



Planning
Assessment
Commission

Bylong Coal Project

SSD 6367

Review Report

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Bylong Coal Project Review Report ©
State of New South Wales through the NSW Planning Assessment Commission 2017

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EXECUTIVE SUMMARY

The Bylong Coal Project is a proposed greenfield mine located in the lower reaches of the Bylong Valley, about 55 kilometres north east of Mudgee. KEPCO Bylong Australia Pty Ltd (the applicant) has acquired several agricultural properties to facilitate the development of a new open cut and underground thermal coal mine and supporting infrastructure. The mine would produce 90 million tonnes of coal for export over a 23-year period and includes progressive rehabilitation of the site.

On 31 March 2017, the Minister requested that the Planning Assessment Commission carry out a review of the project and conduct public hearings during the review. Ms Lynelle Briggs AO, Chair of the Commission, nominated Mr Brian Gilligan (Chair), Ms Abigail Goldberg (Deputy Chair), Mr Stephen O'Connor and Mr Roger Fisher to constitute the Commission for the review.

The Commission held a public hearing at Club Mudgee on 11 May 2017 where a total of 44 speakers provided verbal submissions. The Commission notes that several community members and groups elected not to attend the hearing and to protest outside the hearing venue. Written submissions from the community have been provided and considered by the Commission.

Both verbal and written submissions raised concerns about the project relating to impacts to water resources, agricultural operations, the social fabric of the community, landscape and visual amenity, and heritage values, as well as questioning and highlighting the benefits of the project relating to employment, capital investment and the applicant's support of social and volunteer services.

In summary of its review, the Commission found uncertainty and incomplete information about the risks and benefits of the project. The Commission concluded that, for a greenfield proposal in a location recognised for its agricultural capacity, exceptional scenic value and heritage importance, caution and great care will be required in weighing the benefits and costs of the project, in order to arrive at a balanced decision about competing land uses and interests in the Bylong Valley.

The Commission found that the assessment of groundwater highlighted persistent uncertainty about the availability of water resources for the project, and for agriculture and other land uses. The Commission also found uncertainty in the agricultural mitigation strategies, particularly in relation to the restoration of disturbed land to sustainable agricultural uses, and the provision of make-up water to potentially affected properties. Moreover, the arguments presented to the Commission downplaying the value of mapped and verified *Biophysical Strategic Agricultural Land* and *Equine Critical Industry Cluster* land were unpersuasive.

The Commission found that the landscape of the valley would be substantially and permanently altered, requiring in depth consideration in any decision about the project, while the proposed landscape treatments would be at best, long term in their execution, with few examples of successful implementation elsewhere. In addition, the Commission found the potential for greater heritage significance than previously assessed for Tarwyn Park and Iron Tank, which requires further consideration of the relationship between the project and the setting of these heritage properties.

The Commission found it difficult to evaluate the full extent of social impacts and the sufficiency of proposed mitigation measures, owing to significant gaps in the social impact assessment presented

for the review. Moreover, gaps in the evidence supporting the cost-benefit arguments made it difficult to be confident about the claimed benefits, the costs of impacts and the risks attached to the project.

Overall, the Commission was unable to find in the material presented for the review, recognition of the accumulation of, and interaction between, various impacts to the local community and the Bylong Valley. The effect of many step changes, albeit argued to be individually acceptable, may when taken together, constitute a profound and substantial transformation of the valley's social, economic, heritage and landscape values.

In closing, the Commission found that substantial doubt persists about the potential benefits and impacts of the Bylong Coal Project, despite extensive research and peer assessment. As a result, all aspects of the project will need to be comprehensively and cautiously considered, carefully weighted, and balanced one against another in any decision about the project.

CONTENTS

1. INTRODUCTION	1
1.1 THE BYLONG VALLEY	1
1.2 SUMMARY OF THE DEVELOPMENT APPLICATION	1
1.3 DEPARTMENT'S PRELIMINARY ENVIRONMENTAL ASSESSMENT REPORT	2
2. THE COMMISSION'S REVIEW TASK	3
2.1 MINISTER'S TERMS OF REFERENCE	3
2.2 PUBLIC HEARING.....	3
2.3 BRIEFING FROM THE DEPARTMENT	4
2.4 BRIEFING FROM THE APPLICANT AND SITE INSPECTION	4
2.5 BRIEFING FROM MID-WESTERN REGIONAL COUNCIL.....	4
2.6 INDEPENDENT ADVICE ON THE HERITAGE VALUES OF TARWYN PARK AND IRON TANK	4
3. REVIEW IN RELATION TO THE TERMS OF REFERENCE	5
3.1 WATER AND AGRICULTURAL RESOURCES OF THE BYLONG VALLEY	5
3.1.1 <i>Water resources</i>	5
3.1.2 <i>Agricultural resources</i>	10
3.1.3 <i>Summation of water and agricultural resource issues</i>	14
3.2 SOCIAL IMPACTS ON THE BYLONG VILLAGE AND SURROUNDS.....	15
3.3 IMPACTS ON HERITAGE VALUES ASSOCIATED WITH TARWYN PARK AND IRON TANK.....	18
3.4 JUSTIFICATION FOR THE OPEN CUT STAGE OF THE PROJECT	20
3.5 OTHER ISSUES RELATED TO THE MINISTER'S TERMS OF REFERENCE	23
3.5.1 <i>Landscape and visual impacts</i>	23
3.5.2 <i>Biodiversity</i>	24
3.5.3 <i>Aboriginal heritage</i>	26
3.5.4 <i>Historic heritage</i>	26
3.5.5 <i>Transport and traffic</i>	27
3.5.6 <i>Amenity impacts – air quality, blasting and noise</i>	28
3.5.7 <i>Additional socio-economic issues</i>	29
3.5.8 <i>Cost Benefit Analysis</i>	30
4. SUMMARY OF THE COMMISSION'S FINDINGS	32
APPENDIX 1 – MINISTER'S TERMS OF REFERENCE	
APPENDIX 2 – LIST OF SPEAKERS AT THE PUBLIC HEARING	
APPENDIX 3 – SUMMARY OF ISSUES FROM WRITTEN AND ORAL SUBMISSIONS	
APPENDIX 4 – RECORDS OF COMMISSION MEETINGS	
APPENDIX 5 – GML HERITAGE REPORT	
APPENDIX 6 – APPLICANT'S FURTHER SUBMISSION DATED 19 MAY 2017	
APPENDIX 7 – APPLICANT'S FURTHER SUBMISSION DATED 8 JUNE 2017	
APPENDIX 8 – APPLICANT'S FURTHER SUBMISSION DATED 9 JUNE 2017	
APPENDIX 9 – APPLICANT'S FURTHER SUBMISSION DATED 16 JUNE 2017	

1. INTRODUCTION

1.1 The Bylong Valley

The Bylong Valley is one of a series of rural valleys in the Mid-Western region of NSW with a scenic landscape tied to its history of agriculture and horse breeding. It sits approximately halfway between Mudgee and Denman, in the north east of the Mid-Western Local Government Area. The Bylong Valley is traversed by a rail link that connects the existing mining precinct west of Bylong comprising Ulan, Moolarben and Wilpinjong mines to the Port of Newcastle, via the Hunter Valley.

The valley floor is characterised by alluvial flats associated with the Bylong River and its tributary, the Growee River. It is home to a small rural population in the Bylong village, and is traversed by the Bylong Valley Way, a scenic tourist drive between Sandy Hollow and Illford. The valley is surrounded by the forested steep slopes and sandstone escarpments of Tal Tal Mountain; the Growee Range, Mount Penny, the Bylong State Forest, Goulburn River National Park and Wollemi National Park.

Land uses of the Bylong Valley comprise beef cattle grazing supported by fodder cropping and improved exotic pastures, complementing equine and viticulture operations in surrounding valleys. The Bylong Valley has a long history of agricultural land use, including grazing, cropping and horse breeding. Currently a rural landscape, the valley has been listed as a Landscape Conservation Area by the National Trust for its *“significance as prime agricultural land with a rural landscape of exceptional scenic value”*; its scientific significance to the development of natural sequence farming; and its historic significance, particularly associated with the localities of Bylong, Baerami and Kerrabee.

The *Upper Hunter Strategic Land Use Plan*, released by the NSW Government in September 2012, identifies an equine Critical Industry Cluster *“... around Bylong, Scone and Denman”*, while also noting *“there is significant mining activity occurring in the Bylong-Wollar-Ulan corridor”*. The Bylong Valley represents the western extent of the mapped Equine Critical Industry Cluster. In acknowledgement of these potentially conflicting land uses, the plan notes that the Bylong-Wollar-Ulan corridor will *“be incorporated into the Central West Strategic Land Use Plan, which will address broader land use issues relating to mining in the corridor.”*

The *Central West and Orana Regional Plan 2036 (2017)* re-affirms the importance of mineral, agriculture and water resources to diversifying the regional economy and the importance of managing environmental and heritage values in the region. The regional plan identifies that highly productive agricultural land *“requires ready access to water, high quality soils and suitable climates. While the total area of land available for agriculture is large, comparatively few locations have access to all these characteristics”*.

The plan recognises that areas with potential mineral and energy resources, and important agricultural land needs to be identified and protected. It says a critical mass of agricultural industries is needed to capitalise on demand, increase productivity, employment and to ensure the availability of fresh food.

1.2 Summary of the development application

The Bylong Coal Project is a proposed mine for a greenfield site in the lower reaches of the Bylong Valley about 55 kilometres north east of Mudgee. KEPSCO Bylong Australia Pty Ltd has acquired several agricultural properties to create a project site for the development of a new open cut and underground thermal coal mine. The project site is currently a rural landscape with cleared agricultural and pastoral areas abutting vegetated slopes and ridgelines. The mine would operate over a 25-year period.

The project comprises two open cut pits and an underground mine with 15 longwall panels. The mine operation comprises a two-year construction period followed by 23 years of mining, with four years of open cut mining, followed by four years of combined open cut and underground mining, and finally, 15 years of underground only mining.

The project proposes to extract an estimated total of 124 million tonnes of run of mine (ROM) coal at up to 6.5 million tonnes per year. Thirty-three million tonnes of ROM coal would be extracted from the open cut pits and 91 million tonnes of ROM coal would be extracted from the underground mine.

The project includes a coal handling and preparation plant, a rail loop and loading facility to transport product coal to the Port of Newcastle, a workforce accommodation facility, local road upgrades, progressive mine site rehabilitation resulting in a final landform with no final void, a biodiversity offset and a range of operational infrastructure such as ventilation shafts, water supply and management works, and electricity, communications and workforce infrastructure. Further particulars of the project are detailed in the Department's assessment report.

The applicant estimates a capital investment value of \$1.5 billion, with a return of \$290 million (present value) in royalties to the NSW Government. The applicant expects employment for a construction workforce of up to 665 people and an operational workforce of up to 470 people, reducing to 275 people during underground only mining.

1.3 Department's preliminary environmental assessment report

The Department of Planning and Environment has completed a preliminary assessment of the project and its report (available online) has been submitted to the Planning Assessment Commission for consideration.

The Department's preliminary environmental assessment report addressed the project justification, strategic and statutory context, public and agency submissions, the applicant's response to submissions and addendum reports, and independent expert peer reviews in respect of economic, groundwater and social impacts. It provided a detailed evaluation of several issues comprising: air quality, noise and blasting; subsidence; water and agricultural resources; Aboriginal and historic heritage; biodiversity; traffic and transport; visual amenity; and social impacts.

The report concluded:

"[the applicant] has designed the project in a manner that achieves a reasonable balance between maximising the recovery of a recognised coal resource of state significance and minimising the potential impacts on surrounding land users and the environment as far as practicable, particularly through:

- *avoiding disturbance of the Bylong River and Lee Creek alluvial aquifers;*
- *reducing the open cut pits to a reasonable size and layout;*
- *fully backfilling and rehabilitating the open cut voids;*
- *avoiding subsidence impacts on the Goulburn River and Wollemi National Parks;*
- *avoiding and/or minimizing subsidence impacts on significant cliff lines;*
- *minimizing noise and dust impacts on Bylong village and surrounds; and*
- *reducing impacts on biodiversity, agricultural land, Aboriginal sites and historical heritage sites.*

As has been previously observed by the Commission in other reviews, the Department's provision of a preliminary assessment report at this stage of the review process is a very useful contribution to the review. It adds a significant layer of transparency by allowing the public access to a considered view

of the project before making representations at the public hearing. It also provides a significant amount of focused detail on a multitude of issues.

The Department's report included a suite of draft conditions in the format of a "draft development consent". While the Department's recommended conditions are a useful input to the review, the draft development consent itself is not central to the Commission's review task, which is to provide an independent response to the Minister's terms of reference (see 2.1 below), and recommend appropriate measures to avoid, minimise and/or manage significant impacts of the project.

2. THE COMMISSION'S REVIEW TASK

2.1 Minister's terms of reference

Section 23D of the *Environmental Planning and Assessment Act 1979* allows the Minister to request the Commission to conduct a review of a development application and hold a public hearing into the matter that is the subject of the review. The Minister's terms of reference for this review were issued on 9 January 2017 (**Appendix 1**) and request the Commission to:

- "1. Carry out a review of the Bylong Coal Project, and:
 - a. consider the EIS for the project, additional information provided to the Department, all issues raised in public and agency submissions, and any relevant information provided during the course of the review;
 - b. assess the merits of the project as a whole having regard to all relevant NSW Government policies, and paying particular attention to:
 - the impacts on the water and agricultural resources of the Bylong Valley;
 - the social impacts on the Bylong village and surrounds;
 - impacts on heritage values associated with the Tarwyn Park property, including natural sequence farming; and
 - the justification for the open cut stage of the project; 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 12 weeks of receiving the Department's preliminary assessment report, unless the Secretary agrees otherwise."*

Ms Lynelle Briggs AO, Chair of the Commission, nominated Mr Brian Gilligan (as Chair), Ms Abigail Goldberg (as Deputy Chair), Mr Stephen O'Connor and Mr Roger Fisher to constitute the Commission for the review.

2.2 Public hearing

The Commission scheduled a public hearing at Club Mudgee, 99 Mortimer Street, Mudgee for 11 and 12 May 2017 to hear the public's views on the proposal. A list of the 44 speakers that presented to the Commission, all on 11 May, is provided in **Appendix 2**. A summary of the issues raised by the speakers and provided in written submissions is provided in **Appendix 3**.

The Commission notes that several community members and community groups elected not to attend the hearing and to protest the mine proposal outside the hearing venue. The Commission notes the strong feelings about the project expressed in the protest gathering. Nevertheless, while this may have

resulted in fewer speakers at the public hearing, many written submissions were provided in lieu of verbal presentations. All submissions have been considered by the Commission.

2.3 Briefing from the Department

On 9 May 2017, the Department briefed the Commission on the background to the project, the project site, the planning framework for the application, visual impacts, rehabilitation matters, heritage impacts and the community consultation undertaken by the Department.

Notes on this briefing are provided in **Appendix 4**.

2.4 Briefing from the applicant and site inspection

On 10 May 2017, the Commission met with the applicant and visited the site. The applicant, accompanied by many of its consultants, briefed the Commission on the background of the project and KEPCO's objectives, the anticipated benefits of the project, the mine plan justification, along with proposed measures to address identified potential impacts on water, rehabilitation and agriculture, social and heritage values. Notes on this briefing are provided in **Appendix 4**.

