

Subsidence Management Plan Approval

I, Executive Director, Resource Assessments and Business Systems, of the Department of Planning and Environment, under the provisions of the development consent referred to in Schedule 1, approve the development set out in Schedule 2, subject to the conditions set out in Schedule 3.



David Kitto
Executive Director
Resource Assessments & Business Systems
as nominee of the Secretary

Sydney **30 MAY**

2018

SCHEDULE 1

Condition 7 of Schedule 3 of the development consent granted by the Minister for Urban Affairs and Planning on 20 November 2001 for the development of the Dendrobium Coal Mine and the construction and operation of associated surface facilities (DA 60-03-2001).

SCHEDULE 2

Underground mining operations, and associated monitoring, management and remediation, in Area 3B of the Dendrobium Coal Mine.

SCHEDULE 3

Definitions

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| 1. | Department | Department of Planning and Environment |
| | DRG | Division of Resources and Geoscience within the Department |
| | DSC | Dams Safety Committee |
| | Independent Expert Panel | Independent Expert Panel for Mining in the Catchment |
| | Minor | Not very large, important or serious |
| | Mitigation | Activities associated with reducing the impacts of mining operations prior to or during those impacts occurring |
| | Negligible | Small and unimportant, such as to be not worth considering |
| | NSWET | NSW Environmental Trust |
| | OEH | Office of Environment and Heritage |
| | Remediation | Activities associated with partially or fully repairing or rehabilitating the impacts of mining operations or controlling the environmental consequences of these impacts |
| | Secretary | Secretary of the Department, or nominee |
| | Subsidence Management Plan (2012) | The Subsidence Management Plan prepared by BHP Billiton Illawarra Coal Holdings Pty Limited, Review B; including the attached Watercourse Management Plan, Swamp Management Plan, Groundwater Management Plan and SCA Asset Management Plan; as amended until 1 December 2012. |
| | Subsidence Management Plan (2016) | The Subsidence Management Plan prepared by Illawarra Coal South32 dated 4 March 2016, including Attachments A-U and the Response to Submissions dated 25 August 2016, as amended by the letter and attachments dated 9 November 2016, including the plans DEN-01-6151 Rev 6 and DEN-01-6153 Rev 5. |
| | Subsidence Management Plan (2017) | The Subsidence Management Plan prepared by Illawarra Coal South32 dated October 2017, including Attachments A-D, the Response to Submissions dated 13 April 2018 and plans DEN-01-6151 Rev 6 and DEN-01-6153 Rev 11. |
| | Water NSW | State Water Corporation of NSW |
2. Subject to the definitions above, the definitions in the development consent DA 60-03-2001 apply to this approval.

Terms of Approval

3. The Applicant must carry out the development generally in accordance with the:
- a) conditions of consent (DA 60-03-2001);
 - b) conditions of this approval;
 - c) Subsidence Management Plan (2012);
 - d) Subsidence Management Plan (2016);
 - e) Subsidence Management Plan (2017); and
 - f) the Mining Layout Plan.

Note: The Mining Layout Plan is shown in Appendix 1.

4. If there is any inconsistency with the Subsidence Management Plans, then the conditions of this approval and/or the development consent (DA 60-03-2001) must prevail to the extent of the inconsistency.

Limits on Approval

5. The Applicant must obtain the endorsement of DSC prior to the commencement of the extraction of Longwall 16.

Note: DSC may require that the commencement of extraction is set back further from Avon Reservoir.

6. The Applicant must not extract a height of greater than 3.9 metres from the coal seam.
7. The Applicant must obtain the approval of the Secretary prior to the commencement of gateroad development for Longwalls 17 to 18 or the extraction of Longwalls 17 to 18. The Secretary's approval will take into account the:
- (a) documents required to be reviewed or prepared and other measures required to be developed or implemented under the conditions of this approval; and
 - (b) Applicant's performance under the Subsidence Management Plans, the conditions of this approval and the development consent (DA 60-03-2001).

The Secretary's approval under this condition may vary the conditions of this approval or impose additional conditions on this approval.

