Advice to decision maker on coal mining project

IESC 2025-159: Wilpinjong Coal Mine – Pit 8 Extension (EPBC 2025/10105) – Expansion

Requesting agency	The Australian Government Department of Climate Change, Energy, the Environment and Water
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Advice stage	Assessment

The Independent Expert Scientific Committee on Unconventional Gas Development and Large Coal Mining Development (the IESC) provides independent, expert, scientific advice to the Australian and state government regulators on the potential impacts of unconventional gas and large coal mining proposals on water resources. The advice is designed to ensure that decisions by regulators on unconventional gas or large coal mining developments are informed by the best available science.

The IESC was requested by the Australian Government Department of Climate Change, Energy, the Environment and Water to provide advice on the Wilpinjong Coal Pty Ltd's Wilpinjong Coal Mine – Pit 8 Extension Project in New South Wales. This document provides the IESC's advice in response to the requesting agency's questions. These questions are directed at matters specific to the project to be considered during the requesting agency's assessment process. This advice draws upon the available assessment documentation, data and methodologies, together with the expert deliberations of the IESC, and is assessed against the IESC Information Guidelines (IESC 2024).

Summary

The Wilpinjong Coal Mine – Pit 8 Extension Project (the 'project') is an extension of the approved Wilpinjong Coal Mine (WCM), located 40 kilometres (km) northeast of Mudgee in central New South Wales (NSW). The proposed extension will include extending mining of Pit 8 into the Pit 8 Extension area within Exploration Licence 9399 (Peabody 2025, p. ES-1). The new pit will cover 115 hectares (ha) and allow extraction of an additional 14 million tonnes (Mt) of Run-of-Mine (ROM) thermal coal (Peabody 2025, p. 28). The mine life will be extended by 6 months to June 2034 to shape the final landform and backfill voids (Peabody 2025, p. 27), except for the residual voids of Pits 2 and 6 (Peabody 2025, p. 96) which will become final-void lakes. The project will also include construction of additional supporting infrastructure and water management infrastructure (including 4 clean-water dams to capture runoff diverted from the Pit 8 Extension area), and realignment of some public infrastructure. Existing WCM

infrastructure will continue to be used for coal handling and processing, coal storage, and water management. The project will also continue to discharge water within the limits of Environmental Protection Licence (EPL) 12425 (Peabody 2025, p. 8); however, a new licensed discharge point is proposed on Wollar Creek (WRM 2025, p. 49).

The project area is located within the Goulburn River catchment, adjacent to Wilpinjong Creek and Wollar Creek and upstream of the Goulburn River National Park. Wilpinjong Creek is north of the WCM and project area and currently receives licensed discharges from the WCM mine water system from two licensed discharge points. Wollar Creek is east of the project area and has largely been unaffected by mining upstream of its confluence with Wilpinjong Creek (WRM 2025, p. 33). Proposed mining extends WCM mining boundaries closer to Wollar Creek compared to previous approvals.

In the project area, the proponent has identified three communities listed as Threatened Ecological Communities (TECs) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), as well as eleven species listed as threatened (Peabody 2025, p. 100). Two of these TECs (the Box Gum Woodlands and Grey Box Grassy Woodlands) are identified as potential groundwater-dependent ecosystems (GDEs) that may opportunistically rely on groundwater (Research Strategies 2025, Att. B, p. 52).

The project is one of several mining operations in the region mining the Ulan Seam within the Illawarra Coal Measures of the Sydney-Gunnedah Basin. Impacts from the project will contribute to cumulative impacts of mining and other activities to groundwater and surface water ecosystems and their biota across the region.

Key potential impacts from this project are:

- clearing of approximately 145 ha of native vegetation, some of which are GDEs and habitat for multiple EPBC Act-listed species;
- impacts to GDEs through water table drawdown;
- changes to flow regimes and water quality in Wilpinjong and Wollar creeks; and
- cumulative impacts from the proposed project and current operations, and regional impacts from the surrounding mines, particularly due to increased groundwater drawdown and potential changes to flow regimes and water quality.

The IESC has identified additional work required to address the key potential impacts detailed in this advice. This is summarised below:

- Further characterisation of inter-aquifer connectivity and potential impacts to the surface water environment from project-induced groundwater level change (e.g. baseflow contribution);
- Installation of additional nested or multi-level groundwater monitoring bores, including in the alluvium downgradient of the proposed extension area (e.g. downstream of the railway crossing), to characterise vertical hydraulic gradients and monitor potential future impacts to groundwater resources (including groundwater quality);
- Further characterisation of the existing surface water environment, including instream habitats, water quality and ecologically important components of the flow regimes of Wilpinjong and Wollar creeks. This will inform impact assessment of increased discharges to Wilpinjong Creek and potential initiation of discharges to Wollar Creek, as well as any potential changes in flow regimes in Wollar Creek from diversion of first- and second-order streams in the project area;