Following the presentation, the applicant accompanied the Commission on a site inspection of the project area. The Commission inspected the proposed open cut and underground locations and surrounding properties from Wooleys Road and Upper Bylong Road. The Commission also sighted the project area overall from the elevated site of the Bylong Telstra Tower. The site inspection with the applicant specifically provided an opportunity for the Commission to visit the Tarwyn Park property and homestead as well as sites associated natural sequence farming operations.

After this project site inspection, the Commission undertook an independent and unaccompanied inspection encompassing the wider Bylong Valley and the general context of the project including driving the Bylong Valley Way towards Muswellbrook, and travelling through the Widden Valley Equine CIC area.

2.5 Briefing from Mid-Western Regional Council

On 11 May 2017, Council briefed the Commission on its views on the project. Council noted the potential economic benefits of the project and presented its position that mining and agricultural uses should be able to co-exist. Council raised issues regarding the worker's accommodation facility, traffic and road safety along with potential implications for Tarwyn Park and associated natural sequence farming areas.

Notes on this briefing are provided in **Appendix 4**.

2.6 Independent advice on the heritage values of Tarwyn Park and Iron Tank

The NSW Heritage Council provided advice to the Department on the project in November 2015, which is reflected in the Department's assessment report.

At its meeting on 5 October 2016, the NSW Heritage Council State Heritage Register Committee considered an Interim Heritage Order request from the Bylong Valley Protection Alliance and a State Heritage Register nomination for Tarwyn Park. The Committee resolved at that meeting, among other things, to:

“request that the Planning Assessment Commission (PAC) obtain an independent assessment of significance for Tarwyn Park and Iron Tank, including the areas used for Natural Sequence Farming. The assessment should also examine the heritage impact of the proposal to inform the determination of the SSD6367 application for the mining project

request the PAC to provide a copy of the assessment report for Tarwyn Park and Iron Tank to the Heritage Council of NSW to assist with consideration of the State Heritage Register nomination”

In view of this resolution, the Commission Secretariat engaged a reputable heritage consultant to prepare a heritage report. This report (**Appendix 5**), by consultants GML Heritage, was delivered on 18 May 2017, and published on the Commission’s website. As the timing of the report’s publication was after the public hearing into the project held by the Commission, the Commission is cognisant that a full opportunity for public and agency review and response has not been possible. Accordingly, while the Commission has considered the report in its review, it notes that a formal opportunity for submissions on this matter should be provided prior to a decision about the project.

For the avoidance of doubt, the Minister for Heritage has not requested the Commission to review the State Heritage Register nomination under section 34 of the *Heritage Act 1977*.

3. REVIEW IN RELATION TO THE TERMS OF REFERENCE

3.1 Water and agricultural resources of the Bylong Valley

3.1.1 Water resources

Impacts to water resources are a significant issue for the local community. Submissions from local farmers and residents, as well as experts in water resources, expressed concern about the potential consequences for agriculture in the valley of the applicant’s extraction of water from the Bylong River alluvium. The submissions highlighted the degree of uncertainty around the availability of water in the alluvium. Some indicated personal experience with an inability to extract water from the aquifer at times and raised concern about the risks to water availability posed by climate change and climatic fluctuations for the duration of mining and after it is complete. There was frustration with the absence of certain, specific and enforceable arrangements to prevent impacts to the availability of water supply for agriculture.

The submissions noted that the Department appeared to rely on post approval management plans to finalise the expected groundwater impacts, make-up water supply for the mine, and make-good arrangements for water supply to other landowners, instead of resolving these matters before any decision about the project. Submissions argued that this was an inadequate response to the risks acknowledged in the various peer reviews to the groundwater assessment and they expressed a lack of confidence that this approach would provide the certainty required by local landholders that future impacts would be promptly and effectively addressed.

Several submissions raised concern about cumulative impacts to the Goulburn River catchment, which has been historically modified, initially due to agriculture and more recently due to mining, and which, the submissions argued, is now vulnerable to changes relating to inflows and salinity.

The submissions observed that spatial and temporal data of water quality in the catchment, and the assessment of potential impacts to the catchment, was lacking. The submissions also argued that the main contribution to salinity in the catchment is now the export of salts from mining in the Permian coal measures.

The submissions shared little of the applicant’s confidence that the mine could be *adaptively managed* to avoid mine water discharges during and after mining, particularly in the light of the potentially irreversible nature of some impacts. The submissions also outlined concern about the proposed

approach for managing subsidence impacts, arguing that limited information was provided in relation to direct remediation of subsidence impacts, which were deemed essential.

Groundwater impacts were predicted using a peer reviewed numerical model

Groundwater conditions at the project site and predicted impacts have been reviewed by government and independent experts commissioned by both the Department and the applicant. The applicant's most recent groundwater report describes a history of the groundwater model iterations (July 2016, AGE Pty Ltd, pp 48-84).

The Commission notes that the many documents, peer reviews and counter responses may have been difficult for non-specialist observers to follow. For transparency, a summary that outlines the course of particular issues, as they received increasingly detailed attention, would be beneficial. The Commission also highlights that while there has been extensive review of the numerical groundwater model and the physical conditions affecting water resource behaviour, there has been little critical review of the water balance. The water balance provides several of the critical inputs for the prediction of impacts.

There may be a risk of impacts to the alluvial groundwater resource

The Department's preliminary assessment report indicated that the predicted groundwater take from the Bylong River alluvium peaks in year six of the mine's operation, with 1,835 megalitres per year. The report noted that the applicant holds shares totalling 2,644 megalitres per year out of a total available of 5,843 megalitres per year from the Bylong River alluvial resource, which, if there is water available to permit extraction of the allocated shares, is sufficient for the mine's needs.

The final groundwater model predicted that the proposed bore field would result in minimal drawdown at the nearest privately-owned bore, which is located on the Eagle Hill property adjacent to the project site, such that the project could comply with the NSW Aquifer Interference Policy. Other properties previously predicted to experience drawdown impacts, including most recently, Tinka Tong, have been acquired by the applicant and are now part of the applicant's project area.

The applicant acknowledged there may be conditions, described as 'severe', where the proposed bore field is unable to provide make-up water. The applicant considers these to be improbable scenarios. It says that *"in the unlikely event that the bore field fails to supply make up water, it can be augmented with additional bore sites within the alluvial aquifer"*. The applicant adds that it could also curtail agricultural operations and curtail coal production to reduce water demand. To the extent that any additional take from the alluvium requires additional water shares, both the applicant and the Department argue that *"there is sufficient depth in the market to accommodate the water take for the project"*.

The Department recommended that the applicant be required to demonstrate that it has adequate water supply prior to commencing operations. The Department also recommended further groundwater monitoring to calibrate the groundwater model and validate its predictions so that compensatory water supply could be provided in what the Department considers an unlikely event that there are impacts from the project on private water users.

The Department also indicated that:

- the mine disturbance area is to be kept 150 metres distant from the alluvium to avoid any physical damage from mining activity;
- once groundwater levels stabilise (about 100 years after mining is complete), a small increase of flow from the saline Permian aquifer to the alluvium would persist;
- this extra saline water would be within the range of natural variation in the alluvium and

- unlikely to cause significant impacts; and
- loss of surface flow to the Bylong River from alluvial depressurisation would be detectable, but within the natural variation already observed in the river.

On this final point, the Department of Primary Industries advised that surface water losses may not have been correctly accounted for. It says, for example, that loss of surface flow to the alluvium (induced by aquifer pumping) would peak in year nine of the mine's operation, and in the 99th percentile scenario, could amount to 2.7 megalitres per day (i.e. 986 megalitres per year). The applicant's water shares in the alluvial resource would need to account for this additional loss.

The Commission notes there is uncertainty around potential impacts to the alluvium

The Commission notes that multiple closely reviewed iterations of the groundwater model have been undertaken, all of which highlight uncertainty regarding the performance of and impacts on the alluvium. As such the Commission notes that doubt persists regarding the evidence and arguments on groundwater impacts and management strategies.

In particular, the Commission is mindful of the risk profile of the applicant's water make-up contingencies. The alluvial resource is small and volatile, as is evidenced by the widely ranging permeability, storage and rates of recharge represented in the data. Consequently, the aquifer's response to water extraction or saline intrusion is difficult to predict, which is indicated by the wide range of scenarios in the applicant's sensitivity testing.

The Commission finds it difficult to accept the applicant's and the Department's assertions that there is a low probability of dry periods over the life of the mine, which would lead to impacts that only need to be identified and managed post approval. The Commission's view is that the available evidence of existing variability in the alluvial aquifers, as well as potential effects of climatic variability, suggest that there continues to be significant uncertainty about potential consequences. This necessitates that the risk of impacts requires very careful consideration before a decision is made about the project.

The Department recommended that the applicant should be required to demonstrate to the Secretary that there are adequate water supplies, impact mitigation and make-good strategies before mining can commence. However, the Commission is concerned that this might defer appropriately detailed consideration of contingency plans and potential impacts on agricultural pursuits and other water users until after the application is decided.

The Commission also notes that the Department of Primary Industries suggested that the applicant should identify a non-alluvial make up water source to serve as a contingency against potential shortfalls in water availability.

Inflows to the underground mine would affect the Permian aquifer

The applicant indicates that the predicted drawdown in the Permian aquifers would be of no direct environmental consequence, as the coal seams dip to the east, and become deeper and more remote from surface waters. The Department's preliminary assessment report observed that the applicant has applied for shares in the Permian resource totalling 2,504 megalitres per year, which would be sufficient to account for median inflows until year 19, and 99th percentile inflows to year nine of the mine's operation.

The Department notes that the applicant will ultimately require 4,100 megalitres per year to account for the maximum median inflow predicted in year 23 of the mine's operation, and that there is

“sufficient depth in the market” to accommodate this inflow. The Department says access to the water shares is a commercial risk for the applicant.

The Commission notes that the shares in the Permian resources are yet to be acquired

The Commission notes the applicant’s expert advice that the groundwater drawdown associated with inflows and extraction from the Permian aquifer is relatively limited in extent and unlikely to lead to measurable adverse consequences downstream. The Commission also notes that there are 79,660 shares available in the Sydney Basin-North Coast Groundwater Source, and, according to the Department, no other known users of this resource in the area.

However, the Commission is not yet persuaded that the adequacy of the applicant’s water holdings is exclusively a commercial risk for the applicant. The Commission is hesitant to accept that an assessment of the matters required to obtain shares in the Permian resource can be deferred until after a decision is made about the project.

The Commission also notes that the extraction of saline water from the Permian aquifer and its storage at the surface raises other issues, discussed below.

The proposed surface water management strategy involves a nil-discharge design

The Department’s preliminary assessment report explained that a feature of the nil-discharge mine water management system involves pumping excess water from the underground mine to the south-eastern area of the Eastern Open Cut void for storage (and subsequent re-use). The Department suggested the applicant’s water balance model shows no need for uncontrolled mine water releases as the open cut void would have adequate capacity to accept any overflow of mine water during any wet periods.

The Department suggested that in-pit storage capacity is theoretically sufficient in all climatic scenarios, although it also noted that the water storage may approach capacity towards the end of mining, which, depending on the prevailing weather, may create operational or other technical issues. The Department went on to say that one obvious solution in this case would be to discharge some of the excess water to the catchment following treatment. The Department noted that it had not assessed any discharge option, but also said it would appear a feasible option to consider as mining progresses, given the reasonably good quality water in the aquifers.

The Environment Protection Authority’s (EPA) advice on the matter is more cautious. While the EPA acknowledges the water balance model as being “wide ranging” in respect of the climatic conditions in historical records, it also asserts that the worst case dry and wet years should have been modelled. This is particularly important, the EPA notes, because the mine water may have elevated electrical conductivity (i.e. salinity) and other contaminants, which may require treatment if mine water discharge becomes necessary during wet periods.

The EPA further noted that potential flooding issues could limit increases in out-of-pit mine water storage, should this become necessary to maintain nil-discharge conditions and that the pumping of water from the final void to the underground workings may require licensing by the EPA. In its advice to the Department about surface water dated 9 May 2016, the EPA said it would not licence any discharge of mine water during the mining period, and the applicant should ensure it can comply.

In response to the EPA the applicant reiterated the value of its statistical analysis and its use of sequential multi-year periods in the water balance model, rather than individual wet or dry years. The applicant referred to its commitment to implement adaptive management, with storage conditions

varied according to the prevailing climatic conditions and new water balance simulations based on updated operational monitoring data.

The Commission notes there is uncertainty around the potential for mine water discharges

The Commission notes that uncertainty remains around the proposed nil-discharge mine design. The asserted contingency to discharge raises doubt for the Commission about the evidence supporting the applicant's proposed approaches to mine water management.

The applicant did not provide detailed evidence regarding how any overflow would be managed. While the total mine water capacity in the final void was specified, there is no indication of available storage capacity, or of any potential consequences to open cut mining operations (and water re-use), if the need to store water there arises earlier in the operation. There are no depictions of water storage in the void in any of the applicant's indicative mine plans.

The statistical analysis in the water balance model showed in years three to six:

- there is 50% chance that the open cut void will be required for mine water storage;
- a 10% chance of the need to store 380ML in the void, which is about 77% of the out-of-pit mine water storage area provided for in the indicative mine plan; and
- a 1% chance of the need to store 1,000ML in the void, which is a little more than double the out-of-pit mine water storage area provided for in the indicative mine plan.

The analysis reports there is a small chance (of the order of 1%) that the project may experience climatic conditions outside the range of the historical climate record.

The Commission is reluctant to accept that these probabilities and the potential consequences are remote or trivial. Rather, these statistics show that if the mine encounters wet conditions early on, part of the void may be required for mine water storage and the amount of storage required could be significant enough to require some adjustments to open cut mining. Further, the Commission is concerned about the contingency to discharge mine water toward the end of mining operations.

The potential impacts of mine water discharge have not been assessed and the Commission does not presently share the Department's confidence that discharge is a reasonable and feasible option for mine water accumulation in this relatively fragile environmental context. It is also unclear if other reasonable and feasible options might exist.

The Commission is doubtful that adaptive management is an appropriate or effective approach to mine water accumulation. The applicant's proposal to vary storage conditions according to climatic conditions might be regarded as *active management* of mine water. However, the ways in which the mine might *adapt its operation* to solve the problem of potential water accumulation may need to be clarified before a decision is made about the project.

In summary, the Commission notes that the water balance information and proposed management arrangements raise uncertainties about whether the proposed nil-discharge mine may quickly revert to a discharge mine if wet conditions are encountered either shortly after mining commences or toward the end of mine life. Should mine water discharges continue to be a contingency, then potential discharge impacts should be fully assessed and appropriate discharge parameters established prior to a decision is made about the project.

Other matters to consider in any future decision about the project

The Commission notes that the Department's conclusions on several other water resource matters will require detailed evaluation before any decision about the project. These include claims that:

- the project area is a relatively small portion of the Lee, Bylong, and Growee catchments and it is not expected to have significant impacts on catchment hydrology;
- loss of surface flows in Dry Creek resulting from subsidence deformations and cracking is not expected to be significant, and many physical impacts would be remediated;
- based on nil-discharge mine design, the residual salt loads that are exported from the site are not expected to result in significant impacts on catchment water quality;
- overflow of water from sediment dams during wet periods that exceed the relevant design standard of the sediment control system would be governed by the Environment Protection Licence for the project;
- the open cut pits and surface facilities are largely outside flood affected areas;
- potential impacts to flooding behaviour from two haul-road watercourse crossings would be confined to the project area;
- there are no high priority groundwater dependent ecosystems, while those present are unlikely to be highly reliant on groundwater, nor significant affected by the project; and
- stygofauna species that are present are not endemic, and impacts to local populations are unlikely to be significant to those species.

