




# MIDDLEMOUNT COAL MINE

## SOUTHERN EXTENSION PROJECT EPBC Act Preliminary Assessment Documentation (EPBC 2021/8920)

### Attachment K Surface Water Assessment Addendum Report



## MEMORANDUM

---

<b>Date</b>	3 July 2025
<b>Attention</b>	Michael Moore
<b>Company</b>	Yancoal Australia
<b>WRM ref.</b>	0469-34-B1
<b>Subject</b>	Middlemount Southern Extension Surface Water Assessment Addendum

---

---

## 1 INTRODUCTION

### 1.1 THE PROJECT

Middlemount Coal Pty Ltd (MCPL) owns and operates the Middlemount Coal Mine, an existing open cut coal mine, located approximately seven kilometres (km) to the south-west of the Middlemount township within the Isaac Regional Local Government Area, Queensland. MCPL is seeking Queensland Government and Commonwealth Government approval for changes to the approved Middlemount Coal Mine, herein referred to as the Southern Extension Project (SEP) (the Project).

The Project involves extension within mining lease (ML) 70379 and ML 70417 to the south and extension of waste rock emplacement areas within ML 70014, ML 700027 and ML 70417. The main activities associated with the development of the Project include:

- extension of the open cut pit to the south within MLs 70379 and 70417;
- continued extraction of run-of-mine coal at up to 5.7 million tonnes per annum using conventional open cut mining equipment;
- placement of waste rock in existing emplacements, expanded emplacements (West Dump and East Dump) and within the mined out void;
- minor extensions to waste rock emplacements footprint;
- progressive development of sediment dams, pipelines and other water management equipment and structures;
- re-positioning of the approved southern flood levee and water management infrastructure;
- re-alignment and extension of the approved (but not yet constructed) eastern diversion of Roper Creek (Roper Creek Diversion 2) inside the MLs;
- progressive development of new haul roads and internal roads;
- continued development of soil stockpiles, laydown areas and borrow areas;

- continued use of existing and approved supporting mine infrastructure;
- extension of the approved mine life by approximately seven years (to 2044); and
- a change to the residual landform for the end of the mine life.

A revised Environmental Authority (EA) (EPML00716913) was issued by the Queensland Government for the Project on 25 May 2022. Commonwealth Government approval has yet to be granted.

## 1.2 EPBC APPROVALS

The Middlemount Coal Mine operates under three existing *Environment Protection and Biodiversity Conservation Act 1999* approvals:

- EPBC 2010/5394 – Stage 2 Project;
- EPBC 2016/7717 – North-eastern Extension; and
- EPBC 2017/8130 – Western Extension.

