



**Planning &  
Environment**

***FINAL ASSESSMENT REPORT:  
Airly Mine Extension Project (SSD 5581)***



Section 89E of the  
*Environmental Planning and Assessment Act 1979*

September 2016

Cover photo: Brick-lined mine adit and vent chimney of the former New Hartley Shale Mine (Sites 29 and 30)

© Crown copyright 2016  
Published September 2016

NSW Department of Planning and Environment

[www.planning.nsw.gov.au](http://www.planning.nsw.gov.au)

**Disclaimer:**

While every reasonable effort has been made to ensure that this document is correct at the time of publication, the State of New South Wales, its agents and employees, disclaim any and all liability to any person in respect of anything or the consequences of anything done or omitted to be done in reliance upon the whole or any part of this document.

## EXECUTIVE SUMMARY

---

This final assessment report for the Airly Mine Extension Project has been prepared by the Department of Planning and Environment (the Department) for consideration by the Planning Assessment Commission (the Commission).

It focuses on the matters identified in the Commission's *Airly Mine Extension Project Review Report* of November 2015, and responses to that report by the Applicant, Centennial Coal Company Limited (Centennial) and relevant government agencies including the Division of Resources and Energy (DRE) of the NSW Department of Industry, the Environment Protection Authority, National Parks and Wildlife Service (NPWS) and the Office of Environment and Heritage (OEH).

The Commission agreed with most of the findings and recommendations made in the Department's preliminary assessment report (PAR) but made nine recommendations for further work or consideration.

The most significant of the Commission's recommendations (four in total) relate to the appointment of an independent expert panel to review the mine plan, subsidence predictions, proposed performance measures and post-approval management regime. An Independent Pre-Determination Review Panel (IPRP) was established and has carried out a review based on terms of reference that addressed the Commission's recommendations.

The IPRP was satisfied with the potential for Centennial's proposed methods of coal extraction to avoid significant impacts and minimise residual subsidence effects to cliff lines, steep slopes and pagodas. However, the IPRP recommended that Centennial undertake early monitoring in areas that contain less sensitive surface features (i.e. beneath Mount Airly) in order to calibrate subsidence predictions and demonstrate the effectiveness of remote subsidence monitoring techniques. The IPRP also recommended that the proposed 'panel and pillar mining' be set back an additional 50 metres from cliff lines in the vicinity of the former workings of the New Hartley Shale mine, to increase their protection.

The Department has adopted all of the recommendations of the IPRP and revised its recommended conditions to give effect to these recommendations. Furthermore, the recommended conditions require the establishment of an Independent Review Monitoring Panel (IRMP) that would have an ongoing role in providing advice to the Department and the Applicant, particularly in overseeing the preparation and implementation of Extraction Plans.

The Commission made five other recommendations including the need to consider potential impacts on downstream water users, strengthen conditions relating to compensatory water supply measures, the timing of visual mitigation measures and provision of an alternate, artificial water supply to replace Village Spring. The Commission also recommended that some further information be obtained, including the proposed mining schedule and confirmation the EPA held no residual issues relating to water discharges.

The Department has adopted all of the Commission's recommendations except in regard to providing an alternate, artificial water supply to Village Spring. On the basis of advice from NPWS, the Department believes the potential loss of Village Spring, which is not an identified water source, would not affect the recreational values for bushwalkers and hikers. The Department also understands that it would involve the installation of significant infrastructure, which would be contrary to the draft plan of management for the Mugii Murum-ban State Conservation Area (SCA) and unnecessary considering the low visitation to the SCA and the proximity of the SCA to the town of Capertee.

The Airly Mine Extension Project would result in significant social and economic benefits for the local area and the State of NSW, including the continued employment of 59 employees, increasing up to 135 under full operating conditions. It would also create a substantial number of indirect employment opportunities in related industries and economic contributions to the State through royalty and local tax revenues. The Department believes its recommended conditions of consent provide a comprehensive, strict and precautionary approach to ensuring the project can comply with relevant performance measures and standards and ensure the predicted residual impacts can be effectively minimised, particularly in relation to cliff lines, pagodas and steep slopes.

Consequently, the Department considers the project is in the public interest and should be approved, subject to the recommended conditions of consent.

# 1 INTRODUCTION

---

## 1.1 Background

This Final Assessment Report for the Airly Mine Extension Project (the project) has been prepared for the consideration of the Planning Assessment Commission (the Commission). It should be read in conjunction with the Department's Preliminary Assessment Report (PAR) dated August 2015.

The two reports together comprise the Department's environmental assessment for the project (SSD 5581) and have been prepared to satisfy the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act). They have also been prepared to satisfy the requirements of the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), in accordance with the bilateral agreement between the Commonwealth and NSW Governments.

This report considers the:

- recommendations made in the Commission's *Airly Mine Extension Project Review Report*, dated November 2015;
- the *Report of the Independent Review Panel Established to Review and Report on Accuracy and Reliability of Mine Subsidence Impacts on Sensitive Features* (the IPRP report);
- additional information received from Centennial Coal Company Limited (Centennial) in response to the Commission's merit review report, the IPRP report, and the Department's proposed conditions of consent; and
- further advice received from key Government agencies during and after the merit review.

## 1.2 Project Overview

Centennial is seeking consent to extend underground mining at the Airly Coal Mine to allow the mine to continue operating for an additional 25 years (including 20 years of mining and 5 years of post-mining decommissioning and rehabilitation). The project would involve continued bord and pillar mining operations to extract up to 1.8 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal from the Lithgow Seam.

The development application area, mining titles and boundaries of the Mugii Murum-ban State Conservation Area (SCA) are shown in **Figure 1**, and the proposed Mining zones are shown in **Figure 2**. A detailed description and plans of the major components of the project are provided in the Department's PAR.