- Installation of an additional surface water monitoring point upstream of the proposed new licensed discharge point on Wollar Creek to provide reference water quality monitoring data;
- Surface water monitoring of Dissolved Organic Carbon (DOC), nutrients and metals/metalloids to inform impact assessment and mitigation measures, and to compare with ANZG (2018) guideline values for aquatic ecosystem protection;
- Quantification of increased discharge volumes due to the project, as well as an impact assessment of increased discharges in relation to water quality, flow regimes and ecologically important flow components, giving appropriate consideration to the impacts of global warming on both historical observations and those that are projected to occur over the next decade;
- Updated assessment of the final voids that quantifies water level changes in the voids as a result of the project, considers future climate change, and provides clarification of the Pit 2 void pit crest height in relation to Wilpinjong Creek flood extents, to be able to assess risks of potential overtopping of or flood ingress to the highly saline void;
- Identification of a suitable monitoring program to be able to detect and manage potential impacts to GDEs;
- A thorough assessment of cumulative impacts on water resources from the proposed project with current mining at WCM and surrounding mines;
- Once further site-specific data have been collected, an impact pathway diagram should be developed to refine the understanding of how and where the project may impact water resources. This will inform further proposed monitoring programs and support development of management plans.

Context

The project is an extension of the approved WCM, located 40 km northeast of Mudgee in central NSW. The existing mine contains eight named open-cut pits plus ancillary and supporting infrastructure (Peabody 2025, p. ES-1). The proposed project will expand the eighth pit to the east towards Wollar Creek, and will include extraction of ~14 Mt of ROM thermal coal, diversion of first- and second-order tributaries of Wollar Creek, the development of additional water management infrastructure such as dams, drains, pumps and pipelines, and realignment of some public infrastructure (Peabody 2025, p. ES-1). The project will extend operations by 6 months to 30 June 2034 to shape the final landform and backfill voids (Peabody 2025, p. 27), except the residual voids of Pits 2 and 6 (Peabody 2025, p. 96). There will be no change to the timeframe for ROM coal production or the maximum rate of coal extraction (up to 16 Mt per annum) (Peabody 2025, p. 28). The project will continue to use existing infrastructure, including ROM coal storage, the coal handling and processing plant, rail spur and rail loading facilities, a reverse-osmosis water treatment facility, tailings facilities and water management infrastructure (Peabody 2025, p. ES-1). It will also continue to discharge water within the limits of EPL 12425 (Peabody 2025, p. 8).

The project is in the Western Coalfield, on the northwestern edge of the Sydney-Gunnedah Basin. The target resource is the Ulan Seam of the late Permian-aged Illawarra Coal Measures, a series of interbedded coal, mudstone, siltstone and conglomerate layers (Peabody 2025, p. 32). Surface geology outcropping in and around the project area includes alluvium, the Illawarra Coal Measures and an intrusion of Tertiary basalt (SLR 2025a, Figure 5-5, p. 33). Identified water-bearing units at the project site include a porous/fractured rock aquifer hosted by the Illawarra Coal Measures and a Quaternary alluvium aquifer generally associated with waterways at the surface (Peabody 2025, p. 85). The extent of connectivity between the aquifers is not clear; there are contradictory statements in the groundwater impact assessment where the two aquifers are described as having "limited connectivity" (SLR 2025a, p.

45) but also having “upwards vertical discharge from the Illawarra Coal Measures to the alluvium” under pre-mining conditions (SLR 2025a, p. 45).

The project is located within the Goulburn River catchment of the Hunter River basin (WRM 2025, p.19). Wilpinjong Creek flows west to east along the northern boundary of the WCM. Cumbo Creek runs south to north, separating the existing WCM Pits 3 and 4, and Wollar Creek flows south to north along the eastern boundary of the proposed project area (WRM 2025, Figure 3.1, p. 20). Wilpinjong Creek flows into Wollar Creek, which then flows northeast through the Goulburn River National Park. These creeks are conceptualised as gaining streams under natural conditions but have been altered to losing streams by the influence of mining (SLR 2025a, p. 65).

The WCM has two licensed discharge points under EPL 12425. EPL Point 24 is located on Wilpinjong Creek downstream of the main Pit 2W mine water storage and water treatment facility, while EPL Point 30 is downstream of the Pit 8 clean-water dam (CWD), on a second-order stream to Wilpinjong Creek (downstream of EPL Point 24) (WRM 2025, Figure 2.2, p. 11). EPL limits apply to EPL Point 24 only, as Point 30 releases water that is generally equal to or better quality than receiving waters (SLR 2025b, p. 5).

The project involves the diversion of first- and second-order streams, with runoff captured in 4 CWDs upstream of the Pit 8 Extension area (WRM 2025, p. 19 and Figure 4.2, p. 47) to be used on site or discharged to Wollar Creek through a proposed new licensed discharge point (WRM 2025, p. 49). Overflow from these CWDs is to the Pit 8 Extension area pit (WRM 2025, p. 66). Post-mining, the Pit 8 Extension area pit will be backfilled with waste rock, with catchments reinstated and final landform equivalent to pre-mining landform achieved (WRM 2025, p. 75). No additional final voids are proposed for the project; however, the final landform of WCM includes two final voids that are currently approved (WRM 2025, p. 75).