The Commission notes that the Triassic basalt aquifers above the underground mine are unlikely to be high yielding aquifers owing to their hard-rock geology, any mine inflow from them will nevertheless need to be accounted for by the applicant, as indicated by the Department of Primary Industries.

3.1.2 Agricultural resources

There are competing land uses in the Bylong Valley

The *Central West and Orana Regional Plan*, released by the NSW Government in June 2017, identifies competing land use interests in the Bylong Valley. Solar access resources, agricultural land and the applicant's coal exploration title are all mapped, and the corresponding land use objectives are to:

- protect areas with potential mineral and energy resources extraction through local land use strategies and local environmental plans;
- identify locations with renewable energy generation potential and access to the electricity network; and
- protect important agricultural land from land use conflict and fragmentation, and manage the interface between important agricultural lands and other land uses.

The plan does not make any statutory provisions in respect of the proposed project, although it does illuminate the nature of competing land use objectives in the region.

This is also highlighted in the statutory plans that apply to the project, which include the *Mid-Western Regional Local Environmental Plan 2012* and *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*. Both statutory instruments include aims and objectives that recognise the importance of mineral and agricultural resources, and seek to provide for a balanced and sustainable approach to reconciling the potential for land use conflicts.

The applicant has acquired significant land holdings in the valley, currently comprising approximately 13,229 hectares of land that is in large part, productive agricultural land at present. These holdings include approximately 7,835 hectares of land adjoining the project site.

The *Upper Hunter Strategic Land Use Plan*, released by the NSW Government in September 2012, maps an equine Critical Industry Cluster (equine CIC) and biophysical strategic agricultural land (BSAL) in the Bylong Valley. The extent of equine CIC within the project area is 1,933 hectares, and designated

BSAL covers 1,711 hectares. A further 407.4 hectares of BSAL and 584 hectares of equine CIC have been identified in the proposed biodiversity offset areas. The equine CIC and BSAL in these areas overlap. The occurrence of this mapped land on the project site triggered a statutory referral to the NSW Mining and Petroleum Gateway Panel and the grant of a conditional Gateway Certificate on 15 April 2014.

The community expressed strong concern for the impacts on agricultural land uses

Agricultural impacts are a significant issue for the local community. Submissions from both local farmers and residents expressed concern about the consequences of the current and escalating impacts to agricultural productivity in the region and highlighted the importance of the Bylong Valley including the presence of the equine CIC and BSAL. The submissions expressed considerable doubt about the applicant's statements that the project could co-exist with agriculture in the Bylong Valley.

The submissions stressed the importance of suitable groundwater resources for maintaining agricultural production in the valley, and particularly for agricultural properties near the project. These submissions highlighted the short timeframe between the loss of water and impacts to production through stock death (as little as two days) and impacts on crop health. The submissions also raised concerns about the impacts of water availability on the natural sequence farming techniques established at the Tarwyn Park and Iron Tank properties.

The submissions expressed significant concern in relation to the reliance on rehabilitation of mined areas as a strategy for managing these impacts, arguing that little supporting evidence or comparable precedents had been provided by the applicant. The submissions highlighted the conceptual nature of the restoration practices to be employed for the project to remediate impacts to BSAL and held a general view that once mined the production value of those areas would not be able to be restored.

The applicant argued that important agricultural land has been avoided

The project disturbance area would impact 1,160 hectares of agricultural land, including 451 hectares of arable land (suitable for cropping), 694 hectares of grazing land and 15 hectares of heavily wooded land. The impacted agricultural land is estimated to include 700 hectares of the equine CIC and 440.8 hectares of mapped BSAL. The Department's report also identified 3,800 hectares of agricultural land, including 1,158 hectares of arable land and 1,318 hectares of grazing land, within the proposed offset areas which would be managed for conservation outcomes. Of the areas to be utilised for biodiversity offsets, 287.8 hectares are mapped as BSAL and an additional 515 hectares are mapped as part of the equine CIC.

The applicant suggested that these areas are not prime examples of BSAL and equine CIC lands. The applicant noted that areas of verified BSAL likely to be impacted are generally on lower soil capability, class three land, while the areas of equine CIC are no longer operational and located on the geographical margins of the 'cluster', with the nearest related facilities 30-minutes' drive away.

The applicant noted that subsidence might lead to minor cracks, erosion and ponding on agricultural land, but argued that these impacts would be minor and not require remediation. The applicant also provided a comparative study (**Appendix 8**) showing areas managed with natural sequence farming techniques had approximately equivalent production capacity to nearby farms land that had been managed in more traditional ways; arguing that it was no more valuable than other agricultural land.

The applicant argued that agricultural impacts based on water losses would not occur off site

The applicant considered the impacts to agricultural production potential within its total land holdings (but outside the disturbance area) based upon an assumed cost to agricultural production per megalitre of water removed from the system. Based on the utilisation of the full water entitlement

for mining (but not additional purchase of entitlements during mining), the applicant estimated a net value of lost agricultural production from diverted water to be \$AUD 101 per megalitre, with a peak lost value of \$AUD 410,562 per annum during open cut only operation.

The applicant suggested that the project would not result in a reduction of agricultural production outside of the project site owing to the confinement of draw down impacts in the alluvium to its land holdings. The applicant also reiterated that the predicted water usages from the alluvium would be in accordance with water shares held by the applicant and that no neighbouring private bores, including those at Cherrydale Park and Timnath Pty Ltd, are predicted to be impacted.

Overall, the applicant estimated the total lost value of the agricultural production from all impacts, including lost production and water diversion, at \$AUD 2.7 million per annum.

The applicant proposed to maintain agricultural land within the project site

Both the Department and the applicant identified the maintenance of agricultural production on land owned by the applicant as a principal mitigation strategy for the potential loss of agricultural production caused by the project.

The applicant committed to the management of agricultural land under its ownership, and to retaining a farm manager to oversee this agricultural production. Included within the applicant's identified mitigation measures are proposals to manage reductions in alluvial groundwater availability to productive areas, including those under natural sequence farming methods, through irrigation. However, the applicant's commitment was qualified by its statement that it would be unreasonable:

"to make a binding undertaking to keep a certain area under irrigated agriculture due to the time frame of the project and the potential changes to agricultural economics and technology."

The applicant also proposed to restore disturbed land to productive use

The applicant also proposed to rehabilitate the soils in mined areas to a BSAL-equivalent standard in accordance with criteria for fertility and productivity standards. The conceptual rehabilitation strategy would involve segregating and stockpiling soil resources, reshaping and forming the landscape and re-introducing soil resources. These areas would then be planted with pasture cover and managed to re-establish soil function and profiles. The stated intent is to re-establish BSAL equivalent landscapes, with a land soil capability equivalent to class three and four, consistent with the function and soil capability of the areas directly and indirectly disturbed.

The Commission questions downplaying the value of mapped agricultural land

The Commission is reluctant to accept that the importance of verified lands is reduced based upon their location (with respect to the equine CIC) and land soil capability (with respect to BSAL). Each of the verified and mapped areas of strategic agricultural land has been verified as meeting the requirements of the respective agricultural categories in the *Upper Hunter Strategic Land Use Plan*. While the Commission acknowledges that the plan provides limited guidance on how to strategically manage the coexistence of mining and agriculture, it does provide a contemporary approach to defining rare and valuable agricultural land attributes.

The Commission notes that while there is currently not an operating thoroughbred operation in the Bylong Valley, the key strategic and physical components associated with the identification would remain if the landscape was not mined. This would retain the capability of the identified areas of the equine CIC to contribute to future expansion of the thoroughbred industry.

This aspect was emphasised by the Hunter Valley Thoroughbred Association, who stated that the:

“Bylong Valley Equine CIC lands are highly cultivated and productive (particularly Tarwyn Park). They have been, and remain, an intrinsic part of the Hunter’s Equine CIC – both in terms of their historical significance and future potential for the growth of this sector”.

The Commission notes the applicant verified significant areas of BSAL within the project boundary. These lands underwent a soil capability assessment, establishing the impacted landscapes as class three and four. The Commission notes that these lands have high agricultural capability with moderate limitations and management requirements, and meet the criteria for BSAL.

Moreover, the Commission notes that while the comparative studies undertaken by the applicant to assess the role of natural sequence farming do highlight the similar overall nature of natural sequence farming managed areas to adjacent, non-managed areas, the assessment provided no real consideration of the (pre-natural sequence farming) baseline condition of the surveyed properties.

The Commission also notes that some mapped agricultural land occurs above the underground mine and could be affected by subsidence, while other mapped agricultural land would be lost through the establishment of biodiversity offsets for the project.

The Commission notes persistent uncertainty around the potential for offsite water impacts

The Commission has previously highlighted uncertainty in relation to the usage and security of the groundwater resources, particularly the alluvium utilised for agricultural production. These risks to groundwater resources could have an indirect impact on BSAL landscapes. Consistent with this view, the Commission is concerned that the project may not be able to entirely avoid off-site agricultural impacts, including to agricultural operations which are not currently owned by the applicant.

While the proposed conditions do require the establishment of a water sharing scheme and the provision of compensation requirements, there is significant uncertainty associated with the form and function of these provisions. A prominent issue in the submissions was that the timeframes for monitoring and mitigating potential impacts are unsuitable for a working agricultural enterprise. For example, it was stated that should an adverse impact to stock water supply be realised this could quickly lead to the death of livestock which could occur in a very short timeframe, too short to allow the impacts to graziers to be managed before possibly significant loss occurs. This situation potentially places additional pressure and commercial risk on local land owners.

The Commission is concerned about the proposed agricultural impact mitigation strategies

The Commission notes the risk that specific types of agricultural enterprise may result in production systems that are unable to appropriately respond to climatic and industry constraints and requirements. While the generic processes and commitments have been described by the applicant, detailed analysis of what shape these process and commitments would take is absent. As the maintenance of agricultural production has been identified as a principal and clear objective of the project, the Commission questions why it is not a binding commitment on the applicant.

The Commission notes persistent uncertainty around restoring disturbed land to productive use

The Commission notes that the reestablishment of a sustainable agricultural landscape is a complex process. Beyond the process of redistributing soil resources, considerable time and effort is required to restore the function, structure and cycles (both biotic and abiotic) present in functioning BSAL. Even with careful consideration of these aspects, success is uncertain, infrequently achieved, and contingent upon favourable climatic conditions.

The Commission notes that the NSW Department of Primary Industries highlighted in its submission dated 12 May 2016 several long term soil production and resilience parameters that should be incorporated into the rehabilitation strategy. While the applicant and the Department subsequently addressed some of those concerns, the focus has so far been on the physical nature of the rehabilitation strategy, such as the slope and soil depth (i.e. 'inherent fertility' parameters), and there is little consideration in the material provided to the Commission of the wider range of factors that would be important to restoring the long term agricultural function of the landscape.

The applicant acknowledged that, due to the recent introduction of the BSAL standard for assessing soil quality, no mines in NSW have, to date, returned agricultural land or soil profiles to equivalence, but argued that examples of mine rehabilitation returning mined land to a productive agricultural use post-mining do exist.

While the applicant referenced examples of success in this area, the Commission has not been provided with sufficient evidence to be satisfied that sustainable rehabilitation to the BSAL-equivalent land will be achieved. To assist in evaluating whether there is a reasonable chance of success, a more clearly defined picture of how success will be measured at a local level, particularly how success in restoring soil functionality will be defined and measured would be useful.

The Commission notes that these risks potentially exacerbate the overall agricultural impacts of the project because the applicant has placed a high reliance on the rehabilitation of a post mining landscape to a highly functioning agricultural landscape as part of its impact mitigation strategy.

The Commission recognises the important role that financial securities and bonds play in ensuring that the economic and environmental costs associated with incomplete or unsuccessful mine rehabilitation are not shifted to the public. However, the Commission notes that the NSW Auditor-General's recent audit on the management of mining rehabilitation security deposits found that:

"There is also no financial assurance held over the risk of significant unexpected environmental degradation in the long-term after a mine is deemed to be rehabilitated and the security deposit is returned. A security deposit is not an appropriate vehicle for covering this risk."

The Commission acknowledges that ultimately the rehabilitation plan will require additional studies to finalise details. However, it also notes that the proposed completion criteria for the re-instatement of BSAL equivalent soil relate only to the physical structure of the landscape, rather than its functionality. The Commission observes that there is uncertainty in the proposed rehabilitation and additional detailed information may be necessary to provide an appropriate degree of confidence that objectives would be achieved.

3.1.3 Summation of water and agricultural resource issues

The Bylong Valley currently provides for a variety of agricultural and pastoral pursuits including cropping and cattle grazing. Historically, thoroughbred horse breeding has also been successfully undertaken. Mining impacts to agriculture may result from both the direct displacement of productive and potentially productive agricultural land because of open cut mining and the construction of surface infrastructure, and from indirect physical effects on agricultural productivity, such as impacts that may result from loss of water resources or subsidence.

The Commission notes the release of the *Central West and Orana Regional Plan 2036 (2017)*. The regional plan re-affirms the identified importance of agriculture to the regional economy as set out in the *Upper Hunter Strategic Land Use Plan*. The plan identifies that highly productive agricultural land:

“requires ready access to water, high quality soils and suitable climates. While the total area of land available for agriculture is large, comparatively few locations have access to all these characteristics.”

Through both the *Upper Hunter Strategic Land Use Plan* and the *Central West and Orana Regional Plan*, the Bylong Valley has been identified as an important agricultural centre and verified to contain mapped strategic agricultural land. The consequence of impacting these lands and the proposed mitigation measures, including any conditions recommended by the Department need to be evaluated to reflect this importance and the high level of uncertainty associated with the management of these impacts to ensure agriculture can co-exist with the project.

The Commission recognises the relationship between the management of impacts to groundwater resources and the retention of agricultural productivity. This relationship makes the establishment of an effective water sharing and compensation program, including appropriate make good components, essential in limiting the impacts of the project on agricultural enterprises, and ensuring sustainable land use co-existence outcomes.

These issues require further detailed consideration before a decision is made about the project. However, the conclusion that might be reached is that any approval of the project would represent a fundamental shift in the valley in favour of mining as opposed to agricultural or pastoral pursuits, and that the water security on which agricultural activities depend, may be jeopardised, particularly during extended dry periods. The potential for this outcome should be considered in any decision about the project.

3.2 Social impacts on the Bylong village and surrounds

Mining projects can lead to acute social impacts in the localities where they occur, particularly when mining activities result in the displacement of local populations as well as physical changes to the environment. Socio-economic issues for the wider region, and particular social impacts in the Bylong Valley were prominently featured at the public hearing and in written submissions. The Commission’s focus here is the particular social impacts on the Bylong village and surrounds, as requested in the Minister’s terms of reference. Socio-economic issues for the wider region are discussed in section 3.5.7 of this report.

The Department’s report provides a useful summary of the social fabric of the Bylong Valley:

“The Bylong Valley is a rural community of approximately 100 residents. Bylong village is the focus of community activity and has a small general store, a community hall, sporting grounds, a church (St Stephens Anglican Church) and the Bylong Rural Fire Service (RFS). The Bylong Upper Primary Public School is located on Upper Bylong Road about 1 kilometre from the village, however the Department of Education and Training has closed the school due to lack of enrolments and has recently sold the land to KEPCO. The school is located within the project disturbance area for the open cut mine.

There are 3 houses in or near Bylong village, 2 of which have been acquired by KEPCO. The privately owned house is located to the south-west of the village (Receiver 60). The general store also includes a residence which is currently privately-owned (Receiver 65). KEPCO has offered to purchase these 2 privately-owned properties.”