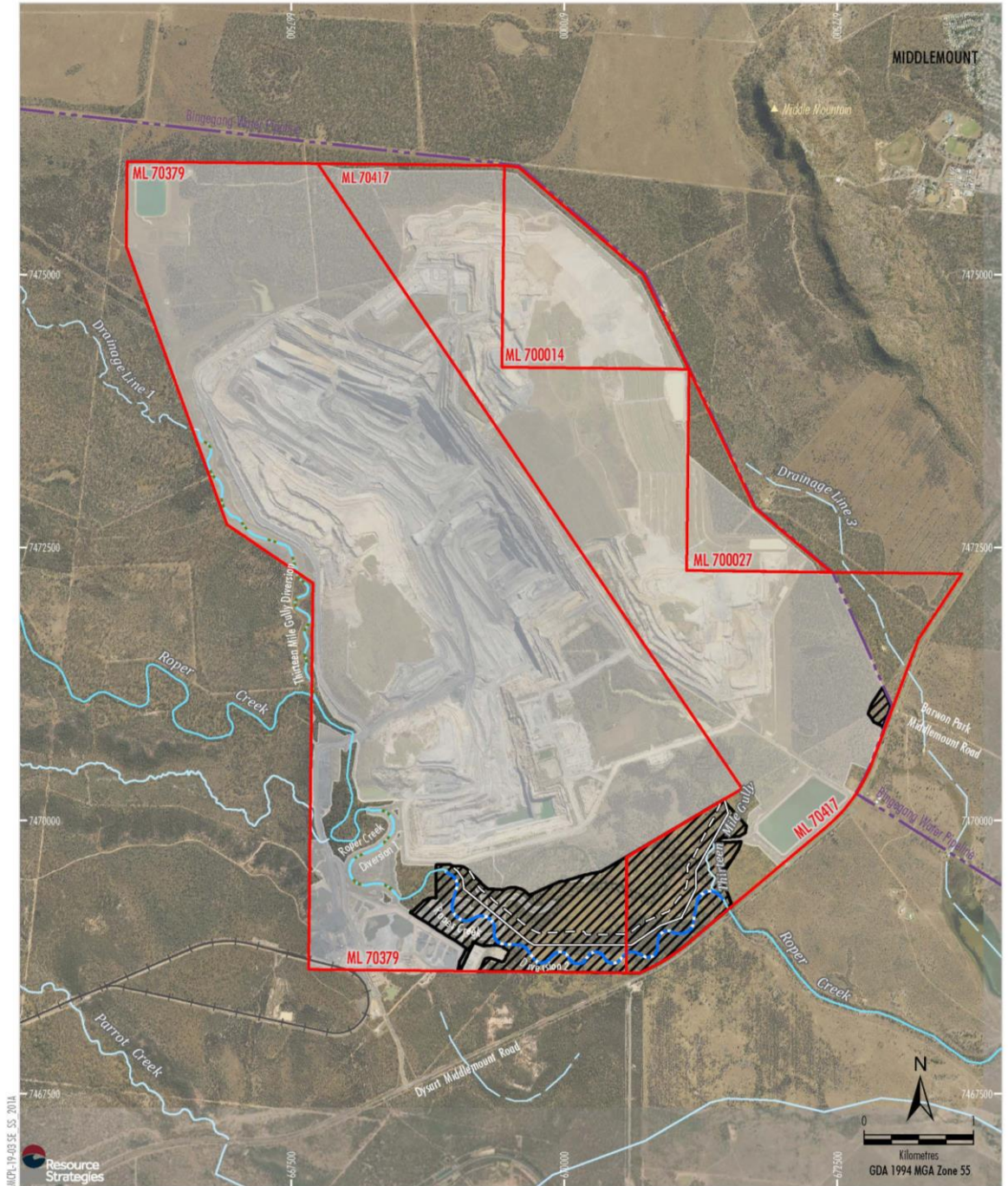
On 17 June 2021, the Project was determined to be a Controlled Action (EPBC 2021/8920) and to be assessed by Preliminary Documentation. On 7 February 2025, MCPL sought to vary the Project Referral to revise the extent of disturbance associated with the proposed Action. Figure 1.1 shows the varied extent of disturbance.

Following the Project Controlled Action decision, MCPL prepared the draft Preliminary Documentation in accordance with the Assessment Approach decision. MCPL has progressively updated the draft Preliminary Documentation to address the Department’s review comments during 2022, 2023 and 2024. Following the most recent meeting on 15 October 2024 to discuss the draft Preliminary Documentation, one key assessment matter remains unresolved. This matter relates to MCPL’s proposed approach to the redesign of the Roper Creek Diversion 2 within areas of land approved for disturbance under EPBC 2010/5394.

EPBC 2010/5394 approved the construction of Roper Creek Diversion 2 as part of a larger referred mine extension Action. Subsequent detailed design of the Roper Creek Diversion 2 confirmed the design footprint for this infrastructure, with that design being illustrated in the assessment documents prepared in support of EPBC 2016/7717 and EPBC 2017/8130. The Roper Creek Diversion 2 corridor forms part of the footprint of the mine site for which biodiversity offsets have been established in accordance with the approved Offset Management Plan.

As part of EPBC 2021/8920, MCPL proposes to extend open cut mining to the south, requiring construction of an alternative Roper Creek Diversion 2. The extended open cut would mine through part of the Roper Creek Diversion 2 corridor previously approved under EPBC 2010/5394.

MCPL has elected to reassess impacts to the approved Roper Creek Diversion 2 corridor as part of the Preliminary Documentation for the EPBC 2021/8920 referred Action by adjusting the referred Action disturbance area to include an assessment of the proposed development of the Project within the approved Roper Creek Diversion 2 corridor.