The project will clear approximately 145 ha of native vegetation (Peabody 2025, p. ES-9). The proponent has identified 14 Matters of National Environmental Significance (MNES) listed under the EBPC Act that may potentially be impacted by the project. These include three TECs (White Box-Yellow Box-Blakely’s Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered), Central Hunter Valley Eucalypt Forest and Woodland (Critically Endangered), Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Endangered)) and 11 species (pink-tailed legless lizard (*Aprasia parapulchella*, Vulnerable), south-eastern glossy black-cockatoo (*Calyptorhynchus lathami lathami,* Vulnerable), white-throated needletail (*Hirundapus caudacutus,* Vulnerable), brown treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*, Vulnerable), swift parrot (*Lathamus discolor*, Critically Endangered), regent honeyeater (*Anthochaera phrygia*, Critically Endangered), south-eastern hooded robin (*Melanodryas cucullata cucullata*, Endangered), diamond firetail (*Stagonopleura guttata*, Vulnerable), koala (*Phascolarctos cinereus*, Endangered), large-eared pied bat (*Chalinolobus dwyeri*, Endangered); and Corben’s long-eared bat (*Nyctophilus corbeni*, Vulnerable)).

The project includes avoiding direct disturbance of the Cumbo Creek corridor and Rocky Hill complex, currently approved to be mined under the state development consent SSD-6764. This will reduce the amount of approved ROM coal to be mined by more than 7 Mt and will reduce the development footprint by ~50 ha (Peabody 2025, p. ES-1).

Response to questions

The IESC’s advice in response to the requesting agency’s specific questions is provided below.

Question 1: Advice is sought on whether the proponent has adequately characterised surface and groundwater resources to allow for an adequate assessment of the proposal’s impacts on surface and groundwater water resources, and water-related assets.

1. The proponent has not adequately characterised surface and groundwater resources to understand baseline conditions and allow for an adequate assessment of potential project impacts on surface and groundwater water resources, and water-related assets. The proponent's assessment and conclusions rely heavily on previous studies or reports for the approved WCM, without presenting sufficient recent information or quantifying project-specific changes. Further information is needed to adequately characterise surface and groundwater resources and GDEs, as described in Paragraphs 3–9.

2. Following collection of the data and information outlined in Paragraphs 3–9, an updated evidence-based ecohydrological conceptual model and associated impact pathway diagrams (described in Commonwealth of Australia 2024) should be developed for all water resources and their ecological components in the project area, to ensure that all potential impact pathways are identified and assessed. This will also help guide the development of appropriate monitoring, mitigation and management actions (see responses to Questions 4 and 5).

Groundwater

3. Groundwater – surface water connectivity has not been adequately characterised. Contradictory information is provided regarding inter-aquifer connectivity. The degree of connectivity between the surface, the alluvial aquifer and the fractured rock aquifer is unclear, as the reports variously indicate that the fractured rock aquifer is disconnected from surface layers (SLR 2025a, p. 45), that the fractured rock aquifer discharges to surface springs (SLR 2025a, p. 41), and that there is discharge from the fractured rock aquifer to the alluvium under natural conditions but that this has been reversed by mining (SLR 2025a, p. 45). Further work is required to establish the nature and spatial extent of connectivity between these layers, particularly in the area from the Pit 8 Extension to the alluvium associated with Wollar Creek, and then to revise the conceptualisation accordingly.

4. Insufficient information is provided regarding groundwater quality. A site-specific baseline has not been established for either pre-mining conditions or existing mining conditions prior to this project. The monitoring regime lacks sufficient spatial coverage in the vicinity of the project area (Peabody 2025, Figure 17, p. 83) and does not detail monitoring frequency or measured parameters. The proponent should monitor a complete suite of metals (including total Al, Fe and Mn) and compare concentrations to ANZG (2018) guideline values. Of particular importance are concentrations of contaminants known to occur in the area (i.e. arsenic (As), molybdenum (Mo) and selenium (Se)) (SLR 2025a, p. 63; GEM 2025, pp. 30 and 35).

5. The groundwater impact assessment presents modelling of drawdown impact on the local water table, as well as the inferred water-bearing geology (SLR 2025a, Figures 8-2 to 8-4, pp. 85 – 87). As the indicative water table does not align with either aquifer, the geological strata hosting the water table should be clarified, a quantitative assessment of current depth to the water table should be provided, and the assessment of potential impacts of drawdown on sensitive receptors (e.g. GDEs) revised accordingly.