The submissions raised issues with the social impacts that have already occurred in the Bylong Valley and those that might occur because of the project.

The submissions observed that “*only a skeleton community remains*” and argued that the community had “*disintegrated*”, largely because of the applicant’s property acquisitions. The submissions noted a strong sense of loss caused by the population decline, and expressed profound regret that the movement of long term residents away from established homes had affected local community organisations such as the Rural Fire Service as well as the village churches and school. The latter was placed into recess at the end of 2014 and later closed in 2015. It has since been acquired by the applicant.

Profound sadness was also expressed regarding the loss of local cultural traditions, including the cancellation of the Bylong Mouse Races in 2014. This 25-year-old, annual charitable event was once nominated for ‘Community Event of the Year on Australia Day’, and posted record proceeds and charitable donations as recently as 2013. Residents also wrote about the personal stress that has resulted from uncertainty around the location, timing and impacts of mining, while both residents and people from further afield wrote about their devastation at losing long and enduring family ties to the valley.

Moreover, people wrote about the social consequences of physical changes to the valley should mining proceed. The industrialisation of scenic, productive and historically important landscapes was described as significant and the irreversible loss of the valley’s rural character and ‘place’ value was highlighted in submissions. It was noted that the physical impacts of mining could also further marginalise remaining private landholdings while the removal or relocation of social fabric such as churches, graveyards (including exhumation of historic graves), the school, and meeting places would irreversibly erode social connections with the place.

For remaining residents, the destruction of the local social fabric was projected to be aggravated by proposed changes to the local road network, which are expected by objectors to impact travel times, property management regimes and road safety. The loss of agricultural land (including BSAL and equine CIC land) as well as tourism opportunities was considered to further compound impacts and make post-mining social recovery particularly difficult.

The depth of social concerns resulted in the Department commissioning a peer review of the applicant’s social impact assessment. This review found that local social issues and concerns had been given relatively superficial treatment by the applicant considering how profound the impact had been, and continues to be, on valley residents. The peer review highlighted that:

- several key social impacts on community structure had been overlooked, including the significant effects of property acquisitions and the community engagement process itself;
- the engagement process had fallen short of accepted standards for accuracy, completeness and transparency. Many residents would have been unable to contribute views about the impacts on their lives and daily activities; and
- there was no information on community health, little discussion of impacts arising from bio-physical factors (dust, noise, traffic, visual changes, water supplies), a lack of an evidence base from other mining projects, and a poor understanding of the processes and significance of cumulative change.

The peer reviewer recommended the avoidance or minimisation of further local level social impacts wherever possible, efforts to rebuild community relationships, and support for the co-existence of new and existing residents so that Bylong can survive as a village.

While the applicant challenged the peer review findings, the Commission also received various submissions outlining concerns with the applicant’s social impact assessment methodology. Those concerns include claims that:

- baseline data for the assessment had been obscured by the applicant's property acquisitions;
- social impacts had already occurred, and people who had already moved on may not have had opportunity to speak about those impacts;
- there was no rating or assessment of impacts against a defined assessment matrix and consequently the severity, extent and temporality of the impacts had been poorly evaluated;
- regional economic benefits had been emphasised, rather than local social impacts. Non-monetary and human values had been discounted;
- there was an inadequate assessment of cumulative social impacts resulting from the interconnection of other small rural villages and existing mines;
- there was an inadequate assessment of social impacts related to the resettlement of residents; and
- there was an inadequate assessment of impacts on wellbeing resulting from the extended period of uncertainty with the exploration and application process.

The Department maintained that it is acutely aware that the project had, and continues to have, a considerable effect on social structure, dynamics and cohesion in the local area. It said that the local community would bear most impacts but not receive a significant portion of the benefits in employment, contributions to community infrastructure or services. The Department goes on to say that these impacts are, however, inevitable where coal resources occur, and have been experienced in other small villages impacted by large resource projects. The Department also notes that the applicant's property acquisitions occurred on the open market.

Nevertheless, the Department recommended several mitigation measures to support what remains of the local community. These include that the applicant should:

- make every effort to provide funding to local community projects;
- retain agricultural productivity, where possible, within the project area and return disturbed areas to an agricultural land use following mining;
- afford acquisition and/or mitigation rights to the remaining noise affected residents;
- establish a Community Consultative Committee to ensure that the views and concerns of the community through its representatives are considered during the life of the project;
- undertake an oral history of the area, preparing archival documentation, relocating where possible important local historical items of importance to the local community and managing impacts on heritage items, including on Tarwyn Park;
- prepare a Burial Management Plan for exhumations from the church grounds; and
- assist the Rural Fire Service, and ensure the mine is equipped for fire-fighting.

The Commission is concerned that social impacts in the Bylong Valley have not been fully recognised

The project has already had significant adverse consequences for the existing social fabric of the Bylong Valley. The Commission notes that the acquisition of land for the project area has resulted in the depopulation of the valley, with profound consequences for its organically grown community networks.

The Department's assessment of social impacts and recommended mitigation measures appear to accept a degree of inevitability to these existing and potential social impacts; implying that they occur because of the location of the resource; that wider, regional benefits justify them; and in the case of the applicant's property acquisitions, that they occur under open market conditions.

The Commission is, however, concerned that the importance of social impacts may be diminished if there is a view that they are an inevitable consequence of the occurrence of a mineable resource. This concern is reflected in the Department's peer review, and in numerous submissions, which indicate that the severity of the impacts that have already occurred have been overlooked, and that the

community has not been properly engaged on the extent and temporality of the impacts that have occurred and that might be exacerbated should the project proceed.

The Commission is concerned with the Department's explanation that some social impacts have already occurred owing to open market processes considering that several public submissions indicate that some sellers may have felt that they had no option but to sell, and that there was a possibility that, having sold, the landowners may have no longer felt able to participate in the planning process, or may have been excluded from such processes by contractual provisions.

The Commission is also concerned that there does not appear to be any evaluation of the sufficiency of the mitigation measures proposed by the applicant and recommended by the Department. Indeed, some of the peer reviewer's recommendations appear to have been weakened in the Department's conditions, which require only that the applicant "*make every effort*" to contribute to local community projects, and maintain agriculture, but only "*where possible*". These terms seem to reinforce the Department's acceptance of the inevitability of local social impacts and reliance of open market conditions to protect the interests of impacted people without recognising the full significance of community impacts.

The Commission considers, as a result, that there are several inadequacies in the social impact assessment of the project, and as a consequence, the severity of the social impact cannot be adequately determined. In the absence of this information, any future evaluative judgement on the social benefits and social costs of the project will be impaired.

3.3 Impacts on heritage values associated with Tarwyn Park and Iron Tank

Tarwyn Park and Iron Tank are adjoining agricultural properties within the project area. The properties have been in common ownership for some time. Both properties have been acquired by the applicant and form part of the project area, proximate to the location of open cut activities. Original buildings from the early 20th century are present on the properties and there are associations with prominent families and champion racehorses. More recently, the properties have come to prominence as the original site of a land management practice known as natural sequence farming.

The land is within the Bylong Landscape Conservation Area of the Register of the National Trust of Australia (NSW). This conservation area was registered by the National Trust on 28 August 2013 and it recognises, among other things, Tarwyn Park and the development of natural sequence farming as aspects of the significant landscape.

Concern regarding potential impacts to the heritage values of Tarwyn Park, in particular, featured in submissions to the Commission. The properties are also the subject of an Interim Heritage Order request and State Heritage Register nomination.

The physical features of the properties include:

- Tarwyn Park House, an art nouveau style dwelling, designed by a prominent local architect and constructed in 1926 of locally quarried sandstone;
- stables, which were built prior to construction of the current Tarwyn Park House;
- various farm buildings, including a water tower, storage shed, cattle shed and yards;
- an archaeological site that dates to the Thompson period of occupation (1920s to 1950s);
- horse burials at the entrance to Tarwyn Park. The horses are Rain Lover (Melbourne Cup winner 1968/1969) and Eloisa, and date from the time of the property being used as a thoroughbred stud; and
- natural sequence farming structures and associated land management areas.

While acknowledged by the applicant to have some intrinsic heritage significance, neither property is currently listed locally or at State level for its heritage values. The applicant suggested that the properties have local historical, associative, technical, social, contributory, rarity and representative significance.

The GML report (see **Appendix 5**) however asserted that both the Tarwyn Park and Iron Tank properties satisfied several heritage significance criteria at State level, primarily for their associations with significant people in history, pastoralism, thoroughbred breeding, and natural sequence farming. GML accordingly placed greater heritage value on the properties than previously articulated.

The GML report set out a detailed account of the potential impacts to the heritage values of the property that would result from the project. The impacted values relate directly to the physical features of the properties as well as their wider landscape setting, and include:

- the historic setting and agricultural landscapes of the Tarwyn Park house, stables and Iron Tank, including the historic driveway and entrance to Tarwyn Park and its connection to Upper Bylong Road;
- the natural landscape, rural agricultural landscape, views to and from the homestead complex, and views and vistas to the north of Tarwyn Park;
- historic patterns of land use and circulation within these properties and between other agricultural properties, including patterns of movement among other items with heritage significance such as the church and post office;
- natural sequence farming features in the southwest corner of the property;
- physical evidence associated with the Melbourne Cup and thoroughbred breeding, evidenced by horse burials; and
- research potential associated with the historical archaeological evidence related to human occupation and agricultural activities since colonisation.

The GML report emphasised the importance of the landscape setting in which the properties occur. The report states, in part:

“[the properties are set] on the floor of the Bylong Valley and fringed by scenic picturesque skyline views to sandstone escarpments and vegetated slopes, the historic and evolving rural agricultural cultural landscapes associated with the properties Tarwyn Park and Iron Tank are aesthetically distinctive with positive sensory appeal.

The views and vistas from the homestead complex, seen from within and around the buildings and across the valley in all directions, contribute to the understanding and appreciation of the beauty of the natural environment. The landscaped setting, views and visual connections to other places from within Tarwyn Park and Iron Tank that link to other historic places along Upper Bylong Road contribute to the understanding of the area’s historical evolution as a rural village and have strong visual and sensory qualities.”

The applicant responded to the GML report (**Appendix 7**), disputing its findings about heritage significance and reiterating proposed (but not committing to any additional) heritage mitigation measures. In summary, those measures seek to minimise direct impacts to Tarwyn Park house and its stables, provide ongoing management of the buildings, the continuation of natural sequence farming (unless shown to be unviable, or where water supplies are prioritised for mining), management of the horse burials, and by making the property available for external study.

The Commission considers that impacts to Tarwyn Park and Iron Tank need to be re-evaluated

The Commission notes that both Tarwyn Park and Iron Tank form part of the project area, proximate to open cut activities, with parts of each property within the actual project disturbance area. The project disturbance area includes the entrance and part of the driveway to Tarwyn Park, interrupting the property's historical connections to the village, church and other elements of the landscape. Tarwyn Park would be accessed through the open cut pit, effectively isolating the property. The natural sequence farming areas and racehorse burial sites would also be directly impacted. Remaining farm buildings would be subject to visual impacts and vibration impacts.

The Commission notes the differences between the applicant's position on the heritage significance of Tarwyn Park and Iron Tank, and the GML report, with GML according a higher significance to the heritage values of the properties than the applicant. The Commission is persuaded that the properties have greater heritage significance than has been previously documented by the applicant, or considered by the Department or Heritage Council. As such, it is clear to the Commission that the documented impacts and mitigation measures to the properties need to be re-evaluated taking account of the potential for greater heritage significance.

The Commission also notes that assessment of the values of, impacts to and mitigation measures for the setting of the properties, which is currently part of the proposed disturbance area, is largely absent. The importance of the landscape setting is moreover elevated by the value placed on it by the community, and the designation of a Bylong Landscape Conservation Area by the National Trust. As the natural beauty of the area is widely recognised, the extent of its interruption by the project requires evaluation.

Although the GML report has been made publicly available, the Commission recognises that the timing of its publication (and the peer review that the applicant subsequently elected to submit) has meant that both public and agency responses to the findings and recommendations of the report have not been possible during the review period. The Commission considers that formal opportunity for public and agency review is essential prior to any determination.

The Commission notes that while the GML report makes findings on heritage listing criteria for Tarwyn Park and Iron Tank, eligibility for listing is a matter for the Heritage Council and Minister for Heritage rather than for this review.

The Commission's consideration of other historic and Aboriginal heritage matters is addressed in section 3.5.3.

3.4 Justification for the open cut stage of the project

The Bylong coal project has been presented for review by the Commission as an integrated open cut and underground mine. The applicant asserts that both the open cut and underground components are necessary for the mine to proceed and this is reflected in the proposed mine plan. While, the Minister's terms of reference request the Commission *"to assess the merits of the project as a whole ... paying particular attention to the justification for the open cut stage of the project"*, neither the applicant nor the Department have provided separate assessments of either component.

The submissions described significant concern about the suitability of the project site for either open cut or underground mining. The submissions highlight the open cut's comparatively high level of environmental impacts, and the irreversible effects on the landscape, water and agricultural resources, as well as fauna and flora. The submissions drew attention to the lack of detail around alternate development strategies. Some submissions also highlighted the project's dependence on future coal prices and the demand for thermal coal in South Korea, with the consequent risk that the

Bylong Coal Project may become a 'stranded asset', and an ongoing maintenance or rehabilitation legacy for the community.

The applicant asserts that the open cut and underground mine are interdependent

The applicant argued that the open cut and underground would depend upon each other in the operational mining sequence, and that early coal recovery from shallow coal measures by way of open cut mining would contribute to project feasibility.

The applicant and its peer reviewers highlighted the *"criticality of the short term open cut mining component of the project in regard to its economic viability and technical achievability"*, while also observing the proposed mine plan had already undergone significant refinement to minimise environmental impacts while maintaining an economically viable level of resource recovery.

The applicant explained that, under the proposed mine plan, the open cut void would be utilised for co-disposal of coal rejects and tailings from the underground mine, removing the need to develop and manage a separate tailings storage dam, and as a mine water impoundment. The void would be filled with spoil from the underground resulting in no residual void being present after mining operations.

The applicant asserted that it had carried out a broad consideration of the estimated level of environmental impact and the likely extent and recoverability of the coal resource in relation to five potential development scenarios, including the current mine plan. The applicant argued that, from its perspective, the current mine plan provides the best compromise between feasible resource recovery and environmental impacts.

The applicant explained that the combined underground and open cut improved project feasibility by reducing unit operating costs and providing earlier cash flow. The applicant's high level sensitivity analysis indicated that the combined open cut and underground mine would have a positive net present value of over \$800 million, but that the overall benefit reduces significantly without the early workings in the open cut and is negative on some scenarios.

Notwithstanding, the Department has indicated that the applicant is seeking to secure stable coal supplies from non-Korean sources and has identified the Bylong Coal Project as a key strategic resource for supply of thermal coal for its power generation over the next few decades.

Based on these feasibility, justification and operational analyses, the applicant argued the proposed open cut component of the project is reasonable and warranted.

The Commission notes gaps in the evidence supporting a combined open-cut/underground mine

The Commission recognises that the layout of the project represents a contemporary conceptual design. The integration of the open cut with the underground mines to ensure there is no final void is an advance on many mining operations throughout the Hunter Valley, although the Commission notes that this does not avoid permanent change in the landscape. The Commission also recognises that the conceptual mine plan has undergone significant revision to reduce landscape impacts.

However, the Commission is not yet persuaded by "all-or-none" arguments for the open cut and underground asserted by the applicant because they are at this stage, largely unsupported by probative evidence.

