NSW GOVERNMENT | Office of Environment & Heritage

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Emeritus Prof Jim Galvin
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Dear Professor Galvin

Comments on the 'Initial report on specific mining activities at the Metropolitan and Dendrobium coal mines'

The NSW Office of Environment and Heritage provides advice to approval authorities on terrestrial and aquatic ecology, particularly in relation to threatened species and ecological communities, and Aboriginal cultural heritage to assist them in their consideration of applications for coal mining beneath the Metropolitan and Woronora Special Areas.

We have reviewed the initial report are of the opinion that, if implemented, the following recommendations of the Panel will assist in increasing the rigour of assessment and monitoring of impacts:

- A 'reverse onus of proof' model be used in outcome-based regulation to drive robust predictions and collection of information through improved monitoring.
- Regulation be supported by the inclusion of clear definitions of all key terms in measurable performance measures for swamps, streams and threatened species.
- Consistent, measurable performance measures are used for swamps, streams and threatened species in all underground mines in catchment areas.
- Water monitoring programs for swamps and streams are improved to enable attribution of observed effects at Dendrobium and Metropolitan mines.
- The 'avoid, mitigate, offset' harm management hierarchy is used, with avoidance as the primary objective and residual impacts that cannot be avoided being offset.
- Performance evaluation is improved by ensuring TARP triggers are aligned with measurable performance measures and based on meaningful surface water loss indicators.

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Further discussion on these points is provided in Attachment A. Please contact James Dawson Senior Team Leader Ecosystems and Threatened Species (james.dawson@environment.nsw.gov.au) if you require further information.

Yours sincerely

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Enclosure: Appendix A: OEH comments on the Independent Expert Panel for Mining in the Catchment 'Initial report on specific mining activities in the Metropolitan and Dendrobium coal mines' (November 2018).

Appendix A

OEH comments on the Independent Expert Panel for Mining in the Catchment 'Initial report on specific mining activities in the Metropolitan and Dendrobium coal mines' (November 2018).

Overview of impacts

Risks to the quantity of water in areas above mining domains is a critical issue in assessing the impact of new mining proposals and post-approval management plans (Subsidence Management Plans (SMP) and Extraction Plans (EP)) on threatened species and ecological communities. With little surface infrastructure associated with expansion of underground coal mines, environmental impact assessment to date has concentrated on the impacts of mine subsidence on flora and fauna and Aboriginal cultural heritage.

Deformation or alteration of the land surface does not in itself have direct impacts to all species and communities occurring above a longwall coal mine. However, water dependent species and communities are highly susceptible to the impacts of subsidence, particularly the loss or diversion of surface water. Geological impacts from longwall mining have hydrological effects, which in turn have ecological impacts on terrestrial and aquatic ecosystems.

The impact on multiple species and communities is formally acknowledged by the listing of "Alteration of habitat following subsidence due to longwall mining" as a Key Threatening Process under NSW legislation in February 2011 (NSW Scientific Committee 2005).

Listing of Coastal Upland Swamps as a Threatened Ecological Community (TEC) under the (now repealed) *Threatened Species Conservation Act* 1995 in 2012 (NSW Scientific Committee 2012) provided a community or habitat focus on an issue that had previously been only on frogs (giant burrowing frog, Littlejohns tree frog, red-crowned toadlet), plants (*Pultenaea aristata*) and invertebrates (giant dragonfly).

Performance measures

OEH concurs that regulation can be improved by the inclusion of clear definitions of all key terms in measurable performance measures for swamps, streams and threatened species. The recommendations for performance measures and TARPs in section 5.7.2 are consistent with this.

Performance measures for upland swamps need clear definitions that enable objective conclusions to be made on when an impact is consistent with the conditions of the approval. Key terms need to be defined and be phrased in a manner that avoid subjectivity. Quantifiable definitions of impact categories also should be provided. Performance measure for upland swamps also need to relate directly to shallow groundwater, the critical ecosystem process for an acknowledged water-dependent ecosystem, or for impacts to threatened species.

