



Wilpinjong Coal Mine



Attachment 6 Updated Assessment of Effects to Terrestrial GDEs

Peabody

13 March 2026

SLR Ref No.: 660.v14286.00008-R02.v1.2 Updated GDE Groundwater Level Assessment.docx

Attention: Jon Degotardi
Wilpinjong Coal Mine
1434 Ulan-Wollar Road
Wilpinjong NSW 2580

SLR Project No.: 660.v14286.00008

RE: Wilpinjong Modification 3 - Pit 8 Extension
Updated Assessment of Effects to Terrestrial Groundwater Dependent Ecosystems

1.0 Introduction and Background

Wilpinjong Coal Pty Ltd (WCPL) is seeking to modify Development Consent (SSD-6764) to facilitate an extension of the existing Pit 8 (Pit 8 Extension) of the Wilpinjong Coal Mine within Exploration Licence (EL) 9399 and development of associated supporting infrastructure and facilities (the Modification). In September 2025, SLR prepared a Groundwater Impact Assessment (SLR 2025) as part of the application and assessment for the Modification.

A Modification Report, including the Groundwater Impact Assessment, was placed on public exhibition by the Department of Planning, Housing, and Infrastructure from 2 October 2025 to 30 October 2025. During and following the public exhibition period, submissions on the Modification Report were received from New South Wales (NSW) Government agencies and members of the public.

This document presents the response to comments raised in the submissions relating to potential effects of groundwater drawdown on terrestrial Groundwater Dependent Ecosystems (GDEs).

2.0 Updated Assessment of Effects to Terrestrial Groundwater Dependent Ecosystems

2.1 Duration and Magnitude of Drawdown at Potential GDEs

Figure 1 shows the location of the facultative GDEs in proximity to the Pit 8 Extension (the Modification), groundtruthed by Hunter Eco (2026).

Hydrographs were prepared using model outputs at selected observation points within the selected GDEs (GDE1 to GDE8) indicated on Figure 1, which are intended to monitor predicted groundwater changes as result of the Modification, at these GDEs.

UPDATED ASSESSMENT OF EFFECTS TO TERRESTRIAL GROUNDWATER DEPENDANT ECOSYSTEMS

Groundtruthed GDEs

FIGURE 1

LEGEND

- ▬ Approved Pit Extent
- ▬ Proposed Pit 8 Extension
- ▬ Watercourse
- GDE Observation Point

GDEs

- ▨ 4. Western Grey Box Woodland (PCT 3405)
- ▨ 6. Box-Gum Grassy Woodland on Valley Floors (PCT 3396)
- ▨ 6d. Regeneration (PCT 3396)
- ▨ 8. Fuzzy Box Woodland (PCT 3404)
- ▨ 9. Rough-barked Apple Woodland (PCT 3403)

Data Sources:
NSW SS
Aerial imagery: Client supplied imagery (January 2025) and
ESRI Basemap World Imagery (2023)

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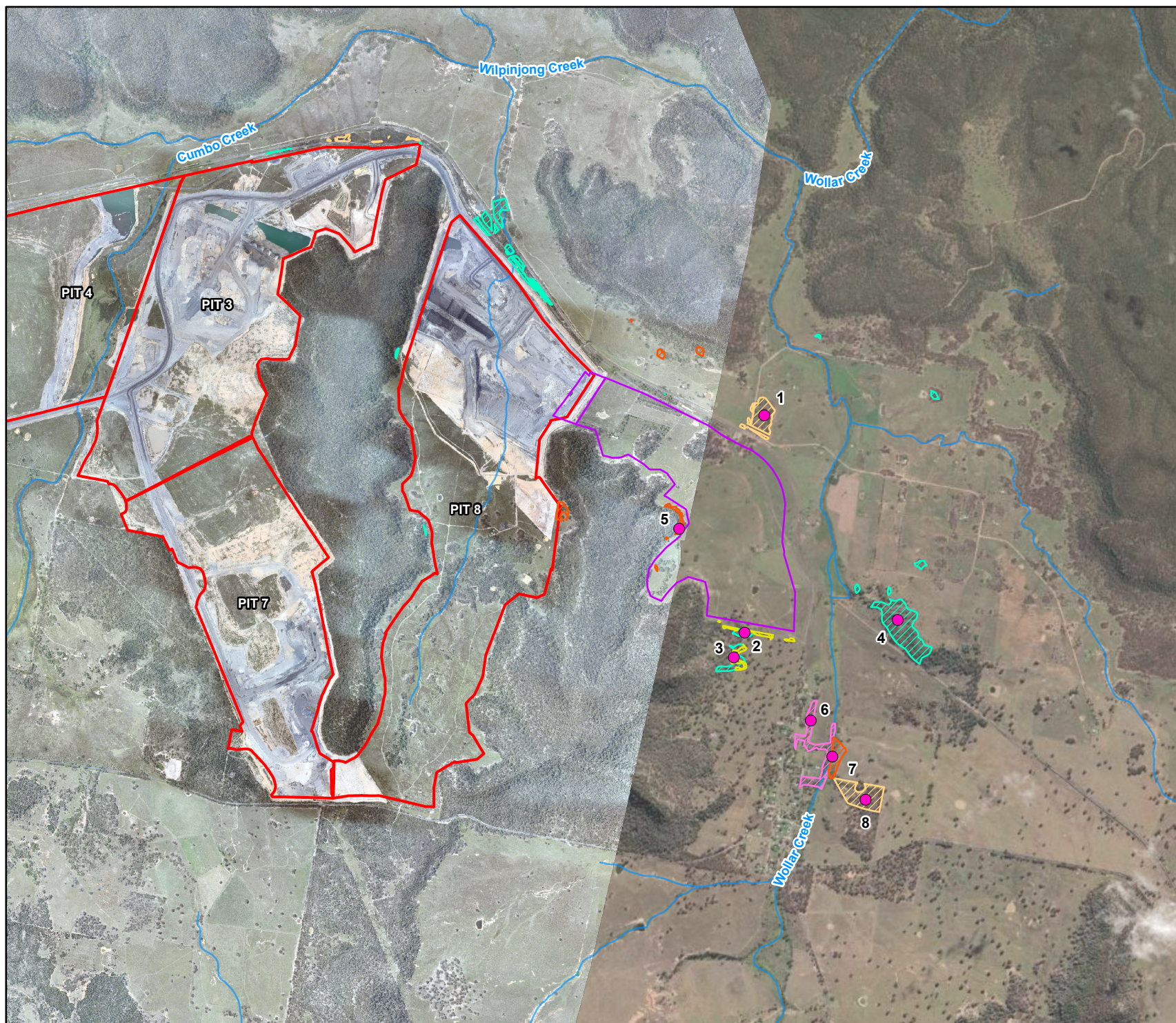
Coordinate System: GDA 1994 MGA Zone 55

