CENTENNIAL

Clarence Colliery

918 Panel

Extraction Plan

Main Report

VOLUME ONE

April 2026

DOCUMENT CONTROL / TITLE BLOCK

EXTRACTION PLAN DETAILS	**Title:**	918 Panel Extraction Plan Main Report
	Applicant:	Centennial Clarence Pty Limited
	Operation:	Clarence Colliery
	Development Consent:	DA-504-00
	Mining Lease:	ML1583
	Version:	Final – 24 April 2026
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EXECUTIVE SUMMARY

As required by Schedule 3, Condition 2 of development consent (DA-504-00), Clarence Colliery (Clarence) has prepared this Extraction Plan for the secondary extraction of 918 Panel sub-panels 918A, 918B1 and 918B2. The three sub-panels will be extracted using the partial extraction mining method (Panel and Pillar Partial Extraction using shortwall (PPPE)). The 918 panel also includes the bord and pillar first workings to access the 918A,918B1 and 918B2 sub-panels which have been excavated in part.

Previously, the 918 and 920 Panels Extraction Plan was submitted to the Department of Planning, Housing and Infrastructure (DPHI) in April 2024 and was the first Extraction Plan for Clarence to be submitted. Given NSW regulatory, stakeholder and Independent Expert Advisory Panel for Mining (IEAPM) feedback on the 918 and 920 Panel Extraction Plan, the extraction plan was withdrawn from DPHI Assessment in October 2024. In consultation with DPHI and the IEAPM the 918 and 920 Extraction Plan and associated mine design and documentation was revised to form the new 918 Panel extraction plan. The key components of this 918 Panel Extraction plan is the significant changes in the mine design, proposed staged assessment and monitoring compared to the previous 918 and 920 Panels Extraction Plan.

The 918 Extraction Plan makes a number of key mine design changes including the: removal of 920 Panel and its two sub-panels 920A and 920B, reduction of 918 sub-panel void widths and lengths, increase in central spine pillar width in proposed first workings. This significantly reduces the footprint to avoid second workings directly beneath most key natural features including most swamps, all third order streams and all cliffs, minor cliffs, pagodas, cliffs and most heritage sites.

The proposed 918 Panel extraction plan aims to extract approximately 345,000 tonnes (t) of Run of Mine (ROM) coal in sub-panels 918A, 918B1 and 918B2. This is a reduction of 1,025,664t compared to the 1,370,664 second workings ROM t in the previously submitted 918 and 920 Panel Extraction Plan.

The 918A, 918B1 and 918B2 sub-panels are a continuation of the second workings using the partial extraction mining method beneath the Gardens of Stone State Conservation Area (GoS SCA). The 918 panel is west of the existing Clarence 900 Panel and to the north of the 919 Panel. Maximum vertical subsidence is predicted to be 76 millimetres (mm) +/- 20mm (SCT, 2026), maximum 0.6 mm/m tilt of and maximum 0.3 mm/m tensile and compressive strains (MSEC,2026) which is within the approved DA-504-00 subsidence impact assessment criteria.

The natural and built features are predicted to experience low levels of vertical subsidence and horizontal movements. The corresponding strains are expected to be in the order of survey tolerance, i.e. not measurable. Adverse physical impacts to the natural and built features are not expected due to the extraction of the proposed sub-panels (MSEC,2026).

Between 2021 and 2026, Clarence have consulted with relevant NSW government agencies, Lithgow City Council, Registered Aboriginal Parties, the Independent Expert Advisory Panel for Mining (IEAPM), and Clarence Colliery Community Consultative Committee on the Extraction Plan, initially as 918 and 920 Panels and then for the 918 Panel only.

Clarence supports a staged assessment and approval process for the 918 Panel Extraction Plan as suggested by the IEAPM. If the 918 Panel Extraction Plan is approved, this would permit initial second workings extraction of sub-panels 918A and 918B1. After mining is completed in the 918A sub-panel, an end of sub-panel report would be provided to DPHI which details 918A sub-panel subsidence performance against predictions and consented limits to validate the subsidence model and the proposed 918B2 sub-panel design for DPHI assessment and determination.

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Volume 2 – Key Component Plans

Volume 2 contains the component Management Plans of the Extraction Plan required by DA-504-00 including:

918 EP-WMP	918 Panel Water Management Plan
918 EP-LMP	918 Panel Land Management Plan
918 EP-BMP	918 Panel Biodiversity Management Plan
918 EP-HMP	918 Panel Heritage Management Plan
918 EP-BFMP	918 Panel Built Features Management Plan
918 EP-PSMP	918 Panel Public Safety Management Plan
918 EP-SMP	918 Panel Subsidence Monitoring Program

Volume 3 - Graphical Plans

Volume 3 contains graphical plans prepared in accordance with the *Extraction Plan Guideline* (DPE, 2022).

Plan 1	Existing and Future Workings	CL2336_01
Plan 2	Surface Features (without Aerial)	CL2336_02
Plan 2A	Surface Features (with Aerial)	CL2336_02A
Plan 3	Geological and Seam Data	CL2336_03
Plan 4	Existing Workings in Other Seams	CL2336_04
Plan 5	Mining Titles and Land Ownership	CL2336_05
Plan 6	Geological Section Lines	CL2336_06
Plan 6A	Geological Cross Sections	CL2336_06A
Plan 7	Subsidence and Environmental Monitoring	CL2336_07

1 INTRODUCTION

1.1 Background

Clarence Colliery (Clarence) is an underground coal mining operation 10 kilometres (km) east of Lithgow in the Western Coalfields of New South Wales (Figure 1). Clarence is operated and managed by Centennial Coal Company Pty Limited (Centennial Coal). Under development consent DA-504-00, an Extraction Plan is required to be developed and approved prior to undertaking secondary extraction from 31/10/2021 if not covered by an existing, approved Subsidence Management Plan (SMP). This Extraction Plan, prepared for the 918 Panel second workings describes the applicable regulatory framework, mine planning, management and monitoring measures to be implemented to protect surface and subsurface, natural and built features in addition to administering public safety measures. The Extraction Plan has been prepared generally in accordance with the Department of Planning & Environment's Guidelines for Extraction Plans (2022) and Managing Risks of Subsidence, Guide: Work Health and Safety (Mines and Petroleum Sites) Legislation (Resources Regulator, 2026).

1.2 Scope and Extraction Plan Application Area

This Extraction Plan has been developed in accordance with Schedule 3, Condition 2 of Development Consent DA-504-00 (as modified, MOD10) to undertake second workings with extraction of coal by partial extraction mining methods in the 918 Panel within the Katoomba seam. The mining technique proposed is known as Panel and Pillar Partial Extraction using shortwall (PPPE). The mine plan has been designed in accordance with Clarence's overarching mine design principles that revolves around the retention of sufficiently sized spine and barrier pillars to support the overlying strata to minimise subsidence.

The Extraction Plan Area (EP Area) comprises a surface area of 87.5 hectares (ha). The depth of cover above the Katoomba seam in the EP Area ranges from 174 metres (m) to 329 m. The surface topography in the EP Area ranges in 130m of elevation from 1014m Australian Height Datum (AHD) in the southeast to 1144m in the northeast. The existing surface environment of the EP Area includes water courses (creeks and swamps), native bushland, steep slopes, cliffs, minor cliffs, pagodas, unsealed tracks and trails and Aboriginal heritage sites. The land within the EP Area is wholly within the Gardens of Stone State Conservation Area (GoS SCA). There is no significant infrastructure present in the area of potential subsidence influence (EP Area).

The EP Area has been derived by combining the areas bounded by the larger of the following polygons:

- The 35° angle of draw polygon from the limit of proposed second workings associated with the 918 sub-panels; and
- The predicted limit of vertical subsidence, taken as the 20 mm subsidence contour resulting from the extraction of 918 sub-panels

1.3 Relevant Features and Component Plans

A summary of the natural and built features within the EP Area and the component Management Plans through which the respective features are managed is provided in Table 1.1.

Table 1.1: Natural and Built Features within the Extraction Plan Area

Features	Present in EP Area? (Y/N)	Section	Comments
Natural Feature			
Steep Slopes, Cliffs and Pagodas	Y	**4.3** **4.7** **5.2.3**	918 Panel Land Management Plan 918 Panel Public Safety Management Plan
Bungleboori Creek and tributaries Paddys Creek and tributaries	Y	**4.2** **4.4** **5.2.1**	918 Panel Water Management Plan 918 Panel Biodiversity Management Plan

Features	Present in EP Area? (Y/N)	Section	Comments
Swamps Biodiversity		**5.2.2** **5.2.4**	
Public Utilities			
Power lines	N		Management Plan not required
Communications	N		Management Plan not required
Pipelines	N		Management Plan not required
Public Roads	N		Management Plan not required
Unsealed tracks and trails	Y	**4.6.1** **4.7** **5.2.6**	918 Panel Built Features Management Plan 918 Panel Public Safety Management Plan
Public Amenities			
Nil	N		Management Plan not required
Farmland and Facilities			
Nil	N		Management Plan not required
Industrial, Commercial and Business Establishments			
Nil	N		Management Plan not required
Areas of Archaeological and/or Heritage Significance			
Aboriginal heritage items	Y	**4.5** **5.2.5**	918 Panel Heritage Management Plan
Items of Architectural Significance			
Nil	N		Management Plan not required
Permanent Survey Control Marks			
Nil	N		Management Plan not required
Residential Establishments			
Nil	N		Management Plan not required
Other			
Nil	N		Management Plan not required

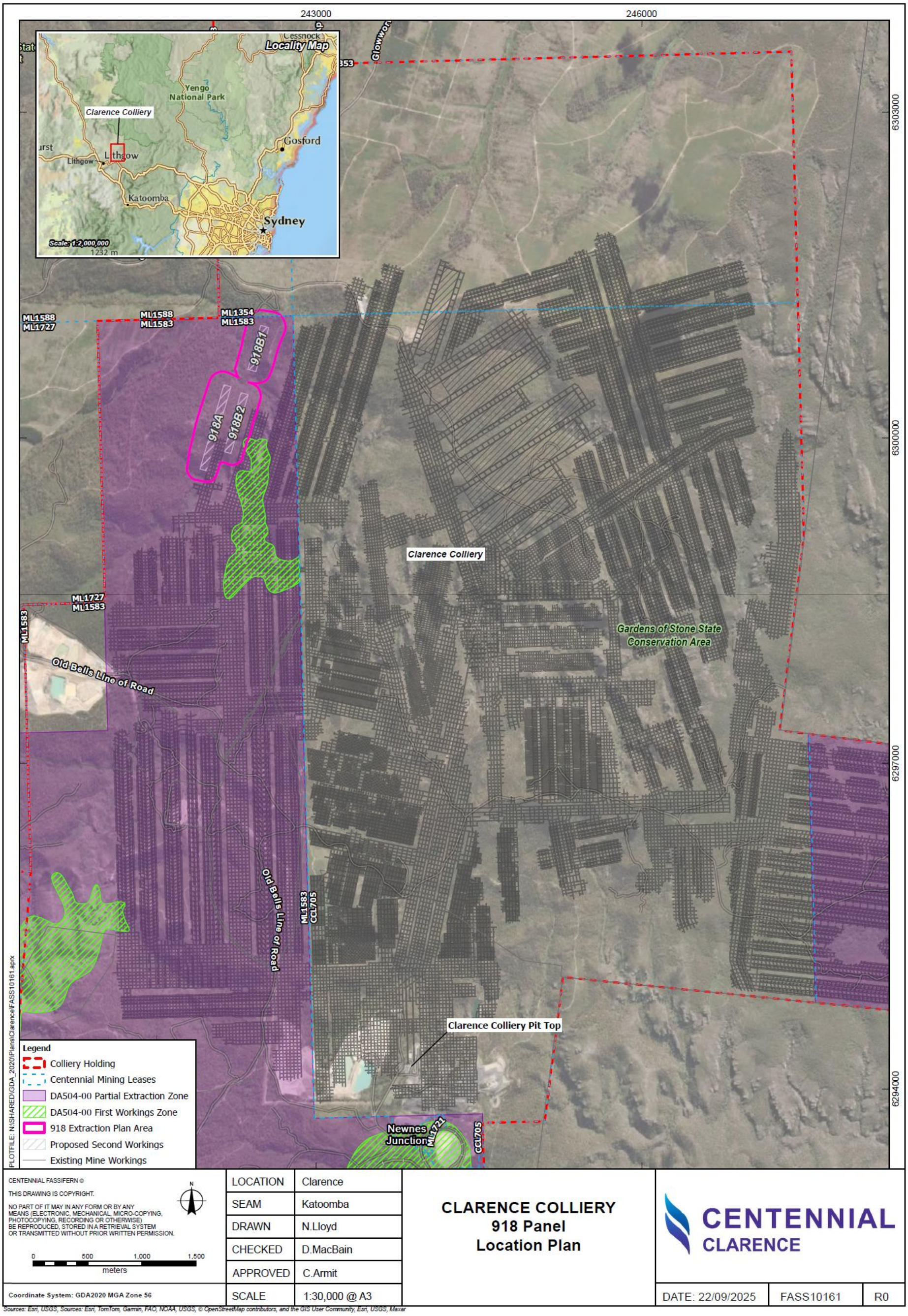


Figure 1 – Location Plan

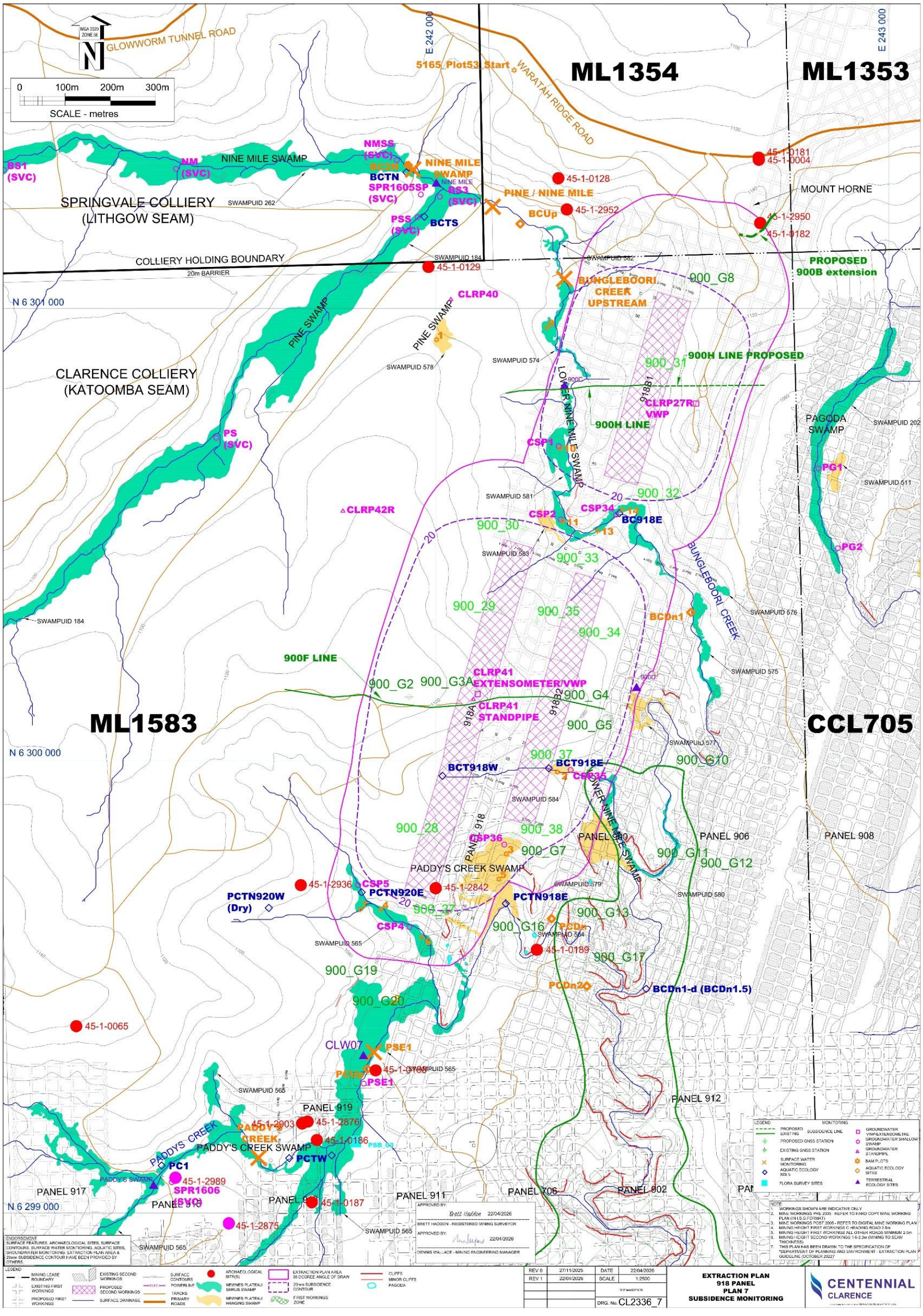


Figure 2 – Surface Built, Natural Features and Subsidence Monitoring (Centennial,2026)

1.4 Document Structure

The 918 Panel Extraction Plan is comprised of three volumes. The first volume is the Extraction Plan Main Report. An overview of the Extraction Plan Main Report is provided below. The second volume includes the seven component Management Plans and the third volume includes the nine Graphical Plans.

VOLUME 1	**Extraction Plan Main Report (this document)**
Section 1	Provides an overall context and introduction to the Extraction Plan.
Section 2	Includes details on the development of the Extraction Plan including: details of the statutory requirements which apply and have been addressed, review of relevant risk assessments and consultation with relevant agencies and other stakeholders within the EP Area.
Section 3	Includes an overview of the mine planning and design, overall subsidence predictions related to the mine design, potential impacts from the predicted subsidence, demonstration of the subsidence predictions meeting the performance objectives and subsidence management strategies and measures.
Section 4	Provides a summary of the component Management Plans of the Extraction Plan including appropriate consideration to subsidence management measures and the plans prepared to address impacts to relevant environmental and/or built features, public safety requirements and compensation and offsets. The individual Management Plans are contained in Volume 2 of the Extraction Plan.
Section 5	Outlines the subsidence and environmental monitoring programs to monitor subsidence impacts and effects associated with the proposed extraction in addition to summarising and consolidating the various component Management Plans presented.
Section 6	Addresses how the Extraction Plan will be implemented, including the required performance measures, performance indicators, Trigger Action Response Plans (**TARPs**), the adaptive management approach and reporting commitments.
Section 7	Outlines the review of other management plans and provides for the Extraction Plan administration which includes assignation of roles and responsibilities for the implementation of the Extraction Plan
Section 8	A list of references relied upon to support Extraction Plan Main Report

There are a number of Appendices attached to this Extraction Plan Main Report. These appendices include copies of detailed technical assessments and other supporting information to support this Extraction Plan as listed below. The Extraction Plan component Management Plans are presented within Volume 2 of this Extraction Plan and Volume 3 contains the nine graphical plans developed as per the DPE (2022) Extraction Plan guidelines.

2 PLAN DEVELOPMENT AND CONSULTATION

2.1 Statutory compliance

The Clarence development consent DA-504-00 was originally approved in 2005 subject to conditions in Schedules 2 to 5 and has been subsequently modified (MOD10 approved May 2024). A DA-504-00 modification application (MOD 11) was submitted in February 2026 to DPHI for assessment and determination to extend the consent past 31 December 2026.

Schedule 3 Specific Environmental Conditions – Subsidence, provides a number of consent conditions relating specifically to subsidence management including the preparation of this Extraction Plan under Condition 2. Additional conditions that inform this Extraction Plan are included in *Schedule 4– Additional Procedures* and *Schedule 5 – Environmental management, monitoring, auditing and reporting.* A Subsidence Compliance and Obligations Register Appendix 2 details each condition and where the requirements of the condition have been addressed within the Extraction Plan or provides applicable comments.

The second workings for the 918 Panel are wholly in Mining Lease (ML) 1583 held by COALEX Pty Ltd. There are no longer any relevant mining lease conditions that specifically relate to the Extraction Plan.

Clarence operates under Environment Protection Licence (EPL) 726, which permits coal handling and production to a scale of up to 5 million tonnes per annum. DA-504-00 conditions no more than 3 million tonnes (run-of-mine coal) extracted per year. There are no specific EPL conditions relating to the preparation of this Extraction Plan, however conditions related to specific aspects such as water management and monitoring associated with the EP Area are detailed within the relevant component Management Plans as well as in this Extraction Plan Main Report.

Clarence has developed a safety management system that integrates plans, policies and procedures that enables a systematic approach to establishing and maintaining effective systems to manage health and safety consistent with Work, Health and Safety (WHS) Legislation and AS/NZS 4804:2001.

Appendix 2 also details the WHS requirements that have been considered for the Extraction Plan principally within the context of subsidence related risks to public safety, including to private property and public infrastructure.

2.2 Stakeholder Consultation

As an established operation, Clarence has an extensive ongoing consultation process across government and community stakeholders. The consultation process undertaken for the previously submitted 918 and 920 Panels Extraction Plan and this 918 Panel Extraction Plan builds on that undertaken by Clarence as part of its existing operations.

During development of the original 918 and 920 Extraction Plan and subsequently the 918 Extraction Plan, consultation has been undertaken with key stakeholders. Stakeholder analysis undertaken during preparation of this Extraction Plan included:

- Risk-based consideration of key environmental and built features within the EP Area;
- Stakeholders prescribed for consultation for this Extraction Plan under the Development Consent and other relevant instruments;
- Existing and known stakeholders to Clarence Colliery, including the Community Consultative Committee (CCC), and
- Landowners relevant to the EP Area.

Key Stakeholders identified for consultation are outlined in Table 2.1 below.

Table 2.1: Key Stakeholders

Group	Stakeholder
Commonwealth Government Department	▪ Department of Climate Change, Energy, the Environment and Water (DCCEEW)
NSW Government Agency	▪ Department of Planning, Housing and Infrastructure (DPHI) ▪ National Parks and Wildlife Service (NPWS) ▪ NSW DCCEEW – Water Group (formerly DPE Water) ▪ Environment Protection Authority (EPA) ▪ Water NSW ▪ Heritage NSW (HNSW) ▪ Resources Regulator (RR) ▪ NSW DCCEEW-Conservation Programs, Heritage and Regulation (CPHR) (formerly BSC)
Local Government Authority	▪ Lithgow City Council (LCC)
Community	▪ Registered Aboriginal Parties ▪ Clarence Colliery CCC ▪ Western Region Aboriginal Heritage Committee

2.2.1 Consultation Required by Development Consent

Condition 2 of Schedule 3 under development consent DA-504-00 requires the preparation of this Extraction Plan in consultation with key relevant stakeholders as detailed in Table 2.2.

Table 2.2: Development Consent Required Consultation

Condition	Consultation requirement
2 (b)	Extraction Plan be prepared in consultation with the Resources Regulator, DPE Water, BCS, EPA and Water NSW
2(g)(i)	include a Subsidence Monitoring Program, which has been prepared in consultation with the Resources Regulator
2(g)(ii)	include a Built Features Management Plan, which has been prepared in consultation with the Resources Regulator
2(g)(iii)	include a Water Management Plan, which has been prepared in consultation with DPE Water and BCS
2(g)(iv)	include a Biodiversity Management Plan, which has been prepared in consultation with BCS
2(g)(v)	include a Land Management Plan, which has been prepared in consultation with any affected public authorities
2(g)(vi)	include a Heritage Management Plan, which has been prepared in consultation with Heritage NSW, Council and relevant stakeholders for both Aboriginal heritage and non-Aboriginal heritage items
2(g)(vii)	include a Public Safety Management Plan, which has been prepared in consultation with the Resources Regulator

2.2.2 Results and Outcomes of Consultation

Summary tables of consultation undertaken since 2021 can be found in Appendix 3. This details the consultation undertaken in addition to the required formal feedback necessary as part of the Extraction Plan process. In summary, Clarence have hosted, presented, met and corresponded with the following stakeholders since 2021: the Registered Aboriginal Parties, Clarence CCC, Western Region Aboriginal Heritage Committee, DPHI, DPE-Water[1], Water NSW, LCC, RR, Heritage NSW, BCS, NPWS and Commonwealth DCCEEW.

The outcomes of the required consultation undertaken (and formal feedback), as set out in DA-504-00 condition 2b (Table 2.2) for the Extraction Plan Main Report are detailed in Appendix 1 The 918 and 920 Extraction Plan Main Report was circulated to the stakeholders listed in Appendix 3 on 21 November 2023 and formal feedback was received on various dates as presented below. Comments raised by the various stakeholders and where these comments have been addressed within the Extraction Plan Main Report. The 918 and 920 Extraction Plan was withdrawn and a letter received from DPHI on 30 October 2024 requesting responses to the August 2024 Requests for Further Information from the NSW regulatory bodies and the IEAPM. The Response to Matters for DCCEEW August 2024 letter and the Response to Matters for the January 2026 IEAPM letter is contained within Appendix 3. There were no further information requests from other NSW regulatory bodies in the August 2024 response. The 918 Extraction Plan and associated documents were uploaded onto the NSW DPHI planning portal for consultation on 26 February 2026.

The outcomes of consultation undertaken for the Extraction Plan component Management Plans are detailed in the relevant Management Plan with copies of formal consultation correspondence provided in respective appendices and is not duplicated within this Extraction Plan Main Report. Copies of the NSW regulatory consultation correspondence are also available within the NSW DPHI planning portal for this project.

2.3 EP Project Team Endorsement

This 918 Panel Extraction Plan and supporting documents were prepared by suitably qualified and experienced persons as endorsed by DPHI in May 2025 (Appendix 1).

2.4 Risk Assessment

2.4.1 Methodology

Clarence has adopted the Stature Risk Assessment Program which was developed to ensure consistency in all risk assessments across the Centennial Coal operations. The Stature Risk Assessment Program sets out a consequences table and risk ranking matrix for managing identified risks consistent with AS/NZS ISO 31000:2009.

All operational processes undertaken at the Clarence operations are subject to the risk assessment process prior to implementation. The process for risk and change management is undertaken according to the methodology and tools contained within the mine's Risk Management Arrangements and Change Management System.

Clarence has undertaken a 918 Panel risk assessment which provides a risk framework basis for development of the component Management Plans. The risk assessments and management plans were also developed with reference to the guideline for *Managing the Risk of Subsidence* (Resources Regulator, 2026). These risk assessments conducted include:

- WRAC Risk Assessment - Subsidence WHS
    - Required by the Work Health Safety (Mines and Petroleum Sites) Regulation 2022 to develop control measures to manage the risk to health and safety associated with subsidence. As outlined in WHS Regulation (Mines and Petroleum Sites) Schedule 1, Part 1, Clause 6, the following matters were considered in developing the control measures to manage the risks of subsidence:

        (a) the characteristics of all relevant surface and subsurface features,

(b) the characteristics of all relevant geological, hydrogeological, hydrological, geotechnical, topographic and climatic conditions, including conditions that may cause elevated or abnormal subsidence or the formation of sinkholes,

(c) the characteristics of any previously excavated or abandoned workings that may interact with any proposed or existing mine workings,

(d) the existence, distribution, geometry and stability of significant voids, standing pillars or remnants within any old pillar workings that may interact with any proposed or existing mine workings,

(e) the predicted and actual nature, magnitude, distribution, timing and duration of subsidence,

(f) the rate, method, layout, schedule and sequence of mining operations.

The risk assessment was originally undertaken in August 2022 for the 918 and 920 Panels. As a result of mine design and personnel changes at Clarence, the risk assessment was reviewed on 31 May 2023 and then again in April 2025 for 918 Panel only. A summary of the outcomes from the risk assessment is provided Section 2.4.2.

The risk assessment was informed by the experience and results of numerous previous risk assessments undertaken for other Centennial Extraction Plan Risk Assessments.

The risks to surface features from the development of mine subsidence from the extraction of the 918 Panels within the EP Area are detailed for each surface feature item using the subsidence predictions and assessments undertaken by SCT and MSEC.

2.4.2 Summary of Risk Assessment Outcomes

A risk ranking (low, moderate, significant, high or extreme) was assigned to each risk/hazard identified in the Extraction Plan risk assessment undertaken in support of the 918 Panel Extraction Plan in accordance with the risk classifications under the Centennial Coal Risk Standard.

A risk ranking (low, moderate, significant, high or extreme) was assigned to each risk/hazard in consideration of the risk - likelihood of occurrence and the Maximum Reasonable Consequence (MRC) for the given controls. Ten potential risks were assessed during the risk assessment; three were ranked as significant, one was ranked as moderate and six were ranked as low. The significant risk rankings were largely dependent upon and driven by the consequence category, despite a likelihood of the risk occurring being assessed as remote/low. The risk associated with the moderate ranking was the same, in that the final risk rating was driven by consequence and not by its likelihood of occurrence.