Surface Water

6. Hydrographs provided for the three streamflow gauges (Wilpinjong Creek Upstream, Wilpinjong Creek Downstream and Cumbo Creek) (WRM 2025, Figures 3.9 – 3.11, pp. 30 – 32) do not provide sufficient detail regarding streamflow metrics and statistics to adequately characterise the flow regime. The proponent should characterise streamflow behaviour in the context of ecologically important flow components (e.g. numbers and spells of low-flow days, flow duration analysis, frequency and duration of overbank flows). Further, no inferences have been made regarding the correlations between the presented streamflow sites and flow in Wollar Creek. The model used to develop the Wollar Creek flow frequency curve (WRM 2025, Figure 9.2, p. 116) could provide information regarding the possible flow regime in Wollar Creek. Further details are needed on the

development of the flow-frequency curves presented (i.e. Wilpinjong Creek at Cumbo Creek and Wollar Creek at Wilpinjong Creek (WRM 2025, Figure 9.1 and 9.2, pp. 116-117)), and calibration across a range of flow magnitudes is required. The precise location for which these flow-frequency curves were generated is unclear and should be specified.

7. Site-specific baseline water quality data for electrical conductivity (EC), pH, sulfate and turbidity, based on long-term monitoring data, are presented for three stations on watercourses adjacent to the project area (WRM 2025, p. 33). These data are presented as annual values only. No data are presented or discussed for other parameters or metals, despite monthly monitoring of several metals (WRM 2025, p. 33).

    a. The proponent should present available monitoring data from these stations, including metals, in a way that provides information about how water quality of Wilpinjong and Wollar Creeks may change over time, to determine baseline conditions and inform assessment of potential impacts from discharges of differing water quality.

    b. No data are presented for on-site storages or sediment dams, or the water quality of water discharged offsite, to understand if licensed or any uncontrolled discharges are releasing contaminated water to Wilpinjong Creek. In line with industry best practice, the proponent should monitor the full suite of metals/metalloids, as well as nutrients and DOC, from the mine water system discharges and in Wilpinjong Creek downstream of the discharge point, to assess the potential movement of contaminants into the receiving environment. These contaminant concentrations should be compared to ANZG (2018) guidelines for 95% aquatic species protection.

Ecology

8. Stygofauna sampling was conducted in accordance with the Western Australian Environmental Protection Authority technical guidance on subterranean fauna surveys (Bio-Analysis 2025, p. 27). However, only one survey was conducted in October 2022 (Bio-Analysis 2025, p. 23). Multiple sampling efforts across different seasons (EPA 2021, p. 18) are recommended (Paragraph 18b) to adequately characterise and assess potential impacts to subterranean GDEs such as stygofauna.

9. The proponent has used groundwater levels, mapped vegetation communities and available literature on vegetation rooting depth to assess the presence of terrestrial GDEs (Resource Strategies 2025, Att. B, p. 52). This assessment and characterisation should be further validated by identifying the water requirements (e.g. timing, duration and volume) of identified GDEs to identify the risks posed by project-related drawdown and help inform monitoring and management measures.

Question 2: Advice is sought on whether the Modification Report has identified and assessed the key risks and impacts to water resources and related assets, in particular on:

a. groundwater resources and surface waters, including drawdown and water quality impacts;

b. groundwater-surface water interactions, including baseflow losses and associated impacts, including on Wollar Creek and the Goulburn River;

c. groundwater-dependent ecosystems (GDEs) and water-dependent features in the locality, including (but not limited to) the Drip and springs in the locality.

10. The Modification Report does not provide enough information to adequately identify and assess the key risks and impacts to water resources and related assets. Further baseline information and characterisation of water resources (see responses to Question 1), as well as quantitative information on project-specific changes in comparison to the overall WCM, are needed to properly assess

potential impacts and have confidence in the proponent's conclusions. The following text answers the three sub questions (a–c) specifically and includes several recommendations for additional work.

Groundwater

11. Given the gaps in the characterisation of groundwater in the project area (Paragraphs 3–5), it is not possible to determine whether all key impacts to groundwater resources have been adequately assessed. In general, the documentation presents limited quantitative assessment and does not consider potential impacts in detail.

    a. Assessment of potential project-specific and cumulative drawdown does not include a quantitative assessment of the depth to water and hence the impacts that drawdown may have on sensitive receptors (Paragraph 5).

    b. As discussed in Paragraph 4, information presented regarding groundwater quality lacks both a site-specific baseline and a detailed monitoring regime designed for the project. Without adequate baseline data, it is not possible to assess the potential for project-specific impacts to groundwater quality.

