Independent Planning Commission

NSW GOVERNMENT

Ms Carolyn McNally
Secretary
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

16 April 2018

Dear Ms McNally

Determination of Modification Application
Integra Underground Mine - New and Extended Longwalls (MP 08_0101 MOD 8)

Thank you for your Department's letter received on 15 March 2018 referring the above modification application to the Independent Planning Commission (the Commission), for determination. Professor Mary O'Kane AC, Chair of the Commission nominated, Mr Paul Forward (chair) and Professor Alice Clark to constitute the Commission to determine the application.

Glencore Australia Holdings Pty Ltd, a related entity of HV Coking Coal Pty Ltd (the proponent) has declared reportable political donations. Accordingly, the Department of Planning and Environment (the Department) requested the Commission to determine the application in accordance with the Minister's delegations of 14 September 2011 and 11 October 2017.

The proponent is seeking to modify its existing underground project approval to:

- develop up to three additional longwall (LW) panels in the Middle Liddell Seam;
- increase the lengths and widths of the currently approved LWs 15-17;
- recover an additional 9.9 million tonnes (Mt) of run-of-mine (ROM) coal;
- construct and operate ancillary surface infrastructure; and
- construct an additional access road off Middle Falbrook Road.

Processing of the proposed ROM coal is expected to generate up to 2.9 Mt of coarse rejects and 0.69 Mt of tailings which are proposed to be managed within existing tailings storage facilities.

The proposed modification includes two potential mine plan options:

- LWs 15-19 layout - maximum void width of 330m; and
- LWs 15-20 layout - maximum void width of 257m.

On 1 March 2018, the EP&A Act was amended. The project is a transitional Part 3A project under Schedule 2 of the *EP&A (Savings, Transitional and Other Provisions) Regulation 2017*. The Commission notes the proposed modification does not fundamentally change the essential nature of the development and considers that the proposed changes are within the scope of section 75W. The ability to modify transitional Part 3A projects under section 75W of the EP&A Act is being discontinued, however as the request for this modification was made before 1 March 2018, the provisions of Schedule 2 continue to apply.

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As part of the Commission's assessment of the application, the Commission met with the Department. Notes from the meeting are contained in **Appendix 1**.

The Commission notes there were no submissions from the public. Singleton Shire Council did not make a submission.

The Commission did not conduct a site inspection or have briefings with any agencies other than the Department, noting that no government agencies have objected to the modification.

The Commission engaged a subsidence expert, Prof Ismet Canbulat, to provide independent technical advice to the Commission on the project. This included undertaking a review of the project documentation, the assessment methodology, and to advise whether the subsidence risks of the project had been appropriately modelled and addressed. Prof Canbulat attended the briefing from the Department. Prof Canbulat's report to the Commission is attached at **Appendix 2**.

The Commission considered carefully the Department's environmental assessment report, information provided by the proponent, recommendations from government agencies, Prof Canbulat's report and the provisions of section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The Commission has considered the objects of the EP&A Act in its assessment and determination of the project and has given application to the principles of these during its consideration of the project. The Commission notes that the Department has also considered and assessed the project against the objects of the EP&A Act within its report.

The Department conducted an assessment of the proposed modification and identified what the Department considered to be the key matters for the proposal. These included:

- subsidence;
- water resources; and
- biodiversity.

The Commission has reviewed the Department's assessment of these matters and accepts the Department's assessment and conclusions regarding impacts to water resources and biodiversity. The Commission supports the Department's comment in relation to the monitoring of groundwater inflows and that this should be addressed as part of the Extraction Plan process and in the development of a Water Management Plan, in accordance with condition 20 of the existing Project Approval.

To this end the Commission is satisfied with the outcomes of the Department's assessment of project impacts on water resources and biodiversity.

The Commission considers subsidence impacts to open cut highwall stability to be the key issue with the proposed application, which is considered further below.

