 1,000 hectares of land based offsets adjacent to existing conservation reserves;
- rehabilitation of almost 3,000 hectares of the land disturbed by mining to woodland, targeting vegetation communities suitable for the Regent Honeyeater; and
- \$660,000 towards the recovery program for the Regent Honeyeater targeting release of captive birds into the wild.

Both the Department and the NSW Office of Environment and Heritage (OEH) consider that the overall offset strategy provides an appropriate balance between land based offsets, maximising the ecological benefits of mine rehabilitation, and targeted contributions towards maintaining populations of critically endangered species.

With proper governance, the Department considers that the strategy has the potential to substantially improve biodiversity values and habitat connectivity in the region, particularly by creating substantial habitat corridor between the Munghorn Gap Nature Reserve and Goulburn River National Park.

Water Impacts

A comprehensive groundwater and surface water impact assessment was completed for the project, drawing on the extensive surface water and groundwater modelling and monitoring program completed for the Wilpinjong Coal Mine over the last decade.

Overall, the project would not significantly increase the impacts associated with existing mining operations, and the Department considers that the project could be managed to avoid significant impacts on water resources.

To ensure this occurs, the Department has recommended a range of mitigation, monitoring and contingency measures in accordance with the recommendations made by the Commonwealth Independent Expert Scientific Committee and the NSW Department of Primary Industries.

The Department also notes that WCPL has sufficient water entitlements to account for the predicted maximum water take from all relevant water sources during operations and post-mining.

Heritage Impacts

The project would impact a number of Aboriginal cultural heritage sites, including 3 sites of high local significance associated with the 'Rocky Hill Complex' which includes rock shelters with artefacts, art and an ochre quarry.

Due to the location of the complex, the Department considers that it would not be possible to avoid these sites without significant economic and operational costs (in the order of \$127 million), as well as potential sterilisation of the coal resource.

WCPL has consulted thoroughly with the relevant Aboriginal stakeholders to devise an acceptable recording and salvage program for these sites, and the Department has recommended conditions that require WCPL to prepare an updated and comprehensive management plan to ensure that Aboriginal heritage sites and cultural values are appropriately managed.

To further address cumulative impacts of mining operations on Aboriginal heritage sites, the Department has recommended that WCPL be required to survey the proposed offset areas. Advice from OEH indicates that these areas have high potential to contain Aboriginal cultural heritage sites of significance, including rock shelters. Any heritage sites identified as part of these investigations would be protected as part of the biodiversity offset strategy.

While both the Department and OEH consider that with the implementation of these measures, the impacts of the project on Aboriginal cultural heritage values in the locality can be managed.

Economic Impacts

This assessment found that the project would result in significant social and economic benefits for the region as well as the State as a whole.

These benefits include:

- continued employment for approximately 550 mine workers that currently work at the Wilpinjong mine, as well as additional employment for up to 75 people;
- increase in direct and indirect spending in the region associated with additional capital investment of \$101 million;
- generating around \$190 million in royalties for the NSW Government and \$173 million in company taxes to the Commonwealth Government, which would be spent on providing infrastructure and services to the broader community; and
- \$300,000 in developer contributions to Mid-Western Regional Council for community services and other local initiatives.

The Cost Benefit Analysis (CBA) prepared by Deloitte Access Economics estimated that the net economic benefit to NSW of the project would be \$735 million (net present value). Even if very conservative assumptions are used (such as adopting lower bound coal price estimates), the project would still deliver net benefits of over \$123 million to NSW.

Summary

The Department has assessed the development application, EIS, submissions on the project, the Response to Submissions, and a range of additional information in accordance with the requirements of the EP&A Act. The Department has also considered the independent expert reviews of the project's economic, noise, air and social assessments.

In assessing the project, the Department has considered the concerns of the local community about the social, amenity and environmental impacts of the project.

Based on its assessment, the Department acknowledges that the project would increase the impacts on the local community and environment compared with the existing mining operations. However, these impacts would not be significantly greater than is currently the case, and apart from some minor exceedances, would comply with applicable government guidelines and policies.

To address the residual impacts of the project, the Department has recommended range of detailed conditions to ensure that these impacts are effectively minimised, mitigated and/or compensated for.

With the implementation of these conditions, the Department considers that the project achieves a reasonable balance between maximising the recovery of the coal resource and minimising potential social, amenity and environmental impacts, including impacts on Wollar Village and surrounds.

The Department considers that the extraction of the identified coal resource is a logical extension to the existing operations that would maintain the existing production and employment levels, maximise the use of existing plant and equipment, and deliver significant economic benefits to the region and to NSW as a whole.

The Department has carefully weighed the impacts of the project against the benefits. On balance, the Department considers that the benefits of the project outweigh its costs, and that the project is approvable, subject to stringent conditions.

1 PROPOSED PROJECT

1.1 Background

Wilpinjong Coal Pty Ltd (WCPL), a wholly owned subsidiary of Peabody Energy Australia Pty Limited, owns and operates the Wilpinjong Coal Mine, an existing open cut coal mine located approximately 40 kilometres (km) northwest of Mudgee, near the village of Wollar (see Figure 1).

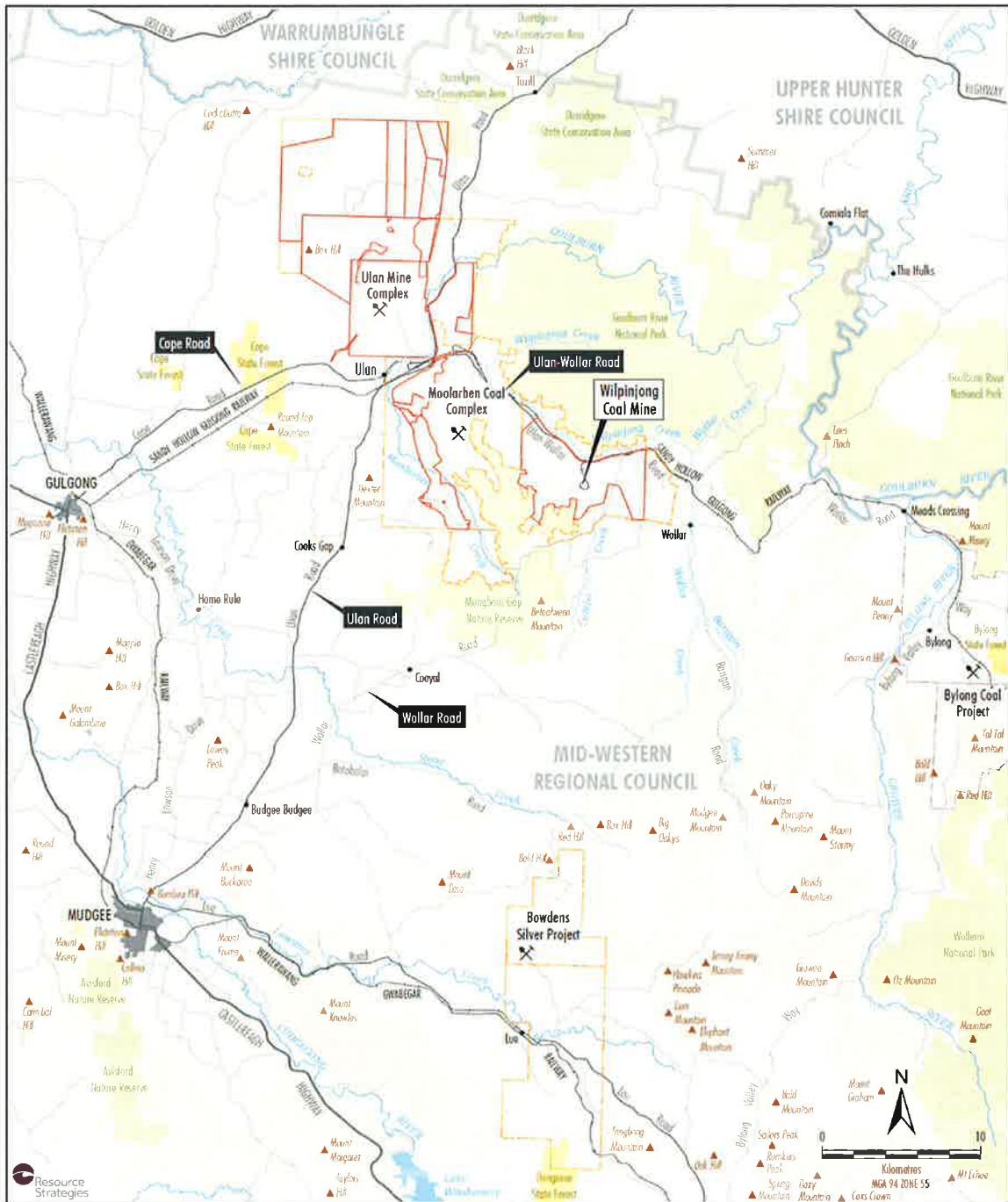


Figure 1: Location of the Wilpinjong Coal Mine

The mine was approved by the then Minister for Planning in February 2006, following a review by an Independent Hearing and Assessment Panel. The approval has been modified on 6 occasions and currently allows WCPL to (see Figure 2):

- carry out mining operations in 7 open cut pits;
- extract up to 16 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal;
- process the coal on site at a Coal Handling and Preparation Plant (CHPP); and
- transport up to 12.6 Mtpa of product coal to domestic and export markets by rail.

The mine has now been operating continuously for 10 years, and employs approximately 550 people.

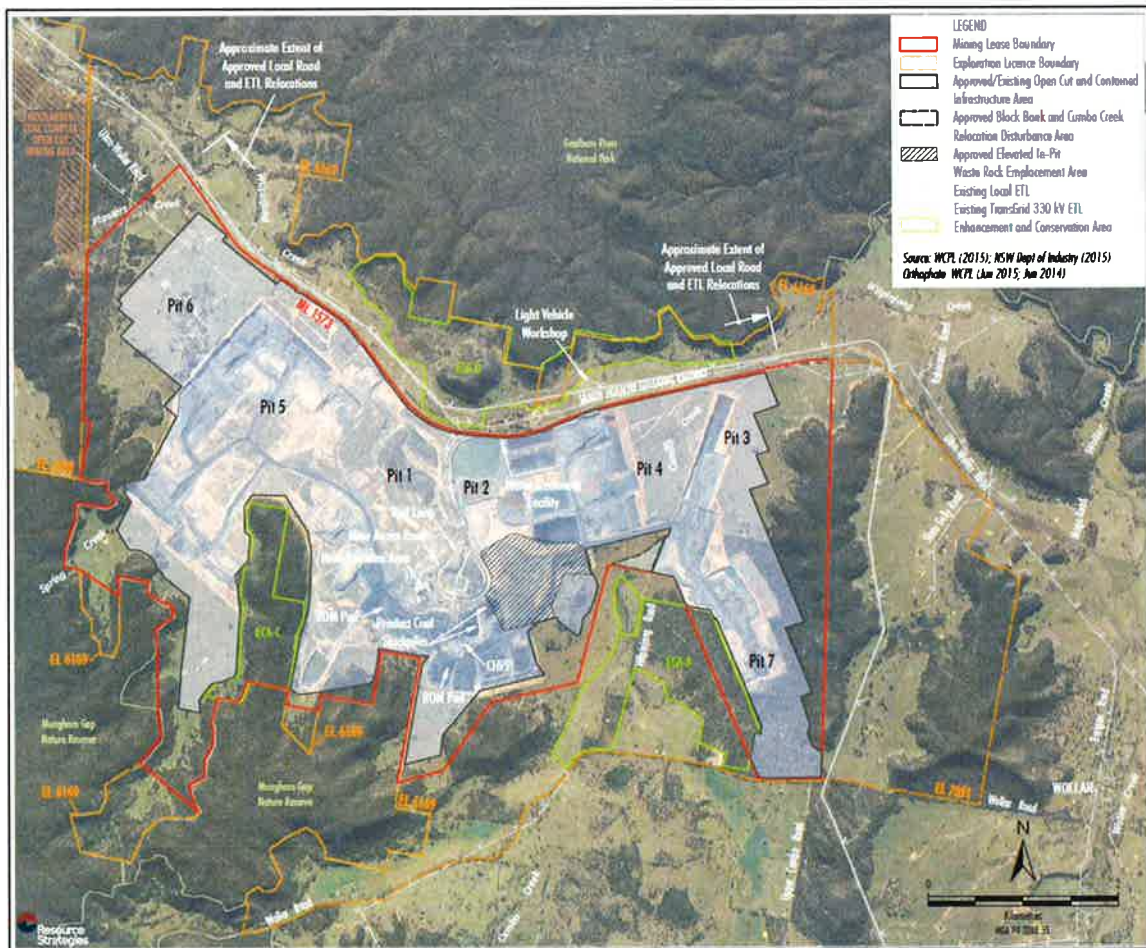


Figure 2: Approved Wilpinjong Coal Mine

Approval to mine under the current approval ceases in early 2027, and there is approximately 79 Mt of ROM coal remaining within the approved footprint of the mine. However, without further approval, production at the mine is expected to decrease significantly from 2017 onwards.

This is primarily due to the mine design which relies on having a number of shallow open cut pits operating simultaneously to maintain maximum production rates and meet customer specifications. The decline is also exacerbated by the geometry of the mine, which limits the number of fleet that can be deployed as mining progresses into the narrower sections of the approved mine plan.

Over the next 10 years, production at the mine is forecast to average around 7 Mtpa (a reduction of almost 6 Mtpa from current levels). WCPL has a contract with AGL Macquarie to supply almost all of the remaining coal to the Bayswater and Liddell power stations in the Hunter Valley until 2026, with only a total of around 6 Mt expected to be available for sale on the more profitable export market. The

forecast reduction in coal production would also be reflected in the number of employees at the mine, which would steadily decline from 550 to 150 by 2026.

While this decline was forecast under the original approval, WCPL has identified an opportunity to extract an additional 95 Mt of ROM coal from land adjacent to its existing mining operations, as a result of further exploration and a review of the current mine plan. The shallow nature of this coal and the very low strip ratios of overburden to coal (between 2:1 and 3:1) mean that the resource can be economically extracted using conventional open cut mining methods. The low strip ratios also allow overburden emplacements and final voids to be substantially reduced when compared to most other open cut mining operations in NSW.

Approval to access this coal would allow WCPL to maintain the current production and employment levels, maximise the volume of coal available for export, continue to use its existing plant and equipment, and deliver the other economic benefits of mining over a significantly longer period than would otherwise be the case under the existing approval. Accordingly, WCPL is seeking approval for an extension to its existing operations (known as the 'Wilpinjong Extension Project') which would allow mining to continue until 2033.

1.2 Wilpinjong Extension Project

The Wilpinjong Extension Project (the project) comprises (see Figure 3):

- the development of a new open cut pit to the east of existing operations (i.e. Pit 8);
- extensions to various existing open cut pits;
- a minor increase in coal production from 12.6 to 13 Mtpa;
- continued use of existing coal processing and surface infrastructure; and
- an extension to the life of the mine by 7 years (i.e. from 2026 to 2033).

The project also involves the development of a range of ancillary infrastructure, including further realignment of Ulan-Wollar Road, relocation of a 330 kV transmission line, and construction of additional surface infrastructure to support mining operations.

The project would not increase the rate of extraction at the mine, which would remain at 16 Mtpa of ROM coal. However, there would be an increase in peak operational employment numbers from 550 to 625, and also a temporary increase of around 100 people during the first 18 months of construction and development.

The project has a capital investment value of around \$172.5 million (present value), and would generate around \$190 million in royalties for the NSW Government.

The major components of the approved operations and the proposed project are summarised in Table 1 below. The project is described in full in the Environmental Impact Statement (EIS) (see Appendix A).

A range of mitigation measures have been incorporated into the design of the project to minimise its likely impacts on people, surrounding land uses and the environment. These measures include:

- minimising the size of the overburden dumps and backfilling the mining pits to reduce the size of the final voids;
- implementing best management practice to minimise the dust, noise, vibration, water, visual and heritage impacts of the project; and
- creating a final landform that would blend in with the surrounding landscape.

Since the exhibition of the EIS, WCPL has made additional changes to strengthen its proposed rehabilitation and biodiversity offset strategy for the project. In addition to 5 land based biodiversity offsets, WCPL is now proposing to:

- rehabilitate the entire mine site to woodland using suitable native vegetation to increase habitat for key threatened species (such as the Regent Honeyeater) and enhance connectivity between the Munghorn Gap Nature Reserve and the Goulburn River National Park; and
- contribute \$660,000 towards the recovery program for the critically endangered Regent Honeyeater.

Table 1: Major Components of the Approved Mine and Proposed Project

Aspect	Approved Wilpinjong Coal Mine	Proposed Project
<i>Mine Life</i>	<ul style="list-style-type: none"> • 21 Years (to 2027) 	<ul style="list-style-type: none"> • 28 Years (7 year extension to 2033)
<i>Mining Method</i>	<ul style="list-style-type: none"> • Truck and excavator open cut mining methods 	<ul style="list-style-type: none"> • Unchanged
<i>Mining Areas</i>	<ul style="list-style-type: none"> • Mining in several contiguous open cut pits, comprising an area of approximately 1,990 hectares 	<ul style="list-style-type: none"> • Extending the existing open cut pits by approximately 500 hectares • Establishing a new open cut pit (Pit 8) to the east of existing operations comprising an area of approximately 300 hectares
<i>Mining and Reserves</i>	<ul style="list-style-type: none"> • Extraction of 208 Mt of ROM coal 	<ul style="list-style-type: none"> • Recovering an additional 61 Mt of ROM coal from open cut extension areas and 34 Mt of ROM coal from the new open cut pit
<i>Extraction Rate</i>	<ul style="list-style-type: none"> • Up to 16 Mtpa of ROM coal 	<ul style="list-style-type: none"> • Unchanged
<i>Product Coal</i>	<ul style="list-style-type: none"> • Producing up to 12.6 Mtpa (with ability to produce up to 13 Mtpa in 2016) 	<ul style="list-style-type: none"> • Producing up to 13 Mtpa
<i>Overburden Emplacement</i>	<ul style="list-style-type: none"> • Waste rock predominantly placed within mining voids 	<ul style="list-style-type: none"> • Unchanged
<i>Coal Processing</i>	<ul style="list-style-type: none"> • Washing up to 9.2 Mtpa of ROM coal 	<ul style="list-style-type: none"> • Unchanged
<i>Coal Rejects</i>	<ul style="list-style-type: none"> • Coal rejects placed predominantly in mining voids 	<ul style="list-style-type: none"> • Unchanged
<i>Coal Transport</i>	<ul style="list-style-type: none"> • Transport no more than 12.5 Mtpa of product coal via the Gulgong to Sandy Hollow Railway • Average of 6 and maximum of 10 laden trains leaving the site per day 	<ul style="list-style-type: none"> • Removing the annual limit for total product coal transported by rail, but retain limits on the number of laden train movements (i.e. average of 6 and maximum of 10)
<i>Infrastructure and Roadworks</i>	<ul style="list-style-type: none"> • On site infrastructure includes: <ul style="list-style-type: none"> - coal handling and preparation plant - mine access roads - water management structures and systems - electricity supply system • Realignment of part of Ulan-Wollar Road • Ongoing contributions to the upgrade and maintenance of Ulan Road 	<ul style="list-style-type: none"> • Continued use of existing surface infrastructure • Relocating a section of TransGrid's 330 kV transmission line and other electricity transmission lines and services • Developing additional infrastructure including satellite mine infrastructure areas, ROM coal pads and mine access roads • Further realignment and sealing of a small section of Ulan-Wollar Road, and associated rail level crossing • Ongoing contributions to the upgrade and maintenance of Ulan Road
<i>Biodiversity Offsets</i>	<ul style="list-style-type: none"> • 5 land based offset areas in the vicinity of the mine totalling 691 hectares • 'Nullo Mountain' property comprising 384 hectares which was incorporated into the Wollemi National Park in 2006 	<ul style="list-style-type: none"> • 5 additional land based offset areas adjacent to the National Park Estate totalling 996 hectares of native vegetation. • Rehabilitation of the entire site with suitable native woodland species • \$660,000 towards the Regent Honeyeater recovery program
<i>Rehabilitation and Final Voids</i>	<ul style="list-style-type: none"> • Progressive rehabilitation of the site • Final landform <ul style="list-style-type: none"> - 2 final voids (Pits 2 and 6) - backfilled pits generally consistent with pre-mining topography - an elevated waste rock emplacement located to the south of Pit 2 • Final land use – mixed woodland/pasture with dense woodland corridors 	<ul style="list-style-type: none"> • Progressive rehabilitation of the site • Final landform – unchanged, except with an additional final void at the southern end of Pit 8 • Final land use – suitable woodland species across the entire site to enhance Regent Honeyeater habitat and integrate with the Munghorn Gap Nature Reserve and the Goulburn River National Park
<i>Operating Hours</i>	<ul style="list-style-type: none"> • 24 hours a day, 7 days a week 	<ul style="list-style-type: none"> • Unchanged
<i>Employment</i>	<ul style="list-style-type: none"> • Operational workforce of approximately 550 people 	<ul style="list-style-type: none"> • Peak operational workforce of approximately 625 people

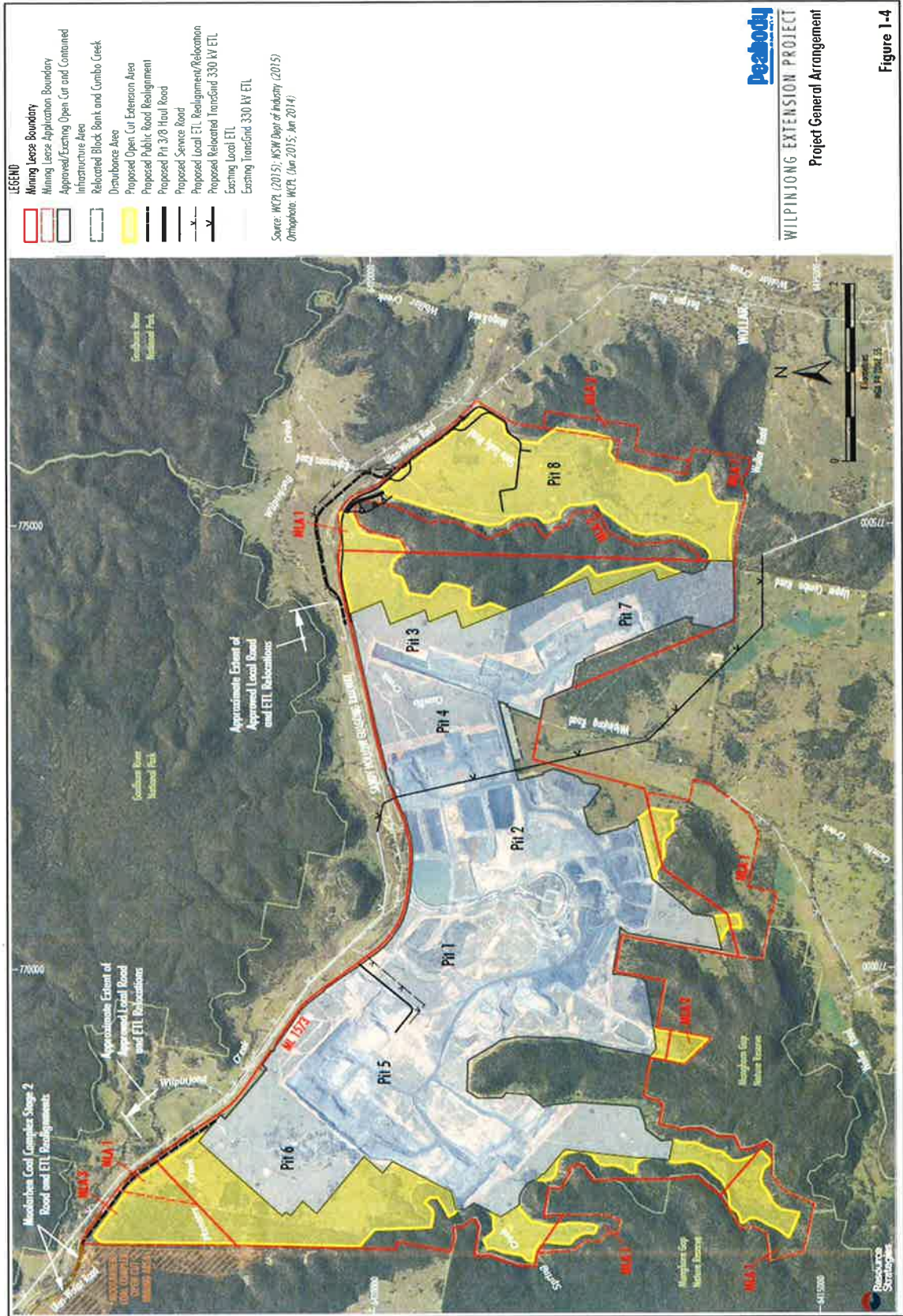


Figure 3: Project Layout

2 STRATEGIC CONTEXT

2.1 Western Coalfields

Along with the Ulan and Moolarben coal mines, Wilpinjong forms part of a large and well-established coal mining complex (see Figure 1). Mining first commenced in the region in the 1920's with the commencement of the Ulan Colliery. Mining activities intensified in the region following the commencement of the Wilpinjong Coal Mine in 2006 and the Moolarben Coal Mine in 2009.

Combined, the three mines have approval to extract up to 57 million tonnes of ROM coal a year, process it at their coal handling and preparation plants, and transport it to domestic and export markets via the Gulgong to Sandy Hollow Railway. This represents around 20% of NSW's coal production.

A new open cut and underground coal mine, known as the Bylong Coal Project, is proposed 20 km east of the Wilpinjong mine in the Bylong Valley (see Figure 1). At the time of writing, the Department was assessing the merits of the project. If approved, the Bylong Coal Project would allow for the extraction of up to 6.5 Mtpa of ROM coal for a period of 25 years.

The Cobbora Coal Mine, located approximately 65 km northeast of Mudgee, was approved by the Planning Assessment Commission in May 2015. The project involved the development a large open cut mine extracting up to 20 Mtpa of ROM coal for a period of 21 years. However, in November 2015, the NSW Government advised that it would not be proceeding with the project and that the land within the site would be sold and returned to agricultural land uses.

The existing coal mines in the area are located on the valley floors between elevated National Park/Nature Reserves or Crown Reserves, and the Department is aware that there are large unallocated coal reserves adjacent to the existing operations that have the potential to be developed in the future.

In this regard, the Department is fully aware of the concerns about potential interactions and cumulative impacts associated with the growth of the industry over recent years, and it has considered these issues in its assessment of the project (see Section 5), including in regard to air quality, noise, biodiversity, water, heritage and traffic.

2.2 NSW Power Generation

WCPL currently supplies approximately 70% of its coal to AGL Macquarie's Bayswater and Liddell Power Stations (i.e. around 7 Mtpa) under a contract which expires in 2026.

These power stations account for around 30% of NSW's electricity generation capacity, and the coal from the Wilpinjong mine comprises up to 80% of the coal required to operate these power stations.

Importantly, regardless of whether the project is approved, the obligations to provide coal to the power stations in accordance with the current supply contract would remain in place.

As detailed in the Economic Assessment in the EIS (see Appendix M of the EIS), the price for thermal coal to AGL Macquarie is set at \$32.90 per tonne. Even accounting for price fluctuations, this is significantly below the forecast prices for thermal coal on the export market which are currently around \$60 to \$80 per tonne, depending on the quality of the coal (see Figure 4).

It is this price differential that is driving the economics of the project, as the additional coal from the project would allow WCPL to meet its domestic supply contracts and maximise its export coal volumes over the next 10 years. After 2026, WCPL advises that all the coal from the project is likely to be sold on the export market.

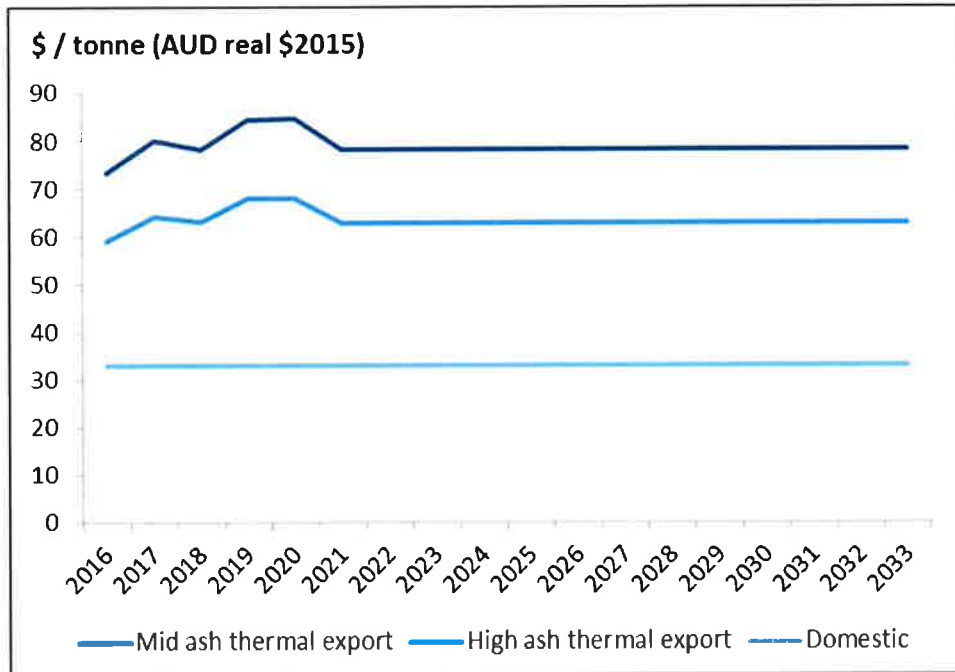


Figure 4: Coal Prices Forecasts – 2016 to 2033 (Deloitte Access Economics, 2016)

2.3 Regional Setting and Land Use

Land use in the area is characterised by a combination of agricultural and rural residential properties and conservation reserves.