12. Groundwater-surface water connectivity has not been adequately incorporated into the assessment of potential impacts to groundwater and surface water resources. As contradictory information is provided regarding inter-aquifer connectivity (Paragraph 3), additional information and clarification are required to properly quantify connectivity between surface waters and aquifers and to assess potential impacts of the project.

    a. The project documentation adopts the same EC mass balance approach as the existing WCM for estimating baseflow (SLR 2025a, p. 65). Despite the low estimated volume of baseflow contribution (i.e. 3 mm/year of baseflow yield or less (SLR 2025a, Table 5-9, p. 65)) and the estimated reduction in baseflow post-mining (i.e. up to 0.0038 ML/day (WRM 2025, Table 9.2, p. 116)), the proponent should assess the potential impacts of drawdown-induced reductions in baseflow contribution to surface waterways in the vicinity of the project.

    b. Further information is required to assess potential impacts to terrestrial GDEs from changes to groundwater-surface water connectivity, as riparian and alluvial GDEs may depend on episodic groundwater flow into creek channels.

Surface Water

13. Results of the water balance modelling indicate that there will be no spills from the site (WRM 2025, p. 69). However, there is limited information regarding the capacity of active pits to store excess water beyond the defined storages, as well as the mechanisms by which these pits receive water (i.e. overland flow or via pumping), and no account has been given to changing climate conditions as projected to occur by 2034. These limitations prevent a clear understanding of the spill margin and reduce confidence in assessing the risk of spills under varying climatic conditions. Further information should be provided to demonstrate that downstream receiving environments will not be impacted by potential spills.

14. The proponent will continue to discharge within water quality and daily volume limits as per the current WCM EPL (WRM 2025, p. 43). The water balance model results present a range of annual discharge volumes that are significantly higher than previous water balance results pre-project (756 – 2,745 ML/yr (WRM 2025, p. 69) compared to 276 – 950 ML/yr (Peabody 2017, p. 21)). Due to pending upgrades to the water treatment facility to increase capacity, and an increase in volume limits of the EPL in response (both of which have been factored into the water balance model (WRM 2025, p. 65)), it is not possible to understand if and how much of this increase is attributable to the project.

a. To be able to assess the potential impacts to the receiving environment from estimated increased discharge volumes both attributable to the project and overall, the proponent should quantify the proposed changes (volumes and timings) to discharges in relation to the capacity of the mine water management system.

b. Once additional work is undertaken to provide more information on the flow regime (Paragraph 6), the proponent should assess the impacts of increased discharges on ecologically important components of the flow regime and identify appropriate management actions for mitigation.

c. Taking into account temporal trends in water quality of the receiving environment (Paragraph 7a), water quality of discharges (Paragraph 7b), and quantified volumes and timings of discharges (Paragraph 14a), the proponent should assess potential water quality impacts of controlled releases to the receiving environment, including the possibility of contaminants moving from the mine water system to Wilpinjong Creek and potentially downstream into the Goulburn River National Park.

d. A new licensed discharge point is proposed on Wollar Creek (WRM 2025, Table 4.1, p. 49). Further information and additional monitoring measures should be presented to understand the water quality, volume and timing of releases and be able to assess potential impacts to water quality and flow regimes in Wollar Creek, and how this may impact downstream ecosystems (see also Paragraph 18c).

e. Appropriate account needs to be given to the selection and treatment of historical data to allow for the impacts of global warming that have already occurred, and which are projected to occur by 2034.

15. Mining of the Pit 8 Extension area will remove one second-order and several first-order tributaries of Wollar Creek (WRM 2025, p. 19). Runoff from upstream catchments will be partially captured in CWDs. It is not clear if water in these dams would be discharged via a proposed new licensed discharge point to Wollar Creek (e.g. WRM 2025, Table 4.1, p. 49) and under what conditions, or if captured water would be used on-site.

    a. Further information on the proposed management strategy of captured clean water should be provided to assess any changes or potential impacts to flow regimes or water quality in Wollar Creek.

    b. The project area catchment will be returned to Wollar Creek as part of the final landform (WRM 2025, p. 75), but information about how these tributaries will be reinstated should be provided. There is limited information provided on how the creek systems would be re-established over backfilled material (waste rock) that is likely to have very different streambed and hyporheic characteristics, and may be sodic and dispersive (GEM 2025, p. 27), possibly resulting in increased sedimentation to Wollar Creek and downstream.

16. The flood models selected by the proponent are industry standard (United River Basin Simulator (hydrological model) and TUFLOW (hydraulic model)), with most parameters, configurations and assumptions appropriately justified in the discussion (WRM 2025, pp. 82 – 91). However, the afflux resulting from the project is compared to existing conditions (WRM 2025, Figure 8.15, p. 111), as opposed to the approved conditions, making it difficult to interpret the impact of the project to flooding in isolation. The proponent could provide an afflux map for the project that compares current conditions with those previously approved, at a scale sufficient to clearly show the extent of downstream impacts attributable to the project.