The applicant stated that four other mine development scenarios had been considered in developing the proposed mine plan, leading it to conclude that the development of the underground component in isolation would still require the disturbance of 400 hectares of land.

The applicant provided information that pointed to the financial benefits of an integrated operation compared with alternative development scenarios, but this information is not sufficient to support a definitive view on the case for the integrated project compared with an underground operation alone, or no project at all, given the range of other factors, such as landscape disturbance, water impacts and visual amenity, that would need to be considered. The Commission is also reluctant to accept an argument that avoidance of the need to disturb 400 hectares for the underground alone is a compelling justification to disturb an additional 600 hectares of land for the combined operation.

The Commission notes that a large proportion of the adverse impacts of the project are associated with the open cut portion of the project. The development of the open cut component would significantly increase the risk of water resource impacts, agricultural impacts, noise and dust impacts, as well as impacts on visual amenity, and endangered native species and vegetation. The open cut would also generate a significant part of the requirement for surface rehabilitation, which carries a high level of cost, uncertainty and consequence.

While the Commission acknowledges that solely developing the underground portion of the project would result in environmental risk and impact, sufficient information was not provided to support a comparative evaluation of the relative levels of impact, risk, environmental costs (including mitigation and remediation). The Commission would expect that the overall environmental and other impacts arising from the project would be reduced if the open cut portion of the project was not developed, but is not in any way in a position to assess the extent to which this would be the case, or whether such a more limited development would be in the public interest.

The Commission notes conflicting arguments in the applicant's justification for the open cut

The applicant's stated reason for developing the project is to increase the level of resource security for electricity generation in South Korean markets. The applicant also claims that the feasibility of the whole project falls into question based on the reduced net present value estimates that result from developing the underground mine only. However, the applicant has made conflicting assertions; on the one hand arguing net present value would be negative, while the peer reviewer suggested it would be positive, but small, and in any case, the business case for the mine needs no scrutiny.

The Commission notes that the target open cut coal seams provide only moderate quality coal, which despite having a low sulphur content contains a moderate to high ash content. In addition, the open cut is targeting a relatively small proportion (only 8%) of the identified resource accessible by open cut operations and 26% of the estimated total project production. The applicant explained that if the low strip ratio of overburden to coal resource were higher, the measured quality of the coal would not be sufficient to warrant mining, indicating the possibility that the open cut is a marginal case and increasing concern regarding the high level of importance placed on this component of the project.

The submissions pointed to risks attached to South Korea's future demand for thermal coal. The Commission notes that the recently elected President of South Korea has indicated that he would be seeking to reduce the country's dependence on coal power. The South Korean Government recently announced that it would lower the share of coal power by shutting down old coal-fired power plants and restricting the construction of new coal-fired plants in the future.

While the Commission acknowledges that policy commitments can change, these developments do raise a question about the risks attached to the project and the overall merit of an open cut operation that front-end loads the adverse impacts and costs associated with the project.

In summary:

- the Commission notes that the project as it stands is based on an integrated open cut and

underground operations. Neither the applicant nor the Department have provided adequate information or analysis that would allow the benefits and costs of the open cut to be isolated from other elements of the project. The information that is provided is moreover incomplete and at times contradictory; and

- as it stands, there is insufficient evidence to conclude that the open cut is vital to the project, or that an alternative development without the open cut would not be in the public interest.

3.5 Other issues related to the Minister's terms of reference

3.5.1 Landscape and visual impacts

The project is in a recognised scenic rural area, characterised by rugged vegetated ridgelines and enclosed pastoral valleys. The valley is a greenfield location and while there are mines nearby, the Bylong valley is presently differentiated by the absence of mining activity.

The submissions emphasised the proposed change from a rural agricultural setting to an open cut mining 'industrialised' landscape. There were also concerns regarding the irreversibility of these changes, and whether the visual impacts could be suitably remediated. Potential damage to the cliff lines in and near the project site because of subsidence due to underground mining operations is a further concern.

The applicant explained that the impacts would be most severe within 2.5 kilometres of the project site, most prominent from the northern and eastern view sectors of the Bylong Valley Way, and from some private residences. The applicant defined a 'percentage of view' occupied by the project, and estimated this to be less than 2.5% of what it called the 'primary view area' from Bylong Valley Way. The applicant noted that there would be years where the impacts are moderate to severe until open cut mining is completed and the disturbed areas are revegetated.

The applicant explained that landscape and visual impacts would mostly relate to landform, lighting and cliffs in the project area and project vicinity. The applicant explained that the final landscape of the project site would be altered through the establishment, management and closure of the overburden emplacement areas (OEA), which would be up to 45 metres above ground, and the mine voids. The treatment of the OEAs and the residual mine voids would be, according to the applicant, shaped to reflect variations in the natural topography, and the eastern OEA would have a distinctly modified topography in comparison to the unmodified landscape.

The applicant explained that lighting impacts at sensitive locations would be low because the natural topography surrounding the project site, including areas of retained vegetation, would shield nearby sensitive receptors. Impacts at more distant receptors, such as the Capertee Valley, were considered to be minor based upon screening by the natural topography.

Over 689 cliffs were identified by the applicant near the project, but not overlaying the proposed underground mine. Six of these cliffs were identified as important or prominent.

Forty-one cliffs were identified within the subsidence zone. Of these, 30 cliffs directly overlie longwall panels and are forecast to experience a maximum total subsidence of 3.3 metres, resulting in rock falls along up to 20% of the length of the cliffs, and visible subsidence movements and cracking along up to 50-70% of the cliffs. The predicted levels of strain and far field movements for cliffs outside the longwall mining area, including the six prominent cliffs, are predicted to be minor, resulting in relatively small impacts, such as minor cracks and rock falls.

The applicant explained that the overall impacts to cliffs would be minor, with most mapped cliffs not exhibiting any significant, visible, change to form or stability. The applicant maintained that where impacts do occur they are likely to impact minor cliffs and/or be suitably shielded from public views by existing vegetation and the current topography.

The Department acknowledged that the project would result in changes to the visual landscape of the Bylong valley. However, the Department considered that these impacts would be localised and generally screened from public view by the surrounding landscape. The Department concluded that while the project would transform the local landscape from a rural setting into a mining/industrial setting, longer term project landscape treatments would generally return the site to a rural setting.

To manage this transformation the Department recommended conditions requiring the applicant to implement mitigation measures to reduce the visibility of the mine operations on privately-owned receivers that have direct views of the mining operations. This includes screening along affected roadsides as well as other measures to reduce visual impacts.

The Commission is concerned about the significance of landscape impacts

The Commission is concerned about the significance of the visual impacts on the valley. The evaluations and estimates of the risks of impacts to a greenfield location are, by necessity, speculative. There is a potential for these impacts to be more severe than predicted.

The Commission notes that the transformation of the Bylong valley landscape would be in large part, irreversible, and that it is not possible for landscape treatments to return the valley to its current appearance. The Commission considers that the project would result in a shift from an agricultural landscape, recognised as exceptional by the National Trust, to an industrial setting.

The Commission recognises that the landscape treatment of mine voids and OEAs is intended by the applicant to manage and minimise the impacts to the landscape of the Bylong Valley. However, while the physical reshaping of the disturbed landscape may mitigate the severest of impacts, the revised landform will be substantially different to the current valley morphology. The Commission also notes the applicant has proposed to 'enhance' screening provided by the topography of the valley through vegetation planting, to reduce the visual impacts to sensitive receptors. As with revegetation on rehabilitated areas, these plantings are expected to take several years to grow to a suitable size to act as effective screens. The Commission considers that even with these landform and landscape treatments, some visual impacts would be permanent, while others would be long lasting.

The Commission notes that the applicant committed to developing a cliff subsidence management plan, including measures to monitor ground movements and the condition of the cliffs as each longwall panel is extracted. The Commission supports in principle the refinement of the subsidence model based upon real data, however the Commission notes the potential for greater than anticipated change to result in irreversible damage to the cliff lines.

The Commission notes that the stated level of lighting impact and proposed management strategy for both direct and diffuse light impacts may not have been considered against the NSW Government's Dark Sky Planning Guideline, particularly in relation to cumulative impacts with mines between the project site and the Siding Spring Observatory.

3.5.2 Biodiversity

Public submissions regarding the project raised several concerns in relation to direct and indirect impacts to endangered and critically endangered species and ecological communities. The submissions highlighted the importance of conserving the biodiversity in the Bylong Valley and concern that the NSW Major Projects Offset Policy and supporting Framework for Biodiversity

Assessment (FBA) had not been applied appropriately. The submissions raised specific issues about whether impacts to the Brush-tailed Rock Wallaby, or to the regionally significant Regent Honeyeater had been adequately assessed, and whether exemptions and transitional arrangements had been properly applied in the assessment of the project.

The applicant surveyed the project site and recorded three threatened ecological communities including the endangered Box-Gum Woodland and Derived Native Grasslands (White Box Woodlands), and three potential groundwater dependent ecosystems. Thirty-one threatened species, including the critically endangered Regent Honeyeater and endangered Brush-tailed Rock Wallaby were also recorded during surveys. A further 31 threatened species were identified as potentially occurring at the project site and were included on a cautionary basis.

The applicant predicted that the project would result in the direct disturbance of 753 hectares of native vegetation for the development of the open cut mine, spoil emplacement areas and mine infrastructure. This would include the loss of 264 hectares of mapped threatened ecological communities, including 251 hectares of White Box Woodland, and habitat for threatened species, including 180 hectares of Regent Honeyeater habitat.

A further 1,698 hectares of native vegetation, including 961 hectares of threatened ecological communities, and an estimated 822 hectares of Regent Honeyeater habitat are mapped within the subsidence impact area. Retained areas of native vegetation and flora and fauna habitat may also be indirectly impacted through construction and operation impacts including mine lighting, dust deposition and noise impacts. While potential groundwater dependant ecosystems were identified on site, the applicant argued that the impacts to these communities would be minimal due to their likely limited reliance on groundwater and the project avoiding the alluvial flood plain.

A total of 730 cliff lines of varying scale, complexity and with varying cave numbers were identified in and adjacent to the project site. The cliff lines provide habitat for protected bat species and the endangered Brush-tail Rock Wallaby. The applicant's subsidence report identified that these cliff lines could be impacted by earth movements triggered by subsidence which could result in cliff falls.

The applicant proposed that these impacts can be effectively managed and/or compensated for through various means. Seven land-based offsets areas have been proposed, including 1,512 hectares of land in the subsidence impact zone, to compensate for vegetation cleared during the development and operation of the project. Indirect impacts, such as from mine subsidence, have not been included in calculating the offset requirements for the project, but are predicted by the applicant to be minor and could be managed through either passive or active remediation. Impacts from cliff falls would be managed through ongoing monitoring and revised mine planning to minimise risks to the potentially impacted cliffs following refinement of the subsidence prediction model.

The Commission notes that the finalisation of a significant area of biodiversity offsets (i.e. the areas in Offset 5 impacted by subsidence) would occur after the commencement of the project. The appropriateness of this approach should be considered in any future decision about the project.

The Commission also notes a number of matters that will require careful consideration prior to a decision about the project, including:

- impacts associated with subsidence deformation in relation to the structure and form of native vegetation, which might need to be managed alongside subsidence remediation;
- potentially observable impacts to identified groundwater dependent ecosystems enough though they are unlikely as they occur in the riparian corridors of the creeks that are largely

ephemeral and already subject to natural variations in flow. Such impacts may nevertheless need to be very carefully monitored and managed;

- verifying that areas of vegetation consistent with the total areas proposed to be cleared are present as offsets in suitable locations, quantities and qualities to maintain landscape connectivity; and
- being satisfied that disturbed areas are expected to be rehabilitated and result in the successful establishment of suitable vegetation communities.

3.5.3 Aboriginal heritage

The Department reported that a total of 144 Aboriginal cultural heritage sites would be impacted by the project with 102 within the disturbance area, and 42 within subsidence or blasting impact zones. Many of the sites with moderate or high significance, including rock shelters, are situated in the subsidence zone where it coincides with the elevated, wooded landscape of the Bylong State Forest.

The Office of Environment and Heritage (OEH) noted the independent rock art specialist report engaged by the applicant, and raised issues with the attributes and potential significance of an ochre site that occurs within the subsidence zone. The OEH also noted the lack of assessment of some Aboriginal sites as well as the need to consider the level of cumulative impacts to Aboriginal heritage with the expansion of mining interests in the region.

The Department reported that the applicant agreed to resolve the OEH issues and included a consent condition requiring the applicant to prepare and implement an Aboriginal cultural heritage management plan. The plan is to be prepared in consultation with the OEH and registered Aboriginal parties. It would deal with, among other things, the salvage of impacted sites, archival recordings and further investigation of unassessed sites and re-evaluation of the ochre site

However, the Commission notes that the applicant considered it “*unreasonable*” for the OEH to expect the cumulative assessment to use the same methodology as others, and that in providing its comments, the OEH had not considered the occurrence of Aboriginal heritage in the “*vast areas of land covered by National Parks and Nature Reserves*”. While the applicant explained that it would prepare methods of cumulative assessment in line with the OEH advice, as well as carry out a more detailed assessment of the ochre site and Aboriginal sites within the biodiversity offset areas, it is unclear to the Commission whether there is agreement on the method and scope of work to be done.

It appears to the Commission that further investigation remains to be completed to properly assess the expected impacts to Aboriginal cultural heritage. The work will also require an agreed approach among the relevant parties, including the OEH.

3.5.4 Historic heritage

Several submissions highlighted concern regarding impacts to the heritage features of the Bylong village and its surrounds. Much of this concern focussed on impacts to Tarwyn Park and Iron Tank properties as discussed earlier in section 3.3. However, there was also concern for visual impacts to the landscape of the valley, the removal or relocation of some of its historic buildings and the disruption of traditional visual and landscape links between the buildings that are to remain. Particular concern was expressed for the applicant’s proposal to exhume graves from the curtilage of the Sacred Heart Catholic Church.

The applicant provided an assessment of the impacts to locally significant heritage values likely to be impacted by the development and operation of the project. This assessment identified 18 items within the project boundary that have been assessed as having local heritage significance. Three of these are listed on the non-government National Trust (NSW) Register. Six heritage items, including the National

Trust recognised Our Lady of the Sacred Heart Catholic Church and Cemetery are located within the project disturbance area and would be directly impacted by the project. Twelve additional sites, including the National Trust (NSW) Register listed Bylong St Stephens Anglican Church and Cemetery (including 44 graves) and the Bylong Landscape Conservation Area, would be indirectly (visually) impacted by the project. No historic heritage sites are in the subsidence area.

The applicant concluded that the heritage impacts to these sites would either be minimal, or where direct impacts were likely, that the corresponding sites had limited heritage value beyond the local context. The applicant proposed several measures to reduce or manage impacts to these sites. These measures include:

- undertaking archival recordings, archaeological test excavation for the sites to be directly impacted by the project;
- exhumation of the graves in consultation with descendants and in accordance with applicable statutory requirements;
- undertaking landscaping treatments to screen views and minimise impacts, and progressively rehabilitating the site; and
- relocation of heritage items, if reasonable and feasible.

The Department concluded that the impacts to these heritage sites were acceptable and could be appropriately managed through the applicant's proposed strategy. It reported that the Heritage Branch of the Office of Environment and Heritage did not raise particular concerns, but suggested a number of additional mitigation measures, which included the preparation of an interpretation plan for the valley, conservation management plans for the heritage buildings that are to remain or be relocated, and the erection of a memorial in the local area for any exhumed graves that are to be re-buried outside the local area. These are included in the Department's recommended conditions.