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Date Drawn: 12-Feb-2026

Drawn by: JH



The hydrographs related to the respective GDE observations are provided in **Attachment A** and include:

- Left hydrograph: Modelled water elevation at each GDE for the Null Mining Scenario (or Non Mining Scenario), the Approved Scenario, and the Modification Scenario (see definition of Model Scenarios in Section 8.1 of the Groundwater Impact Assessment).
- Middle hydrograph: Modelled water level in metres below ground level (mbgl) for the Modification Scenario, along with the elevation of the base of the unconsolidated sediments/regolith (Layer 1) and the assumed rooting depth of 9 mbgl (Hunter Eco, 2026).
- Right hydrograph: Modelled incremental drawdown (due to the Modification only) and cumulative drawdown (due to all approved mining represented in the model).

Of note, if Layer 1 is dry or becomes dry, the water level will be represented in the underlying bedrock layer as shown on the hydrographs. For GDE1, GDE3, GDE4 and GDE7 this is Layer 6 (Illawarra Coal Measures (ICM) [middle]), while at GDE8 the underlying layer is Layer 7 (Ulan Coal Seam) (refer to layer definitions in Section 7.3 of the Groundwater Impact Assessment).

A summary of the groundwater model layers present at each GDE location (down to Layer 7 [Ulan Seam]) is provided in **Table 1**. Unconsolidated sediments are present at each selected GDE location and underlain by the Upper Illawarra Coal Measure, Middle Illawarra Coal Measure (ICM) and/or Ulan Coal Seam.

Observations related to each GDE are detailed below.

Table 1 Groundwater Model Layers

Layer	Hydrostratigraphic Unit	Indicative Thickness (m)	Model Layer Present at GDE Location		
			GDE1, GDE2, GDE3, GDE4 and GDE7	GDE5	GDE6 and GDE8
1	Alluvium, Unconsolidated Sediments, and Regolith	3 to 15	Yes	Yes	Yes
2	Narrabeen Group (upper)	40 to 80	No	No	No
3	Narrabeen Group (middle)	60 to 80	No	No	No
4	Narrabeen Group (lower)	60 to 80	No	No	No
5	Illawarra Coal Measures (upper)	20 to 35	No	Yes	No
6	Illawarra Coal Measures (middle) (includes the Moolarben Coal Member)	15 to 40	Yes	Yes	No
7	Ulan Coal Seam	15 to 40	Yes	Yes	Yes

The following observations are made from the hydrographs (refer to **Attachment A**):

- GDE1 is representative of the GDE located north of the Pit 8 Extension. At this location, Layer 1 represents dry unconsolidated sediments and the water table sits within the underlying Layer 6 representing the ICM. Prior to mining, the modelled groundwater level was at ~11.9 mbgl (i.e. below the assumed rooting depth of 9 m



[Hunter Eco, 2026]). During mining and up to nine years after mining ceases, the groundwater elevation decreases to approximately 19.7 mbgl (approximately 7.8 m maximum drawdown). The groundwater level then recovers to 6.7 mbgl, approximately 6.5 m above the Non Mining level at recovery between 2045 and 2300, at a variable rate of 0.2 m/year between 2045 and 2100, 0.02 m/year between 2100 and 2200 and 0.004 m/year between 2200 and 2300. The groundwater levels also recover under the approved scenario to 8.2 mbgl, which is approximately 4.9 m above the Non Mining level at recovery.

- GDE2 is located 65 m south of the Pit 8 Extension. At this location, the unconsolidated sediment in Layer 1 is modelled to a depth of 2.4 mbgl. Before mining, the groundwater level within Layer 1 is at 2.2 mbgl and remains at that level during mining. Based on our conceptual understanding of the site, the unconsolidated sediments are likely dry at this location (to be verified). Groundwater in the underlying Layer 6 is at 16.0 mbgl before mining, and decreases to 26.3 mbgl during mining and up to eight years after mining ceases (approximately 10 m maximum drawdown). The groundwater level in Layer 6 then recovers to 18.2 mbgl which is approximately 1.1 m below the Non Mining level at recovery.
- GDE3 is located 240 m south of the Pit 8 Extension. At this location, Layer 1 representing the unconsolidated sediment is dry and the water table sits within Layer 6 (representing the ICM). Prior to mining, the groundwater level was at ~20.2 mbgl. During mining and up to sixteen years after mining ceases, the groundwater level decreases to approximately 22.6 mbgl (~2.4 m maximum drawdown). The groundwater level then recovers to 19.6 mbgl which is approximately 1.7 m above the Non Mining level at recovery.
- GDE4 is located 450 m east of Wollar Creek. At this location, the unconsolidated sediment is dry and the water table sits within the underlying Layer 6 representing the ICM. Prior to mining, the groundwater level was at ~16.4 mbgl. During mining and up to four years after mining ceases, the groundwater elevation decreases to approximately 19.0 mbgl (~2.6 m maximum drawdown). The groundwater level then recovers to 14.6 mbgl which is approximately 2.4 m above the Non Mining level at recovery.
- GDE5 is located 30 m west of the Pit 8 Extension. At this location, Layer 1, representing the unconsolidated sediment, is dry and the water table sits within the ICM represented by Layer 5. Prior to mining, the groundwater level in Layer 5 was at ~28.5 mbgl. During mining and up to nine years after mining ceases, the groundwater elevation decreases to approximately 33.7 mbgl and remains at this level after recovery (~5.2 m maximum drawdown).
- GDE6, GDE7 and GDE8 are located between 660 and 1,300 m east of the Pit 8 Extension close to Wollar Creek:
 - The unconsolidated sediments are approximately 5.3 m thick at GDE6 and sustain a groundwater level until approximately year 2021 when the layer is variably saturated or dry. The pre-mining depth to water at GDE6 is 2.0 mbgl. When Layer 1 is dry, the groundwater table is within the underlying Layer 7 (representing the Ulan Seam). A maximum cumulative drawdown of 2.6 m is predicted in Layer 1 and 5.8 m in Layer 7. A maximum incremental drawdown of 2.0 m is predicted in Layer 1 and 4.1 m in Layer 7. The water level at GDE6 recovers 36 years after mining ceases to 4.9 m above the Non Mining level at recovery in Layer 7.