17. The approved WCM final landform includes two final voids (WRM 2025, p. 75). No new voids are proposed as part of the project; however, it is stated that as a result of the project, the “predicted equilibrium water level is higher” in the two voids (WRM 2025, pp. 79 and 80). Final-void modelling

predicts that the Pit 2 final void will have a freeboard of at least 8 m (WRM 2025, p. 80); however, this modelling does not allow for changes in hydroclimatology that have occurred in the past few decades. Further, there is uncertainty in the final landform heights of the Pit 2 void pit crest and the height of the adjacent Wilpinjong Creek channel and potential flood depths. The proponent should provide updated final-void modelling that quantifies water level changes in the Pit 2 final void as a result of the project and provide clarification of the pit crest height in relation to Wilpinjong Creek flood extents, to be able to assess risks of potential overtopping of or flood ingress to the void, potentially releasing highly saline water to the receiving environment. The proponent should incorporate statistical adjustments to reflect future climate changes, and synthetic climate sequences which do not assume historic patterns of behaviour could be derived using the in-built stochastic functions within the GoldSim model.

Ecology

18. The proponent has not adequately identified and assessed key risks and impacts to GDEs or water-dependent assets. Further work is required to improve understanding of potential risks and inform requirements for mitigation and management.

    a. The characterisation and assessment of potential impacts to GDEs concluded that there would be no detrimental effects from changes to the groundwater regime (Resource Strategies 2025, p.124). However, there is notable uncertainty around the characterisation of groundwater and aquifer connectivity (Paragraphs 3–5). A full assessment of GDEs and their groundwater requirements (following Doody et al. 2019) should be conducted once uncertainties identified in Paragraphs 3–5 are addressed.

    b. No stygofauna were identified during the single field survey in October 2022. However, the proponent acknowledges that stygofauna are common and have previously been collected in the Hunter Valley and Goulburn River alluvial aquifers in the surrounding area (Bio-Analysis 2025, p. 26). Given the current uncertainty of the presence and distribution of stygofauna in the project area, together with the limited sampling to date (Paragraph 8), further baseline data are required to adequately assess the project's potential impacts to subterranean GDEs.

    c. No information has been provided regarding potential impacts to downstream ecosystems (including water-dependent assets in the Goulburn River National Park) from the additional licensed discharge point on Wollar Creek (WRM 2025, Table 4.1, p. 49). Changes to the flow regime and water quality (Paragraph 14d) may impact associated GDEs and EBPC Act-listed species habitat downstream of the discharge location. Further information is required to assess potential impacts.

    d. The Drip, a natural water feature in the Goulburn River National Park approximately 18 km northwest of the extension project, was inferred to be a surface-expression GDE on a perched aquifer hosted by the Triassic Narrabeen Group sandstone (SLR 2025a, p.41). Detailed studies (ACARP 2021) including environmental tracers found that The Drip water is a mix of rainfall with groundwater from the Triassic sandstone, and that a degree of hydraulic connection between shallow and deep strata could influence the rate of discharge from The Drip. Despite the possible local vertical connectivity, impacts to The Drip are unlikely from the proposed project, given that the Drip is located many kilometres outside of the range of the project's estimated drawdown influence (SLR 2025a, Figures 8-2 – 8-4, pp. 85-87) and cumulative drawdown influence (SLR 2025a, Figures 8-7 – 8-9, pp. 92-94).

    e. Springs identified by the proponent are not predicted to be impacted by the project because they are outside the modelled predicted drawdown and cumulative drawdown influence (SLR 2025a, p. 114). However, uncertainties regarding aquifer connectivity (Paragraph 3), in addition to the potential for additional springs to be located at the heads of creeks within the Wollar Creek

catchment (SLRa 2025, p. 72), mean that potential impacts to springs cannot be adequately assessed. Further information (e.g. aquifer connectivity and detailed spring characterisation) is required to support the proponent's conclusion that there will be no impact to the springs in the surrounding area.

Question 3: Advice is sought on whether the Modification Report has sufficiently addressed the cumulative impacts on water resources and water-related assets, having regard to other mining operations in the locality, and whether the conclusions on cumulative impacts are appropriately supported.

19. The assessment of potential cumulative impacts for groundwater is limited to modelling cumulative drawdown (SLR 2025a, p. 92). The proponent concludes that the depth and extent of the project-specific modelled drawdown is not enough to cause an impact to sensitive receptors, including GDEs (noting the shortcomings in the GDE assessment described in Paragraph 18). Although the modelled extent of cumulative drawdown is substantial in magnitude and spatial extent (SLR 2025a, Figures 8-7 to 8-9, pp. 93 – 95), the proponent asserts that the project's contribution is small relative to existing projects (e.g. the approved WCM, Moolarben Coal Complex and Ulan Coal Mine) (Peabody 2025, p. 89).

20. Given the absence of information regarding the water table (Paragraph 5), it is unclear how potential impacts caused by project-specific or cumulative changes to the water table have been considered. The proponent should provide more discussion of how this groundwater level change may impact the receiving environment (e.g. baseflow contribution).