While some grazing and dryland cropping has occurred on the site in the past, the land capability of the site is generally low and does not support more intensive agriculture. The site does not contain any Biophysical Strategic Agricultural Land (BSAL) or Critical Industry Clusters (CICs) (see Section 3.5).

The mine is located on the valley floor between the hills and escarpments of the Goulburn River National Park to the north and the Munghorn Gap Nature Reserve to the south. Both these areas are regionally significant for their biodiversity values, including Regent Honeyeater habitat, and Aboriginal cultural heritage values associated with water courses and rock formations.

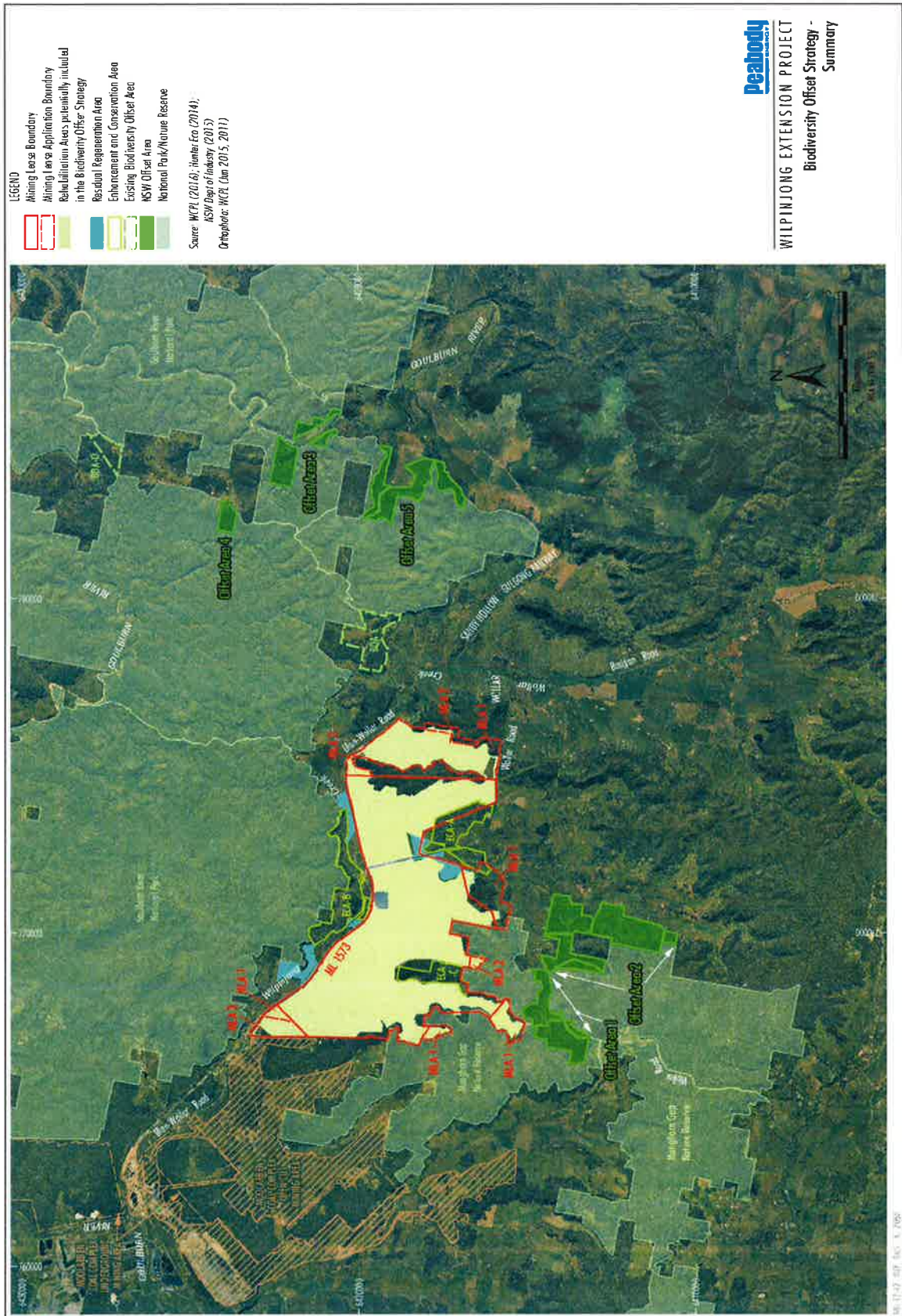
The Munghorn Nature Reserve adjoins various sections of the site and would not be directly impacted by the project. WCPL proposes to conserve areas adjoining both the Goulburn River National Park and the Munghorn Gap Nature Reserve as part of its biodiversity offset strategy (see Figure 5).

The project is located at the south western extent of the Hunter Catchment, forming part of a regional drainage network within the Upper Goulburn River and Wollar Creek Catchments. The site drains to the Goulburn River via its tributaries including Wilpinjong Creek, Cumbo Creek and Wollar Creek.

Cumbo Creek, the largest tributary crossing the site, is approved to be relocated as part of the existing approval.

There are two distinct aquifers in the vicinity of the mine including alluvial aquifers associated with Wilpinjong Creek and Wollar Creek, and a porous rock aquifer associated with the Illawarra Coal Measures.

The major population centres in the region are Gulgong (population of approximately 2,500) and Mudgee (population of approximately 10,000 people), which are located 30 km and 45 km from the site, respectively (see Figure 1).



2.4 Land Ownership

As a consequence of the significant increase in mining activity over recent years, almost all the privately-owned land in the vicinity of the Wilpinjong Coal Mine is now owned by mining companies (see Figure 6).

Ulan Coal and Moolarben Coal own almost all the land along the valley to the west of the project, and WCPL owns almost all the land in the valleys to the south and east of the project.

While it was necessary to purchase a significant proportion of this land to develop the mine, WCPL has also proactively purchased land over the last 10 years to increase the buffer around its existing operations, and in anticipation of the development of the current proposal.

The nearest privately-owned residence is now located in the village of Wollar, although WCPL owns all the land surrounding the village.

The Department considers that the limited land remaining in private-ownership is a key consideration for the merit assessment of the project, particularly in regard to residual social and amenity impacts.

2.5 Wollar Village

The village of Wollar is located approximately 3 km to the east of the approved mining operations, and approximately 2 km from the proposed new open cut pit (i.e. Pit 8).

The village comprises 23 residential dwellings, a primary school, an Anglican and Catholic Church, a community hall, and a local store which also functions as a post office. The population of the village and the Wollar community has declined significantly since 2006 from approximately 304 residents to around 70 residents in 2015.

WCPL has had a long-standing commitment that it would purchase any privately-owned property in the village. As a result, it now owns all the privately-owned properties in the village apart from 3 residential properties and 1 parcel of vacant land (see Figure 7). The Department understands that WCPL is in negotiations to purchase or reach agreement with the owners of these properties, and is also finalising acquisition of the Anglican and Catholic churches.

If successful, there will be no privately-owned properties remaining in the village.

However, it is important to note that there are a number of other residences located in the greater Wollar area that form part of the Wollar community and who visit the village of Wollar for services and social interaction. The majority of these people reside near Mogo Road immediately northeast of the village, and Barrigan Road to the south (see Figure 6). There are approximately 15 residences in these areas.

Around 23 people currently residing in the Wollar area are employed at the mine.

The declining population has affected the viability of a range of community services in the area. For example, the local Rural Fire Service (RFS) has amalgamated with the neighbouring Cooks Gap RFS, Wollar public school enrolments have decreased from 20 in 2006 to 8 in 2015, WCPL now subsidises the general store to keep it operating, and visiting services to the area, including a health service, have become more difficult to justify.

The impacts on these community services, and associated impacts on community cohesion, have been an ongoing concern for residents remaining in the village and the Wollar area. Many of these concerns have been re-iterated throughout the assessment process for this project.

The monitoring data associated with the current operations indicates that the mine is currently complying with applicable amenity criteria in the village. However, some of the remaining residents of Wollar and its surrounds consider that they are already adversely affected by dust and noise impacts from mine (including rail noise), and that the proposed extension would increase these impacts to unacceptable levels.

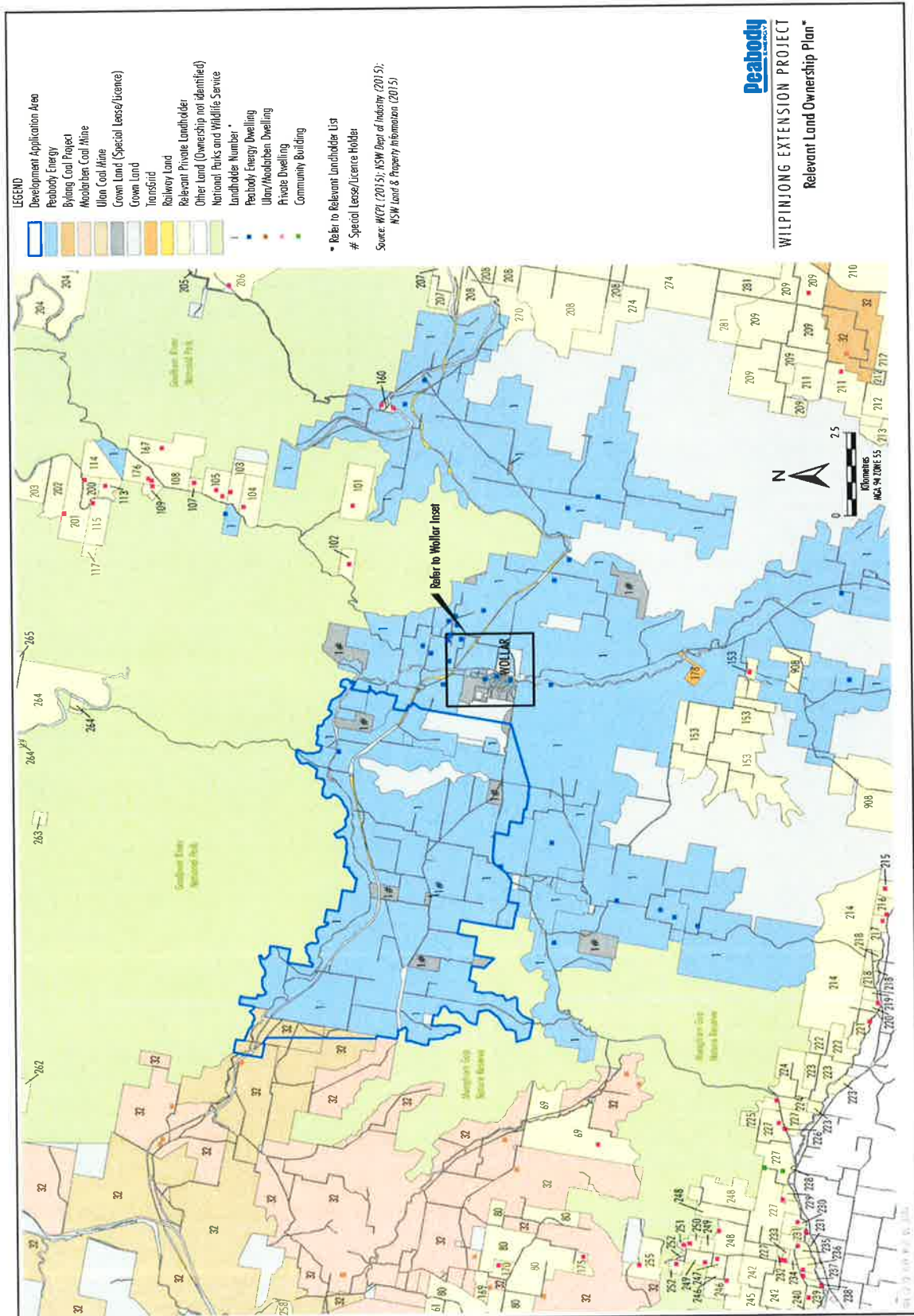


Figure 6: Land Ownership - Regional



Figure 7: Land Ownership - Wollar

2.6 Infrastructure

Key infrastructure in the region includes the Gulgong to Sandy Hollow Railway, the regional road network and electricity supply infrastructure (see Figure 1).

The Gulgong to Sandy Hollow Railway line provides a link to the Port of Newcastle. The line is used exclusively for freight and is dominated by coal transported from the mines in the region. Combined, the three operating mines have approval to transport up to 51 Mtpa of coal on the line which results in an average of 20 laden train movements (i.e. 40 train movements) each day.

On average, the Wilpinjong mine accounts for 6 of the daily laden train movements, and the proposed extension would not materially increase the frequency of trains from the site. The Bylong Coal Project also proposes to transport coal via this line to Newcastle for export, although this would only increase movements on the railway to the east of Bylong.

The regional road network comprises three important roads – Ulan Road, Ulan-Wollar Road and Wollar Road (see Figure 1).

Ulan Road provides a link between Mudgee and Ulan and serves as the primary access route for all the regional mine traffic heading to and from Mudgee. The three operating mines currently contribute to the upgrading and maintenance of Ulan Road through the Ulan Road Strategy, which was developed by the mines in consultation with Mid-Western Regional Council and the Department, and finalised in 2013.

Ulan-Wollar Road links Ulan Road to Wollar Village and serves as the primary access route to the mine. This road would be re-aligned and sealed over its entire length as part of the project.

Finally, Wollar Road provides a regional connection between Bylong, Wollar and Mudgee, passing through the Munghorn Gap Nature Reserve.

A number of local and regional electricity transmission lines are situated in the area including a 330 kV transmission line owned by Transgrid from Wollar to Wellington. Part of this transmission line would be relocated under the project.

3 STATUTORY CONTEXT

3.1 State Significant Development

The project is declared to be State Significant Development (SSD) under Section 89C of the EP&A Act as it is 'development for the purposes of coal mining', which is specified in Clause 5 of Schedule 1 to *State Environmental Planning Policy (State and Regional Development) 2011*.

Consequently, the Minister for Planning is the consent authority for the development. However, the development application falls within the Minister's delegation to the NSW Planning Assessment Commission (Commission) dated 14 September 2011, because there were more than 25 public submissions in the nature of objections. Consequently, the Commission must determine the application.

3.2 Permissibility

The site is located in the Mid-Western local government area. Under the *Mid-Western Regional Local Environmental Plan 2012* (Mid-Western Regional LEP) the development application area includes land zoned as:

- E3 – Environmental Management;
- R5 – Large Lot Residential;
- RU1 – Primary Production; and
- SP2 – Infrastructure.

Open cut mining is permissible with consent in zones E3 and RU1, however it is prohibited in the R5 and SP2 zones.

However, under Clause 7(1)(b)(i) of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*, development for the purpose of mining may be carried out on land where agriculture is a permissible land use. Extensive agriculture may be carried out in both the R5 and SP2 zones without development consent.

A public utility undertaking in the form of an Electricity Transmission Line is permissible with consent in zones RU1 and R5, however it is prohibited in the E3 and SP2 zones. Under Clause 41(1) of *State Environmental Planning Policy (Infrastructure) 2007*, development for the purpose of an electricity transmission or distribution network may be carried out on or behalf of an electricity supply authority or public authority on any land.

Consequently, the project is permissible with development consent and the Commission may determine the application.

3.3 Integrated & Other Approvals

Under Section 89J of the EP&A Act, a number of other approvals are integrated into the SSD assessment process, and consequently are not required to be separately obtained for the project. These include:

- an authorisation under the *Native Vegetation Act 2003* for the clearing of native vegetation; and
- various approvals relating to heritage under the *National Parks and Wildlife Act 1974* and the *Heritage Act 1997*

Under Section 89K of the EP&A Act, a number of other approvals are required, but must be substantially consistent with any development consent for the project. These include:

- additional mining lease(s) required under the *Mining Act 1992*;
- variations to the environment protection licence under the *Protection of the Environment Operations Act 1997*; and
- consent under Section 138 of the *Roads Act 1993* for the re-alignment of Ulan-Wolar Road and development of new mine access roads and intersections.

WCPL also requires other approvals for the project which are not integrated into the State Significant Development approval process, including:

- certain water licences under the *Water Act 1912* and *Water Management Act 2000*; and
- approval under the *Crown Lands Act 1989* for any works on Crown Land.

3.4 Commonwealth Approvals

On 12 March 2015, a delegate for the then Commonwealth Minister for the Environment determined the Wilpinjong Coal Project (EPBC 2015/7431) to be a 'controlled action' in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to likely significant impacts to listed threatened species and communities (sections 18 and 18A) and water resources (Sections 24D and 24E).

The assessment process under the EP&A Act has been accredited under a bilateral agreement with the Commonwealth Government. This means that the NSW Government is undertaking the assessment on behalf of the Commonwealth and must assess matters of national environmental significance (MNES).

The Department's assessment of the potential impacts of the project on controlling provisions under the EPBC Act relating to biodiversity and water resources is provided in relevant subsections of Section 5. Further information on the matters that the Commonwealth Minister must consider under the EPBC Act is provided in Appendix M.

As required under the bilateral agreement, the Department sought advice from the Commonwealth Independent Expert Scientific Committee on Coal Seam Gas and Large Mining Development (IESC)

about the potential impacts of the project on water resources (see Appendix J). This advice has been considered by the Department in Section 5 and incorporated into the recommended conditions of consent (see Appendix N).

3.5 Site Verification Certificate

Under Clause 50A of the EP&A Regulation, a development application that relates to mining development in areas where a Strategic Agricultural Land Map has been prepared by the NSW Government must be accompanied by a gateway certificate or a site verification certificate that certifies that the land on which the proposed development is to be carried out is not Biophysical Strategic Agricultural Land (BSAL).

In August 2014, WCPL lodged an application for a site verification certificate with the Department, prepared in accordance with the *Interim Protocol for Site Verification and Mapping of Biophysical Strategic Agricultural Land*.

On 17 October 2014, following receipt of advice from soil scientists at the NSW Office of Environment and Heritage, the Department issued a site verification certificate confirming that the site does not contain BSAL (see Appendix K). Accordingly, a gateway certificate was not required for the project, as the application was accompanied by a site verification certificate.

3.6 Section 79C Considerations

Section 79C(1) of the EP&A Act outlines the matters that a consent authority must take into consideration when determining development applications.

These matters can be summarised as:

- the provisions of environmental planning instruments (including draft instruments), development control plans, planning agreements, and the EP&A Regulation;
- the environmental, social and economic impacts of the development;
- the suitability of the site;
- any submissions; and
- the public interest, including the objects of the Act which include encouraging Ecologically Sustainable Development (ESD).

The Department has considered all of these matters in its assessment of the project, as summarised in Section 5 of this report. The Department has also given specific consideration to the relevant provisions of environmental planning instruments in Section 5 and Appendix L.

3.7 NSW Planning Assessment Commission

On 20 October 2016, the Minister for Planning asked the NSW Planning Assessment Commission (the Commission) to review the project. Due to the level of public interest in the project, the Minister also requested the Commission to hold public hearings during the review. The terms of reference for the Commission review are set out below (see Table 2).

Table 2: Terms of Reference for the Commission's Review of the Wilpinjong Extension Project

1.	Carry out a review of the Wilpinjong Extension Project, and: <ol style="list-style-type: none"> a) consider the EIS for the project, all issues raised in public and agency submissions, and any other information provided on the project during the course of the review; b) assess the merits of the project as a whole having regard to all relevant NSW Government policies, paying particular attention to the impacts of the project on Wollar Village; and if necessary; c) recommend appropriate measures to avoid, minimise, and/or manage significant impacts of the project.
2.	Conduct public hearings during the review as soon as practicable after the Department of Planning and Environment provides its preliminary assessment report to the Commission.
3.	Submit its final report on the review to the Department of Planning and Environment within 10 weeks of receiving the Department's preliminary assessment report, unless the Secretary agrees otherwise.

Once it receives the Commission's review report, the Department will finalise its assessment of the merits of the project and refer the application back to the Commission for determination.

4 CONSULTATION

4.1 Exhibition

Under Section 89F of the EP&A Act, the Secretary is required to publicly exhibit the EIS for the project for at least 30 days.

After accepting the EIS for the project, the Department:

- publicly exhibited the EIS from 27 January until 10 March 2016 at the:
 - Department's Information Centre in Sydney;
 - Mid-Western Regional Council offices in Mudgee and Gulgong;
 - Nature Conservation Council; and
 - Department's website.
- notified relevant State government authorities and Council by email;
- notified relevant electricity supply and transmission authorities in accordance with the Infrastructure SEPP;
- notified Aboriginal stakeholder groups in accordance with the Mid-Western Regional LEP; and
- advertised the exhibition in The Australian, Sydney Morning Herald, and Mudgee Guardian.

In undertaking these processes, the Department has satisfied the requirements of Section 89F of the EP&A Act, the Infrastructure SEPP and the Mid-Western Regional LEP.

4.2 Additional Consultation

In addition to the formal exhibition, the Department arranged a public information session in the Wollar community hall in February 2016.

Representatives from the Environment Protection Authority, Division of Resources and Energy, and Department of Primary Industries - Water also attended.

During the meeting, the Department explained the development assessment process, the procedures for making submissions, and invited members of community to ask questions about the process and raise any initial concerns about the project.

The Department also held a further meeting with local community members on 20 April 2016, focusing on social and noise impacts.

The Department visited the area on several occasions to inspect the existing mining operations, the proposed extension areas, Wollar Village and its surrounds.

The Department also met with key government agencies throughout the assessment of the project, including the Environment Protection Authority, the Office of Environment and Heritage, Division of Resources and Energy, Department of Primary Industries – Water, and the Commonwealth Department of Environment and Energy. It also sought further advice from the IESC about its recommendations for managing the impacts of the project on water resources (see Appendix J).

4.3 Submissions

During the exhibition period, the Department received 752 submissions including (see Table 3):

- 11 from public authorities;
- 30 from special interest groups and organisations; and
- 711 from individuals.

A summary of the issues raised in submissions is provided below. A full copy of the submissions is provided in Appendix B.

Table 3: Summary of Submissions

Submitter	Number	Objecting/Supporting
Public Authorities	11	• No objections
Australian Rail Track Corporation Department of Primary Industries Division of Resources and Energy Environment Protection Authority Heritage Council Mid-Western Regional Council NSW Health Office of Environment and Heritage Roads and Maritime Services Rural Fire Service Transport for NSW		
Special Interest Groups & Organisations	30	• 17 objected • 12 supported • 1 provided comments
350.org Australia Bathurst Community Climate Action Network BirdLife Australia Bylong Valley Protection Alliance Central West Environment Council Denman Aberdeen Muswellbrook Healthy Environment Group Double R Pty Ltd Fence U Pty Ltd GB Auto Electrics Gulgong LPO HIC Services Hunter Community Network Hunter Environment Lobby KEPCO Bylong Australia Minnamurra Pastoral Co Mudgee Cranes Mudgee District Environment Group Mudgee Local Aboriginal Land Council Mudgee Rugby Club Murong Gialinga Aboriginal and Torres Strait Islander Corporation National Parks Association of NSW Nature Conservation Council One Key Resources Running Stream Water Users Association Ryde – Hunter's Hill Flora and Fauna Preservation Society Signature Properties Mudgee Rylstone District Environment Society Thai to You @ Gulgong The Australia Institute Wollar Progress Association		
Community	711	• 616 objected, 93 supported & 2 provided comments
Approx. distance from the Wilpinjong Mine		
<5 km	10	• 4 objected & 6 supported
5-15 km	17	• 14 objected & 3 supported
15-50 km	211	• 142 objected & 69 supported
>50 km	464	• 450 objected & 14 supported
unknown	9	• 6 objected, 1 supported & 2 provided comments

4.4 Response to Submissions

In May 2016, WCPL provided a detailed Response to Submissions (RTS) (see Appendix C).

The Department placed a copy of the RTS on its website, and forwarded a copy to key agencies for comment. A copy of the responses is provided in Appendix D.

Through the process WCPL also provided a range of additional information to address issues raised by the Department and other agencies. This information is provided in Appendix E.

4.5 Public Authorities

None of the public authorities objected to the project. However, they raised issues with specific aspects of the project and/or made recommendations relating to a range of matters relevant to their administrative and regulatory responsibilities.

A summary of the residual issues raised by agencies is provided below.

Environment Protection Authority (EPA) initially raised concerns about the assessment of noise, air quality, surface water and waste. WCPL addressed these matters in detail in its RTS and subsequent documentation. The EPA advised that it is satisfied with WCPL's responses, and recommended a number of conditions to ensure these matters are appropriately managed. The Department has adopted these recommendations, and the EPA has advised it is satisfied with the recommended conditions.

Office of Environment and Heritage (OEH) raised a number of concerns relating to the application and reporting requirements of the NSW Biodiversity Offsets Policy, including the Framework for Biodiversity Assessment (FBA), the proposed offset strategy, residual impacts on the Munghorn Gap Nature Reserve and Eastern Bentwing-bats.

With respect to the proposed offset strategy, OEH raised concerns about the adequacy of the strategy, particularly in relation to the species credit shortfall for Regent Honeyeater habitat. It also raised concerns about the use of rehabilitation as an offset for impacts to Regent Honeyeater habitat, given the high extinction risk of the species and time required for rehabilitation to produce suitable foraging habitat.

OEH made a number of recommendations to mitigate some of the residual impacts. In particular, OEH requested that a 50 m buffer be maintained between any mining operations and the Munghorn Gap Nature Reserve to minimise potential edge effects. It also recommended that WCPL implement measures to mitigate impacts on Eastern Bentwing-bats by implementing a monitoring program and measures to maintain access to an old mine shaft near Pit 8.

In response to OEH's residual concerns, WCPL provided further justification for the proposed setback from the Munghorn Gap Nature Reserve and its proposed management measures for the Eastern Bentwing-bat. It also substantially strengthened its biodiversity offset strategy, including commitments to rehabilitate an additional 2,906 hectares of land to establish Regent Honeyeater habitat, and contribute \$660,000 towards recovery actions for the Regent Honeyeater. These issues are discussed in more detail in Section 5.3.

With respect to Aboriginal Cultural Heritage, OEH accepts that the impact assessment has been undertaken in accordance with relevant requirements and accepts that any impacts could be managed through revisions to the mine's existing Aboriginal Cultural Heritage Management Plan. Notwithstanding, OEH raised concerns about the cumulative harm to Aboriginal heritage in the region as a consequence of mining development.

Department of Primary Industries (DPI) provided comments from its water and lands divisions.

DPI Lands raised no objection subject to WCPL obtaining the appropriate approvals prior to use and occupation of any Crown Land.

DPI Water initially raised a number of concerns about water take and licensing and water quality impacts concerning salinity levels in Wilpinjong Creek. WCPL provided additional information following the RTS to clarify the impacts of the project in accordance with the *NSW Aquifer Interference Policy (AIP)* and these issues have since been resolved.

DPI Water requested that it be consulted on the preparation of a revised Water Management Plan for the project and that 'make good' provisions be applied for the predicted impacts to the Wollar Public School's groundwater bore.

Division of Resources and Energy (DRE) raised concerns about rehabilitation and final landform design. In particular, DRE requested further detail about the final landform design including consistency with the surrounding topography, justification for final voids, geotechnical stability of the final voids, scheduling of progressive rehabilitation and the suitability of post-mining land use, including the vegetation communities to be established.

WCPL provided a detailed response to the concerns raised by DRE, and DRE has advised that it is satisfied that these matters can be appropriately managed through conditions of consent.

In this regard, the Department's recommended conditions include requirements to minimise the size of final voids, incorporate micro-relief into the final landform, progressively rehabilitate the site, and use suitable vegetation communities in consultation with OEH. These matters are discussed further in Section 5.6.

Additionally, DRE confirmed WCPL's reported coal reserve of 95 Mt of ROM coal, and advised that the proposed mine plan would adequately recover the in-situ coal resources on the site.

Roads and Maritime Services (RMS) requested that the re-alignment of Ulan-Wollar Road be designed and constructed in accordance with Austroads standards and recommended measures to minimise traffic during school times and reduce cumulative impacts from mine-related traffic. These recommendations were addressed by WCPL and RMS raised no residual concerns following its review of the RTS. The Department has formalised these commitments in the recommended conditions.

NSW Health raised concerns about air quality impacts on human health. In particular, NSW Health requested a plan be developed and implemented to notify the agency and residents of Wollar when air quality limits are exceeded. It also recommended that measures be adopted to respond to any exceedances. While the Department's assessment indicates that the project can be operated to meet air quality criteria at surrounding privately-owned residences, the recommended conditions include a range of notification requirements in regard to potential exceedances of applicable environmental criteria and a requirement to prepare a detailed Air Quality Management Plan.

Rural Fire Service (RFS) recommended consideration of bush fire protection measures and the preparation of a Bush Fire Risk Management and Emergency Evacuation Plan for the project. WCPL has internal measures to manage the risk of bushfire and has committed to updating its existing management plan to include the project, in consultation with the RFS.