## 1.3 Commission's Review

On 13 August 2015, the Minister for Planning requested that the Commission carry out a review of the Airly Mine Extension Project based on the following terms of reference:

- a) *consider the environmental impact statement for the project, the issues raised in submissions, the Commonwealth Independent Expert Scientific Committee's advice, the additional information and response to submissions provided by Centennial Coal, the Department of Planning and Environment's preliminary environmental assessment report, and any other relevant information provided on the project during 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 its potential:*
  - *subsidence impacts on the natural values of the Mugii Murum-ban State Conservation Area, including cliff lines, steep slopes, pagodas and gorges and any threatened species or endangered ecological communities;*
  - *water impacts, including any downstream water quality impacts in the Gardens of Stone National Park; and*
  - *social and economic impacts, and if necessary,*
- c) *recommend further measures to avoid, minimise, and/or manage the potential impacts of the project.*

The Minister also requested that the Commission hold a public hearing during the review. The public hearing was held on 23 September 2015 in Lithgow. Forty verbal submissions and 34 written submissions were received from individuals, special interest groups, local businesses and employees of the mine. In addition, the Commission received a total of 509 written submissions before and after the public hearing, including 412 objections and 97 submissions in support.

The Department's PAR records a further number of submissions received during the original exhibition of the project.



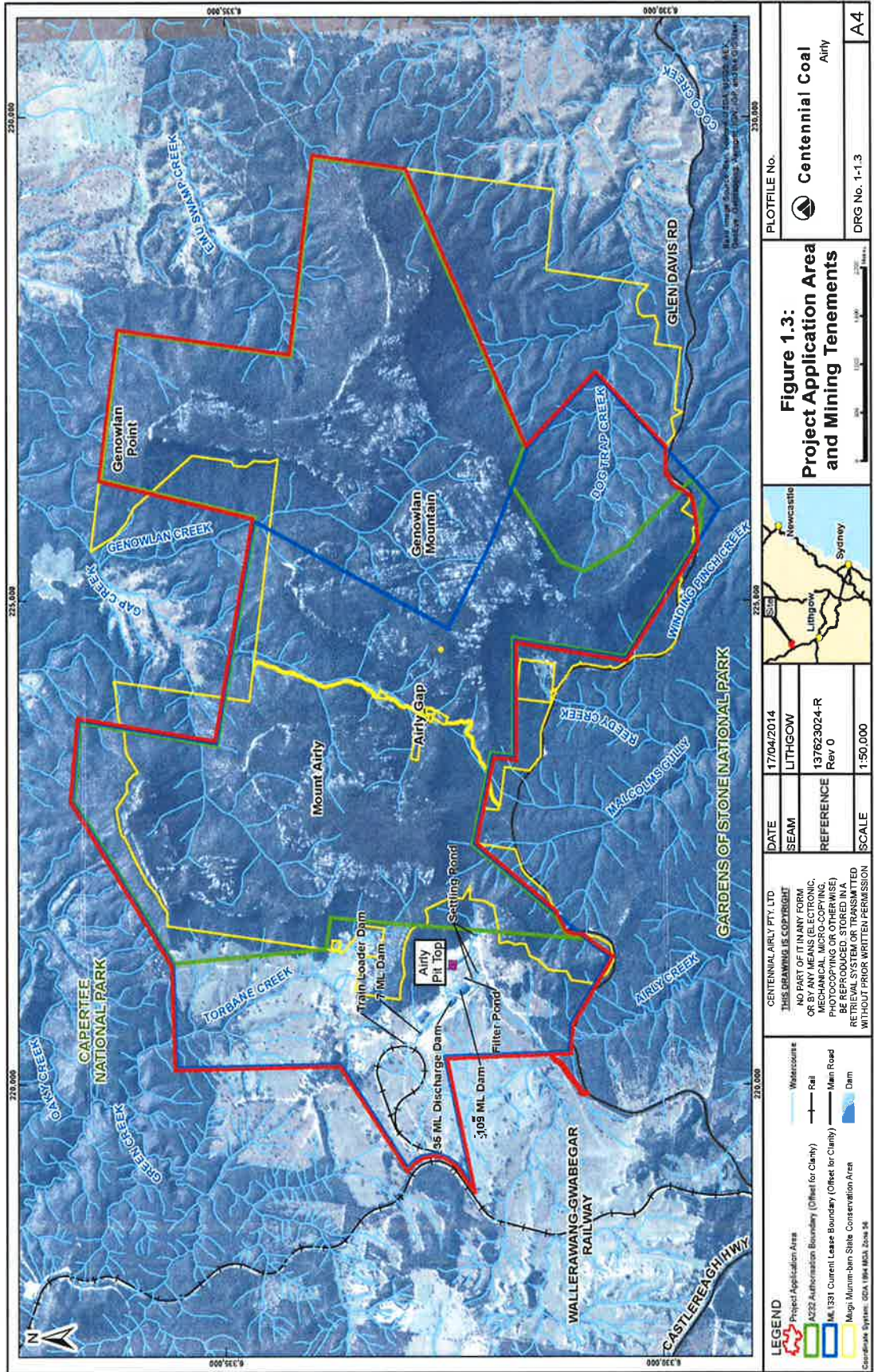


Figure 1: Development application area, mining titles and boundary of the Mugji Murum-ban SCA