21. The proponent indicates that the project will not result in cumulative impacts to surface waters exceeding those of the approved mine (WRM 2025, p. 123); however, the information provided is insufficient to support this claim. The proponent should assess cumulative impacts to surface waters from the project with the approved WCM and surrounding mines, taking into consideration the following:

    a. The potential cumulative impact of the project on flooding (i.e. the impact of the project in conjunction with the approved conditions) has been provided (WRM 2025, Figure 8.15, p. 111); however, the extent of the impact downstream cannot be assessed within the current extent of the model.

    b. The groundwater model predicts that Wollar Creek may experience drawdown (up to 1 m) resulting in reduced baseflow (Peabody 2025, p. 88). The cumulative impacts of reduced baseflow on ecologically relevant components of the flow regime, possible reduced flows due to stream diversions, and interactions with the timing and volume of discharges from the proposed new licensed discharge point have not been discussed. Cumulative impacts of changes to baseflow and the surface water flow regime in all impacted waterways to receiving environments, including associated ecological receptors such as GDEs and MNES (including water-dependent habitats) should be assessed.

    c. No surface water assessment has been conducted to evaluate the cumulative impacts of local and regional mining activities or other industries – including Moolarben Coal Complex, Ulan Coal Mine and the approved WCM – on flow regimes or water quality. As Wilpinjong Creek joins Wollar Creek, with the combined flow passing through the Goulburn River National Park, the cumulative impact on these waterways may have downstream impacts on water-related assets such as GDEs and some MNES habitats in the National Park.

22. The proponent has not adequately considered cumulative impacts to GDEs within the zone of predicted cumulative drawdown. The proponent should provide a detailed assessment of the potential impacts of cumulative drawdown on stygofauna (if detected by the recommended additional

sampling, Paragraph 18b), aquatic GDEs (e.g. groundwater-fed reaches of Wilpinjong, Cumbo and Wollar Creeks) and terrestrial GDEs (e.g. riparian vegetation). This assessment should specify the predicted extents and durations of drawdown during and after mining in each area of known and expected GDEs (e.g., alluvium, mapped terrestrial GDEs) and then infer, providing evidence where available, the likely cumulative impacts on specific GDEs in each area. These predicted impacts can then be assessed by ongoing monitoring of specific GDEs (e.g. stygofauna/GDE sampling recommended in Paragraphs 29–30) in the zones of cumulative drawdown.

Question 4: Can the committee provide comment on the adequacy of the proposed monitoring, mitigation and management activities?

Question 5: Does the committee consider that any additional measures are needed to adequately reduce risks and projected levels of impacts to water resources and related assets?

23. The proponent proposes limited new monitoring, mitigation and management activities specific to the project and instead presents the existing WCM monitoring regime and high-level management measures (Peabody 2025, p. 91). The proponent states that management plans will be reviewed and revised to incorporate the project (Peabody 2025, p. 91; Resource Strategies 2025, p. 107; WRM 2025, p. 120), but these have not been provided. Future impact assessment documentation needs to clearly detail and justify the updates proposed to the current plans.

24. Detailed information on proposed monitoring and mitigation measures should be provided in management plans, such as a receiving environment management plan, surface water and groundwater management plans, a GDE management plan, a sediment and erosion control plan and a rehabilitation and void management plan, using the baseline data and modelling updates outlined above. These plans should incorporate Trigger Action Response Plans that provide clear linkages between monitoring, mitigation and management actions allowing timely responses and actions to prevent or rectify impacts.

25. The proponent does not appear to propose any new groundwater monitoring for this project, instead relying on the existing monitoring regime and management plans. The proponent should install additional nested or multi-level groundwater monitoring bores, including in the alluvium downgradient of the proposed extension area (e.g. downstream of the railway crossing), and compare their expanded suite of groundwater quality monitoring data with ANZG (2018) guidelines.

26. The proponent states that the existing WCM surface water monitoring program is sufficient to monitor potential impacts from the project (WRM 2025, p. 120), and no additional surface water gauging (streamflow) and monitoring (water quality) stations are proposed. The lack of any gauging or monitoring station on Wollar Creek upstream of the project area prevents reliable assessment of potential impacts of the project. The proponent should establish an additional gauging station and monitoring station upstream of both the project area and proposed new licensed discharge point, to detect potential changes in flow regimes or water quality related to the project.

27. Surface water monitoring locations, including the main on-site storages and an upstream Wollar Creek station (Paragraph 26), should be monitored for an expanded range of parameters, including DOC, nutrients and the full suite of metals/metalloids to identify any risks of movement of potential contaminants into the surface water system during controlled or uncontrolled discharges. The concentrations of metals and metalloids should be compared to ANZG (2018) guidelines and any exceedances reported.

28. Detailed information should be provided on how the proponent plans to manage potentially acid-forming waste material and monitor for potential leaching of contaminants to surrounding groundwater and surface waters, in line with recommendations outlined in GEM (2025).