- At GDE7, the layer representing the unconsolidated sediments is dry at 0.8 mbgl and the groundwater table lies within Layer 6 (ICM at 2.6 mbgl). Between years 2037 and 2050 Layer 6 becomes dry and the groundwater table lies within Layer 7.
A maximum cumulative drawdown of 0.7 m and a maximum incremental drawdown of 0.3 m occur 2 years after mining ceases and continues 36 years after in Layer 6. Groundwater level recovers to pre-mining levels approximately 46 years after mining ceases in that layer. Recovered levels are 1.3 m above the Non Mining level at recovery 66 years after mining ceases.
A maximum cumulative drawdown of 3.2 m and a maximum incremental drawdown of 2.3 m is predicted in Layer 7 between years 2037 and 2042. The groundwater level recovers to pre-mining levels at year 2050 in this layer and recovered levels are 3.3 m above the Non Mining level at recovery, 66 years after mining ceases.
- At GDE8, the layer representing the unconsolidated sediments is dry and the groundwater table lies within Layer 7 (Ulan Seam) at approximately 14 mbgl. A maximum cumulative drawdown of 1.8 m and a maximum incremental drawdown of 1.3 m occur 3 years after mining ceases and continues for 8 years after. Groundwater level to levels 2.2 m above the Non Mining level at recovery, 66 years after mining ceases.

When assessing groundwater levels and drawdown in relation to ecosystem groundwater dependency, the following trends are observed:

- At GDE2, GDE3, GDE4, GDE5 and GDE8 the predicted pre-mining water table depth is modelled to be below the assumed 9 m rooting depth (Hunter Eco 2026) - suggesting that these ecosystems do not rely on groundwater and any groundwater drawdown related to the Wilpinjong Coal Mine is not expected to affect these GDEs.
- At GDE1, the pre-mining water table is below the assumed rooting zone at almost 12 mbgl suggesting that this GDE does not rely on groundwater. Recovery of groundwater levels post-mining result in the water table reaching the rooting zone in the Approved Scenario and the Modification Scenario at year 2180 and year 2100 respectively.
- At GDE6 and GDE7 the groundwater level before mining lies within the rooting zone. Predicted drawdown associated with the Modification Scenario affects both GDEs, but recovers post-mining to elevations higher than pre-mining conditions.

2.2 Depth to Water Maps

Maps showing the depth to the water table (based on the water table level subtracted from natural topography) are presented in **Attachment B** for the following time periods:

- Pre-mining conditions - informed by the groundwater level under steady state conditions (**Figure B-1**);
- At the end of mining - informed by the groundwater levels at year 2034 (**Figure B-2**); and
- At the end of recovery - informed by the groundwater levels at year 2300 (**Figure B3**).

The modelled pre-mining depth to water map indicates that the depth to water was likely greater on the higher plateaus and shallower in the valleys, specifically along Wollar Creek and Wilpinjong Creek (**Figure B-1**).



As described in the previous section and based on our conceptual understanding of the area, the depth to water at GDE2 and within the Pit 8 Extension may be lower than shown on **Figure B-1** and the unconsolidated sediments are likely dry.

On **Figure B-1**, GDE1, GDE2, GDE3, GDE4, GDE5 and GDE8 are all located in areas where the depth to water is deeper than 10 m (and deeper than the 9 m assumed rooting depth), consistent with the hydrographs shown on **Attachment A**. This would suggest that in pre-mining conditions these GDEs do not rely on groundwater.

GDE6 and GDE7 are located within areas where the depth to water is within 1-5 mbgl, consistent with the hydrographs in **Attachment A**, which is within the assumed rooting zone of the GDEs (i.e. 9 mbgl).

At the end of mining (**Figure B-2**), the modelled depth to water is observed to increase in areas immediately east of the Pit 8 Extension and north of Pit 3, Pit 8 and the Pit 8 Extension. This is to be expected as excavation of the pit and removal of the water in the pit will create a cone of depression around the voids. It should be noted that maximum drawdown is predicted to be observed at the GDEs between 6 and 16 years after end of mining (see hydrographs in **Attachment A**).

At the end of recovery (**Figure B-3**), the modelled depth to water maps show the depth to water recovering to pre-mining conditions in the area immediately east of the Pit 8 Extension and north of Pit 3, Pit 8 and the Pit 8 Extension.

Along Wollar Creek and east of the Pit 8 Extension, the depth to water is modelled to be slightly higher than in pre-mining conditions. This would suggest that in those areas the groundwater level recovers to a level higher than in pre-mining conditions (i.e. depth to water is shallower), as result of higher recharge in the backfilled voids.

This observation is consistent with the modelled drawdown and recovery at GDE1, GDE4, GDE3, GDE6, GDE7 and GDE8 presented in **Attachment A**.

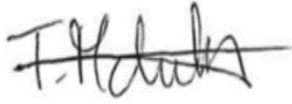
3.0 References

Hunter Eco (2026) Wilpinjong Coal Mine Pit 8 Extension Modification – Baseline Flora Report.

SLR (2025) Pit 8 Extension Modification Groundwater Impact Assessment, Wilpinjong Coal Mine, dated 11 September 2025.