Performance Measures for Area 3B

8. The Applicant must ensure that the development does not cause any exceedance of the performance measures in Table 1, to the satisfaction of the Secretary.

Table 1: Subsidence Impact Performance Measures

Swamps	
Swamps 1a, 1b, 5, 8, 11, 14 and 23	Minor environmental consequences including: <ul style="list-style-type: none"> • <i>negligible</i> erosion of the surface of the swamps; • <i>minor</i> changes in the size of the swamps; • <i>minor</i> changes in the ecosystem functionality of the swamp; • <i>no significant</i> change to the composition or distribution of species within the swamp; and • <i>maintenance or restoration</i> of the structural integrity of the bedrock base of any significant permanent pool or controlling rockbar within the swamp.
Swamps 3, 4, 10, 13, 35a and 35b	No significant environmental consequences beyond predictions in the Subsidence Management Plan (2012).
Watercourses	
Waterfall WC-WF54	Negligible environmental consequences including: <ul style="list-style-type: none"> • <i>no</i> rock fall occurs at the waterfall or from its overhang; • <i>no</i> impacts on the structural integrity of the waterfall, its overhang and its pool; • <i>negligible</i> cracking in Wongawilli Creek within 30 m of the waterfall; and • <i>negligible</i> diversion of water from the lip of the waterfall.
Wongawilli Creek Donalds Castle Creek	Minor environmental consequences including: <ul style="list-style-type: none"> • <i>minor</i> fracturing, gas release and iron staining; and • <i>minor</i> impacts on water flows, water levels and water quality.

Water storages	
Avon Reservoir	Negligible environmental consequences including: <ul style="list-style-type: none"> • <i>negligible</i> reduction in the quality or quantity of surface water inflows to the reservoir; • <i>negligible</i> reduction in the quality or quantity of groundwater inflows to the reservoir; and • <i>negligible</i> leakage from the reservoir to underground mine workings.

Notes: These performance measures apply to Longwalls 9 to 16. The Applicant may meet the requirements of this condition either by avoidance, mitigation or remediation. Most swamps and watercourse features are shown on the site and key natural features plan (see Appendix 1).

Rehabilitation

9. If the Applicant does not meet the performance measures in Table 1, then following consultation with OEH, DSC, WaterNSW and DRG, the Secretary may issue the Applicant with a direction in writing to undertake actions or measures to mitigate or remediate subsidence impacts and/or associated environmental consequences. The Applicant must implement the direction in accordance with its terms and requirements, in consultation with the Secretary and relevant agencies.
10. The Applicant must undertake remediation programs for WC21 and Donalds Castle Creek, to the satisfaction of the Secretary.

Note: Following consultation with OEH, Water NSW and DRE, the Department has approved a Remediation Program for WC21. The Department has also requested that the Applicant prepare a remediation program for Donalds Castle Creek in consultation with these agencies.

Watercourse Impact Monitoring, Management and Contingency Plan

11. Prior to the extraction of Longwall 15, the Applicant must review the Watercourse Impact Monitoring, Management and Contingency Plan for Area 3B prepared under condition 4 of Schedule 3 of the development consent (DA 60-03-2001) to provide for achievement of the performance measures listed in Table 1 in consultation with WaterNSW, to the satisfaction of the Secretary. The revised plan must include:
 - (a) a program of long-term groundwater monitoring, to be developed in consultation with WaterNSW, to monitor groundwater levels at specific locations and depths until post-mining groundwater levels have stabilised;
 - (b) flow gauges with sufficient low flow accuracy in watercourses LA2, LA3 and WC12;
 - (c) a monitoring and management strategy for waterfall WCWF54, which considers adaptive management of mining to avoid impacts to the waterfall; and
 - (d) suitable revisions to the Trigger Action Response Plan, which take into consideration the revised groundwater model predictions and advice from the Independent Expert Panel.