The Commission acknowledges that some aspects of locally significant heritage will be impacted by the development of the project. The Commission acknowledges that the applicant and the Department have worked with the Mid-Western Regional Council and the Office of Environment and Heritage to develop a strategy to manage the impacts to items of local heritage significance. However, the Commission considers that these impacts potentially have a significant interaction with the social impacts of the project.

3.5.5 Transport and traffic

Mid-Western Region Council, Muswellbrook Shire Council, and public submissions raised concerns about continuity of access via local roads (through construction, operation and subsidence phases of the mine), the requirement to carry out road safety upgrades in the wider area, road maintenance funding, and issues around the origin/destination data of mine worker traffic and mine haulage vehicles.

The Department recommended that the applicant be required to:

- contribute funding toward road safety upgrades and maintenance in the wider road network;
- maintain access to nearby properties through the upgrade and realignment of local roads;
- confine larger heavy vehicles to Wollar Road from Mudgee (and prohibit use of the southern and eastern routes, and Ulan-Wollar Road);
- prepare a plan for the management of commuter fatigue, which should include car-pooling and a mine-worker bus-service; and
- ensure shift changeover does not coincide with the time of operation of school bus services.

The Commission notes that funding arrangements for road upgrades and maintenance would be agreed between the applicant and Council in time for those agreements to be scrutinised as part of

any future decision about the project. Similarly, the details and timing for realignment works to maintain access continuity in the local road network should also be available to inform any future decision on the project.

However, the Commission notes that the applicant's commitments around commuter safety and haul road usage remain uncertain. Muswellbrook Shire Council highlighted concerns in relation to the likelihood of mine traffic originating within Muswellbrook Shire, which is geographically closer to the project than Mudgee and was argued to have a higher capability to provide the materials and labour likely to be required by the project.

Muswellbrook Shire Council provided an independent appraisal of the applicant's traffic assessment, which challenged elements of the applicant's analysis, including delivery routes, timetables, material quantities, and mine worker origin/destination assumptions. The report examines the occurrence of mine traffic on roads in the Muswellbrook Shire that ostensibly have mine traffic restrictions and it highlights the risk in setting conditions of consent to regulate third parties, such as by way of directing mine employees and contractors on their modes of transport and the routes they must take. The applicant elected to submit a further 'peer review' of Muswellbrook Shire Council's independent report (**Appendix 9**), although the Commission notes that it relied on earlier material provided by the applicant.

The Commission is concerned about the ongoing management of subsidence impacts to the Bylong Valley Way from a public safety perspective. The Commission notes that the Bylong Valley Way is likely to experience an overall increase in traffic, including mine related traffic, and that the predicted levels of subsidence and surface cracking could have an impact on the safe operation of the Bylong Valley Way. The Commission notes subsidence impacts have been successfully managed in other road networks, including the Charlton Road, Hume Highway and Appin Road as referenced by the applicant. However, the Commission considers that for this to be successfully achieved, binding and comprehensive commitments need to be established and implemented relating to timely monitoring of impacts on the road surface attributable to subsidence and prompt remediation action to ensure road safety.

The Commission also notes that the impacts of increased traffic movements in relation to school bus services was not considered in respect of heavy vehicles other than B-doubles. The applicant identified a significant change in the volume of heavy vehicle traffic, particularly between Mudgee and the project site, which has the potential to coincide with the operation of school bus services.

3.5.6 Amenity impacts – air quality, blasting and noise

The Department provided a comprehensive review of the potential air, noise and blasting impacts that would result from the project. The Commission recognises the government policy arrangements regulating the Department's assessment of these impacts, the role and expertise of the Environment Protection Authority in advising the Department on predicted impacts and suitable mitigation measures, and the conservative methods of impact modelling and prediction.

Overall, the Department presented an argument showing that the project could, with the proper oversight of a modern suite of consent conditions, largely comply with the relevant air, noise and blasting criteria set out in the relevant government policies. The Commission recognises that this degree of compliance is largely due to the applicant's recent and ongoing land acquisition strategy whereby properties that are predicted to experience non-compliant impacts have been or are proposed to be purchased by the applicant.

At the time the Department referred its report to the Commission, the applicant had not reached an agreed purchase arrangement with several of the landowners affected by such non-compliant impacts. In those cases, the Department recommended, according to its Voluntary Land Acquisition and Mitigation Policy (VLAMP), nominating those properties in the consent conditions to have voluntary acquisition rights. The effect of such a nomination allows a landowner to offer their adversely affected property for sale to the applicant and the applicant must purchase it.

The Commission notes a submission on behalf of the landowner of nearby 'Cherrydale Park', which disputes the Department's exclusion of the property from the application of the VLAMP, and whether there is a need for other air quality mitigation measures.

The Commission notes that the Department recommended several residual matters be dealt with in post-approval arrangements. However, the suitability of this approach will require careful consideration before a decision is made about the project. It appears to the Commission that there is residual uncertainty around the:

- mitigation measures that could reasonably be deployed to minimise diesel emissions (as raised by the EPA);
- suitability of background data used in the air quality model;
- incomplete analysis of the low frequency noise spectrum and third octave bands under the modified UK Department of Environment, Food and Rural Affairs' method of assessment; and
- noise and air quality impacts that approach the limits of acceptability for receivers that have not been nominated under the VLAMP for acquisition, particularly Cherrydale Park.

The Commission notes the Department recommended pro-active and predictive management of amenity impacts. However, it appears to the Commission that these residual uncertainties could be remedied before a decision is made about the project, or alternatively, in relation to air and noise impacts, could be the subject of a more cautious approach in the application of the VLAMP.

The Commission is concerned about the Department's recommended approach to blast impacts on heritage features and sensitive sites, including Tarwyn Park. It appears to accept either blast specifications that will not cause impacts, or blast specifications that are likely to cause impacts, provided any subsequent damage is remediated. This either/or approach will require careful consideration before a decision is made about the project, particularly in light of the potential for Tarwyn Park to be judged to have greater heritage significance than previously thought. If damage is to be permitted to occur by way of a management plan, the particulars of likely damage and proposed remediation measures ought to be available to the determining authority and not simply deferred to post approval arrangements.

3.5.7 Additional socio-economic issues

The Commission encountered several socio-economic issues in its engagement with the Mid-Western Region Council, and at the public hearing, that were broader than social impacts to the Bylong Village and surrounds as referred to in the Minister's terms of reference.

On-site workers' accommodation facility

While acknowledging the contribution of mining projects to the local economy, Council indicated that it was not prepared to support the provision of an on-site workers' accommodation facility. Council noted that the applicant's arguments for an on-site facility, (i.e. its construction work force estimates) were unverifiable, and that accommodation and services in the local region had been sufficient for both construction and operational work forces for mining projects in the Ulan-Wilpinjong-Moolarben cluster. Both Council and speakers at the public hearing said that on-site accommodation for workers would generate potential problems of social isolation that have been experienced at other project-

related accommodation facilities and would mean that some of the potential economic benefits of the project would bypass the region.

The Department suggested that the proposed accommodation facility was essentially the applicant's risk management strategy if short-term accommodation for construction workers could not be secured during peak construction periods. The Department does not appear to have been fully convinced by the applicant's arguments, however, and reached a compromise whereby the applicant could submit more detailed justification for the facility, in consultation with Council, if the project proceeds.

The Commission notes the uncertainty in the Department's compromise position. The compromise effectively defers until after approval, a critical element of the overall mine strategy. An on-site accommodation facility has not historically been necessary for other mining projects in the region. Moreover, its provision is likely to be accompanied by impacts, to the local community and to the wellbeing of workers, of a kind that have been well documented for remote mining projects elsewhere. These impacts may be significant and it may be inappropriate to defer their assessment to the post-decision domain. The Commission also notes that some of the socio-economic benefits of the project would be eroded by the provision of on-site workers' accommodation.

The risks of project discontinuation

The Commission also heard concerns at the public hearing that the mine would not be viable due to declining coal prices and demand. A verbal submission indicated that industry analysts are sceptical of the need for new mining projects generally, and especially on greenfield sites. The submissions noted that the project could now be in doubt because of the recent South Korean presidential election and that there would be a significant negative social and environmental legacy of an approved but un-commenced or partially commenced project, or a discontinuation of mining.

The applicant explained that it had not put a case for the financial viability of the project as it is not a relevant matter for consideration. It said that:

"International mining companies routinely make investment decisions across their portfolios that on the surface may appear sub-economic, but for other strategic reasons are attractive to the broader business ... if the mine is truly not economically viable ... the project would be unlikely to proceed. This would result in the claimed benefits of the project not being realised, but would equally mean that none of the impacts of the mine would eventuate either."

While the applicant's business case for the mine is not a relevant matter for a decision about the project, the Commission notes that the project will lead to substantial and irreversible social and environmental impacts, while there is a risk that its stated benefits may only be partially realised, or not realised at all. The risk of project failure, especially if the project has a non-commercial imperative, is likely to continue to be a particular concern for the community, as has been represented in submissions.

3.5.8 Cost Benefit Analysis

The applicant claimed that the project would provide production benefits to NSW over the life of the project of \$846 million in nominal dollar terms, consisting of \$756 million in company tax payments, \$763 million in royalties and \$9 million in payments under voluntary planning agreements. The cost benefit analysis submitted by the applicant identified net benefits to NSW over the life of the project of \$314 million in net present value terms.

The peer review of the economic assessment conducted for the Department by the Centre for International Economics raised questions about aspects of the analysis that generated these results, but nonetheless acknowledged a minimum potential net economic benefit from royalties of \$177 million (present value). While it acknowledged the complexity of estimating the net benefits of projects, the Department accepted the view of the peer reviewer that the project's economic benefits would significantly outweigh its costs, from an economic perspective.

Several submissions explained that the region had undergone a period of decline, particularly around Kandos and Rylstone with the closure Kandos Cement, Sibelco's lime plant and the Charbon colliery. These speakers said that diversifying the economy with additional mining inputs was important to maintain economic growth. The Bylong Coal Project would provide direct and indirect employment and its capital investment would result in royalty and tax revenue for the State.

However, a number of submissions noted that the main economic benefits would flow to South Korea, while impacts would accrue locally.

The Commission also heard concerns that the cost benefit analysis did not accurately reflect the likely economic costs and benefits of the project. The submissions challenged the coal price assumptions in the cost benefit analysis and argued that the sensitivity analysis was flawed. Other submissions noted that the cost benefit analysis for the project assumed that mitigation and offset measures would entirely offset the project's impacts, which they argued was an unrealistic assumption that serves to overstate the value of the project. Other speakers challenged the methodology by which the greenhouse costs associated with the project were valued at close to zero.

The input-output methodology that generated the applicant's estimates of local economic impacts was also challenged. The peer reviewer considered that the estimates of regional effects should be regarded as an upper bound and pointed to alternative measures of regional flow-on benefits derived from Computable General Equilibrium (CGE) modelling. Another expert submission argued that the input-output analysis is based on multipliers that are mathematically certain to overstate the employment impacts of a project and suggested that the impact analysis assessment should be read with the knowledge that it is likely to significantly overstate the positive impacts of the project.

The applicant disputes claims by the public against the project and the methods used to evaluate its economic benefits: By way of summary, the applicant:

- stressed the reasonableness of the assumptions behind the estimated monetary value of the project;
- asserted that the cost of impacts had been (or would be) fully internalised to the project by acquiring farms and water access rights, and by paying for other impact mitigation measures; and
- asserted that its approach complied with NSW Treasury guidelines.

Commission notes shortcomings in the cost benefit analysis and economic assessment

The Commission recognises that cost benefit analyses are required to be prepared in the development application process and acknowledges that they can assist in understanding the economic implications of major projects. However, the Commission also recognises the limitations of the cost benefit analysis approach and notes that the methodology rests on a range of contestable principles and value assumptions. A cost benefit analysis cannot in itself provide a definitive or comprehensive statement of economic impacts, given the assumptions, uncertainties and exclusions involved in constructing a cost benefit analysis, but can provide a useful input to the consideration of the overall social and economic consequences of a project.

It is necessary, however, that decision makers have access to as full an understanding of the potential impacts of a project as possible, and the Commission notes that the assumptions underpinning the cost benefit analysis for the project were not fully transparent and in some cases, could be problematic. Submissions argued that the coal price assumptions in the economic assessment were optimistic. The peer reviewer also noted that the cost benefit analysis uses a US/AUD exchange rate higher than is currently the case. Another expert submission argued that the methodology for the sensitivity analysis lacked transparency and that the results could not be replicated.

The Commission is concerned about the relatively narrow range of assumptions in the calculation and the exclusion of some potentially negative impacts. Consideration of the proposal across a wider range of price and exchange rate values would generate different outcomes. A different approach to externalities would potentially reduce the calculated benefits. Some specific externalities include the greenhouse and transport (accident) costs. There is also arguably a case for reconsideration of the loss of heritage values associated with Tarwyn Park and other heritage items within the valley. The inclusion of government funding, for example, for the Bylong-Wollar Road, would also reduce the calculated benefits. While these factors may not produce a negative net present value in a cost benefit analysis, they should be included in the analysis to support transparent decision making.

While the Commission notes that input-output analysis is recognised as an appropriate methodology for the assessment of local area economic impacts in the relevant NSW Treasury Guidelines, it also notes that the Guidelines warn that this approach has been criticised for overstating positive impacts. The Commission suggests that an assessment based on alternative measures derived from Computable General Equilibrium (CGE) modelling would help to calibrate the expected welfare gain to the community.

The Commission notes that the claimed benefits to the State are relatively small in each year of the project, and would not flow until sometime after initial adverse impacts are incurred. The critical issue for a proper assessment is not the nominal value of the gross benefits claimed for the project over its entire life, but the extent to which the claimed benefits exceed the costs, including the unquantified externalities and costs not included in the analysis, such as the permanent, irreparable change to a valuable rural landscape with roots in Australia's agriculture and equine heritage, and the risks attached to the achievement of those benefits.

The Commission considers the economic assessments provided by the applicant currently lack the comprehensiveness, rigour and transparency required to enable a decision-maker to make a fully informed judgment about the mix of input assumptions that generate the claimed net benefits for the State and the probabilities attached to those assumptions.

4. SUMMARY OF THE COMMISSION'S FINDINGS

This summary is intended to provide an overview of the Commission's findings and is not an attempt to collate the various findings documented throughout this report. All the findings in the previous sections of this report need to be taken into consideration, not just those specifically mentioned in the following summary.

The Commission acknowledges the strong views expressed both for and against the Bylong Valley project, at the public hearing, in written submissions, and by those community members and community organisations that elected to protest outside the public hearing.

The Commission also acknowledges that a significant body of additional information was presented to it as part of this review, which was not previously available for consideration by the Department, or the public. This includes compendiums of information from the applicant (as attached in the

appendices to this report), the coming into effect of the *Central West and Orana Regional Plan 2036*, as well as particular technical reports such as the independent traffic study prepared on behalf of Muswellbrook Shire Council and the GML heritage report into the heritage values of Tarwyn Park and Iron Tank (also attached).

In summary, through this review the Commission has found uncertainty and incomplete information regarding the risks of the project. The Commission considers that for a greenfield proposal in a location recognised for its agricultural capacity, exceptional scenic value and heritage importance, caution and great care will be required in weighing the benefits and costs of the project in order to arrive at a balanced decision about competing land uses and interests.