Subsidence

The proponent's Environmental Assessment was accompanied by a Subsidence Assessment, prepared by Strata Control Technology (SCT) Operations Pty Ltd. SCT considered the predicted subsidence effects and impacts for the two potential mine layouts.

SCT considered the potential for instability of the exposed highwall associated with the adjacent mining operations at Ravensworth East-West Pit to the south and the Mount Owen North Pit to the north of the modification LWs. SCT concluded that subsidence effects at Ravensworth are likely to be limited by the distance the proposed LW panels extend beyond the highwall. Rock falls and perceptible cracking are predicted along sections of the highwall that are directly undermined. However, the assessment notes that the effects of this instability are not considered significant in the context of the current usage of the pit and position of access roads above the highwall or within the pit.

With regards to the Mount Owen North Pit, the assessment identified a number of potential interactions between the open cut and the LW panels, including:

- slope instability;
- in-pit floor heave;
- decreased blasting efficiency;
- blast vibrations; and
- increase in surface inflows and methane emissions.

SCT states that based on the current mine plans, it appears that only LW 15 would mine below an active highwall of the North Pit. The assessment notes that the top section of the south-western highwall has the potential to be impacted by subsidence and the main risk within this section is rock fall and slope instability. The SCT assessment notes that the potential consequences of slope instability will require further consideration in mine planning and management of residual risks, which would be undertaken as part of the Extraction Plan process, in consultation with Mount Owen Mine.

Notwithstanding the potential for subsidence impacts, the SCT assessment indicates that the proposed modification is likely to comply with the current subsidence performance measures contained in the existing Project Approval.

The Department assessed the potential subsidence impacts on natural, heritage and built features, including mine owned infrastructure. The Department acknowledges that the subsidence parameters for the project differ to those assessed under the existing Project Approval, noting that the changes reflect the increased height, changed mining geometry and influence of overburden emplacements. The Department notes that the increases in subsidence parameters do not necessarily reflect greater subsidence impacts or greater environmental consequences from what has previously been assessed, and predicts that the increases are likely to be insignificant in the substantially modified landform of the modification area.

To address the potential for exceedances to the subsidence performance measures, the Department has recommended conditions 17A and 17B requiring additional offsets, should unpredicted impacts that are unable to be remediated occur. The Commission supports the inclusion of conditions 17A and 17B in relation to the provision of additional offsets, should subsidence performance measures be exceeded.

The Department is satisfied that the subsidence prediction model is appropriate and has been calibrated to local conditions and that the assessment and its predictions are conservative. The Department notes that a review of the proponent's annual reporting indicates that subsidence impacts have generally been less than predicted, indicating that the existing subsidence management framework is operating effectively.

Prof Canbulat's independent review finds that the SCT assessment should be considered a "best estimate", providing the most likely maximum subsidence predictions and associated impacts. The review notes that the best approach will be to conduct a detailed assessment as part of the Extraction Plan process. Notwithstanding, Prof Canbulat considers

that the estimates provided by SCT are reasonable and it is highly unlikely that a more detailed assessment would predict significantly higher estimates or increased impacts on surface features or the environment.

In terms of assessment methodology, the independent review notes that the most common and reliable method is the empirical method, based on previous experience. SCT utilised the same empirical method, based on previous subsidence monitoring, which has proven suitable in providing reasonable estimates of upper limits of key subsidence parameters for LWs 6-12 and the same method was adopted for LWs beyond LW 12 in the Middle Liddell Seam, which in Prof Canbulat's opinion, is a suitable method for assessing potential subsidence associated with the proposed LWs.

In summary, Prof Canbulat concurs with SCT's findings and recommendations for future assessment and controls to manage any associated risks, particularly in active open cut mines.

Accordingly, the Commission finds that the potential subsidence impacts have been appropriately addressed by the proponent and by the Department. The Commission notes that the existing Project Approval includes conditions requiring the proponent to assess the potential subsidence impacts on built features through the Extraction Plan process and manage any impacts in accordance with established performance measures. Existing conditions also include performance measures to protect all natural and built features in the underground mining area.