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Attachments

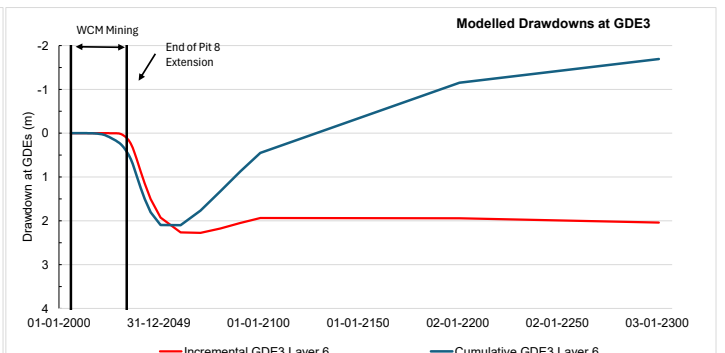
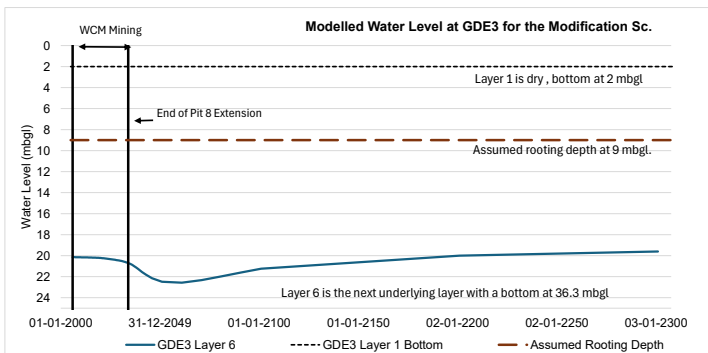
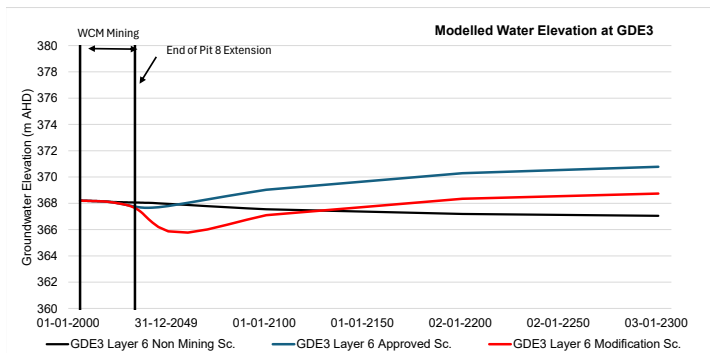
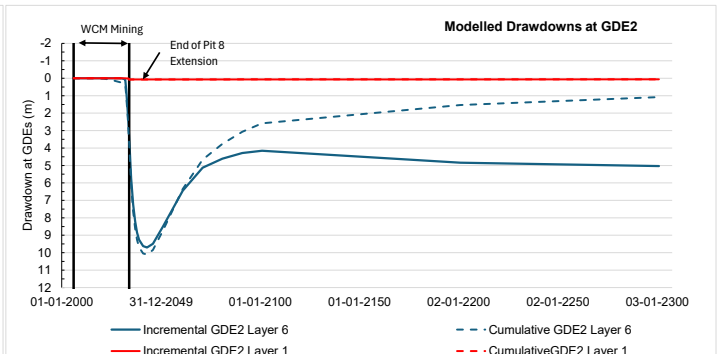
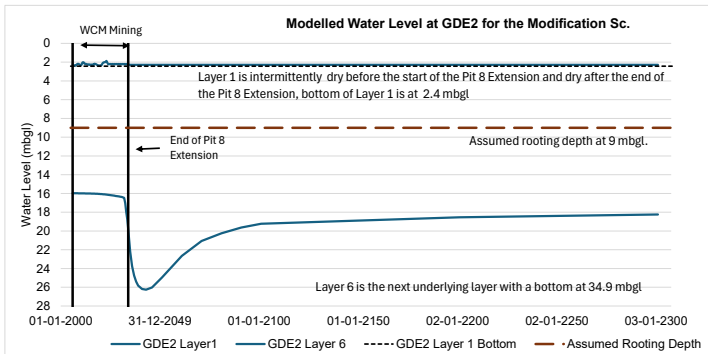
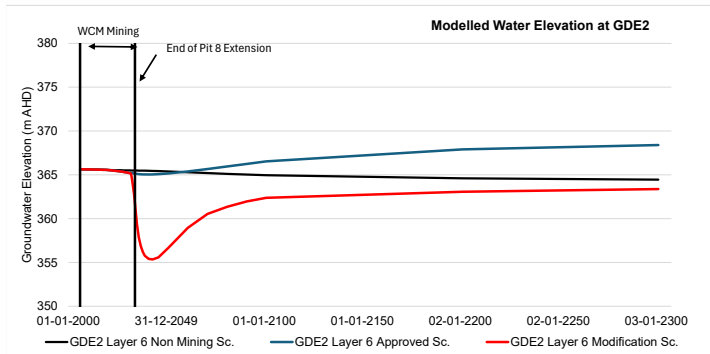
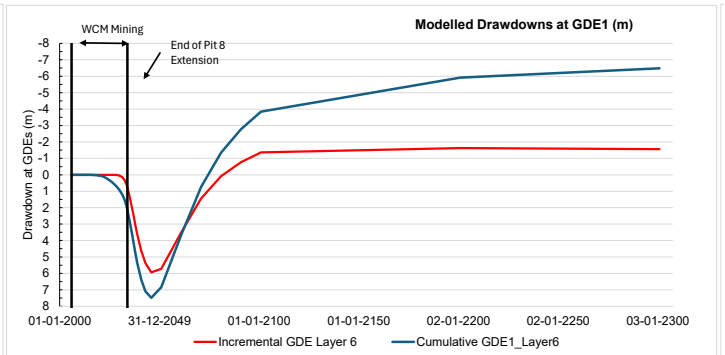
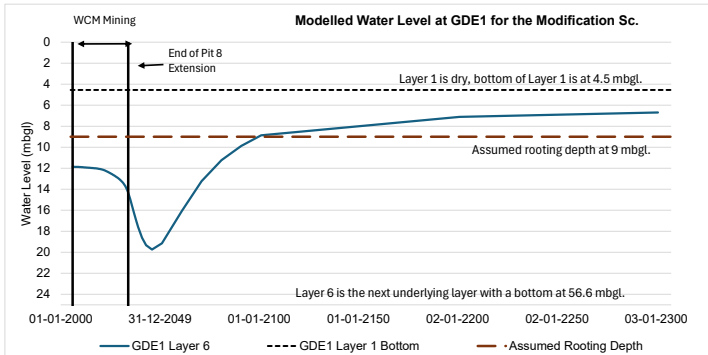
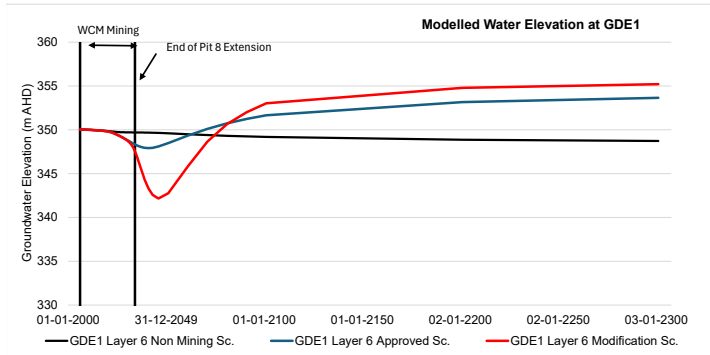
Attachment A – Selected GDE Hydrographs