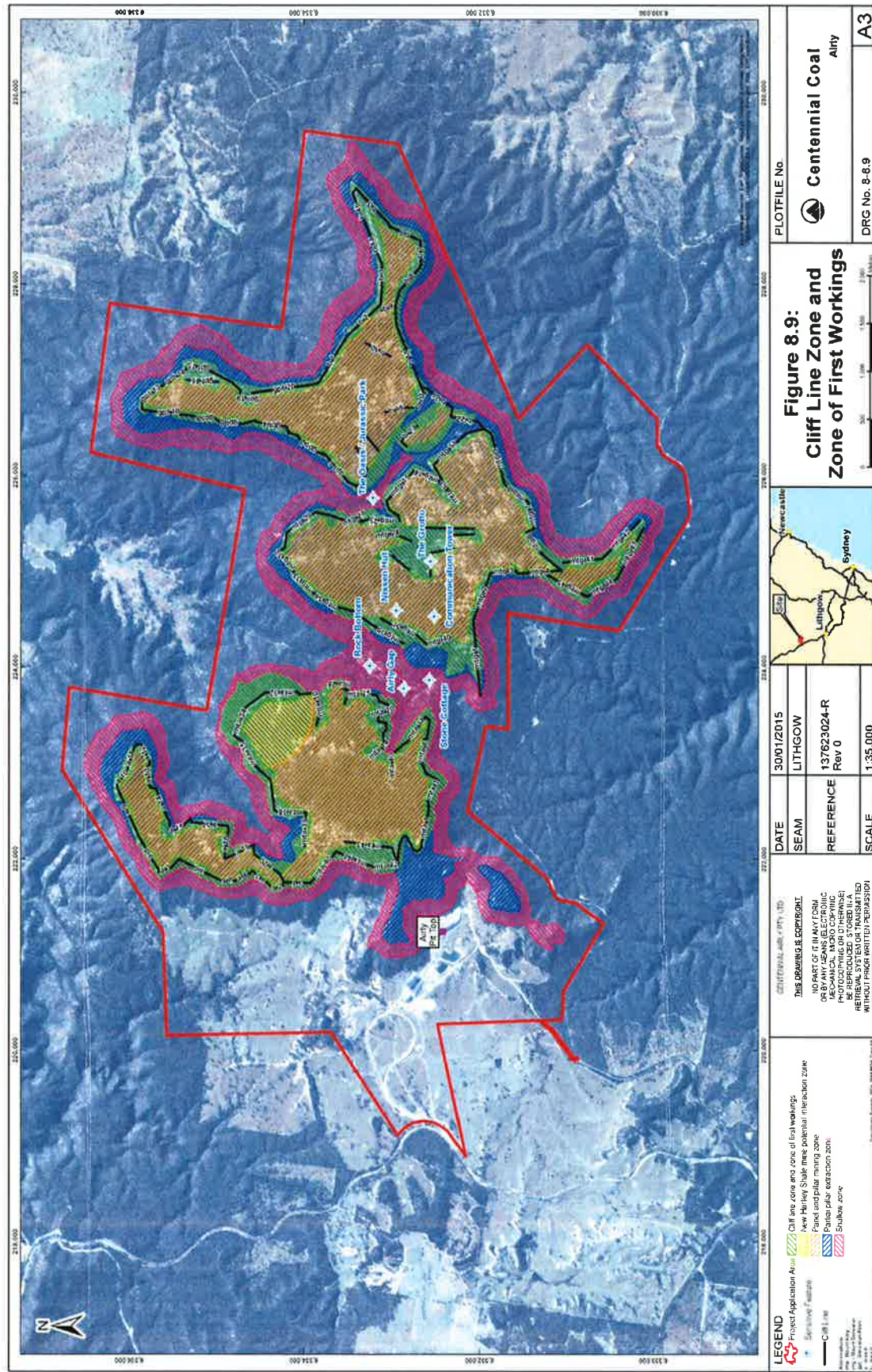


Figure 2: Proposed mining zones, cliff lines and other surface features

## 1.4 Chronology of Events

A brief chronology of the key events following the Commission's merit review is presented in **Table 1**.

**Table 1: Chronology of events and correspondence**

Date	Event
12 November 2015	The Commission published its review report on the project
13 November 2015	The Department sought responses from relevant agencies and Centennial on the recommendations made in the Commission's review report
20 November 2015	Response received from National Parks and Wildlife Service (NPWS)
30 November 2015	Response received from the Environment Protection Authority (EPA)
1 December 2015	Response received from Centennial stating that an independent expert panel should only be required if an exceedance to a performance measure has been observed
18 December 2015	Response received from DRE advising that it supports the Commission's recommendations 1 to 5 inclusive
24 December 2015	Centennial reiterated its position that independent expert review should only be required if and when an exceedance to a performance measure is observed
During January 2016	The Department consulted with agencies on draft conditions of consent and received responses from DPI-Water, Office of Environment & Heritage (OEH, which includes NPWS), Lithgow City Council and Roads and Maritime Services
29 January 2016	Response received from DRE advising that it did not support the Department's draft condition that the independent expert panel is formed post-consent and that the panel should instead provide advice and recommendations on mine design prior to determination
19 February 2016	Centennial advised the Department of its intention to convene the independent expert panel (i.e. the IPRP) and proposed terms of reference for the panel
17 March 2016	Following consultation with DRE, the Department issued Centennial with expanded and revised terms of reference for the IPRP (see <b>Appendix C</b> )
8 July 2016	The Department received the IPRP's report (see <b>Appendix D</b> ) together with Centennial's consideration of some of its recommendations and input to recommended conditions of consent (see <b>Appendix E</b> )
19 July 2016	In response to a request by the Department, Centennial confirmed its position with respect to the remaining recommendations in the IPRP's report
22 July 2016	OEH advised the Department that it was supportive of the IPRP's recommendations and is satisfied by Centennial's response to the recommendations (see <b>Appendix F</b> )
29 July 2016	DRE provided comments on the IPRP report (see <b>Appendix F</b> )
4 August 2016	Centennial provided a response to DRE's comments
8 August 2016	The Department sought comment on revised conditions from Centennial and key agencies, including DRE, OEH and EPA
15-16 August & 22 September 2016	Agencies supported the Department's revised conditions of consent and no objections were received from Centennial (see <b>Appendix I</b> )

## 2 CONSIDERATION OF COMMISSION'S REVIEW

### 2.1 Overview of Commission's Review

The Commission's Review Report stated that:

*"The Commission has carefully balanced the key areas of concern, including: the presence of unique cliff lines and pagodas, the proximity of the Greater Blue Mountains World Heritage Area, groundwater and surface water resources, and the socio-economic benefits. The Commission considers that the continued employment of existing staff and the creation of new jobs would make a significant positive contribution to the Lithgow City Council LGA and the region. The Commission also believes it is important to view the proposal from a broader strategic context, and notes that the Muggi Murum-ban State Conservation Area was originally established to both protect a natural area and allow access to an important coal resource.*

*On balance, the Commission is satisfied that the project's benefits outweigh its potential impacts, and that on balance the project is approvable. The project should proceed to determination, subject to the recommendations outlined in this report."*

The Commission agreed with most of the PAR's findings and recommendations, but made nine further recommendations. These recommendations are summarised in **Table 2** below.