The Commission considers that the proposed modification does not change the essential nature of the approved development as the site would continue to be used for both underground and open cut mining and finds that:

1. surface impacts by way of mining subsidence has been appropriately modelled, confirmed by way of independent peer review by Prof Canbulat, with acceptable impacts which can be adequately managed by conditions;
2. ground and surface water impacts have been appropriately assessed with acceptable impacts and can be adequately managed by conditions; and
3. biodiversity impacts have been appropriately assessed with acceptable impacts which can be offset and adequately managed by conditions.

For the reasons set out above, the Commission has determined to approve the modification application subject to the conditions set out in the modified instrument of approval.

Mr Paul Forward
Member of the Commission (Chair)

Prof Alice Clark
Member of the Commission

cc. The Hon. Anthony Roberts, MP
Minister for Planning
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APPENDIX 1

BRIEFING NOTES FROM THE DEPARTMENT

This meeting is part of the determination process		
Meeting note taken by: Alana Jelfs	**Date:** 11 April 2018	**Time:** 10.30am
Project: Integra Underground Mine Project (MP 08_0101 MOD 8)		
Meeting Place: Independent Planning Commission NSW (IPCN)		

Attendees:

IPCN Members:
Paul Forward (Chair) and Prof Alice Clark

IPCN Secretariat:
David Koppers (Team Leader) and Alana Jelfs (Senior Planning Officer)

Department of Planning and Environment:
Howard Reed (Director Resource Assessments) and Jessie Evans (Team Leader, Resource Assessments)

Independent Subsidence Expert:
Prof Ismet Canbulat (UNSW)

Meeting Purpose: For the Department to brief the Commission on the project.

Meeting notes:

The following matters were discussed:

- Overview of the Extraction Plan process, including the requirement for management plans, rehabilitation, trigger action plans, subsidence performance measures and other relevant matters.
- Extraction plans are required for second workings and usually cover several longwall panels.
- Currently, the proponent is extracting longwall 13. Extraction of longwall 14 was scheduled to commence February 2018.
- The proponent presented two alternate mine plans, but has not decided which it will proceed with however the subsidence assessment is based on the worst-case option.
- Key risks of the project that would require further consideration and assessment as part of the Extraction Plan process include:
  - potential interaction of mining slope instability and potential for interaction of mining with Mount Owen North Pit Highwall;
  - potential for surface water/groundwater connectivity or increase groundwater inflow.
- The Department considers the risks could be managed appropriately through the existing conditions of consent and through preparation of Extraction Plans.

Outcomes/Agreed Actions: Department to send the Commission modified instrument

Meeting closed at: 11.30am

Date: 15 April 2018

Alana Jelfs
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Independent Planning Commission NSW
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Report No: IPC-2018/1

Subject: Review of subsidence assessment conducted as part of Integra Underground Project (MP 08-0101 MOD 8)

1. BACKGROUND

HV Coking Coal Pty Limited (HVCC) operates the Integra Underground Mine (Integra) in the Upper Hunter region of New South Wales (NSW). The mine is located at Glennies Creek, approximately 12km north-west of Singleton. HVCC operates under a Project Approval (PA 08_0101) granted under Part 3A of the *Environmental Planning and Assessment Act 1979*. PA 08_0101 was granted on 26 November 2010 and has been modified on different occasions. PA 08_0101 enables mining operations (in three coal seams) to be undertaken at Integra.

HVCC has identified an additional coal resource further north of the currently approved longwalls (LW). HVCC proposes to modify MP 08_0101 to develop up to three additional LWs in the Middle Liddell Seam, with the scope of increasing the approved longwall mining footprint area of the Middle Liddell Seam and includes:

- an extension of the project boundary
- a change to the direction of main roadway development headings
- changes to the start and finish positions of the currently approved LWs 15 to 17, to increase the length and resource recovery for these panels
- two or three additional longwall panels
- a potential change to longwall panel width.