The three significant risks related to groundwater and biodiversity including:

- Subsidence affecting swamp/alluvial and perched groundwater (the likelihood of this occurring was ranked as remote and the consequence, if it did happen, was ranked as major)
- Subsidence affecting rock aquifers/aquitards which support GDEs and other users (the likelihood of this occurring was ranked as remote and the consequence, if it did happen, was ranked as major)
- Subsidence affecting threatened flora and fauna, swamps/wetlands and GDEs and aquatic ecology (the likelihood of this occurring was ranked as remote and the consequence, if it did happen, was ranked as major)

The moderate risk included:

- Subsidence affecting surface water (the likelihood of this occurring was ranked as remote and the consequence, if it did happen, was ranked as moderate)

The low risks included:

- Subsidence affecting steep slopes, cliffs, minor cliffs and pagodas;
- Subsidence affecting Aboriginal heritage sites;
- Subsidence affecting fauna habitat;
- Subsidence affecting public safety;

- Subsidence cracking increasing erosion potential; and
- Subsidence affecting built features.

The risk assessments undertaken for the Extraction Plan and subsequently identified control measures have been developed to manage the potential for these risks to occur are appropriately controlled to ensure that there is no impact to the environment, built infrastructure or public safety. The primary control is the mine design. Specific risks are further detailed in the relevant component Management Plans.

3 MINE DESIGN AND SUBSIDENCE ASSESSMENT

3.1 Surface Environment

The EP Area is located to the northwest of the existing mine workings and comprises a surface area of approximately 87.5 ha. The EP Area lies within the catchment of Bungleboori Creek and the lower reaches of Paddy's Creek which is a tributary of Bungleboori Creek. Across the EP Area, the ground surface elevation ranges from 1014 m to 1144 m Australian Height Datum (AHD). The depth of cover above the Katoomba seam in this area ranges from approximately 174 m to 329 m. The existing surface environment of the EP Area includes, unsealed tracks and trails, environmental and subsidence monitoring equipment and bores, creeks, swamps, native bushland, steep slopes, a threatened ecological community, threatened species and their habitat, minor cliffs, pagodas, cliffs and archaeological heritage items.

There are no private properties or residences, power lines, transmission lines, telecommunication networks and other associated infrastructure in the area covered by this Extraction Plan.

3.1.1 Land Ownership

The surface land of the EP Area is located within the GoS SCA, which is managed by NPWS for environmental protection. DPE (2022a) prepared a Plan of Management for the GoS SCA and describes the SCA as having outstanding natural and cultural value. It protects ancient sandstone pagodas, rich eucalypt forests, an array of threatened species and important Wiradjuri cultural heritage. It is noted to be an outstanding destination that will attract visitors and support the continued growth of the Lithgow region's economy. Prior to being gazetted as an SCA in May 2022, the area was managed by Forestry NSW for softwood and hardwood plantation and harvesting. Remnant harvested softwood, radiata pine areas are adjacent in the west and north of the EP Area.

The classification of the area as a SCA requires it to be managed in accordance with the management principles under the National Parks and Wildlife Act for SCAs. These principles require the land to be managed for conservation and public appreciation and enjoyment, while also enabling the continued operation of existing mining infrastructure within the SCA and the continuation of coal mining operations beneath the SCA.

3.1.2 Surface Infrastructure

There are a number of four-wheel drive (4WD) tracks and motorbike trails traversing the EP Area. These tracks are being managed by NPWS. NPWS has a program of track closures to reduce the number of tracks within the GoS SCA and reduce environmental impacts from vehicles. NPWS is also in the process of planning for and establishing recreational facilities within the SCA. This will include the establishment of camping areas, amenities, information shelters, lookouts, fireplaces and walking and mountain biking tracks (DPE, 2022a). The GoS SCA will offer opportunities for a range of formal multi day walking tracks, sightseeing, rock climbing, canyoning, sustainable 4WD activities, cycling and bushwalking. The location of these proposed facilities are not confirmed and may or may not traverse the EP Area. The Extraction Plan acknowledges the potential for any one of the above mentioned facilities to be located within the EP Area and consultation with NPWS during the Clarence operations will continue.

Noting the above, during consultation with NPWS during the development of the Extraction Plan, NPWS provided feedback that there are planned mountain bike trails potentially within the EP Area. A shape file of the planned mountain bike trails was provided by NPWS. From this data it was found that there are some trails planned within the EP Area. NPWS has also provided feedback on the GoS SCA access strategy and it appears from the GIS data provided that there is potential to eventually reduce vehicle surface access to the EP Area.

Other surface infrastructure located within the EP Area include environmental and subsidence monitoring infrastructure installed, owned and utilised by Clarence.

3.1.3 Landscape Features

Landscape features are presented in Figure 2. There are steep slopes, pagodas, minor cliffs, and cliffs on the elevated ridges within the Banks Wall sandstone mainly located in the south and east of the EP Area adjacent to Paddys Creek and Bungleboori Creek.

Approximately 75% of the EP Area is characterised by gentle to moderate slopes with 25% of the EP Area characterised by steep slopes (i.e. slopes with gradients of between 1:3 and 2:1). Analysis of LiDAR data, coupled with topographical cross sections and extensive field survey and photography has identified 15 significant rock features within the EP Area with five cliffs, seven minor cliffs and three pagodas. No gorges were located within the EP Area. Definitions of the above mentioned features can be found in Section 3.2 of the 918 Panel Land Management Plan (LMP) (Centennial, 2026c).

There are no cliffs, minor cliffs, pagodas directly above the 918 sub-panel second workings (Figure 2). All of the cliffs, minor cliffs and pagodas are located above first workings, barrier pillars or un-mined areas of the EP Area.

One Threatened Ecological Community (TEC) listed under the Biodiversity Conservation Act 2016 was found within the EP Area, being the Newnes Plateau Shrub Swamp Plant Community Type (PCT) 3945 which is associated with the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) listed Temperate Highland Peat Swamps on Sandstone (THPSS). These swamps are generally located in and around Bungleboori Creek and Paddys Creek. PCT 3945 includes the previously known Newnes Plateau Shrub Swamps (NPSS) and Newnes Plateau Hanging Swamps (NPHS).

There are three registered Aboriginal heritage sites (1 isolated find, 2 rock shelters with art) and no European heritage sites within the EP Area.

3.2 Mine Planning and Design

3.2.1 Mining Method

The PPPE mining technique, is a partial extraction underground coal mining method. “Partial extraction” indicates that some of the coal that could have been mined has been left in place for a particular purpose. The most common reason for leaving mineable coal in place is to reduce subsidence. The mine’s design and layout and the percentage of coal deposit extracted, can be varied to achieve a compromise between limiting subsidence and maximising coal recovery. Recovery rates using Partial Extraction vary considerably but are typically in the range of 45%–65%, depending on local geotechnical conditions and surface subsidence constraints (IESC, 2023). The PPPE mining technique to be employed to extract the 918 Panel, proposes to extract 52% of the 918 Panel coal resource.

Clarence has operated since the 1980’s, utilising a range of extraction methods that result in either partial extraction (i.e. limited extraction ratio from the coal seam) and/or total extraction (i.e. higher extraction ratio from the coal seam). To provide clarity around the differences between partial extraction and total extraction mining methods, the following definitions are provided in the Independent Expert Scientific Committee (**IESC**) Information Guidelines, Explanatory Note, “*Subsidence associated with underground coal mining*”:

> “***Partial Extraction*** *– A form of bord and pillar mining where a system of pillar panels is formed up during the development stage and then a limited percentage of the pillar coal is extracted on the retreat, to ensure the remaining pillars are still able to provide regional support to the overburden and restrict surface subsidence by minimising extraction widths, usually without inducing significant caving. (IESC, 2023)*
>
> “***Total extraction*** *A term used in bord and pillar extraction where the intention is to extract the maximum percentage of the pillar coal formed up during development, in a safe and effective manner, with caving and goaf formation as part of the extraction mining process. Recovery rates within total extraction bord and pillar panels can reach 70% or greater but do not achieve the 95%–100% levels possible with longwall mining. The term can also be applied to longwall mining panels (IESC, 2023)*

The PPPE mining technique employs shortwall hydraulic roof supports in conjunction with a continuous miner. With the PPPE technique, panels of limited widths are extracted. Down the centre of each panel, a set of three long term stable pillars are driven and retained, referred to as first workings, central spine pillars. Second workings coal can be extracted either side of these central spine pillars. These extraction areas are referred to as sub-panels.

In between adjacent panels, solid coal barrier pillars are retained either side of the panel for the full length of the panel. From a subsidence perspective, the central spine pillars and the solid coal barriers (together) are

designed to support the overlying strata which, for Clarence, comprises strong massive sandstone formations that can bridge and transfer load onto the remaining pillars. The resulting subsidence is less than that from total pillar extraction or longwall mining and can be controlled to meet surface constraints by altering the design of the mine and dimensions of the sub-panels and pillars.

As noted above, each panel is initially developed using first workings. Once the central spine pillars are developed, the continuous miner drives an installation road, which will be supported with a bolter, prior to installation of the hydraulic supports and associated infrastructure. The installation face is a widened roadway (up to 11 m) which is fully supported to allow the shortwall equipment to be installed prior to the commencement of secondary extraction. The miner is then used to cut a slice or web of coal across the face, perpendicular to the direction of the first workings driveage. After the passage of the miner, the hydraulic shields are advanced to support the roof in the area of the cut coal. This sequence of operation is repeated with a series of cuts, for the full length of the sub-panel, until the sub-panel completion. In the case of the proposed 918A sub-panel, the cut length is 68.5m and the width of the cut, is approximately 3-4m. Once the extraction on the left hand side reaches the end of the panel, the same process occurs on the eastern side of the panel (referred to as sub-panel 918B1 and 918B2). Extraction starts from the panel end (the inbye end) and continues back to where the panel started (the outbye end).

3.2.2 Proposed Mining Geometry and Parameters

The 918 Panel has been designed based on the following:

1. Maximum panel void widths of 75m for sub-panels 918A and 918B2 and 83m for sub-panel 918B1 (which includes the first workings roadway width of 6.5m)
2. The four heading, first workings pillars are generally rhomboid shaped (in plan) and are referred to as the central spine pillars. The existing 918 first workings panel spine pillars from 1 cut through (c/t) to 19c/t have a combined pillar width of 84m. From 19c/t to 21c/t the proposed A heading to B heading and B Heading to C heading spine pillars transition and increase in width to 21ct. The 21ct to the end of panel combined pillar width is 90m.
3. The eastern barrier pillar width between sub panels 918B1 and 918B2 and the 900 Panel will be between 65.9m to 74m (solid), respectively
4. The minimum and maximum cover depths above the extracted sub-panels range from 227m in the south-east below Paddys Creek (918B2) and increase to 294 m in the north-west beneath the elevated ridges adjacent to Mount Horne and Waratah Ridge Road (918B1)
5. The Katoomba (KAT) seam thickness ranges in the sub panels from 1.9m to 2.3m
6. The sub-panel extraction height will be similar to the seam thickness (+/- 0.1m)
7. The first workings roadways will range from 5.5m wide to 6.5 m wide and 2.5 m to 2.8m high
8. The length of sub-panels 918A, 918B1 and 918B2 are proposed to be 823m, 438m and 580m respectively which excludes the shortwall installation roadway (11 m width) and end of sub-panel roadway (5.5m width)

Graphical Figure 1 illustrates the proposed mine design and associated dimensions.

Each of the proposed extraction sub-panels are planned to be extracted in sequence commencing with 918A followed by 918B1 and then 918B2. The proposed direction of mining for 918A is south to north, north to south in 918B1, and north to south 918B1.

The maximum void width for each sub-panel maybe be reduced depending on subsidence performance to predictions and if an adverse geological structure impacts mining operations. For example, if an unknown in-seam geological structure is intersected within the planned sub-panel that the continuous miner cannot pass through, the full void width may not be able to be achieved. In summary, there may be instances where the void width could be less and/or, panel length shortened, as is the case in current partial extraction mining practices at Clarence.

3.2.3 Geology and Stratigraphy

The surface geology of the EP Area includes Quaternary Colluvium and Alluvium (including Peat and loose sand deposits of the Temperate Highland Peat swamps on sandstone-THPSS) and the sandstones and claystones of the Burralow Formation and Banks Wall Sandstone of the Triassic Narrabeen Group (Figure 3).

The Burralow Formation comprises alternating sandstones and claystones, referred to as the "YS aquitard plies". YS is a shorthand lithology code abbreviation used by drillers and geologists for claystone or shale, especially when the rock is yellow, weathered, or weak. It is often applied to soft, plastic, or poorly indurated claystone in coal measures.

The Burralow Formation and Banks Wall Sandstone form the perched and shallow groundwater systems which are important from both an ecological and economic perspective as it supports groundwater users and Groundwater Dependent Ecosystems (GDEs) including the:

- Newnes Plateau Shrub Swamps (NPSS) in valleys; and
- Newnes Plateau Hanging Swamps (NPHS) at the margins of plateau areas.

The cliffs, minor cliffs and pagodas within the EP Area are associated with the Burralow Formation and Banks Wall Sandstone.

SCT (2026) reports that the Mount York Claystone forms the boundary between the shallow / upper and deep / lower groundwater systems.

For the above mentioned reasons, the maintenance of the Mount York Claystone integrity is very important to avoid disruption to the shallow / upper aquifers located higher up in the stratigraphy. Section 3.3 further discusses height of fracturing and the avoidance of impact on the Mount York Claystone.

Beneath the Banks Wall Sandstone is the Mount York Claystone which is a regionally significant aquitard comprises claystone bands interbedded with siltstone and sandstone bands. The Mount York Claystone is an important geological unit in the stratigraphy as important shallow aquifers overlie it which contribute to the Groundwater Dependent Ecosystems that are the THPSS. The Burra-Moko Head Sandstone is a strong, competent sandstone and underlies the Mount York Claystone. The Caley Formation underlies the Burra-Moko Head Sandstone and is a interbedded sandstone, siltstone and claystone unit.. The Katoomba seam (KAT) is the target 918 Panel mining horizon and marks the transition from Triassic aged strata to the top of the Permian Illawarra coal measures. Beneath the KAT seam is the Middle River (MDR) seam, Farmers Creek Formation, Denman Formation, Lithgow seam and Nile subgroup which form the base of the Illawarra Coal measures. Beneath the Illawarra Coal Measures are the Permian sedimentary rocks of the Shoalhaven group which are underlain by the older sedimentary and metamorphic basement.

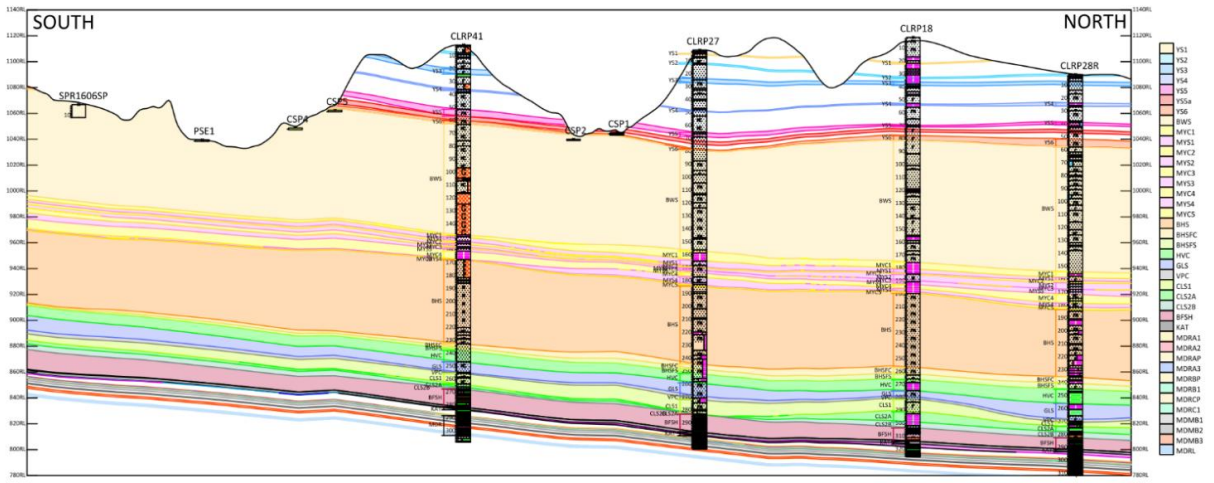


Figure 3 - 918 Cross section (MSEC, 2026)

3.2.4 Immediate KAT Roof, KAT seam and immediate KAT floor lithology

The immediate roof strata of the Katoomba seam consists mainly of interbedded sandstone and siltstone (Caley Formation). The Katoomba seam is a bituminous coal which ranges from 1.5 m to 3.0 m thickness and thins to the west in the EP Area. The Katoomba seam floor varies in composition but is mainly sandstone and siltstone. This material is strong (i.e., a Uniaxial Compressive Strength of typically 40 to 70 Mega Pascals (MPa)), not moisture sensitive and not susceptible to softening, weathering and/or heave.

The Middle River seam underlies the Katoomba seam with varying interburden depths. Based on available borehole data within the EP Area, the average interburden thickness between the Middle River and Katoomba seams is approximately 5 m, varying between 3.5 m to the east (900 Mains panel) to 9 m in the southwest of the EP Area.

3.2.5 Geological Structures

The Katoomba seam generally dips towards the north east at approximately 3º.

The faults at Clarence are typically in a NNW-SSE, NW-SE or NNE-SSW orientation. For the 918 Panel, the projected faults have a NNW orientation.

Inferred and mapped geological lineaments are presented in Graphical Plan 3 (Figure 4). These lineaments have been grouped into four (4) types, Type 1 being the most significant and Type 4 the least significant. There is one Type 2 lineament and four Type 4 lineaments orientated in a north west orientation and one Type 3 lineament in a north-north-western orientation inferred to intersect the 918 Panel.

Palaris (2013) classified and interpreted the Type 1 and Type 2 structure zones to be structures that penetrate from the basement strata, through the coal measure strata, to the surface. Type 3 structure zones are noted to occur only to Lithgow seam level (and have been conservatively interpreted to exist within the Katoomba seam for the purposes of this Extraction Plan) and Type 4 structure zones occur within the basement.

It is considered unlikely that igneous intrusions are present within the EP Area given that there are few igneous intrusions that are mapped in the adjacent underground workings.

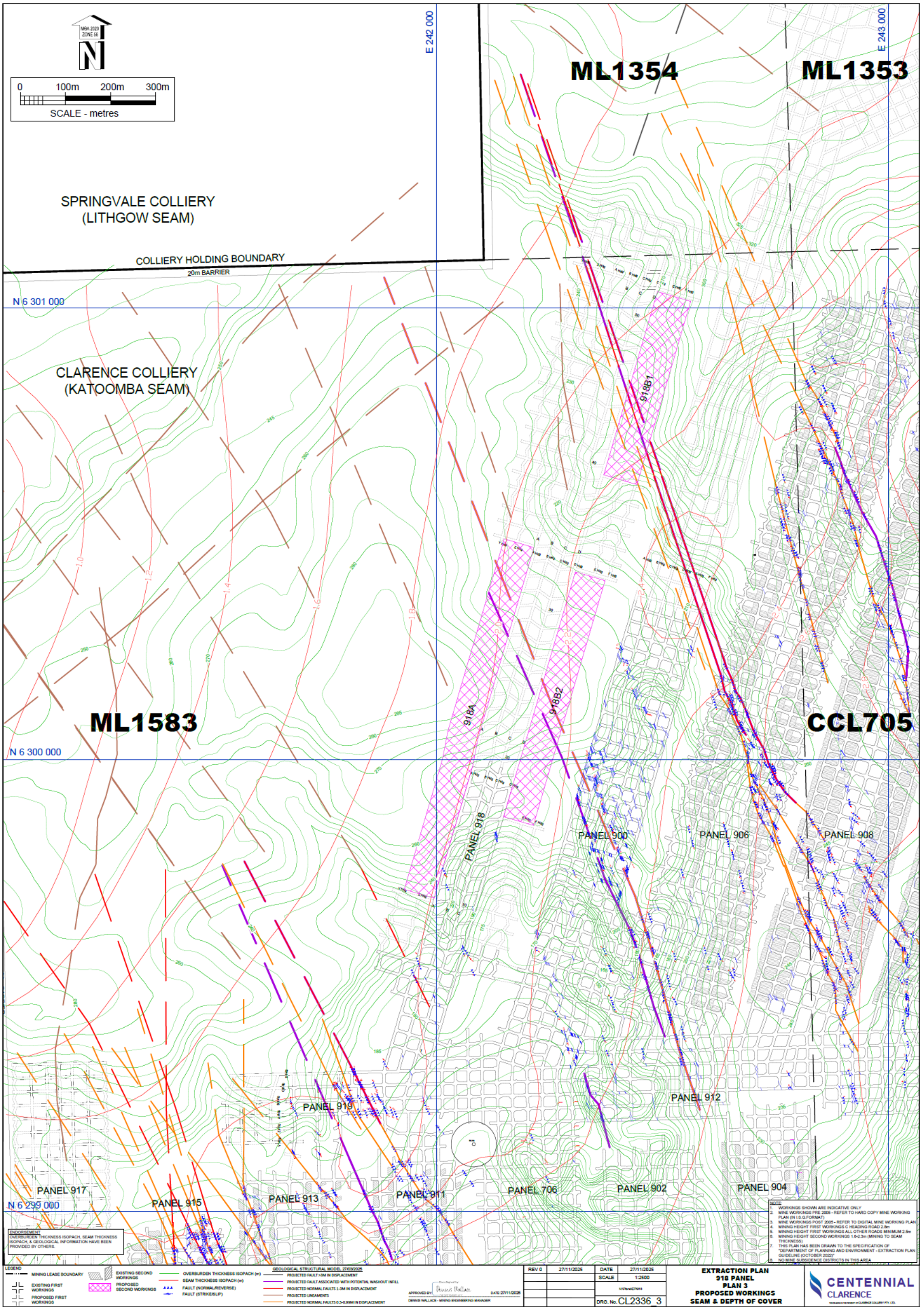


Figure 4 – Inferred Geological Lineaments (Centennial,2026)

3.2.6 Mine Schedule

Clarence operates seven days per week, 24 hours a day. The proposed sequence of second workings under the Extraction Plan and anticipated start and completion dates are summarised in Table 3.1. The rate, start date and finish dates of extraction in each panel are subject to mining conditions encountered and life of mine plan scheduling changes.

Table 3.1: Proposed Mining Schedule

Panel	Start Date	Finish Date
918A	December 2026	March 2027
918B1	June 2027	July 2027
918B2	July 2027	August 2027

3.2.7 Other Mining

Secondary extraction in the form of partial extraction has previously been undertaken within the Katoomba seam at Clarence under other SMP approvals.

At the adjacent Springvale Mine, longwall mining activities are currently being undertaken in accordance with the approved Springvale Extraction Plans within the Lithgow seam (approximately 100 m below the Katoomba seam). The nearest historical Springvale Mine longwall panel (Longwall 425) is located approximately 1.27km from the nearest Clarence sub-panel, 918A.

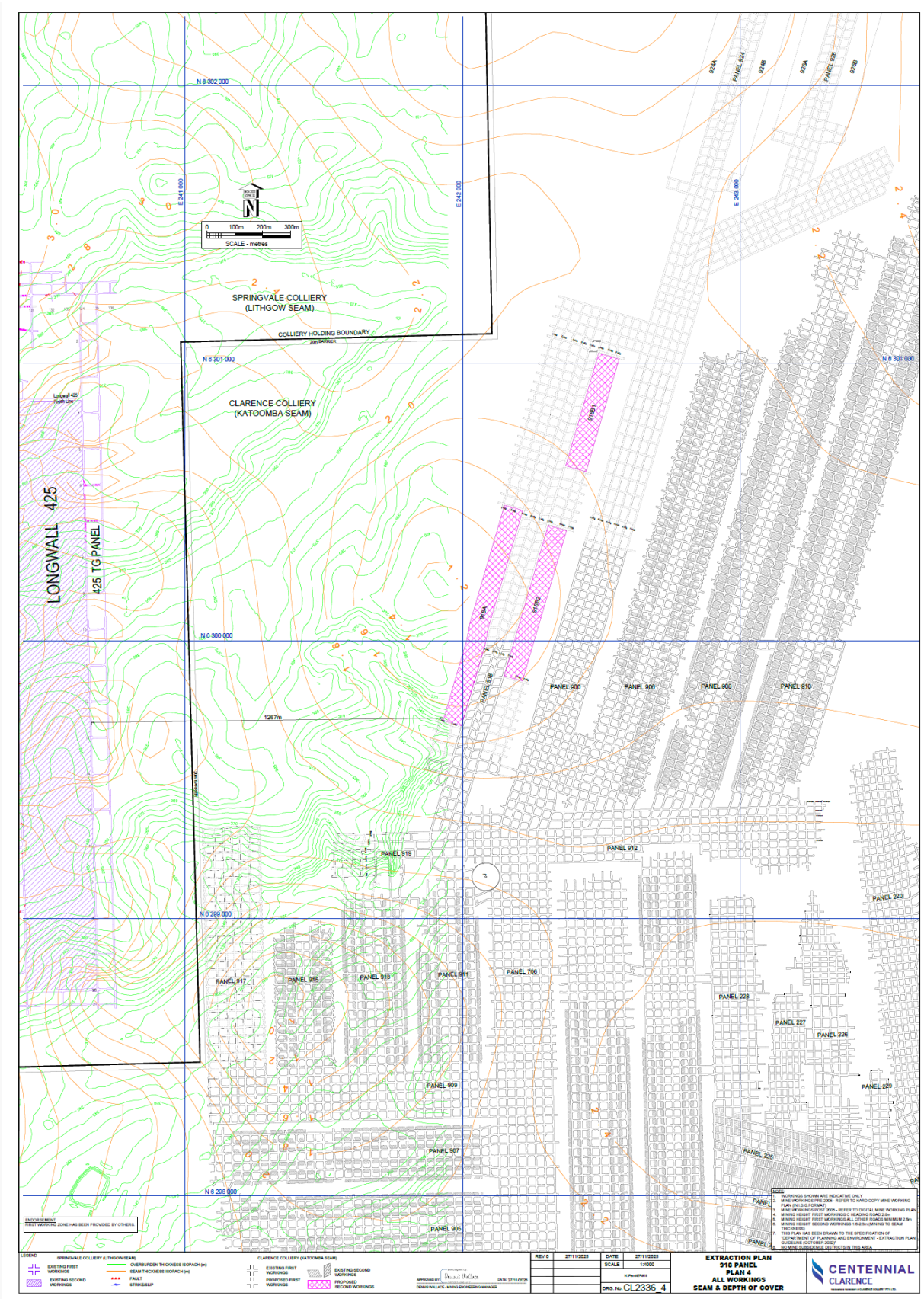


Figure 5 presents the nearby Springvale mine and the Lithgow seam thickness within the 918 EP Area, which illustrates that the Lithgow seam thickness is 2 m or less within the EP Area.

3.2.8 Clarence Colliery Resource Recovery

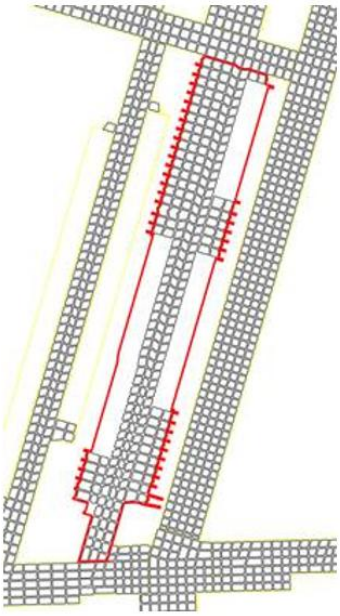
The Katoomba seam thickness ranges between 1.5 m to 3.0 m within the EP Area. The seam thickness for the 918 panels varies between 1.9 m and 2.3 m. The continuous miner equipment is able to cut to seam thickness, therefore the full seam thickness will be mined. The total recoverable reserves from the extraction area is 683,450 tonnes (t). This includes 338,450 t recovered from the first workings development of the central spine roadways (918) and 345,000 t from the sub-panels (Table 3.2) which results in a mining recovery of 52%.

Given the change in 918 and 920 Panels Extraction Plan scope reduction to 918 panel only and the reduction in 918 sub-panel void widths and the avoidance of the mining directly beneath most swamps under the 918 Extraction Plan the second workings tonnage has reduced by 1,025,664 t (1,370,664 t to 345,000 t).

The proposed extraction of the 918 Panel has no detrimental impact on the potential to mine economically recoverable coal in the remainder of the lease area. Clarence's overall mine planning strategy targets maximising resource recovery within the identified environmental constraints and the geotechnical and geological characteristics of the lease and consent areas.