Mid-Western Regional Council (Council) raised a number of concerns and/or made comments in relation to:

- **Traffic and Transport** - including road maintenance, intersection upgrades and the sealing of Ulan -Wollar Road;
- **Noise** – the nature and extent of predicted noise impacts, the implementation of reasonable and feasible noise mitigation measures, and the need for independent noise modelling;
- **Biodiversity** – the significance assessments for MNES under the EPBC Act;
- **Aboriginal Heritage** - the impacts on heritage items and recommended further consultation with the Aboriginal community to identify mitigation measures;
- **Air Quality** - requested independent modelling of impacts; and
- **Social and economic impacts** – in particular, the social impacts on Wollar and the community's ability to sustain community services and requested WCPL to support the community in managing these impacts.

These matters are considered in more detail in Section 5.

The Heritage Council of NSW raised concerns about potential impacts on heritage sites including the historical Shale Oil Mine and associated Caretakers Cottage. It recommended conditions that would require WCPL to develop and undertake a salvage and excavation methodology in consultation with the Heritage Council. The Department has recommended a condition requiring the preparation of the Historic Heritage Management Plan prior to undertaking any development associated with the project, including the measures recommended by the Heritage Council.

Australian Rail Track Corporation and *Transport for NSW* did not raise any concerns about the project.

4.6 Community Submissions

Of the 741 submissions from special interest groups and the general public, 633 objected, 105 supported, and 3 submissions made comments on the project.

Of the 711 submissions from individuals, 10 were from residents of Wollar Village, 17 were from residents residing in the local area (within 15 km of the project), 211 were from the regional area (up to 50 km from the project) including the regional centres of Mudgee and Gulgong, and 464 were from other locations.

Of the 27 submissions from local residents, 9 supported the project and the remaining 18 objected.

The majority of submissions in support of the project were from residents living between 15 and 50 km from the mine. The key reasons for support of the project related to its employment and socio-economic benefits, particularly for the Mudgee area. A number of special interest groups or organisations also supported the project citing the benefits to business and employment in the region.

The Department received a substantial submission from the Wollar Progress Association (WPA) which was supported by two reports/peer reviews of the EIS in relation to noise and biodiversity. The WPA also made a submission on the RTS.

A summary of the issues raised by special interest groups and individuals is provided in Table 4.

Table 4: Summary of Submissions - Issues

Issue	
Social	<ul style="list-style-type: none"> - Loss of population and sense of community as a result of mining and extensive mine land ownership in the Bylong-Wollar area. - Impacts on residents who rely on the village as a community centre. - Inadequate assessment of social impacts caused by mining in the region. - Remaining residents in the Wollar district should be acquired and compensated.
Noise	<ul style="list-style-type: none"> - Impacts have been greater than predicted. - Noise impacts should not exceed existing levels as Wollar residents would be subjected to unacceptable impacts. - Assessment does not consider the cumulative impacts of rail and road transport. - Government noise criteria are not suitable for quiet rural areas. - Accuracy of low frequency noise monitoring.
Air Quality	<ul style="list-style-type: none"> - Ongoing coal extraction would produce greenhouse gas emissions, further exacerbating the impacts of climate change. - Impacts have been greater than predicted. - Residents in Wollar would be subjected to unacceptable air quality. - Assessment has not considered new air quality standards agreed by the National Environment Protection Council. - No consideration of diesel emissions from the mining fleet and idling coal trains. - Adopted PM_{2.5} concentration is not based on local data. - Impacts from spontaneous combustion would increase.
Aboriginal Cultural Heritage	<ul style="list-style-type: none"> - Aboriginal heritage values have not been assessed in a regional context. - Cumulative impacts on Aboriginal heritage - Impacts to areas with high cultural heritage values, including Slate Gully. - Concerns about the classification of significance of a range of heritage items.

Issue	
Biodiversity	<ul style="list-style-type: none"> - Impacts on 354 hectares of remnant vegetation, including 3 Endangered Ecological Communities. - Destruction of habitat for Regent Honeyeater. - Impacts to threatened species, including the <i>Ozothamnus tessellatus</i> - Impacts to existing Enhancement and Conservation Areas. - Offsets are inadequate and do not comply with the requirements of the Offset Policy for Major Projects. - Insufficient biodiversity offsets for the Regent Honeyeater. - Inadequate assessment of impacts to Koalas. - Concerns about the use of rehabilitation as an offset. - Impacts to the Goulburn River National Park and Munghorn Gap Nature Reserve as a result of dust, flyrock, vibration, light and noise.
Rehabilitation	<ul style="list-style-type: none"> - The extension would leave 3 final voids that would impact the environment and waterways for hundreds of years. - Insufficient justification for the final landform.
Groundwater	<ul style="list-style-type: none"> - Cumulative impacts of drawdown have not been assessed. - Ongoing impacts would be greater than predicted. - Concerns about the recovery of the water table and salinity and heavy metal concentrations. - Impacts on the bore at Wollar public school.
Surface water	<ul style="list-style-type: none"> - Request for independent regional study of impacts on the Upper Goulburn River water source. - Concerns about the poor condition of Wilpinjong Creek and risk of increased salinity. - Sediment dams have not be adequately designed to prevent uncontrolled discharge from the site. - Ongoing impacts would be greater than predicted
Transport	<ul style="list-style-type: none"> - Cumulative impacts associated with the Bylong Coal Project have not been adequately assessed, particularly through Wollar.
Economic	<ul style="list-style-type: none"> - Benefits are overstated and are based on inflated job numbers, coal reserve estimates and production rates. - Additional employment is not significant and does not justify the impacts of the proposal. - Concerns that WCPL is not in a financial position to meet obligations and liabilities associated with the project. - Social and environmental costs are not adequately costed. - The project is not required because the contract for AGL's Bayswater Power Station can be met under the existing approval, and there is no indication that there will be a continuing export market for high ash coal in the future.

5 ASSESSMENT

In accordance with Section 79C of the EP&A Act, the Department has considered the following in its assessment of the project:

- the environmental, social and economic impacts of the project, including WCPL's EIS, RTS and additional information provided during the assessment process;
- all submissions received throughout the assessment process, including advice from public authorities;
- independent reviews commissioned by the Department of the social, noise, air quality, and economic assessments of the project;
- advice from the IESC;
- applicable environmental planning instruments and draft instruments;
- other relevant NSW Government policies and guidelines;
- the suitability of the site for the project;
- the public interest; and
- other relevant provisions of the EP&A Act and Regulations, including the objects and Section 5A of the Act.

5.1 Noise, Blasting and Air Quality

Introduction

The project has the potential to increase noise, blasting and air quality impacts in the locality. This is because mining operations would advance toward privately-owned receivers located in Wollar Village and surrounds as a result of mining in Pit 8. Additionally, the mine would develop beyond one of two ridgelines that acts as a barrier between the existing mine and the village.

On this basis, objectors (including a number residents of the Wollar community) raised concerns that the project would increase the impacts of the existing mining operations, and that noise and dust levels would be unacceptable as a result.

Many of the submissions also claim that the mine has underestimated impacts in previous environmental assessments and that the impacts have been greater than predicted.

The Department notes that regular attended noise monitoring undertaken since 2012 has demonstrated that WCPL is able to comply with its existing noise limits. However, in the first few years of operations, both the EPA and the Department investigated a number of noise complaints, particularly from residents located in the valleys to the south of the mine.

To address these concerns, WCPL improved its real-time noise management system, and modified its mining operations to reduce noise during adverse meteorological conditions. It also embarked on a program of land acquisition to increase the buffer around the mine.

The Department notes that the project approval has been strengthened through successive modifications, including a requirement to undertake monthly attended noise monitoring to demonstrate compliance with the noise criteria, and a program to calibrate and validate the real-time noise monitoring results with the attended monitoring results over time. This has allowed the real-time noise monitoring program to be used as an indicator of compliance with the noise criteria and trigger further attended monitoring if required.

The historical monitoring data has enabled WCPL and its consultants to develop a far more comprehensive understanding of the existing noise environment and the effects of topography and adverse weather on the propagation of noise from the mine.

With regard to air quality, the Department notes that monitoring has shown that the existing mine has been able to comply with the dust criteria, apart from some isolated events where exceedances of short term dust criteria have occurred. These instances have generally coincided with widespread dust events, and there have been no exceedances of the long term annual average dust criteria.

In response to the strong community concerns, the Department commissioned independent reviews of the specialist noise, blasting, and air quality assessments included in the EIS. These reviews were undertaken by Wilkinson Murray and Ramboll Environ (see Appendix G and H).

The impacts resulting from the predicted noise, blasting and dust impacts, as well as the assessments of the independent reviewers, are discussed below.

Noise

The EIS includes a specialist noise impact assessment undertaken by SLR Consulting (SLR) in accordance with applicable guidelines including the *NSW Industrial Noise Policy (INP)*, *Rail Infrastructure Noise Guideline (RING)* and *NSW Road Noise Policy*.

To minimise the risk of under-predicting noise impacts, the modelling used in the assessment incorporates a range of conservative assumptions, including worst-case weather conditions.

Nonetheless, a number of residents raised concerns about the accuracy of the noise modelling and requested that the noise model be independently reviewed.

On behalf of the Department, Wilkinson Murray undertook a comprehensive review of SLR's noise assessment, including a detailed analysis of the inputs into the noise model. This review concluded that the noise model was in line with best practice, consistent with attended and real-time noise monitoring results, and if anything, may marginally over-predict noise impacts.

Given the above, the Department is satisfied that the model presents an accurate and reasonable prediction of the potential noise impacts of the project.

Background Noise

The background noise levels in the area are relatively low, as would be expected in a low density rural area. The assessment adopts 30 dB(A) as the relevant day, evening and night Rated Background Level (RBL) for all locations with the exception of the Wollar Village which has a daytime RBL of 31dB(A).

Under the INP, this results in a Project Specific Noise Level (PSNL) of 36 dB(A) for Wollar Village during the day (i.e. 31 plus 5 dB(A)) and 35 dB(A) for evening and night time. The applicable PSNL for all other locations is 35 dB(A) for day, evening and night.

A number of submissions raised concerns about the adopted background levels, and some believe that background noise levels should be set lower than specified in the INP.

In response to these concerns, the Department notes that the background noise levels adopted for this assessment are the lowest allowable under the INP, and are the same as those applied in 2006 before the mine was established.

Furthermore, PSNLs do not set the upper bounds of acceptability in regard to noise. Under the INP, the PSNLs are known as 'intrusive' criteria, and are applied in the assessment process to ensure that noise from multiple industrial sources does not exceed the recommended 'amenity' criteria for a particular location.

In rural areas such as Wollar, the INP sets the 'acceptable' night-time noise criterion at 40 dB(A) and the 'recommended maximum' at 45 dB(A). This means that in most situations, the PSNLs are lower than the amenity criterion. This allows other industrial noise sources to be introduced into the area while maintaining the overall industrial noise below the amenity criteria.

In assessing the acceptability of noise impacts, the Department is supposed to consider both the PSNLs and the amenity criteria.

Reasonable and Feasible Noise Mitigation Measures

To minimise noise impacts, WCPL proposes to continue to implement a number of measures currently being implemented at the mine.

These measures include:

- maintaining and operating all machinery and plant used on site in a proper and efficient manner;
- testing sound power levels of new mobile fleet, and testing a proportion of existing mobile equipment and fixed plant each year to ensure compliance with applicable specifications; and
- operating a continuous real-time noise management system and automated weather station, and using this monitoring data to assist in the implementation of pre-emptive management actions and operational changes to ensure compliance with applicable noise criteria at surrounding residences.

The use of this real-time management system, in particular, has enabled WCPL to accurately identify elevated noise levels and proactively manage noise by modifying its mining operations, including shutting down equipment when necessary, to ensure compliance with noise criteria. For example, between November 2014 and October 2015, individual mobile fleet were shut down for a total of 600 hours.

Even with the implementation of the existing mitigation measures, the preliminary noise modelling undertaken by WCPL found that the proposed extension could exceed the PSNLs by up to 7 dB(A) at the remaining 3 privately-owned residences in Wollar Village (i.e. noise levels up to 42 dB(A)), during adverse meteorological conditions coinciding with peak operations in Pit 8.

WCPL has investigated what additional mitigation measures would be required to comply with the PSNLs in Wollar Village (i.e. 35 dB(A)).

The investigation found that in order to meet these noise objectives, WCPL would need to:

- shut down both mining fleets working in Pit 8; or
- attenuate noise from all trucks operating at the mine and shut down one of the mining fleets working in Pit 8; or
- attenuate noise from all major mobile plant supplemented with additional equipment shutdowns, under adverse meteorological conditions.

The capital and operational cost of these additional mitigation measures would be approximately \$56 million over the remaining life of the mine.

While this extent of mitigation would be technically feasible, WCPL argues that it would not be reasonable.

As an alternative, WCPL proposes to only shut down and attenuate some of the fleet in Pit 8 to achieve a noise level of 37 dB(A) in Wollar Village during the evening and night (i.e. 2 dB(A) above the PSNLs). The estimated capital and operational cost of these measures would be \$14 million (i.e. \$42 million less than the full cost of achieving the PSNLs).

The assessment of impacts presented below is based on the \$14 million mitigation scenario.

Operational Noise Impacts

The assessment modelled the likely operational noise of the project under 5 representative mining scenarios (Years 2, 4, 8, 12 and 15).

After applying the relevant noise mitigation measures discussed above, the assessment indicates that the noise from the project would exceed the PSNL criteria at 4 privately-owned residences - 3 in Wollar Village, and one (102) to the northeast of the project, off Mogo Road (see Figure 8).

However, the noise at all residences is predicted to remain well below the acceptable amenity criteria specified in the INP for rural areas at all times.

The assessment also includes consideration of impacts on vacant land in accordance with the *NSW Voluntary Land Acquisition and Mitigation Policy (VLAMP)* for mining projects. WCPL's assessment indicates that there would be no exceedances of the relevant criteria at any privately-owned vacant land.

The predicted noise impacts of the project at privately-owned residences are summarised in Table 5 and shown in Figure 8. Note that the predicted noise levels at night were adjusted in accordance with the recommendations of the Department's independent peer reviewer (Wilkinson Murray), and are therefore higher than those presented in the EIS.

Table 5: Summary of Noise Impacts (exceedances in brackets)

Receiver No.	Worst Case Noise Prediction (dBA $L_{Aeq(15min)}$)		
	Day	Evening	Night
102	22	36 (+1)	38 (+3)
903	21	36 (+1)	37 (+2)
908	22	37 (+2)	37 (+2)
933	21	37 (+2)	37 (+2)

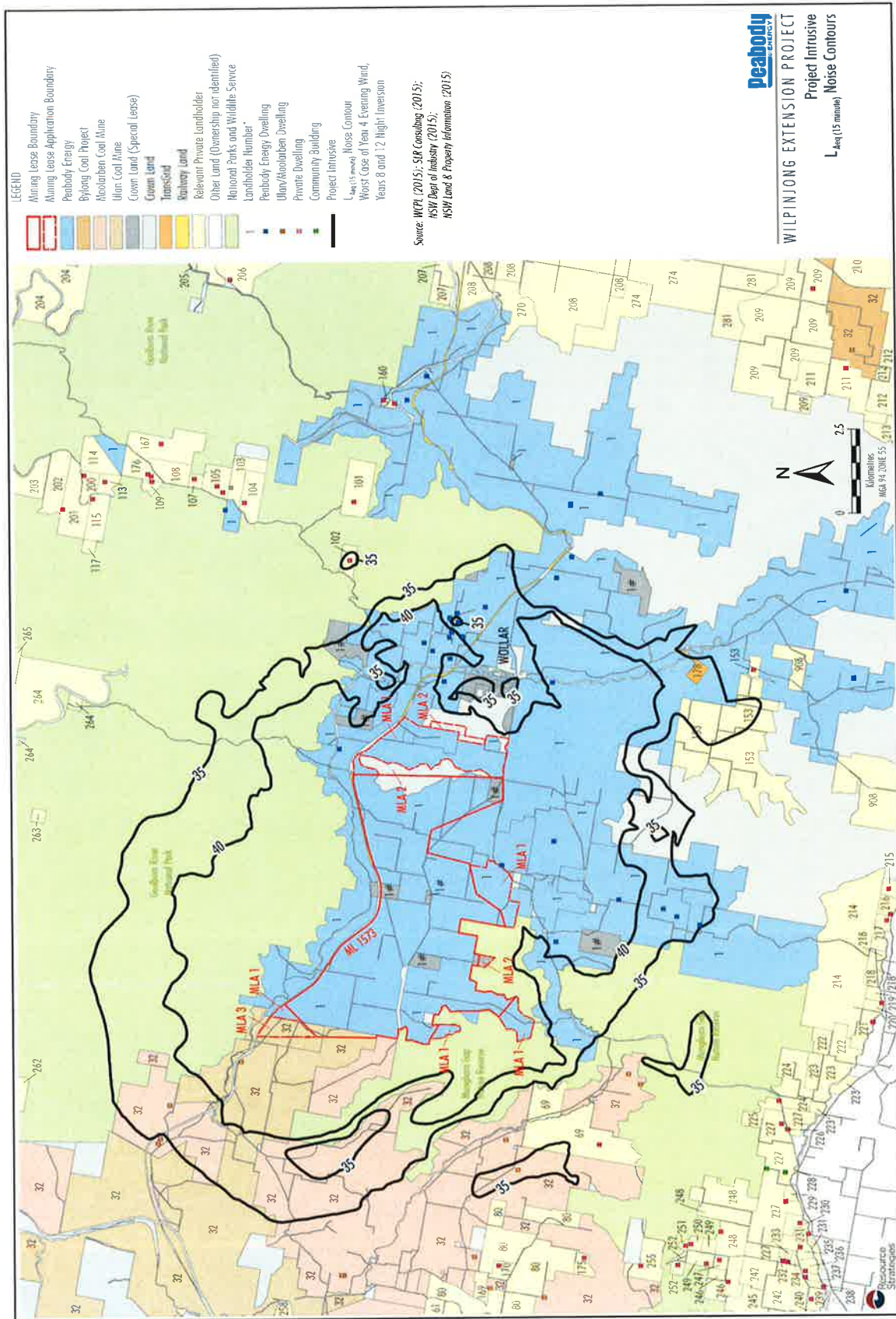


Figure 8: Worst Case Noise Levels – All Modelled Scenarios

During the day, noise generated by the project is predicted to comfortably comply with the PSNLs. However, during the evening and night, residences in Wollar are predicted to experience noise impacts up to 2 dB(A) above the PSNLs. Receiver 102, which is approximately 5 km northeast of the proposed extension, is predicted to experience impacts up to 3 dB(A) above the PSNLs during the evening and night.

The higher noise levels at receiver 102 compared to Wollar (which is closer to the mine) is primarily due to shielding offered by the ridge between the project and the village. The effect of this ridge on noise propagation can be seen from the noise contours on Figure 8.

Under the VLAMP, an exceedance of 2 dB(A) of the PSNLs is considered 'negligible' and represents an increase over the existing approved noise levels that would not be discernible to the average listener. An exceedance of 3 dB(A) of the PSNLs is considered to be a 'moderate' impact, and the VLAMP recommends additional noise treatments at the residence.

In addition to considering the magnitude of the potential exceedances, the Department has also considered other factors such as the frequency and duration of these impacts, and whether all reasonable and feasible mitigation measures have been proposed.

In regard to the frequency and duration of impacts, the Department notes that the predictions are based on worst-case scenarios assuming adverse meteorological conditions combined with the most intensive mining occurring in areas closest to receivers. For receiver 102, the exceedances are predicted to occur in only one modelled scenario (i.e. Year 2020).

As mentioned above, in regard to reasonable and feasible mitigation, WCPL argues that while additional mitigation would be feasible it is not warranted in this case because:

- for all but one privately-owned residence, the predicted exceedances would be no more than 2 dB(A) above the PSNLs, which is considered 'negligible' under the VLAMP;
- there is historical precedent to impose noise criteria above 35 dB(A) for the Wilpinjong mine, with the original approval for the mine including a number of privately-owned residences where the noise criteria were set between 36 and 40 dB(A); and
- the incremental cost of further mitigation would be significant (i.e. \$42 million), and would only result in a very marginal reduction in noise levels (i.e. 2 dB(A)).

On this basis, WCPL argues that the proposed noise strategy provides an appropriate balance between the competing factors of capital and operational noise management costs, and the environmental benefits to nearby residential receivers.

Wilkinson Murray also evaluated the proposed mitigation in its peer review, concluding that:

"The INP and the VLAMP recognise that a change in noise levels of 2 dB(A) is considered negligible, and in this context an expenditure of an additional \$42 million to attenuate a small number of residences by a negligible amount cannot be considered reasonable. As such, Wilkinson Murray considers that mitigation to achieve noise levels below 37dBA are not warranted in terms of being feasible and reasonable."

Overall, the Department considers that the predicted exceedances are not significant, and that the noise levels would remain well below those that the EPA has determined are 'acceptable' for a rural area in the INP. It also considers that the costs of further 'at source' mitigation outweighs the potential noise benefits gained.

That being said, the Department acknowledges the concerns of the community about existing and future noise impacts, and the issue raised in submissions recommending that the remaining residents in Wollar be acquired by WCPL.

The Department understands that as part of its proactive land purchase strategy, WCPL has had a long-standing commitment to acquire any property in Wollar Village. While the predicted impacts would not normally trigger acquisition under the VLAMP, the Department considers that it would be reasonable in this case to formalise this offer in the development consent.

Accordingly, the Department has recommended a condition granting voluntary acquisition rights to the remaining 3 residences and one parcel of vacant land within the village. WCPL has advised the Department it has no objection to such a condition.

The Department has also recommended that the remaining residences in Wollar and receiver 102 be provided with noise mitigation measures (such as double glazing, insulation and/or air conditioning) at the request of the landowner.

Finally, the Department notes that WCPL is continuing to actively negotiate agreements and/or acquisition of the remaining properties in Wollar and with the owner of property 102. Should this process be successful, it may be appropriate to reconsider whether the \$14 million mitigation strategy requiring shutdown and attenuation of equipment is still necessary.

Low Frequency Noise

WCPL's assessment includes a consideration of low frequency noise (LFN) against the INP methodology. The assessment concludes that noise from the existing mining operations does not contain a significant low frequency component and therefore no 'modifying factor' would need to be applied to account for LFN.

Notwithstanding the above, the Department and Wilkinson Murray recognise that there are known limitations with the INP methodology, and requested an updated assessment of LFN in accordance with the *Draft Industrial Noise Guideline*, which provides a more contemporary methodology for assessing impacts of LFN.

A more detailed discussion about the limitations of the INP methodology is provided in Wilkinson Murray's report in Appendix G.

The additional LFN assessment supports the original findings that the mine does not contain dominant low frequency noise content, and Wilkinson Murray has advised the Department that it concurs with this conclusion.

However, the EPA has advised that monitoring conducted in June 2016 indicated that LFN may be an issue for the mine. Analysis of the data collected by the EPA shows that while the difference between dB(C) and dB(A) was greater than 15 dB (which is an indicator of LFN), mine noise was around 30 to 31 dB(A).

Consequently, even if a modifying factor of 5 dB(A) is applied to the monitored data (as required by the INP), the mine would still be in compliance with the potential noise limit of 37 dB(A) in Wollar.

The EPA also advised that because LFN was not taken into account in the assessment, it would need to be monitored following any approval, and a modifying factor applied should LFN be found to be an issue. It has also flagged the implications of applying the modifying factor for compliance with any noise limits, and potentially for the application of mitigation and acquisition rights.

The Department notes this is the standard approach to addressing potential LFN associated with mining projects, and has incorporated detailed noise monitoring requirements in the recommended conditions, including a requirement to assess LFN in accordance with both the INP and the new draft Industrial Noise Guidelines methodologies, and apply penalties if necessary.

The EPA has confirmed it is satisfied with these conditions.

Other Land Uses

No exceedances of the applicable criteria are predicted for other land uses in the village, which include the school, two churches and the community hall.

However, the assessment predicts an exceedance of the applicable noise criteria for passive recreational areas (i.e. 50 dB(A)) at the edges of the Goulburn River National Park and Munghorn Gap Nature Reserve. A number of public submissions raised concerns about the potential noise impacts on these reserves.

In considering this issue, the Department notes that the predicted impacts on these reserves are comparable to those assessed and approved for the existing operations, and there is very limited public access to the parts of these reserves adjacent to the project.

Given that the exceedances of the applicable criteria would only occur on the edges closest to the mine, the Department considers that any noise impacts would be localised and unlikely to result in any material loss of amenity for visitors to these reserves.

Cumulative Noise

A cumulative noise assessment was completed which assessed the impact of the project, together with the Moolarben and Ulan mines, against the amenity criteria in the INP. The assessment focused on evening and night-time noise levels because project noise is predicted to be greatest in these periods.

Under the INP, the acceptable amenity criteria is $L_{Aeq(periode)}$ 45 dB(A) in the evening and 40 dB(A) during the night, and the recommended maximum is a further 5 dB(A) above these levels.

The assessment also considered the potential for the proposed Bylong Coal Project to contribute to cumulative noise levels. However, as this proposal is more than 15 km to the southeast of the Wilpinjong mine, it was determined that it would not result in any material cumulative impacts at privately-owned residences in the vicinity of the project.

The assessment found that the cumulative noise levels are predicted to comply with the amenity criteria at all privately-owned residences, with noise levels between 33 and 38 dB(A) $L_{Aeq(periode)}$ predicted in Wollar Village during the evening and night.

Given there are no privately-owned residences towards the Moolarben and Ulan mines, and the majority of the remaining privately-owned residences are to the east around the village of Wollar (i.e. further away from the other mines), the Department accepts that there are unlikely to be any significant cumulative noise impacts associated with the project.

The only exception is rail noise, which is discussed further below.

Sleep Disturbance

The EIS includes an assessment of the potential for sleep disturbance associated with mining operations during the night-time period. The assessment indicates that the project would not exceed the applicable sleep disturbance criteria of $L_{A1(1 min)}$ 45 dB(A) at any privately-owned residences. The Department has incorporated the standard sleep disturbance criteria in the recommended conditions.

Traffic Noise

The assessment considers the cumulative contribution of the project's increase in operational and construction traffic. All construction and operational traffic would continue to access the project site from Ulan Road and Ulan-Wollar Road (i.e. not through Wollar Village). The assessment focuses on Ulan Road as no privately-owned residences remain on Ulan-Wollar Road, but there are 14 privately-owned residences along Ulan Road.

The project would result in an increase in traffic volumes on Ulan Road of between 6 and 25%, which would increase total road noise levels by between 0.3 dB(A) and 0.8 dB(A) during the daytime period, and 0.2 dB(A) and 1 dB(A) in the night-time period.

A number of receivers on Ulan Road are currently subject to noise levels above the road noise criteria in the *NSW Road Noise Policy* (daytime 60 dB(A) and night-time 55 dB(A)). However, the assessment predicts that no additional residences would exceed the criteria as a result of the project.

The *NSW Road Noise Policy* recommends that any increase in total traffic noise as a result of additional traffic on existing roads generated by new projects should be limited to 2 dB. The minor increases in road noise generated by the project would be well below this limit.

Furthermore, under the Ulan Road Strategy there are requirements to mitigate road noise at any receivers affected by exceedances of the criteria. Mitigation may include noise barriers, reductions in speed limits, low noise road pavement and acoustic treatment of affected residences.

Furthermore, there is funding under the Ulan Road Strategy to provide road noise mitigation at receivers affected by exceedances of the criteria. These measures may include treatment of exposed residences.

Given the above, the Department is satisfied that the additional traffic generated by the project would be unlikely to result in any noticeable noise impacts on receivers near Ulan Road.

Rail Noise

Rail noise is a significant issue for local residents, and has been raised in submissions and in community meetings held by the Department. The issue is not confined to Wollar Village, but is also an issue for residents living further down the Gulgong to Sandy Hollow Railway towards Bylong.

Currently, there are approximately 40 train movements on the railway each day. These trains are almost exclusively generated by the 3 operating mines in the area (Moolarben, Ulan and Wilpinjong). Under the current approval, the Wilpinjong mine is allowed to dispatch an average of 6 trains a day from the site, and a maximum of 10 (i.e average of 12 movements, and maximum of 20 movements). This represents around 30% of average daily movements.

Importantly, the project is not proposing any increase in the number of trains or rail loading hours at the mine.

Nonetheless, the EIS includes a cumulative assessment of the rail noise associated with the transportation of coal on the Gulgong to Sandy Hollow Railway between Wilpinjong and Bylong, in accordance with the *NSW Rail Infrastructure Noise Guideline (RING)*.

The assessment takes a conservative approach as it incorporates trains from the Ulan, Moolarben, Wilpinjong and Cobbora mines, even though the NSW Government has announced that the Cobbora mine will not be proceeding.

The assessment does not include trains generated by the Bylong Coal Project, as this project has not been approved and would only add trains to the rail network to the east of Bylong. The rail noise impacts of the Bylong proposal will be considered separately by the Department in its assessment of that project.

There are approximately 10 privately-owned residences between Wilpinjong and Bylong. The assessment found that the project would not result in any increase in rail noise at these residences, and that the cumulative train noise would comply with the average, peak and maximum pass-by criteria in the RING at all residences, at all times.

In this regard, it is noted that the nearest privately-owned residence is more than 500 metres from the railway, and the assessment found that compliance with all of the applicable criteria would be achieved at around 105 metres.

Notwithstanding the above, the Department acknowledges that the project would extend the time that the rail line is used to transport coal from the site by around 7 years (i.e. until 2033). It would also extend the time that daily train movements generated by the mine would remain at the higher end of the approved limits. The Department also recognises concerns in the community about the difference between the site-based noise criteria in the INP and the higher limits in the RING.