The final longwall layout would be determined as part of the Extraction Plan already required for project approval. The proposed layout of LWs 15-19 contain a maximum panel width of 320m and a resulting maximum void width of 330m. The proposed layout of LWs 15-20 contain a maximum panel width of 246m and a resulting maximum void width of 257m.

To inform an Environmental Assessment (EA), HVCC commissioned SCT Operations Pty Ltd (SCT) to prepare an assessment predicting the key subsidence parameters and impacts expected from the proposed extension to mining operations, which has been conducted and submitted.

It is understood that the project application has already been submitted and approved by the Department of Planning and Environment with modifications.

The modified application has been deferred to the Independent Planning Commission (IPC) NSW that commissioned the author to conduct an independent review of the subsidence assessment conducted by SCT. This short report summarises the findings of this review.

2. PURPOSE AND SCOPE OF THIS REVIEW

The scope of this review is outlined by Alana Jelfs in a document submitted on 5/4/2018, with the following key deliverables:

- Review relevant project documentation (see list below);
- Review assessment methodology and advise whether fit for purpose;
- Review subsidence risks and advise whether risks have been adequately addressed;
- Verbal briefing to Commission on findings; and
- Prepare a short report on findings.

The deliverables of this review include:

- Verbal briefing to the Commission; and
- A short report on findings.

3. INFORMATION PROVIDED

The following information has been provided for this review:

- Integra Underground Subsidence Assessment;
- Subsidence Advisory NSW submission;
- Integra Underground MOD 8_Response to Submissions;
- Integra Underground MOD 8_Secretary's Assessment Report;
- Integra Underground MOD 8_Recommended Consolidated Approval;
- Integra Underground MOD 8_Recommended Notice of Modification.

4. GENERAL COMMENTS

The general behaviour of rock masses in the area of underground coal mining by longwall methods, which initiate mine subsidence and surface ground movements, are well established and understood (Department of the Environment, 2014). The actual behaviour varies on a site-by-site basis, depending on local geology, mine layouts and surface features; therefore, subsidence assessments require site-based data to predict subsidence magnitudes and associated impacts. A variety of methods, such as empirical, analytical and numerical are used to accurately predict expected subsidence. These methods have evolved over the years and have led to the establishment of procedures for predicting, monitoring and assessing impacts of mining to meet public expectations.

Longwall mining typically results in horizontal and vertical movements at the land surface, which can extend beyond the mine footprint and can impact natural and built environments (Department of the Environment, 2014). Vertical subsidence, tilt, horizontal displacement, curvature and strain are the subsidence parameters used to define the extent and magnitude of surface movement.

5. COMMENTS ON SCT'S ASSESSMENT

5.1 Current Surface Conditions

With currently available methods, the prediction of subsidence profiles in undisturbed ground is a relatively straightforward exercise. However, in the case of Integra, the surface of the proposed workings have been heavily modified by open cut mining operations, mine infrastructure, creek diversion, rail tracks, and other activities. Therefore, the assessment conducted by SCT should be considered to be a best estimate, providing the most likely maximum subsidence and associated impacts. In this case, the best approach will be to conduct a detailed assessment in the Extraction Plan, as required by the Department of Planning and Environment. Nevertheless, in my opinion, the estimates provided by SCT are reasonable and it is highly unlikely that a detailed assessment would predict significantly higher estimates, which would otherwise increase the impacts on surface features or the environment.

5.2 Additional Subsidence due to Proposed Longwalls

The proposed longwalls will be located under different surface structures than the previous mine plan. These structures include the Mt Owen rail line and the loop, the Mine Infrastructure Area (MIA), open cut mines, the Ravensworth State Forest and other features which include active or idle open cut pits, partially filled tailing dams, emplacement areas, rehabilitated areas and haul roads associated with the open cut mines. There are also features located above the previously approved longwalls (i.e., above LW 15), which may not be relevant to this particular assessment. The land within the proposed longwall and the associated infrastructure are owned almost entirely by Glencore (or subsidiary companies) for mining purposes.