### 2.2 Summary of the Department's consideration

A summary of the Department's consideration of and response to the Commission's recommendations is provided in **Table 2** below, while a more detailed discussion is provided in subsequent sections.

**Table 2: Summary of Department's consideration of the Commission's review recommendations**

<b>Commission recommendation</b>	<b>Department response</b>
<b>Recommendation 1</b> That the Department requires the Applicant to provide a proposed timeline of coal extraction including a plan showing the expected progression of mining over the 25 year project life.	Done (see plan in <b>Appendix A</b> ).
<b>Recommendation 2</b> That the proposed condition of consent that establishes the Panel of suitably qualified experts should specify that the Panel will be constituted by suitably qualified, experienced and independent experts (ie. an Independent Expert Panel) whose appointment has been approved by DRE.	Done (see condition 5 of Schedule 3 in <b>Appendix H</b> ).
<b>Recommendation 3</b> That the Independent Expert Panel should be established prior to determination and undertake the following: <ul style="list-style-type: none"> <li>review all submitted material on subsidence, including additional information supplied by the Applicant and its consultant, and comments from DRE and its Principal Subsidence Engineer;</li> <li>provide advice and recommendations about the following:               <ul style="list-style-type: none"> <li>the accuracy and reliability of predicted subsidence impacts on sensitive surface features, particularly in relation to cliff lines in the vicinity of the areas to be mined and beneath the former New Hartley Shale Mine;</li> <li>the adequacy of the management regime in the proposed conditions of consent, including the performance criteria, management plans and monitoring requirements, in terms of providing appropriate protection to sensitive surface features.</li> </ul> </li> </ul>	Done.  The IPRP has undertaken a review in accordance with Terms of Reference which were developed by the Department in consultation with DRE and reflected the Commission's specific wording. A copy of the Terms of Reference is provided in <b>Appendix C</b> . The IPRP's report is attached at <b>Appendix D</b> .
<b>Recommendation 4</b> That the proposed condition for the Extraction Plan expressly requires consultation with the Independent Expert Panel in preparing, revising and enforcing the Extraction Plans and associated management plans (including the Water Management Plan, Biodiversity Management Plan and Land Management Plan), particularly in relation to relevant mine design principles, the development of detailed Trigger Action Response Plans and performance indicators.	Done (see conditions 5 and 8 of Schedule 3 in <b>Appendix H</b> ).
<b>Recommendation 5</b> That all information relevant to the Independent Expert Panel's advice and recommendations is made publicly available on the Applicant's website.	Done (see condition 5 of Schedule 3 in <b>Appendix H</b> ).
<b>Recommendation 6</b> That prior to determination, the Department seeks written confirmation from EPA that any residual issues relating to water discharges into Airly Creek and any downstream water quality impacts in the Gardens of Stone National Park can be adequately resolved, particularly in relation to the achievement of 99% species protection.	Done (see EPA letter in <b>Appendix B</b> ).
<b>Recommendation 7</b> That the recommended condition of consent relating to the Water Management Plan should be strengthened to include specific consideration of the potential impacts to downstream water users of subsidence-related flow reductions in Gap Creek and Genowlan Creek, and the measures to implement the provision of compensatory water supply.	Done (see condition 15(c)(ii) of Schedule 4 in <b>Appendix H</b> ).
<b>Commission recommendation</b>	<b>Department response</b>
<b>Recommendation 8</b> That the Department should include a condition of consent requiring that the Applicant provides an alternative, artificial water source to the Village Spring to ensure that bushwalkers and hikers have access to drinking water.	See <b>Section 2.6.3</b> for the Department's consideration.
<b>Commission Recommendation 9</b> That the proposed conditions of consent relating to visual mitigation measures are strengthened to ensure that vegetation screening or other mitigation measures commence before any construction occurs and are implemented in a timely manner.	Done (see condition 21 of Schedule 4 in <b>Appendix H</b> ).

### 2.3 Mine Schedule

The Commission considered that the absence of a proposed timetable for mine extraction (i.e. a mining sequence) for Airly made its task of assessing the project's potential subsidence impacts more difficult, particularly in identifying subsidence impacts that may occur in the project's early stages.



**Commission Recommendation 1**

*That the Department requires the Applicant to provide a proposed timeline of coal extraction including a plan showing the expected progression of mining over the 25 year project life.*

Centennial provided the plan, as requested, in its first response. At the Department's request, in January 2016, Centennial revised this plan to improve the clarity of the information presented. The revised drawing is included in **Appendix A**.

**2.4 Establishment of an Independent Expert Panel**

The Commission made two recommendations relating to the establishment of an independent expert panel that had been previously proposed in the Department's draft conditions of consent.

**Commission Recommendation 2**

*That the proposed condition of consent that establishes the Panel of suitably qualified experts should specify that the Panel will be constituted by suitably qualified, experienced and independent experts (ie. an Independent Expert Panel) whose appointment has been approved by DRE.*

This recommendation has been adopted in the Department's recommended condition 5 of Schedule 3 (see **Appendix H**). As requested by the Commission, the Department has significantly expanded the framing of the proposed condition of consent relating to the post-approval panel (the IMRP) i.e. "*suitably qualified, experienced and independent*". The Department has also included a requirement that the Secretary consult with DRE on the proposed members before establishing the IMRP.

The Department applied the same criteria to the appointment of the pre-determination panel (the IPRP). The IPRP consisted of Prof Ismet Canbulat, Mr Ken Mills and Mr Don Kay, each of whom is a recognised mine subsidence expert. DRE was consulted on this appointment and supported the qualifications, experience and independence of the proposed members and chair of the IPRP.