Table 3.2: 918 Sub-Panel Resource Recovery

Sub-Panel	Workings	Length (m)	Panel cut width (m)	Panel Void width (m)	Tonnes
918A	Second	811	68.5	75	150,500
918B1	Second	426	76.5	83	85,500
918B2	Second	568	68.5	75	109,000
918 Sub-panels					**345,000**
918	First	N/A	N/A	N/A	338,450
Total Mined Tonnes					**683,450**
Total Block Resource Tonnes					**1,324,470**
Mining Recovery %					**52%**



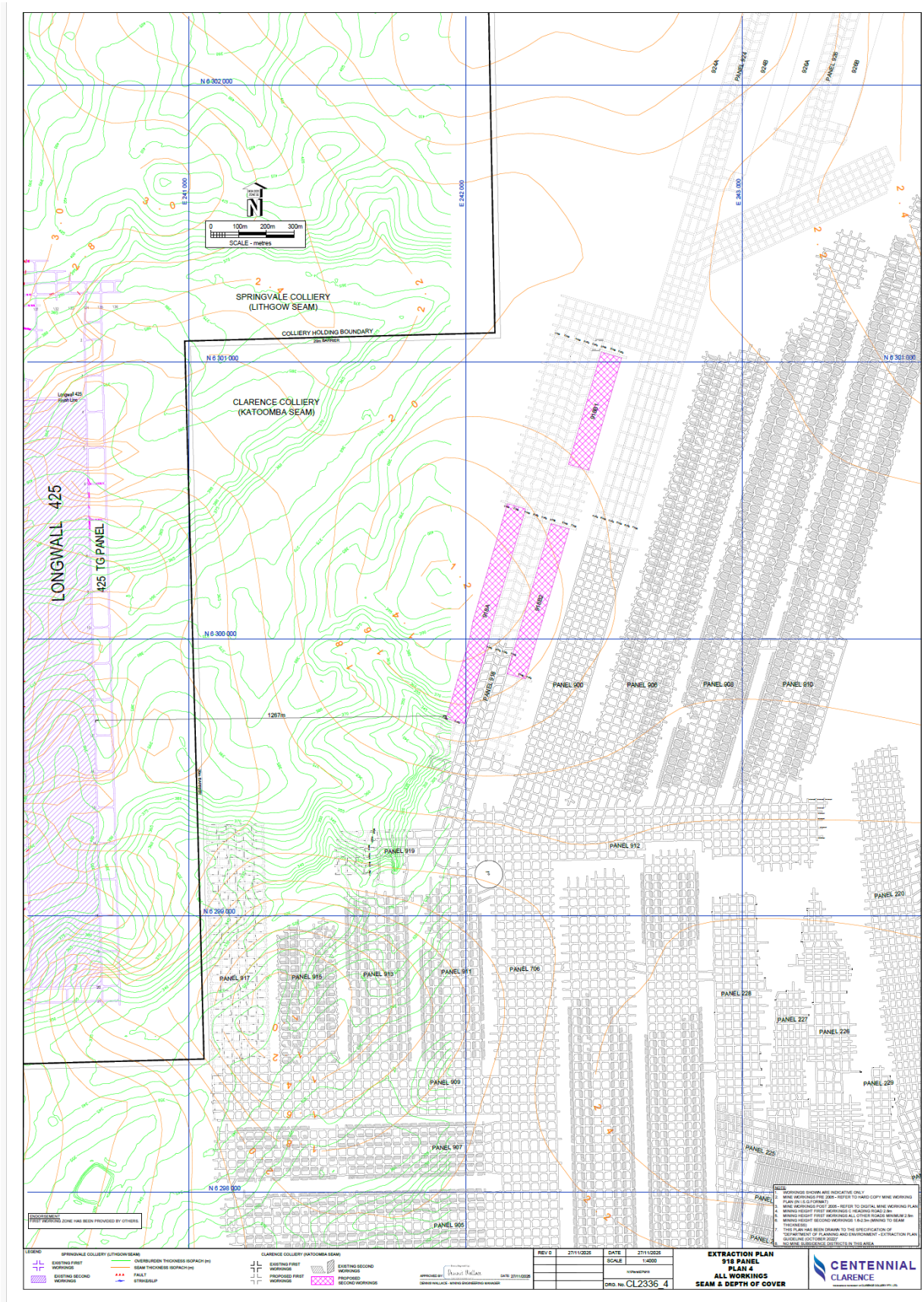


Figure 5 - Lithgow seam thickness and Depth of Cover (Centennial, 2026)

3.3 Subsidence Predictions

SCT (2026) and MSEC (2026) provided subsidence predictions for the 918 sub-panels using a range of geotechnical modelling methods. SCT (2026) provided two-dimensional, vertical subsidence prediction profiles using numerical modelling methods, based on the site-specific geotechnical characteristics of the proposed 918 Panel layout and stratigraphic units. SCT (2026) developed and validated its numerical model primarily on observations during the extraction of Panels 910 to 906, which are located to the east of the proposed 918 Panel. Various scenarios were modelled, to test the sensitivity of the subsidence outcomes.

Whilst Clarence has yet to conduct panel and pillar partial extraction using the shortwall mining method, there are nearby examples of secondary extraction of Panels 910 to 906, which have mining geometries and extraction ratios that are similar to the proposed 918 sub-panels. A key difference, however, is that the spine pillar between Panels 918A and 918B2 is 84 to 90 metres in width, which is substantially greater than the pillar widths between Panels 910 to 906 (56 to 60 metres).

The Incremental Profile Method (IPM) has been used by MSEC (2026) to prepare three-dimensional predicted subsidence contours for the 918A, 918B1 and 918B2 sub-panels based on the predicted two-dimensional subsidence profiles determined by SCT (2026). The predicted subsidence contours are shown in Figure 6.

Subsidence profiles were developed to reasonably match the shape of SCT's two predicted subsidence profiles. The IPM model adjusts the profiles within the EP Area based on actual depths of cover and seam thickness, interpolating between the two profiles. The subsidence profiles were adjusted to achieve an angle of draw of approximately 35° following a review of available subsidence monitoring data along the 900B and 900D Lines during and after the extraction of Panels 910 to 906.

A summary of the maximum predicted values of total vertical subsidence and tilt derived using the IPM is provided in Table 3.3. The total values are the accumulated movements after the extraction of each sub-panel.

Table 3.3– Maximum predicted total vertical subsidence and tilt

After Panel	Maximum predicted total vertical subsidence (mm)	Maximum predicted total tilt (mm/m)
918A	50	0.5
918B1	60	0.6
918B2	76	0.6

SCT (2026) advises that a variance of ± 20 mm is to be applied to its modelled maximum subsidence estimates.

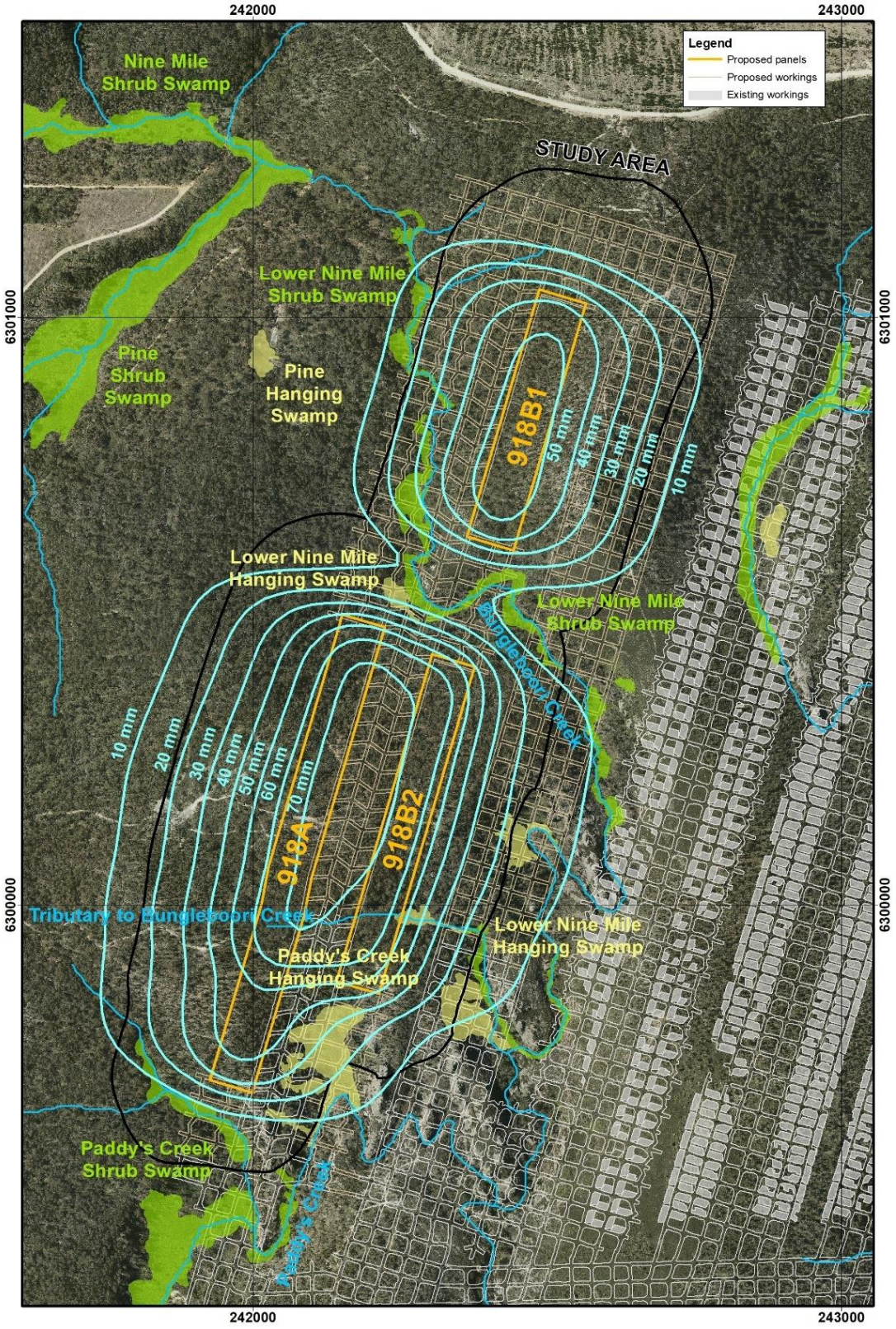


Figure 6 - Predicted total vertical subsidence contours (MSEC,2026)

MSEC (2026) has carried out a statistical analysis of ground monitoring data to assist with the prediction of strains including the potential for irregular or anomalous movements. The range of potential strains has been determined using monitoring data from the NSW coalfields where the maximum measured vertical subsidence was less than 100 mm, as for the proposed 918 Panel.

The dataset contains 5000 available measurements of strains above partial or total extraction areas where the maximum measured vertical subsidence was less than 100 mm. The majority (approximately 95 %) of the measured strains were in the order of survey tolerance, taken as 0.3 mm/m. The 95th percentiles therefore are approximately 0.3 mm/m tensile and compressive.

The maximum predicted strains for 918 Panel have therefore been taken as 0.3 mm/m tensile and compressive. While strains greater than 0.3 mm/m can occur, the rate of occurrence is expected to be approximately 5 %.

3.3.1 Non-conventional Ground Movements and Far Field Movements

Non-conventional subsidence effects, such as upsidence, valley closure and far-field horizontal displacements, are generally ascribed to strains resulting from large-scale redistributions of horizontal stress due to mining. Non-conventional ground movements may occur within the Study Area due to near surface geological conditions, steep topography and valley-related effects (MSEC, 2026). Numerical modelling by SCT (2026) suggests that the ground surface will experience closure of approximately 70 to 75 mm across the width of Panel 918. Whilst the ground surface may experience closure across Panel 918, it is unlikely that closure will concentrate within a valley to a magnitude that results in adverse impacts.

MSEC (2026) advise that the potential for non-conventional movements is considered to be very low due to the low levels of subsidence that are predicted to occur.

3.3.2 Subsidence Predictions for Natural and Built Features

The surface natural and built features are predicted to experience low levels of vertical subsidence and horizontal movements. The corresponding curvatures and strains are expected to be in the order of survey tolerance, i.e. not measurable. Adverse physical impacts to the natural and built features are not expected due to the extraction of the proposed sub-panels. Impacts have not been observed at similar surface features above the existing panels at Clarence, where the predicted vertical subsidence was up to approximately 100 mm i.e., higher than predicted for the proposed extraction of the 918 sub-panels.

4 MANAGEMENT PLANS AND MONITORING

4.1 Overview

Clarence have developed an integrated, holistic approach to subsidence management for key risks within its operations at a regional, individual mine site and EP Area level in order to provide an appropriate and systematic management approach. The hierarchy of management plans are set out below:

- Regional management plans provide a framework for strategic management under which site plans and EP Area plans are established in accordance with consent conditions.
- Site management plans typically cover all aspects of mining operations (including surface operations and non-subsidence related aspects) as required by other conditions of the development consent.
- Management Plans for individual SMP Areas or more recently EP Areas (referred to as component Management Plans) are developed specifically to address Condition 2 (Extraction Plan) in Schedule 3 of DA-504-00 which has a specific focus in terms of both location and context as well as environmental management of subsidence and underground mining operations specifically related to the EP Area.

The component Management Plans have been developed in consultation with government agencies and stakeholders as required under Development Consent DA-504-00. Drafts of the component Management Plans have also been provided to the Clarence Community Consultative Committee for comment.

The following Management Plans have been finalised with feedback from Regulators received and incorporated:

- 918 Panel Public Safety Management Plan;
- 918 Panel Built Features Management Plan;
- 918 Panel Land Management Plan;
- 918 Panel Subsidence Monitoring Program;
- 918 Panel Water Management Plan;
- 918 Panel Biodiversity Management Plan; and
- 918 Panel Heritage Management Plan.

Each component Management Plan has been designed to be a standalone document, with referencing to related Management Plans and this Main Report for further details as required. The following sub-sections introduces each of the component Management Plan associated with the 918 Panel Extraction Plan.

4.2 Water Management Plan

The 918 Panel Water Management Plan (WMP) (GHD, 2026) has been prepared for the 918 Panel Extraction Plan in accordance with the following and in consultation with the DPE-Water (now, NSW Water Group) and BCS:

- Condition 2(g)(iii) in Schedule 3 of DA-504-00;
- Statements of Commitment of the EIS for DA-504-00;
- EPL 726;
- Groundwater Bore Licences; and
- Clarence Colliery: Water Management Plan (CWMP) (GHD, 2022)

Details on the environmental aspects (climate, topography and hydrogeology, geology and hydrology) relevant to the EP Area are provided in GHD (2026).

A numerical groundwater model has been developed in MODFLOW-USG (Modular Flow – Unstructured Grid) (JBS&G, 2026). The technical report associated with the model and the predicted outcomes is provided in Appendix 6. The purpose of the model was to assess the change in the elevation of the uppermost water table level, groundwater elevation and pressure in aquifers and aquitards above the mined coal seams and mine dewatering rates predicted as a result of the extraction of the 918 Panel.

Modelling indicates that the PPPE mining technique will lead to a small (transitory only) to negligible decline in elevation of the uppermost water table associated with NPSS and NPHS, collectively THPSS groundwater dependent ecosystems. These THPSS include Pine Swamp, Nine Mile Swamp, Paddys Creek Swamp and Lower Nine Mile Swamp (see Figure 2 and Section 4.4). Modelling also indicates that extraction of the 918 Panel will lead to a negligible change to groundwater contribution to surface water flow within the Bungleboori Creek catchment.

JBS&G (2026) also modelled the predicted increase in mine dewatering rate at Clarence as a result of the extraction of the 918 Panel. Provided in Appendix 6, the groundwater model report predicts that the increase in dewatering rate is 0.9 Mega-litres per day (ML/day) in the peak and 0.2ML/day in the long term. JBS&G (2026) assessed this to be negligible as the magnitude of change is less than 10%. Furthermore, JBS&G (2026) found that the impact from the extraction of the 918 Panel on groundwater users in the vicinity of the EP Area is predicted to be insignificant.

Modelling indicates there is a negligible change to groundwater contribution to surface flows and groundwater baseflow to the Newnes Plateau Shrub Swamps (JBSG, 2026). The heights of fracturing are not predicted to occur above the Mount York Claystone, and will not extend to the surface (SCT,2026). Accordingly, the change to groundwater contribution to surface water flow and groundwater availability for THPSS will be negligible, resulting in impacts assessed to be insignificant.

As per the requirements of the Australian Groundwater Modelling Guidelines the JBS&G Groundwater Model Report for 918 Panel has been peer-reviewed. The peer review was undertaken by Alyssa Baron and James Dowdeswell of GHD Pty Ltd and in conclusion of their peer review they deemed the groundwater model supporting the Clarence 918 Panel Extraction Plan fit-for-purpose to address the modelling objectives set out in the report (GHD, 2026). The peer review can be found in Appendix 7**.**

The scope of the WMP for 918 Panel addresses management and monitoring of potential subsidence impacts on surface and groundwater water resources within the EP Area, including but not limited to all water courses and aquifers in the EP Area. The WMP provides information on (but not limited to) the following:

- Surface water monitoring for:
  - Surface water quality;
  - Flow monitoring;
  - Stream and flow path inspections;
- Groundwater monitoring of:
  - Water levels in the established groundwater piezometer network;

  - Underground water transfers;
  - Groundwater inflows to the mine;
- Baseline data associated with the above mentioned surface and groundwater monitoring;
- Identification of registered groundwater bores;
- Impact Assessment, Triggers and Performance Criteria for surface and groundwater (including stream health);
- Managing outcomes of modelling assessments for:
  - Groundwater quantity and quality, and mine water inflows;
- Water management measures for surface and groundwater; and
- Detailed Trigger Action Response Plans.

Surface and groundwater features and monitoring locations (including watercourse stability monitoring) under the WMP and related subsidence monitoring for the 918 Panel are presented in the WMP. Groundwater and surface water monitoring locations are presented in Figure 2.

The following tables, Table 4.1 to Table 4.4, detail the water related performance measures and criteria. It is noted that "Performance criteria achieved" as set out in the following tables is ranked either as "likely" or "not likely".

Table 4.1-Water course criteria – Bungleboori creek and Paddys Creek

Aspect	DA504-00 Schedule 3, Section 5	Criteria	Performance criteria achieved
Watercourse quality	The Applicant must ensure that the development does not result in any: c. reduction in surface flows and groundwater baseflow to upland swamps (NPSS) and wetlands d. reduction in surface flows and groundwater baseflow to waterbodies including Marrangaroo Creek, Farmers Creek, Dargans Creek, Wolgan River, Dumbano Creek, Bungleboori Creek, and Wollangambe River	Within or below trigger values as per Table 4.1 of the WMP	Likely
Watercourse flow		Creek flow rates and relationships with rainfall are consistent with historical baseline results.	Likely

Source: GHD (2026)

Table 4.2 Stream health criteria

Aspect	DA504-00 Schedule 3, Section 5	Criteria	Performance criteria achieved
Geomorphic condition and watercourse stability			
Incisional processes and instabilities Waterway bed condition	The Applicant must ensure that the development does not result in any: – Reduction in surface flows and groundwater baseflow to upland swamps (NPSS) and wetlands. – Reduction in surface flows and groundwater baseflow to waterbodies including Marrangaroo Creek, Farmers Creek, Dargans Creek, Wolgan River, Dumbano Creek, Bungleboori Creek, and Wollangambe River.	Occurrence of erosional processes does not occur as a result of subsidence.	Likely
Waterway cross sectional area		Change in cross sectional area does not vary beyond the predictions of the subsidence modelling undertaken as part of impact assessment.	Likely
Stream gradient		Change in stream gradient does not vary beyond the predictions of the subsidence modelling undertaken as part of impact assessment.	Likely

Source: GHD (2026)

Table 4.3-Watercourse subsidence

Aspect	DA504-00 Schedule 3, Section 5	Criteria	Performance criteria achieved
Watercourse subsidence			
3 order and above streams GDEs	The Applicant must ensure that the development does not result in any: – Reduction in surface flows and groundwater baseflow to upland swamps (NPSS) and wetlands.	No connective cracking between the surface, or the base of the alluvium, and the underground workings. No subsidence impact or environmental consequence greater than minor.	Likely
1st and 2nd order streams	– Reduction in surface flows and groundwater baseflow to waterbodies including Marrangaroo Creek, Farmers Creek, Dargans Creek, Wolgan River, Dumbano Creek, Bungleboori Creek, and Wollangambe River.	No subsidence impact or environmental consequences greater than predicted by impact assessment. No connective cracking between the surface and the underground workings.	Likely

Source: GHD (2026)

Table 4.4-Groundwater Environment Criteria

Aspect	DA504-00 Schedule 3, Section 5	Criteria	Performance criteria achieved
Groundwater level	The Applicant must ensure that the development does not result in any: – Significant inflows to mine workings. – Reduction in pumping yield in privately-owned groundwater bores. – Reduction in surface flows and groundwater baseflow to upland swamps (NPSS) and wetlands.	Exceedance of groundwater trigger values as per Table 4.2 of the WMP. No complaints regarding groundwater access	Likely
Groundwater quality		No complaints regarding groundwater quality.	Likely

Source: GHD (2026)

The monitoring program set out in the WMP will be used to demonstrate that the environmental performance satisfies relevant performance indicators, particularly those relating to water levels within the shallow groundwater system and the groundwater dependant THPSSs. Required actions and responsibilities are defined within the WMP to ensure detection of any potential impacts from mining induced subsidence are detected, reported and actioned.

4.2.1 Groundwater Take and Licencing

The WMP sets out the predicted groundwater inflows as modelled by JBS&G (2026). Section 2.2.3.2 of the WMP presents the additional mine water inflows as a result of the extraction of the 918 Panel to be less than 1 ML/day, reducing to 0.05 ML/day over the longer term (post extraction).

Clarence holds a number of Water Allocation Licences (WAL) authorising groundwater extraction from the mine. Clarence also holds a number of Water Supply and Works Approvals authorising the operation of infrastructure to enable the groundwater extraction. The details of these authorisations are included within the Clarence Colliery Water Management Plan (CWMP) (GHD, 2022). The CWMP is a Clarence wide management plan required under Schedule 3, condition 6 of DA-504-00.

The two WALs that Clarence holds includes:

- WAL 36479, within the Sydney Basin West Groundwater source has an allocation of 6,623 Mega-litres (ML) per water year; and
- WAL 41882, within the Sydney Basin West Groundwater source has an allocation of 1,095 ML per water year.

Together, the two WALs authorise Clarence to extract up to 7,718 ML per water year. Averaged over a year, this equates to 21.1 ML/day. Reviewing Clarence predicted water make from JBS&G (2026), inflows into the mine workings at Clarence is expected to be up to 15 ML/day of groundwater which includes the inflows from the extraction of the 918 panel, which is less than the authorised take. Therefore, Clarence has sufficient allocation in place to cater for the predicted groundwater make for the mine.

Groundwater management at Clarence is highly complex as water is stored in large storage areas which are pumped down based on operational needs, so volumes of water pumped from the mine is likely to be different to groundwater inflows (see 918 WMP). Therefore, a review of actual water extracted per water year, averaged to daily extraction to the nearest Mega-litres, has been undertaken to ensure, empirically, that there is sufficient allocation.

Reviewing the last four years of water extraction, Clarence has extracted the following quantities in ML/day over the water year:

- 2019/2020 – 13 ML/day
- 2020/2021 – 13 ML/day
- 2021/2022 – 15 ML/day
- 2022/2023 – 17 ML/day
- 2023/2024 – 18ML/day (average to date, noting that the 2023/2024 water year concludes 30 June 2024)

The above data demonstrates that whilst there is an increasing trend in water extraction, Clarence has historically had sufficient allocation available via its two WALs. Furthermore, if there is an additional water make of 1 ML/day due to the extraction of the 918 Panel, it could be estimated that, on average, Clarence will likely extract up to 19 ML/day (i.e. 2023/2024 average water extraction plus the additional 1 ML/day predicted as a result of extracting the proposed 918 panel) depending on operational requirements. This is an estimate as dewatering from various storage areas due to operational requirements will change. In any case, Clarence currently has an additional 3 ML/day of allocation available, therefore has sufficient allocation to support the extraction of the predicted additional 1 ML/day of additional water make as a result of the proposed 918 Panel. Importantly, Clarence has sufficient allocation available to extract predicted mine inflows.

4.3 Land Management Plan

The 918 Panel Land Management Plan (LMP) has been developed in accordance with Condition 2(g)(v) in Schedule 3 of the Development Consent for DA-504-00 in consultation with NPWS.

The purpose of the LMP is to provide the management strategies, controls and monitoring programs to be implemented for the management of potential subsidence impacts on landscape features that will be affected by the secondary extraction of sub-panels 918A, 918B1 and 918B2 (Centennial, 2026).

The landscape features managed by the LMP are cliffs, minor cliffs, pagodas and steep slopes (Figure 2). A summary of the performance measures and indicators associated with these landscape features located within the EP Area are presented in Table 4.5 along with their relevant management plan and monitoring programs.

Table 4.5: Landscape Feature Performance Indicators

Feature	Performance Measure	Performance Indicator	Monitoring	Management
Steep slopes, pagodas, cliffs and minor cliffs	Negligible subsidence impact or environmental consequences.	No significant surface cracking or movement of steep slopes, cliffs or pagodas.	Monitoring of features pre and post secondary extraction. Visual inspections of steep slopes, cliffs and pagodas and access tracks will be conducted as per the TARP. Selected GNSS units will continuously measure x, y, z positioning (Graphical Figure 7) The 900H survey line passes over areas of steep slopes specifically to measure conventional and non-conventional subsidence (if the later occurs) (Graphical Figure 7)	In accordance with LMP TARP.

In total, there are five cliffs, seven minor cliffs and three pagodas within the EP Area. Importantly, there is only one rock feature situated over the proposed extraction of the 918 Panel. All cliffs, minor cliffs and pagodas are located either over first workings or unmined areas (including barrier pillars) within the EP Area.

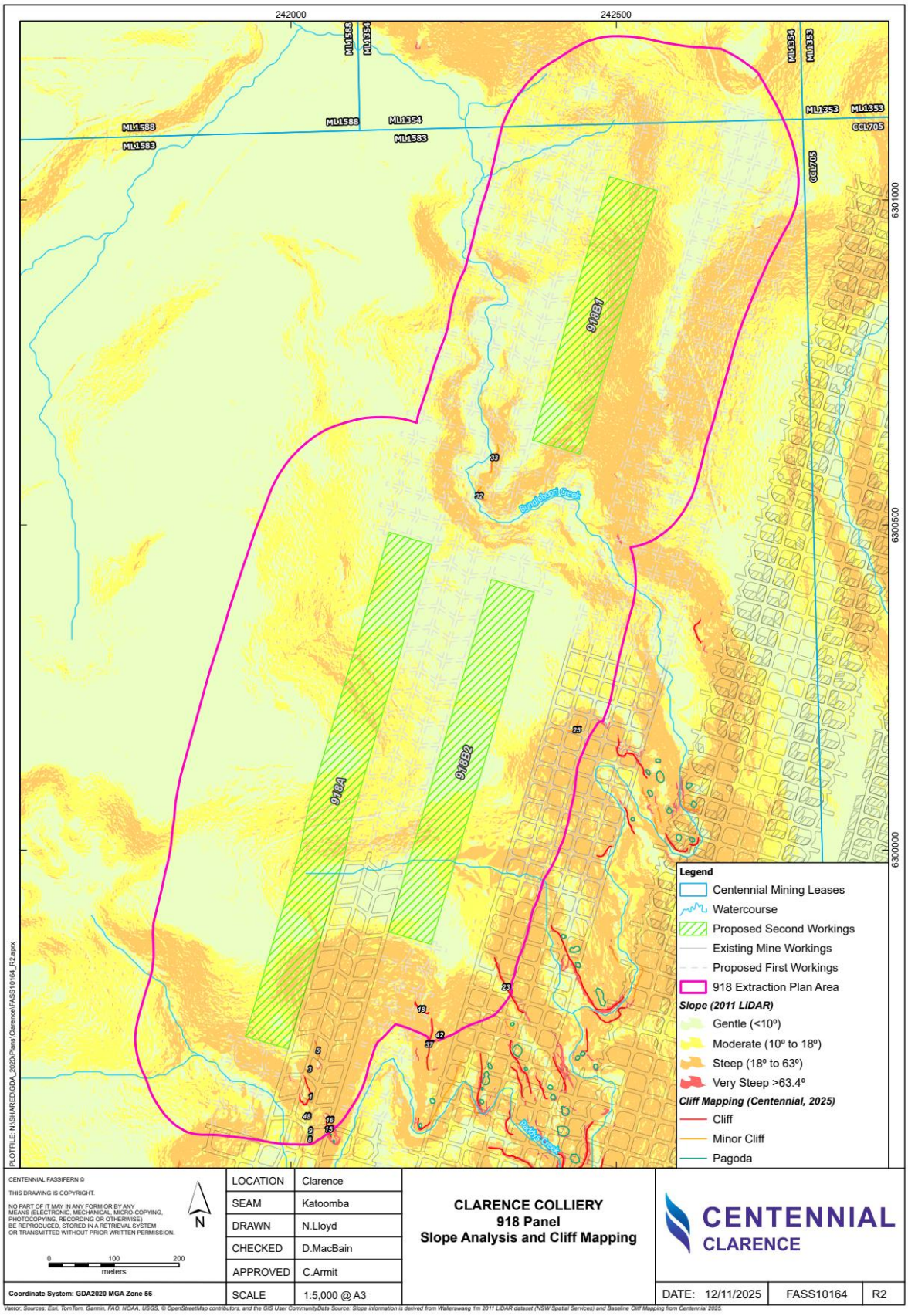


Figure 7 - Steep Slopes (Centennial, 2026)

Coupled with site based experience of negligible/imperceptible consequences to cliffs under areas that have been historically partially extracted, the likelihood of cracking or toppling of cliffs, pagodas or rock features as a result of the approved 100 mm of subsidence is considered remote.