Attachment B – Depth to Water Table Maps

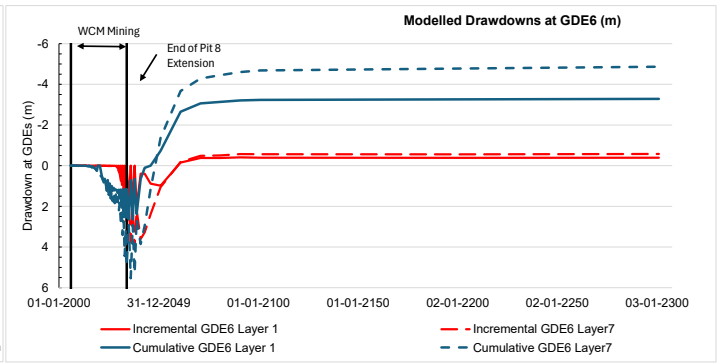
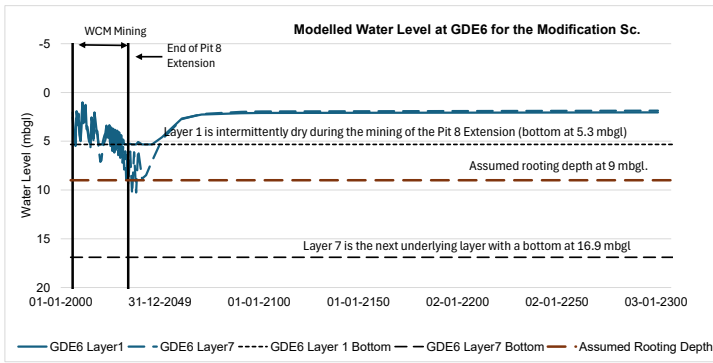
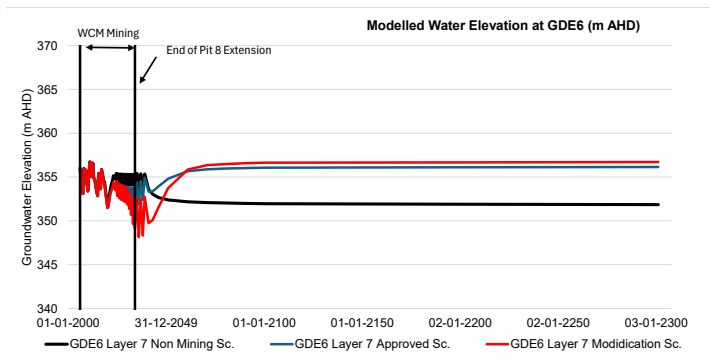
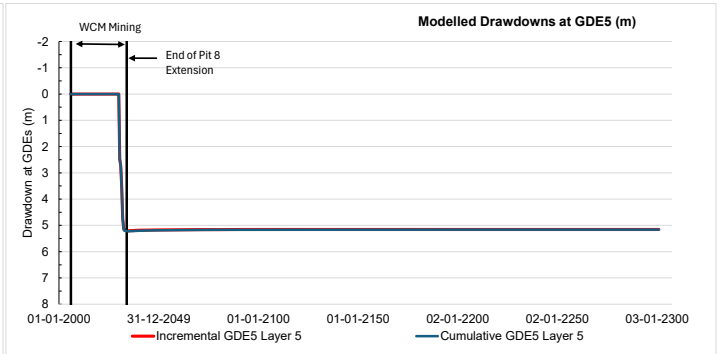
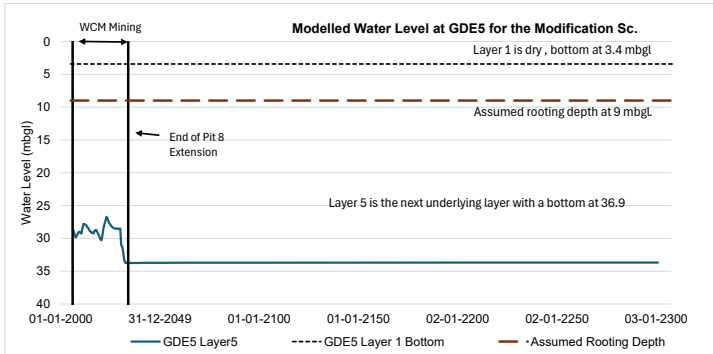
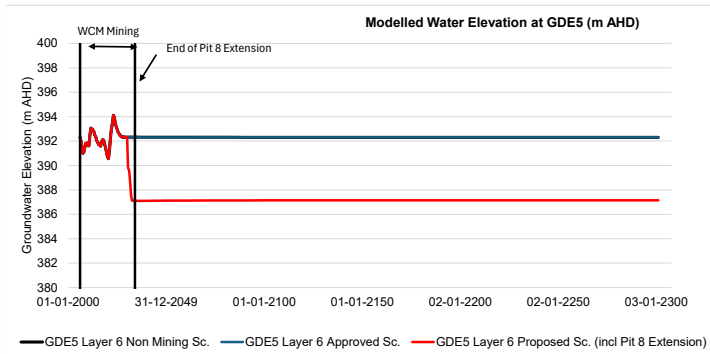
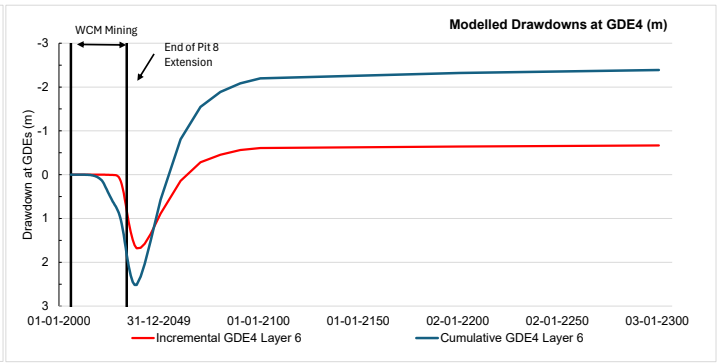
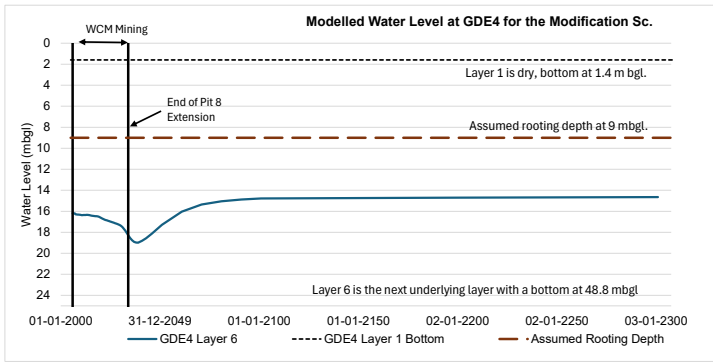
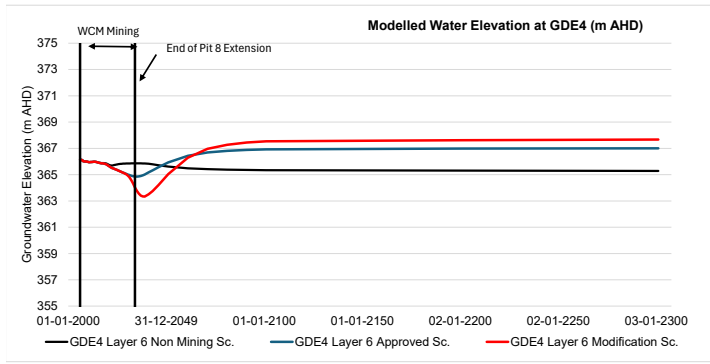
- Figure B-1 Pre-mining Depth to Water Table (2006)
- Figure B-2 Depth to Water Table at the End of Mining (2034)
- Figure B-3 Depth to Water Table at the End of Recovery (2300)