**Commission Recommendation 3**

*That the Independent Expert Panel should be established prior to determination and undertake the following:*

- *review all submitted material on subsidence, including additional information supplied by the Applicant and its consultant, and comments from DRE and its Principal Subsidence Engineer;*
- *provide advice and recommendations about the following:*
  - *the accuracy and reliability of predicted subsidence impacts on sensitive surface features, particularly in relation to cliff lines in the vicinity of the areas to be mined and beneath the former New Hartley Shale Mine;*
  - *the adequacy of the management regime in the proposed conditions of consent, including the performance criteria, management plans and monitoring requirements, in terms of providing appropriate protection to sensitive surface features.*

An IPRP was established in March 2016 and has carried out a review based on terms of reference that borrowed heavily from the specific wording of the Commission's Recommendation 3. Consequently, the Department is of the view that the Commission's recommendation has been satisfied through the establishment of the IPRP and the preparation of its report and recommendations.

**2.4.1 IPRP Report**

The IPRP completed its report on the review of the Airly mine plan, in accordance with its Terms of Reference, on 1 July 2016. The IPRP's review involved:

- identifying a natural rate of cliff fall (including likely natural causes) which is unrelated to mining and cannot be avoided or eliminated by proposed protection measures;
- considering the accuracy and reliability of predicted subsidence impacts, including independent assessments of pillar stability (utilising a new method recently developed by the University of NSW) to determine the likelihood of remnant pillars remaining stable in the long-term; and
- whether the management regime proposed in draft conditions of consent would provide appropriate protection to sensitive surface features.

The IPRP also gave consideration to detailed comments provided by DRE's Principal Subsidence Engineer (Dr Gang Li), which accompanied DRE's previous submissions to the Commission. In addition, Prof Canbulat, undertook a site visit to Airly mine and inspected the underground workings.

Overall, the IPRP considered Centennial's approach to designing a low-impact mine plan to be reasonable and, in their experience, likely to limit subsidence to the low levels predicted. Accordingly, the IPRP stated that it was:

*"...satisfied that the proposed methods of extraction have the potential to avoid significant impacts and minimise residual effects and impacts from subsidence on cliffs, steep slopes and pagodas".*

The IPRP was of the view that the key parameters of the mine plan would be expected to deliver long-term stable outcomes based on its pillar stability assessments.

However, the IPRP made various recommendations that require early, high confidence monitoring, additional protection to cliffs near the New Hartley Shale mine interaction zone, and careful consideration of long-term stability. A detailed discussion of the IPRP's recommendations and how they have been addressed in the Department's recommended conditions is provided in **Section 2.4.4** below.

#### **2.4.2 Centennial's response to the IPRP Report**

Centennial forwarded the IPRP's report to the Department, together with its response to its recommendations on 7 July 2016. The Department and DRE noted that Centennial had only addressed those recommendations contained in the report's Executive Summary and that there was further advice contained in the report which required a response. A second response from Centennial was received on 19 July. Centennial has agreed to implement all the recommendations of the IPRP and has commenced collecting the baseline data for its remote subsidence monitoring system.

#### **2.4.3 Agency responses to the IPRP Report**

The Department forwarded the IPRP's report and Centennial's first response to DRE for comment. DRE advised that it was satisfied that the IPRP review had been conducted in accordance with its Terms of Reference and that identified risks associated with the mine plan could now be managed in the Extraction Plan process provided that Centennial is required to address the IPRP's findings and recommendations (see **Appendix F**). A detailed minute from Dr Li suggesting specific conditions to be applied in any development consent was enclosed in DRE's response.

The Department also received a submission from OEH, on behalf of NPWS, which manages the Muggi Murum-ban State Conservation Area (SCA). OEH advised the Department that it was supportive of the IPRP's recommendations and was satisfied with Centennial's response (see **Appendix F**).

#### **2.4.4 Discussion of IPRP Report recommendations**

The Department has carefully considered the IPRP's report and recommendations, Centennial's three responses (the third being Centennial's response to DRE's submission on the IPRP report) and the two agency submissions, particularly in relation to Dr Li's recommended conditions. The Department supports all of the IPRP's recommendations and has revised its recommended conditions of consent accordingly, as described below.

##### Early, high confidence subsidence monitoring

The IPRP recognised the key aspect of Centennial's mine plan providing protection to sensitive surface features was implementation of extraction methods that would lead to very low levels of subsidence (<125 millimetres). The IPRP considered the mine plan could be implemented in a manner that would postpone extraction beneath significant cliff lines until sufficient monitoring results demonstrating low levels of subsidence had been obtained.

The IPRP stressed the importance of undertaking early, high confidence monitoring over initial areas of extraction involving panel and pillar mining at high depths of cover (>250 metres) in order to demonstrate that the mine plan would maintain the very low levels of subsidence expected. The IPRP indicated this early monitoring could be undertaken on Mount Airly as there are few, or no sensitive surface features in the central areas of the plateau. This would mean that, if greater than expected subsidence occurred, the environmental consequences would be low.

The IPRP advised further that this initial monitoring should include both conventional, high confidence survey methods together with remote (i.e. aerial or satellite-based) monitoring methods in order to validate subsidence predictions made in the EIS and also to demonstrate the effectiveness of remote monitoring methods proposed to be used over rugged or inaccessible land elsewhere in the mine plan.

The Department has given effect to the IPRP's recommendations relating to subsidence monitoring by revising its recommended conditions of consent to restrict Centennial from undertaking 'panel and pillar mining' or pillar lifting beneath or adjacent to significant cliff lines until it has completed mining of at least four mini-walls in less sensitive areas around the central plateau of Mt Airly (see condition 1(a) of Schedule 3 in **Appendix H**). The Department specifically sought clarification from the Chair of the IPRP on this restriction, and the Chair confirmed that it gives effect to the IPRP's recommendations.