Similarly for steep slopes, MSEC (2026) noted that given partial extraction will not result in material changes in either slope angle or hydrology, no impacts are expected.

4.4 Biodiversity Management Plan

The 918 Panel Biodiversity Management Plan (BMP) has been prepared for the 918 Panel Extraction Plan in accordance with Condition 2(g)(iv) in Schedule 3 of DA-504-00, in consultation with BCS. Consultation has also been carried out with NPWS.

The BMP outlines the monitoring and management measures, including the prescribed actions and responsibilities, required to detect and appropriately manage potential subsidence-related impacts to biodiversity resulting from the extraction of the 918 Panel. The BMP addresses potential subsidence-related impacts to biodiversity resulting specifically from secondary extraction within the EP Area, including habitats, threatened flora and fauna, Endangered Ecological Communities (EECs), and aquatic ecosystems (RPS, 2026).

The BMP provides the management strategies, controls and monitoring programs to be implemented for the management of potential impacts and environmental consequences on land and landforms affected by subsidence from the extraction of the 918 Panel. The BMP aims to ensure the performance measures are appropriately monitored and, through adaptive management, not exceeded. A summary of the performance criteria associated with biodiversity within the EP Area is presented in Table 4.6.

Table 4.6: Biodiversity Performance Criteria

Biodiversity	Performance Criteria
Threatened species, threatened populations and endangered ecological communities and groundwater dependant ecosystems	Negligible environmental consequences

Compliance with the biodiversity performance measures is determined through the comparison of monitoring data with the performance indicators using Before-After Control-Impact (BACI) methodology. A BACI design involves data collection at monitoring sites where impacts are expected and corresponding control/ reference sites before and after the impact event. RPS (2026) state that a BACI monitoring design is preferred over a simple Before-After monitoring model because it enables causation to be assigned to observed change (e.g., distinguish between the effects of mining or some other unrelated environmental factor) rather than simply detecting change.

Performance measures and indicators for the EP Area are outlined in the BMP together with the corresponding monitoring program described in Section 5 of the BMP. The monitoring program will be used to demonstrate that the environmental performance satisfies relevant performance indicators. Required actions and responsibilities are defined to ensure detection of any potential biodiversity impacts from mining induced subsidence are identified by the responsible person.

A TARP has been developed using the performance indicators for biodiversity (RPS, 2026). With such a small subsidence magnitude already approved, even if the 100 mm subsidence criteria is reached (exceeding the predictions of 76 mm), and tilts of ≤ 3 mm/m and strains of ≤ 2 mm/m are reached impacts to biodiversity are expected to be negligible.

4.4.1 Ecological Communities and Groundwater Dependent Ecosystems

One TEC was found within the EP Area, being the Newnes Plateau Shrub Swamp PCT 3945. PCT 3945 is associated with EPBC Act listed THPSS. Biodiversity Conservation Act 2015 (BC Act) listed Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion is listed as a component of the EPBC Act TEC in the listing advice of this community. Furthermore PCT 3945 relates to the Commonwealth Temperate Highland Peat Swamps on Sandstone TEC where it occurs at elevations below 1100 m above sea level (asl). Therefore, PCT 3945 conforms to EPBC Act listed THPSS (RPS, 2026).

The PCTs within the EP Area (presented in Figure 8) include (RPS, 2026):

- 3688 - Newnes Plateau Silvertop Ash Woodland;
- 3695 - Western Blue Mountains Peppermint Sheltered Forest;
- 3946 - Newnes Plateau Swamp Woodland;
- 3691 - Upper Blue Mountains Fringing Swamp Woodland;
- 3865 - Western Blue Mountains Pagoda Scrub;
- 3862 - Newnes Plateau Rockplate Heath;
- 3691 - Upper Blue Mountains Fringing Swamp Woodland;
- 3945 - Newnes Plateau Shrub Swamp; and
- Non-native – pine plantation, cleared land

Figure 8 presents the BAM (Biodiversity Assessment Method) plots employed for the baseline and impact monitoring program. There is one type of GDE (THPSS) within the EP Area that is listed in Schedule 4 as high priority groundwater dependent ecosystems in the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2023.

Three control sites, associated with the monitoring program, are located within THPSS, approximately 3.7 km and 6 km northeast of the EP Area. The location of these control sites are presented in the BMP.

By maintaining the integrity of the Mount York Claystone (see Section 3.3) the aquifers that are associated with the THPSS and groundwater dependent ecosystems will be protected. Therefore, impacts to THPSS are predicted to negligible and imperceptible (in relation to impacts to the groundwater aquifers that support the THPSS, see also Section 4.2).

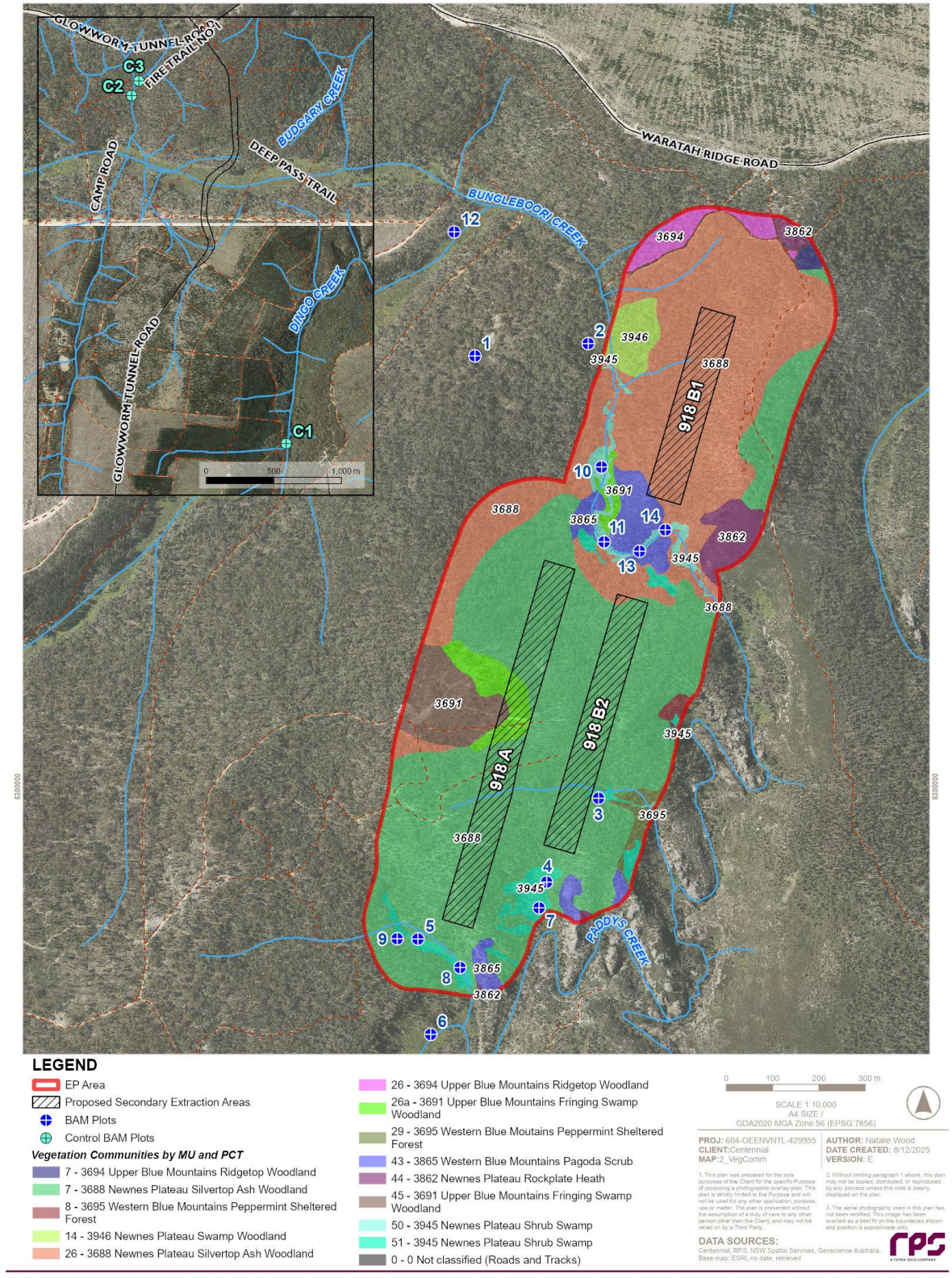


FIGURE 2: VEGETATION COMMUNITIES WITHIN THE EP AREA

Source: RPS (2026)

Figure 8 - Vegetation Communities (including Temperate Highland Peat Swamps on Sandstone)

4.5 Heritage Management Plan

The 918 Panel Heritage Management Plan (HMP) has been prepared by Umwelt (2026) to support the Extraction Plan for the 918 Panel. The HMP addresses specific heritage components of Development Consent DA-504-00. Schedule 3, Condition 2(g)(vi) of DA-504-00 requiring Clarence to develop and implement a HMP as part of the Extraction Plan for the 918 Panel. This condition requires that the HMP be prepared in consultation with Heritage NSW, Lithgow City Council and the registered Aboriginal parties to manage the potential environmental consequences of the proposed second workings on Aboriginal and non-Aboriginal heritage items and reflect the requirements of condition 30 of Schedule 3.

Clarence currently operates in accordance with the Centennial Western Region Aboriginal Cultural Heritage Management Plan (WRACHMP) (RPS, 2025) and Western Region Historic Heritage Management Plan (WRHHMP) (RPS, 2018) to satisfy Schedule 3, Condition 10 of DA-504-00.

This Extraction Plan specific HMP has been developed to meet the requirements of Condition 2(g)(vi) and ensure consistency with and referencing to the commitments contained within the approved Western Region ACHMP. It identifies the monitoring and mitigation measures for heritage sites within the Colliery Holdings (including the EP Area) that are required to be implemented to demonstrate that the relevant performance measures are achieved.

There are no historic heritage sites identified within the 918 Panel EP Area.

There are three (3) registered Aboriginal cultural heritage sites within the EP Area for the 918 Panel (**Figure 2**). The sites within the EP Area include (Umwelt, 2026):

- One (1) Artefact sites and
- two rock shelters with art

A site walkover was conducted in the EP Area over a two day period in December 2021 by three registered Aboriginal Party field officers, one Centennial employee and an archaeologist to photograph and record their current condition and find any other unidentified sites within the EP Area.

One of the three sites within the EP Area were registered within the AHIMS at the time of the field survey. A previously not registered site, an isolated find (IF1-quartz flake), was recorded during the fieldwork effort. The isolated find has now been registered within AHIMS and is known as:

- Site Name: Clarence 918 and 920 Panels IF1
- Site ID: 45-1-2936

Table 4.7 summarises the sites and predicted impacts based on the layout of 918 Panel.

Table 4.7: Cultural Heritage Sites and Predicted Impacts (MSEC, 2026)

Site Name	AHIMS Number	Site Type	Predicted Vertical Subsidence (mm)
Mt Horne 2 Newnes SF SWD SWA	45-1-0182	Rock Shelter with Art	<20
Clarence 918 and 920 Panels IF1	45-1-2936	Open Artefact Site	40
Newnes SF 45-1-0004 South-eastern Shelter 2	45-1-2950	Rock Shelter with Art	<20

A series of risk control measures and procedures has been outlined in the HMP. The implementation of the risk control and procedures will be through the Trigger Action Response Plan (Section 12 of the HMP) and the three-phase monitoring system detailed (Umwelt, 2026):

- Phase 1: Baseline recording (prior to the occurrence of undermining in the vicinity of the site). This involves the recording of the condition of the site before mining.
- Phase 2: Post mining primary recording (immediately after undermining in the vicinity of the site). The purpose of this monitoring is to evaluate whether there has been any change to the site and if any change that has occurred is the result of subsidence.
- Phase 3: Post mining secondary recording (approximately eight (8) months after undermining). The purpose of this monitoring is to identify whether there has been any change to the site in the period since mining and to make an assessment on whether conditions have stabilised. If conditions have stabilised, no further monitoring is required. If subsidence has not stabilised further monitoring will be required.

In the event of unpredicted impacts or deviation from predictions, site personnel will follow the corrective actions outlined in the TARP. Whilst not expected, should any previously unidentified Aboriginal heritage sites/items be encountered, Clarence will follow the procedures outlined in the Western Region ACHMP.

4.6 Built Features Management Plan

The 918 Panel Built Features Management Plan (BFMP) has been developed as a key component of the Extraction Plan in accordance with Condition 2(g)(ii) in Schedule 3 of DA-504-00. The purpose of the BFMP is to provide the management strategies, controls and monitoring programs to be implemented for the management of potential subsidence impacts on built features affected by the secondary extraction of the 918 Panel (Centennial, 2026). Built features identified within the EP Area and the relevant component Management Plans are set out in Table 4.8

As required, the BFMP has been prepared in consultation with the RR and relevant stakeholders (including NPWS) and infrastructure owners to manage the potential subsidence impacts and/or environmental consequences of the proposed second workings.

The BFMP:

- identifies built features present (unsealed tracks and trails and mine owned infrastructure) and acknowledges proposed built features;
- includes commitments to mitigate, repair, replace or compensate mine impacts on potentially affected built features in a timely manner; and
- provides for reporting of compliance and monitoring.

Table 4.8: Built Features within the 918 Panel EP Area and Relevant Management Plans

Feature	Identification and Assessment	Management and Monitoring
Unsealed tracks and trails	Subsidence Predictions and Impact Assessment for 918 Panel (MSEC, 2026)	**918 Panel Built Features Management Plan** 918 Panel Public Safety Management Plan 918 Panel Subsidence Monitoring Program

4.6.1 Unsealed Tracks and Trails

The existing built features within the EP Area are presented on Figure 9, and predominantly include unsealed 4WD tracks. During consultation with NPWS regarding the development of the BFMP, NPWS provided feedback that there are planned mountain bike trails potentially within the EP Area. A shape file of the planned mountain bike trails was provided by NPWS. From this data it was found that there are some trails planned within the EP Area. Whilst this is acknowledged, subsidence of 100 mm is not likely to impact these trails once established. Furthermore, subsidence of 100 mm is not likely to exacerbate erosional or natural instability processes.

The BFMP follows on from existing approved management plans prepared for previous SMP Areas at Clarence. The BFMP manages the potential risks identified associated with built features within the EP Area along with impact predictions and assessment.

Appropriate management and monitoring measures (including baseline) have been developed in consultation with the land owners to meet the required performance measures as detailed within the BFMP. Management measures including mitigation works for unpredicted cracking are detailed within the BFMP, noting that subsidence levels such as those predicted by the extraction of the 918 Panel, it is highly unlikely to result in visible impacts. In the absence of appreciable strains and tilts, no impacts to tracks and trails are expected. A detailed TARP was developed during preparation of the BFMP in consultation with NPWS and is presented in the BFMP (Centennial, 2026a).

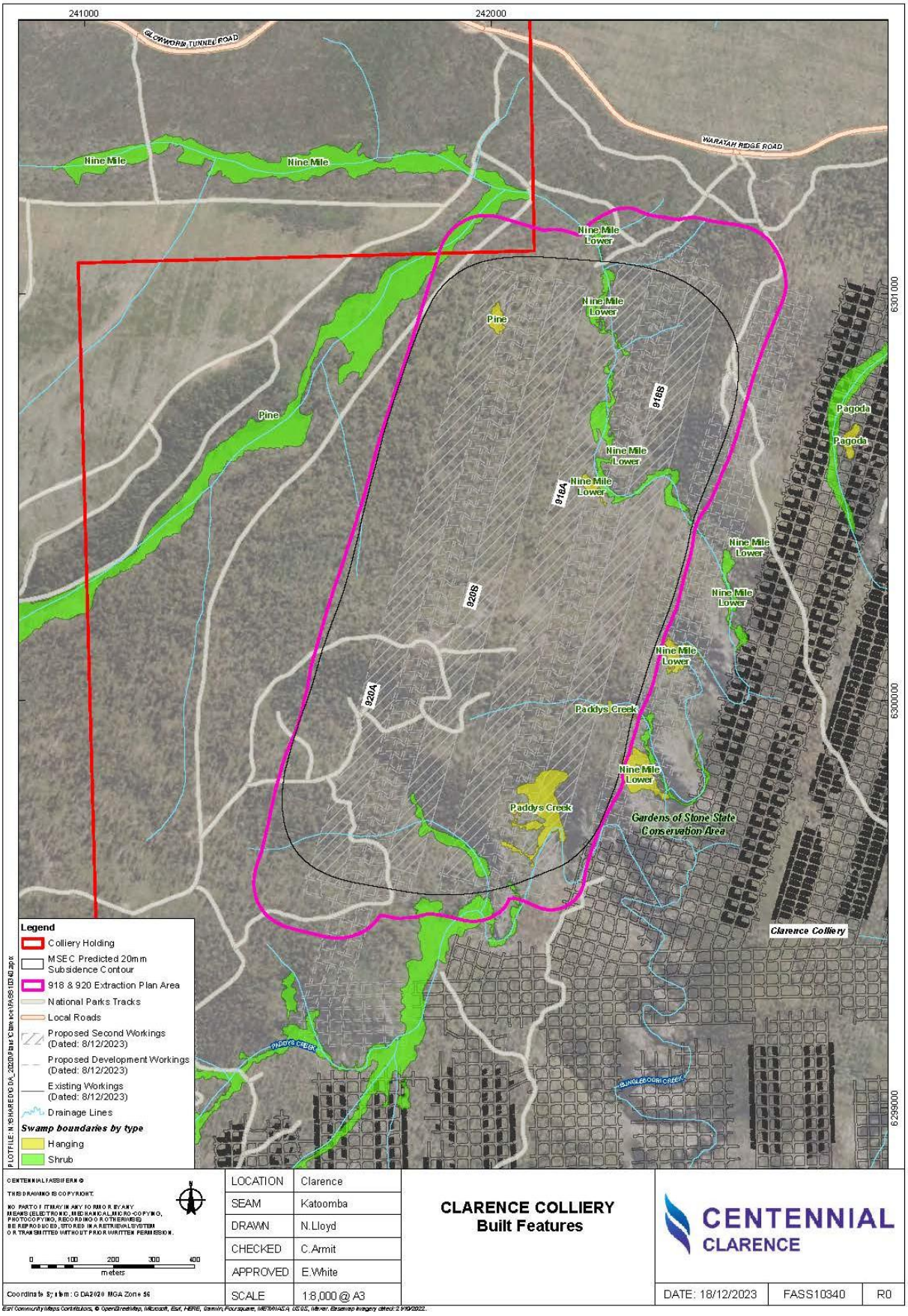


Figure 9 – Built Features (Tracks and Trails)

4.7 Public Safety Management Plan / Principal Hazard Management Plan

The 918 Panel Public Safety Management Plan (PSMP) has been developed as a component of the Extraction Plan in accordance with Condition 2(vii) in Schedule 3 of DA-504-00. The PSMP has been developed in consultation with the RR. Consultation has also been carried out with NPWS voluntarily.

The purpose of the PSMP is to provide the management strategies, controls and monitoring programs to be implemented for the management of potential risks from subsidence related impacts that may affect public safety, specifically from the secondary extraction of 918A, 918B1and 918B2 (Centennial, 2026b).

Additionally, the PSMP has also been prepared to address the requirements of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2022 (Schedule 1, Part 1, Section 6) to manage subsidence as a principal mining hazard. Regulatory requirements applicable to the development of the PSMP include the identification and management of subsidence related risks to public safety, including to private property and public infrastructure. These are outlined in the PSMP.

The features identified within the EP Area relevant to public safety are managed under a number of supporting plans in addition to the PSMP as noted in Table 4.9 below.

Table 4.9 – Public Safety Features

Feature	Identification and Assessment	Management and Monitoring
Unsealed tracks and trails	Subsidence Predictions and Impact Assessment for 918 Panel (MSEC, 2026)	918 Panel Built Features Management Plan 918 Panel Subsidence Monitoring Program
Steep slopes, cliffs, pagodas and gorges	Subsidence Predictions and Impact Assessment for 918 Panel (MSEC, 2026)	918 Panel Land Management Plan 918 Panel Subsidence Monitoring Program

As set out in Section 4.3, there are five cliffs, seven minor cliffs and three pagodas within the EP Area. Importantly, there is only one rock feature situated over the proposed extraction of the 918 Panel. All cliffs, minor cliffs and pagodas are located either over first workings or unmined areas (including barrier pillars) within the EP Area.

MSEC (2026) consider it unlikely that adverse impacts would occur to the cliffs, minor cliffs or pagodas within the Study Area due to extraction of the proposed 918A, 918B1 and 918B2 sub-panels, even if the actual movements exceeded the predictions by a factor of two times.

Based on the above, the risk to public safety from rockfall and/or surface deformation caused by the extraction of the 918 Panel is considered to be remote.

5 MONITORING PROGRAM

5.1 Subsidence Monitoring Program

The 918 Panel Subsidence Monitoring Program (MSEC,2026b) has been developed as a key component of the Extraction Plan in accordance with Condition 2(g)(i) of Schedule 3 of DA-504-00. The Subsidence Monitoring Program has been developed in consultation with the RR.

The Subsidence Monitoring Program aims to address two purposes. The first is to set out the program for monitoring the subsidence effects associated with the proposed secondary extraction of the 918 Panel EP Area within the Katoomba seam. The second is to summarise, consolidate and/or link the various environmental monitoring programs presented in each of the component Management Plans, in terms of monitoring subsidence magnitude and monitoring the overall performance of the mine design. These environmental monitoring programs are directed towards monitoring the subsidence impacts and environmental consequences of mine subsidence from the extraction of the 918 Panel.

All forms of subsidence monitoring will be undertaken by appropriately qualified and experienced personnel and by fit for purpose equipment. The results from the Subsidence Monitoring Program will be evaluated by appropriately qualified and experienced personnel against the performance measures and subsidence predictions and reported appropriately.

The overall subsidence monitoring program will provide the "*vital signs*" for the overall mining performance. With such a small subsidence magnitude already approved, even if the 100 mm subsidence criteria is reached (exceeding the predictions of 76 mm), and tilts of ≤ 3 mm/m and strains of ≤ 2 mm/m are reached (exceeding the expected ≤ 0.6 mm/m tilt and ≤ 0.3 mm/m strain), environmental consequences are expected to be negligible and/or imperceptible. To this end, magnitudes of movement are the most sensitive and critical to ensure the environmental performance measures are achieved and the approved subsidence impact assessment criteria is not exceeded. An overview of the Subsidence Monitoring Program is provided in the sub sections below.

5.1.1 Subsidence Effects Monitoring Program

Table 5.1 provides a summary of the monitoring program that will be undertaken to monitor and manage the effects of subsidence within the EP Area. Figure 2 presents the locations of the proposed and/or installed subsidence monitoring equipment. All forms of subsidence monitoring will be undertaken by appropriately qualified and experienced personnel. The results from the Subsidence Monitoring Program will be evaluated by appropriately qualified and experienced personnel against the performance measures and subsidence predictions (MSEC, 2026b).

The primary objective of the mine layout is to prevent any significant mine induced risk to surface features by designing the layout in consideration of the geotechnical environment such that extraction results in low levels of subsidence. This minimises potential for environmental impacts and allows built features to remain safe, serviceable and repairable. Accordingly, adherence to the final mine design (ie. actual extraction is in accordance with design dimensions) during implementation (mining) will be monitored as part of underground mining controls as per the Clarence Strata Failure Management Plan, Mines Inspection Plan and the Survey Management Plan.

There are several components associated with the proposed subsidence monitoring program as presented in Table 5.1 and it includes:

- Underground monitoring
  - Reconcile "as mined or as cut" is per design via inspections and survey measurement
  - Monitoring pillar compression, fracturing and stress (pillar loading) using pillar instrumentation. These installations will measure pillar performance including the depth of fracturing into the pillar and the amount of load the pillars are experiencing (load transfer/stress)
- Overburden monitoring
  - Reconcile height of fracturing is as predicted using the installed extensometer which has seventeen anchors installed at varying depths below ground level (above the seam). The intensity and spacing of anchors has been increased within as well as above and below the Mount York Claystone to increase data sensitivity

- Surface monitoring
  - Subsidence lines via survey
  - Real time subsidence levels using remote GNSS units
  - Visual inspections and photographic records

In addition to the above, technical experts carrying out monitoring for: ecology, groundwater, surface water, survey lines, creek inspections, geomorphological inspections, aquatic ecology, rock features, scheduled inspections; will mean that there will be many person hours traversing and inspecting the EP Area for signs of subsidence effects and environmental consequences. Subsidence impacts, effects and consequences picked up by any of the above mentioned technical experts, will be directly reported to Clarence staff for investigation.

Table 5.1- Subsidence Monitoring Program Summary

Monitoring Feature	Purpose	Monitoring method	Frequency & Duration
Underground mine control	Confirm the formation of underground first and second workings are implemented as per approved plan	Underground survey of workings as completed in the active panel. Visual inspections. Overlay of 'as mined / as cut" pillars (as surveyed) against designs	During mining: weekly in active working areas during mining Post Mining: Final inspection/survey of pillars at completion of active panel, additional post mining inspections for accessible pillars
Conventional survey lines	Subsidence measurements	Marks on rock outcrop or driven into ground, 20m spacing to survey standard	Prior to mining 918 Panel First workings Post mining: 900F-working face is 200m past OR one month after (whichever is longer) passing the 900F line for each sub-Panel 900H- within one month of sub-panel completion Annual on the anniversary of overall Panel completion for 3 years Cessation and removal of the survey marks on the anniversary of overall Panel completion for 3 years.
GNSS Monitoring stations and adjacent survey marks within EP Area	Continuous monitoring of subsidence development and x,y,z positioning	Continuous near real time point data using GNSS units	Install prior to mining first sub-panel Cessation and removal of GNSS units after 1 year of completion of planned secondary extraction Cessation and removal of the adjacent survey marks on the anniversary of overall Panel completion for 3 years.
GNSS Monitoring stations and adjacent survey marks outside of EP Area	Continuous monitoring of potential far field movements (in the unlikely event that it occurs) – x,y,z positioning	Continuous near real time point data using GNSS units	Install prior to mining first sub-panel Cessation after 1 year of completion of planned secondary extraction Cessation and removal of the adjacent survey marks on the anniversary of overall Panel completion for 3 years.
Targeted visual inspections	Complementary supportive Monitoring	Visual inspection of relevant area/location where safely accessible	Only if triggered as per TARP triggers

Monitoring Feature	Purpose	Monitoring method	Frequency & Duration
Scheduled visual inspections	Photographic monitoring as evidence of inspection regime	Visual inspection of representative surface features and rock features	Pre-mining inspection Within 3 months of post mining of each sub-panel Annually within 2 months of the anniversary of Panel completion (ie 918A&B) for 3 years
Surface extensometer	Provide displacement/strain measurements of overburden fracturing above 918A to confirm height of fracturing	17 anchors installed at varying depths below ground	Install and read prior to mining 918A sub-panel Continuously logging data Download data on minimum weekly basis when 918A Sub-panel face within 100 m radius Read Post mining of each sub-panel Cessation after 1 year of completion of planned secondary extraction of 918A or when data stabilises

The location of the subsidence monitoring program installations are presented in Figure 2.

5.2 Environmental Monitoring Program

5.2.1 Surface Water Monitoring

The WMP (GHD, 2026) has been developed to meet relevant approval requirements for the mine within the EP Area. Clarence has commenced baseline monitoring of surface water and groundwater bodies identified within the EP Area. A summary of the proposed monitoring is provided below and the location of these monitoring locations within Bungleboori Creek and Paddys Creek are presented on Figure 2.

Baseline

Baseline surface water monitoring data is detailed in the WMP. The extent of baseline data considered for surface water quality data relevant to the EP Area includes:

- Paddys Creek. Period from 24/11/2017 to current
- Bungleboori Creek Period from 29/09/2021 to current

A baseline and pre mining assessment of drainage line geomorphology associated with the drainage lines (Bungleboori Creek and Paddys Creek) has been undertaken by GHD (2025). Due to the relatively undisturbed nature of the area, the geomorphic condition of the assessed streamlines are generally in good condition. Following mining, the geomorphic condition of the assessed streamlines will be revisited by an appropriately experienced and qualified geomorphologist. Baseline watercourse stability monitoring locations and field visit locations are presented in Figure .

Baseline aquatic ecology monitoring at Clarence has been undertaken within Bungleboori Creek and Paddys Creek since 2021 in accordance with the AusRIVAS methodology. Aquatic ecology monitoring locations are presented in Figure 2. Baseline aquatic ecology monitoring is detailed in the BMP.

Monitoring Summary

The WMP provides information on (but not limited to) the following surface water monitoring:

- surface water quality;
- flow monitoring and stream health monitoring, including geomorphic condition;
- watercourse stability; and
- aquatic ecology monitoring.