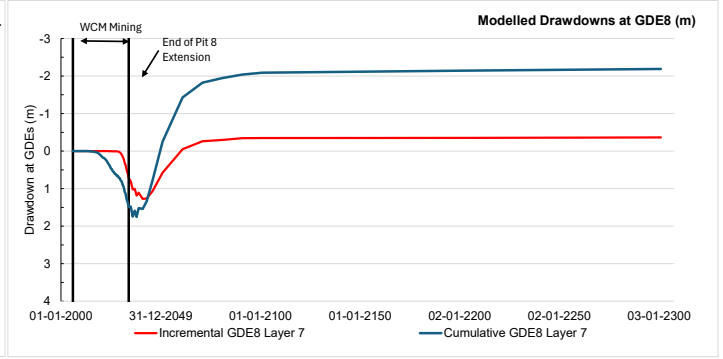
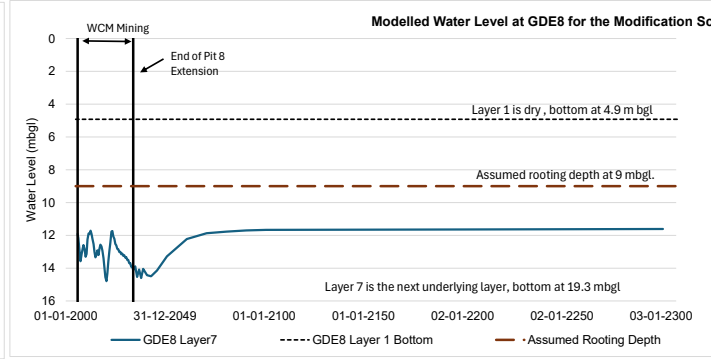
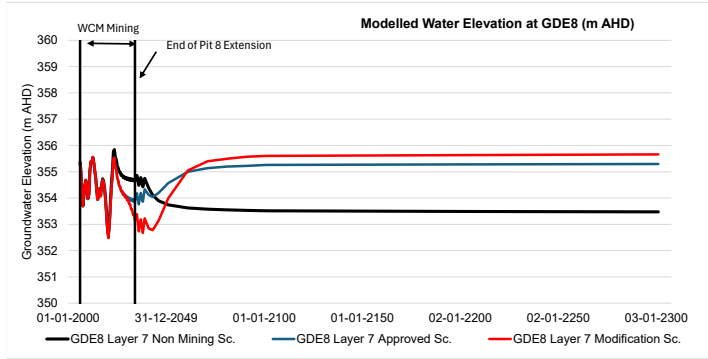
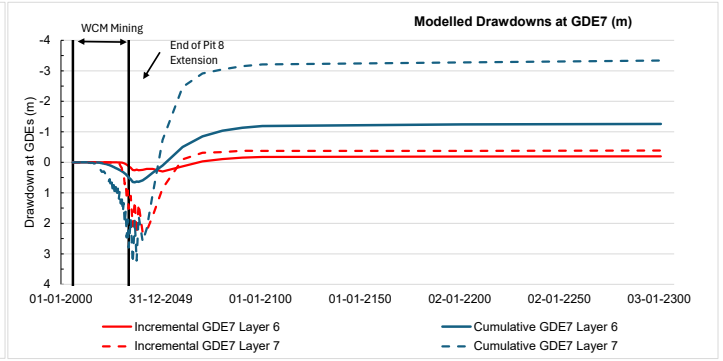
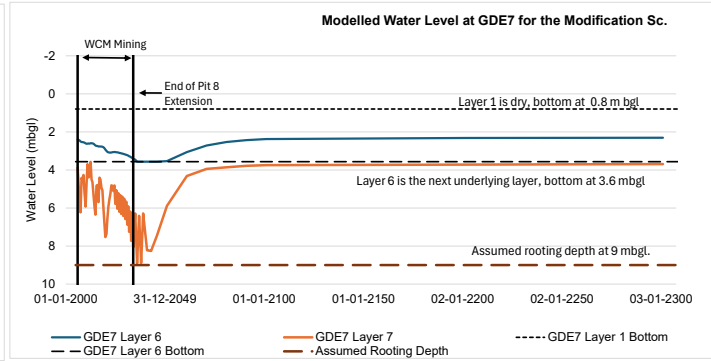
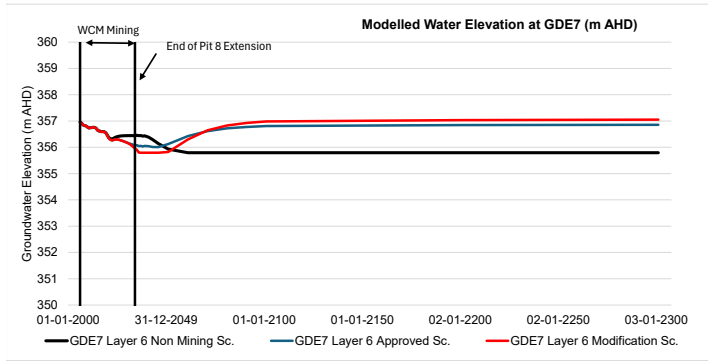
Attachment A – Selected GDE Hydrographs