However, like all major railways in NSW, the Gulgong to Sandy Hollow Railway is owned by the Australian Rail Track Corporation (ARTC), and rail noise is regulated separately by the EPA under ARTC's Environment Protection Licence (EPL). The licence includes noise criteria for train movements and sound power levels for locomotives. It also includes various operating, monitoring, and reporting requirements.

Overall, the Department considers that the rail noise impacts of the project would be similar to the existing situation, albeit for an extended period. The Department also notes that even if the project does not proceed, it is likely that any spare capacity on the railway would be utilised by other mines, and hence the overall rail noise impact is unlikely to be materially different to the current situation.

While the Department recognises the concerns of local residents about the noise impacts of trains, particularly at night, the assessment clearly shows that noise levels are well below the criteria established under applicable NSW Government policy.

To ensure rail noise impacts remain consistent with existing impacts, the Department has recommended conditions requiring WCPL to comply with its existing rail transport limits (i.e. an average of 6 trains, and a maximum of 10 trains, leaving the site each day). It has also recommended a condition requiring WCPL to only use locomotives and rolling stock that are approved to operate on the NSW rail network in accordance with the noise limits in ARTC's EPL.

Blasting and Vibration

The EIS includes a specialist assessment of blasting and vibration impacts completed by SLR in accordance with applicable guidelines and relevant standards, including *ANZEC Technical Basis for Guidelines to Minimise Annoyance due to Blasting and Overpressure and Ground Vibration 1990* and *Australian Standard (AS) 2187: Part 2-2006 Explosives – Storage and Use – Part 2: Use of Explosives*.

These documents relevantly provide practices and criteria to manage blast overpressure and ground vibration impacts on human comfort and structural damage to buildings. In addition to these impacts, SLR also considered blast impacts on livestock, public infrastructure (such as road, rail and electricity transmission lines) and on heritage items, including on Aboriginal rock shelters. Assessment of blast fume is discussed in the air quality section below.

The Department also engaged Wilkinson Murray to undertake a review of SLR's blast impact assessment. The review findings concurred with the general methodology and conclusions of the blast assessment.

The blast and vibration assessment has been informed by blast practices currently implemented at the Wilpinjong mine, which are documented in an approved Blast Management Plan. These practices have been effective in minimising blast impacts, with no exceedance of blast criteria at private residences based on available blast monitoring results since 2012 and no evidence of blast damage to public infrastructure or significant Aboriginal heritage sites.

In particular, WCPL currently implements a range of measures to avoid and mitigate impacts from blasting and vibration. These include:

- careful blast design and assessment of meteorological conditions prior to blasting;
- public notification of blasts;
- co-ordinating blasts with adjoining mining operations to minimise cumulative impacts;
- monitoring of blasts to assess compliance and ongoing review of blast practices;
- reducing blast maximum instantaneous charge (MIC) to ensure that blasting does not impact significant Aboriginal cultural heritage sites; and
- temporarily closing Ulan-Wollar Road and the Sandy Hollow to Gulgong Railway in circumstances where blasting is carried out within 500m, to manage safety risk associated with fly rock.

However, the Department notes that WCPL has received complaints following blasts, with 23 complaints received during 2014 and 13 complaints in 2015, indicating the concerns of the surrounding community and the importance of properly managing blasts at the mine.

The blast assessment indicates that the project would comfortably comply with the applicable amenity and structural damage criteria at all privately-owned receivers, community facilities and historic heritage sites in the vicinity of the project. The predictions are based on an MIC of 3,900 kg, with smaller MIC also modelled where blasting would be close to public infrastructure and significant Aboriginal heritage items, in particular shelters incorporating rock art.

In recognition of the significance of the rock art sites in particular, WCPL has set a performance measure of managing ground vibration to 80 mm/s, well below that recommended by SLR of 250 mm/s, which is based on research conducted in the United States on rock fall in unlined tunnels. This reduced blast criterion has been adopted from practical local experience from monitoring and managing blast impacts on significant Aboriginal rock shelters.

The Department notes that there are a number of rock shelter sites identified as having low significance that would not be directly impacted by mining operations, but potentially indirectly impacted by blast vibration. Submissions from Aboriginal stakeholders raised concerns over potential impacts on Aboriginal cultural heritage values within Munghorn Gap Nature Reserve, particularly with the proposal to undertake open cut operations to within 20m of the reserve boundary.

Based on the surveys completed, a number of the identified rock shelter sites are located within the reserve in closer proximity to areas to be blasted for open cut mining. The Department considers that the indirect impacts on Aboriginal sites within the reserve should be avoided or risk of impact minimised as far as reasonable and feasible. The Department notes that no moderate to high significant¹ rock shelter sites were identified within the reserve during Aboriginal heritage surveys undertaken for the extension project, or prior surveys for the existing mine. However, this does not preclude the potential for these sites to exist, based on limited survey coverage within the reserve.

The Department has therefore recommended conditions requiring WCPL to ensure that blasting activities do not impact any moderate to high significant rock shelter sites (if found), located within the Munghorn Gap Nature Reserve, cause no more than negligible impacts on rock shelters of low significance and to develop measures to meet these objectives as part of an updated Blast Management Plan.

This could largely be managed through selection of an appropriate MIC relative to the distance to rock shelters. Based on Table 39 of the Blast Impact Assessment, the SLR recommended target of 250mm/s for heritage sites would be achieved within 82m from the blast area for an overburden blast with an MIC of 3,900 kg and 49m for a lower MIC of 1,350 kg.

Blasting associated with the project also has the potential to impact on a potential maternity roost site of the threatened Eastern Bentwing-bat, located within an old mining adit adjacent to the Pit 8 open cut area. OEH raised concerns on proximity of blasting to the roost site and potential collapse of the adit and disturbance of the bats. For example, blasting during the day could potentially cause bats to exit the roost site.

To address OEH's concerns, WCPL has committed to design blasts to achieve a ground vibration limit of 80mm/s at the roost site. This would require careful management of blast design including appropriate selection of the MIC to ensure this ground vibration limit was achieved.

To further reduce any potential impacts, the Department has recommended conditions requiring WCPL to prepare an Eastern Bentwing-bat Management Plan as part of an updated Blast Management Plan for the project. This plan would require WCPL to establish ground vibration thresholds of no more than 80mm/s at the potential roost site, monitor disturbance to Eastern Bentwing-bats, and review and revise thresholds to minimise disturbance. Further consideration of the impacts and mitigation measures on the potential roost site is provided in Section 5.3.

The Department and OEH are satisfied that with the ongoing implementation of standard blast management practices identified in the approved Blast Management Plan along with the additional measures recommended for the roost site and Aboriginal heritage sites within Munghorn Gap Nature Reserve, that blasting can continue to be managed to avoid or minimise impacts and comply with the relevant blast criterion.

¹ These were rock shelters identified as having higher scientific significance due to evidence of occupation with rock art, ochre quarry or extensive artefacts

Air Quality

The EIS includes a specialist air quality impact assessment undertaken by Todoroski Air Sciences in accordance with applicable guidelines, including the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*.

The assessment was peer reviewed by Dr Nigel Holmes (on behalf of WCPL) who concluded that the report followed the relevant assessment procedures and was a realistic assessment of the air impacts of the project.

The assessment modelled the likely total suspended particulates (TSP), fine particulate matter (PM₁₀ and PM_{2.5}) and deposited dust impacts of the project under 5 representative mining scenarios (Years 2, 4, 8, 12 and 15), along with the cumulative impacts associated with other nearby mining operations including the Moolarben and Ulan mines.

While concerns were raised in some submissions that the air quality modelling was not undertaken satisfactorily, both the Department and the EPA are satisfied that the air quality predictions are a conservative representation of the potential dust impacts of the project.

The Department also engaged Ramboll Environ to undertake a comprehensive independent review of the air quality assessment for the project (see Appendix H).

Subject to implementing real-time monitoring of PM_{2.5} fine particulate matter and associated amendments to the current Air Quality Management Plan, Ramboll Environ has advised that the air quality impacts of the project can be managed to comply with all relevant criteria.

Reasonable and Feasible Mitigation Measures

WCPL proposes to continue to implement a range of dust minimisation and management measures identified in the EPA's *NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining* (Katestone Environmental Pty Ltd 2010).

These measures have been incorporated into the modelling and include:

- watering of haul roads, stockpiles and conveyor transfers;
- restricting blasting during adverse meteorological conditions;
- limiting speed of haulage vehicles;
- dust control systems on drill rigs;
- progressive rehabilitation of disturbed areas;
- measures to minimise wind erosion on stockpiles and exposed surfaces (e.g. profiling, contouring and re-vegetation); and
- suspending operations during adverse meteorological conditions.

WCPL also proposes to continue to implement 'proactive' mitigation measures including real-time dust monitoring and meteorological forecasting to guide day-to-day mining operations and avoid any potential for exceedances of applicable air quality criteria. In response to concerns raised by Ramboll Environ, WCPL has also committed to undertaking real-time monitoring of PM_{2.5} in Wollar Village.

As part of its review, Ramboll Environ considered the implementation of these management measures against best practice and the Katestone Review.

While it does not raise any specific concerns about the proposed measures, it recommended that the review completed by WCPL as part of an EPA pollution reduction program in 2012 be updated to demonstrate that the project would remain consistent with best practice.

Given that the project is a continuation of the existing mine, using the same mining methods and equipment, the Department considers that the existing measures would generally be suitable for the ongoing management of dust emissions from the mine. Nevertheless, the Department has recommended a condition requiring WCPL to update its review, consistent with the recommendations

from Ramboll Environ, to ensure that emission sources would continue to be controlled in the most efficient manner as the mine progresses.

Dust Impacts

With the above measures in place, the assessment indicates that dust levels are predicted to increase in areas east of the mine, as would be expected with mining in Pit 8.

Although dust levels would increase in Wollar as a result of the project, the results show that the natural topography between the project and the village would substantially mitigate any significant impacts from occurring on the remaining 3 privately-owned receivers.

In this regard, the air quality assessment indicates that the project-alone or incremental dust generation would not result in any exceedances of the EPA criteria for PM₁₀, TSP and dust deposition at privately-owned residences in the vicinity of the project.

The predicted worse-case project only dust contours are shown in Figures 9 and 10.

The cumulative impact assessment showed that when the dust generated by the project is added to background levels, dust concentrations would also comply with applicable EPA criteria for PM₁₀, TSP and dust deposition, apart from some minor exceedances of the 24-hour PM₁₀ criteria (i.e. 50 µg/m³).

To provide an indication of the nature and extent of these exceedances, a Level 2 contemporaneous assessment for 24-hour PM₁₀ was undertaken in accordance with EPA's approved methods.

This assessment found that there would be up to 2 additional days (when compared to background only) above the criteria at residences in Wollar Village (903, 908 and 933) and up to 1 additional day at receiver 102 over the life of the project (i.e. over the five modelled years between 2018 and 2031).

In considering the acceptability of these impacts, the Department notes that:

- the contemporaneous assessment is conservative as it combines the highest predicted 24-hour PM₁₀ concentrations generated by the project with the highest observed background concentrations for a given day;
- the monitoring data shows that background levels already exceed the 24-hour PM₁₀ criteria on a few days each year due to natural causes such as dust storms and bush fires;
- as the project is predicted to generate a maximum of 2 additional exceedances of 24-hour PM₁₀ criteria at nearby residences, these impacts would not exceed the air quality mitigation or acquisition criteria in the VLAMP; and
- additional analysis presented in the EIS shows that these impacts can be effectively avoided by temporarily pausing activities in Pit 8 during adverse meteorological conditions.

In this regard, the Department also notes that 'proactive' management systems are increasingly being used for mining projects in NSW, with results indicating that predicted impacts are able to be significantly reduced or eliminated. With this system in place, the Department considers that WCPL should be able to avoid significantly contributing to the potential cumulative short term dust impacts identified above.

Under the VLAMP, vacant land is considered to be affected if greater than 25% of the property is predicted to exceed the applicable EPA assessment criteria. In this case, the assessment found that there would be no impacts on privately-owned vacant land that would exceed these thresholds.

The modelling predictions also found that the project would comply with the 'standards' for PM_{2.5} of 8µg/m³ (annual average) and 25 µg/m³ (24-hour) at all privately-owned receivers.

Ramboll Environ and a number of submitters raised some concerns about the PM_{2.5} predictions, particularly in relation to the background level adopted in the assessment.

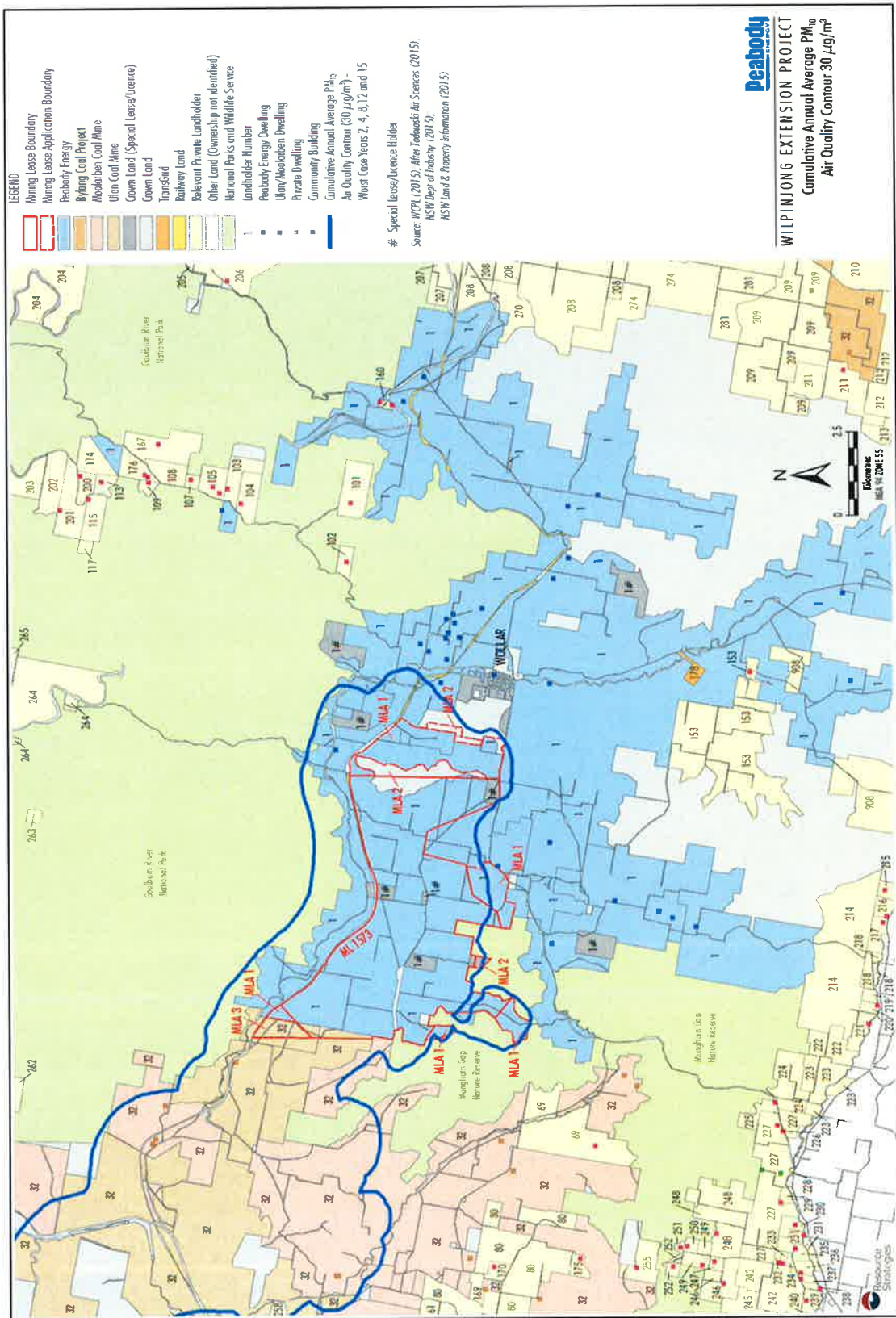


Figure 9: Predicted Worst Case Air Quality Contour – Annual Average PM_{10}

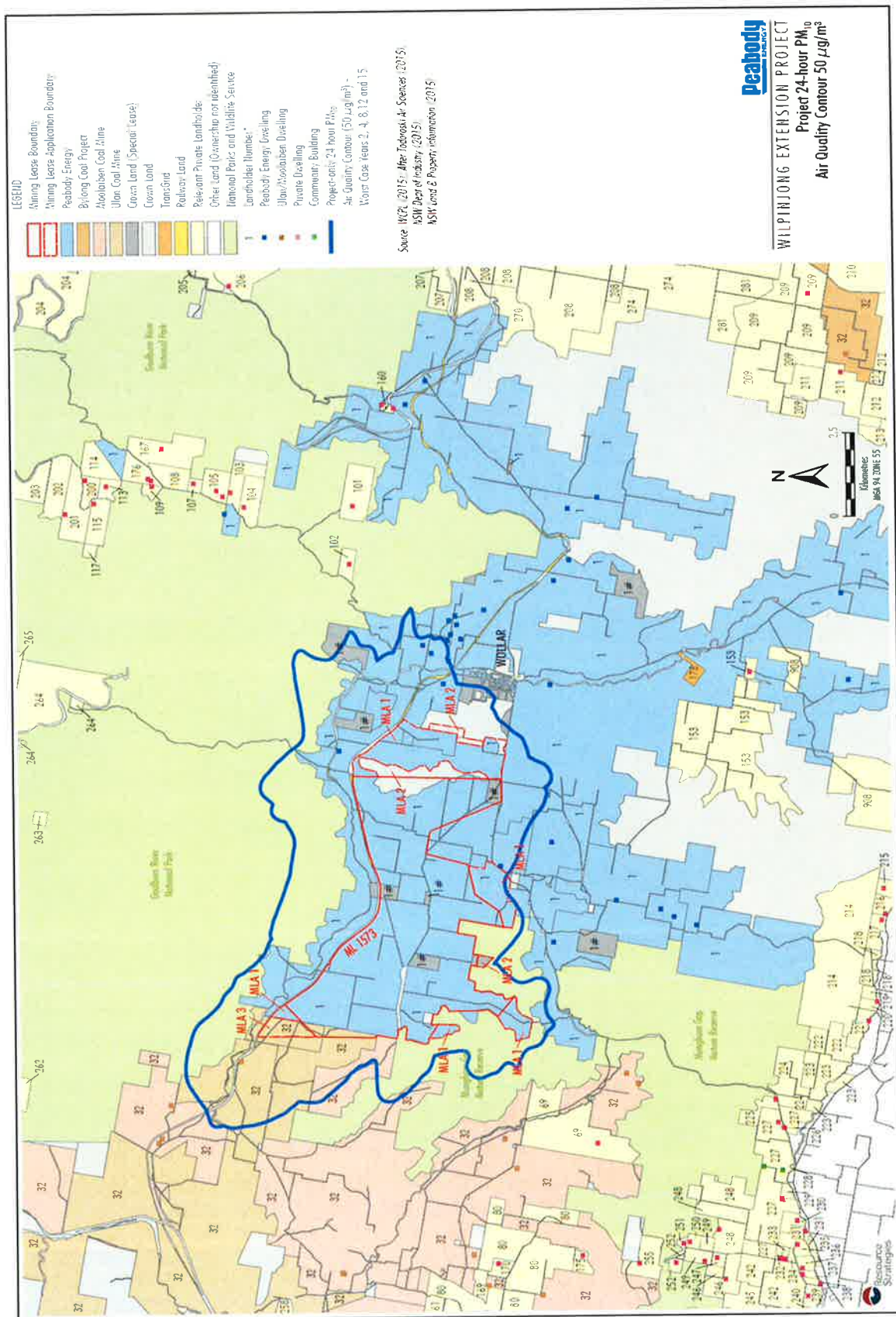


Figure 10: Predicted Worst Case Air Quality Contour – Project 24-Hour PM₁₀

In response to these concerns, WCPL analysed project emissions against a range of background levels derived from other areas of NSW (including from the Hunter Coalfield and levels used for the Bylong Coal Project). This analysis found that the project would have a very low contribution to ambient PM_{2.5} levels (an incremental annual average of up to 0.6 µg/m³) and that the background level would not change the conclusions and findings of the assessment.

Consequently, the Department is satisfied that the potential for any significant PM_{2.5} impacts is low and considers that any risk could be further minimised through WCPL's commitment to monitor PM_{2.5} levels and adjust operations according to trigger levels.

In line with this commitment and Ramboll Environ's recommendations, the Department has recommended that WCPL be required to monitor PM_{2.5} levels and include an appropriate trigger action response plan in an updated Air Quality Management Plan.

Finally, NSW Health requested WCPL notify the agency and the residents of Wollar in the event of an air quality exceedance. The Department has incorporated this into the recommended conditions.

Mine-owned land

In addition to privately-owned residences, 10 mine-owned residences surrounding the mine are predicted to be affected by dust above the applicable EPA air quality criteria during the project, albeit that 3 of these residences were already predicted to exceed applicable criteria under the current approval.

Consistent with contemporary conditions, the current approval requires WCPL to advise landowners and/or future tenants of the possible health and amenity impacts of the existing Wilpinjong mine.

Tenants of affected mine-owned properties can also request the installation of air quality mitigation measures (commensurate with the impact of the mine) and can reasonably terminate their tenancy agreement due to the impacts of the mine.

The Department has incorporated these requirements in the recommended conditions for the project.

Other Air Emissions

The assessment considered air quality impacts associated with blast fumes, diesel use, and potential spontaneous combustion.

There are a range of standard protocols in the mining industry to manage the potential of blast fume emissions, including consideration of geology, moisture levels, meteorological conditions, and the length of time that charges remain in the ground.

Blasting associated with the existing operations are managed in accordance with the *Code of Practice: Prevention and Management of Blast Generated NO_x Gases in Surface Blasting* (2011) and a detailed Blast Fume Management Strategy within the Blast Management Plan. This strategy incorporates a range of measures to ensure that management measures are implemented to avoid and/or minimise potential for fugitive fume emissions, including limiting blast activities under unfavourable meteorological conditions.

The Department is not aware of any blast fume incidents at the Wilpinjong mine, and with the continued implementation of the existing protocols across the site, the Department considers the risk of blast fumes can be appropriately managed. To this end, the Department has recommended that WCPL be required to update and revise its existing Blast Management Plan to cover the new areas associated with the project.

Particulate emissions associated with the use of diesel were considered as part of the dispersion modelling in the EIS. However, an additional explicit estimation of diesel emissions was undertaken to address a request from the EPA. The assessment found that estimating the diesel emissions in the manner requested by the EPA did not result in any material change in total particulate matter emissions, nor any change to predicted impacts at privately-owned residences as presented in the EIS.

Notwithstanding, WCPL proposes to continue to implement a range of control measures to minimise emissions from diesel engines, including:

- optimising the design of haul roads to minimise the distance travelled between the pit and the CHPP;
- minimising the rehandling of material (i.e. coal, overburden and topsoil); and
- maintaining mobile equipment in good operating order.

The EPA advised that it is satisfied with the assessment and management of diesel emissions for the project. However, the Department notes that the EPA is investigating options for further minimising diesel emissions from mining operations across NSW. If there are any additional regulatory measures in this regard they would be imposed by the EPA through the EPL, in a similar manner to the 'dust stop' program that has been implemented over recent years.

Spontaneous combustion (sponcom) occurs when a substance (such as silage, hay, compost or some types of coal) ignites as a result of the rapid oxidation of its own constituents, without heat or ignition from any external source. Sponcom is commonly associated with smoke and gaseous hydrocarbons, potentially causing offensive odours downwind.

Sponcom events have occurred at the Wilpinjong mine in some coal stockpiles and waste emplacement areas (due to the presence of carbonaceous material). These events have primarily been associated with a temporary waste rock emplacement area (known as the 'Keylah' emplacement) that was established before the higher spontaneous combustion propensity of some materials was identified at the mine.

Odours are sometimes perceptible on Ulan-Wollar Road as a result of these events and residents of Wollar have also complained about offensive odours. Submitters have raised concerns about existing sponcom at the mine and the potential for the project to increase odour and emissions.

The Department notes that WCPL is currently removing the Keylah emplacement area to address the historical issues associated with sponcom, and expects that this would be complete by the end of May 2017.

Nevertheless, there would continue to be some potential for sponcom at the mine in the new areas associated with the project. This is because the material to be extracted is expected to have similar sponcom propensity to that currently being handled and managed at the mine.

In considering the potential sponcom impacts, it is important to note that monitoring results have indicated that WCPL has complied with the relevant air quality criteria for all pollutants at Wollar Village, including those associated with odour. WCPL has also advised that no significant sponcom events have occurred since 2014, and during that time there has only been one event that did not relate to the Keylah emplacement area.

WCPL proposes to continue to implement a range of measures to prevent sponcom events, including:

- undertaking spontaneous combustion propensity testing;
- placing higher risk materials as low as practicable in backfilled mine voids and waste rock emplacements;
- sealing exposed seams of non-active mining faces with inert material; and
- capping carbonaceous material.

WCPL would also continue to monitor sponcom related pollutants in Wollar.

With the continued implementation of the existing measures across the site, the Department considers the risk of spontaneous combustion can be appropriately managed. To this end, the Department has recommended that WCPL be required to update and implement its existing Spontaneous Combustion Management Plan to cover the new areas associated with the project.

Overall, the Department and the EPA are satisfied with the assessment of these issues, and that any impacts can be effectively managed through the implementation of standard mitigation measures. Nonetheless, the Department has recommended conditions requiring WCPL to update applicable management plans, and implement all reasonable and feasible measures to minimise off-site odour, blast fumes, and spontaneous combustion.

Greenhouse Gas Emissions

The Greenhouse Gas Assessment identified that direct or indirect (i.e. Scope 1 and 2) greenhouse gas emissions (GHG) from the project and the existing mine would contribute some 130,000 tonnes of CO₂ equivalent a year, or around 0.02% of Australia's annual average emissions under the Kyoto Protocol.

The assessment also indicates that the total indirect emissions (i.e. Scope 3) from the project and the existing mine would be around 20.4 Mt of CO₂ equivalent a year, however much of this would not be accounted for in Australia's emissions as the majority of product coal extracted as part of the project is likely to be exported and used overseas.

In considering the potential GHG emissions of the project, the Department notes that the project would be a relatively low producer of GHG emissions compared to other large mining developments in NSW. The Department also notes that the recovery of an additional 95 million tonnes of coal through the proposed extension would be far less greenhouse gas intensive than extracting an equivalent volume of coal from a new coal mine.

While the Department notes that it is in WCPL's financial interest to minimise GHG emissions, it has recommended a condition requiring WCPL to implement all reasonable and feasible measures to minimise GHG emissions from the site, and describe these measures in the Air Quality Management Plan for the project.

Conclusion

The Department is satisfied that WCPL has incorporated all reasonable and feasible mitigation measures into the design of the project to minimise air, noise and blasting impacts on neighbouring residents and the village of Wollar.

In particular, the project is predicted to comply with the relevant air quality criteria at all privately-owned residences remaining in the village and the broader locality.

Although there would be some residual noise impacts on the 3 remaining privately-owned residences located in the village and one receiver located northeast of the project, these impacts would not be significant.

Notwithstanding, the Department considers that it is appropriate to grant voluntary acquisition rights to the remaining residences in the village to reflect WCPL's long-standing commitment in this regard. It also considers that it is appropriate for WCPL to be required to implement additional noise mitigation measures (upon request) at the moderately affected residence at the request of the landowner, in accordance with the VLAMP.

In addition or complementary to the commitments by WCPL, the Department has also recommended a range of conditions to ensure that the mine operates in accordance with best practice to manage air quality, noise and blasting, including requirements for WCPL to:

- comply with standard air and blasting criteria;
- comply with 37 dB(A) noise criteria in Wollar Village, subject to the mitigation and acquisition provisions mentioned above;
- develop comprehensive management plans, including real-time noise and dust monitoring and proactive management systems to identify and avoid potential exceedances as they occur;
- consult with relevant agencies and stakeholders in the preparation of the management plans;
- notify affected landowners and tenants about any exceedances of air quality criteria and the potential health-related dust impacts associated with mine dust;
- allow tenants of affected mine-owned residences to terminate tenancy agreements without penalty;
- limit blast frequency and hours and co-ordinate blasting operations with neighbouring mines;

- keep residences notified and up-to-date regarding blasting operations, and facilitate feedback and complaint management;
- provide for baseline property assessments within 3 km of any blasting activity and any structural property inspections and investigations on request;
- repair any structural damage to buildings or infrastructure caused by the project;
- manage blasting operations to avoid fly-rock and blast fume related safety risks;
- independently investigate complaints and undertake applicable corrective and other management measures;
- communicate regularly with the community, including publicly reporting all monitoring results, and effectively responding to enquiries and complaints.

With these measures in place, the Department considers that the residual amenity and/or health impacts of the project can be effectively minimised to acceptable levels.

5.2 Social

Introduction

The EIS includes a Social Impact Assessment (SIA) prepared by Elliot Whiteing. The SIA considers the potential impacts at a local and regional level and is informed by consultation with various stakeholders including the broader Wollar community, Council, social infrastructure and service providers and WCPL employees.

A number of people and the WPA were critical of the SIA, suggesting that the methodology, analysis and assessment are inadequate. In particular, a number of people raised concerns about the community consultation process used in the SIA, including concerns about the independence of the process and absence of information required to inform views about potential impacts of the project.

These issues were considered by Elton Consulting which was commissioned by the Department to provide independent advice on the adequacy of the SIA, undertake further consultation with the local community, and suggest ways to address any residual issues.