Overall, the Commission recognises the competing land-use objectives in the Bylong Valley, which place high value on maintaining areas of important agricultural land, the cultural, natural heritage and exceptional visual amenity of the region, as well as the sustainable and economic development of mineral resources. The Commission observes that while development of the project could make some contribution to the regional and State economy, other local industries, the community and the natural attributes of the Bylong Valley would be likely to be adversely impacted.

The Commission notes from multiple iterations of the groundwater model that doubt persists about the availability of water resources to the project and for other land and environmental uses. In view of the characteristics of the alluvial aquifer relied upon by the project, the Commission considers there is uncertainty around the probability of impacts and the potential consequences. Similarly, the probability of mine water discharge and the potential consequences for the wider catchment presents risks that are sufficient to warrant detailed evaluation prior to a determination.

The validity of arguments that downplay the value of mapped equine CIC and BSAL agricultural land is also unclear to the Commission. The *Upper Hunter Strategic Land Use Plan* (2012), under which the land has been verified, is a recent policy of the NSW Government and explicitly defines land attributes that are rare and valuable. Moreover, the proposed mitigation strategies, such as the provision of make-up water, continuation of agricultural productivity, and the restoration of disturbed land to productive use, have not been adequately demonstrated to be able to be successful, and are in addition not all proposed to be binding commitments on the applicant.

The evaluation of visual impacts in a greenfield location is additionally emphasised by the irreversibility of changes that may occur because of mining activities. Proposed landscape treatments are at best long-term in their execution, with few examples of successful implementation. Even with landscape treatments, the morphology of the valley would be substantially and permanently altered. This should be given in-depth consideration in any decision about the project.

The potential for greater heritage significance than previously assessed for the Tarwyn Park and Iron Tank properties also needs to be addressed. Further consideration of the relationship of the project to these properties and to their landscape setting is important in view of the GML report, and the listing of the Bylong Valley by the National Trust. The project approach to the open cut, as well as blasting, also requires review in light of heritage concerns.

Concerns were raised about the applicant's property acquisition strategy masking the severity and extent of social impacts that have already been incurred and would likely continue. The social impact assessment of the project does not recognise the full extent of this social interruption, which means that it is difficult to evaluate the sufficiency of proposed mitigation measures. Moreover, the provision of a workers' accommodation facility could be accompanied by social problems of a kind well

documented elsewhere, and these have not been effectively considered given the uncertainty about whether such a facility will be required.

A large portion of the project's impacts would be associated with the open cut operation. The project presented to the Commission is an integrated underground and open cut coal mine. There is insufficient evidence to conclude that the open cut is essential to the project or that alternate development options, or no development at all, would not better serve the public interest. Moreover, the cost-benefit arguments presented for the project lack the rigour and transparency that would be required to fully evaluate the claimed benefits, the costs of impacts and the risks attached to the project. The risk of project failure or abandonment after commencement is of concern to the community. Many of the project's impacts are front-loaded and may be incurred before full benefits for the region are realised.

The Commission highlights other residual matters in this review that require further clarification:

- further investigation of Aboriginal cultural heritage matters is required, with methods agreed by the Office of Environment and Heritage;
- further evaluation of traffic origin/destination probabilities is required, along with information about road deformation management following subsidence, and consideration of heavy vehicle and school bus conflicts; and
- deficiencies in the data and analysis of air quality and noise impacts, particularly low frequency noise impacts could be remedied before any decision about the project.

The Commission is additionally unable to observe in the material presented for the review recognition of the accumulation of, and interaction between, various impacts to the Bylong Valley. The effect of many step changes, albeit argued to be individually acceptable, may, taken together, constitute a profound and substantial transformation of Bylong Valley's social, economic, heritage and landscape values.

A range of mitigation measures are proposed, but their effectiveness is uncertain and at times qualified. The Commission finds it unusual, for example, that impacts to mapped agricultural land are to be mitigated by the pursuit of agricultural land uses only where the applicant finds it reasonable to do so, or that disturbed land would be restored to productive agricultural land use, despite the absence of empirical evidence that this is possible on the scale proposed. Despite qualifications of this kind, the applicant assumes that its proposed treatments will be entirely successful in mitigating the impacts of the project. The Commission is of the view that a decision-maker would need to carefully consider the risks attached to the proposed mitigation treatments in its assessment of the overall merits of the project. The case for the project, particularly those aspects of the project responsible for the most severe impacts, is eroded when impacts and the uncertainty of the proposed mitigation measures are considered together.

In closing, the Commission finds that doubts persist about the potential benefits and impacts of this project, despite extensive research and peer assessment. As a result, all aspects of the project will need to be comprehensively and cautiously considered, carefully weighted, and balanced one against another at the determination stage.



Mr Brian Gilligan
Member of the Commission



Ms Abigail Goldberg
Member of the Commission



Mr Roger Fisher
Member of the Commission



Mr Steve O'Connor
Member of the Commission

APPENDIX 1 – MINISTER’S TERMS OF REFERENCE

Request to the Planning Assessment Commission Bylong Coal Project

**Section 23D of the *Environmental Planning and Assessment Act 1979*
Clauses 268R and 268V of the *Environmental Planning and Assessment Regulation 2000***

I, the Minister for Planning, request the Planning Assessment Commission to:

1. Carry out a review of the Bylong Coal Project, and:
 - (a) consider the EIS for the project, additional information provided to the Department, all issues raised in public and agency submissions, and any relevant information provided during the course of the review;
 - (b) assess the merits of the project as a whole having regard to all relevant NSW Government policies, and paying particular attention to:
 - the impacts on the water and agricultural resources of the Bylong Valley;
 - the social impacts on the Bylong village and surrounds;
 - impacts on heritage values associated with the Tarwyn Park property, including natural sequence farming; and
 - the justification for the open cut stage of the project; 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 12 weeks of receiving the Department’s preliminary assessment report, unless the Secretary agrees otherwise.



**The Hon Rob Stokes MP
Minister for Planning**

Sydney *9th January* 2017

APPENDIX 2 – LIST OF SPEAKERS AT THE PUBLIC HEARING

Planning Assessment Commission Bylong Coal Project (SSD 6367)

Date and Time: 10am, Thursday 11 May 2017

Place: Club Mudgee, 99 Mortimer Street, Mudgee

List of Speakers

- | | |
|--|---|
| 1. Mayor Martin Rush
(Muswellbrook Shire Council) | 23. Caitlin Gilbert |
| 2. Bill Vatovec
(KEPCO) | 24. Vinesa Walker |
| 3. Rusty Russell | 25. Lionel Braithwaite |
| 4. James Armitage | 26. Andrew Burleigh |
| 5. Nick Godfrey-Smith | 27. Steve Bennett |
| 6. Brendan Tobin | 28. Robert Gillespie |
| 7. Travis Rixon | 29. Ross Granata |
| 8. Ken Hopkins | 30. James Tomlin |
| 9. John Weaver | 31. Grant Gjessing |
| 10. Andrew Palmer
(Mudgee Chamber of Commerce) | 32. Shaun Mace |
| 11. Flinn Malnic
(Sydney Mining Club) | 33. Beatrice Ludwig |
| 12. Kristian Brockmann | 34. Clayton Richards |
| 13. Wayne Diemar
(HunterNet) | 35. Cassandra Jones |
| 14. Hugh McMahon | 36. Bronwyn Pressland |
| 15. John Epton | 37. Rochelle McDonald |
| 16. Craig Hort | 38. Steven Pells
(Bylong Valley Protection Alliance) |
| 17. Chris Dickson | 39. David Paull
(Central West Environment Council) |
| 18. Henry Bosman | 40. Julia Imrie
(Mudgee District Environment Group) |
| 19. Annette Rhodes | 41. Hedda Askland
(Hunter Communities Network) |
| 20. Geoff Miell | 42. Rod Campbell (via telephone)
(The Australia Institute) |
| 21. Cory Robertson | 43. Jeff Braithwaite |
| 22. Martin Eagan | 44. Stephen Gould (via telephone)
(Hunter Environment Lobby) |

APPENDIX 3 – SUMMARY OF ISSUES FROM WRITTEN AND ORAL SUBMISSIONS

The Planning Assessment Commission notes that during the public hearing for this project some community members and groups chose to demonstrate their opposition to the mine outside the public hearing venue rather than presenting at the session. This is assumed to have resulted in fewer speakers than anticipated, however many of the boycotting individuals and groups presented written submissions.

The Commission also observes that many speakers at the public hearing noted their direct involvement with the mine company. Six individuals identified themselves specifically as having contributed to the preparation of the Environmental Impact Statement and/or supporting studies for this project.

The following points summarise the diverse, and sometimes conflicting, submissions provided to the Planning Assessment Commission at the hearing. The summary is not reflective of a prioritisation, sorting or moderation by the Commission in any way. Written submissions can be viewed directly on the Commission's Webpage at: www.pac.nsw.gov.au/projects/2017/02/bylong-coal-project

Ground water and surface water

- Groundwater studies have been conducted, including sampling from a very large bore field. Independent peer review has found them to be fit for purpose.
- Groundwater resources have been clearly defined, with a thin, but productive alluvium present which is separated from lower quality (deeper) aquifers.
- Management strategies will be developed and approved by the Department of Planning and Environment prior to operations commencing.
- The mine currently holds sufficient water licences to enable suitable water extraction from the alluvium to operate the mine.
- The current combination of open cut and underground mining components will allow the mine to operate as a nil discharge mine.
- The presence of a void will allow for tailings to be co-mingled with overburden and placed in the void, eliminating the need for a tailings storage dam.
- Modelling for groundwater is reasonable. The analysis of impacts and commitments to manage impacts are however unsuitable and vague.
- Analysis of impacts and commitment to effective management of groundwater impacts are very limited, with no genuine consideration of cumulative impacts. The assessment documentation generally contains commitments to manage to the best of the applicant's ability, rather than for best public and social outcomes.
- A high level and range of uncertainty remains in the groundwater modelling, in particular the yield of the alluvial bore field.
- Most of the identified impacts to groundwater resources are irreversible and cannot be remediated once they occur.
- Uncertainty in groundwater impacts need to be addressed, including through conditions which are specific, targeted and enforceable. Some mining conditions do not meet these criteria.
- Water assessment and licensing are based on a full allocation of the KEPCO licenses being met, with a low percentage of the (approx. 30%) other licensee's allocations being met.
- The proposed conditions need to be strengthened and amended to ensure the water management plan is prepared prior to licenses commencing, make good agreements are established and appropriate responses are set to address unexpected impacts to groundwater.
- There is a need for water sharing agreements between mining companies and farmers.
- Risks exist to the Goulburn River catchment, which has been highly modified over the last 40 years and is now highly vulnerable to flow and salinity changes.

- Salinity inputs are a result of natural weathering of Permian coal resources and the more recent exposure of related marine strata through mining.
- There are differences between the modelled and measured stream flows in the EIS as well as the GWE recharge rate.

Social impacts

- Social impact assessment has been undertaken, which has identified a long-term decline in population in the Bylong Valley since the 1980s. Property acquisition by KEPCO has accelerated this decline.
- Significant direct benefits to the local and regional economy are forecast as a result of employment, and indirect benefits from flow on impacts of employment, and through sourcing materials and services locally (to the extent possible).
- As the mine forms part of a vertically integrated project for KEPCO, the project is less sensitive to changes in the coal price than is otherwise the case.
- There has been consultation, including a project hotline, for impacted residents and groups, accompanied by a land acquisition for properties likely to be impacted by mine activities.
- The mines proposed as a residential mine as the proposal includes a worker's accommodation facility (WAF). The WAF is included to reduce employee travel and road safety impacts.
- Most social impacts have already occurred in the Bylong region and have been inadequately assessed.
- The social impact assessment represents a system of clear winners and losers, with groups from the Mudgee region experiencing the benefits while those closer to Bylong receive fewer benefits while living with most of the costs.
- Assessment of the social impacts has been narrow in scope, and does not consider the cumulative nature of the social impacts occurring both locally and in the region. .
- The manner of assessment reduces people to objects, with the impacts being given a diminished status as they have already occurred.
- The social impact assessment has not been conducted against a defined matrix or assessment of risk to the community.
- The applicant has not provided a meaningful response to critiques or comments of their social impact assessment in the response to submissions and simply redirected individuals back to the original document.
- The social impact assessment provides very little discussion of establishing a "greenfield" mine, especially as society starts moving towards renewable energy sources.
- Importance of recognising the adverse impacts of a lack of economic opportunity on a region, especially in relation to youth employment.
- Local and regional youth unemployment is high, with associated disillusionment and noted lack of ambition in secondary students.
- KEPCO's contributions help with maintaining local training programs, including life skills programs.
- High level of engagement and consultation between KEPCO and impacted groups and individuals.
- Projects such as Bylong provide opportunities for people in the region to remain employed and/or draw new individuals or families to the region.
- Significant contributions (approximately 2 million AUD per annum) are made by the mining sector, including KEPCO, to help meet the 12 Million per annum shortfall in operational funding for the WESTPAC helicopter.
- Social impacts will spread beyond the Mid-Western Regional Council with towns in Muswellbrook Shire being closer to the project.

Heritage impacts

- Buildings are being restored at Tarwyn Park, with the natural sequence farming techniques to be continued and potentially expanded to assist the agricultural rehabilitation processes.

Economic

- The economic assessment methodology has been peer reviewed.
- A cost benefit analysis was undertaken and concludes the project is economically beneficial to the local, state and federal level governments.
- The project will have a high net production benefit at a local, regional, state and federal level.
- Current design, which combines open cut and underground mining components, is necessary for the viability of the project.
- Peer review states that detailed and transparent costings are required. Same methodology which was used to justify the now bankrupt Cobbra Coal Project.
- The Mudgee Region has undergone a period of decline, with recovery now evident as a result of increasing commodity prices.
- The viability of the project is in doubt because of the policies advocated during the campaign by the winner of the recent South Korean Presidential Election.
- Principle economic benefits will be provided to the South Korean economy, while the local and regional area will need to manage the long-term impacts of the project.
- Market and resource analysts are sceptical of the need for increased capacity, especially in greenfield sites, with reference to long term coal forecasts by the Commonwealth Treasury .
- Assessment methodology assumes that mitigated impacts have a nil impact, which is unrealistic.
- The importance of diversifying the regional / local economy. Mudgee is too small a region to maintain economic growth without mining inputs.
- The local area is impacted by recent industry changes in Kandos and Rylstone, including the closure of the Kandos Cement Plant, Sibelco Australia Ltd's Lime Plant and Charbon mine.
- Development will provide increased opportunity for local employment / labour hire firms.

Agricultural impacts and rehabilitation

- Areas of the project are mapped as Biophysical Strategic Agricultural Land (BSAL), corresponding to land capability classes 3 and 4 in relation to agricultural capability.
- KEPCO currently manages a large cattle grazing operation, which contributes to local employment. KEPCO also supports local organisations, including the Thirsty Cow charitable organisation and the Cooyong Fire Brigade.
- Agricultural rehabilitation of Class 3 BSAL land is possible and has been demonstrated in other mining regions, including the Hunter Valley Alluvial Lands Project and the Bengalla Class 3 Project.
- The timeframe for rehabilitation will vary depending on conditions. A shorter timeframe is expected to re-establish definitional elements of the BSAL areas, but it will take longer to create a self-sustaining agricultural environment and re-establish soil cycles.
- Natural sequence farming can result in up and downstream impacts from weeds and flooding.
- While it is in BSAL land, the mine is not on prime agricultural land.
- Mining and agricultural production can co-exist.
- The project avoids the flood plain
- The current mining plan excludes the flood plain in the project area.
- Good examples of agricultural rehabilitation do exist, including on the Bylong project site through rehabilitation of exploration / drilling sites.