Table 5.2 provides a summary of the monitoring program for surface water within the EP Area. Monitoring results are compared with the detailed performance criteria which have been developed from baseline

information and/or ANZECC (2000) default guideline values (DGVs) adopted as trigger values for water quality in Bungleboori Creek and Paddys Creek. The trigger values assigned for water quality for Bungleboori Creek and Paddys Creek are presented within the WMP. The management performance measures specified by water resource impact criteria conditions within development consent DA-504-00 are also set out in within the WMP.

Table 5.2 – Surface Water Monitoring Program Summary

Monitoring Feature	Purpose	Monitoring method	Frequency & Duration
Surface water flow and quality	Evidence of subsidence impacts compared to baseline records	Undertake surface water quality and flow monitoring in accordance with WMP	Undertake surface water quality and flow monitoring in accordance with WMP
Stream Health	Evidence of subsidence impacts compared to baseline records	Undertake stream health monitoring in accordance with WMP	Undertake stream health monitoring in accordance with WMP

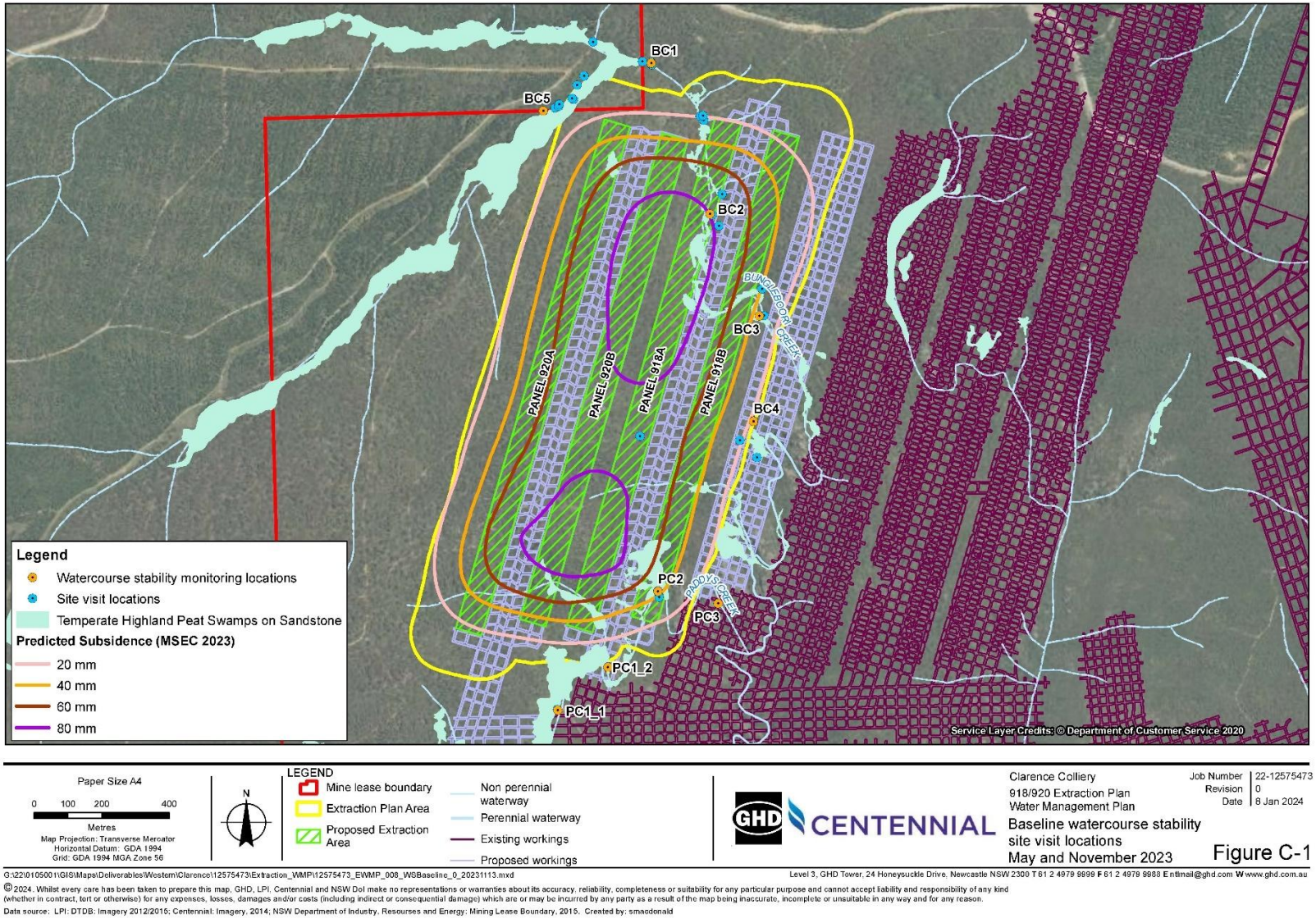


Figure 10 – Watercourse Stability Monitoring (GHD, 2025)

5.2.2 Groundwater Monitoring

The WMP was developed in consultation with relevant stakeholders and in consideration of the mine design for the EP Area. Identified aquifers and groundwater systems within the EP Area are outlined in the WMP.

The purpose of the WMP is to detail monitoring and management measures to be implemented for groundwater values (including groundwater levels and quality, groundwater seepage, underground water transfers) within the EP Area. The WMP also presents a TARP and performances measures specific to the partial extraction of the 918 Panel.

There is one GDE – Temperate Highland Peat Swamps on Sandstone within the EP Area that is listed in Schedule 4 as high priority groundwater dependent ecosystems in the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2023.

No significant impacts to the surface or sub-surface in these areas (including no expected cracking) is predicted for these features.

Baseline

The extent of baseline data, captured by open hole standpipe piezometers and Vibrating Wire Piezometers (VWP), considered for existing (pre-mining) groundwater levels is provided in the WMP. Groundwater features and monitoring locations are detailed in the WMP and related 918 Panel Subsidence Monitoring Program. Figure 2 presents the location of installed piezometers. Within the EP Area, there are seven standpipe piezometers located within the THPSS including:

- CSP1(BSE1) – located in Lower Nine Mile Shrub Swamp, installed in August 2022
- CSP2(BSE2) – located in Lower Nine Mile Shrub Swamp, installed in August 2022
- CSP4(PHS1) – located in Paddys Creek Shrub Swamp, installed in August 2022
- CSP5(PHS2) – located in Paddys Creek Shrub Swamp, installed in August 2022
- CSP34 – located in Lower Nine Mile Swamp, Bungleboori Creek, installed in May 2025
- CSP35 – located in Paddys Creek Hanging Swamp, installed in May 2025
- CSP36 – located in Paddys Creek Hanging Swamp, installed in May 2025

There are two VWPs located within the EP Area. One located over the 918A sub panel (CLRP41R), and the other location is to the east of the 918B1 sub panel (CLRP27R).

A shallow open standpipe hole CLRP41A (at the CLRP41 monitoring site) was drilled in January 2024 to compliment the VWP installed at the same location.

There are two open standpipe holes (CLRP40 and CLRP42) monitoring deeper aquifers, installed in March and April 2023 respectively, adjacent to the EP Area that were in the previous 918 and 920 Panels extraction plan area.

Monitoring

The WMP provides information on (but not limited to) the following groundwater monitoring:

- water levels in the established groundwater piezometer network; and
- underground water transfers.

Groundwater trigger levels in the swamp piezometers and shallow strata were determined by JBS&G (2026), based on review of historical groundwater elevations and the numerical groundwater model predictions. These triggers are set out in the WMP and have been determined by simulating climatic and consequent groundwater variability between the years 1886 through to 2021, which includes periods of extreme drought and periods of extremely wet periods (GHD, 2026).

Groundwater level trigger values are not required for VWPs as they generally monitor groundwater elevations below the Mount York Claystone and therefore do not monitor for impacts on environmental receptors (JBS&G, 2026). Groundwater level triggers for the swamp piezometers are provided in the WMP.

The WMP also sets out the monitoring expectations associated with water make as a result of the 918 Panel extraction.

Table 5.3 provides a summary of the monitoring program for groundwater within the EP Area.

Table 5.3- Groundwater Monitoring Program Summary

Monitoring Feature	Purpose	Monitoring method	Frequency & Duration
Groundwater levels (swamp piezometers)	Confirm impacts of mining are consistent with hydrogeological model predictions	Continuous groundwater level sensors	Downloaded every 2 months for the same duration as THPSS monitoring set out in the BMP
Groundwater levels (VWP)	Confirm and calibrate groundwater model	Continuous sensors	Downloaded every 2 months
Groundwater Extraction	Confirm impacts of mining are consistent with hydrogeological model predictions and are compliant with existing WALs	Undertake monitoring of underground water transfers	Daily, review daily data annually

5.2.3 Landform Monitoring

The LMP for 918 Panel has been developed as a component of the Extraction Plan in accordance with Condition 2.(g)(v) in Schedule 3 of Development Consent DA-504-00.

The purpose of the LMP is to provide the management strategies, controls and monitoring programs to be implemented for the management of potential subsidence impacts on landscape features that will be potentially affected by the secondary extraction of the 918 Panel.

The landscape features managed by the LMP are cliffs, minor cliffs and pagodas and the general surface area of the GoS SCA (which includes steep slopes and rock outcrops). No gorges were mapped within the EP Area (Centennial, 2026d).

Baseline Monitoring

Baseline monitoring of natural features as they relate to land within the EP Area has commenced using a combination of the following methods:

- The installation of the GNSS network to be completed following receipt of necessary approvals from the landowner followed by capture of baseline continuous data from installation through to commencement of secondary extraction of the nearest panel;
- Geotechnical baseline inspections and photography; and
- Visual inspections and photography.

Monitoring Summary

The land features managed by the LMP for the EP Area are presented in in Table 5.4 along with their relevant monitoring programs.

Table 5.4 - Landform Monitoring Program Summary

Monitoring Feature	Purpose	Monitoring method	Frequency & Duration
Cliffs, Minor Cliffs & Pagodas	Presence/absence of mine induced damage or change to features (significant rock falls and surface cracking) Various parameters relevant to each method	Geotechnical Inspections, desktop analysis and feature photography	Pre mining and post mining
		Targeted GNSS Monitoring Stations (**Figure 7 -** Steep Slopes (Centennial, 2026)): • Above the 918 Panel, within EP Area; • GNSS 900_G7 (located adjacent to cliff No. 18) • GNSS 900_G8, 900_G5 (located over steep slopes) • Remote from the 918 Panel, outside of EP Area;	Install prior to mining first sub-panel Cessation after 3 years of extraction Cessation after 1 years of extraction
		Visual inspection of relevant area/location where safely accessible Scheduled inspections of representative features (see LMP)	Opportunistic and only if triggered as per TARP triggers Pre-mining inspection Within 3 months of post mining of each sub-panel for relevant features Annually within 2 months of the anniversary of Panel completion (i.e. 918A, 918B1 & 918B2) for 3 years

5.2.4 Biodiversity Monitoring

The BMP for 918 Panel has been developed as a component of the Extraction Plan in accordance with Condition 2 (g)(iv) in Schedule 3 of DA-504-00.

The purpose of the BMP is to provide the management strategies, controls and monitoring programs to be implemented for the management of potential subsidence impacts on aquatic and terrestrial flora and fauna affected by the secondary extraction of 918 Panel. The BAM monitoring locations are presented in Figure 8 **Figure 2.** Aquatic ecology monitoring is also presented in **Figure 2.** The location of control sites are presented within the BMP.

Baseline Monitoring

The BMP was informed by baseline monitoring undertaken by RPS and EcoResolve for the EP Area with the purpose of reviewing the relevant biodiversity information. Baseline monitoring was undertaken over the years 2021– 2025.

Aquatic ecology baseline monitoring was undertaken by MPR over the years 2021 – 2025.

Monitoring Summary

The biodiversity features managed by the 918 Panel BMP for the EP Area are detailed in Table 5.5 along with their relevant monitoring programs.

Table 5.5 Biodiversity Monitoring Program Summary

Monitoring Feature	Purpose	Monitoring method	Frequency & Duration
Terrestrial Ecology	Evidence of subsidence impacts compared to baseline records and control sites	Terrestrial Ecology monitoring is undertaken in accordance with the 918 Panel BMP using BACI methodology	Terrestrial Ecology monitoring is undertaken in accordance with the 918 Panel BMP. - Threatened flora species – annually for 5 years - BAM plots annually for 5 years
Aquatic Ecology	Evidence of subsidence impacts compared to baseline records and control sites	Aquatic Ecology monitoring is undertaken in accordance with Section 4.5.2 of the BMP in accordance with the AusRIVAS methodology	Aquatic Ecology monitoring is undertaken in accordance with the 918 Panel BMP - Annual (Spring and Autumn) for 5 years

5.2.5 Heritage Monitoring

The HMP for 918 Panel has been developed as a component of the Extraction Plan in accordance with Condition 2(g)(vi) in Schedule 3 of DA-504-00. There are three known Aboriginal and cultural heritage sites in the 918 Panels EP Area. There are no known historic heritage sites within the 918 Panels EP Area.

The purpose of the HMP is to provide the management strategies, controls and monitoring programs to be implemented for the management of potential subsidence impacts on Aboriginal Cultural Heritage sites affected by the secondary extraction of 918 Panel.

Clarence also currently operates under the existing Western Region ACHMP and the Western Region HHMP which were developed in consultation with the (then) Office of Environment and Heritage and key stakeholders in accordance with Condition 30 in Schedule 2 of DA-504-00.

The Western Region ACHMP and Western Region HHMP outline the mitigation measures and management protocols relevant to the operation, including protocols for unexpected finds. The Western Region ACHMP and Western Region HHMP are available on the Clarence website.

Baseline

The HMP was informed by the baseline heritage survey conducted by Umwelt and the participating registered Aboriginal Parties for the EP Area with the purpose of reviewing the relevant heritage information and to find any unknown sites within the EP Area.

Monitoring Summary

The heritage features managed by the 918 Panel HMP for the EP Area are detailed in Table 5.6 along with their relevant monitoring programs.

Table 5.6 Heritage Monitoring Program Summary

Monitoring Feature	Purpose	Monitoring method	Frequency & Duration
Aboriginal Heritage sites	Evidence of subsidence impacts compared to baseline records	Heritage monitoring is undertaken in accordance with the 918 Panel HMP - Detailed archaeological recordings - Archival quality photographs - Survey control points to determine site curtilage	Heritage monitoring is undertaken in accordance with the 918 Panel HMP and is based on a three phase approach including: - Phase 1 – baseline recording - Phase 2 – post mining recording (immediately post extraction) - Phase 3 - post mining recording (8 months post extraction)

5.2.6 Ongoing Baseline Data Collection Program

Complementary environmental monitoring associated with ongoing existing programs required separately to the Extraction Plan (e.g. for site-wide management plans requires separately by Development Consent) provide useful baseline and monitoring information for the EP Area. This includes downstream surface waters, groundwater, biodiversity and aquatic ecology, stream health monitoring and unsealed roads and tracks.

An outline and overview of environmental monitoring programs to monitor potential subsidence impacts and environmental consequences within the EP Area and over the Colliery Holdings as a whole includes several components as set out below. The Clarence wide monitoring sites are presented in Figure 11.

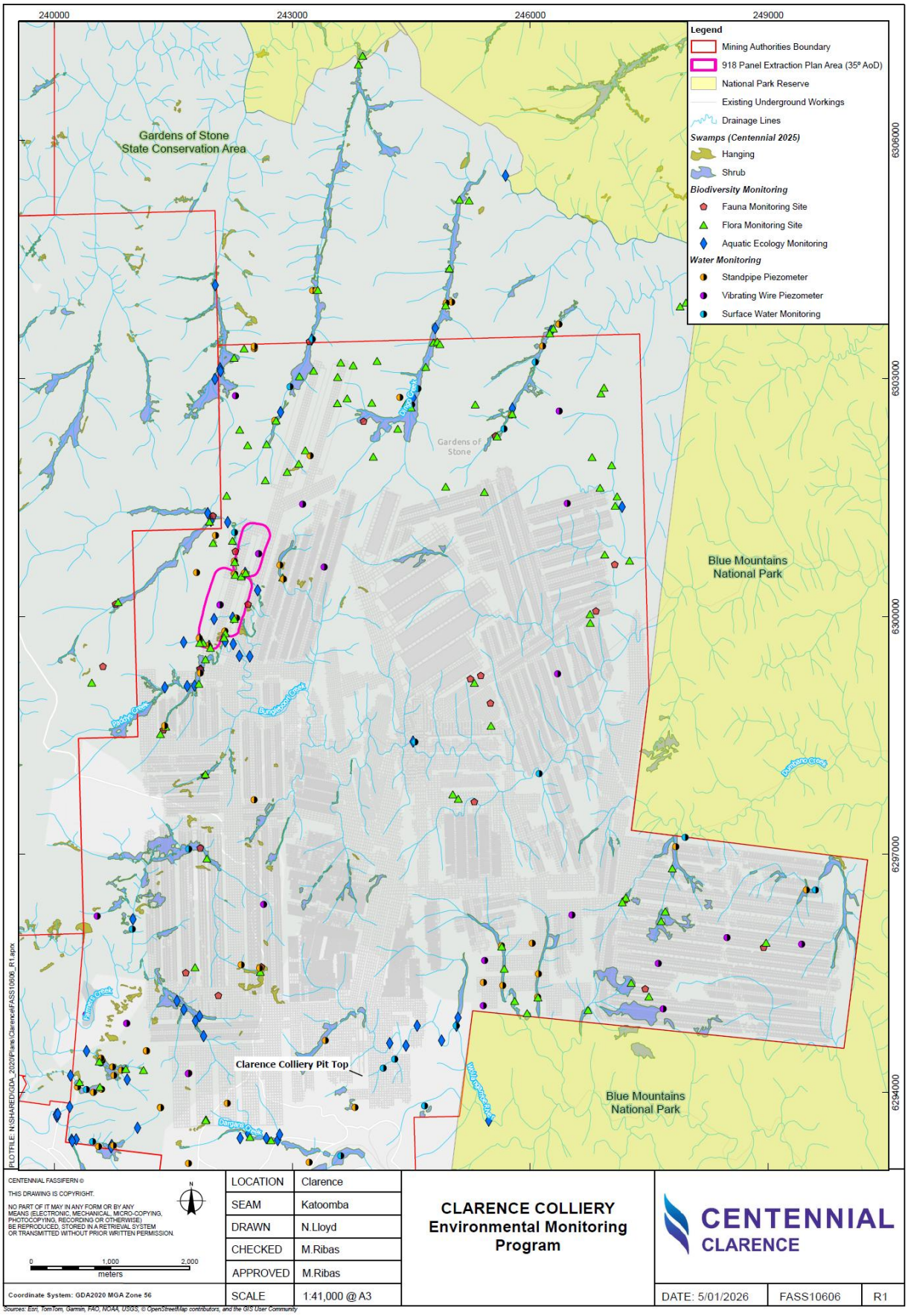


Figure 11 - Existing Environmental Monitoring at Clarence

Broader Water Monitoring

The Clarence Water Management Plan (**CWMP**) (GHD, 2022) has been developed to meet broader relevant approvals and licensing requirements for the mine beyond the EP Areas. Monitoring described within the CWMP includes:

- Surface water monitoring;
- Groundwater monitoring; and
- Aquatic ecology and stream health.

Monitoring to date, has not detected any environmental consequences due to partial extraction mining activities.

Broader Biodiversity Baseline

A broadscale Biodiversity Monitoring Program is currently being undertaken at Clarence within the Colliery holdings as per the Western Region Biodiversity Management Plan – Clarence (Centennial, 2019) and various Environmental Monitoring Programs associated with various SMP approvals including;

- Threatened vegetation communities monitoring;
- Threatened/non listed flora monitoring;
- Threatened/non listed fauna monitoring; and
- Aquatic ecology monitoring.

Biodiversity monitoring commenced in 2004, and has been continuously growing across the Clarence Colliery Holdings. The existing biodiversity (specifically fauna) monitoring program already samples the same types of habitats as those that can be found within the EP Area and samples areas adjacent to the EP Area. Monitoring to date, has not detected any environmental consequences as a result of partial extraction activities.

Broader Monitoring ground movement

The GNSS Monitoring Stations / Continually Operating Reference Station (**CORS**) which provide long occupation real time point data will be installed prior to secondary extraction commencement and provide continuous data from installation through to commencement of secondary extraction of the nearest panel (i.e. some stations far from 918 Panel will continue to provide baseline until mining comes nearer). It is noted that six GNSS units have already been installed within the EP Area and eight GNSS outside and adjacent to the 918 EP Area are measuring the extents of natural ground movements throughout the seasons.

Clarence continues to monitor subsidence lines situated over historic workings to maintain its database of mining performance. The proposed subsidence monitoring associated with the Extraction Plan will contribute to the extensive empirical database of mining performance.

Monitoring to date, has not detected any environmental consequences as a result of partial extraction activities.

Unsealed roads and tracks

Unsealed roads and tracks are monitored across Clarence's mining authorisations on an ad hoc basis based on accessing environmental monitoring sites and survey stations. This will continue across the Clarence's mining authorisations including the 918 EP Area. All things considered, technical experts carrying out monitoring for: ecology, groundwater, surface water, survey lines, creek inspections, geomorphological monitoring, aquatic ecology, rock features, scheduled inspections; will mean that there will be many person hours traversing the EP Area. Subsidence impacts, effects and/or consequences picked up by any of the above mentioned technical experts, will be directly reported to Clarence staff for investigation.

Monitoring to date, has not detected any environmental consequences as a result of partial extraction activities.

With a maximum of 100 mm subsidence, it is highly unlikely that there will be impacts such as cracking or erosion caused by subsidence to existing roads that requires remediation.

6 MANAGEMENT, MITIGATION, REMEDIATION AND REPORTING

6.1 Predicted Subsidence Effects and Subsidence Impacts

The predicted subsidence effects predicted by SCT (2026) and MSEC (2026) for the proposed 918 Panel is less than the approved DA-504-00 Subsidence Impact Assessment Criteria. The predicted subsidence is low and below levels expected to cause damage or any adverse impacts on the relevant features within the EP Area.

Environmental and built feature impacts as a result of the 918 Panel are expected to be insignificant.

The maximum, worst case, subsidence predicted as a result of the secondary extraction of the 918 Panels is 76 mm. An exceedance of this level of subsidence will trigger a mine design review to ensure subsidence does not exceed the consented 100 mm of vertical subsidence. An exceedance of the consented 100 mm subsidence criteria will trigger a non-compliance (amongst other things).

6.2 Performance Measures and commitments

The primary objective of the mine design is to prevent any significant mining induced risk to surface features by providing low levels of subsidence. This minimises potential for environmental impacts and allows built features to remain safe, serviceable and repairable (**SSR**).

There are some stipulated performances measures for the 918 Panel Extraction Plan provided within DA-504-00 consent conditions. There is detail contained within the Variation to DA-504-00 and Supplementary documentation (Centennial, 2005) and in the absence of consented performance measures (conditioned by DA-504-00), Clarence proposes the below performance measure commitments relating to built infrastructure, public safety, natural and heritage features in Table 6.1 and Table 6.2 for the 918 EP Area. It is noted that some public infrastructure listed in Table 6.1 are not relevant for the 918 EP Area and these have been denoted with a "*".

The below definitions are provided in the context of the proposed performance measures.

Minor - Not very large, important or serious.

Negligible - Small and unimportant, such as to be not worth considering.

Environmental consequences - The environmental consequences of subsidence impacts, including: damage to built features; loss of surface water flows to the sub-surface; adverse water quality impacts; cliff falls; rock falls; damage to Aboriginal heritage sites; and impacts on aquatic ecology.

Subsidence - The totality of subsidence effects, subsidence impacts and environmental consequences of subsidence impacts, subsidence effects, deformation of the ground mass due to mining, including all mining-induced ground movements, including both vertical and horizontal displacement, tilt, strain and curvature.

Subsidence impacts - Physical changes to the ground and its surface caused by subsidence effects, including tensile and shear cracking of the rock mass, localised buckling of strata caused by valley closure and upsidence and surface depressions or troughs.

Table 6.1 - Subsidence Impact Performance Measure commitments – Built Features

Key Public Infrastructure	***Subsidence Performance Measure***
Lithgow (Water Supply) Dam No. 2*	No damage or additional risk.
Railway*	Always safe and serviceable. Damage that does not affect safety or serviceability must be fully repairable, and must be fully repaired.
High voltage power supply infrastructure*	
Other Built Infrastructure	
Power lines and power poles*	Always safe and serviceable.
Telecommunications infrastructure*	
Privately-owned residences and businesses*	Damage must be fully repairable and must be fully repaired or else replaced or fully compensated. Clarence will repair, or pay the full cost associated with repairing and/or relocating infrastructure (Sch. 2 cond. 10)
Local roads*	
Other built features and improvements, (including access roads, farm dams, tracks, trails and fences)	
Public Safety	
Public Safety	Negligible additional risk.

* - Not relevant to the 918 EP Area

Table 6.2 - Subsidence Impact Performance Measure commitments – Natural and Heritage Features

Watercourses	***Subsidence Performance Measure***
3rd Order and above streams (Strahler stream order system) and Groundwater-dependent Ecosystems	• No connective cracking between the surface, or the base of the alluvium, and the underground workings. • No subsidence impact or environmental consequence greater than negligible.
1st and 2nd order streams (Strahler stream order System)	• No connective cracking between the surface, or the base of the alluvium, and the underground workings. • No subsidence impact or environmental consequence greater than negligible.
Aquatic and riparian ecosystems, including affected sections of Bungleboori Creek and Paddys Creek	• Maintain baseline channel stability • Develop site-specific in-stream water quality objectives in accordance with ANZECC 2000 and *Using the ANZECC Guidelines and Water Quality Objectives in NSW* procedures (DECC 2006), or their latest versions.
Land	
Steep slopes, minor cliffs, cliffs, pagodas, gorges	• Negligible/insignificant subsidence impact or environmental consequences.
Biodiversity	
Threatened species, threatened populations and endangered ecological communities including Temperate Highland Peat Swamps on Sandstone	• Negligible/insignificant environmental consequences.
Heritage sites	
Aboriginal Cultural Heritage sites/items at the site	• Negligible/insignificant subsidence impacts or environmental consequences.
Mine workings	
Second workings	• To be carried out only within the approved mine plan, in accordance only with an approved Extraction Plan. • Must not exceed 100 mm vertical subsidence

6.2.1 Performance Indicators within DA-504-00

Detailed performance indicators (including impact assessment criteria) for subsidence and water resources performance measures are detailed in the various management plans that are required under DA-504-00 including:

- Performance indicators relating to subsidence as presented in Table 6.3
- Performance indicators relating to water resources as presented in Table 6.4

Subsidence Performance Indicators

Clarence must ensure that surface subsidence generated by the development does not exceed the Subsidence Impact Assessment criteria listed in Table 1 of Schedule 3 condition 1 of DA-504-00 (Table 6.3).

Table 6.3 - Subsidence Impact Assessment Criteria

Level of Extraction	Subsidence	Tilt	Horizontal Strain (Compressive and Tensile)
First Workings	20mm	1.0 mm/m	1.0mm/m
Partial Extraction	100mm	3.0mm/m	2.0mm/m

The first workings and partial extraction areas refer to those areas presented in DA-504-00 Appendix 2. The first workings subsidence protection zone is reproduced and overlain with the planned first and second workings (**Figure 1)**. The partial extraction area is the remainder of the development consent area within ML 1583.

The Subsidence Monitoring Program has been developed in consultation with the affected stakeholders, and the TARPs establish the appropriate subsidence monitoring, parameters and associated trigger levels in order to demonstrate that subsidence performance meets the criteria set out above.

The mine design and site specific geotechnical conditions determine the level of subsidence expected from the secondary extraction of panels at Clarence, including the 918 Panel. Clarence has employed the expertise from several independent geotechnical and subsidence engineers to design and assess (and peer review) the mine design and determine the expected subsidence, all of which conclude that subsidence will not exceed the DA-504-00 criteria (Table 6.3).

Every SMP in place for Clarence has a specific Subsidence Monitoring Program associated with the subject panels. The 918 Extraction Plan has its own Subsidence Monitoring Program detailing the planned monitoring in place and/or proposed to confirm that the three sub panels will achieve the subsidence impact assessment criteria.

Water Resources Performance Indicators

The CWMP (GHD, 2022) sets out how Clarence addresses, details and monitors the various strategies, controls and actions to achieve the water resources impact assessment criteria. The stated criteria and where the criteria is addressed within the CWMP is presented in Table 6.4. The strategies, controls and actions provided in the CWMP will be expanded to include the 918 Panel.

For clarity, the water resources impact assessment criteria have also been quantified in the 918 Panel Water Management Plan for the relevant features within the EP Area.