Elton Consulting concluded that the SIA 'appears to be of a high standard and aligns with leading practice' and includes a 'wide-ranging' stakeholder engagement process and good understanding of baseline conditions (see Appendix I).

The Department believes that with a combination of the SIA, Elton Consulting's peer review and input from the community (provided in submissions and at public meetings), it has sufficient information to assess the potential social impacts of the project.

As with most mining developments, the project has the potential to result in both positive and negative social impacts. These impacts would be experienced differently by different communities, groups and individuals.

Positive impacts of the project, including those associated with employment, would largely benefit communities residing in the broader region, including Mudgee and Guldong.

On the other hand, negative impacts would primarily affect the Wollar community including residents in the village and its surrounds, their families and others who feel connected to the village. The Wollar community currently includes approximately 3 households in the village, 8 households in the Mogo Road Area to the northeast of the village, and 8 households in the Barrigan Road area to the south of the village (on private property).

Historically, the Wollar community has focused on the Wollar Village as a hub for community services, social interaction, and cultural and sporting activities, although there has always been reliance on both Mudgee and Guldong for the provision of a full range of services.

Since mining operations commenced at Wilpinjong in 2006, the Wollar community has consistently raised concerns about the negative social impacts of the mine including:

- declining population and adverse changes in the composition of the community;
- reduction in the availability of community services;
- loss of social cohesion and opportunities for social interaction in the area; and
- impacts on the health and amenity of residents as a result of noise and dust emissions from the mine and nearby railway.

While the Department acknowledges the concerns of the community about social impacts, and has considered these issues in its assessment, it considers that it is important to place these issues in the context of the current proposal.

In this regard, while the project would bring the mine closer to the village and has the potential to exacerbate negative social impacts, the Department considers that the most significant social impacts have already occurred as a result of the approval of the original mine in 2006, and there is limited scope to effectively reverse these impacts. The Department also notes that even if the project is not allowed to proceed, the decline in population and associated social impacts is likely to continue.

Over the years, WCPL has implemented (and would continue to implement) a number of measures and initiatives to mitigate negative social impacts and provide support to the community, including:

- support for local schools including financial and in-kind support;
- equipment purchases for the Rural Fire Service;
- contribution towards operating costs of the Wollar Community Hall; and
- support for community and cultural events.

WCPL has also entered into a Voluntary Planning Agreement with Council for around \$300,000 a year (depending on the number of employees). The VPA includes funding for social infrastructure and services in the Mid-Western local government area, and ground keeping and in-kind support for maintenance and cleaning of ablution facilities in Wollar Village.

Positive Social Impacts

The project is predicted to have considerable social benefits for the broader community including benefits associated with the ongoing employment of up to 550 people and employment of up to an additional 65 people.

The SIA predicts that the majority of these positions would be filled by people residing in the Mid-Western Regional local government area or adjacent LGA's.

This employment is also predicted to support up to 2,900 additional jobs in the region and more broadly across NSW, with a particular positive benefit for local businesses in Mudgee.

Many participants in the SIA support the project on the basis of job security and identified ongoing employment as an important contributor to family wellbeing.

The majority of submissions received in support of the project, identified ongoing direct and indirect employment as reasons for supporting the project.

While the Department acknowledges that the precise quantum of flow-on benefits of mining projects to the regional economy are often disputed, it is clear that the employment of around 600 people for another 7 years along with other spending in the region, would make an appreciable contribution to the regional economy.

Negative Social Impacts

The Wollar community has reported a strong attachment to Wollar and its social, heritage and environmental values. Through submissions and consultation undertaken for the SIA, residents of the Wollar community have reported negative impacts as a result of the operation of the existing mine and have raised concerns that the project would increase these impacts.

The Department notes that WCPL has bought most of the land in and around Wollar Village in recent years, resulting in reductions in the numbers of residents, and has a standing offer to buy any of the remaining properties in the village.

The SIA estimates that the local population has decreased from approximately 304 residents in 2006 to approximately 70 residents in 2015. WCPL currently rents the habitable residences it owns to general members of the community and employees. Of the 70 residents remaining in the Wollar locality, approximately 20 are mine employees.

Since submitting the development application for the project, WCPL has acquired several additional residences in the Wollar Village and at the time of writing only 3 privately-owned residences (comprising 5 people) remain in the village.

However, the Department notes that population decline was also observed prior to the commencement of mining. For example, enrolments at the Wollar Public School fell from 32 in 1990 to 14 students in 1996.

It is also important to note that small town decline has been an ongoing trend across regional NSW. Small rural villages such as Windeyer, located approximately 20 km south of Mudgee, have been losing population to major regional centres irrespective of coal mining and competing land uses.

Notwithstanding, the Department acknowledges that the project has the potential to result in further reduction in population and associated social impacts, particularly if the remaining landowners in Wollar elect to sell to WCPL.

Although WCPL encourages the occupancy of residences it acquires, many houses in the area have fallen into disrepair and are not suitable for occupation. Concerns have also been expressed about the ability of mine workers to integrate with residents not associated with the mine, and the associated social division this creates.

At present, 30% of the Wollar community is comprised of mine employees. The percentage of mine workers may rise if further property acquisitions result in non-mine employees moving away or if additional employees relocate to the village.

However, given that the number of employees at the mine would not increase significantly if the project is approved, the Department considers that it is unlikely that the total number of mine workers residing in the immediate vicinity of the mine would substantially increase.

Given the above, the Department considers that the population of Wollar and surrounds is likely to continue to decline even if the project is not approved, and that this decline would further reduce the availability of community services and accelerate the isolation of remaining residents in the village and the broader Wollar community.

In this regard, the Department notes that the decline in population has previously led to a reduction in available community services.

For example, the local Rural Fire Service (RFS) has already lost capacity and amalgamated with the neighbouring Cooks Gap RFS. The Wollar Store is currently commercially unviable, is subsidised by WCPL and no longer provides some services previously provided, such as a mechanic service. Wollar Public School enrolments dropped to 8 students in 2015 and 2016, and the operation of the school is under review by the Department of Education and Communities. Recreational and other community events have decreased and visiting services, including a visiting health service, have become harder to justify.

The majority of the Wollar community lives in more isolated areas, at least 7 km from the village. Should the project result in further population decreases, it is likely that these residents would be further isolated from social networks and some services.

The Department notes that these concerns have been raised in submissions, and there have been calls for WCPL to be required to acquire these properties due to the broader social impacts of the project and the loss of access to necessary community services.

However, the Department notes that the project would comply with the acceptable air quality and noise amenity criteria established by the EPA for rural areas. It is also not clear that the project (in and of itself) would materially reduce access to services as these impacts have either occurred as a result of previous mining activities and/or as a result of a broader decline in the viability of rural villages such as Wollar.

As mentioned above, WCPL proposes to continue a number of initiatives to support the local community. However, Elton Consulting has raised concerns about the adequacy of these measures to effectively address the negative social impacts of the project on the Wollar community, and has made a number of recommendations to strengthen these measures. These include:

- ongoing support for the Wollar store or convenience shopping and postal needs;
- funding or works in-kind to restore or maintain buildings, properties and lands;
- funding or in-kind support for a specific number of RFS volunteers; and
- offering acquisition to the remaining residents in Wollar Village, should they wish to relocate.

WCPL prepared a detailed response to these recommendations (see Appendix I). The key points raised in this response are summarised below:

- *Wollar Store* - WCPL does not support ongoing funding of the store given that it is not economically viable;
- *Maintenance of buildings, properties and lands* – WCPL considers that the proposed VPA, including in-kind commitments for grounds keeping and provision of ablution facilities, is adequate for the project; and
- *Rural Fire Service* – WCPL considers that existing support, including financial contributions and encouragement of volunteers, is appropriate and that no further commitment is required.

WCPL also provided a response to Elton Consulting's recommendation that it consider acquiring the remaining residents in the village. WCPL indicated that it is negotiating with landholders to purchase the remaining residential properties in the village. On this basis, WCPL has no objection to the Department offering acquisition rights to the remaining residents in the village (receivers 903, 908, and 933), even though it would not normally be required to do so under the VLAMP (see Section 5.1 above).

The Department is satisfied with the measures proposed by WCPL to support the RFS and maintain grounds in the Wollar Village. The Department has also recommended a condition requiring WCPL to fulfil its commitment of offering the remaining residents in the village with acquisition rights. This would provide the few remaining residents of the village with the opportunity to leave, and be compensated for the associated disturbance, should they wish to relocate.

The Department has considered Elton's recommendation that WCPL provide ongoing support of the Wollar Store and WCPL's response. Although the Department acknowledges the social value of the store, it considers that any requirement for its ongoing operation would not fairly or reasonably relate to the project or a planning purpose. Consequently, the Department considers that in the absence of a commitment from WCPL, it is not in a position to impose a condition requiring WCPL to subsidise or operate the store as part of the project.

Notwithstanding, the Department considers that it would be appropriate for WCPL to give further consideration to this matter, including investigating options for providing alternative services provided by the store such as an alternate postal service.

Finally, given that WCPL now owns the majority of properties in Wollar Village, the Department considers that WCPL should give further consideration to maintaining residences and other buildings on land that it owns to avoid these structures falling into disrepair over time.

Conclusion

The Department notes that there have already been negative social impacts on the Wollar community including impacts on social infrastructure, social networks, community cohesion and residents' sense of place. These impacts are largely attributed to population decline in the village that has been accelerated by WCPL's proactive purchasing strategy.

Given that the viability of Wollar's local services is already marginal, and population is already in decline, the Department considers that the village is likely to experience further decline irrespective of whether the project proceeds. In other words, even if the project was not approved, the village would be unlikely to recover from existing population decrease and the resulting impacts on community services and social networks.

However, the Department notes that the assessment shows that the project would be able to comply with the recommended noise, air quality and blasting criteria established by the EPA for a rural area. Hence, a reasonable level of amenity would be maintained in the village for local residents for those who wish to remain.

For those who wish to relocate, the Department has recommended that the owners of all the remaining privately-owned properties be afforded acquisition rights under the conditions of consent. This would ensure that those people remaining in the village who do not consider the residual impacts of the project to be acceptable would have the opportunity to leave should they wish to do so.

Finally, the Department considers that it is important to recognise the significant positive social impacts that would be realised if the project proceeds, including those associated with direct employment of over 600 people, ongoing contributions to infrastructure and services through the VPA with Council, sealing of the last remaining unsealed section of the Ulan-Wollar Road, and the broader benefits associated with indirect employment in the region.

5.3 Biodiversity

Introduction

The project would affect a number of threatened ecological communities, threatened flora and fauna species and habitat for these species. These impacts would be a result of:

- direct impacts from clearing of native vegetation due to open cut mining operations including surface infrastructure; and
- indirect impacts from mining operations on adjacent native vegetation, particularly within the Munghorn Gap Nature Reserve.

Hunter Eco prepared a Biodiversity Assessment Report (BAR) and Biodiversity Offset Strategy (BOS) to assess the impacts of the project, identify avoidance and mitigation measures to reduce or minimise these impacts and identify biodiversity offsets for residual impacts.

Impacts on aquatic ecology were also assessed by Bioanalysis, concluding that there would be negligible impact, as surface water flows or quality would not materially change as a result of the mine extension.

As outlined in Section 3 above, the project was determined to be a controlled action under the EPBC Act due to the potentially significant impacts on MNES under Sections 18 and 18A of the EPBC Act for listed threatened species and communities. In addition, the biodiversity assessment was assessed under the *NSW Biodiversity Offsets Policy for Major Projects 2014* (NSW Offsets Policy) using the *Framework for Biodiversity Assessment* (FBA), which are accredited under the Assessment Bilateral Agreement between NSW and the Commonwealth.

The Department notes that the NSW Offsets Policy is in a transitional period prior to formal legislative reform. The intention of the transitional period is to provide some flexibility in application of the FBA rules to deal with technical issues, practical implementation and unintended outcomes that may arise. The NSW Government is currently progressing the Biodiversity Conservation reform package including the proposed Biodiversity Conservation Act and revisions to the Biodiversity Assessment Method.

Biodiversity Impacts

Vegetation Communities

Out of a total disturbance area of 1,022 ha, the project would involve the direct disturbance of approximately 354 ha of native woodland vegetation which is largely fragmented across the project area. The remaining 668 ha is mainly cleared grazing land along the valley floors.

Table 7 provides details of the vegetation proposed to be cleared, with around 19 ha conforming to the definition of one or more listed ecological communities under the *Threatened Species Conservation Act 1995* (TSC Act). This table also shows the impact ecosystem credits, determined through applying the FBA.

The Department notes that the ecosystem credits were revised subsequent to the EIS, following consultation and input from OEH. In particular, the EIS applied the linear-based assessment method² to determine impact credits rather than the site-based tool. While the differences were not large, to ensure a robust assessment, the Department requested WCPL to revise its credit calculations. Both OEH and the Department are satisfied with the final impact credit calculations provided in Table 7.

The vegetation communities within the project disturbance area are shown in Figure 11 with Endangered Ecological Communities (EECs) within and surrounding the project area shown in Figure 12.

Table 7: Native Vegetation Communities and Ecosystem Credit Requirements – Disturbance Area

Native Vegetation Communities	Disturbance Area (ha)	Disturbance Area (ecosystem credits)
Listed Ecological Communities		
Slaty Box Forest ¹	9.5	519
Box Gum Woodland ²		
- Blakely's Red Gum Woodland	6	258
- Yellow Box Woodland (Grassy)	3.5	119
Total Listed Ecological Communities	19	896
Other Forest and Woodland		
Fuzzy Box Woodland	1.5	37
Rough-barked Apple Woodland	126	5,995
Blakely's Red Gum Woodland (Shrubby)	4	197
Grey Gum – Narrow-leaved Stringybark Forest	42.5	2,250
Red Ironbark Forest	39.5	2,161
Whitebox Woodland (Shrubby)	98	4,590
Western Grey Box Woodland	3	76
Narrow-leave Ironbark Forest	20.5	722
Total Other Forest and Woodland	335	16,028
Total Native Vegetation	354	16,924

Notes:

1. Listed as a Vulnerable Ecological Community (VEC) under the NSW Threatened Species Conservation Act 1995 (TSC Act) as "Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion"
2. Listed as an Endangered Ecological Community (EEC) under the TSC Act as 'White Box – Yellow Box – Blakely's Red Gum (Box Gum) Woodland' and listed as Critically Endangered Ecological Community (CEEC) under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) as 'White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland', together termed in this report as 'Box Gum Woodland'.

Classification of Derived Native Grassland (DNG)

DoEE raised concerns that the classification of grasslands as pasture improved grasslands in the vegetation mapping may not have followed the Commonwealth listing and policy advice for identifying Box Gum Woodland DNG. This centres on the definition of a 'patch', which under EPBC policy and guidance includes areas of a combination of continuous woodland and derived native grassland with a predominantly (>50%) native cover.

² This method is appropriate for development such as road, rail, pipeline and transmission line corridors.

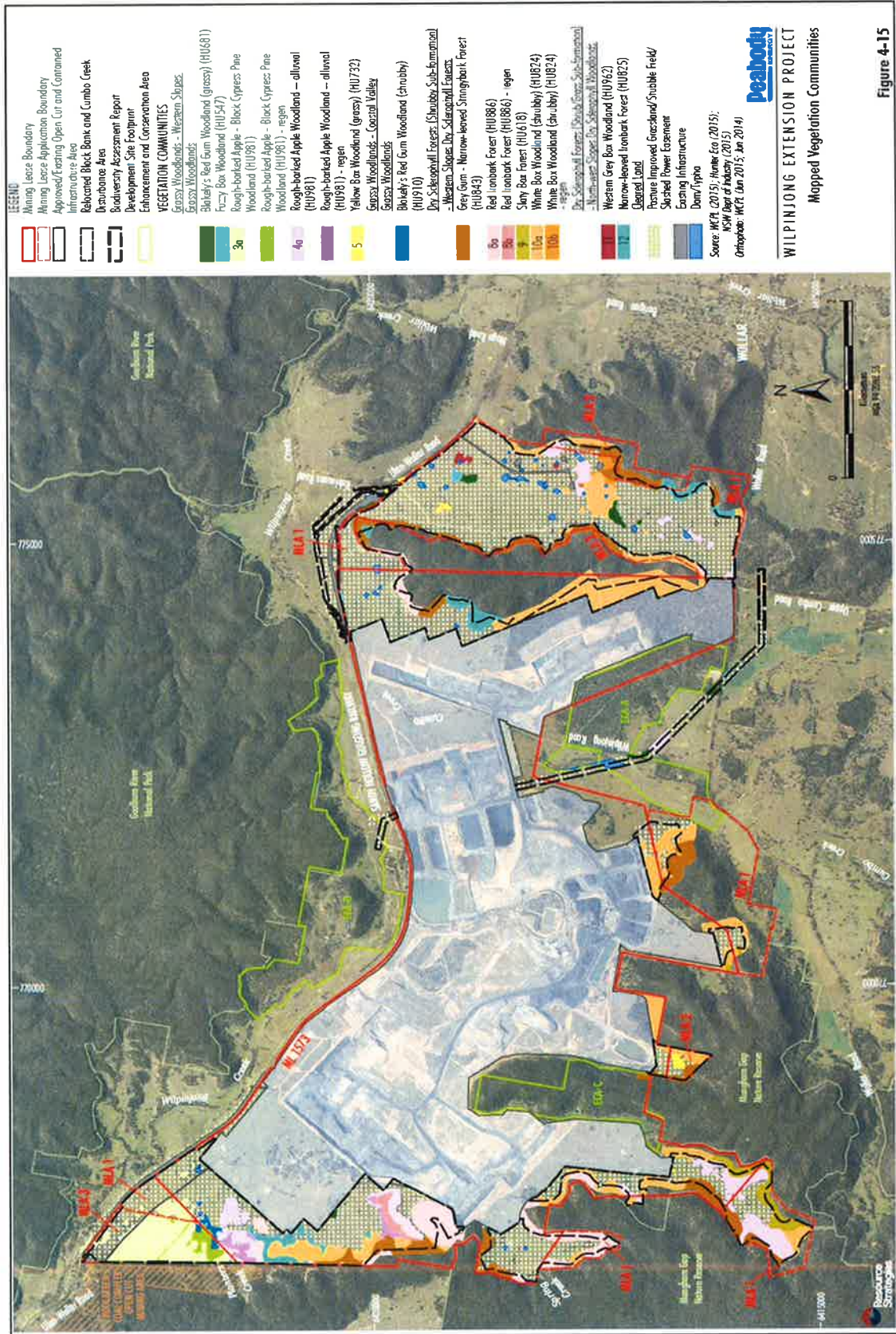


Figure 11: Vegetation Communities – Wilpinjong Extension Project

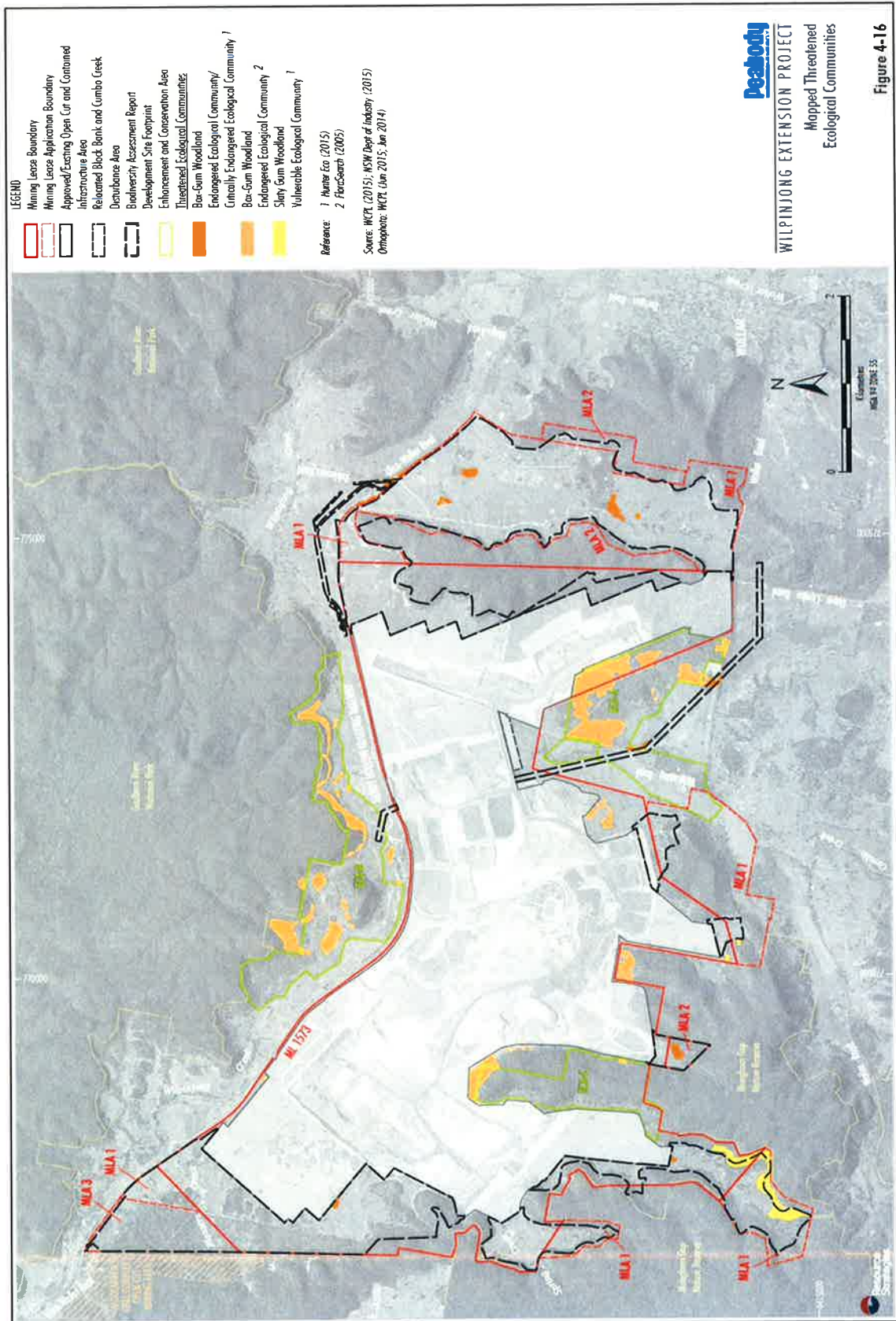


Figure 12: Endangered Ecological Communities – Wilpinjong Extension Project

Hunter Eco provided additional information on the plot data for grasslands to justify its position on classifying the grassland. However, DoEE has advised the Department it considers that the additional advice does not justify the exclusion of some grassland areas, particularly where survey locations show predominantly native cover in close proximity to mapped Box Gum Woodland.

While there is some uncertainty over the extent of Box Gum Woodland DNG, the Department notes that under the FBA, the grassland in question would be of a condition class that would not require offsetting. That is, even if the grassland was reclassified, it would not affect the offset liability or the outcome of the FBA assessment.

Further, the Department notes that OEH accepted that the grassland did not meet the definition of derived native grassland under the TSC Act and as such was not identified as Box Gum Woodland for the NSW biodiversity assessment.

Nonetheless, the Department accepts that baseline vegetation mapping is a fundamental aspect of any biodiversity assessment. The Department is facilitating further expert review on this matter to reach an agreed position. Any updated mapping and assessment outcomes will be included in the Department's addendum report prior to determination of the project. However, as indicated above, it is unlikely to be a significant issue for the Commission's merit review of the project.

Threatened Flora Species

The ecological assessment recorded one threatened plant species *Ozothamnus tessellatus*, listed as vulnerable under both the TSC and EPBC Acts. This species is a dense shrub that grows to 1m high and is from the Asteraceae (daisy) family. It is generally found in dry eucalypt woodland habitat.

Three separate populations with a total 1,090 individual plants were mapped. The extension project would have a direct impact on 589 individuals. *Ozothamnus tessellatus*, is a species credit species under the FBA and the loss of 589 individuals equates to 23,560 impact credits.

Fauna Impacts

The modification has the potential to impact fauna species through the removal of habitat trees and resources associated with the woodland communities identified in Table 7 above.

A total of 20 threatened fauna species were recorded within or near the disturbance area as summarised in Table 8 below. The EIS also identified that a further 18 species that may occur, based on available habitat.

Table 8: Threatened Fauna Species recorded or may occur in the development footprint

Group	Species (Common Name)	TSC Act ¹	EPBC Act ¹	Recorded
Birds 13 recorded, 9 may occur	Blacked Chinned Honeyeater, Brown Treecreeper, Diamond Firetail, Gang-gang Cockatoo, Glossy Black Cockatoo, Grey Crowned Babbler, Hooded Robin, Little Eagle, Little Lorikeet, Masked Owl, Scarlet Robin Speckled Warbler, Turquoise Parrot	V	-	Yes
	Regent Honeyeater	CE	CE ²	No
	Barking Owl, Flame Robin, Painted Honeyeater, Powerful Owl, Square-tailed Kite, Varied Sitella,	V	-	No
	Swift Parrot	E	E	No
	Bush Stone-curlew	E	-	No
Mammals 7 recorded 5 may occur	Eastern Bentwing-bat, Eastern Cave Bat, Eastern Freetail-Bat, Little Bent-wing Bat, Yellow-bellied Sheath-tail Bat	V	-	Yes
	Corben's Long-eared Bat, Large-eared Pied Bat	V	V	Yes
	Spotted Tail Quoll	E	E	No
	Brush-tailed Rock Wallaby	E	V	No
	Eastern False Pipistrelle, Squirrel Glider,	V	-	No
Koala	V	V	No	

Notes:

1. V = vulnerable; E = endangered; M = migratory; CE- critically endangered
2. Status changed from E to CE occurred after the determination of the action being a controlled action and accordingly assessed as Endangered under the EPBC Act in the EIS and assessment report.

The majority of these species are identified as ecosystem credit species under the FBA. This means that the impacts on these fauna species are accounted for in the impact ecosystem credits identified in Table 7 above. That is because these vegetation communities provide suitable habitat for these species.

However, two fauna species are identified as species credit species under the FBA, the Regent Honeyeater and the Koala. The extension project would clear 190 ha of potential foraging habitat for the Regent Honeyeater and 165 ha of potential Koala habitat. The Department notes that the impact area on Regent Honeyeater habitat was revised down from 273 ha as documented in the EIS, following advice from OEH on field inspection of the vegetation communities.

Significance of Impacts on Threatened Species and Communities

Sections 5A to 5D of the EP&A Act relate to threatened species assessment and management. The Department confirms that its assessment of the project has taken into account the matters listed in these sections in assessing whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats.

These matters include the:

- factors in Section 5A(2), known as the '7 part test of significance';
- threatened species assessment guidelines³ identified in Section 5A(1); and
- register of critical habitat as identified in Section 5B.

Hunter Eco assessed significance of impacts on relevant State listed threatened species using the 7 part test and Commonwealth listed species using the methodology outlined in *Matters of National Environmental Significance Significant Impact Guidelines 1.1 (2013)*.

The Department's consideration has had regard to Hunter Eco's assessment, along with the threatened species assessment guidelines which assist in the interpretation and application of the 7 factors (or tests) of significance. This assessment has considered the direct and indirect impacts of the project on threatened species, populations or ecological communities, or their habitats – both on the site and the broader study area, as defined under the threatened species assessment guidelines.

The Department notes that the Commonwealth referral decision in determining that the action is a controlled action was based on there being potential impacts on 7 threatened Commonwealth listed species, including Box Gum Woodland, *Ozothamnus tessellatus*, Regent Honeyeater, Swift Parrot, Spotted-tail Quoll, Large-eared Pied Bat and the South-eastern Long-eared Bat (Corben's Long-eared Bat). In addition to these species, Hunter Eco concluded that there was potential habitat for the Koala and the Brush-tailed Rock Wallaby in the disturbance footprint.

The EIS significance assessments concluded that there would not be a significant impact on any threatened species listed under the TSC or EPBC Acts.

DoEE determined in its assessment of the EPBC referral documentation that there are likely to be significant impacts on 3 of these threatened species – Box Gum Woodland, Regent Honeyeater and *Ozothamnus tessellatus*. Following consultation with DoEE, the Department considers that without mitigation and offsetting, there would likely be a significant impact as a result of the development on these three MNES.

³ Assessment guidelines means assessment guidelines issued and in force under Section 94A of the Threatened Species Conservation Act 1995 or, subject to section 5C, section 220ZZA of the Fisheries Management Act 1994, including the Threatened Species Assessment Guidelines – The Assessment of Significance, prepared by the then Department of Environment and Climate Change, dated August 2007.

The Department has undertaken a detailed consideration of Hunter Eco's assessment of significance, relevant approved conservation advice, recovery plans and threat abatement plans (TAPs) for each of the three MNES potentially significantly impacted. A summary of this assessment is provided in Appendix M.

The Department has carefully considered the significance assessments for the remaining threatened species and accepts that there is unlikely to be a significant impact on these species. Further review of the EPBC listed threatened species is provided in Appendix M.

Notwithstanding, the Department notes that the residual impacts on these species are proposed to be fully offset in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*. The offsets for these species are discussed below.

Avoidance and Mitigation

The Department is satisfied that WCPL has avoided impacts on biodiversity and in particular Box Gum Woodland EEC/ CEEC and Regent Honeyeater habitat as far as practicable, particularly given the location of the coal resource relative to the remnant native vegetation and known populations of threatened flora.

Further, a range of best practice mitigation measures are currently applied for existing operations and implemented through the approved Biodiversity Management Plan. These include clearing protocols, salvage of habitat features, collection of local seed, pest and weed management, erosion control and bushfire management. This is supplemented by an ongoing ecological monitoring program.