Other

- The surrounding mountainous landscape will moderate dust impacts.
- Importance of mining to the Australian economy needs to be recognised. There is a need to maintain the Australian environment.
- Adequacy of current government regulations to manage mining impacts.

Subsidence

- Modelling for subsidence is reasonable. The analysis of impacts and commitments to manage impacts are however unsuitable and vague.
- Subsidence impacts are noted as being 5 times greater than accepted safe levels along Bylong Valley Way.
- Substantial cliff fall and slumping have been identified as likely impacts, which are inadequately proposed to be managed by the applicant.
- Industry has a poor record for remediating subsidence, citing Sugarloaf example.

Biodiversity

- The assessment of impacts to biodiversity has been done in accordance with the Framework for Biodiversity Assessment and NSW regulations and policies.
- While the project will result in impacts to biodiversity, where they cannot be avoided they can be effectively managed.
- The applicant has provided a substantial, land based, biodiversity offsets strategy to compensate for unavoidable impacts to biodiversity.
- Offset strategy is not compliant with the Framework for Biodiversity Assessment and the NSW Major Projects Offset Policy.
- The EIS ignores the requirements for further consideration for the Regent Honeyeater, Brush-tail rock wallaby and white-box grassy woodlands. Additionally, the Brush-tailed rock wallaby is noted as a species which cannot “withstand further loss” in that area.
- The Regent Honeyeater was recorded on site, but dismissed as being transient. Ignores recent and nearby breeding records.
- Will remove a linkage between areas of conservation significance, resulting in increased fragmentation.
- Impacts to native vegetation, such as river red gum communities, through drawdown, are either underplayed or discounted.
- Proximity to both Goulburn River National Park and Wollemi National Park make the location particularly sensitive.
- The proposed biodiversity offsets are not adequate to compensate for impacts to native flora and fauna.

Noise

- Background levels are lowest possible under Industrial Noise Policy (INP) which are much higher than exists in the area.
- The INP is not suitable in rural areas for mining noise.
- Low frequency noise has not been adequately assessed in accordance with the INP, in particular the application of low frequency noise penalties.
- Noise modelling is not based on local conditions.
- The surrounding mountainous landscape will moderate noise impacts.

Infrastructure (local roads and rail lines)

- Impacts to road networks especially linkages to Muswellbrook LGA, have been poorly assessed and need to be adequately considered.
- Capability of the rail network to meet the transport needs of the Bylong project was questioned.
- Material inputs to the project are likely to be sourced from the Hunter Valley due to availability, with increased impacts on Muswellbrook Shire Roads, though Muswellbrook Shire has been inadequately consulted on the impacts. The road impacts are supported by an independent review of the project.

- Placement of infrastructure to support the project area needs to consider the requirements of the Westpac rescue helicopter, especially with regard to the placement of transmission lines.

APPENDIX 4 – RECORDS OF COMMISSION MEETINGS

Notes of Briefing from the Department

This meeting is part of the review process.		
Meeting note taken by Jade Hoskins	Date: 9 May 2017	Time: 10am
Project: Bylong Coal Project Review		
Meeting place: Commission's Office – Level 3, 201 Elizabeth Street, Sydney		
<p>Attendees:</p> <p>Commission Members:</p> <p>Brian Gilligan – Member of the Commission (Chair)</p> <p>Abigail Goldberg – Member of the Commission (Deputy Chair)</p> <p>Stephen O'Connor – Member of the Commission</p> <p>Roger Fisher – Member of the Commission</p> <p>Commission Secretariat:</p> <p>David Mooney – Team Leader</p> <p>Jade Hoskins – Senior Planning Officer</p> <p>David Way – Planning Officer</p> <p>On behalf of the Department:</p> <p>Mike Young – Director, Resource Assessments</p> <p>Steve O'Donoghue – Team Leader, Resource Assessments</p>		
The purpose of the meeting: For the Department to brief the Commission on its assessment report.		
<p>The Department raised the following matters:</p> <p><u>Background and Location</u></p> <ul style="list-style-type: none">• Coal exploration in the area was undertaken by the NSW Government in 1970s.• Authorizations for coal exploration were granted in 1982 and 1984.• Hunter Valley is a mature coal field and the applications being lodged with Department are for extensions to existing mines, rather than new mines.• Coal exploration and applications for coal mines are progressing west.• Coal will need to come from somewhere over the next 20 years to meet demand.• There are other mines within the locality including Ulan, Wilpinjong and Moolarben.• The Peabody company has lodged an application for further coal exploration between Wollar and Bylong.• Advice from the Gateway Panel which granted the exploration license was submitted with the development application.• The Department of Resources and Energy publishes approved tonnages for each mine in NSW. <p><u>Acquisition of surrounding properties</u></p> <ul style="list-style-type: none">• The applicant's acquisition of surrounding properties is consistent with the Department's Voluntary Land Acquisition and Mitigation Policy and recommendations in the Department's assessment report.• Receiver 60 has commenced negotiations with the Applicant. If this agreement is reached, the Applicant will own all land within the project area.		

Planning Framework

- The mine is permissible and needs to comply with numerous environmental planning instruments.
- The mine technically complies with all legislation.
- There is a demand for coal.
- The Government has not expressed a determinative view on the possible location of mining in the Bylong Valley.

Visual Impacts

- There is limited guidance on assessing visual impacts of mines.
- The surrounding ridgelines are expected to shield the mine from Bylong Valley Way. There may be glimpses of the mine, but no significant views.

Rehabilitation

- The applicant proposes to reinstate the same area of rehabilitated land as is impacted by the project.
- The final land form will have a reasonable level of land capability for agricultural uses.
- A similar rehabilitation strategy was approved for the Liverpool Plains project.
- Other NSW agencies did not raise any objections to the removal of Biophysical Strategic Agricultural Land (BSAL).
- Open cut mining operations will be completed after eight years. The applicant has committed to progressive rehabilitation.
- Underground material will be used to fill the open cut void and there will be no final voids at the end of the project life.

Heritage

- There was correspondence from the former Minister for Heritage to the former Minister for Planning requesting that the Commission seek independent advice on the heritage values of Tarwyn Park.

Consultation

- The Department undertook formal community consultation, outside statutory requirements. This is outlined in the assessment report.

Other

- The draft social impact assessment guidelines do not apply to this project as they were developed subsequent to the EIS.
- In the second response to submissions, the applicant provided detailed financial justification for the mine.
- There will be royalties associated with the extracted resources.

Documents tabled at meeting: N/A

Meeting closed at 12pm

Notes of Briefing from the Applicant

This meeting is part of the review process.		
Meeting note taken by Jade Hoskins	Date: 10 May 2017	Time: 9:30am
Project: Bylong Coal Project Review		
Meeting place: Bylong Coal Project Site Office – 355 Upper Bylong Road, Bylong		
<p>Attendees:</p> <p>Commission Members:</p> <p>Brian Gilligan – Member of the Commission (Chair)</p> <p>Abigail Goldberg – Member of the Commission (Deputy Chair)</p> <p>Stephen O’Connor – Member of the Commission</p> <p>Roger Fisher – Member of the Commission</p> <p>Commission Secretariat:</p> <p>David Mooney – Team Leader</p> <p>Jade Hoskins – Senior Planning Officer</p> <p>David Way – Planning Officer</p> <p>On behalf of the applicant:</p> <div> <div> <p><u>KEPCO</u></p> <p>Je Hyeon Kim</p> <p>William Vatovec</p> <p>Albert Kim</p> <p>Kwanpill Park</p> <p><u>WorleyParsons</u></p> <p>Rory Gordon</p> <p>Andrew Burleigh</p> <p>Antony Leone</p> <p>Tom Frankham</p> <p>Fernando Hernandez</p> <p><u>HW Bosman Pty Ltd</u></p> <p>Henry Bosman (Farm Manager)</p> <p><u>Advisian</u> (a division of WorleyParsons Group)</p> <p>Rob Power</p> <p>Elena Miceski</p> <p>Kane Smith</p> <p><u>Hansen Bailey</u></p> <p>James Bailey</p> <p>Nathan Cooper</p> <p>Bronwyn Pressland</p> </div> <div> <p><u>Mine Subsidence Engineering Consultants</u></p> <p>Peter DeBono</p> <p><u>AGE Consultants</u></p> <p>James Tomlin</p> <p><u>WRM Water & Environment</u></p> <p>David Newton</p> <p><u>Scott Barnett & Associates</u></p> <p>Scott Barnett</p> <p><u>SLR Consulting</u></p> <p>Clayton Richards</p> <p><u>Pacific Environment Limited</u></p> <p>Aaron McKenzie</p> <p><u>Cumberland Ecology</u></p> <p>Katrina Wolf</p> <p><u>Edward Higginbotham & Associates</u></p> <p>Ted Higginbotham</p> <p><u>Gillespie Economics</u></p> <p>Robert Gillespie</p> </div> </div>		

The purpose of the meeting: For the applicant to brief the Commission on the project.

A PowerPoint presentation to the Commission was provided, covering the following matters:

Background of the project and KEPCO

- Coal authorizations were granted in 1982/84;
- Authorizations were acquired by KEPCO in 2010;
- Stakeholder engagement and land acquisition commenced in 2011;
- KEPCO has started a community investment fund.

Benefits of the project

- There will be significant economic benefits for Australia, NSW and the region from company tax, royalties and the voluntary planning agreement.
- The mine would employ local workers.
- The applicant will upgrade surrounding roads.

Mine plan justification

- The open cut will allow access to the quality coal resource occurring within the lower slopes of the valley outside the alluvial flats.
- The economic viability of the project hinges on the initial open cut mining operations.
- The open cut will provide a location for reject materials and the management of mine water.
- Without the open cut, the project would not proceed as the underground only option would not be viable.
- If an underground only was approved, an entirely different mine plan would be required.

Water

- The project has been designed to avoid impacts to productive alluvial land and neighbouring landholder's water allocations within the Bylong Valley.

Rehabilitation and agriculture

- A rehabilitation strategy was developed for the EIS to ensure impacts to agricultural land are appropriately managed.
- Farm manager and team of farm hands are increasing production.
- Conceptual rehabilitated final landform has been designed to enable post mining land uses to be generally consistent with those currently occurring (cattle grazing and equine CIC uses).
- No thoroughbred horse breeding has occurred on the mapped equine CIC within the project boundary for many years.

Social

- KEPCO would like to construct the WAF if there is insufficient accommodation available in the local area.
- KEPCO has acquired a large portion of land within the Bylong Valley.
- The population in the Bylong Valley was already occurring.
- KEPCO has committed to operate the Bylong General Store, contribute to the operating costs of the Bylong Community Hall, provide support for the Bylong Rural Fire Service, appoint a farm manager and develop a farm management plan for all KEPCO owned land and enhance the Bylong Village.

Heritage

- There are no heritage items or sites listed on Commonwealth, NSW or Local Government registers.

- The heritage assessment identified 18 sites of heritage significance within and adjacent to the project area. For items that are directly affected, the Applicant will undertake archival recording, test excavation and salvage excavation (if required) and documentation.
- Conservation management plans will be prepared for Tarwyn Park Farm Complex, Bylong Station Farm Complex and Homestation.

Following the presentation, the applicant accompanied the Commission on a site inspection of the project area. The site visit route is included in the 'Booklet of Maps and Photomontages'. Specifically, the Commission inspected the proposed project area and surrounding properties from Wooleys Road and Upper Bylong Road. The Commission then viewed the proposed project area and surrounding properties from the elevated site of the Bylong Telstra Tower. The Commission also inspected the Tarwyn Park property and the associated natural sequence farming interventions.

Documents tabled at meeting: PowerPoint Presentation and Booklet of Maps and Photomontages (published on the Commission's Website under 'Additional Information from Applicant' section of the project page).

Meeting and site visit were concluded by 2:30pm

Notes of Briefing from Mid-Western Regional Council

This meeting is part of the review process.		
Meeting note taken by Jade Hoskins	Date: 11 May 2017	Time: 8am
Project: Bylong Coal Project Review		
Meeting place: Council's Mudgee Office – 86 Market St, Mudgee		
<p>Attendees:</p> <p>Commission Members:</p> <p>Brian Gilligan – Member of the Commission (Chair)</p> <p>Abigail Goldberg – Member of the Commission (Deputy Chair)</p> <p>Stephen O'Connor – Member of the Commission</p> <p>Roger Fisher – Member of the Commission</p> <p>Commission Secretariat:</p> <p>David Mooney – Team Leader</p> <p>Jade Hoskins – Senior Planning Officer</p> <p>David Way – Planning Officer</p> <p>Representing Mid-Western Regional Council (Council):</p> <p>Mayor Des Kennedy</p> <p>Brad Cam – General Manager</p> <p>Sally Mullinger – Acting Director Operations</p> <p>Julie Robertson – Director Development</p>		
The purpose of the meeting: For Council to provide its views on the project to the Commission.		
<p>Council raised the following matters:</p> <p><u>Economic benefits for the Mudgee region</u></p> <ul style="list-style-type: none"> • Council supports both the open cut and underground components of the project. • Mudgee is a growth area and Council is pro-employment. • The community and the economy is geared towards Mudgee. • Local businesses are ready for the mine. • Given the distance between Bylong and Mudgee, the mine would not impact on tourism. • Regional areas are declining in population because people want to live close to facilities. There has been minimal activity in Bylong for a long time. • The Kandos and Rylstone communities were affected by the closing of the Kandos Cement Plant. • Kandos and Rylstone need additional people for schools and accommodation. • There would be flow-on economic benefits from the mine in Mudgee, Kandos and Rylstone. <p><u>Worker's accommodation facility</u></p> <ul style="list-style-type: none"> • Council does not support the worker's accommodation facility. • There is uncertainty about whether the facility will be constructed. • Should any facility be constructed, it must be demolished after use. • Any workers residing in the facility would unlikely become involved with the Mudgee, Kandos or Rylstone communities. • There is a better road to the site from Mudgee than there is to Kandos and Rylstone. 		

- There are lots of vacant houses in Kandos and Rylstone – the social and employment studies submitted with the EIS may be flawed.

Voluntary Planning Agreement (VPA)

- The VPA between Council and the applicant has been publicly exhibited and signed.
- This is the first VPA that Council has entered into that requires the applicant to pay a dollar amount per tonnage, rather than payment being based on the number of employees.

Traffic and road safety

- The upgrade of Upper Bylong Road has a preliminary design and final costings should be finalised before the project is determined. Council will work on its own public roads and will not employ contractors. The applicant has been made aware of and accepts this position.
- Trucks must come from the Golden Highway.
- The Wollar Road and Bylong Valley Way intersection needs turning lanes.
- There have been several fatalities and accidents in the Munghorn National Park area.
- The company undertaking the construction work will provide buses and car pooling mechanisms for workers.

Coexistence of mining and other land uses

- Other mine operators have demonstrated that mining and agricultural/cattle farming can be successfully conducted concurrently. Coexistence is possible.
- The mine may encourage more intense cattle farming and agricultural uses by employing farming expertise.
- Prior to any exploration licence being granted, Bylong was known as a small, boutique horse stud. It was not an equine centre.
- Bylong is unlikely to be an equine centre as thoroughbred breeders would prefer shorter distances between mare and stud farms.
- The proposed mine is not impacting the main part of the valley where thoroughbred horses are taken.

Heritage

- Council would like to ensure that the Tarwyn Park homestead and areas of natural sequence farming are protected.

Agreed actions: Council may provide recommendations on the preliminary draft conditions.

Meeting closed at 9am