The Department has also revised its recommended conditions to require the IMRP to oversee subsidence monitoring that is carried out in these initial four mini-walls and later areas of mining (see condition 5 of Schedule 3), including providing advice on:

- all relevant monitoring results and compliance with the performance measures in respect of cliff lines, pagodas and steep slopes;
- the development and implementation of a Subsidence Monitoring Program and Land Management Plan through the Extraction Plans, including any adaptive management plans; and
- the development of effective remote monitoring techniques that could be used in the rugged terrain above the mine.

#### Additional protection to cliffs near New Hartley Shale mine

Another key area investigated by the IPRP was proposed panel and pillar mining in the vicinity of cliff lines that have been previously affected by mining-induced subsidence from the former workings of the New Hartley Shale mine.

In this interaction zone, additional protection was considered necessary by the IPRP in order to address uncertainties as to whether:

- the cliff lines that had previously been affected by mining-induced subsidence from the former workings in the New Hartley Shale mine have since stabilised; and/or
- there are any remnant pillars in the former workings that may collapse as a result of proposed under mining, thereby leading to otherwise unpredicted surface subsidence of up to 500 mm.

The IPRP noted that cliffs had been successfully protected at Baal Bone Colliery (also located in the Western Coalfield) from greater levels of subsidence of up to 1.8 m caused by longwall mining where a setback distance defined by half the depth of cover (i.e. a 26.5° angle of draw) *plus* 50 m was applied between the edge of cliffs and second workings.

In light of the uncertainties noted above, the IPRP recommended that Centennial's proposed setback from the edge of cliffs in the vicinity of the New Hartley Shale mine to any new second workings (i.e. a 26.5° angle of draw) be increased by an additional 50 m. The IPRP considered this would be likely to provide protection to the cliff lines previously affected by mining-induced subsidence from workings in the New Hartley Shale mine. No restrictions on first workings extraction in the Cliff Line Zone, proposed to be undertaken beneath and adjacent to cliffs, were considered necessary by the IPRP.

The Department has given effect to the IPRP's recommendation by revising its conditions of consent to implement the additional 50 m setback to cliffs, steep slopes and pagodas in the New Hartley interaction zone (see condition 1(b) in Schedule 3 in **Appendix H**).

#### Long-term stability

The IPRP's pillar stability assessments investigated the potential effects of pillar spalling and roof collapses on long-term pillar stability within the mine. These assessments considered the implications of a weak roof (as identified in the EIS and by DRE's Dr Li) and flooding (identified in the EIS and the Pell submission) on the reliability of Centennial's predictions of long-term stable outcomes.

Despite these geological and potential flooding conditions, the IPRP concluded that the mine plan parameters could deliver long-term stable outcomes at the relevant depths of cover but identified some uncertainty in areas where there are complex loading conditions (i.e. beneath steep cliffs). Dr Li also identified this as an area of concern.

In order to manage this uncertainty, the IPRP recommended that Centennial undertake work to calibrate the EIS's loading condition assumptions so as to inform Extractions Plans. The IPRP considered that this further work would define areas in the Shallow Zone in which pillar quartering may not be able to be undertaken in order to maintain a sufficient factor of safety having regard to complex loading conditions beneath cliffs and steep slopes.



The Department has given effect to this recommendation by revising its conditions of consent to:

- require Centennial to monitor pillar loads underground to develop an understanding of the loading conditions on pillars in the vicinity of cliff lines, pagodas and steep slopes (see condition 8(i)(i) of Schedule 3); and
- require the IMRP to oversee all further monitoring and mine design work in relation to pillar stability and loading conditions (see condition 5 of Schedule 3), including providing advice on:
  - monitoring to improve the understanding and predictions of loading conditions on pillars in the vicinity of cliff lines, pagodas and steep slopes;
  - assessment of the likely stability of cliff lines, pagodas and steep slopes; and
  - mine design in sensitive areas and whether the proposed pillar geometries in these areas have a sufficiently high probability of remaining long term stable.

#### **2.4.4 Omission of the Partial Pillar Extraction Zone**

The IPRP report noted that Centennial had indicated that it was no longer intending to implement the second workings extraction method known as 'pillar lifting' in the previously proposed Partial Pillar Extraction Zone (PPEZ). On this basis, the IPRP stated that:

*"As a consequence of this redesign by [Centennial] many of the IPRP's concerns after reviewing the EIS have been addressed".*

However, Centennial has since advised the Department that this is not the case. The Department understands that this is the result of a misunderstanding between Centennial staff and the IPRP.

Centennial had previously proposed pillar lifting in limited areas around the base of cliffs and steep slopes (see **Figure 2**). Both Dr Li and the IPRP identified such areas as of concern due to uncertainties around the complex loading conditions of cliffs and steep slopes above a mining area featuring different forms of extraction. In such areas it is very important that the remaining coal pillars are long-term stable. The IPRP considered that, even if the lower impact method of pillar splitting and quartering was undertaken in place of pillar lifting, an assessment of these complex loading conditions would be required and would possibly lead to a lesser level of extraction (e.g. pillar splitting, but not quartering).

The Department notes that the recommended conditions require that any proposed pillar lifting or other pillar extraction would only be allowed following approval of an Extraction Plan. However, the Department acknowledges the concern expressed by Dr Li and confirmed by the IPRP over pillar lifting as proposed in the EIS's mine plan. In light of this, the Department agrees that pillar lifting and should not be permitted without additional study and endorsement by the IPRP.

The Department has therefore strengthened the recommended conditions to ensure that any Extraction Plan that proposes pillar lifting or any other pillar extraction must:

- consider the long-term stability of pillars (condition 8(e) of Schedule 3 in **Appendix H**);
- provide revised predictions of any subsidence impacts (condition 8(g) of Schedule 3);
- give express consideration to the IPRP's report (condition 8(f) of Schedule 3); and
- be prepared in consultation with both DRE and the IRMP (see condition 8(b) and (i) of Schedule 3).

Any advice from DRE or the IRMP would either have to be incorporated within the Extraction Plan or else reported as an exception to the Department. The Department would then be able to seek additional advice from the IRMP regarding any such exception, before the Secretary decides whether the proposed pillar extraction should be allowed.