- LEGEND**
- Middlemount Coal Mining Lease Boundary (ML)
  - Middlemount Rail Spur and Loop
  - Approved Disturbance Footprint
  - Approved Diversion Structure
  - Realigned Diversion
  - Levee
  - Open Cut Pit Extension
  - Approximate Extent of Additional Disturbance Associated with the Action

Source: MCPL (2025); The State of Queensland (2023)  
 Orthophoto: MCPL (June 2025); ESRI BaseMap (2024)



**SOUTHERN EXTENSION PROJECT**  
 Varied Action Footprint Extent

Figure 1.1 Action described in the varied proposal

### 1.3 PURPOSE OF THIS ASSESSMENT

WRM Water & Environment Pty Ltd (WRM) prepared a Surface Water Impact Assessment (SWIA) to support the EPBC application for the Project (WRM, 2020). The SWIA:

- described the surface water management system implemented at Middlemount Coal Mine to minimise downstream impacts and comply with the conditions of the EA;
- presented results of water balance modelling undertaken to assess the performance of the water management system across the operational and final landform phases of the Project;
- prepared a functional design of the Roper Creek Diversion 2; and
- presented results of flood modelling undertaken to assess the impact of the proposed levees and stream diversions on Roper Creek.

WRM has been requested to review the SWIA prepared in 2020 considering works that have been undertaken at the site since the 2020 assessment to determine whether the findings and conclusions in the SWIA remain the same. The review is based on:

- the SWIA (WRM, 2020);
- the Operational Water Management Plan prepared by Engeny Water Management (Engeny) (2022) to incorporate the project;
- a Technical assessment prepared by Engeny (2024) to support an EA Amendment; and
- the Middlemount Coal Mine Progressive Rehabilitation and Closure Plan, prepared by MCPL (2023).

---

## 2 SURFACE WATER REVIEW

### 2.1 OVERVIEW

The potential impacts of the Project on surface water resources that were assessed in the SWIA include:

- impacts on the geomorphology and the flooding regime of Roper Creek;
- impacts on regional water availability due to the potential need to obtain water from external sources to meet operational water requirements of mining operations;
- impacts on stream flows due to loss of catchment area draining to local drainage paths due to capture of runoff within onsite storages and the open cut pit; and
- adverse impacts on environmental values in Roper Creek associated with the Project.

A summary of the findings of the SWIA addressing these potential impacts together with a discussion as to whether findings remain valid due to any changes that have occurred are provided in the following sections.

## 2.2 GEOMORPHIC AND FLOODING IMPACTS

The approved Middlemount Coal Mine included a system of levees and stream diversions to convey Roper Creek flows through the mining area without impacting on mining operations. The works proposed as part of the Project that impact on the geomorphic and flooding impacts include:

- re-positioning of the approved southern flood levee and water management infrastructure;
- re-alignment and extension of the approved (but not yet constructed) eastern diversion of Roper Creek (Roper Creek Diversion 2) inside the MLs; and
- a change to the residual landform for the end of the mine life.

### 2.2.1 Stage 2 Roper Creek Stream Diversion

The SWIA included the functional design of the proposed Stage 2 Roper Creek Diversion. The functional design was prepared in accordance with the Queensland Government *Guideline: Works that interfere with water in a watercourse — watercourse diversions* (Department of Natural Resources and Mines, September 2014). It was designed to replicate the channel that it replaces as much as practicable.

The Stage 2 Roper Creek Diversion was to be undertaken in two stages. The channel would be realigned during the operational phase and the adjoining floodplain widened post mining by the removal of the southern levee and undertaking floodplain modifications. The pre-mining and proposed diversion hydraulic criteria, defined within the above guideline, were generally consistent for the in-channel flows, which means that the channel would perform in a similar manner to how it was prior to mining. However, the hydraulic criteria were higher than both existing and guideline values for the outer bank flows. The proposed post mining final landform floodplain changes would reduce all of the key hydraulic criteria to be close to the pre-mining conditions and therefore be more sustainable.

The functional design was approved by the Queensland Government in 2021 but has not yet been constructed. MCPL has confirmed that there have been no changes to the proposed Stage 2 Roper Creek Diversion or the levee system for both the operational phase and final landform phases of the Project since the SWIA and therefore the results of the functional design assessment in the SWIA remain the same.

### 2.2.2 Flood risk management

WRM prepared a flood impact assessment for the SWIA. An URBS hydrological model was developed to estimate design discharges and a TUFLOW two-dimensional hydraulic model was developed to estimate design flood levels and impacts for the following scenarios:

- pre-mining conditions,
- approved conditions,
- proposed end-of-mine conditions, and
- the proposed final landform.

The approved conditions included the approved but not constructed Western Extension levee and Thirteen Mile Gully diversion as well as the approved Stage 1 of the Roper Creek diversion and levee. Both diversions and the levees were constructed in 2020 along the same alignments and configurations used for the approved conditions modelling.