Swamp Impact Monitoring, Management and Contingency Plan

12. Prior to the extraction of Longwall 15, the Applicant must review the Swamp Impact Monitoring, Management and Contingency Plan for Area 3B prepared under condition 6 of Schedule 3 of the development consent (DA 60-03-2001) to provide for achievement of the performance measures listed in Table 1 in consultation with Water NSW, to the satisfaction of the Secretary. The revised plan must include suitable revisions to the Trigger Action Response Plan, which take into consideration the revised groundwater model predictions and advice from the Independent Expert Panel.

Groundwater Model

13. Prior to the extraction of Longwall 15, unless otherwise agreed by the Secretary, the Applicant must review and update the Area 3B Groundwater Model to the satisfaction of the Secretary. The updated model must:
 - (a) provide adequate water table contour plots, drawdown plots and pore pressure vertical section plots for predicted and observed conditions;
 - (b) take into consideration the findings of any independent report on groundwater commissioned by the Department, or advice from the Independent Expert Panel, and the report required under condition 18(c) of this approval; and
 - (c) be peer reviewed by a suitably qualified, experienced and independent expert, who is approved by the Secretary.

Groundwater Monitoring and Height of Cracking

14. The Applicant must undertake a comprehensive program of groundwater monitoring and assessment, including:
- (a) undertaking detailed geotechnical and hydrological investigations of the height of connective cracking in Longwalls 6 to 12, prior to the extraction of Longwall 14;
 - (b) installing a combination of time domain reflectometry and multi-level piezometers directly above Longwalls 14, 15 and 16, in consultation with WaterNSW and OEH, prior to the extraction of Longwall 15;
 - (c) engaging a suitably qualified, experienced and independent expert, who is approved by the Secretary, to update and submit a report to the Department prior to the extraction of Longwall 15, unless otherwise agreed by the Secretary, which includes:
 - a model describing the measured height of connective cracking across Longwalls 6 to 12;
 - detailed predictions of the height of cracking for Longwalls 14 to 18, and associated impacts on sensitive surface features, including watercourses, swamps and Avon Reservoir;
 - an analysis of the extent of surface cracking and potential connections with horizontal partings; and
 - consideration of the findings and recommendations of any independent report on groundwater commissioned by the Department or advice from the Independent Expert Panel; and
 - (d) undertaking an assessment of the height of connective fracturing and the extent of surface cracking before and after the extraction of Longwalls 14, 15 and 16; to the satisfaction of the Secretary.

Swamp Rehabilitation Research Program

15. The Applicant must update the Swamp Rehabilitation Research Program in consultation with OEH, WaterNSW and DRG and to the satisfaction of the Secretary. Following approval, the Applicant must implement the program.

Area 3C Mine Layout and Monitoring Program

16. By 30 June 2018, and prior to the commencement of any longwall gateroad development in Area 3C, the Applicant must submit the:
- (a) proposed mine layout and mining geometry for Area 3C; and
 - (b) proposed baseline monitoring program for Area 3C, for approval by the Secretary and DRG.

Regular Reporting

- 20A By 30 September 2018, and every 4 months thereafter, the Applicant must submit a summary report to the Secretary which provides a:
- (a) consolidated summary of the monitoring results gathered during each 4 month period;
 - (b) tracks compliance with the water performance measures listed in Table 1 of this approval;
 - (c) details any actions undertaken in the period to investigate any exceedances of predictions in the Subsidence Management Plans and any reported Level 2 or Level 3 Triggers in the Trigger Action Response Plans; and
 - (d) accurately records the mining seam height during the period;

Independent Environmental Audit

17. The Applicant must ensure that the audit team for the Independent Environmental Audit, required under Condition 6 of Schedule 8 of the development consent (DA 60-03-2001), includes suitable experts in the fields of mine subsidence impacts and remediation, upland swamps, and stream hydrology and water quality; and carries out an extensive audit of the impacts of mining in Area 3B, and the efficacy of the Biodiversity Offset Strategy.

Revision of Environmental Management Strategy

18. Prior to the extraction of Longwall 15, the Applicant must review and revise the Environmental Management Strategy required under condition 1 of Schedule 8 of the development consent (DA 60-03-2001).

Appendix 1: Mining Layout Plan