In addition, the Department has expanded the role of the IRMP to allow the Department to seek advice at any time on pillar loading conditions in the vicinity of cliff lines, pagodas and steep slopes, and the likely stability of these sensitive features (see condition 5(b) and (c) of Schedule 3).

#### **2.4.5 Summary and conclusion on IPRP Report**

The Department supports all of the IPRP's recommendations and has revised its conditions of consent to give effect to these recommendations. The Department is satisfied that the revised conditions are strict, and would require Centennial to achieve an acceptable level of protection to the environment.

DRE (including Dr Li) has reviewed these recommended conditions of consent and confirmed that they appropriately address the IPRP's findings and recommendations. In particular, Dr Li confirmed that the recommended conditions have been strengthened by requirements to consider the mine design parameters underpinning the advice in the IPRP's report. Consequently, Dr Li has endorsed the recommended conditions and confirmed that DRE has no residual concerns (see **Appendix I**).

## 2.5 Post-approval Role of the Independent Expert Panel

The Commission made another two recommendations relating to the role of the independent expert panel post-approval.

### **Commission Recommendation 4**

*That the proposed condition for the Extraction Plan expressly requires consultation with the Independent Expert Panel in preparing, revising and enforcing the Extraction Plans and associated management plans (including the Water Management Plan, Biodiversity Management Plan and Land Management Plan), particularly in relation to relevant mine design principles, the development of detailed Trigger Action Response Plans and performance indicators.*

By way of background, the recommended condition of consent in the Department's PAR relating to the independent expert panel was in the following terms:

*'The Applicant shall establish a review panel of suitably qualified experts to provide advice on the preparation of Extraction Plans and their implementation in order to meet the performance measures ... relating to cliffs and pagoda formations, to the satisfaction of the Secretary.'*

This form of words focussed on the key significant environmental features located above or close to the proposed Airly mine plan (i.e. 'cliffs and pagoda formations'). This approach was adopted because there is little evidence that potential impacts to watercourses, groundwater, Aboriginal heritage or historic heritage (for example) are key subsidence risks at Airly.

The Department continues to believe that the role of the IRMP should be focused on key risks such as the potential impact on cliffs, pagodas and steep slopes, rather than overseeing all elements of all Extraction Plans over the life of the mine. However, the Department accepts the Commission's intention to broaden the IRMP's role, and has revised the conditions accordingly

Firstly, the Department would establish the IRMP following consultation with DRE, and would be able to seek advice from the IMRP on all phases of the post-approval process (see condition 5 of Schedule 3 in **Appendix H**).

Secondly, the IRMP would have an oversight role which would be a critical input into the development of the Subsidence Monitoring Program and the interpretation of monitoring results, the mine design, and decision making about the level of panel extraction that should be allowed (see condition 8(b) of Schedule 3).

Thirdly, the IRMP would be involved in the development and review of all Extraction Plans (see condition 8(b) of Schedule 3), including mine design and adaptive management measures (see condition 8(f) of Schedule 3), with a particular focus on the Land Management Plan, which covers cliffs, pagodas and steep slopes (see condition 8(i)(v) of Schedule 3).

Fourthly, Centennial would have to regularly provide monitoring data to the IRMP (see condition 6 of Schedule 3), and the IRMP would provide expert advice to the Department if Centennial has exceeded the performance measures and enforcement is required (see condition 5(g) of Schedule 3).

Finally, while the IRMP would focus on key risks, the Department could if necessary obtain independent advice from other experts, including water and biodiversity experts, and require Centennial to pay the costs associated with seeking this advice (condition 9 of Schedule 3).

### **Commission Recommendation 5**

*That all information relevant to the Independent Expert Panel's advice and recommendations is made publicly available on the Applicant's website.*

The recommended conditions of consent have been updated to reflect this recommendation (see condition 14 in Schedule 6 of **Appendix H**). Further, the report of the IPRP and Centennial's response to that report (see **Appendices D and E**) have been made publicly available.

## 2.6 Water Resources

### 2.6.1 Water discharges to Airly Creek

**Commission Recommendation 6**

*That prior to determination, the Department seeks written confirmation from EPA that any residual issues relating to water discharges into Airly Creek and any downstream water quality impacts in the Gardens of Stone National Park can be adequately resolved, particularly in relation to the achievement of 99% species protection.*

Although the Commission concluded that it was “generally satisfied that the potential discharge impacts can be adequately managed through recommended conditions of consent and an amended EPL”, it also recommended that the Department seek written confirmation from the EPA to ensure that residual issues associated with water discharges to Airly Creek can be adequately resolved.

The Department requested the EPA's advice in accordance with the Commission's recommendation. The EPA advised the Department that it is “...satisfied that the issues relating to surface water management and discharge can be adequately resolved with particular reference to the achievement of 99% species protection” (see **Appendix B**).

### 2.6.2 Subsidence-related impacts on watercourses

**Commission Recommendation 7**

*That the recommended condition of consent relating to the Water Management Plan should be strengthened to include specific consideration of the potential impacts to downstream water users of subsidence-related flow reductions in Gap Creek and Genowlan Creek, and the measures to implement the provision of compensatory water supply.*

The Department notes that the Commission “is satisfied that there would be no cracking of Gap Creek and Genowlan Creek, and that any potential reduction in flow associated with the cracking of first order drainage lines would likely be within the limits of natural variability based on the small flows potentially affected”. However, the Commission considered that the conditions relating to the impacts of such subsidence-related flow reductions on downstream water users should be strengthened.

The Department supports the suggested revision to its condition, which has been updated to include specific consideration of the potential impacts to downstream water users of subsidence-related flow reductions in Gap Creek and Genowlan Creek. The Department has also included a requirement for Centennial to outline the measures it would implement to provide a compensatory water supply, in the event of an impact other than a negligible impact as part of the WMP (see condition 15(c)(ii) in Schedule 4 of **Appendix H**).