Compared to approved conditions, the modelling found that the proposed conditions levees would increase the depth and frequency of flooding downstream of the mine for the 5 percent (%) annual exceedance probability (AEP) event and for more rare events. There would be no change in flooding for the more frequent events or impact upstream of the mine from approved conditions.

For the final landform, the width of the floodplain post mining would be increased to improve the flood conveyance, which in turn would mitigate the increased flooding downstream of the mine compared to approved conditions.

MCPL has advised that there have been no changes to the approved or proposed levee locations since the SWIA. That is, the approved conditions in the SWIA represent the current drainage conditions at Middlemount Coal Mine and the proposed operational and final landform configurations are unchanged from the SWIA.

On this basis, the flood model results presented in the SWIA remain unchanged.

### 2.3 IMPACTS ON REGIONAL WATER AVAILABILITY

The approved and proposed Middlemount Coal Mine requires an external water supply during dry periods for dust suppression and coal washing. At the time of the SWIA, MCPL had a water offtake agreement with Anglo American plc to supply water from the German Creek Mine. The supplied water exceeded the water quality objectives in the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* and therefore was only suitable for mine site use. The agreement would therefore have no impact on regional water availability.

This agreement ceased in 2022 and was replaced with a third-party agreement with BHP for water supplied from the Nogoia Mackenzie Scheme. The water taken under this scheme is managed under the *Water Plan (Fitzroy Basin) 2011*, which was developed under the *Water Act 2000* to sustainably manage and allocate water resources in Queensland. That is, the take of water has been approved as being acceptable by the Queensland Government.

### 2.4 STREAM FLOW IMPACTS

During active mining operations, the mine water management system and the flood protection levee will capture runoff from areas that would have previously flowed to the receiving waters of Roper Creek. The captured catchment area will change as the mine develops.

The additional surface disturbance area associated with the Project would excise a maximum of an additional 110 hectares (ha) during operations of the Roper Creek catchment. The loss represents less than 0.3% of the Roper Creek catchment to the downstream boundary of Middlemount Coal Mine. The loss of catchment flows in Roper Creek would be indiscernible, and as such the potential impact on water quantity in Roper Creek due to the Project was considered negligible. Further, there are no licenced users of water on Roper Creek downstream of the Project that could be impacted by this take.

Post mining, permanent drainage of waste rock emplacement areas will be installed to minimise capture of surface runoff. The majority of the disturbed area at the site will be rehabilitated and allowed to drain back to Roper Creek. A residual area of approximately 6.8 square kilometres (km<sup>2</sup>) will continue to drain to the residual voids. This area is less than what was previously approved for the Middlemount Coal Mine.

MCPL prepared a Progressive Rehabilitation and Closure Plan (PRCP) for Middlemount Coal Mine using the same final landform proposed and assessed in the SWIA. The PRCP was approved by the Queensland Government with an effective date of October 2023.

MCPL has advised that the locations of the proposed levees, which separate the catchment runoff from the mine water management system, have not changed and that the proposed final landform described in the SWIA and the approved PRCP has not changed. Therefore, the findings in the SWIA that the impacts on stream flows would be negligible remain unchanged.

## 2.5 IMPACTS ON THE ENVIRONMENTAL VALUES OF RECEIVING WATERS

### 2.5.1 SWIA

The Middlemount Coal Mine Water Management Plan (WMP) (WRM, 2019) for the approved operations and the SWIA outlined the water management system objectives and principals, which have been developed to protect water quality and the environmental values of the waterways potentially affected by the Project. No changes were proposed to these objectives and principals as part of the Project and the water management system and infrastructure remains mostly unchanged from the approved operations.

The general principles to manage surface water for the site are as follows:

- The separation of undisturbed catchment runoff, on-site stormwater runoff from overburden areas, mine affected water (that has been in contact with coal), tailings return water and contaminated water.
- Minimise the area of surface disturbance, thus minimising the volume of on-site stormwater capture or contaminated water runoff.
- Collect and contain on site all potential mine affected water pumped from the open cut pits in dedicated mine water storages. The mine water storages will be used as the primary water source for the coal handling and preparation plant (CHPP) and for dust suppression.
- Retain and reuse on site any on-site stormwater runoff that has high sediment concentrations whenever possible. If not, release it in a controlled manner (i.e. following settlement) in compliance with an erosion and sediment control plan (ESCP).
- Minimise the potential for generation of contaminated water by installing a roof over the bunded areas. Where this is not possible, use oil and water separators or collect and contain the potentially contaminated water within the bunds and pump it to the mine affected water storages.
- Maximise the use of on-site water and thus minimise the need for importing external water.
- Prioritise the use of poorer quality water over better quality water.
- Only release water to the receiving environment in accordance with the EA.
- Complete flood mitigation works to provide a minimum of 0.1% AEP immunity from Thirteen Mile Gully and Roper Creek floods.