Attachment A – Selected GDE Hydrographs



Attachment A – Selected GDE Hydrographs



UPDATED ASSESSMENT OF EFFECTS TO TERRESTRIAL GROUNDWATER DEPENDANT ECOSYSTEMS

Pre-mining Depth to Water Table

FIGURE B-1

LEGEND

- ▬ Approved Pit Extent
- ▬ Proposed Pit 8 Extension
- Water Table Contour (m)
- Watercourse
- GDE Observation Point

GDEs

- ▨ 4. Western Grey Box Woodland (PCT 3405)
- ▨ 6. Box-Gum Grassy Woodland on Valley Floors (PCT 3396)
- ▨ 6d. Regeneration (PCT 3396)
- ▨ 8. Fuzzy Box Woodland (PCT 3404)
- ▨ 9. Rough-barked Apple Woodland (PCT 3403)

Depth to Water Table (m)	
■	15 - 20
■	< 1 (not shown)
■	1 - 2
■	2 - 5
■	5 - 10
■	10 - 15
■	20 - 40
■	40 - 60
■	60 - 80
■	80 - 100
■	> 100

Data Sources:
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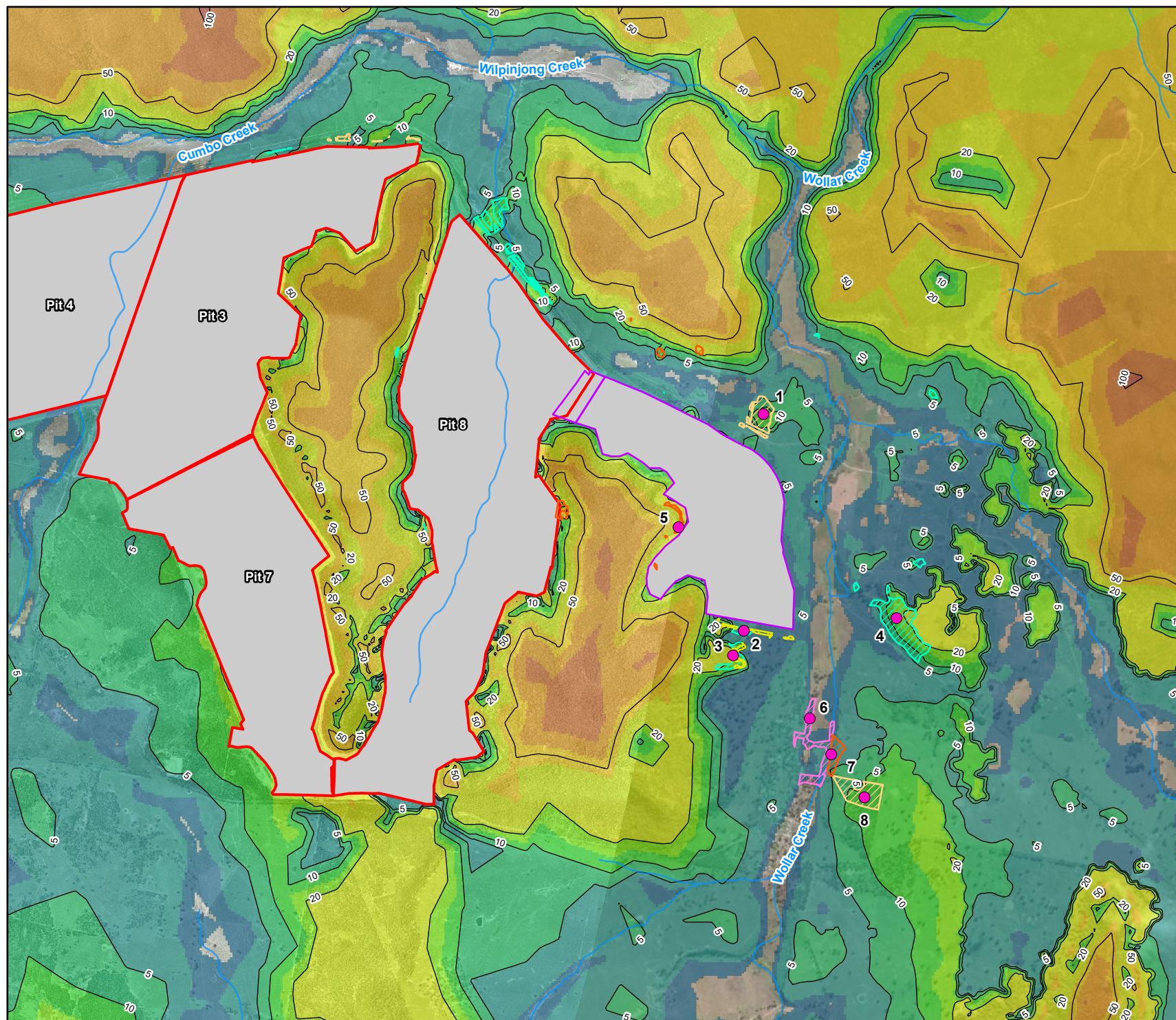
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UPDATED ASSESSMENT OF
EFFECTS TO TERRESTRIAL
GROUNDWATER DEPENDANT
ECOSYSTEMS