### 2.6.3 Replacement of Village Spring

**Commission Recommendation 8**

*That the Department should include a condition of consent requiring that the Applicant provides an alternative, artificial water source to the Village Spring to ensure that bushwalkers and hikers have access to drinking water.*

The Commission considered that the potential loss of Village Spring would be an unacceptable impact, given the recreational values of the Mugii Murum-ban SCA and therefore recommended that it be replaced with an alternate and artificial (i.e. piped) water source.

While some submissions identified that Village Spring was used by bushwalkers and hikers, the Department does not consider that a loss or reduction in flow from the spring would be an unacceptable impact. The Department's view is based on a site visit to Village Spring, which revealed that it is situated upslope from a 4WD track amongst bushland and without any identifying signage, or information about water quality. While the seep may be known amongst some bushwalkers and hikers, it is unlikely to be easily identified by other visitors unfamiliar with the area as it is not identified on any maps of the area. It is also possible that during prolonged dry periods, flows at many seeps and creeks in the SCA may reduce, or cease even without the presence of any mine workings.



The Department has consulted with the NPWS Area Manager who advised that the provision of an alternate water supply was not supported because it would be impractical and unnecessary. NPWS considered that to carry out such a recommendation would likely involve work including collecting water, piping or transporting it, storing the water and regular testing and certification of the water as being suitable for consumption. NPWS considers this would require significant initial work and ongoing maintenance, which is unadvisable considering the low visitation to the area. There is also an expectation that visitors to this area are self-sufficient in terms of supplying water, as evidenced by a draft Plan of Management for the SCA that promotes it as a destination for self-reliant recreation.

Overall, the Department remains of the view that the loss or, or reduction in flows at Village Spring would be an acceptable impact, which is not likely to significantly affect the recreational values of the SCA based on the advice of NPWS. Accordingly, the Department has not adopted the Commission's recommendation.

## 2.7 Visual mitigation

### **Commission Recommendation 9**

*That the proposed conditions of consent relating to visual mitigation measures are strengthened to ensure that vegetation screening or other mitigation measures commence before any construction occurs and are implemented in a timely manner.*

Centennial has advised the Department that it would commence tree planting three months prior to commencing construction of the reject emplacement area. The Department has included a new condition of consent to reflect this commitment (see condition 21 of Schedule 3 in **Appendix H**). In the interim, the Department notes that Centennial has undertaken additional tree planting required under Mod 3 to screen glimpses of the existing coal stockpile to travellers on Glen Davis Road.

## 3 BILATERAL ASSESSMENT

---

In accordance with the bilateral agreement between the Commonwealth and NSW Governments, the Department provides additional information required by the Commonwealth Minister in deciding whether or not to approve a proposal under the EPBC Act (see **Appendix G**).

The Department also consulted with the Commonwealth Department of the Environment (DoE) on the recommended conditions of consent. DoE advised the Department on 16 March 2016 that it was satisfied that the recommended conditions would provide protection suitable for those Matters of National Environmental Significance (MNES) applicable to the proposal under the EPBC Act. Since this time, the IPRP report has been received and the Department has further revised its conditions. The Department does not consider these revisions result in less protection to MNES.

The Department notes that, if approved by the Commission, the proposal would be referred to the Commonwealth Minister for the Environment for determination under the EPBC Act.

## 4 RECOMMENDED CONDITIONS

---

Revisions have been made to the Department's conditions of consent to reflect those recommendations of the Commission that have been adopted, final input from agencies and comments from Centennial (see **Appendix H**).

## 5 CONCLUSION

---

The Commission was satisfied that the project's benefits outweigh its potential impacts, and that the project could be approved, subject to its recommendations. The Department has carefully considered the Commission's review report and its recommendations, advice from key agencies including DRE, EPA and NPWS and Centennial's response to the Commission's recommendations. In addition, the Department consulted with Centennial and key agencies on the recommended conditions of consent.

The Department is satisfied that the Commission's key recommendation for an independent expert review of the proposed mine plan and monitoring systems has been carried out by the IPRP. The Department has also revised its recommended conditions to continue the involvement of independent expertise in this process through the IRMP, which would focus on mining beneath and adjacent to sensitive areas (cliff lines, pagodas and steep slopes and the former New Hartley Shale mine interaction zone). The Department believes that the Commission's desire for a precautionary approach to the proposed mining beneath sensitive areas of the Mugii Murum-ban SCA has been fully satisfied.

The Department has carefully considered the Commission's request for an alternative, artificial water source to replace the potential loss of Village Spring. The Department accepts the position of Centennial and the advice of NPWS that this would involve the installation of significant infrastructure, which would be inconsistent with the draft Plan of Management for the SCA which encourages self-reliant recreation. On the basis of this advice, the Department considers that the potential reduction or loss of flows from Village Spring would not result in an unacceptable impact on the recreational values of the SCA.

The Department has adopted all of the Commission's recommendations by requiring the:

- IPRP Report and any future advice of the IRMP to be published on Centennial's website;
- water management plan include specific consideration of subsidence-related impacts to flow in Gap and Genowlan Creek and measures to provide a compensatory water supply; and
- planting of visual tree screening a minimum of three months prior to the commencement of construction of the reject emplacement area and for this to be maintained over the life of the mine.


The Department believes its recommended conditions of consent provide a comprehensive, strict and precautionary approach to ensuring the project can comply with relevant performance measures and standards and ensure the predicted residual impacts can be effectively minimised. These conditions represent current best practice for the regulation of underground mining projects in NSW and would therefore protect the local environment and amenity of the local community and promote the orderly development of the region's important coal resources.


## 6 RECOMMENDATION

---

It is RECOMMENDED that the Planning Assessment Commission exercise the powers and functions delegated to it in the Minister for Planning's Instrument of Delegation, dated 14 September 2011, and:

- **considers** the findings and recommendations of this report;
- **approves** the development application, subject to conditions; and
- **signs** the attached instrument of consent (see **Appendix H**).

  
Howard Reed  
Director  
Resource Assessments  
28.9.16

  
David Kitto  
Executive Director  
Resource Assessments & Business Systems  
28/9/16