The performance of the mine affected water management system was assessed using the OPSIM water balance model. OPSIM is a computer-based operational simulation model that has been developed to assess the dynamics of the water balance under varying rainfall and catchment conditions throughout the development of the Project. The model has been in operation since the conception of the mine and has been continually updated as data becomes available or mining operations have changed.

The results of the water balance modelling indicate that, under the current model assumptions and configuration, there would be less than a 1% chance of uncontrolled spills of mine affected water from the site to the receiving environment. Further, no controlled releases from the mine water dams to Roper Creek would occur based on the conditions of the EA. This is due to the high salinity from the external water supply pipeline elevating salinity levels in the mine water dams.

Given this, no impacts on downstream water quality or environmental values are predicted to occur due to the mine water management system.

The additional disturbance footprint associated with the Project (233 ha) would increase the volume of stormwater requiring to be contained and managed on the mine site. The on-site stormwater management system including the ESCP will remain generally unchanged from the approved mine (i.e. continued collection of runoff from the overburden dumps). Overflows from sediment dams were not expected to have a measurable impact on receiving water quality.

Since the preparation of the SWIA in 2020, progressive rehabilitation at the Middlemount Coal Mine has resulted in an improvement to erosion and sediment control through an increase in groundcover.

### **2.5.2 Operational Water Management Plan 2022 (Engeny, 2022)**

The Middlemount Coal Mine WMP was updated by Engeny (2022) to incorporate the Project. The WMP provides MCPL with a forecast of future water management system performance and provides an outline of the infrastructure and operational strategies required to minimise impacts to operations and environmental compliance. The WMP was developed in accordance with the EA (EPML00716913).

The water management strategies, system and infrastructure described in the WMP are consistent with the SWIA. There were minor changes to sediment dam locations and their associated catchments (only indicative locations were defined in the SWIA). None of the changes would have any significant impact on the performance of the mine water management system.

An operational water balance model was developed as part of the WMP to assess the performance of the water management system since the SWIA and to provide a five year forecast for a range of potential rainfall sequences. The WMP water balance model used the same rainfall runoff parameters, similar water demands and operating rules as the SWIA model. The WMP model was validated using recorded site water inventory over the period between July 2019 and April 2022 indicating that the runoff parameter assumptions for both assessments were reasonable. The overall site water inventory over this period was generally consistent with SWIA predictions with storage volumes being topped up by German Creek supplies over the relatively dry wet seasons of 19/20 and 20/21 and then rising over the very wet 21/22 wet season.

Similar to the SWIA water balance modelling, the WMP water balance predicted no controlled releases from the mine water storages to the downstream environment due to elevated salinity concentrations above the EA release limits. As a result, no impacts on downstream quality or environmental values were predicted, consistent with the SWIA.

Of note, the WMP made recommendations to assess options for another out of pit mine water storage and options to improve mine water release capability to minimise impact to operations due to pit inundation.

### **2.5.3 Technical assessment, Environmental Authority Amendment (Engeny, 2024)**

In response to the WMP recommendations and following the wet 21/22 and very wet 22/23 wet seasons, MCPL constructed an additional out-of-pit Mine Water Dam and applied to the Queensland Government to adjust the mine water release conditions in their EA. Both assessments undertaken for the SWIA and the WMP determined that no releases could occur

due to elevated salinity levels in the Mine Water Dams. The revised EA was granted to MCPL in June 2024, which included:

- an additional mine water release point from SD12 (Table C1 of the EA);
- increased electrical conductivity (EC) (to 10,000 microsiemens per centimetre [ $\mu\text{S}/\text{cm}$ ]) and sulfate (to 1,000 milligrams per litre) end-of-pipe release limits (Table C4 of the EA); and
- increased EC receiving water contaminant trigger levels (to 2,000  $\mu\text{S}/\text{cm}$ ) (Table C5 of the EA).