In addition to the existing biodiversity mitigation measures some specific avoidance and mitigation measures are discussed below to address concerns raised by OEH in its submissions on the EIS and RTS.

Munghorn Gap Nature Reserve

OEH in its submission raised concerns over potential indirect impacts from mining operations on the Munghorn Gap Nature Reserve. In particular, OEH recommended that a 50 m buffer to the open cut pit and mine infrastructure be required to minimise connectivity and indirect impacts. WCPL did not specify any buffer distance from the reserve boundary, but in response to OEH's concerns proposed that the edge of the open cut be limited to 20 m distance from the reserve, with ancillary infrastructure (such as roads and water infrastructure) to be placed within this buffer.

WCPL provided additional information (see Appendix E) advising that:

- there is about a 2 km total length of the proposed mining operational area (including roads and water infrastructure) within 50m of the reserve (see Figure 13);
- there is around 11 ha of native vegetation within this buffer, with no EEC identified; 780,000 tonnes (worth around \$50 million) of ROM coal would be sterilised if no mining infrastructure was allowed within the 50m buffer, with 350,000 tonnes (worth around \$23 million) sterilised if the open cut pit maintained a 50m buffer, but with some ancillary infrastructure (such as access tracks) allowed within the buffer.

WCPL argues that the current approval already allows mining to occur within the 50m nominal buffer and that both mining and rehabilitation of these areas would be undertaken relatively quickly. Mining operations would occur over an approximate 1 year period, followed by active rehabilitation works to landform establishment including native vegetation planting, over an approximate 2 year period.

Further, WCPL argues that in the long term, the rehabilitation to woodland of the mined areas up the valleys between the reserve boundary would increase connectivity, noting the prior land-use included agricultural production, restricting conservation outcomes. The Department notes, however, that WCPL had already committed to establishing connectivity in some of these areas through natural and assisted regeneration of woodland as part of the 357 ha regeneration area on WCPL owned land.

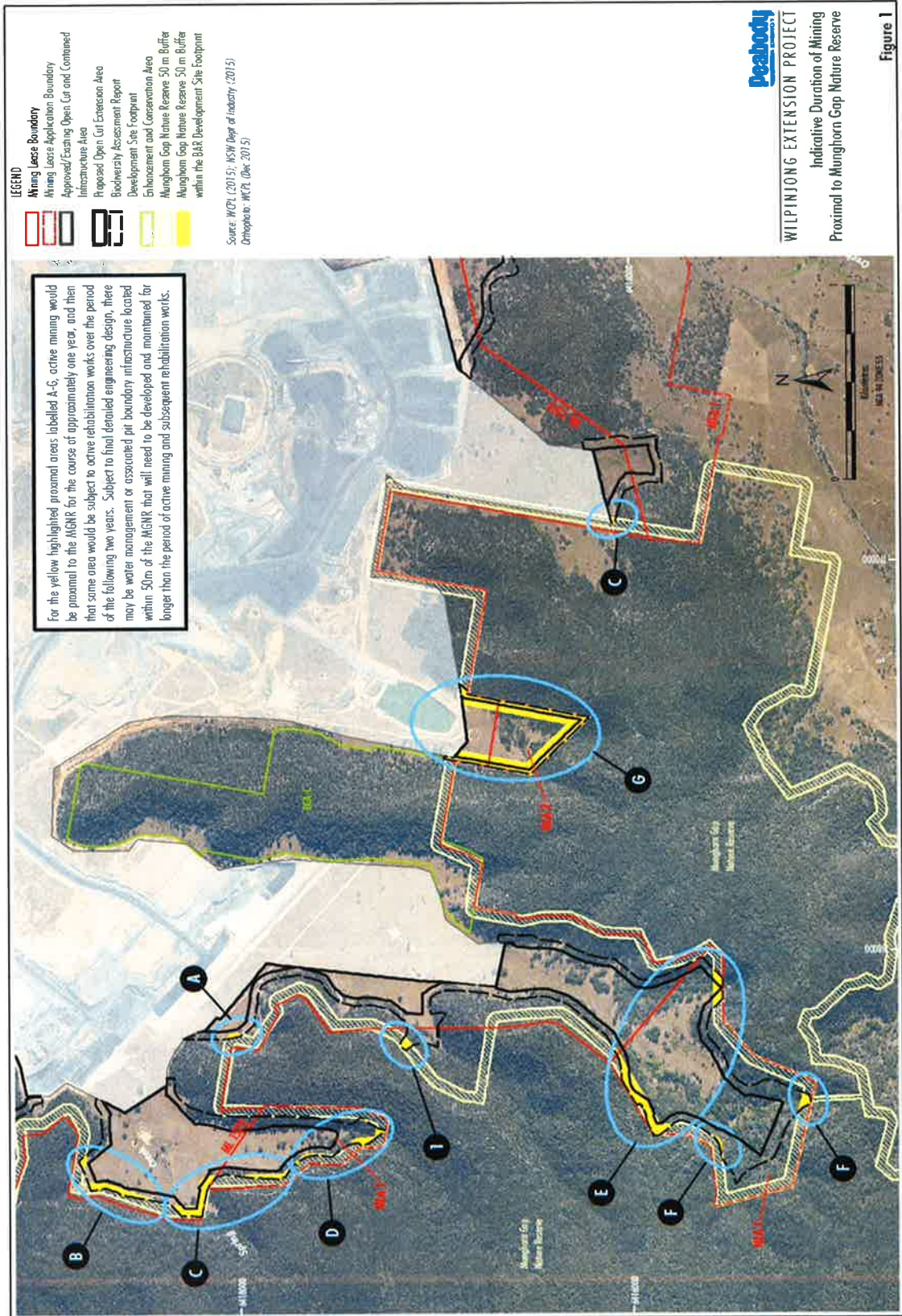


Figure 13: Mining Adjacent to Munghorn Gap Nature Reserve

Based on the additional advice provided by WCPL, the Department and OEH are satisfied that the indirect impacts (such as dust, noise, light and vibration) from operating within a 50m buffer of the reserve, would be short term. Further, a large portion of the areas to be impacted are already subject to edge effects from adjoining cleared agricultural land. In the medium to long term, with rehabilitation to woodland, connectivity would improve and there would be consequent reduction in edge effects.

Further, while the coal resource within the 50m buffer is a small percentage (<1%) of the total additional resource of 95 Mt proposed to be extracted over the life of the extension, the Department considers that the economic benefits of efficiently extracting this additional coal outweighs incremental indirect impacts on the reserve. Especially in the context of the medium-long term benefits following rehabilitation.

To address OEH's concerns, the Department recommends conditions that:

- WCPL undertake a survey of the adjoining reserve boundary and ensure that the boundary is clearly delineated through survey markers and on geographic information systems (GIS);
- relevant digital GIS spatial data be provided to the Department and OEH;
- the open cut setback limit be no closer than 20m from the surveyed boundary;
- active rehabilitation works within 50m of the Nature Reserve be prioritised, with final landform and initial plantings to be completed within 2 years following mining operations, apart from within areas of retained ancillary infrastructure for water management and access.

Eastern Bentwing-bat Roost Site

An old mining adit located approximately 152 m from the Pit 8 mining operations was identified as a potential maternity roost site of the Eastern Bentwing-bat. WCPL contends that the adit entry is unstable, with evidence of rock-fall and root penetration around the entry and therefore even without mining occurring, there is inherent risk to the roost site.

As a mitigation measure from blast impacts, WCPL proposes to install a concrete or steel pipe through the entrance to maintain access in the event of further rock fall. As discussed earlier, WCPL has also committed to design the blasts to achieve a ground vibration limit of 80 mm/s at the adit, to further reduce potential for rock fall and disturbance to the site.

OEH in its submission advises that there are few known maternity roost sites in the Hunter Valley and that the loss of these sites may place regional populations at risk. Further, OEH recommends that a monitoring program incorporating remote cameras and ultrasonic detectors be implemented to monitor the Eastern Bentwing-bat occupation of the roost site.

This monitoring program would assist in confirming whether it is a maternity roost, and whether the proposed reduced blast vibration intensity is effective in minimising impacts. It would also be able to be combined with blast vibration monitoring to guide the design and implementation of any blasting in proximity to the adit.

The assessment indicates that standard blast sizes with an MIC of 3,900 kg would achieve the nominated vibration limits of 80 mm/s at around 250 m. Given that open cut mining would occur up to 150 m from the adit, WCPL would be required to reduce its MIC to an appropriate level, probably around 1,350 kg, when mining is in close proximity to the adit.

However, the Department notes that careful blast design and reduced MIC is commonly applied to protect natural and built infrastructure across the mining industry, and considers that it would be possible for WCPL to adjust the blast MIC to meet its nominated blast vibration limits, or even lower if this is justified by the monitoring data.

Given that the reduced blast size would only be required over a relatively small portion of the footprint of Pit 8 (up to 5 ha out of a total of 300 ha), the Department does not consider this is an unreasonable constraint on mining operations.

The Department also notes that the offset sites proposed for the project include 2 km of sandstone escarpment, including caves that may provide roost habitat for bats. However, the Department notes OEH's advice that it is rare for sandstone caves to provide the specific micro-climate requirements for a maternity roost site.

Nonetheless, the Department considers that there is benefit in undertaking targeted surveys within offset areas to identify potential cave roosting bat habitat, in particular potential maternity sites.

To manage potential impacts from mining operations on the roost site, the Department recommends conditions that WCPL:

- develop and implement a specific monitoring program at the adit, targeting occupation and access of the roost site and blast vibration and overpressure monitoring;
- revise the Blast Management Plan to include the initial target vibration limit of 80 mm/s – with ongoing review of this limit based on the outcomes of the monitoring program;
- revise the Biodiversity Management Plan in consultation with OEH, to include the adit monitoring program and identify in detail the proposed engineering works at the adit entry; and
- undertake targeted monitoring of cave dwelling bats within offset areas to inform potential roost sites, including maternity sites.

Summary of avoidance and mitigation measures

Overall, these avoidance and mitigation measures are consistent with Principle 1 of the NSW Biodiversity Offsets Policy:

“Principle 1: Before offsets are considered, impacts must first be avoided and unavoidable impacts minimised through mitigation measures. Only then should offsets be considered for the remaining impacts.”

The Department is satisfied that WCPL has reasonably avoided impacts on threatened species, particularly given the location of the coal resource. The mitigation measures proposed are in line with best practice and have already been implemented for the existing mining operations through an approved Biodiversity Management Plan. In addition, as identified above, the Department has recommended additional measures to enhance these existing measures.

The residual impacts proposed to be offset are discussed below.

Biodiversity Offsets

Existing Offsets

To inform consideration of the proposed offsets and rehabilitation areas under the current project, it is important to understand the interactions these areas have with the existing biodiversity offsets required under the current project approval for the Wilpinjong mine. The existing offsets and commitments for biodiversity conservation outcomes are summarised in Table 9.

Table 9: Existing Biodiversity Conservation Commitments or Offsets

Conservation or Offset Area	Area (ha)	Description
Enhancement and Conservation Areas (ECAs) A, B and C	480	<ul style="list-style-type: none"> • Comprise 295 ha of native vegetation; including 80ha of Box Gum Woodland EEC. • 185 ha of cleared land to be restored. • Managed under a Conservation Agreement with OEH.
Biodiversity Offset Areas D and E	211	<ul style="list-style-type: none"> • Comprise 211 ha of native vegetation including 47.8 ha of Box Gum Woodland EEC. • Offset security proposed by adding to the Goulburn River National Park, subject to finalising agreement, including transfer funding arrangements, with NPWS.
TOTAL AREA ACTIVELY MANAGED AS FORMAL OFFSETS	691	

Mine rehabilitation to forest/ woodland communities	921	<ul style="list-style-type: none"> Rehabilitation to woodland/ forest¹ No formal security required under the project approval.
Additional WCPL land identified for regeneration	311	<ul style="list-style-type: none"> Additional WCPL owned land on predominantly cleared agricultural land targeted for natural regeneration and selective planting to provide connectivity between rehabilitation areas and remnant woodland. No formal security required under the project approval.
TOTAL AREA TO BIODIVERSITY LAND USE POST MINING	1,923	

Note1: A further 1,049 ha would be rehabilitated back to open woodland/ agriculture land use and while there would be some biodiversity benefits in paddock trees, an agricultural land use post approval is envisaged.

In addition to these offset areas and biodiversity conservation commitments currently under WCPL's management, the "Nullo Mountain" offset was also included which has been subsequently transferred to National Park estate.

These existing offsets, along with rehabilitation to woodland and the adjacent regeneration areas, were designed to provide discrete biodiversity corridors in the final landform between Munghorn Gap Nature Reserve and Goulburn River National Park. The landform also included continuation of grazing and agricultural land use within the rehabilitated mine site as depicted in Figure 14.

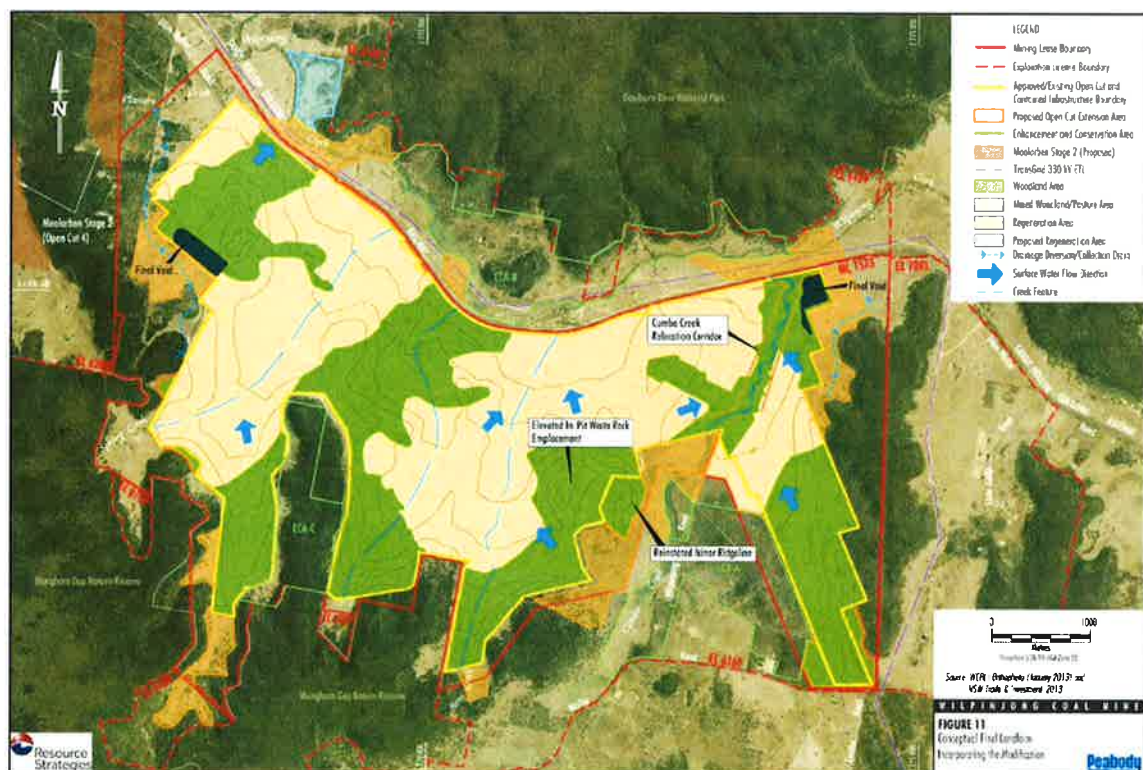


Figure 14: Conceptual Final Land Use Plan – Existing Approval

The Department notes that the re-alignment of the transmission line would traverse two ECA's which would require an equivalent replacement area of around 3 ha to be found and the Conservation Agreement modified. The impact credits have accounted for the additional clearing of remnant native vegetation within the transmission line corridor.

The Department has recommended a condition formalising the requirement to revise the ECA Conservation Agreements for these two ECA's to ensure that the total ECA is retained at 480 ha.

Due to the extension of the mining and ancillary infrastructure areas, the regeneration areas that identified in Table 9 would be reduced from 311 ha to 148 ha. However, this is more of a delay to the final outcome, as the obligation to rehabilitate these areas at the end of mining would remain in place.

Proposed Biodiversity Offsets

WCPL propose to offset the residual biodiversity impacts by using a combination of:

- five land based offsets, located adjacent to Munghorn Gap Nature Reserve and Goulburn River National Park, which are identified by OEH as potential areas for transfer into park estate;
- rehabilitation of disturbed areas to woodland for biodiversity conservation outcomes; and
- supplementary measures, including providing funding towards a Regent Honeyeater recovery program.

Table 10 below provides a summary of the direct land based offsets that would be used to meet the ecosystem and species credit liabilities of the project.

Table 10: Land Based Biodiversity Offsets

Offsets Description
<p>996 ha of native vegetation, including 46.5 ha Box Gum Woodland EEC, 203 ha Slaty Box Woodland EEC, 601.5 ha of Regent Honeyeater habitat and 647.5 ha Koala habitat.</p> <p>a) <u>Offset Area 1</u></p> <ul style="list-style-type: none"> • 199 ha of native vegetation including: <ul style="list-style-type: none"> ○ 2.5 ha Slaty Box Woodland EEC/ CEEC ○ 171.5 ha Regent Honeyeater habitat ○ 162.5 ha Koala habitat <p>b) <u>Offset Area 2</u></p> <ul style="list-style-type: none"> • 416.5 ha of native vegetation including: <ul style="list-style-type: none"> ○ 28 ha Box Gum Woodland EEC/ CEEC and 14.5 ha Slaty Box Woodland EEC/ CEEC ○ 149.5 ha Regent Honeyeater habitat ○ 198 ha Koala habitat <p>c) <u>Offset Area 3</u></p> <ul style="list-style-type: none"> • 124.5 ha of native vegetation including: <ul style="list-style-type: none"> ○ 12 ha Box Gum Woodland EEC/ CEEC and 18 ha Slaty Box Woodland EEC/ CEEC ○ 52.5 ha Regent Honeyeater habitat ○ 57.5 ha Koala habitat <p>d) <u>Offset Area 4</u></p> <ul style="list-style-type: none"> • 38 ha of native vegetation including: <ul style="list-style-type: none"> ○ 6.5 ha Box Gum Woodland EEC/ CEEC ○ 10 ha Regent Honeyeater habitat and 11.5 ha Koala habitat <p>e) <u>Offset Area 5</u></p> <ul style="list-style-type: none"> • 218 ha of native vegetation including: <ul style="list-style-type: none"> ○ 171 ha Slaty Box Woodland EEC/ CEEC ○ 218 ha Regent Honeyeater habitat ○ 218 ha Koala habitat ○ 45,852 individuals <i>Ozothamnus tessellatus</i>

Ecosystem Credits

Table 11 below compares the impact 'ecosystem' credits⁴ and offset ecosystem credits calculated by Hunter Eco using the FBA. The credits available within Offset Areas 1-5 include credits generated by the same Biometric Vegetation Type (BVT) as the impacted community or where the FBA allows credit trading to occur for vegetation types of a similar formation and has the same or a higher percentage of clearing, as long as they are not listed as endangered or critically endangered. OEH has accepted the ecosystem credit calculations.

⁴ Ecosystem credits for Plant Community Types (PCT) under the FBA assume the presence of a range of threatened flora and fauna species. Individual species credits are not required where the PCT is a surrogate for these species.

As can be seen from Table 11, there is a shortfall in ecosystem credits for some BVT's. WCPL has proposed to meet the shortfall in credits through mine rehabilitation, which would need to specifically target these three vegetation communities, or other communities that meet the trading rules under the FBA, to meet this shortfall.

Table 11: Ecosystem Credit Calculations

Vegetation community	Biometric Vegetation Types (BVT)	Impact	Offset Areas 1-5	Residual
Slaty Box Forest	HU618	519	519	0
Box Gum Woodland	HU681, HU732	377	377	0
Fuzzy Box Woodland	HU547	37	0	37
Rough-barked Apple Woodland	HU981	5,995	2,279	3,716
Blakely's Red Gum Woodland (Shrubby)	HU910	197	197	0
Grey Gum – Narrow-leaved Stringybark Forest	HU843	2,250	2,250	0
Red Ironbark Forest	HU886	2,161	2,161	0
Whitebox Woodland (Shrubby)	HU824	4,590	2,173	2,417
Western Grey Box Woodland	HU962	76	76	0
Narrow-leaved Ironbark Forest	HU825	722	722	0
TOTAL		16,924	10,754	6,170

Species Credits

As described above, the project would directly impact three "species credit" threatened species. Table 12 below summarises the impact credits required against credits available in the land based offsets and identifies residual credits.

Table 12: Offsets for Threatened Species

Species	Impact	Species Credits Required	Species Credits (Offsets 1-5)	Species Credits Shortfall
<i>Ozothamnus tessellatus</i>	589 individuals	23,560	45,852	0
Koala	190 ha	4,290	4,598	0
Regent Honeyeater	165 ha	14,630	4,271	10,359

The Department also notes that in addition to meeting the required credits for two of the impacted species, including excess credits for the Koala and *Ozothamnus tessellatus*, populations of the "species credit" threatened species, Scant Pomaderris and *Tylophora linearis*, were also found in these offset areas.

However, there is a significant shortfall in Regent Honeyeater credits.

WCPL argues that the large number of credits is a perverse outcome of the FBA, in that land based offset ratios in the order of around 11 to 1 would be required for the Regent Honeyeater. This is significantly greater than the offset ratios that were required for the original project. As the NSW Offsets Policy is transitional and subject to reform as part of the NSW Government's biodiversity conservation legislative review, WCPL argues that the full offset liability should not apply for the Regent Honeyeater.

However, the Department notes that the Regent Honeyeater is a critically endangered species and that the FBA biometric calculations have been independently reviewed and determined appropriate for this species. In this regard, the Department accepts that the Regent Honeyeater credit liability is appropriate and consistent with the NSW Offsets Policy.

Mine Rehabilitation

In considering potential biodiversity offsets, it is important to understand the regional context and the historical pattern of native vegetation clearing that has occurred as a result of both mining and agricultural land use practices in the area.

As with many other areas, clearing has largely occurred along the valley floors reflecting the location of the most productive agricultural land and coal reserves. Over the decades, this has resulted in a loss of biodiversity values associated with valley floor communities and a significant reduction in habitat connectivity between the Goulburn River National Park and the Munghorn Gap Nature Reserve.

The Department considers that the rehabilitation of mine sites can play an important role in promoting the recovery of local and regional biodiversity values over the medium to long term by re-establishing vegetation communities that are disturbed by mining or are present in the surrounding area, and creating habitat and preferred feed species for key threatened fauna, such as the Regent Honeyeater.

While the existing biodiversity offset strategies for the Wilpinjong and Moolarben mines incorporate significant areas of woodland and rehabilitation in the areas between these reserves, the Department considers that more can be done to enhance and restore habitat connectivity.

In particular, the Department considers that the project presents an important opportunity to improve the current situation through rehabilitation of land disturbed by mining back to self-sustaining woodland communities on a broad scale.

The Department considers this outcome would also result in a number of significant regional landscape and biodiversity benefits, including connecting the relatively isolated Munghorn Gap Nature Reserve (an area of 6,000 hectares) to the larger reserve system.

From a policy perspective, both the NSW Offsets Policy and the FBA allow rehabilitation to be used towards ecosystem and species credit liability. In particular, the policy states:

"Proponents will receive upfront credits for a certain amount of rehabilitation. The amount of credits essentially represents the gain in biodiversity that would be expected at a highly disturbed site. This equates to around half the credits per hectare that can be generated at a typical biobank site."

WCPL initially sought credits for the rehabilitation to woodland communities of 610 ha of the extension area disturbance. As discussed above, the Department considers there are regional benefits in focusing rehabilitation effort to increasing woodland connectivity along the Ulan-Wollar Road corridor.

To this end, the Department requested WCPL to consider options for increasing the area of rehabilitation to woodland, and in particular targeting vegetation communities that meet shortfalls in ecosystem credits and Regent Honeyeater habitat. In addition, there was opportunity to review rehabilitation objectives for the existing mine footprint and increase the area of rehabilitation to woodland for biodiversity outcomes.

In its response to the Department, WCPL identified around 2,906 ha of rehabilitation area that could be used to meet the shortfall in both ecosystem and species credits. This includes 921 ha already committed to rehabilitation to woodland under the previous project approval, including 107 ha where rehabilitation has already commenced. These areas would require additional management actions and enhancement to re-focus the rehabilitation to Regent Honeyeater habitat and vegetation communities.

As discussed above, for ecosystem credits, the FBA allows that 50% of the credits normally generated for offsets located on remnant native vegetation, could contribute towards the offset credits. WCPL has argued strongly that as an incentive to rehabilitate to a woodland biodiversity outcomes, particularly targeting Regent Honeyeater habitat 100% of species credits should apply.

The Department and OEH do not consider that 100% credits up-front is justified, as the basis of applying 50% reduction is reflective of the increased risk and uncertainty in achieving biometric benchmarks. This is consistent with the approach for ecosystem credits. However, there is opportunity for WCPL to claim the additional credits for Regent Honeyeater depending on the success of the rehabilitation in the medium to long term.

WCPL subsequently advised it would accept 50% rehabilitation credits over all rehabilitation areas, including areas already approved to be rehabilitated to woodland communities. WCPL argued that while rehabilitation to woodland was already a clear commitment under the existing approval, additional rehabilitation costs would be incurred to target specific BVTs, rather than a generic woodland targeting a native seed mix with plant species for threatened fauna species.

The Department accepts that there would be additional costs to re-focus the already approved woodland to BVTs and rehabilitate the woodland for Regent Honeyeater. To provide incentive, the Department considers that 25% rehabilitation credits be provided for already approved woodland rehabilitation. Both the OEH and the Department consider there is benefit in moving from rehabilitation based on vegetation formation to rehabilitation targeting specific plant community types and Regent Honeyeater habitat.

Table 13 below identifies rehabilitation credits available for the project to meet the shortfall in ecosystem and species credits.

Table 13: Rehabilitation Credits

Vegetation community or Threatened Species	Residual Credits	Rehab Area (ha)	Rehab Credits (50%)	Rehab Credits (25%)	Residual
Fuzzy Box Woodland (HU547)	37	9	37	-	0
Rough-barked Apple Woodland (HU981)	3,716	880	3,716	-	0
Whitebox Woodland (Shrubby) (HU824)	2,417	575	2,417	-	0
Regent Honeyeater	10,359	2,897 ¹	7,015	1,635	1,709

Note 1: Rehabilitation to BVT's acceptable to meet ecosystem credits for Rough-barked Apple Woodland and Whitebox Woodland (Shrubby) would also provide species credits for Regent Honeyeater. However, there are no matching BVTs for Fuzzy Box Woodland that would provide Regent Honeyeater species credits.

As shown in Table 13, species credits for the Regent Honeyeater dominate the rehabilitation requirements across the mine site. OEH has advised the Department that only three BVTs would be acceptable for rehabilitation areas to meet Regent Honeyeater species credits. This is because the three communities recommended⁵ are known to include key feed species as a major canopy component and are observed to be more regularly used by Regent Honeyeaters in the Wollar area for foraging and breeding habitat.

WCPL has sought to use up to eleven BVTs for rehabilitation, arguing that the OEH advice is not consistent with the FBA (which identifies other BVTs as suitable for Regent Honeyeater habitat) and that this would restrict rehabilitation options and flexibility to meet completion criteria.

The Department does not consider that limiting the number of target vegetation communities to be overly restrictive and supports OEH's recommendation, subject to some flexibility to include additional BVT's subject to the approval of the Secretary in consultation with OEH. This would allow further vegetation communities to be included during the mine life, pending updated Regent Honeyeater survey information or expert review by OEH.

In accordance with the NSW Offsets Policy, the Department has also recommended that performance and completion criteria for rehabilitation be developed in consultation with OEH and the Department, and to the satisfaction of DRE.

⁵ These BVTs are HU697 *Mugga Ironbark-Black Cypress Pine shrub/ grass open forest of the upper Hunter Valley*, HU 732 *Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion* and HU824 *White Box-Black Cypress Pine shrubby woodland of the Western Slopes*

The Department has recommended that assessment of rehabilitation against interim performance criteria commence 10 years after rehabilitation landform establishment, and completion criteria 10 years after completion of mining at the site.

If the performance and completion criteria are not met, then WCPL would be required to retire residual ecosystem and species credits in accordance with the NSW Offsets Policy, for example through acquiring or retiring credits under the Biobanking Scheme, making payments into an offset fund to be established by the NSW Government, or providing supplementary measures agreed by OEH.

With the inclusion of mine site rehabilitation, there is still a shortfall in Regent Honeyeater species of 1,709 credits. The Department and OEH consider that rather than provide additional land based offset areas, there is considerable merit in providing funding towards supplementary measures targeting key objectives in the Regent Honeyeater Recovery Program, as discussed below.

Further Consideration and Supplementary Measures

The NSW Offsets Policy requires that the consent authority consider impacts requiring further consideration. The Regent Honeyeater was a species that was identified as a matter for further consideration by OEH in its advice on the assessment requirements for the project, along with Box Gum Woodland and *Ozothamnus tessellatus*.

Following advice from OEH, the Department considers that the shortfall in Regent Honeyeater credits should be supplemented through funding a capture/ breeding and release program proposed to be developed by OEH and Dubbo Zoo. This is a proposed extension to the successful breeding program that commenced at Taronga Zoo in 1975, with release of captive birds into the wild in 2008 and 2010.