To provide a platform for transparent regulation, performance measures should specify the level of acceptable impact in quantifiable terms. A set of consistent performance across measures for swamps, streams, surface water and threatened species all mines in catchment areas would enable all stakeholders to better understand the terms of the approvals

TARPs

OEH notes the Panel's findings in relation to TARPs in place for Dendrobium and Metropolitan mines. In summary these include:

- The nature of the surface water TARP triggers at Dendrobium and Metropolitan is not suited to determining the level of confidence that can be placed in surface water modelling results.
- TARPs for surface flow losses (for both swamps and streams) are not explicitly related to materiality of flow losses, being defined only by terms such as 'negligible'. This limits the objectivity of performance evaluation.
- TARPs classify the seriousness of events that have already occurred rather than fulfilling a role of early signalling to prompt intervention that prevents escalation of impacts.

These issues illustrate the need to have well-defined performance measures that allow the assessment of outcomes for surface water and hydrological regimes in swamps and streams.

Monitoring

OEH agrees that limitations in monitoring and modelling mean it is difficult to verify conclusions that mining has had negligible consequences on surface water resources in swamps and streams. Monitoring can be improved by having adequate baseline data, using robust experimental designs that enable causation to be determined (e.g. a rigorous BACI design) and continuation of monitoring after mining concludes for a time sufficient to understand long-term effects. Open access to raw monitoring data would allow all stakeholders to pool information and share lesson learned. All raw monitoring data should be made publicly available to allow review of analysis and conclusions.

The Panel concluded that the responsibility to ensure a monitoring network is adequate to demonstrate compliance with project approval conditions should remain with the company. However, the current situation has arisen with this is already in place. Improvement could be achieved by requiring an independent peer review of experimental design of monitoring programs and ongoing analysis of the results of monitoring programs by a panel of relevant acknowledged experts.

Avoidance and offsetting

We note that the Panel identifies avoidance as the primary objective of this hierarchy, with residual impacts that cannot be avoided, mitigated or rehabilitated being offset as an approach of last resort. This is consistent with the provisions of the *Biodiversity Conservation Act 2016* and is required for all environment assessment in NSW.

The Panel states that there is currently an offset in place for the Dendrobium mine for impacts to swamps in Areas 2 and 3. OEH is of the understanding that there is no offset for Area 2 only Areas 3B and 3C under the 'Strategic Biodiversity Offset' (South32 Illawarra Coal 2016a). OEH also notes that the offset provided under this agreement (being 598ha of land at Madden Plains) was not identified or calculated using the 'consistent and scientifically-based approach' provided by the Biodiversity Offsets Scheme under the *Biodiversity Conservation Act 2016* or other offset policy. Rather the land containing 140ha of upland swamps was purchased by South32 and offered to the NSW Government as an offset outside of contemporary biodiversity offsetting schemes because the development approval predated the introduction of those schemes.

Please note that the "Addendum for upland swamps impacted by longwall mining subsidence" (Office of Environment and Heritage 2016) under the NSW Biodiversity Offsets Policy for Major Projects has been finalised but is yet to be formally implemented.

Avoidance should remain the primary objective in development assessment of new mines given the increasing understanding of the impacts of longwall mining on swamps and streams. Upland swamps are a restricted ecological community that occurs largely on protected land that cannot be improved by change of tenure and management actions to improve its quality. If like-for-like environmental offsets are required by either the NSW or Commonwealth governments, the magnitude of offsets required for predicted impacts to upland swamps in Areas 5 and 6 may be difficult to find. If these circumstances arise, mine plans may need to be modified to achieve predictions that result in no impact to upland swamps.

Remediation for upland swamps is at this stage unproven. The 'Dendrobium Swamp Research and Rehabilitation Plan' (South32 Illawarra Coal 2016b) proposes to undertake a trial of swamp remediation in Area 3B. Until methods are proven to re-establish baseline hydrological regimes in trial swamps, the reverse onus of proof dictates that rehabilitation is not considered as feasible.

References

NSW Scientific Committee (2005). *Determination on Longwall Mining as a Key Threatening Process. Alteration of habitat following subsidence due to longwall mining key threatening process listing.* From https://www.environment.nsw.gov.au/determinations/LongwallMiningKtp.htm accessed 26 Feb 2019.

NSW Scientific Committee (2012). *Coastal Upland Swamp in the Sydney Basin Bioregion - endangered ecological community listing - NSW Scientific Committee - final determination.* From https://www.environment.nsw.gov.au/determinations/coastaluplandswampfd.htm accessed 26 Feb 2019.

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