I concur with the findings of SCT that subsidence for both proposed longwall options will not cause more impacts on surface structures and/or groundwater compared to the currently approved longwalls. However, a detailed assessment will be required in the Extraction Plans.

5.3 Characterisation of Surface and Sub-Surface Features and Assessment of them

The EDG17 Guideline for Application for Subsidence Management Approvals (NSW Government Trade and Investment, 2003) provides a list of over 70 surface and sub-surface features to be considered in subsidence assessments to assist the applicants. This list is not a comprehensive list of all surface or sub-surface features that may be affected by underground coal mining. EDG17 states that applicants should be responsible for identifying all surface or sub-surface features that may be affected by any proposed mining. The main features included in the list are natural features, public utilities, public amenities, farm land and facilities, industrial, commercial and business establishments, areas of archaeological and/or heritage significance, items of architectural significance, permanent survey control marks and residential establishments.

In my opinion, considering the current surface use and land ownership, SCT has provided an assessment of all surface features and the risks associated with the subsidence impacts on these features located within the proposed mining area.

SCT recommended that an assessment of ground and surface water should be conducted by relevant experts. It is understood that a detailed groundwater assessment has been conducted, peer-reviewed and accepted by the Department of Planning and Environment.

5.4 Methodology Used by SCT

As mentioned above, there are a variety of assessment methodologies used for subsidence assessments in Australia. The most common and reliable method is the empirical method (i.e., experience-based). SCT utilised the same empirical method, based on previous subsidence monitoring, as used to estimate subsidence and the associated impacts of LWs 10-17. This methodology has reportedly been proven suitable in providing reasonable estimates of the upper limits of key subsidence parameters for LWs 6-12. This same methodology has been adopted for longwall panels beyond LW 12 in the Middle Liddell Seam. Therefore, in my opinion, this method is suitable for the subsidence assessment of the proposed longwalls.

SCT provided estimates of key subsidence parameters for ground that is not currently disturbed by open cut mining, and for areas of waste rock fill, either in obsolete open cut voids, or in emplacement areas. The results indicate that the subsidence impacts are generally manageable through minor surface works or are of no consequence.

I concur with SCT's findings that there is expected to be the potential for greater subsidence, tilt, and strains in the mining modified landform over emplacement areas, in and near the edges of the open excavations and at locations where interfaces of natural ground and fill material exist. However, such increases are likely to be inconsequential in the substantially modified surface landform of the Assessment Area, which will need to be managed during mining to prevent any residual risks.

6. CONCLUSIONS

In conclusion, the assessment methodology and input parameters utilised by SCT are fit for purpose. Although further enhancements will be required to estimate and manage subsidence impacts during mining, the assessment is sound and acceptable.

SCT provided an assessment of all surface features within the proposed mining area. This assessment included all observable surface features. It is understood that an assessment of groundwater and inflows have been conducted by another consulting group and a report detailing the findings have been submitted to the Department of Planning and Environment.

I concur with SCT's findings and recommendations for future assessments and controls to manage any associated risks, particularly in active open cut mines.

7. REFERENCES

Department of the Environment (2014). Background review: subsidence from coal mining activities. June.

NSW Government Trade and Investment (2003). EDG17 Guideline for applications for subsidence management approvals. December.

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Title:	Review of subsidence assessment conducted as part of Integra Underground Project (MP 08-0101 MOD 8)
Report No:	IPC-2018/1
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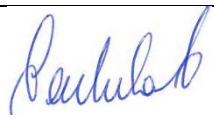
Signature:	

Disclaimer

Ismet Canbulat is employed as Professor and Kenneth Finlay Chair of Rock Mechanics at The University of New South Wales Sydney (UNSW). In accordance with policy regulations of UNSW regarding external private consulting, it is recorded that this report has been prepared by the author in his private capacity as an independent consultant, and not as an employee of UNSW. The report does not necessarily reflect the views of UNSW, and has not relied upon any resources of UNSW.