A key strategy in the recent April 2016 National Recovery Plan for the Regent Honeyeater is to *"bolster the wild population with captive-bred birds until the wild population becomes self-sustaining."*

Rather than increasing land based offset areas, the Department considers that the offset strategy would be better able to meet the objectives of the Recovery Plan through directing funding towards the breeding and release program, or an alternative Regent Honeyeater program as agreed by OEH.

OEH, the Department and WCPL have agreed that the funding for the credit shortfall be based on \$386.15 per residual credit. This figure has been derived in accordance with the NSW Offsets Policy, based on historical land values for acquisition of for biodiversity conservation in the vicinity of the development. This equates to the residual credits providing \$660,000 funding towards supplementary measures.

The Department considers that a funding contribution of \$660,000 towards the Regent Honeyeater breeding and release program to be developed at Dubbo Zoo is an important component of the offset package and would potentially contribute to successful implementation of the National Recovery Plan.

The Department has recommended that funding be provided in annual instalments with an initial \$110,000 followed by annual contributions over the following 9 year period of \$60,000/ year. This could contribute directly to release programs following the commissioning of the facility, pending suitable release conditions. This payment schedule would also tie in with proposed 10 year assessment against performance criteria with the option of provision of ongoing funding pending success of rehabilitation to Regent Honeyeater habitat.

Overall, the Department considers that the proposed avoidance, mitigation and offsetting measures for the Regent Honeyeater, Box Gum Woodland and *Ozothamnus tessellatus* are comprehensive and that no further offsets or supplementary measures would be required. In particular, the Department considers that with the proposed measures, the project would be unlikely to cause the extinction of, or significantly reduce the viability of these 3 species.

Conclusion

The Department acknowledges that the project would result in the clearing of 354 ha of native vegetation, including 190 ha of Regent Honeyeater habitat, 9.5 ha of Box Gum Woodland and impact on 589 *Ozothamnus tessellatus* individuals.

However, the Department is satisfied that the project has been designed to avoid, mitigate, manage and/or offset the residual impacts of the project in accordance with the NSW Offsets Policy, so that biodiversity values would be enhanced or maintained over the medium to long term.

In particular, the overall offset strategy for the project would include:

- a further 996 ha of land based offsets, with the total offset area increased to 1,687 ha;
- rehabilitation of the majority of the site to woodland for a biodiversity conservation outcome, with a total area of 2,906 ha to be rehabilitated to woodland, mainly to provide suitable forage habitat in vegetation communities preferred by Regent Honeyeater;
- regeneration area of 148 ha to provide additional connectivity along the Ulan-Wollar Road corridor; and
- funding of \$660,000 towards recovery program for the Regent Honeyeater targeting release of captive birds into the wild.

The Department considers that the overall offset strategy provides an appropriate balance between land based offsets, maximising the ecological benefits of mine rehabilitation, and targeted contributions towards maintaining populations of critically endangered species.

With proper governance, the Department considers that the strategy has the potential to substantially improve biodiversity values and habitat connectivity in the region.

5.4 Water Resources

Introduction

The EIS includes specialist surface water and groundwater impact assessments prepared by WRM Water & Environment (WRM) and HydroSimulations respectively. Peer reviews of these assessments were also undertaken by Emeritus Professor Thomas McMahon and Dr Frans Kalf.

These assessments update and draw on the extensive surface water and groundwater modelling and monitoring program completed for the Wilpinjong Coal Mine over the last decade.

The project would potentially impact water resources in a number of ways including:

- reducing the catchment area and runoff to downstream waters as mining progresses;
- affecting downstream water quality from surface water discharges from the mine;
- altering geochemistry from waste rock, reject and tailings with potential mobilisation of contaminants and seepage into surrounding aquifers and surface waters; and
- affecting groundwater extraction and quality in aquifers sourced by private users.

As discussed above, impacts on water resources was identified as a controlled action under the EPBC Act with the project jointly referred to the IESC by the Department and DoEE.

The IESC provided its initial advice, and following a detailed response from WCPL, provided its final advice which recommended a number of water management measures and monitoring programs (see Appendix J). The Department has considered the IESC's advice and WCPL's response to the IESC recommendations.

DPI Water supported the key recommendations of the IESC in regard ongoing monitoring, including collection of additional groundwater data from core testing and installation of additional bores, for model verification and calibration and recommended that these be incorporated into a revised Water Management Plan for the project. DPI Water also requested that WCPL commit to clear timeframes for additional data collection and frequency for updating the groundwater model.

WCPL has agreed to implement the measures recommended by the IESC and DPI Water, and the Department has recommended a condition requiring these matters to be incorporated into a revised Water Management Plan.

Water Management

Augmentation of the existing water management system would be undertaken progressively by WCPL as mining progresses into the extension areas. The works would involve installing additional up-catchment diversion structures, sediment dams and mine water storages.

A comprehensive water balance was undertaken for the project to inform the design of water management infrastructure and to assess water demand over a range of wet and dry weather scenarios.

Importantly, only minor changes in water balance are predicted as a result of the mine extension which shows that under average climatic conditions:

- the mine has a peak water demand of 1,346 ML a year (3.7 ML a day);
- water inflows would peak at 3,323 ML a year (9.1 ML a day) sourced from runoff, direct rainfall or groundwater ingress; and
- total water discharges from sediment dams and treated water from the Reverse Osmosis (RO) plant would peak at 1,120 ML a year (3.06 ML a day), however under wetter conditions up to 1,280 ML a year or around 3.5 ML/day could be released from the RO plant to Wilpinjong Creek.

Overall, the water balance shows that the project would be a water surplus mine and would store water for future use or discharge excessive water following treatment through the RO plant. Importantly, the water balance shows that no off-site water from Wilpinjong Creek or other surface water sources would be required at the mine.

Shortfalls during drier conditions would be sourced from the existing approved borefield, which is licensed to provide up to 550 ML each year. The water balance predicts a shortfall of 1 to 2 ML/year in the mid to later stages of the mine life under average meteorological conditions, with up to 130 ML/year predicted under very dry climatic conditions (1% of the time).

The Department is satisfied that the proposed augmentation of existing water management infrastructure would appropriately manage water risks, including water inflows, usage and outflows associated with the WEP.

On this basis, the Department recommends that WCPL be required to revise the site water balance annually in consideration of any augmented water management infrastructure installed during the previous reporting period.

Additionally, the Department recommends that WCPL be required to revise its existing Water Management Plan, and adjust the scale of operations on site to match its available water supply and hold all necessary water licences required for the project.

Impacts on Surface Water Resources

Catchment and base flow reductions

Over the life of the project there would be a small reduction in the maximum catchment area intercepted by the project, when compared to the approved operations, with a reduction from 24.1km² to 23.8 km² (or around 1.2%). However, at the end of mine life there would be a minor increase of 0.1 km² (0.2 to 0.3 km²) in the total catchment area captured by the final voids as a result of the additional void proposed for the final landform, which is less than 0.1% of the catchment area down to the confluence of Wollar Creek and the Goulburn River.

Modelled base flow loss of the approved Wilpinjong Coal Mine (0.37 ML a day) would incrementally increase by 0.04 ML a day upstream of the Goulburn River to the Hunter River confluence and 0.03 ML a day for the Wollar Creek to Goulburn River confluence. There is no incremental increase in base flow loss predicted for Wilpinjong Creek to Wollar Creek confluence. Overall, there is negligible incremental change to predicted base flow loss as a result of the project.

It is also noted that during mining operations base flow loss would be offset by discharges from the RO plant, which would need to meet water quality criteria under the EPL.

Surface water quality

Changes to surface water quality would potentially occur as a result of discharges containing metals and salts from mining areas including overburden spoil, coal stockpiles and coal rejects, and sediments as fine/ colloidal clay particles suspended in runoff from disturbed areas.

The surface water study completed by WRM reports that impacts to downstream users or the environment would be negligible from salt and sediments. In support of this conclusion, WCPL argues that:

- the mine water management system is designed to ensure no uncontrolled discharges of water from mine water storage dams or catchments affected by mining activities;
- overflow from sediments dams would only occur during significant rainfall events which would also generate runoff from surrounding catchments, and mean that sediment dam overflows would unlikely have a measurable impact on receiving water quality; and
- water treated in the RO plant would continue to be released to Wilpinjong Creek in accordance with the existing EPL criteria, which is generally better than the receiving water quality.

Surface water quality – seepage of salt

WCPL argues that the project would have negligible incremental effect on the long term average salinity of Wilpinjong Creek, Wollar Creek or the Goulburn River and would meet the Level 1 minimal impact consideration under the *NSW Aquifer Interference Policy (AIP)*, which requires less than 1% increase in long term average salinity in a highly connected surface water sources as a result of the activity.

WCPL's assessment against the AIP reiterates the findings of the surface water assessment noting the project would have no discernible incremental effect on salinity during operations as a result of base-flow loss or controlled discharges from the RO Plant. The assessment also found that increases in the long term average salinity of Wilpinjong Creek as a result of the existing operation and the project would conservatively be 0.8%.

DPI Water acknowledged the assessment conclusion that downstream impacts would not exceed the Level 1 water quality requirements for salinity under the AIP. However, DPI Water raised concerns that existing surface water monitoring along Wilpinjong Creek shows evidence of increasing salinity, with WCPL arguing that this is consistent with historical trends and linked to climatic conditions, with increasing salinity during drier periods.

DPI Water recommended that ongoing monitoring and statistical analysis be undertaken along Wilpinjong Creek to improve understanding of salinity changes and potential increase as a result of mining operations. This assessment would need to consider the effects of discharges from the RO plant against changes in salt within groundwater base flow.

The Department has included specific reference to monitoring and statistical assessment of salinity trends in Wilpinjong and Wollar Creek for the revised Water Management Plan, in consultation with DPI Water.

Surface water quality – sediment dams

Runoff from dirty water catchments, where sediment is the key pollutant, is proposed to be directed to sediment dams prior to discharge. This would not include runoff from catchment areas where mine water is generated, such as runoff from coal stockpiles or pit water where other pollutants, such as metals and salt, could potentially be mobilised.

The EPA noted in its submission that the current EPL for the mine does not include discharge points from sediment dams and that the licence would need to be varied to include any sediment dams that discharge directly to receiving water as discharge points.

While initially proposing to operate and manage sediment dams to meet a 90%ile 5 day rainfall depth, WCPL has responded to EPA's submission by committing to a higher containment level for a 95%ile 5 day rainfall depth⁶, which would reduce the discharge frequency of uncontrolled overflows from the sediment dams.

The Department notes that sediment dams are common control measures used across many industries including mining for managing runoff and sedimentation following disturbance to land. WCPL has committed to establishing licensed discharge points for all sediment dams through an EPL variation.

The Department supports EPA's recommendation for a higher sediment dam containment level for the site, noting that sediment dam discharges from the adjoining Moolarben mine are required to meet this design standard. Accordingly, WCPL would be required to upgrade the capacity of its sediment dams and manage the sediment dams to retain the design capacity within 5 days of a storm event.

However, the Water Management Plan would need to be reviewed and the water balance updated to reflect a higher sediment dam containment standard, as additional water captured in the sediment dams would need to be managed on-site.

The Department has recommended conditions that require discharges from the mine comply with Section 120 of the *Protection of the Environment Operations Act 1997* in regards pollution of waters, unless discharges meet limits for pollutants specified in the EPL. This would include requiring sediment dams to be constructed and managed to meet a design capacity for a 5 day 95%ile rainfall depth.

Impacts on Ground Water Resources

The project has the potential to result in groundwater drawdown and base flow reduction to surface waters as a result of open cut mining and depressurisation of the coal seams.

Cumulative impacts

The groundwater modelling undertaken for the project included cumulative impacts from the adjoining Moolarben mine as well as project specific impacts. In particular, the Moolarben mine operations would also depressurise the target Ulan Coal Seam, which is the main coal resource for the Wilpinjong mine.

The groundwater assessment included predictions on water level/ pressure reductions on the confined porous rock aquifer, represented by the Ulan Coal Seam as having the greatest impact, and the surface alluvium associated with the surrounding creek systems.

The IESC considered that the assessment of cumulative impacts would be strengthened by developing a sub-regional groundwater model, incorporating all mines and major water users in the vicinity of Ulan and Wollar areas.

WCPL argues that its assessment included cumulative impacts by incorporating actual monitoring data from nearby mines in its groundwater model and that this is a more robust approach than preparing a sub-regional model based on simplified representations and assumptions about mines in the region.

Further, the Moolarben operations would already dewater the Ulan Coal Seam aquifer which is included in the modelling and therefore any further cumulative contribution from Ulan would be negligible.

The IESC accepted that the inclusion of the Ulan mine in the groundwater model was not warranted.

The Department is satisfied that cumulative impacts have been adequately considered. Nonetheless, as discussed above, WCPL would be required to routinely validate and refine its groundwater model which would necessarily need to consider cumulative impacts from the adjoining Moolarben mine.

⁶ Based on the Landcom document 'Managing Urban Stormwater Soils and Construction Volume 2E –Mines and Quarries' which equates to designing sediment dams to capture 44mm of rainfall depth.

Groundwater drawdown and take of water

As mining progresses, the open cut pits would act as a localised groundwater sink as the Ulan coal seam is dewatered, with the modelled average volume of groundwater inflow into the mine of 1.9 ML / day, up to a peak of 4.5 ML a day.

This would cause depressurisation of up to 2m within the Ulan Coal Seam extending approximately 15-20km to the north, with minimal depressurisation to the south of the mine due to the coal seams being dry or less saturated. While the depressurisation extends a significant distance, only one private bore (Wollar Primary School) located within the porous rock aquifer is predicted to be impacted by more than 2m drawdown. The bore is predicted to experience drawdown of 6 m or 15% of the current water level, which is above the minimal impact criteria of the AIP.

The Department notes that even with this level of drawdown, the depth of the bore and available water supply is such that water supply is unlikely to be affected. Nonetheless, WCPL have established in-principle make good provisions with the Wollar School if its water supply is affected, which may include deepening the bore, providing a new bore or alternative water supply source.

As a result of depressurisation of the porous rock aquifer, it is also predicted that there would be standing water level reduction in the alluvial aquifer as a result of reduction in flow from the porous rock to the alluvium or flow from the alluvium into the underlying porous rock. The extent of drawdown is confined to reasonably close proximity of mining operations with 1-2m drawdown generally not predicted to extend beneath the creeks or mapped 'potential' groundwater dependent ecosystems, as shown in Figure 15 below.

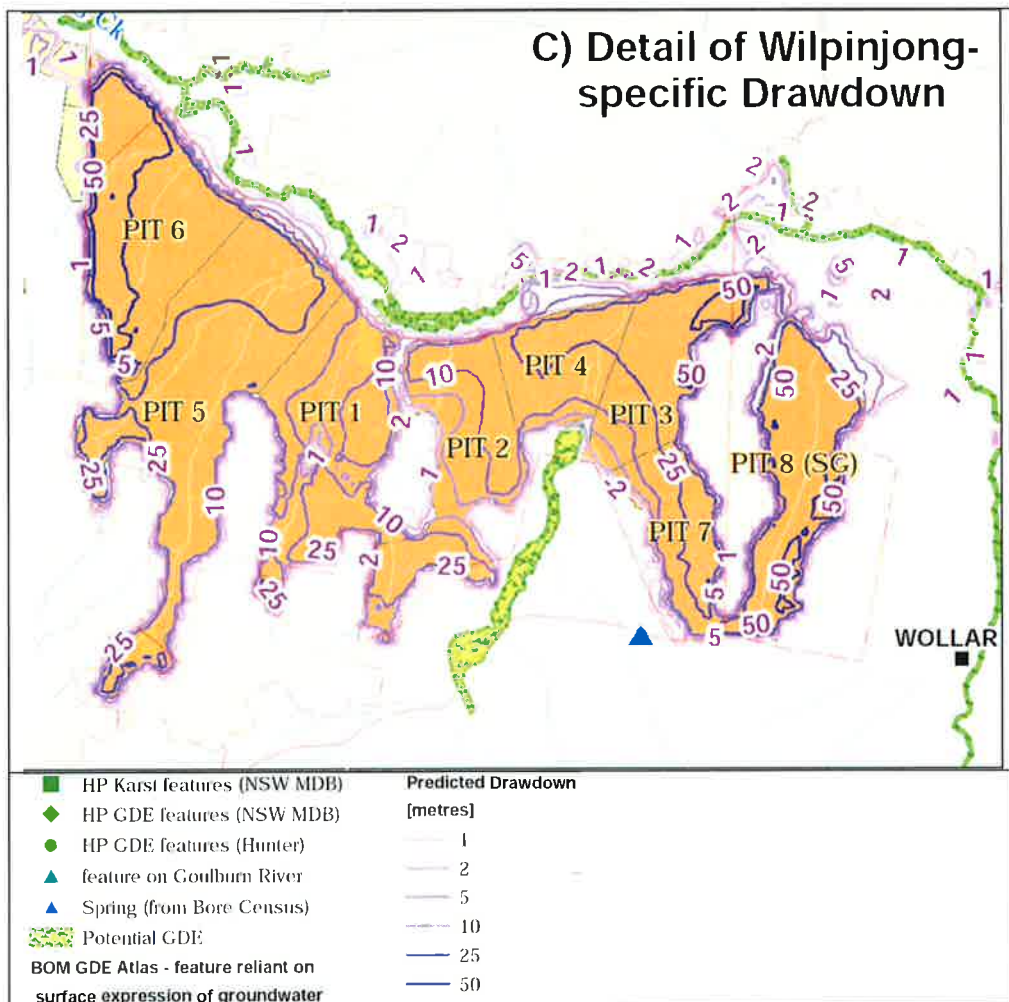


Figure 15: Drawdown in alluvium/ regolith – Wilpinjong Coal Mine only

However, apart from the Wollar School, the project is not predicted to result in any appreciable increase to drawdown in privately owned bores located within 10 km of the mine and is predicted to be within Level 1 minimal impact consideration of the AIP.

It is also important to note that groundwater monitoring undertaken around Wilpinjong mine has not identified any significant drawdown in alluvial aquifers as a result of mining operations, with no mining associated drawdown observed in bores within alluvial or porous-rock aquifers at Wollar Village.

Nonetheless, there would be a net loss of water out of the alluvium as a result of the mining operations and also during post mining recovery that needs to be accounted for under the relevant Water Sharing Plan (WSP). The peak predicted take of water from the Wollar Creek Alluvium is 171 ML/year which is the relevant water source under the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources*.

WCPL has sufficient entitlements under the WSP to account for this water take and to also permanently retire water entitlements to account for a peak predicted post-mining take of 147 ML/year. The existing entitlements of 474 units in this water source are also used for agricultural activity on landholdings owned and leased by WCPL.

It also has sufficient entitlement for its predicted peak take of 1,099 ML/year of water from the hard rock aquifer, with 2,021 units held under the *Water Act 1912*. The Department notes that this entitlement would need to be transferred to the *Water Sharing Plan for the North Coast Fractured Rock and Porous Rock Groundwater Sources*, which commenced on 1 July 2016.

The modelling also predicts that the groundwater drawdown would have no effect on local natural features, including high priority groundwater dependent ecosystems, high priority culturally significant sites, groundwater springs in adjacent National Parks.

DPI Water's assessment against the minimal impact considerations of the AIP demonstrated that the project would meet the level 1 minimal impact requirements for alluvium interception and apart from the impacts at Wollar School, the level 2 minimum impact requirements for hard rock interception. In its submission, DPI Water advised that this impact is considered acceptable, however that the proposed make good provisions are formalised in conditions for the project and updated in the revised Water Management Plan.

The Department notes that the provision of compensatory water supply is a requirement in the existing approval conditions and has been retained in the recommended conditions for the project.

Groundwater quality

As described above, changes in water quality of adjacent groundwater systems may also arise as a result of enrichments and solubilities in the overburden and inter-burden, and coal rejects, and the presence of potentially acid forming (PAF) and/or sodic materials produced by the mine. The impacts of salinity on connected alluvial surface water sources has been discussed above, with the project meeting the minimal impact criteria for long term salinity in the adjacent creeks.

The groundwater assessment concludes that there would be no discernible deterioration in groundwater quality as a result of mining and the post-mining period. This is mainly because, the background water quality in surrounding groundwater and surface watercourses is relatively poor, with high background salinity, with most groundwater only suitable for livestock and irrigation of salt tolerant crops.

Further, while additional geochemical testing undertaken by Geo-Environmental has confirmed that while most of the waste rock and reject materials are non-saline, non-sodic and non-acid forming (NAF), a number of recommendations were made for managing PAF and sodic materials to minimise potential mobilisation of pollutants and surface erosion.

While WCPL has implemented strategies for managing waste rock and coal rejects in its current operations, the Department has recommended that the Water Management Plan be revised to incorporate the materials management recommendations from the current geochemical assessment.

It is also noted that two of the three remaining voids in the final landform would in the long term act as groundwater sinks and therefore would not be a source of salt migration into surrounding aquifers. The impacts of these final voids and recommendations for further investigation into minimising these voids is discussed further in Section 5.6.

Overall, the Department is satisfied that the proposed extension would result in a minimal incremental increase in groundwater impacts above those associated with the approved operations.

Conclusion

The Department is satisfied that the project could be managed to avoid significant impacts on water resources, noting that the project is predicted to meet the Level 1 minimum impact criteria under the AIP.

For the one impacted bore at the Wollar School, WCPL has committed to 'make good' provisions, if required and has consulted with the school on this matter. The Department considers that there is no major impediment to providing alternative water supply if the water supply were to be affected.

WCPL also has sufficient water entitlements to account for the predicted maximum water take from all relevant water sources during mine operations and post mining.

Notwithstanding, the Department has recommended conditions requiring WCPL to:

- ensure that sufficient water licences are held to account for the maximum take from relevant water sources for all stages of the project, and if necessary adjust the scale of the operations to match available water supply;
- provide compensatory water supply to any private landowner where the water supply has been directly impacted by the project;
- only discharge water from the site in accordance with an EPL or in accordance with Section 120 of the POEO Act;
- comply with a range of best practice water management performance measures;
- prepare and implement a comprehensive revised Water Management Plan for the project that includes appropriate controls and measures to monitor, mitigate and manage any water quality impacts and ensure compliance with the water management performance measures; and
- implement relevant recommendations of the IESC and DPI Water in the revised Water Management Plan, including ongoing model verification and data collection, additional surface and groundwater monitoring and ongoing statistical assessment and review of salinity in downstream waters.

5.5 Heritage

Aboriginal Heritage

The EIS includes an Aboriginal Cultural Heritage Assessment undertaken by South East Archaeology. The assessment considers the findings of surveys of the extension areas as well as results of previous archaeological assessments within the project area, including:

- surveys undertaken for the original Wilpinjong Coal Project EIS;
- surveys undertaken for the Wilpinjong Coal Mine Modification 5; and
- archaeological excavations associated with these operations.

Both the Department and OEH are satisfied that the Aboriginal heritage assessment and consultation for the project has been undertaken in accordance with applicable guidelines, including the OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010)*.

The archaeological assessment identified 296 Aboriginal sites in the project area. Of these sites, the project would directly impact 92 sites located within the open cut pit areas and may impact a further 138 sites within ancillary infrastructure areas. These ancillary areas include for example water management infrastructure, roads, relocation of the power infrastructure and realignment of the public road.

The assessment adopts a conservative approach, assuming all these sites may be impacted, although it may be possible for WCPL to design infrastructure to avoid impacts. In the event that all these sites are impacted, the project would result in impacts to 230 of the identified Aboriginal heritage sites. Of these, 3 are assessed as having high local archaeological significance, and 3 of moderate local significance. A summary of the sites is provided in Table 14.

The Department considers that all reasonable and feasible measures should be undertaken to avoid direct impacts on the 138 sites within the ancillary infrastructure areas, particularly the 15 sites identified as having moderate or low-moderate significance.

The Department has recommended a condition to ensure this is further considered in the detailed design, construction and operation of ancillary infrastructure.

The key impact on Aboriginal cultural heritage would be on the values associated with a site complex referred to as the Rocky Hill Complex, located in the proposed Pit 8 open cut mining area (see Figure 15). The Rocky Hill Complex includes a number of Aboriginal sites including all three of the highly significant sites that would be directly impacted by the project. These include:

- a cultural area associated with the landscape features which comprise a visually prominent hill top situated in the valley floor;
- a rock shelter with artefacts and art (site WCP579); and
- a rock shelter with artefacts and an ochre quarry (site WCP578).

Table 14: Aboriginal Sites

Site Type	Sites Identified	Sites Directly Impacted (within open cut pit areas)	Sites Potentially Directly Impacted (within ancillary areas)
Cultural Area/Value	3	3	0
Open Artefact Site	133	71	37
Rock Shelter with Artefacts	9	4	4
Rock Shelter with Artefacts and Art	1	1	0
Rock Shelter with Artefacts and Ochre Quarry	1	1	0
Rock Shelter with Artefacts and Waterhole/Well	1	0	0
Rock Shelter with PAD ¹	124	7	89
Possible Scarred Tree	20	4	5
Waterhole/Well	4	1	3
Total	296	92	138
High Local Significance ²	3	3	0
Moderate Local Significance	3	2	1
Low-Moderate and Low-Possibly Moderate Local Significance ³	29	8	14

Notes:

1. Potential Archaeological Deposit

2. The art and ochre quarry sites were also considered to be low-possibly moderate regional significance

3. Includes one site classified as low-moderate and 28 sites classified as low to possible moderate sites

The complex also includes a number of sites assessed as having low archaeological significance including an artefact scatter, rock shelters with potential archaeological deposits (PAD) and waterhole/well.

The project would also impact an open artefact site (site WCP282) and 2 rock shelters with artefacts (sites WCP118 and WCP119), which are assessed as having moderate archaeological significance (see Figure 16).

The project also has the potential to indirectly impact approximately 58 rock shelters (including a site WCP504 identified as having 'possibly moderate' significance) in close proximity to the open cut. Possible causes of impacts include damage due to vibration from blasting and from dust deposition due to emissions from mining operations.

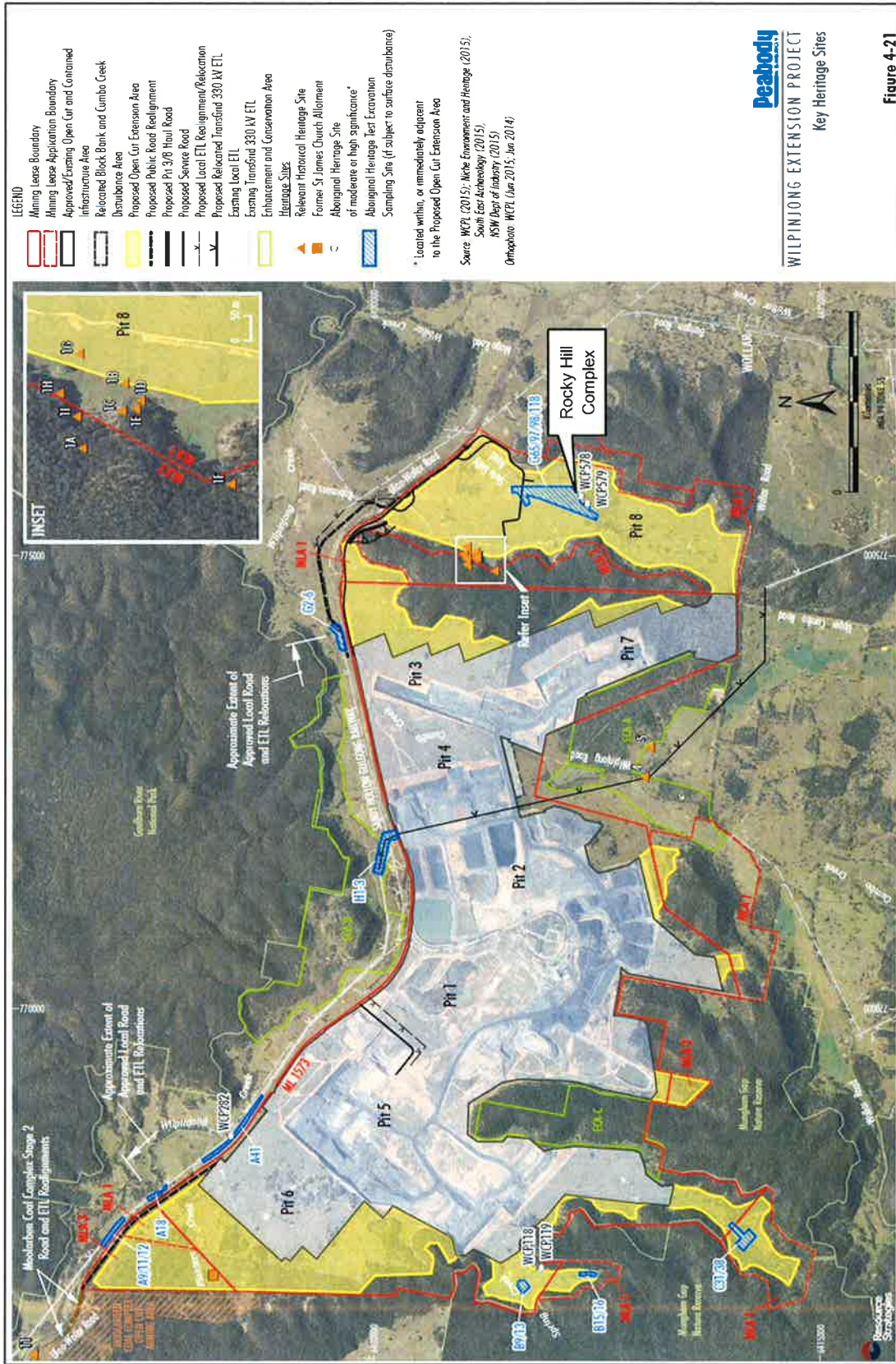


Figure 16: Key Heritage Sites

Apart from site WCP504, these sites are assessed as low significance as they are rock shelters with lower potential for PADs, due to the size of the shelter and limited sub-surface material within the shelter for artefacts. That is, no Aboriginal objects were found within these rock shelters and there was no evidence of substantive occupation by Aboriginal persons. Therefore indirect impact from blast or dust damage would be unlikely to occur to Aboriginal objects.