Table 6.4 – Water Resources Impact Assessment Criteria

	Criteria	Addressed in CWMP
Schedule 3 **Condition 5** The Applicant must ensure that the development does not result in any:	• significant inflows to mine workings	• Section 3.3.2, • Section 5.2.2, • Section 6.1.4
	• reduction in pumping yield in privately-owned groundwater bores	• Section 2.5.2, • Section 5.2.1
	• reduction in surface flows and groundwater baseflow to upland swamps (Newnes Plateau Shrub Swamps) and wetlands	• Section 4.3.1, • Section 5.2.1
	• reduction in surface flows and groundwater baseflow to waterbodies including Marrangaroo Creek, Farmers Creek, Dargans Creek, Wolgan River, Dumbano Creek, Bungleboori Creek, and Wollangambe River (excluding reduction in flows associated with the proposed water transfer scheme)	• Section 4.2.2, • Section 4.4, • Section 5.1

TARP – Performance Measures

To establish compliance with the performance measures outlined in Table 6.3 and Table 6.4, Clarence has established performance indicators for each feature within the corresponding component Management Plans. Escalating triggers and levels of investigation, via TARPs, have also been established in accordance with the trigger values as outlined in Table 6.5

Table 6.5: Performance Indicators & TARP Risk Management Scenarios

Performance Indicator	General Description	Action / Response
Level 1: **Condition Green**	**Operations within predictions, and within approved impacts**.	Continued operations and monitoring as normal.
Level 2: **Condition Amber**	**Operations within approved impacts but potentially exceed / exceed predictions**.	Review and investigation processes are engaged, with adaptive management as required.
Level 3: **Condition Red**	**Operations exceed approved impact.** *The approved Performance Measures (criteria thresholds) of Development Consent (and any other relevant approvals) are listed in Condition Red.*	Adaptive Management measures are fully engaged as per the TARP and relevant sections of the Extraction Plan and the SMP.

6.2.2 Predicted Environmental Consequences

At 100 mm (or less) of subsidence, environmental consequences are expected to be insignificant. The predicted subsidence impacts and environmental consequences for the proposed 918 Panel are essentially equivalent to

those which would be experienced for the currently approved mining using partial extraction mining techniques. Accordingly, this represents a negligible change to the impacts considered and approved by DA-504-00.

Environmental consequences on rock features including cliffs, minor cliffs, pagodas, steep slopes and the species that rely on these habitat features as result of 100 mm of subsidence or less will be imperceptible.

The height of significant / continuous fracturing above the mining horizon is predicted to be well below the Mount York Claystone unit and will not impact the integrity of the unit. The integrity of the Mount York Claystone will be maintained and therefore, the potential to result in impacts to the overlying shallow groundwater systems will be negligible. Therefore, the shallow aquifers supporting the NPSS and NPHS (together THPSS) and other groundwater dependent ecosystems will be protected. Subsidence consequences to biodiversity relying on these shallow groundwater systems are predicted to be negligible.

Groundwater model results incorporating uncertainty analysis indicate that the change to elevation of the uppermost water table in Pine Swamp, Nine Mile Swamp and Paddys Creek Swamp is negligible (less than 0.1 m) (JBS&G, 2026). Therefore, imperceptible impact on NPHS and NPSS and the species that rely on the swamp habitat caused by the extraction of the 918 Panel is expected.

At Paddys Creek Swamp, the groundwater model predicts 10th percentile loss of groundwater contribution to surface water of 0.33 m^3/day due to proposed mining. The model indicates that 10th percentile groundwater contribution to Paddys Creek Swamp is 124 m^3/day. Therefore, modelled changes in baseflow at Paddys Creek Swamp are less than 0.26% and therefore likely insignificant (JBS&G, 2026).

At Pine Swamp, the groundwater model predicts 10th percentile loss of groundwater contribution to surface water of 0.21 m^3/day due to proposed mining. The model indicates that 10th percentile groundwater contribution to Pine Swamp is 53 m^3/day. Therefore, changes in modelled baseflow at Pine Swamp are less than 0.4% and therefore likely insignificant (JBS&G, 2026).

At Bungleboori Creek downstream of the 918 Panel, the groundwater model predicts 10th percentile loss of groundwater contribution to surface water of 1.04 m^3/day due to proposed mining. The model indicates that 10th percentile groundwater contribution to Bungleboori Creek downstream of the 918 Panel is 520 m^3/day. Therefore, changes in baseflow to Bungleboori Creek downstream of the 918 Panel is approximately 0.2% and therefore likely insignificant (JBS&G, 2026).

Groundwater modelling has also predicted that the proposed extraction of the 918 Panel is anticipated to result in negligible changes to groundwater contribution to surface water flow within Bungleboori Creek. Accordingly, the change to groundwater contribution to surface water flow and groundwater availability for THPSS is expected to be negligible resulting in impacts assessed to be insignificant.

Conclusion

Historic monitoring undertaken over partial extraction mining areas has demonstrated that mining resulting in 100 mm of subsidence has not resulted in significant impacts to surface features. The mine layout associated with the proposed 918 Panel has been carefully designed, assessed, analysed and reviewed in the context of the known geotechnical and geological conditions by multiple independent experts who all agree, that subsidence is not expected to exceed the consented 100 mm criteria.

The proposed 918 Panel is a continuation of the approved partial extraction mining activities which is better suited to lower / thinner coal seam conditions. Therefore, it is expected that negligible impacts associated with the historic partial extraction mining activities would continue as a result of the partial extraction of the 918 Panel.

It is for the above-mentioned reasons that the proposed partial extraction of the 918 Panel is considered unlikely to result in any measurable impacts to listed species, habitat, ecological communities, water resources and/or steep slopes, cliffs, minor cliffs and pagodas. The mine plans have been designed to conform within the subsidence criteria currently stipulated within DA-504-00 for the mining of coal within the EP Area. Accordingly, predicted surface subsidence impacts from PPPE mining techniques will be generally consistent with those previously approved to be undertaken by partial extraction mining methods.

Predicted environmental consequences as a result of the extraction of the 918 Panel is expected to achieve the proposed performance measures as well as the performances measures stipulated in DA-504-00.

6.3 Subsidence Management Strategies and Measures

Potential environmental consequences during the mining of the 918 Panel will be managed in accordance with the relevant requirements of development consent (DA-504-00) and other approvals, through:

- **Avoidance/Mitigation Through Mine Design** – the layout of the 918 Panel has been developed to meet the subsidence impact performance measures
- **Subsidence Monitoring** – visual, survey and in-ground monitoring (via extensometer) and reporting will be conducted to confirm predictions of subsidence effects and potential subsidence impacts and environmental consequences
- **Management Measures and Remediation** – implementation of management measures and/or remediation, as required, to address subsidence impacts and/or environmental consequences (in consideration of the potential impacts of the unmitigated impact, including the potential for self-healing or long-term degradation, and the potential impacts of the remediation)
- **Trigger Action Response Plan (Contingency Plans)** – implementation of TARPs in the event of an exceedance of a subsidence impact performance measure or if an unexpected impact is detected, including consideration of identified potential contingency measures
- **Adaptive Management** – adaptive management will be implemented where appropriate by reviewing and evaluating the effectiveness of management strategies, mine design, subsidence monitoring and adjusting management strategies to improve performance, particularly following an exceedance of predicted subsidence, ground deformation monitoring (extensometer) and underground monitoring as required. A specific review of monitoring data will be carried out before or at the end of each sub-panel in an End of Sub Panel Report. Should predictions be exceeded, Clarence has the ability to reduce the extraction void as is allowable by the PPPE mining technique on a sub-panel by sub-panel basis if and as required.
- **Reporting and Review** – procedures for investigations of incidents (including all exceedances of performance measures and monitoring data) and appropriate response, as well as procedures for quality assurance and review of the management system. Regular reporting avenues are proposed to ensure relevant stakeholders are kept abreast of mining performance and/or exceedances as necessary

6.4 Trigger Action Response Plans and Summary TARP

Clarence has developed TARPs for the relevant component Management Plans prepared to support the 918 Panel Extraction Plan. These TARPs are developed in consultation with stakeholders as required and use escalating triggers and responses to meet the relevant performance measures for each aspect/feature. The TARPs build upon the well-established TARPs and management plans previously developed for prior SMP areas. Triggers described in the TARPs are typically monitored by the Subsidence Monitoring Program and/or the monitoring programs set out within each component Management Plan. TARPs have been developed to implement the relevant component Management Plans in support of the 918 Panel Extraction Plan as summarised in Table 6.6. The TARPs have been combined into a Summary TARP which is contained within the Subsidence Monitoring Program (MSEC, 2026b).

Table 6.6 - TARP's and Associated Management Plans

Management Plan	Relevant TARP
Land	Steep slopes, cliffs, minor cliffs and pagodas TARP
Water	Groundwater TARP Surface Water and Swamps TARP Geomorphic condition and watercourse stability TARP
Biodiversity	Biodiversity – EEC, GDE, Threatened Species Habitat, Aquatic Ecology TARP
Heritage	Heritage TARP
Public Safety	Unsealed tracks and trails TARP
Built Features	Unsealed tracks and trails TARP

6.5 Adaptive Management and Staged Implementation

In addition to the conservative narrow sub-panel widths and wide spine and barrier pillar widths, which were specifically designed to provide reduced levels of subsidence and impact, Clarence has developed an adaptive management approach in accordance with Condition 2(g)(ix) of Development Consent DA-504-00, which requires a *"**Contingency Plan** that expressly provides for:*

- *adaptive management where monitoring indicates that there has been an exceedance of any impact assessment criteria in Table 1 or condition 5, or where any such exceedance appears likely;*
- *an assessment of remediation measures that may be required if exceedances occur and the capacity to implement those measures."*

Table 1 refers to the Subsidence Impact Assessment Criteria, which are described in Section .DA-504-00 Schedule 3 Condition 5 refers to Water Resources Impact Assessment Criteria, which are monitored and managed in accordance with Clarence's Water Management Plan (GHD, 2026)

The Adaptive Management Strategy includes the following three steps:

1. Implementation of a detailed monitoring program to measure and record mining-induced ground movements and impacts on natural and built features during and after mining;
2. A review of relevant observations at appropriate stages, when:
   a) mining of each sub-panel has progressed a sufficient distance such that the majority of mining-induced movements have occurred; and
   b) there remains sufficient time to adjust the mine plan for future sub-panels without resulting in delays to mine production if required; and/or
   c) monitoring results exceed the TARPs.
3. A decision on whether to adjust the mine plan for future sub-panels to further reduce the potential for exceeding the conditions of approval of development consent DA504-00.

For clarity, changes to extraction void widths (and associated changes to barrier pillar widths) can be made prior to the extraction of each sub-panel, if required. It is difficult but possible to adjust extraction void widths mid extraction.

The process for assessing and determining if a change to the mine plan is required during or after the mining of an approved sub-panel is illustrated by the Adaptive Management Strategy decision flow chart (Figure 12)

In relation to Criteria A, Clarence will engage a suitably qualified and experienced person to review and assess subsidence monitoring data and conduct Assessment 1. If Assessment 2 is required, Clarence will engage a subsidence expert to recalibrate the subsidence modelling/predictions and determine whether a change to the mine plan is likely to be effective in reducing likelihood of exceeding Criteria A.

As shown in Figure 12 the review will be conducted on at least two occasions: once during the extraction of sub-panel 918A and again during the extraction of sub-panel 918B1, prior to the commencement of the next sub-panel. In addition to the review, Clarence will not extract sub-panel 918B2 until approved by DPHI following a review of monitoring results for sub-panels 918A and 918B1. A review would also be conducted if monitoring results exceed the TARPs during the mining of sub-panels 918A, 918B1 and 918B2.

The findings of the review will be included in an Adaptive Management Report, which will be submitted to DPHI for review. The Adaptive Management Report can be a standalone report or be included as part of an End of Sub-Panel Report.

In addition to the Adaptive Management Strategy, Clarence Colliery supports a staged assessment and approval process for the 918 Panel Extraction Plan. This is in alignment with IEAPM Advice (23 January 2026) Recommendation 7 that states:

Should the Applicant resubmit a new EP application, the Department could consider a staged assessment approach whereby 918A and 918B1 are determined and, subject to satisfactory confirmation of subsidence predictions and pillar monitoring, then determine 918B2 panel if there remains a low likelihood of exceeding the long-term subsidence performance measure of 100 mm.

The approved 918 Extraction Plan would be undertaken in stages, with the extraction of the 918A sub-panel and the 918B1 sub-panel followed by a hold point prior to the extraction of the 918B2 sub-panel.

After completion of mining of sub-panel 918A, and stabilisation of subsidence, an 918A End of Sub-panel Report will be prepared by a suitably qualified and experienced person and will incorporate environmental and subsidence monitoring data to validate subsidence performance predictions, and confirm compliance status within the applicable consent conditions.

The 918A End of Sub-panel Report will provide a defined compliance and adaptive management hold point and inform whether any refinement to the adjacent 918B2 sub-panel design, e.g. reduction of void width or length, is required prior to 918B2 approval determination and extraction commencement.

The 918A End of Sub-Panels Report will be submitted to the DPHI via the planning portal for assessment and determination.

An End of Sub-panel Report will also be prepared and submitted for 918B1 upon completion of mining, noting that as an individual extraction void, its performance will not significantly affect subsidence in the 918A/918B2 area.

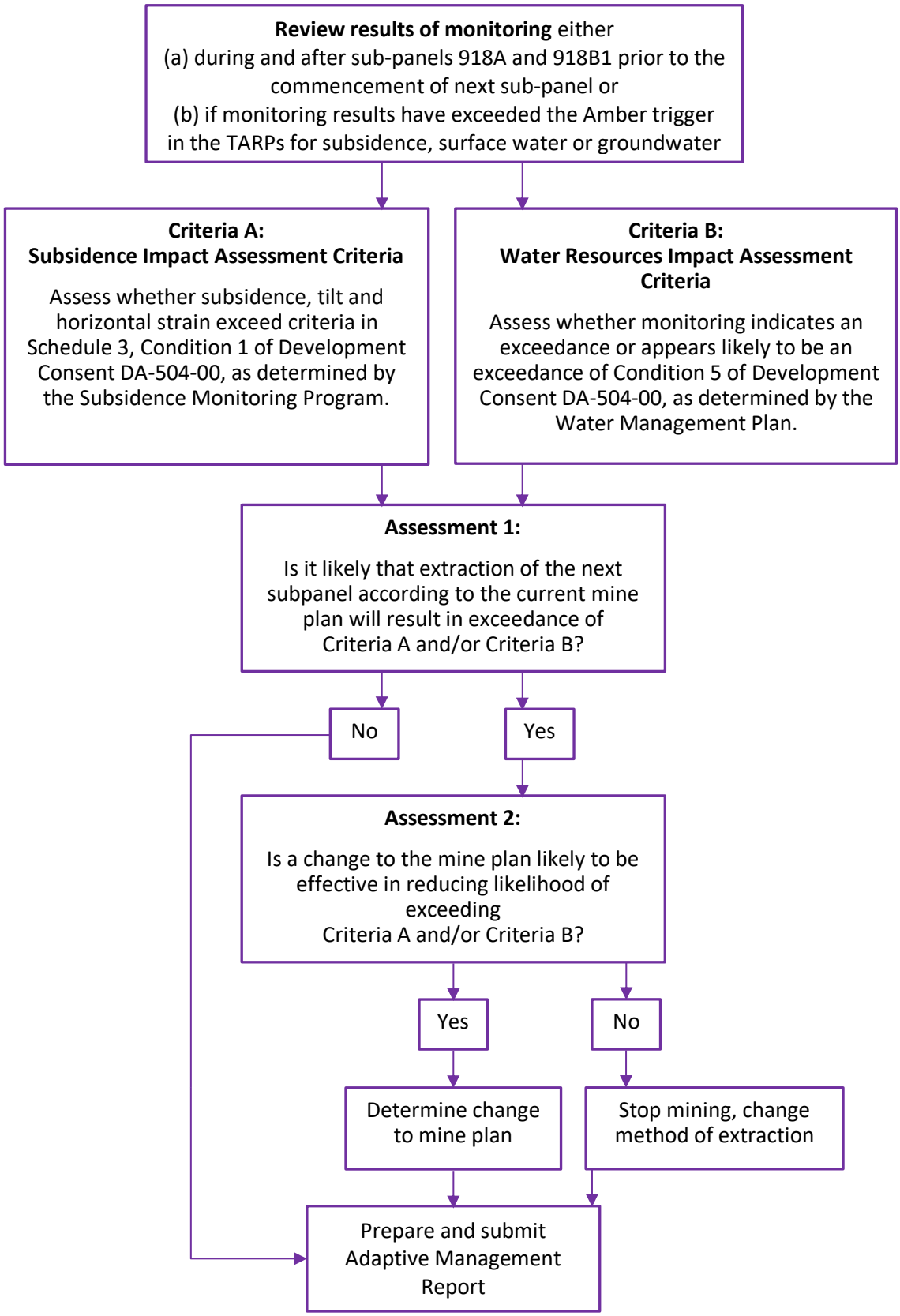


Figure 12–Staged Implementation and Adaptive Management Strategy decision flowchart

The contingency plan where a performance indicator has been exceeded is outlined in the TARP that is relevant to the performance trigger. A trigger will result in additional investigations to determine if the exceedance is

related to non-mining-factors or is a consequence of mining activity. The response to these exceedances will follow the TARP. Management and corrective actions can be implemented where required to remedy these non-conformities and reported accordingly.

6.6 Remediation and Rehabilitation Measures

Subsidence remediation is outlined in the Clarence Rehabilitation Management Plan (Clarence Colliery, 2023). Clarence commits to mitigating, monitoring, repairing to pre-mining condition at full cost or equivalent unless the owner agrees otherwise or the damage is fully restored, repaired or compensated under the Coal Mine Subsidence Compensation Act 2017, features which are damaged by mining operations. Schedule 2, Condition 10 of DA-504-00 also requires the repair or relocation of public infrastructure damaged by the development to be paid by Clarence. The timely repair is also required from a public safety aspect. This is detailed further in the PSMP (Centennial, 2026b). Clarence will consult with NPWS and arrange prompt temporary repairs to make access tracks safe, followed by timely permanent repairs to the appropriate NPWS standards to make access tracks safe and serviceable where necessary and where those impacts have been caused by subsidence.

6.7 Reporting Framework

Reporting is undertaken in accordance with the specific requirements of relevant approvals and licences including DA-504-00 and EPL726, and generally in accordance with the Extraction Plan Guideline (NSW Department of Planning & Environment, 2022). The proposed reporting framework is summarised in Table 6.7.

Table 6.7: Reporting Requirements

Report	Trigger	Requirements	Stakeholders
Incident Reporting	Any occasion or incident in accordance with consent condition, WHS legislation requirement or TARP.	In accordance with requirements of incident and non-compliance reporting within the consent, WHS legislation requirement (see relevant TARP.	DPHI RR NPWS
Notification to Resources Regulator	An indication from monitoring data of the development of subsidence that may result in damage to plant or structures or a failure of ground. Dangerous incident - a failure of ground, or of slope stability control measures, or rock falls, instability of cliffs, steep slopes or natural dams, occurrence of sinkholes, development of surface cracking or deformations or release of gas at the surface, due to subsidence.	Notify as soon as reasonably practicable after becoming aware of the incident and no later than 7 days after becoming aware of the incident or 48 hours after becoming aware the incident resulted in an illness or injury. The Notification must be made in accordance with s124(4) of the WHS (Mines and Petroleum Sites) Regulation 2022 Notifiable incident – notify immediately after becoming aware that a notifiable incident, given in accordance with section 15 of the WHS (Mines and Petroleum Sites) Act	RR

Report	Trigger	Requirements	Stakeholders
End of Sub-Panel Subsidence Impact Reporting	Within one month of the end of each Sub-Panel	Present a summary of the relevant Subsidence and environmental monitoring for the relevant sub-panel Provide a preliminary characterisation of any impact exceedances in accordance with the relevant TARP(s) and/or performance measures. Distinguish impact: • Subsidence and environmental monitoring within or exceeding predictions; • those which exceed predictions but remain within performance measures and/or performance indicators; and • those which exceed performance measures and/or performance indicators. Report to include: • monitoring data analysis; • full description of any subsidence impacts that exceed predictions and/or performance measures; • location identification of unpredicted impacts using aerial photos with mine layout superimposed; • photos of the impact that exceeded predictions; • requirement to implement the Adaptive Management Procedure; and • mine design recommendations.	DPHI RR NPWS
Three (3) monthly monitoring Reporting	In accordance with DA-504-00 Sch. 5 Condition 12	(a) make a summary of the results of all monitoring required under this consent publicly available both at the mine and on the Applicant's website; and (b) update these results on a regular basis (at least every 3 months) to the satisfaction of the Secretary	DPHI RR NPWS
Annual Review	Annual Report required under development consent DA-504-00.	Report to include: • six-monthly reports of impacts and environmental monitoring results; • monitoring results; and • summary of subsidence impacts.	DPHI RR NPWS LCC
CCC	CCC meetings are typically held three times per year.	Subsidence and environmental performance is included as an agenda item at each meeting.	CCC
Aboriginal Heritage Committee (**AHC**)	AHC meetings are held twice per year as set out in the ACHMP Western Region (Centennial, 2021)	Subsidence and environmental performance is included as an agenda item at each meeting.	AHC

In accordance with Schedule 5, Condition 11, once this Extraction Plan is approved, Clarence Colliery will:

- Provide a copy of the Extraction Plan to the LCC, relevant agencies and the Clarence CCC;

- Upload a copy of the Extraction Plan onto the Centennial Coal website.

In accordance with Schedule 5, Condition 12, following the commencement of the 918 Panel, Clarence will continue to make a summary of the results of all monitoring required under DA-504-00 publicly available on the Centennial Coal website and will update these results at least every six months.

6.8 Audit and Review of Extraction Plan

Typically Extraction Plans are reviewed in the event that the following occurs:

- Stakeholders raise issues that necessitate a review;
- Relevant statutory changes affecting management requirements (e.g. modification to related approvals or licences);
- Significant change in mine design/s or layout and/or the Adaptive Management Procedure is enacted;
- Where triggered by a TARP, including where unpredicted impacts or consequences have required implementation of contingency actions under this plan;
- Monitoring, incident, or audit processes demonstrate that a review is warranted;
- Review is triggered as per Development Consent requirements noted immediately below; or
- Where triggered by circumstances set out within the WHS (Mines and Petroleum Sites) Regulation 2022.

Clarence is required to review, and if necessary revise, the strategies, plans, and programs within 3 months of the submission of an:

- **Annual Review** under Schedule 5, Condition 5;
- **Incident Report** under Schedule 5, Condition 5A;
- **Audit Report** under Schedule 6, Condition 5; and
- **Any modification** to the conditions of Development Consent (unless conditions require otherwise).

Any revision to the Extraction Plan including component Management Plans must be submitted to the Secretary, DPE (now DPHI) for approval within four (4) weeks of the review.

Amendments to the Extraction Plan will be undertaken in consultation with relevant stakeholders as necessary. Following changes (or as otherwise required above) a copy of the amended Extraction Plan will be forwarded to the Secretary of the DPE (now DPHI) for approval. Once approved, the Extraction Plan will be placed on the Centennial website so that it is available to interested stakeholders.

7 PLAN ADMINISTRATION AND RESPONSIBILITIES

The responsibility for implementation, monitoring and review of the Extraction Plan lies with the nominated document owner. The ultimate responsibility for the implementation of the Extraction Plan lies with the Manager of Mining Engineering (MME) (also referred to as the Mine Manager), who shall make appropriate resources available. The roles and responsibilities for the Clarence 918 Panel Extraction Plan are provided in Table 7.1 and are complimentary to those roles and responsibilities set out within each component Management Plan. Delegation of roles and/or responsibilities may be determined by the MME at any time.

Table 7.1: Key Roles and Responsibilities

Position	Responsibility
Manager of Mining Engineering (**MME**)	▪ Ensuring that sufficient resources are available to implement and execute the requirements of this Extraction Plan including the component Management Plans.

Position	Responsibility
	▪ Notifying the Resources Regulator in the event that there is Notifiable incident as per the WHS (Mines and Petroleum) legislation. ▪ Approving changes to the mine design if required as a result of the Adaptive Management Procedure.
Technical Services Manager (or delegate) (**TSM**)	▪ Coordinate the subsidence monitoring program associated with this Extraction Plan and relevant component Management Plans; ▪ Assist and monitor the implementation of the approved mine design and TARPs for compliance; ▪ Coordinate the management of subsidence impacts in accordance with the Extraction Plan, component Management Plans and Procedures; ▪ Maintain the Centennial Clarence Compliance Database; ▪ Install, maintain and measure underground and surface to seam instrumentation; ▪ Consult with the landowners, infrastructure owners and relevant local and state government departments ▪ Reporting triggers/non-conformances/incidents to the MME as appropriate; ▪ Coordinating any mitigation and/or remedial work as required; ▪ Prepare and co-ordinate the End of Sub-Panel Report; ▪ Reporting to DPHI and NSW RR of subsidence performance upon completion of specified monitoring intervals; ▪ Ensuring subsidence/underground monitoring requirements and reporting schedules are entered into the Centennial Clarence Compliance Database ▪ Managing, maintaining and complying with relevant monitoring and management commitments within the Subsidence Monitoring Program; ▪ Enact and manage the Adaptive Management Procedure, including outcomes and recommendations, where required; and ▪ Coordinate audit of the Extraction Plan.
Mine Surveyor	▪ Assist implementation of the approved mine design and TARPs; ▪ Sign-off on Graphical Plans and associated spatial information; ▪ Establishment of subsidence monitoring in accordance with the Subsidence Monitoring Program; ▪ Review and assess subsidence monitoring results; ▪ Promptly notify the TSM and ECC of any issue, non-compliance or exceedance identified during a subsidence survey/inspection/trigger of any public safety issues; ▪ Provide the subsidence monitoring results to the TSM, ECC, RR and NPWS; ▪ Schedule and carry out subsidence surveys; ▪ Undertake underground “as cut” surveys and compare to mine design dimensions; and ▪ Manage the GNSS database and troubleshoot data and instrument issues.
Environment and Community Coordinator (**ECC**) or delegate	Implementation, monitoring and review of this plan, including: ▪ The carrying out of targeted inspections and photo monitoring; ▪ Reporting triggers/non-conformances/incidents to the MME and TSM as appropriate; ▪ Consulting with landowners, landholders and managers regarding any land management issues arising from subsidence within the EP Area; ▪ Consultation during the review process with relevant stakeholders and distributing this Extraction Plan and relevant component Management Plans;

Position	Responsibility
	▪ Scheduling and budgeting for environmental monitoring required under the relevant component Management Plan; ▪ Regularly checking and reviewing monitoring data to detect early signs of a non-compliance and then reporting any non-compliances, including the potential for a non-compliance; ▪ Coordinating environmental aspects of any remediation work as required; ▪ Assist in the generation and submission of formal reporting requirements (including non-compliances and incidents); ▪ Schedule and budget for environmental monitoring required under this Extraction Plan; ▪ Attending and providing mining and monitoring updates as relevant to the CCC and AHC; ▪ Managing and maintaining and complying with relevant monitoring and management commitments within the LMP, BMP, HMP, BFMP, WMP, PSMP and RMP; ▪ Trigger reviews and manage any necessary reviews of this Extraction Plan; ▪ Complete the Annual Reporting requirements; ▪ Co-ordinate the review of the Extraction Plan and component Management Plans as required; ▪ Ensuring environmental monitoring requirements and reporting schedules are entered into the Centennial Clarence Compliance Database; ▪ Monitor compliance with the commitments set out in the Extraction Plan and component Management Plans; ▪ Registration of community complaints and regulatory liaison in the Environment & Community Database; ▪ Contribute to and/or co-ordinate the completion of the End of Sub-Panel Report as required by the TSM; ▪ Manage the timely publish of data, reports and Management Plans onto the Centennial Coal website as required by DA-504-00.

7.1 Review of Other Management Plans

DA-504-00, Schedule 3 Condition 2(h) requires that “appropriate revisions to the Rehabilitation Management Plan (required under condition 29 schedule 3)” are made as a result of the Extraction Plan process.

The Clarence Colliery Rehabilitation Management Plan (**RMP**) was reviewed in November 2023 following the development of the draft 918 Panel Extraction Plan. An updated copy of the RMP has been placed on the Centennial Coal website. The 918 Panel Extraction Plan is consistent with the information provided in the RMP.

7.2 Program for future Extraction Plans

Clarence Colliery is in the process of collecting baseline data for its next Extraction Plans. An extraction Plan for 701,718 to 724 Panel is being developed concurrently in consultation with the relevant stakeholders.

As required under Schedule 3, Condition 2(i), Clarence Colliery has developed a program to collect sufficient baseline data for future Extraction Plans. The program includes:

- Annual Review the Life of Mine Plan (LOMP) and confirm second workings timing for future extraction panels
- Three (3) years before Extraction Plan is required - Nominate a conservative study area

- Three (3) years before Extraction Plan is required – Identify exploration requirements for the study area and nominate installation of groundwater and geotechnical monitoring installations
- Two (2) years before Extraction Plan is required - Identify surface features by conducting the following activities:
    - Carry out site inspections
    - Review aerial photographs and topography
    - Conducting Dial before you Dig surveys
    - Field inspections
    - Vegetation mapping – confirm extents of CEECs/EECs, threatened species
    - Ecological (including terrestrial and aquatic) monitoring where relevant
    - Installation of groundwater monitoring
    - Identify safe and accessible monitoring sites (surface water)
    - Develop, document and implement the baseline environmental monitoring program
    - Undertake steep slopes and rock feature/cliff assessments
- Eighteen (18) months out - Engage with the registered Aboriginal parties and undertake Archaeological field survey
- Twelve (12) to eighteen (18) months out – confirm and finalise panel designs and mine layouts
- Twelve (12) months before Extraction Plan is required – undertake geomorphological and stream stability assessment as baseline. Confirm subsidence monitoring requirements and installations and obtain approvals from the landowner.