29. Modelled post-mining drawdown in the alluvium of 1-2 m is claimed not to have a detrimental effect on potential GDEs (Resource Strategies 2025, p. 52). However, given the uncertainty around aquifer connectivity and modelled drawdown (Paragraphs 3–5), changes to the groundwater system could cause stress (e.g. dieback) to some GDEs where that change is prolonged or rapid, especially during drought conditions. The proponent should outline a suitable monitoring program of the condition of potential terrestrial GDEs to be able to detect any impacts of shifts in seasonal variation in the water table. Options for mitigating or managing these impacts should also be described.

30. No stygofauna were identified in the single field survey in 2022. However, the proponent acknowledges that stygofauna are common and have previously been collected from the Hunter Valley and Goulburn River alluvial aquifers in the surrounding area (Bio-Analysis 2025, p. 26). The IESC recommends additional sampling to determine whether stygofauna are actually absent in the predicted area of groundwater drawdown (Paragraphs 8 and 18b). If this suggested sampling also fails to detect stygofauna, there may not be a need for ongoing monitoring for this GDE. However, if stygofauna are collected, monitoring will be required to validate the proponent's predictions of 'minimal impact' on stygofauna (Bio-Analysis 2025, p. 57). The proponent will also need to explain how any impacts on stygofauna that the monitoring detects will be mitigated or managed.

Date of advice	10 November 2025
Source documentation provided to the IESC for the formulation of this advice	Bio-Analysis 2025. *Wilpinjong Coal Mine Pit 8 Extension Modification Aquatic Ecology Assessment.* Prepared for Bio-Analysis Pty Ltd for Wilpinjong Coal Pty Ltd. 17 September 2025. GEM 2025. *Wilpinjong Coal Mine Pit 8 Extension Modification – Geochemistry Assessment.* Prepared by Geo-Environmental Management Pty Ltd for Wilpinjong Coal Pty Ltd. August 2025. Peabody 2025. *Wilpinjong Coal Mine – Pit 8 Extension Modification Report.* Prepared by Peabody Energy Australia Pty Ltd for Wilpinjong Coal Pty Ltd. September 2025. Resource Strategies 2025. *Wilpinjong Coal Mine Pit 8 Extension Modification Biodiversity Development Assessment Report.* Prepared by Resource Strategies Pty Ltd for Wilpinjong Coal Pty Ltd. 18 September 2025. SLR 2025a. *Pit 8 Extension Modification Groundwater Impact Assessment.* Prepared by SLR Consulting Australia for Wilpinjong Coal Pty Ltd. 11 September 2025. WRM 2025. *Surface Water Assessment Pit 8 Extension Modification.* Prepared by WRM Water & Environment Pty Ltd for Wilpinjong Coal Pty Ltd. 8 August 2025.
References cited within the IESC's advice	ACARP 2021. *Water tracer tools for optimisation of water management of coal mines*, by Timms, W and Kurukulasuriya, D. Final draft report for Australian Coal Association Research Program (ACARP) Project C28024, November 2021. ANZG 2018. *Australian and New Zealand guidelines for fresh and marine water quality. Australian and New Zealand Governments and Australian state and territory governments*. Available [online]: Water Quality Guidelines Home. Accessed 6 November 2025. Commonwealth of Australia 2024. *Information Guidelines Explanatory Note: Using impact pathway diagrams based on ecohydrological conceptualisation in environmental impact assessment*. Report prepared for the Independent Expert Scientific Committee on Unconventional Gas Development and Large Coal Mining Development through the Department of Climate Change, Energy, the Environment and Water, Commonwealth of Australia 2024. Available [online]: Information

Guidelines Explanatory Note - Using impact pathway diagrams based on ecohydrological conceptualisation in environmental impact assessment | iesc. Accessed 6 November 2025.

Doody TM, Hancock PJ, Pritchard JL 2019. *Information Guidelines Explanatory Note: Assessing groundwater-dependent ecosystems*. Report prepared for the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development through the Department of the Environment and Energy, Commonwealth of Australia 2019. Available [online]: Information Guidelines Explanatory Note - Assessing groundwater-dependent ecosystems | iesc. Accessed 6 November 2025.

Environmental Protection Authority (EPA) 2021. *Technical guidance – Subterranean fauna surveys for environmental impact assessment*, EPA, Western Australia. Accessed 20 October 2025.

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Peabody 2017. *Wilpinjong Coal – Site Water Balance*. Appendix 1 of *Wilpinjong Coal – Water Management Plan*. Prepared by Peabody Energy Australia Pty Ltd for Wilpinjong Coal Pty Ltd. August 2017. Available [online]: Water Management Plan - Appendix 1 Site Water Balance. Accessed 17 October 2025.

SLR 2025b. *Site Water Balance Model, Model Update and Calibration 2025, Wilpinjong Coal Mine.* Prepared by SLR Consulting Australia for Wilpinjong Coal Pty Ltd. 28 March 2025. Available [online]: WCM 2024 Annual Review - Appendix 3C - Surface Water Monitoring Data, pp. 53 – 150. Accessed 20 October 2025.