Depth to Water Table at
End of Mining (year 2034)

FIGURE B-2

LEGEND

- Approved Pit Extent
- Proposed Pit 8 Extension
- Water Table Contour (m)
- Watercourse
- GDE Observation Point

GDEs

- 4. Western Grey Box Woodland (PCT 3405)
- 6. Box-Gum Grassy Woodland on Valley Floors (PCT 3396)
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- 9. Rough-barked Apple Woodland (PCT 3403)

Depth to Water Table (m)	
15 - 20	
< 1 (not shown)	
1 - 2	
2 - 5	
5 - 10	
10 - 15	
20 - 40	
40 - 60	
60 - 80	
80 - 100	
> 100	

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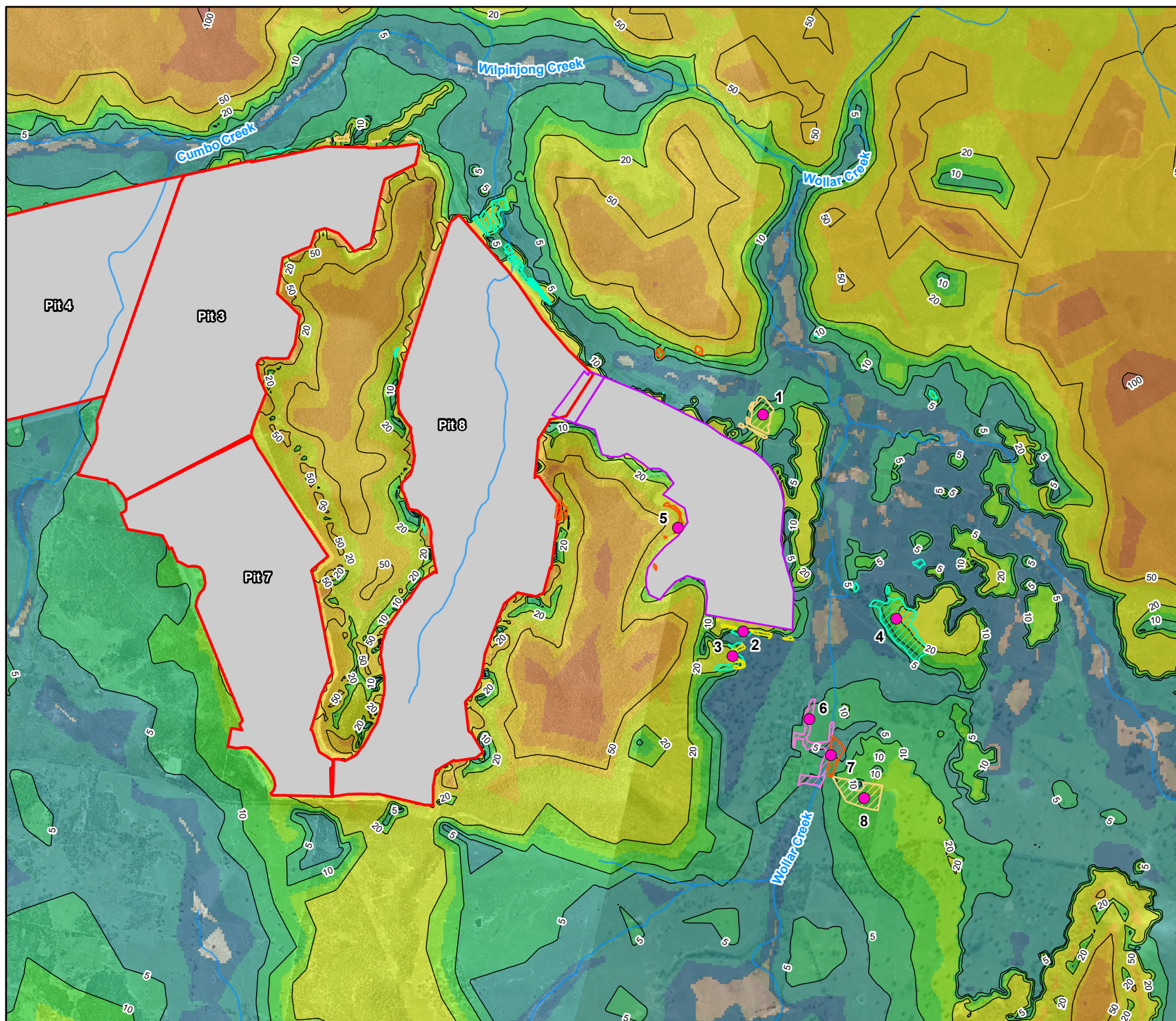
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Drawn by: JH



UPDATED ASSESSMENT OF EFFECTS TO TERRESTRIAL GROUNDWATER DEPENDANT ECOSYSTEMS

Depth to Water Table at
End of Recovery (year 2300)

FIGURE B-3

LEGEND

- ▬ Approved Pit Extent
- ▬ Proposed Pit 8 Extension
- Water Table Contour (m)
- Watercourse
- GDE Observation Point

GDEs

- ▨ 4. Western Grey Box Woodland (PCT 3405)
- ▨ 6. Box-Gum Grassy Woodland on Valley Floors (PCT 3396)
- ▨ 6d. Regeneration (PCT 3396)
- ▨ 8. Fuzzy Box Woodland (PCT 3404)
- ▨ 9. Rough-barked Apple Woodland (PCT 3403)

Depth to Water Table (m)	
■	15 - 20
■	< 1 (not shown)
■	1 - 2
■	2 - 5
■	5 - 10
■	10 - 15
■	20 - 40
■	40 - 60
■	60 - 80
■	80 - 100
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