8 REFERENCES

ACARP (2002) *Subsidence Impacts on River Valleys, Cliffs, Gorges and River Systems*

Centennial (2005) *Clarence Colliery Lease Extension (DA No. 504/00). Centennial Coal Company Limited. Variation to Development Application No. 504/00 Application and Supplementary Information.*

Centennial (2026a) *Clarence Colliery 918 Panel Built Features Management Plan*

Centennial (2026b) *Clarence Colliery 918 Panel Public Safety Management Plan*

Centennial (2026c) *Clarence Colliery 918 Panel Land Management Plan*

Centennial (2023) Clarence Colliery - *Rehabilitation Management Plan for Large Mines*

DPE (2022) *Extraction Plan Guideline*

DPE (2022a) *Gardens of Stone State Conservation Area: Plan of Management*

GA (2015). *Review of Subsidence Information from Partial Extraction Areas (2015), including Implications for Future Equivalent Operations*. Report No. 127621107-174-R-Rev0 to Clarence Colliery.

GHD (2022) *Clarence Colliery Water Management Plan*

GHD (2025) *Geomorphological Assessment 918 Panel Area*

GHD (2026a) *Clarence Colliery 918 Extraction Plan Groundwater Model Peer Review*

GHD (2026b) *Clarence Colliery 918 Panel Water Management Plan*

IESC (2023) Information Guidelines Explanatory Note Subsidence associated with underground coal mining

JBS&G (2026) *918 Extraction Plan Groundwater Impact Assessment Report*

MSEC (2026a) *Centennial Clarence Colliery 918 Panel Subsidence predictions and impact assessment* MSEC1939.

MSEC (2026b) *Clarence Colliery 918 Panel Subsidence Monitoring Program*

NSW Department of Planning & Environment. (2022) *Extraction Plan Guideline*

Palaris (2013) *Geological Structure Zones in Angus Place and Springvale Mine Extension Areas*

RPS (2025) *Western Region Aboriginal Cultural Heritage Management Plan*

RPS (2018) *Western Region Historic Heritage Management Plan*

RPS (2026) *Clarence Colliery 918 Panel Biodiversity Management Plan*

Resources Regulator (2023) *Managing Risk of Subsidence, Guide: WHS (Mines and Petroleum Sites) Legislation.*

SCT (2026) *Geotechnical, subsidence and caving assessment for 918 Panel*. Report No. CLR5894

Umwelt (2026) *Clarence Colliery 918 Panel Heritage Management Plan*

ABBREVIATIONS

4WD	Four-Wheel Drive
ACHMP	Aboriginal Cultural Heritage Management Plan
AHC	Aboriginal Heritage Committee
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
asl	above sea level
BACI	Before-after Control-impact
BAM	Biodiversity Assessment Method
BMP	918 Panel Biodiversity Management Plan
BFMP	918 Panel Built Features Management Plan
BC Act	Biodiversity Conservation Act
BCS	Biodiversity and Conservation Scientific Directorate
CCC	Community Consultative Committee
Centennial Coal	Centennial Coal Company Pty Limited
Clarence	Clarence Colliery
CORS	Continually Operating Reference Station
CWMP	Clarence Colliery Water Management Plan
DCCEEW	Department of Climate Change, the Environment, Energy and Water
DGV	Default Guideline Values
DPE	NSW Department of Planning and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure
ECC	Environment and Community Co-ordinator
EEC	Endangered Ecological Community
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).
EP Area	Extraction Plan Area defined by the larger of the 35 degree angle of draw or the 20mm subsidence contour
EPA	Environment Protection Authority
EPL	Environment Protection License
GDE	Groundwater Dependent Ecosystem
GNSS	Global Navigation Satellite System
GoS SCA	Gardens of Stone State Conservation Area
ha	hectares
HHMP	Historic Heritage Management Plan
HMP	918 Panel Heritage Management Plan

HNSW	Heritage New South Wales
IESC	Independent Expert Scientific Committee (Commonwealth)
KAT	Katoomba Seam
km	kilometres
LCC	Lithgow City Council
LMP	918 Panel Land Management Plan
m	metres
MEG	Mining, Exploration and GeoScience
ML	Mining Lease
ML/day	Megalitres per day
mm	millimetres
MME	Manager of Mining Engineering
MOD	Modification to Clarence Colliery development consent DA-504-00
MODFLOW-USG	Modular Flow – Unsaturated Grid
MPa	Mega Pascal
MRC	Maximum Reasonable Consequence
MSEC	Mine Subsidence Engineering Consultants
MYC	Mount York Claystone
NPHS	Newnes Plateau Hanging Swamps
NPSS	Newnes Plateau Shrub Swamps
NPWS	NSW National Parks and Wildlife Service
NSW Water Group	NSW DCCEEW – Water Group
PCT	Plant Community Type
PPPE	Panel and Pillar Partial Extraction
PSMP	Public Safety Management Plan
RMP	Rehabilitation Management Plan
RR	NSW Resources Regulator
SCA	State Conservation Area
SCT	Strata Control Technologies
Smax	Maximum measured subsidence
SMP	Subsidence Management Plan
SSR	Safe, serviceable and repairable
t	tonnes
TARP	Trigger Action Response Plan
TEC	Threatened Ecological Community

THPSS	Temperate Highland Peat Swamps on Sandstone
TSM	Technical Services Manager
UDEC	Universal Distinct Element Code
UNSW	University of New South Wales
WHS	Work, Health and Safety
VWP	Vibrating Wire Piezometer
WAL	Water Access Licence
WMP	918 Panel Water Management Plan

APPENDICES

Appendix 1 – DPHI Persons Endorsement

CENTENNIAL

Department of Planning, Housing & Infrastructure

NSW GOVERNMENT

Our ref: DA504-00-PA-144

Chris Armit
Approvals Coordinator
Centennial Coal Company Pty Ltd
Via: NSW Planning Portal

17 April 2025

Subject: Clarence Colliery (DA504-00) – Appointment of Suitably Qualified Experts for Preparation of 918 Panel Extraction Plan

Dear Chris

I refer to your request dated 6 March 2025 for the Planning Secretary's approval of suitably qualified persons to prepare the 918 Panel Extraction Plan, required by Condition 2, Schedule 3 of DA 504-00.

I have reviewed the nominations and information you have provided and I consider that the nominated persons are suitably qualified and experienced. As delegate of the Planning Secretary I can advise that I approve the appointment of the people listed in Table 1 in accordance with Condition 2, Schedule 3 of DA 504-00.

Table 1 Appointment of Experts

Personnel	Project Role
- Yvette Heritage* - Rhys Pitchers (SCT)	Technical Specialist – Geotechnical characterisation and numerical modelling
- Glenn Sharroc - Mikael Svartjaern (ITASCA)	Technical Specialist – Geotechnical numerical modelling (Peer Review)
- Daryl Kay (MSEC)	Technical Specialist - Subsidence Impact Assessment and Subsidence Monitoring Program
- Justin Bell (JBS&G)	Technical Specialist – Groundwater Assessment
- Bishnu Gautam - Alyssa Barron (GHD)	Technical Specialist – Groundwater Assessment (Peer Review)
- Stuart Gray* - Ian Gilmour(GHD)	Technical Specialist – Water Management Plan
- Tara Boreham*	Technical Specialist – Biodiversity Management Plan

- Pippa James (RPS)	
Andrew Crisp (Umwelt)	Technical Specialist – Heritage Management Plan
Chris Armit (Centennial)	Author – Extraction Plan main document, Land Management Plan, Built Features Management Plan and Public Safety Management Plan

Note: * The Department assigns these persons as the primary specialist for the respective project roles.

The Department notes that Peter Corbett (Centennial) would also be involved in the preparation of the Extraction Plan components listed in Table 1.

The Department requests that all components of the Extraction Plan are thoroughly reviewed and signed off by the relevant specialist listed in Table 1. Where a primary specialist has been assigned (refer Table 1), the Department requests that the respective works of the supporting specialist are thoroughly reviewed and signed off by the primary specialist.

Please ensure that the Extraction Plan is prepared in accordance with Condition 2, Schedule 3 of DA 504-00.

If you wish to discuss the matter further, please contact Polina Golberg on 02 8275 1072 or via email at polina.golberg@dpie.nsw.gov.au.

Yours sincerely

Carl Dumpleton,
A/Director – Energy and Resource Assessments
As nominee of the Planning Secretary

Appendix 2 - Subsidence Compliance and Obligations Register

Development Consent Schedule 2 Condition Requirements

Condition	Condition Requirement	Location Addressed
1	Obligation to Minimise Harm to the Environment 1. The Applicant must implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.	Applied throughout EP Main Report, specifically the Mine Design and adaptive management
2	Terms of Approval 2. The Applicant must carry out the development: • generally in accordance with the EIS and Statement of Commitments; and • in accordance with the conditions of the consent.	Applied throughout document and mine design
5	5. This consent shall lapse on 31 December 2026.	Second workings planned before 31 Dec 2026. DA-504-00 MOD 11 submitted to increase consent period.
10	Protection of Public Infrastructure 10. The Applicant must: (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and (b) relocate, or pay the full costs associated with relocating any public infrastructure that needs to be relocated as a result of the development.	This EP **Section 6.6** component Management Plans
11	Operation of Plant and Equipment 11. The Applicant must ensure that all plant and equipment used at the site, or used in connection with the development, are: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	Acknowledged

Development Consent Schedule 3 Condition Requirements

Condition	Condition Requirement	Location Addressed
1	Subsidence Impact Assessment Criteria 1. The Applicant must ensure that surface subsidence generated by the development does not exceed the criteria listed in Table 1. Table 1: Subsidence Impact Assessment Criteria Level of Extraction Subsidence Tilt Horizontal Strain (compressive and tensile) First Workings 20 mm 1.0 mm/m 1.0 mm/m Partial Extraction 100 mm 3.0 mm/m 2.0 mm/m Note: The first workings and partial extraction areas refer to those areas shown conceptually on Figure 5.6 (revised) of the Supplementary Report, as reproduced in Appendix 2.	Appendix 4 Appendix 5 **Section 3** of the EP Main Report First workings subsidence protection zone replicated in Graphical Plan 1 Component Management Plans
2	2. From 31 October 2021, the Applicant must prepare an Extraction Plan for all second workings on the site of the development that are not covered by an existing approved Subsidence Management Plan, to the satisfaction of the Secretary. Each Extraction Plan must:	This Extraction Plan
2a	(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;	Appendix 1
2b	(b) be prepared in consultation with the Resources Regulator, DPE Water, BCS, EPA and WaterNSW;	**Appendix 3**
2c	(c) include detailed plans of existing and proposed first and second workings and overlying surface features, including any applicable adaptive management measures;	See Graphical Plans and TARPs
2d	(d) include adequate consideration of mine roof and floor conditions, pillar width to height ratio, final pillar design dimensions and the long-term stability of pillars which has been undertaken in consultation with the Resources Regulator;	Appendix 3 **Appendix 4** **Appendix 5**
2e	(e) provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed mining covered by the Extraction Plan, incorporating any relevant information obtained since this consent;	**Appendix 4** **Appendix 5**
2f	describe in detail the performance indicators to be implemented to ensure compliance with the subsidence impact assessment criteria in Table 1 and water resources impact assessment criteria in condition 5 schedule 3, and manage or remediate any impacts and/or environmental consequences;	Volume 2 - Component Management Plans **Section 5** **Section 6**
2g (i)	Include a (i) Subsidence Monitoring Program which has been prepared in consultation with the Resources Regulator to: • describe the ongoing conventional and non-conventional subsidence monitoring program; • provide data to assist with the management of risks associated with conventional and non-conventional subsidence; • validate the conventional and non-conventional subsidence predictions; • analyse the relationship between the predicted and resulting conventional and nonconventional subsidence effects and predicted and resulting impacts under the plan and any ensuing environmental consequences; and • inform the adaptive management process;	Volume 2 – 918 Panel Subsidence Monitoring Program **Section 5**
2g (ii)	(ii) Built Features Management Plan which has been prepared in consultation with the Resources Regulator, to manage the potential subsidence impacts of the proposed underground workings on built features	Volume 2 – 918 Panel Built Features Management Plan

2g(iii)	(iii) Water Management Plan which has been prepared in consultation with DPE Water and BCS, which provides for the management of potential impacts and environmental consequences of the proposed underground workings on watercourses and aquifers, including: • detailed baseline data on: – surface water flows, quality and geomorphic conditions of watercourses and/or water bodies that could be affected by subsidence; and – groundwater levels, yield and quality in the region, including for privately-owned licensed bores; • detailed surface and groundwater impact assessment criteria, including specific trigger levels for: – investigating any potentially adverse impacts on water resources or water quality; – active remediation of geomorphic and erosional impacts (including supporting justification for the selected triggers); and – providing compensatory water supply to affected water users; • a surface water monitoring program to monitor and report on: – stream flows and quality; – stream and riparian vegetation; – channel and bank stability; and – the effectiveness of remediation measures in controlling geomorphic and erosional impacts; • a groundwater monitoring program to monitor and report on: – groundwater inflows to the underground mining operations; – the height of groundwater depressurisation; – height of fracturing above extraction areas following mining; – background changes in groundwater yield/quality against mine-induced changes, in particular, on privately-owned groundwater bores in the vicinity of the site; – permeability, hydraulic gradient, flow direction and connectivity of the deep and shallow groundwater aquifers; and – impacts of the development on groundwater dependent ecosystems; a description of any adaptive management practices implemented to guide future mining activities in the event of greater than predicted impacts on aquatic habitat; • a program to validate the surface water and groundwater models for the development, and compare monitoring results with modelled predictions; and • a plan to respond to any exceedances of the surface water and groundwater assessment criteria.	Volume 2 – 918 Panel Water Management Plan
2g(iv)	(iv) Biodiversity Management Plan which: • has been prepared in consultation with BCS; • establishes baseline data for existing habitat within the subsidence area, including water table depth, vegetation condition, stream morphology, key fish habitat and threatened species habitat; and • provides for the adaptive management of potential impacts and environmental consequences of the proposed second workings on aquatic and terrestrial flora and fauna, with a specific focus on threatened species, populations and their habitats, EECs/CEECs and water dependent ecosystems;	Volume 2 – 918 Panel Biodiversity Management Plan
2g(v)	(v) Land Management Plan which: • has been prepared in consultation with any affected public authorities; • provides for the management of potential impacts and/or environmental consequences of the proposed underground workings on land in general, with a specific focus on cliffs, pagodas, steep slopes and gorges;	Volume 2 – 918 Panel Land Management Plan
2g(vi)	(vi) Heritage Management Plan which: • has been prepared in consultation with Heritage NSW, Council and relevant stakeholders for both Aboriginal heritage and non-Aboriginal heritage items; 10 • includes a pre-mining assessment of the condition and structure of heritage items within the subsidence area; • describes the measures to be implemented to: – protect, monitor and manage potential environmental consequences of the proposed second workings on identified heritage items; – manage the discovery of suspected human remains and any new Aboriginal objects or Aboriginal places, including provisions for burials, over the life of the development; and – facilitate ongoing consultation and involvement of Registered Aboriginal Parties in the conservation and management of Aboriginal cultural heritage sites within the subsidence area;	Volume 2 – 918 Panel Heritage Management Plan
2g(vii)	(vii) Public Safety Management Plan which has been prepared in consultation with the Resources Regulator, which ensures public safety and manages access on the site;	Volume 2 – 918 Panel Public Safety Management Plan

2g(viii)	(viii) Trigger Action Response Plan/s, which contain: • appropriate triggers to warn of increased risk of exceedance of any performance measure; • specific actions to respond to high risk of exceedance of any performance measure to ensure that the measure is not exceeded; • an assessment of remediation measures that may be required if exceedances occur and the capacity to implement the measures; and • adaptive management where monitoring indicates that there has been an exceedance of any impact assessment criteria in Table 1 or condition 5, or where any such exceedance appears likely; and	Volume 2 – TARPs within component Management Plans and Summary TARP in 918 Panel Subsidence Monitoring Program
2g(ix)	(ix) Contingency Plan that expressly provides for: • adaptive management where monitoring indicates that there has been an exceedance of any impact assessment criteria in Table 1 or condition 5, or where any such exceedance appears likely; • an assessment of remediation measures that may be required if exceedances occur and the capacity to implement those measures;	Volume 2 – Contingency and Adaptive management within component Management Plans
2h	(h) propose appropriate revisions to the Rehabilitation Plan required under condition 29 schedule 3; and	Clarence website
2i	(i) include a program to collect sufficient baseline data for future Extraction Plans.	**Section 7.2**
2A	2A. The Applicant must not undertake second workings until the relevant Extraction Plan is approved by the Planning Secretary.	918 Panel second workings not commenced as per Graphical Plans.
2B	2B. The Applicant must implement the Extraction Plan as approved by the Planning Secretary.	Post – approval conditions – Extraction Plan not approved. Second workings in 918 Panel not commenced.
5	**Water Resources Impact Assessment Criteria** 5. The Applicant must ensure that the development does not result in any: (a) significant inflows to mine workings; (b) reduction in pumping yield in privately-owned groundwater bores; (c) reduction in surface flows and groundwater baseflow to upland swamps (Newnes Plateau Shrub Swamps) and wetlands; and (d) reduction in surface flows and groundwater baseflow to waterbodies including Marrangaroo Creek, Farmers Creek, Dargans Creek, Wolgan River, Dumbano Creek, Bungleboori Creek, and Wollangambe River (excluding reduction in flows associated with the proposed water transfer scheme), to the satisfaction of the Planning Secretary. Note: Each of these impact assessment criteria must be quantified in the respective sub-plans of the Water Management Plan (see condition 6 below), to the satisfaction of the Planning Secretary.	Volume 2 – Water Management Plan **Section 6.2.1** **Appendix 7**
29	29. The Proponent shall prepare and implement a Rehabilitation Management Plan for the development, in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992.	Clarence website

Schedule 4 Additional Procedures

Condition	Commitment	Location Addressed
1	NOTIFICATION OF LANDOWNERS 1. If the results of monitoring required in schedule 3 identify that impacts generated by the development are greater than the relevant impact assessment criteria in schedule 3, then the Applicant must notify the Planning Secretary and the affected landowners and/or existing or future tenants (including tenants of mine owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the development is complying with the criteria in schedule 3.	**Section 6.7**

Schedule 5 Additional Procedures Relating to the Extraction Plan

Condition	Commitment	Location Addressed
5	REPORTING Annual Reporting 5. The Applicant must prepare and submit an Annual Review to the Planning Secretary and the relevant agencies. This report must: (a) identify the standards and performance measures that apply to the development; (b) describe the works carried out in the last 12 months; (c) describe the works that will be carried out in the next 12 months; (d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years; (e) include a summary of the monitoring results for the development during the past year, (f) include an analysis of these monitoring results against the relevant: • impact assessment criteria; • monitoring results from previous years; and • predictions in the EIS; (g) identify any trends in the monitoring results over the life of the development; (h) identify any non-compliance during the previous year; and (i) describe what actions were, or are being taken to ensure compliance.	**Section 6.7**
5A	Incident Notification 5A. The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing via the Department's Major Projects Website and identify the development (including the development application number and name) and set out the location and nature of the incident.	**Section 6.7**
5B	5B. Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing via the Department's Major Projects Website and identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the noncompliance. Note: A non-compliance which has been notified as an incident does not need to also be notified as a noncompliance.	**Section 6.7**
9	The CCC must: (d) review and provide comment on the environmental performance of the development, including any environmental management plans, monitoring results, audit reports, or complaints.	**Section 2.2** **Appendix 3**
10	10. The Applicant must, at its own expense: (b) provide the Committee with regular information on the environmental performance and management of the development; (g) respond to any comments or recommendations the Committee may have in relation to the environmental management or performance of the development;	**Section 2.2** **Appendix 3**
11	ACCESS TO INFORMATION 11. Within 1 month of the approval of any management plan/strategy required under this consent (or any subsequent revision of these management plans/strategies), the completion of the independent audits required under this consent, or the completion of the Annual Review, the Applicant must: (a) provide a copy of the relevant document/s to the Council, relevant agencies and the CCC; (b) ensure that a copy of the relevant documents is made publicly available at the mine; and © put a copy of the relevant document/s on the Applicant's website, to the satisfaction of the Planning Secretary.	N/A – Post – approval conditions - Extraction Plan not yet approved. **Section 6.7**
12	12. During the life of the development, the Applicant must: (a) make a summary of the results of all monitoring required under this consent publicly available both at the mine and on the Applicant's website; and (b) update these results on a regular basis (at least every 3 months), to the satisfaction of the Planning Secretary.	N/A – Post – approval conditions - Extraction Plan not yet approved. **Section 6.7**
13	REVISION OF STRATEGIES, PLANS OR PROGRAMS 13. Within 3 months of: (a) the submission of an incident report under condition 5A of Schedule 5; (b) the submission of an annual review under condition 5 of Schedule 5; (c) the submission of an audit report under condition 6 of Schedule 5; or (d) any modification to the conditions of this consent (unless the conditions require otherwise), the Applicant must review the strategies, plans, and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary. Note: This is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve the environmental performance of the development.	N/A – Post – approval conditions - Extraction Plan not yet approved. **Section 6.8**
APPENDIX 2:	MINE PLAN AND SUBSIDENCE PROTECTION ZONES	Volume 3 – Graphical Plans Subsidence Protections Zones **Figure 1**

WHS Legislation and Clause	Condition Requirement	Section Addressed
WHS Regulation 2017 Clause 34	**Duty to identify hazards** A duty holder, in managing risks to health and safety, must identify reasonably foreseeable hazards that could give rise to risks to health and safety.	**Section 1.1** **Section 2.4** Volume 2 - Component Management Plans
WHS Regulation 2017 Clause 35	**Managing risks to health and safety** A duty holder, in managing risks to health and safety, must: (a) eliminate risks to health and safety so far as is reasonably practicable, and (b) if it is not reasonably practicable to eliminate risks to health and safety, minimise those risks so far as is reasonably practicable.	**Section 1.1** **Section 2.4** Volume 2 - Component Management Plans Appendix 4 Appendix 5 **Section 3**
WHS Regulation 2017 Clause 36	**Hierarchy of control measures** (1) This clause applies if it is not reasonably practicable for a duty holder to eliminate risks to health and safety. (2) A duty holder, in minimising risks to health and safety, must implement risk control measures in accordance with this clause. (3) The duty holder must minimise risks, so far as is reasonably practicable, by doing 1 or more of the following: (a) substituting (wholly or partly) the hazard giving rise to the risk with something that gives rise to a lesser risk, (b) isolating the hazard from any person exposed to it, (c) implementing engineering controls. (4) If a risk then remains, the duty holder must minimise the remaining risk, so far as is reasonably practicable, by implementing administrative controls. (5) If a risk then remains, the duty holder must minimise the remaining risk, so far as is reasonably practicable, by ensuring the provision and use of suitable personal protective equipment. **Note.** A combination of the controls set out in this clause may be used to minimise risks, so far as is reasonably practicable, if a single control is not sufficient for the purpose.	**Section 1.1** **Section 3** Volume 2 - Component Management Plans Appendix 4 Appendix 5
WHS Regulation 2017 Clause 37	**Maintenance of control measures** A duty holder who implements a control measure to eliminate or minimise risks to health and safety must ensure that the control measure is, and is maintained so that it remains, effective, including by ensuring that the control measure is and remains: (a) fit for purpose, and (b) suitable for the nature and duration of the work, and (c) installed, set up and used correctly.	Volume 2 - Component Management Plans **Section 5** **Section 6**
WHS Regulation 2017 Clause 38	**Review of control measures** (1) A duty holder must review and as necessary revise control measures implemented under this Regulation so as to maintain, so far as is reasonably practicable, a work environment that is without risks to health or safety. (2) Without limiting subclause (1), the duty holder must review and as necessary revise a control measure in the following circumstances: (a) the control measure does not control the risk it was implemented to control so far as is reasonably practicable, (b) before a change at the workplace that is likely to give rise to a new or different risk to health or safety that the measure may not effectively control, (c) a new relevant hazard or risk is identified, (d) the results of consultation by the duty holder under the Act or this Regulation indicate that a review is necessary, (e) a health and safety representative requests a review under subclause (4). (3) Without limiting subclause (2) (b), a change at the workplace includes: (a) a change to the workplace itself or any aspect of the work environment, or (b) a change to a system of work, a process or a procedure. (4) A health and safety representative for workers at a workplace may request a review of a control measure if the representative reasonably believes that: (a) a circumstance referred to in subclause (2) (a), (b), (c) or (d) affects or may affect the health and safety of a member of the work group represented by the health and safety representative, and (b) the duty holder has not adequately reviewed the control measure in response to the circumstance.	**Section 5** **Section 6.8** Volume 2 - Component Management Plans Volume 2 - 918 Panel Subsidence Monitoring Program **Section 6**
WHS Regulation (Mines and Petroleum Sites) 2022	**Management of risks to health and safety** (Part 3, Division 1, Subdivision 1, Section 14) (1) A person conducting a business or undertaking at a mine or petroleum site must manage risks to health and safety associated with mining	Volume 2 - Component Management Plans

WHS Legislation and Clause	Condition Requirement	Section Addressed
Management of Risks to Health and Safety	operations or petroleum operations at the mine or petroleum site in accordance with the WHS Regulations, Part 3.1 . (2) A person conducting a business or undertaking at a mine or petroleum site must ensure that a risk assessment is conducted in accordance with this section by a person who is competent to conduct the risk assessment having regard to the nature of the hazard. (3) In conducting a risk assessment, the person must have regard to: (a) the nature of the hazard, and (b) the likelihood of the hazard affecting the health or safety of a person, and (c) the severity of the potential health and safety consequences. (4) Subsection (3) does not limit the operation of another requirement to conduct a risk assessment under this Regulation. (5) A person conducting a business or undertaking at a mine or petroleum site who is the operator of the mine or the petroleum site or who is a contractor must keep a record of the following: (a) each risk assessment conducted under this section and the name and competency of the person who conducted the risk assessment, (b) the control measures implemented to eliminate or minimise any risk that was identified by the risk assessment. (6) A person conducting a business or undertaking at a mine or a petroleum site is not required to keep a record of a risk assessment if: (a) the risk assessment is required to be carried out by an individual before the worker commences a tasks that forms part of an activity, and (b) the person keeps a record of risk assessments that addresses the overall activity being undertaken, of which the task forms a part. (7) A record kept under subclause (5) by an operator of a mine or petroleum site forms part of: (a) the safety management system of the mine or petroleum site, and (b) the records of the mine or petroleum site. (8) A record, kept under subsection (5) by a contractor who has prepared a contractor health and safety management plan, forms a part of the plan.	
WHS Regulation (Mines and Petroleum Sites) 2022 Review of Control Measures	**Review of control measures** (Part 3, Division 1, Subdivision 1, Section 15) (1) A person conducting a business or undertaking at a mine or petroleum site must review and as necessary revise control measures implemented under section 14(5)(b) in the following circumstances: (a) an audit of the effectiveness of the safety management system for the mine or petroleum site indicates a deficiency in a control measure, (b) a worker is moved from a hazard or assigned to different work in response to a recommendation contained in a health monitoring report provided under Part 4, (c) an incident referred to in section 124 occurs, (d) another incident occurs that is required to be notified to the regulator under the WHS laws. (2) The operator of a mine or petroleum site must ensure that a control measure the subject of a request under the WHS Regulations, clause 38(4) is reviewed and as necessary revised, whether the request is made (a) to the operator be a health and safety representative, or (b) notified to the operator under subsection (3) (3) A person conducting a business or undertaking at the mine or petroleum site who is not the operator of the mine or petroleum site must immediately notify the mine operator of a request made to the person under WHS Regulations, clause 38(4). (4) A health and safety representative for workers at a mine or petroleum site may request a review of a control measure under WHS Regulations, clause 38 (4) as if the circumstances referred to in subsection (1) were included as a circumstance in the WHS Regulations, clause 38(4)(a)	Volume 1 – Extraction Plan Volume 2 - Component Management Plans
WHS Regulation (Mines and Petroleum Sites) 2022 Part 3, Division 2, section 27 Identification of principal hazards and conduct of risk assessments	(1) The operator of a mine or petroleum site must identify all principal mining hazards associated with mining operations or petroleum operations at the mine or petroleum site. (2) The operator must conduct, in relation to each principal mining hazard identified, a risk assessment that involves a comprehensive and systematic investigation and analysis of all aspects of risk to health and safety associated with the principal hazard. (3) The operator, in conducting a risk assessment under subclause (2), must: (a) use investigation and analysis methods that are appropriate to the principal hazard being considered, and (b) consider the principal hazard individually and also cumulatively with other hazards at the mine or petroleum site.	Centennial Risk Management System Clarence Safety Management System
WHS Regulation (Mines and Petroleum Sites) 2022	(1) The operator of a mine or petroleum site must prepare a principal hazard management plan for each principal hazard associated with	Volume 2 - 918 Panel Public Safety Management Plan