The Department accepts the conclusion that, apart from standard dust and blast management practices, no additional measures are warranted to manage indirect impacts on these rock shelters.

In terms of cultural significance, the Aboriginal community has indicated that the Rocky Hill Complex is of high cultural significance and has raised concerns about the classification of significance in the assessment, together with concerns about the indirect impacts of the project, including on the Munghorn Gap Nature Reserve.

The Department acknowledges these concerns and recognises that all Aboriginal heritage is of significance and value to the Aboriginal community. However, the Department is satisfied with the assessment given that:

- the assessment concludes that the majority of sites in the Rocky Hill Complex are of high cultural significance to the Aboriginal community;
- the assessment has been undertaken by qualified archaeologists in consultation with the Aboriginal groups; and
- OEH is satisfied that the assessment has been undertaken in accordance with relevant guidelines.

The Aboriginal community also raised concerns about the potential impacts on the Castle Rock site (WCP72) which has been avoided and protected under the existing approval for the mine. The Department notes that mining activities would not move any closer to this site as part of the project.

Additionally, the Castle Rock site would continue to be managed in accordance with the approved Aboriginal Heritage Management Plan, including ongoing monitoring of ground vibration and dust deposition levels.

The Department is satisfied that that the project would have no material impact on this site and that WCPL could continue to mitigate any impacts through its existing monitoring and management measures.

WCPL has considered the option of avoiding the Rocky Hill Complex and has estimated that it would reduce revenue by approximately \$127M (not including additional mine sequencing costs) and other benefits of the project including approximately \$10 million in royalties to the State of NSW.

The Department considers that there are no viable alternatives to avoid the more significant sites associated with the Rocky Hill Complex given the economic costs associated with avoidance and the location of the shallow open cut coal reserves.

WCPL proposes to implement a number of measures to mitigate the potential impacts of the project on Aboriginal heritage. These include general measures for open artefact sites including surface collection and sub-surface testing and excavation. WCPL also proposes to implement a number of measures specific to the highly significant sites associated with the Rocky Hill Complex (WCP578 and WCP579). These include:

- salvage excavation of deposits and surface collection of artefacts;
- detailed recording of the ochre quarry evidence and rock art and removal of samples for further analysis where feasible; and
- an archaeological research program to improve knowledge about the heritage value of the sites.

The Department considers that the indirect impacts on Aboriginal sites within the reserve should be avoided or risk of impact minimised as far as reasonable and feasible. Consequently, the Department recommends that WCPL ensure that blasting activities do not impact any moderate to high significant rock shelter sites (if found), located within the Munghorn Gap Nature Reserve, cause no more than

negligible impacts on rock shelters of low significance and to develop measures to meet these objectives as part of an updated Blast Management Plan (see Section 5.1).

Although OEH did not raise any concerns specific to the project, it did raise concerns about regional impacts on Aboriginal heritage values as a result of mining in the region. OEH also raised similar concerns with regard to the Bylong Coal Project, stating that impacts on Aboriginal Cultural Heritage is approaching unacceptable thresholds for the region. These concerns were also raised by a number of special interest groups, including concerns about impacts on future generations.

While the assessment concludes that the project is unlikely to result in any cumulative impacts, the Department notes that regional heritage values have been impacted by mining in the region, and would be further impacted by the project. In this regard, the Department also acknowledges that the project would disturb a significant number of sites including 3 sites of high significance and 3 sites of moderate significance.

To further address cumulative impacts of mining operations on Aboriginal heritage sites, the Department considers that WCPL should be required to survey the proposed land based offset areas for Aboriginal heritage sites. The Department has recommended a condition requiring WCPL to carry out an investigation into heritage values, focusing on identifying areas of moderate to high significance that may be commensurate with the values to be impacted as part of the project.

Offset Areas 1 and 3 in particular have a high potential for rock shelters, with cliff lines and escarpments associated with these offset areas. Offset Area 1 is also located adjacent to Munghorn Gap Nature Reserve with a significant rock shelter with art site adjoining the offset area boundary. A waterhole site is also recorded within this offset area.

The Department believes that adding information to the Aboriginal heritage database would assist in addressing cumulative impacts in the region. Any heritage sites identified in these investigations would also be protected in the future given that the offset areas would be transferred to the National Park Estate or secured in perpetuity via a Biobanking agreement.

In its advice on the Bylong Coal Project, OEH emphasised the importance of ochre sources and rock art in the region and, given cumulative impacts from mining, considered that further investigation into art site patterns in the region was warranted. The Department agrees that there would be considerable merit in mines in the Western mining precinct contributing towards this type of research, in consultation with OEH and Aboriginal stakeholders. The Commission may wish to consider this matter further in its review of the project.

The Department has recommended conditions that require WCPL to prepare an updated and comprehensive management plan to ensure that Aboriginal heritage sites and cultural values are appropriately managed. The plan would require:

- ongoing consultation with Registered Aboriginal Parties and OEH;
- a description of the measures to be implemented for:
 - management of sites not impacted by the project;
 - reasonable and feasible measures to avoid direct impacts on sites within ancillary infrastructure areas;
 - management of rock shelter sites in the Munghorn Gap Nature Reserve;
 - surface collection and salvage of sites prior to disturbance;
 - test and salvage excavation;
 - recording of the ochre quarry evidence and rock art to inform archaeological research;
 - reasonable access to heritage sites, including offset areas, for the Aboriginal community;
 - managing the discovery of human remains or new sites;
 - adequate training and induction of personnel; and
 - the storage, management and conservation of salvaged artefacts.

Historic Heritage

The EIS includes a Historic Heritage Assessment undertaken by Niche. The assessment considers the findings of previous archaeological investigations and surveys of the extension areas.

A total of 21 sites of local heritage significance have been identified in the vicinity of the project. Of these, 4 would be directly or indirectly impacted by the project. None of the items are assessed as having State significance. The sites are shown on Figure 16 and outlined in Table 15.

Table 15: Historic Heritage Items

Item	Type	
1. Shale Oil Mine Complex	A - Mine Adit	Abandoned shale oil mine adit
	B - Retort	Concrete blocks and slab
	C - Ramp leading to Retort	Gravelled ramp
	D - Post and Rail Fence Remains	Collapsed timber post and fence
	E - Glass Bottles	Discarded glass bottles
	F - Ventilation Shaft	Vertical ventilation shaft
	G - Possible Location of Caretakers Cottage	Level area with brick fragments
	H - Fireplace Remains	Remains of the Caretakers Cottage
	I - Cut Timber Stockpile	Hardwood timber stockpile
4. Road Embankment	Retaining wall of the old Mudgee to Wollar Road	
5. Pine Park	Grain Silo and shed structures	
11. William Car's Hut	Slab hut (c1883)	

The project would have direct impacts on a number of sites associated with an historical Shale Oil Mine including the Retort (item 1B) and possible location of the Caretaker's Residence (item 1G). A number of items may also be directly impacted by ancillary infrastructure (items 1C, 1D, 1E and 1H).

All the items associated with the Shale Oil Mine would also be subject to indirect impacts due to blasting in the proposed Pit 8 mining area.

The Road Embankment may be subject to direct impacts due to the re-alignment of the transmission line. The extent of impacts is subject to detailed design of the infrastructure and WCPL have committed to avoid impacts where practicable. However, the site would indirectly impacted by blasting in the event that direct impacts could be avoided.

Both the Pine Park and William Car's Hut sites would be indirectly impacted by blasting. WCPL proposes to implement the following measures to avoid, minimise and/or mitigate the impacts on the heritage values of these sites:

- archival recording of all the features of the Shale Oil Mine Complex;
- archaeological test excavation of the possible location of the Caretakers Cottage; and
- avoidance of the road embankment if practicable.

Similarly to avoidance measures for Aboriginal heritage, the Department considers that all reasonable and feasible measures should be undertaken to avoid direct impacts on heritage sites located within the ancillary infrastructure areas. The Department has recommended a condition to ensure this is further considered in the detailed design, construction and operation of ancillary infrastructure.

The Heritage Council raised concerns about the proposed management of heritage items associated with the possible location of the Caretakers Cottage (Site 1G), particularly concerning potential impacts on subsurface archaeological material. The Heritage Council recommended that it be consulted on the excavation program to ensure that excavations are undertaken to an appropriate standard.

The Department agrees and recommends these recommendations be incorporated into a Heritage Management Plan for the project. The plan would require:

- consultation with the Heritage Council, Council, local historical organisations and relevant landowners;
- reasonable and feasible measures implemented to avoid direct impacts on sites within ancillary infrastructure areas;

- a description of measures to be implemented for photographic and archival recording of the Shale Oil Mine Complex;
- preparation and implementation of a test excavation program for the Caretakers Cottage site and detailed salvage program if required; and
- identification of a suitable artefact repository.

With these measures in place the Department is satisfied that historic heritage sites within and surrounding the project site would be appropriately managed and the project would be unlikely to have any significant impact on the historical heritage values of the locality.

5.6 Final Landform and Rehabilitation

WCPL has designed an undulating landform that would be generally sympathetic to the surrounding natural landscape. Due to the shallow depth of the resource and low strip ratio, the final landform has been designed to closely match the pre-mining landform and the project does not involve any large overburden emplacements (see Figure 17).

The final landform design also incorporates conceptual drainage lines that have been designed to be representative of pre-mining conditions, including sub-catchment distributions and location and length of minor streams.

Rehabilitation of the final landform would focus on maximising biodiversity outcomes, through the establishment of areas of woodland and habitat for the Regent Honeyeater (see Section 5.3).

A consequence of these characteristics is that there are some relatively steep slopes (up to 17%) associated with the final landform, primarily in areas adjacent to the Munghorn Gap Nature Reserve where the natural landform is characterised by steep slopes. WCPL propose to stabilise these areas through the use of woodland revegetation.

At the completion of mining, the final landform would comprise 3 final voids, including one void (Pit 6 void) located at the far west of the site, adjacent to the Moolarben open cut mining area (see Figure 17).

Voids in Pit 2 and Pit 6 are predicted to form saline pit lakes as groundwater reaches equilibrium above the final pit floor. These two voids would operate as permanent hydraulic sinks for groundwater. Pit 6 void depth would be around 70 m with a lake predicted to form to a depth of up to around 22 m. Pit 2 void depth and lake depth would be around 20 m and 11 m respectively. Salt would build up in the two pit lakes overtime with over 50,000 $\mu\text{S}/\text{cm}$ forming in the Pit 2 void.

The Pit 8 void would be above the long term groundwater recovery level and would remain dry, apart from short term storage of water following rainfall.

WCPL has considered the potential for groundwater impacts from the Pit 2 and Pit 6 voids and has concluded that the project would comply with the minimal impact considerations of the *NSW Aquifer Interference Policy*. Consequently, the Department and DPI Water are satisfied that the project would be unlikely to have any significant impacts as a result of the configuration of the final voids.

Most of the public submissions questioned the need for final voids with DRE also requesting further justification for final voids. In response, WCPL has mounted several arguments for maintaining final voids.

In particular, WCPL argues that mine sequencing, including the need to operate several pits simultaneously, reduces the ability to further minimise the extent of the voids. WCPL also estimate that the cost of backfilling the voids would not be reasonable, highlighting the cost of backfilling the Pit 8 void alone, would cost in excess of \$15 million.

The Department notes that the size of the final voids is relatively small (i.e. a combined catchment area of 42 ha or about 1.6% of the disturbance area for the entire site) and would not be significant in the context of the other open cut coal mining operations in the Hunter Valley.

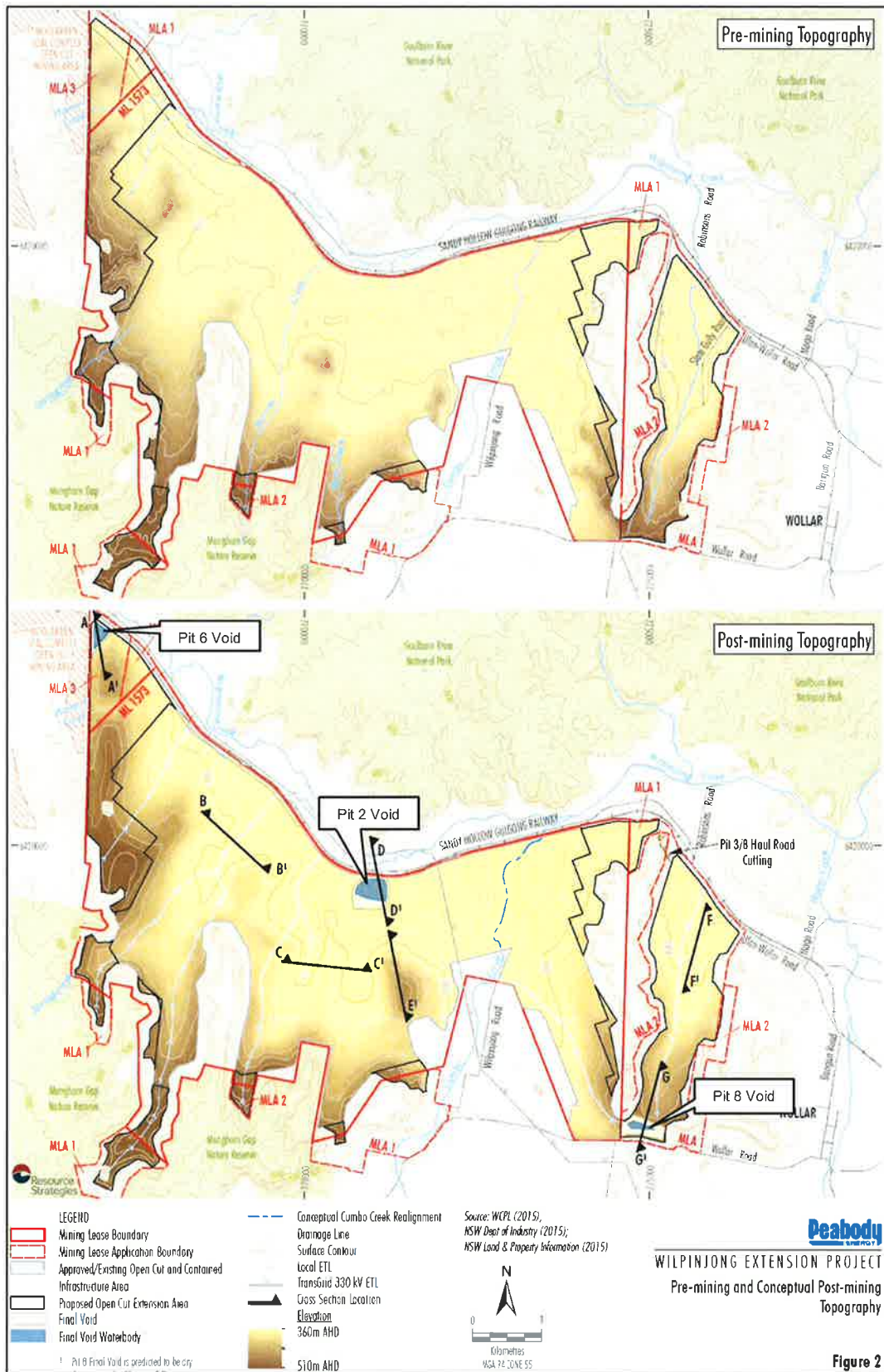


Figure 17: Pre-mining and Post-mining Landform

The Department believes that the proposed final landform and rehabilitation strategy provides an appropriate basis for rehabilitation of the site and would achieve a final land use that supports and enhances the conservation land uses in the area.

Overall, the Department is satisfied that the final landform has been designed to integrate with the surrounding landscape. However, the Department believes that there are a number of aspects of the final landform that could be improved.

Firstly, the Department and DRE consider that micro-relief should be incorporated into the final landform. Micro-relief would remove the general-uniformity of the current design, provide greater opportunities for a free draining landform, and contribute to long term stability.

Secondly, the Department believes that further controls are required to prevent erosion and preferential flow paths developing between natural and rehabilitated land, particularly in areas where slopes exceed 15% and interface with the unmined landscape.

Thirdly, the Department considers that shallow coal seam depth and absence of large overburden dumps provides further opportunities to minimise the voids and their catchments. To this end, the Department notes that there are opportunities to partially fill the Pit 2 and Pit 6 voids to be above the groundwater recovery level, preventing the formation of saline pit lakes.

Finally, the Department believes that there are opportunities to integrate the final landform with the Moolarben coal mine, including integrating the Pit 6 void with Moolarben's final void. This would minimise the size and extent of mining voids in the landscape and improve post mining land use outcomes across the two mining operations.

To address these issues, the Department has recommended that WCPL prepare and implement a Rehabilitation Strategy in consultation with DRE, and investigate opportunities to improve the final landform including incorporating micro-relief, minimising final voids and investigating options to integrate the landform with the Moolarben coal mine.

The Department has also recommended a range of best practice rehabilitation objectives for the project, including objectives aimed at long term stability and hydrological performance of steep landforms. These would update the existing objectives for the mine and provide a consolidated set of objectives that can be applied across all rehabilitation areas. WCPL would be required to prepare and implement a detailed Rehabilitation Management Plan that describes how these objectives would be met.

Additionally, the Department has recommended conditions requiring WCPL to progressively rehabilitate the site and include an indicative schedule for staged rehabilitation as part of the Rehabilitation Management Plan.

DRE is satisfied that the matters raised in its submission, including concerns about progressive rehabilitation and final landform design, can be appropriately managed through these recommended conditions.

5.7 Economic Impacts

The EIS includes an economic assessment prepared by Deloitte Access Economics, which includes a Cost Benefit Analysis (CBA).

The assessment has been prepared generally in accordance with the applicable NSW Government guidelines and considers a range of matters including environmental and social impacts, the principles of ecologically sustainable development and the cost of rehabilitating the site.

In summary, the CBA calculates that the project would have a net benefit of around \$735 million (net present value), including \$190 million in royalties to the NSW Government and \$173 million in company taxes to the Commonwealth Government.

The CBA also includes an estimate a lower bound estimate in recognition that is often uncertainty associated with the valuation of impacts.

Results indicate that even if very conservative assumptions are used (i.e. adopting lower bound coal price estimates and ignoring all other potential benefits associated with the project including company tax and employment benefits), the project would still deliver net benefits of over \$123 million.

The project would also result in continued employment for approximately 550 people, as well as additional employment for up to 75 people. The project is also expected to result in in-direct employment opportunities with the assessment estimating that this could be up to 2,900 jobs across the region and NSW.

A large percentage of submitters raised concerns about the financial viability of WCPL's parent company WCPL Energy, including the ability for the company to meet its financial obligations under any development consent, particularly in relation to rehabilitation.

Under the EP&A Act, the consent authority is not required to consider the financial viability of any applicant in determining a development application. This is because the development relates to 'land' rather than a 'person'. The current application must be assessed in this manner.

Nevertheless, there are mechanisms in place to ensure that financial obligations can be met, including the rehabilitation of the site.

Under the *Mining Act 1992*, DRE holds substantial security deposits for the rehabilitation of every operating mine in NSW, including Wilpinjong. The security deposit is designed to cover the full cost of undertaking rehabilitation, and may be 'called in' by DRE in the event that a leaseholder fails to meet rehabilitation requirements set by the *Mining Act 1992* and within the relevant mining lease.

WCPL has lodged a security deposit for the Wilpinjong mine which addresses all mining operations covered by its current Mining Operations Plan. This deposit would be regularly reviewed over the life of the mine and would be revised to reflect changes resulting from the project as well as progressive rehabilitation.

To test the methodology and assumptions of the CBA against applicable NSW Government policies, the Department commissioned the Centre for International Economics (CIE) to review the economic assessment for the project.

CIE is satisfied that the CBA has generally been undertaken in a manner that is broadly consistent with the applicable NSW guidelines and has concluded that the project would deliver significant net benefits to the community, even under highly conservative assumptions (see Appendix F).

The Department notes that the project would generate significant direct economic activity, a considerable number of ongoing employment opportunities for the region, and generate a considerable income for the NSW and Commonwealth governments through royalties and taxes.

5.7 Other Issues

Table 16: Assessment of other issues

Issue	Potential Impacts	Consideration
Traffic and Transport	<ul style="list-style-type: none"> The EIS includes an assessment of transport and traffic related impacts of the project and includes a consideration of the cumulative impacts from existing and proposed mines in the area. The assessment concludes that the road network would satisfactorily accommodate the additional traffic from the project. WCPL would realign Ulan-Wollar Road to accommodate extensions to Pit 6 and the development of the Pit 8 mining area. WCPL has 	<ul style="list-style-type: none"> To ensure that the project does not significantly increase traffic and transport related impacts, the Department recommends that WCPL be required to comply with the existing conditions which include requirements to: <ul style="list-style-type: none"> co-ordinate shift changes with the adjoining Moolarben and

Issue	Potential Impacts	Consideration
	<p>also committed to seal the remaining unsealed sections of the road adjacent to the mine.</p> <ul style="list-style-type: none"> • The Wollar community raised concerns about potential impacts on the safety of Wollar Road and raised concerns about mine traffic traveling through the village. • A large majority of mine related traffic would continue to access the site via Ulan Road and Ulan-Wollar Road and would not travel on Wollar road or through Wollar Village. • Consequently, the project is not anticipated to have any significant impacts on the safety or capacity of Wollar Road or any increased traffic related impacts on the village. • WCPL would continue to fund upgrades and maintenance of Ulan Road, under the Ulan Road Strategy. The Ulan Road Strategy was implemented to account for the large proportion of mine related traffic using Ulan Road. 	<p>Ulan Mines to minimise cumulative traffic impacts;</p> <ul style="list-style-type: none"> ◦ schedule shift changes to occur outside of school bus hours; and ◦ make contributions towards the implementation of the Ulan Road Strategy. <ul style="list-style-type: none"> • The Department has also recommended a condition requiring WCPL to realign and upgrade Ulan-Wollar Road to the satisfaction of Council.
<i>Visual</i>	<ul style="list-style-type: none"> • The project has low potential for any significant visual impacts. This is because: <ul style="list-style-type: none"> ◦ there are very few privately-owned receivers in the area; ◦ natural topography would provide visual screening from the village of Wollar and other privately-owned receivers; and ◦ the final landform does not include any large overburden emplacements. • Nevertheless, the project has the potential to generate some visual impacts to users of Ulan-Wollar Road and Wollar Road. • Users of Ulan-Wollar Road would experience increased views of open cut mining areas and mine infrastructure. In particular, the cutting associated with the development of a haul road between Pit 3 and Pit 8 would be visible to road users and would be a permanent landscape feature. • The potential impact on users of Wollar Road would result from increased views of open cut workings, a waste rock emplacement and the relocated 330 kV ETL. • Night-lighting impacts are predicted to be similar to the existing mine, however there is potential for increased views of mobile equipment and operational lighting from sections of Ulan-Wollar Road and Wollar Road. • Visual impacts on both these locations are assessed as being low due to either the low visual sensitivity of the location or visual modification level. • To minimise these impacts, WCPL has committed to progressively rehabilitate the site and implement a range of measures including the use of bunds and vegetation screens and installation of lighting in accordance with relevant Australian Standards. • In considering these visual impacts it is important to recognise that road users would already be exposed to views of mining operations including the existing Wilpinjong coal mine and in the case of Ulan-Wollar road, the Ulan and Moolarben coal mines. 	<ul style="list-style-type: none"> • The Department notes that the project would not be visible from any privately-owned receivers and that any impacts on road users would reduce over-time as the site is rehabilitated. • The Department is satisfied that the proposed bunding and tree screening along public roads would provide reasonable mitigation for the likely visual impacts on road users. • Notwithstanding, the Department has recommended conditions that require WCPL to establish vegetation screens and bunding to minimise the views of the haul road cutting as far as practicable. • The Department has also recommended conditions to minimise potential lighting impacts including a requirement to ensure that no lights shine above the horizontal

6 RECOMMENDED CONDITIONS

The Department has prepared draft recommended conditions of consent for the project (see Appendix N). These conditions are required to

- prevent, minimise, and/or offset adverse impacts of the project;
- ensure standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

The conditions incorporate the recommendations of relevant government authorities where applicable, and the Department considers they reflect best practice and provide a sound basis for managing the various potential impacts of the project.

The conditions also incorporate a requirement for WCPL to surrender its current project approval within 6 months of commencing the development of the project. This would ensure that the ongoing operations of the Wilpinjong mine are regulated under a single integrated instrument that reflects the most contemporary environmental performance requirements.

7 CONCLUSION

The Department has assessed the development application, EIS, submissions on the project, the Response to Submissions, and a range of additional information in accordance with the requirements of the EP&A Act. The Department has also considered the independent expert reviews of the project's economic, noise, air and social assessments.

In assessing the project, the Department has carefully considered the concerns of the local community about the social, amenity and environmental impacts of the project expressed in submissions and at community meetings.

While the project would bring mining closer to Wollar Village and other privately-owned receivers, the Department assessment shows that with the implementation of the proposed mitigation measures this mining can occur without any significant exceedances of applicable amenity criteria.

In particular, the project would comply with applicable EPA criteria for dust and blasting at all privately-owned residences surrounding the mine, including those in Wollar. Although there would be some residual noise impacts on 4 privately-owned residences, these impacts would not be significant and could be suitably managed through the provision of acquisition and/or mitigation rights to affected residents.

The Department acknowledges the social impacts of mining in the locality, and the significant decline in population within Wollar and the surrounding area. However, the Department considers that the most significant social impacts have already occurred as a result of the approval of the original mine in 2006, and the subsequent purchase of large areas of land by WCPL since that time.

The Department considers that the project would not result in any significant additional social impacts, and that even if it does not proceed, the decline in population and associated social impacts would most likely to continue. Accordingly, the Department considers that any residual social impacts on the local community are largely unavoidable, and there are limited options available to effectively mitigate these impacts.

However, the Department has recommended a number of measures to at least partially mitigate the social impacts of the project, including:

- a range of funding and in-kind support obligations for local services and facilities; and
- formalising WCPL's offer to purchase any remaining privately-owned residences in Wollar Village through the provision of acquisition rights in the consent.

While the Department's assessment of dust, noise and blasting shows there is no reason that residents cannot remain living in Wollar, the provision of acquisition rights would allow any remaining residents to receive a fair price for their properties and to relocate if they wish to do so.

With regard to impacts on natural and cultural values, the project would disturb approximately 354 ha of native vegetation, including 19 ha of EECs and 190 ha of threatened Regent Honeyeater habitat. To offset these impacts, WCPL would be required to implement a comprehensive biodiversity offset strategy incorporating:

- almost 1,000 ha of land based offsets adjacent to the Goulburn River National Park;
- rehabilitation of the entire mine site to woodland species suitable for the Regent Honeyeater; and
- \$660,000 towards a captive breeding program for the Regent Honeyeater to be developed by OEH and Dubbo Zoo.

Both the Department and OEH consider the offset strategy adequately compensates for the biodiversity impacts of the project, and would result in an improvement in regional biodiversity outcomes in the medium to long term.

The project would also impact a large number of Aboriginal cultural heritage sites, including 3 sites which are considered to have high local archaeological significance. The Department considers that it would not be possible to avoid these sites without significant economic and operational costs, and WCPL has consulted with the relevant Aboriginal stakeholders to devise an acceptable recording and salvage program for these sites.

In addition, the Department has recommended that WCPL be required to undertake further surveys to identify any sites of cultural significance that could be conserved as part of the biodiversity offset strategy.

Based on its assessment, the Department is satisfied that the project has been designed in a manner that achieves a reasonable balance between maximising the recovery of the coal resource and minimising potential environmental impacts, including impacts on Wollar Village and surrounds.

The Department has drafted a detailed set of conditions to ensure that the project complies with applicable criteria and standards, and to ensure that the predicted residual impacts are effectively minimised, mitigated and/or compensated for. The conditions require the project approval for the existing mining operations to be surrendered so that the entire mine is regulated under a single integrated consent, and the Department considers that the conditions reflect current best practice for the regulation of mining projects in NSW, and provide a high level of protection to the residents remaining in the Wollar area.

The project involves expanding and continuing the existing open cut operations at the Wilpinjong mine to access an additional 79 Mt of coal. The project would allow the existing operations to continue for an additional 7 years (i.e. to 2033), and allow WCPL to continue to supply coal for the AGL power stations in the Hunter Valley as well as increase the proportion of coal it produces for the export market.

Extraction of a coal resource of this size would result in significant economic benefits to the Mid-Western Region and to NSW as a whole. These benefits included direct capital investment of \$172.5 million, \$190 million in royalties to the NSW Government, and employment for up to 625 people. WCPL has also entered into a Voluntary Planning Agreement with Council for around \$300,000 a year (depending on the number of employees) for the provision of community services and infrastructure.

The Department has carefully weighed the impacts of the project against the benefits. On balance, the Department considers that the benefits of the project outweigh its costs, and that the project is approvable, subject to stringent conditions.


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3/11/16


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