Engeny (2024) prepared a Technical Assessment, which included water balance modelling, to support the application. The modelling used the same runoff parameters as used in the SWIA but used conservative estimates of pit catchment area and mine water dam EC concentrations to provide a conservative estimate of release opportunities and downstream impacts. The modelling predicted the following:

- Controlled releases would occur on 1% of modelled days.
- An average annual release volume of approximately 308 megalitres (compared to an average annual flow volume in Roper Creek of 11,164 megalitres per year).
- No releases would occur for Roper Creek flows, which are less than 2 cubic metres per second.
- The revised instream EC receiving water contaminant trigger levels were not exceeded on release days, with the instream EC getting diluted as it travels downstream. On release days, the EC was predicted to be at most 880  $\mu\text{S}/\text{cm}$  at German Creek and at most 594  $\mu\text{S}/\text{cm}$  at the Barwon Park Gauging Station.
- There would be no significant impact on the release opportunity of the downstream mining operations (German Creek Mine) due to the changes. The revised EC end-of-pipe release limit and EC receiving water contaminant trigger levels for Roper Creek are now consistent with the German Creek Mine EA (EPML00732613).

Further to this, the replacement of the high salinity external water supplies from the German Creek mine with fresh water from the Nogoa-Mackenzie River system should reduce salt loads on site, which will reduce the potential for downstream impacts. Overall, the approved changes to the EA and the external water supply changes have improved the robustness to the mine water management system, which will in turn reduce the potential for downstream impacts to the receiving waters.

#### 2.5.4 Final void

The proposed final landform included two final voids, North Void and South Void. A final void water balance assessment was undertaken for the SWIA, which assessed the long-term void water level and salinity behaviour. Salinity was used as a proxy for water quality.

The residual void modelling indicated that the expected maximum pit water levels were well below the overflow levels for each void, and the voids will remain as long-term groundwater sinks in perpetuity with no escape of contained water into the Rangal Coal Measures or Fort Cooper Coal Measures (Australasian Groundwater and Environmental Consultants Pty Ltd [AGE], 2020).

MCPL prepared a PRCP for the mine using the same final landform and void configuration proposed and assessed in the SWIA. The PRCP was approved by the Queensland Government with an effective date of October 2023.

MCPL has advised that there have been no changes to the final void locations or configurations since the SWIA. On this basis, the results presented in the SWIA remain the same.

---

### 3 CONCLUSIONS

Based on the review of available information and considering the works that have been undertaken at the site since the completion of the SWIA in 2020, the findings and conclusions in the SWIA remain the same. The following is of note:

- There have been no changes to the proposed Stage 2 Roper Creek Diversion or the levee system for both the operational phase and final landform phases of the Project since the SWIA and therefore;
  - the results of the functional design assessment for the diversion in the SWIA remain the same;
  - the flood model results presented in the SWIA remain unchanged; and
  - the impacts on stream flows presented in the SWIA remain unchanged.
- The change in the supply of external water for mine site use from German Creek mine water to water supplied from the Nogoia Mackenzie Scheme will not impact on regional water availability as it is an authorised supply deemed acceptable by the Queensland Government.
- The latest EA release conditions authorised for Middlemount Coal Mine and the change from highly saline to fresh external water supplies will potentially increase the frequency of mine water releases than that predicted in the SWIA. The additional releases are not expected to impact on the environmental values of the receiving waters because the releases are infrequent, do not occur during low flows in Roper Creek and are small in comparison to the overall Roper Creek flows.

---

### 4 REFERENCES

AGE, 2020	<i>Middlemount Coal Mine Southern Extension Project – Groundwater Impact Assessment</i> , Australasian Groundwater and Environmental Consultants Pty Ltd, November 2020
Engeny, 2022	<i>Middlemount Coal Pty Ltd Operational Water Management Plan 2022</i> , Engeny Water Management, October 2022.
Engeny, 2024	<i>Middlemount Coal Pty Ltd Technical Assessment Environmental Authority Amendment</i> , Engeny Water Management, April 2024.
MCPL, 2023	<i>Middlemount Coal Mine Progressive Rehabilitation Closure Plan</i> , Middlemount Coal Pty Ltd, February 2023
WRM, 2019	<i>Middlemount Coal Mine Water Management Plan (MP 207-001)</i> WRM Water & Environment Pty Ltd, June 2019
WRM, 2020	<i>Middlemount Coal Mine Southern Extension Project, Surface Water Impact Assessment</i> , Water & Environment Pty Ltd, September 2020