WHS Legislation and Clause	Condition Requirement	Section Addressed
Part 3, Division 2, section 28 Preparation of principal hazard management plan	mining operations or petroleum operations at the mine or petroleum site in accordance with this section and Schedule 1. (2) A principal mining hazard management plan must: (a) provide for the management of all aspects of risk control in relation to the principal hazard, and (b) as far as reasonably practicable, be set out and expressed in a way that is readily understandable by persons who use it.. (3) A principal mining hazard management plan must: (a) describe the nature of the principal hazard, and (b) describe how the principal hazard relates to other hazards associated with mining operations or petroleum operations at the mine or petroleum site, and (c) describe the analysis methods used in identifying the principal hazard, and (d) include a record of the most recent risk assessment conducted in relation to the principal hazard, and (e) describe the investigation and analysis methods used in determining the control measures to be implemented, and (f) describe all control measures to be implemented to manage risks to health and safety associated with the principal hazard, and (g) describe the arrangements in place for providing the information, training and instruction required by the WHS Regulations, clause 39 in relation to the principal hazard, and (h) refer to any design principles, engineering standards and technical standards relied on for control measures for the principal hazard, and (i) set out the reasons for adopting or rejecting each control measure considered. (4) The operator of a mine or petroleum site must consider the following when preparing a principal hazard management plan for a principal hazard at the mine or petroleum site: (a) the matters set out in Schedule 1 for the principal hazard, and (b) any other matter relevant to managing the risks associated with the principal hazard at the mine.	Appendix 4 Appendix 5 **Section 3**
WHS Regulation (Mines and Petroleum Sites) 2022 Part 3, Division 5, section 70 Subsidence	(1) In complying with section 14, the mine operator of an underground coal mine must manage risks to health and safety associated with subsidence at the mine. (2) Without limiting subsection (1), the mine operator must ensure: (a) as far as is reasonably practicable, the rate, method, layout, schedule and sequence of mining operations do not put the health and safety of any person at risk from subsidence, and (b) monitoring of subsidence is conducted, including monitoring of its effects on relevant surface and subsurface features, and (c) an investigation of subsidence and an interpretation of subsidence information is carried out only by a competent person, and (d) all subsidence monitoring data is provided to the regulator (i) in the approved way and form and (ii) at the times required by the regulator, and (e) as far as is reasonably practicable, procedures are implemented for the effective consultation, co-operation and co-ordination of action in relation to subsidence between the mine operator and relevant persons conducting any business or undertaking that is, or is likely to be, affected by subsidence	918Extraction Plan Main Report Volume 2 - Component Management Plans TARPs Appendix 4 Appendix 5 Volume 2 - 918 Panel Subsidence Monitoring Program
WHS Regulation (Mines and Petroleum Sites) 2022 Part 7, section 124 Duty to notify regulator of certain incidents S190 – dangerous incidents	(1) The operator of a mine or petroleum site must take all reasonable steps to ensure that the regulator is notified in accordance with this section after becoming aware of an incident (other than a notifiable incident) arising out of the carrying out of mining operations or petroleum operations at the mine or petroleum site, but only if the incident: (a) results in illness or injury that requires medical treatment within the meaning of schedule 9 of section 12, or (b) is a high potential incident. (5) In this section: *high potential incident* means any of the following: (m) any indication from monitoring data of the development of subsidence which may result in damage to plant or structures or a failure of ground For the WHS (MPS) Act, section 14(c), an incident in relation to a workplace that exposes a worker or other person to a serious risk to a person's health or safety emanating from an immediate or imminent exposure to one or more of following is a dangerous incident: 190(1)(p) - a failure of ground, or of slope stability control measures, or	Volume 2 - Component Management Plans TARPs Volume 2 - 918 Panel Public Safety Management Plan **Section 6.7**

WHS Legislation and Clause	Condition Requirement	Section Addressed
	190(1)(q) - rock falls, instability of cliffs, steep slopes or natural dams, occurrence of sinkholes, development of surface cracking or deformations or release of gas at the surface, due to subsidence.	
WHS Regulation (Mines and Petroleum Sites) 2022 Schedule 1, Part 1, section 6 Subsidence Principal hazard management plans – additional matters to be considered	**Subsidence** The following matters must be considered in developing the control measures to manage the risks of subsidence: (a) the characteristics of all relevant surface and subsurface features, (b) the characteristics of all relevant geological, hydrogeological, hydrological, geotechnical, topographic and climatic conditions, including any conditions that may cause elevated or abnormal subsidence or the formation of sinkholes, (c) the characteristics of any previously excavated or abandoned workings that may interact with any proposed or existing mine workings, (d) the existence, distribution, geometry and stability of significant voids, standing pillars or remnants within any old pillar workings that may interact with any proposed or existing mine workings, (e) the predicted and actual nature, magnitude, distribution, timing and duration of subsidence, (f) the rate, method, layout, schedule and sequence of mining operations.	This Extraction Plan Volume 2 - Component Management Plans Volume 3 - Graphical Plans Appendix 4 Appendix 5
WHS Regulation (Mines and Petroleum Sites) 2022 Schedule 3 Part 3 Section 17 High Risk Activities	**Secondary extraction** (1) secondary extraction is identified as high risk activity: (2) The waiting period for the activity is 3 months. (3) The information and documents that must be provided in relation to any such activity are as follows: (a) details of the authoritative sources used in determining that the proposed method of work can be done safely, (b) engineering plans showing the method and sequence of extraction, endorsed by the individual nominated to exercise the statutory function of mining engineering manager at the mine, (c) information about the land above or near the proposed activity including land use and details of who owns or occupies any land that may be affected by subsidence, (d) for a pillar extraction, details of the procedures for the recovery of buried and immobile mining plant in or around a goaf, (e) details of how the risks to the health and safety of workers and other persons from subsidence caused by the activity will be managed.	This Extraction Plan High Risk Activity Notification for 918 Panel

Appendix 3 – Consultation

Tables 1 to 13, summarise the consultation completed for the 918 and 920 Extraction Plan and the subsequent 918 Panel Extraction Plan. The information contained within these tables demonstrates that the consultation carried out for this project has been carried out adequately.

Table 1. DPHI (formerly DPE) Consultation

Who	Date	Consultation material	Mode
DPE	24/05/2022	From DPE-Expert endorsement Letter	Email
DPE	15/06/2022	Update to the Department of Planning regarding the 918-920 extraction Plan.	Presentation
DPE	7/09/2022	Update to the Department of Planning regarding the 918-920 extraction Plan.	Presentation
DPE	8/12/2022	Update on 918-920 Extraction Plan. Presentation of mine plan, subsidence assessment outcomes, key surface features, update on timing for the component Management Plans	Presentation
DPE	21/12/2022	Provision of Draft Biodiversity Management Plan for comment	Email
DPE	17/03/2023	Update to the Department of Planning regarding the 918-920 Extraction Plan and update on consultation process. Detailed presentation on mine design, mining method, subsidence modelling and assessment process, experts and outcomes, height of fracturing analysis, justification for mining method/technique, confirmation of partial extraction method	Presentation
DPE	29/03/2023	Update of outstanding actions and mine design process for the 918-920 Extraction Plan, new layout, peer review process, presentation of adaptive management implementation	Presentation
DPE	4/4/2023	To DPE: Provision of the Partial Extraction Paper for Extraction Plan approval pathway request	Email
DPE	26/4/2023	From DPE: Confirmation that an Extraction Plan for 918-920 panels can be submitted under the existing DA504-00 consent.	Email
DPE	27/06/2023	From DPE-Expert endorsement Letter	Letter
DPE	28/06/2023	Update to the DPE on EP timing and progress update. Outline of consultation undertaken, update on groundwater model build, justification of mining technique/mining method, progress on subsidence assessments and peer review, adaptive management processes, proposed subsidence monitoring	Presentation
DPE	21/08/2023	Brief update on timing of EP for 918-920 Extraction Plan	Presentation
DPE	3/10/2023	Update to the DPE on EP timing and progress update. Outline of consultation undertaken since June, component Management Plan status update, update on additional proposed subsidence monitoring, groundwater model build and update on timing	Presentation
DPE	8/11/2023	From DPE-Expert endorsement Letter	Letter
DPE	16/11/2023	Planning Portal submission of Draft Biodiversity Management Plan for comment	Email
DPE	18/11/2023	Planning Portal submission of Draft Land Management Plan for comment	Email
DPE	19/11/2023	Planning Portal submission of Draft Subsidence Monitoring Program for comment	Email
DPE	21/11/2023	Planning Portal submission of Draft Extraction Plan Main document (Volume 1) and Graphical Plans (Volume 3)	Email

Who	Date	Consultation material	Mode
DPE	05/01/2024	Planning Portal submission of the final 918 and 920 Panels BFMP and PSMP	Planning Portal
DPE	12/01/2024	Planning Portal submission of the final 918 and 920 Panels HMP	Planning Portal
DPE	22/03/2024	Planning Portal submission of the final 918 and 920 Panels WMP, LMP, BMP, Subsidence Monitoring Program, Graphical Plans, Extraction Plan Main Report for assessment	Planning Portal
DPHI	29/10/2024	Withdrawal of 918&920 Panels Extraction Plan	Meeting and email
DPHI	29/10/2024	Provision of August 2024 NSW regulatory feedback on 918&920 Panels Extraction Plan	Email
DPHI	30/10/2024	Acknowledgement of withdrawal and cease assessment of 918&920 Panels Extraction Plan Items to address in 918 Panel Extraction Plan	Letter
DPHI	6/3/2025	Endorsement Letter request of suitably qualified and experienced persons to author EP	Planning Portal
DPHI	17/4/2025	Endorsement Letter of suitably qualified and experienced persons to author EP	Planning Portal
DPHI	2/6/2025	Presentation on 918 Panel mine design, subsidence modelling, subsidence and environmental monitoring	Meeting
DPHI	23/1/2026	IEAPM recommendation letter to DPHI Clarence Colliery 918 Panel Revised Extraction Plan IEAPM's Responses to DPHI Request for Further Advice	Email
DPHI	26/2/2026	Planning Portal submission of the draft 918 Extraction Plan and associated documentation Including 30/10/2024 Letter items	Planning Portal
DPHI	24/4/2026	Submission of 918 Panel Extraction Plan with response from March/April consultation from NSW regulators on Planning Portal Notification to DPHI that final 918 EP submitted on the portal	Planning Portal Email

Table 2. IEAPM Consultation

Who	Date	Consultation material	Mode
IEAPM	2/6/2025	Presentation on 918 Panel mine design, subsidence modelling, subsidence and environmental monitoring	Meeting
IEAPM	19/6/2025	Provision of proposed Groundwater Monitoring locations and types	Email
IEAPM	3/7/2025	Provision of proposed Ecological Monitoring locations and types	Email
IEAPM	23/7/2025	Provision of Draft SCT 918 Geotechnical and Subsidence Report	Email
IEAPM	8/10/2025	IEAPM Subsidence and Geotechnical matters email	Email
IEAPM	11/11/2025	Provision of SCT letter response to IEAPM 8 October technical matters email. Provision of 918 Panel MSEC Subsidence predictions and Impact assessment report via data transfer.	Email / data transfer
IEAPM	11/11/2025	IEAPM GW and Ecological monitoring comments received	Email
IEAPM	14/11/2025	IEAPM provided a figure with recommended eDNA aquatic ecological monitoring locations	Email
IEAPM	15/12/2025	IEAPM Presentation to DPHI and Clarence	Meeting / Presentation
IEAPM	23/1/2026	IEAPM recommendation letter as provided by DPHI *Clarence Colliery 918 Panel Revised Extraction Plan IEAPM's Responses to DPHI Request for Further Advice*	Email
IEAPM	26/2/2026	Notification to IEAPM that draft 918 EP has been submitted	Email

Who	Date	Consultation material	Mode
IEAPM	24/4/2026	Notification to IEAPM that final 918 EP has been submitted to DPHI	Email

Table 3. DCCEEW-CPHR,BCS,NPWS Consultation

Who	Date	Engagement Mode	Mode
BCS	20/05/2022	Provision of Draft Biodiversity Management Plan for comment	Email
NPWS	9/06/2022	Introduction to the 918-920 EP mining area	Presentation
NPWS	9/09/2022	Detailed the requirements of the Extraction Plan as required under DA-504-00. Listed the component Management Plans required for the 918-920 Extraction Plan and presented surface features within the EP Area.	Presentation
NPWS	29/09/2022	To NPWS – draft Heritage Management Plan, request for feedback	Letter
NPWS	31/10/2022	From NPWS - comments on draft Heritage Management Plan	Letter
NPWS	20/12/2022	Provision of Draft Built Features Management Plan for comment	Email
NPWS	20/12/2022	Provision of Draft Public Safety Management Plan for comment	Email
NPWS	20/12/2022	Update on 918-920 Extraction Plan. Presentation of mine plan, subsidence assessment outcomes, key surface features, update on timing for component Management Plans	Presentation
NPWS	21/12/2022	Provision of Draft Biodiversity Management Plan for comment	Email
BCS	21/12/2022	Provision of Draft Biodiversity Management Plan for comment	Email
NPWS	13/02/2023	Provision of information – data files	Email
NPWS	16/01/2023	Provision of 918 and 920 Panels Subsidence Report	Email
NPWS	23/02/2023	Provision of Draft Public Safety Management Plan for comment	Email
NPWS	14/04/2023	From NPWS: Provision of comments on Draft Built Features Management Plan	Email
NPWS	14/04/2023	From NPWS: Provision of comments to Draft Public Safety Management Plan	Email
NPWS	19/06/2023	Detailed presentation on the 918-920 Extraction Plan including justification for the proposed mining technique and partial extraction mining method, how the proposed method is within Clarence mining experience, adaptive management processes to be employed, proposed monitoring, subsidence assessment process and outcomes including peer review process, analysis of height of fracturing, groundwater modelling approach, environmental outcomes and EP progress update.	Presentation
BCS	19/06/2023	Detailed presentation on the 918-920 Extraction Plan including justification for the proposed mining technique and partial extraction mining method, how the proposed method is within Clarence mining experience, adaptive management processes to be employed, proposed monitoring, subsidence assessment process and outcomes including peer review process, analysis of height of fracturing, groundwater modelling approach, environmental outcomes and EP progress update.	Presentation
BCS	16/11/2023	Provision of updated Draft Biodiversity Management Plan for comment	Email
NPWS	16/11/2023	Provision of updated Draft Biodiversity Management Plan for comment	Email
NPWS	18/11/2023	Provision of Draft Land Management Plan for comment	Email
NPWS	19/11/2023	Provision of Draft Subsidence Monitoring Program for comment	Email
NPWS	21/11/2023	Provision of Draft Extraction Plan Main document (Volume 1) and Graphical Plans (Volume 3)	Email
BCS	21/11/2023	Provision of Draft Extraction Plan Main document (Volume 1) and Graphical Plans (Volume 3)	Email

Who	Date	Engagement Mode	Mode
BCS	23/11/2023	Provision of Draft Water Management Plan for comment	Email
NPWS	23/11/2023	Provision of Draft Water Management Plan for comment	Email
NPWS	23/11/2023	Detailed presentation on the 918-920 extraction plan including, mining technique/mining methods proposed, justification for the mining technique, subsidence assessments/predictions and modelling calibration, proposed subsidence monitoring, environmental baseline outcomes,	Presentation and site visit
BCS	23/11/2023	Detailed presentation on the 918-920 extraction plan including, mining technique/mining methods proposed, justification for the mining technique, subsidence assessments/predictions and modelling calibration, proposed subsidence monitoring, environmental baseline outcomes,	presentation and site visit
BCS	4/12/2023	Request extension to review draft Extraction Plan and component management plans out to 31 January 2024	Email
BCS & NPWS	4/12/2023	Request for an extensive set of raw data files and spatial drawing files	Email
NPWS	11/12/2023	Request extension to review draft Extraction Plan and component management plans out to 31 January 2024	Email
BCS & NPWS	11/12/2023 13/12/2023	Provision of extensive set of raw data files and spatial files	Email
NPWS	19/12/2023	Request for data and queries on data provided	Email
BCS	08/01/2024	Provision of final data files	Email
NPWS	11/01/2024	Provision of final data files	Email
NPWS	30/01/2024	Request extension of time to provide feedback on draft Extraction Plan and component management plans out to 2 February 2024	Planning Portal
BCS	02/02/2024	Request extension of time to provide feedback on draft Extraction Plan and component management plans out to 2 February 2024	Planning Portal
NPWS and BCS	02/02/2024	Request extension of time to provide feedback on draft Extraction Plan and component management plans out to 9 February 2024	Planning Portal
NPWS and BCS	09/02/2024	From NPWS and BCS – provision of feedback on the 918 and 920 Extraction Plan, subsidence assessments, LMP, Subsidence Monitoring Program, WMP and BMP	Planning Portal
NPWS and BCS	21/03/2024	To NPWS and BCS response to feedback provided on 09/02/2024. Included updated copy of the LMP	Email
DCCEEW NPWS/BCS	22/8/2024	Request for Further information for 918/920 Extraction Plan	Email via DPHI
DCCEEW NPWS/CPHR	22/9/2025	Introductory Letter to 918 Extraction Plan	Planning Portal
DCCEEW NPWS/CPHR	8/10/2025	Request for Extraction Plan with additional Spatial and Environmental Monitoring data request	Planning Portal
DCCEEW/CPHR	25/2/2026	Clarence Site provision of Spatial and Environmental Monitoring data from Oct 2025 request	Email
DCCEEW NPWS/CPHR	26/2/2026	Provision of response to matters from DCCEEW-CPHR 918 and 920 Panel August 2024 Request for further information	Planning Portal EP Document - Appendix 3
DCCEEW NPWS/CPHR	26/2/2026	Provision of draft 918 Extraction Plan and associated documentation	Planning Portal
DCCEEW NPWS/CPHR	March 2026 March 2026	Two consultation time extensions from 26 March deadline to 9 April and 17 April.	Planning Portal

Who	Date	Engagement Mode	Mode
DCCEEW NPWS/CPHR	17/4/2026 21/4/2026	DCCEEW/NPWS letter with project objection, recommendations and technical issues on approval pathway, subsidence, water and biodiversity	Letter via Planning Portal/Email
DCCEEW NPWS/CPHR	24/4/2026	Response to 17 April letter is contained in 918 Panel Extraction Plan Consultation Appendix and also within the appropriate management plans (Water Management and Biodiversity Management Plan)	Planning Portal

Table 4. (DCCEEW) - Commonwealth

Who	Date	Consultation material	Mode
DCCEEW	20/04/2023	Detailed presentation on proposed mining technique and subsidence modelling outcomes and subsidence monitoring predominantly for 918/920	Presentation
DCCEEW	22/05/2023	Update on impact assessments for 918/920. Subsidence modelling outcomes, proposed subsidence monitoring, new mine layout, introduction to the groundwater model and specific considerations of IESC requirements, height of fracturing analysis, subsidence and environmental outcomes, surface features within the EP Area, results of baseline monitoring and heritage surveys, update on timing	Presentation
DCCEEW	21/11/2023	Provision of Groundwater model report and draft Water Management Plan in advance of meeting to be held on 4 December 2023	Email
DCCEEW	4/12/2023	Detailed presentation on the groundwater model report including model build and outputs. Recap on the mine design, mining process, mining technique, subsidence assessment/predictions and monitoring	Presentation
DCCEEW	28/2/2024	Proposed Action - Secondary Extraction of the 918 and 920 Panels using Partial Extraction Mining Methods	Business Portal
DCCEEW	18/7/2024	918/920 Panels Notification of referral decision and designated proponent – controlled action and assessment approach	Letter
DCCEEW	31/8/2024	Request for Further information required for preliminary documentation for Secondary Extraction of the 918 and 920 panels	Letter
DCCEEW	20/10/2025	918 Panel Controlled Action Variation Application	Letter
DCCEEW	14/11/2025	Notification of decision to accept a varied 918 Panel proposal	Letter
DCCEEW	26/3/2026	918 Extraction Plan update	Presentation

Table 5. DCCEEW-Water (formerly DPE-Water)

Who	Date	Consultation material	Mode
DPE-Water	25/07/2023	Detailed presentation on the 918-920 Extraction Plan including justification for the proposed mining technique and partial extraction mining method, how the proposed method is within Clarence mining experience, adaptive management processes to be employed, proposed monitoring, subsidence assessment process and outcomes including peer review process, analysis of height of fracturing, groundwater modelling approach, environmental outcomes and EP progress update.	Presentation
DPE-Water	21/11/2023	Provision of Draft Extraction Plan Main document (Volume 1) and Graphical Plans (Volume 3)	Email
DPE-Water	23/11/2023	Provision of Draft Water Management Plan for comment	Email
DPE- Water	18/12/2023	Request to extend feedback on Water Management Plan and Extraction Plan out to 24 January 2024	Email
DPE- Water	24/01/2024	Feedback on the 918-920 Panels Water Management Plan Feedback on the 918 and 920 Extraction Plan Main report	Letter Letter

Who	Date	Consultation material	Mode
DCCEEW-Water	24/4/2024	Feedback adequately addressed in 29 February 2024 WMP Version. No further comments.	Letter
DCCEEW-Water	22/9/2025	Introductory Letter to 918 Panel EP	Letter
DCCEEW-Water	26/2/2026	Planning Portal submission of the draft 918 Extraction Plan and associated documentation	Planning Portal
DCCEEW-Water	26/3/2026	DCCEEW-Water group response letter with recommendations to; • confirm the availability of water entitlement to account for water take where Water Access Licences are linked to additional mines. • • Confirm if water take is to occur from the Lachlan Fold Belt Metropolitan Groundwater Source. • • Implement standard 6 monthly monitoring of watercourse stability. • • Include details of remedial and preventative actions in the Trigger Action Response Plan and attachment for details.	Planning Portal
DCCEEW-Water	24/4/2026	Response to 26 March letter is contained in the consultation section of the 918 Water Management Plan and supporting documentation. Notification of 918 Panel Extraction Plan submission on Planning Portal to DPHI	Email

Table 6. WaterNSW

Who	Date	Consultation material	Mode
Water NSW	25/07/2023	Detailed presentation on the 918-920 Extraction Plan including justification for the proposed mining technique and partial extraction mining method, how the proposed method is within Clarence mining experience, adaptive management processes to be employed, proposed monitoring, subsidence assessment process and outcomes including peer review process, analysis of height of fracturing, groundwater modelling approach, environmental outcomes and EP progress update.	Presentation
Water NSW	21/11/2023	Provision of Draft Extraction Plan Main document (Volume 1) and Graphical Plans (Volume 3)	Email
Water NSW	7/12/2023	From WNSW-*Extraction Plan Area located to the north and outside Sydney Drinking Water Catchment. As such, WaterNSW has no comments in relation to Extraction Plan including Water Management Plan.*	Email
Water NSW	22/9/2025	Introductory Letter to 918 Panel EP	Planning Portal
Water NSW	14/10/2025	Introductory Letter receipt acknowledged	Planning Portal
Water NSW	26/2/2026	Planning Portal submission of the draft 918 Extraction Plan	Planning Portal
Water NSW	20/3/2026	Water NSW response letter included; • Concern on mining method impact on SDWC • Review undertaken of DA504-00 consent, modifications and supporting EIS and modification reports • Requested clarification on how the proposed mining approach aligns with the existing approvals under DA 504-00, rather than requiring a Consent Modification prior to assessment and approval	Planning Portal
Water NSW	24/4/2026	Response to 20 March letter is contained in 918 Panel Extraction Plan Consultation Appendix and also within the updated 918 Water Management Plan Notification of 918 Panel Extraction Plan submission	Planning Portal Email

Table 7. EPA

Who	Date	Consultation material	Mode
EPA	15/11/2023	Correspondence proposing and scheduling a presentation to the EPA regarding the 918-920 Extraction Plan. EPA response was "given the EPAs involvement in the management of subsidence is limited, the EPA consider a review of the finalised plans would suffice."	Emails
EPA	21/11/2023	Provision of Draft Extraction Plan Main document (Volume 1) and Graphical Plans (Volume 3) requesting feedback on the draft documents	Email
EPA	12/01/2024	Forwarded Draft Extraction Plan Main document (Volume 1) and Graphical Plans (Volume 3) again (for convenience) requesting feedback on the draft documents	Email
EPA	31/01/2024	Requested update on feedback regarding the consultation phase associated with the Extraction Plan Main Report	Email
EPA	28/02/2024		
EPA	14/10/2025	Introductory Letter receipt acknowledged	Planning Portal
EPA	26/2/2026	Planning Portal submission of the draft 918 Extraction Plan	Planning Portal
EPA	24/4/2026	No response received to date	Planning Portal
EPA	24/4/2026	Notification of 918 Panel Extraction Plan submission on Planning Portal to DPHI	Email

Table 8. Heritage NSW

Who	Date	Consultation material	Mode
Heritage NSW	1/03/2022	Introduction letter for 918 and 920 Panels	Email
Heritage NSW	18/10/2022	Correspondence with Heritage NSW to assist NPWS HMP response	Email
Heritage NSW	11/12/2023	From Heritage NSW: Comments received on draft HMP and the Extraction Plan Main report	Email
Heritage NSW	22/9/2025	Introductory Letter to 918 Panel EP	Planning Portal
Heritage NSW	23/9/2025	Letter Response with contacts and understanding of reduced impacts	Planning Portal
Heritage NSW	26/2/2026	Planning Portal submission of the draft 918 Extraction Plan	Planning Portal
Heritage NSW	18/3/2026	Response on draft 918 EP and associated documentation – particularly the 918 Heritage Management Plan	Planning Portal
Heritage NSW	24/4/2026	Responses on the 18 March letter is contained within the 918 Panel Extraction Plan submission, particularly within the updated 918 Heritage Management Plan taking into account HNSW comments Notification of 918 Panel Extraction Plan submission on Planning Portal to DPHI	Planning Portal Email

Table 9. Heritage Council of NSW

Who	Date	Consultation material	Mode
Heritage Council	26/2/2026	Planning Portal submission of the draft 918 Extraction Plan	Planning Portal
Heritage Council	18/3/2026	Response on draft 918 EP and associated documentation – in particular the 918 Heritage Management Plan. *"The subject site is not registered on the State Heritage Register (SHR) nor is it in the vicinity of SHR items. Heritage NSW has no further comment on the Extraction Plan."*	Planning Portal
Heritage Council	24/4/2026	Responses on the 18 March letter is contained within the 918 Panel Extraction Plan submission, particularly within the updated 918 Heritage Management Plan taking into account HNSW comments Notification of 918 Panel Extraction Plan submission on Planning Portal to DPHI	Planning Portal Email

Table 10. Resources Regulator (RR)

Who	Date	Consultation material	Mode
RR	8/02/2022	Introduction letter for 918 and 920 Panels	Email
RR	20/12/2022	Provision of Draft Built Features Management Plan for comment	Email
RR	20/12/2022	Provision of Draft Public Safety Management Plan for comment	Email
RR	23/02/2023	Provision of Draft Public Safety Management Plan for comment	Email
RR	30/08/2023	Detailed presentation on the 918-920 Extraction Plan including justification for the proposed mining technique and partial extraction mining method, how the proposed method is within Clarence mining experience, adaptive management processes to be employed, proposed monitoring, subsidence assessment process and outcomes including peer review process, analysis of height of fracturing, groundwater modelling approach, environmental outcomes and EP progress update.	Presentation
MEG	11/11/2023	Company update including 918-920 extraction plan, location, consultation, progress and timing	Presentation
RR	19/11/2023	Provision of Draft Subsidence Monitoring Program for comment	Email
RR	21/11/2023	Provision of Draft Extraction Plan Main document (Volume 1) and Graphical Plans (Volume 3)	Email
RR	13/12/2023	Response from DPE Portal submission (Table 2). From RR- *Built Features Management Plan is adequate given the low levels of risk due to the nature of the site and the expected subsidence*	Email
RR	13/12/2023	Response from DPE Portal submission (Table 2). From RR regarding the Subsidence Monitoring Program - *Based on the review of the document, the Resources regulator advises that it has no specific comments regarding mine safety or mine rehabilitation in relation to the proposals*	Letter
RR	20/12/2023	Response from DPE Portal submission (Table 2). From RR regarding the Built Features Management Plan - *Based on the review of the document, the Resources regulator advises that it has no specific comments regarding mine safety or mine rehabilitation in relation to the proposals*	Letter
RR	20/12/2023	Response from DPE Portal submission (Table 2). From RR regarding the Public Safety Management Plan – *Based on the review of the document, the Resources regulator advises that it has no specific comments regarding mine safety or mine rehabilitation in relation to the proposals*	Letter
RR	20/12/2023	Response from DPE Portal submission (Table 2). From RR regarding the Extraction Plan Main Report – *Based on the review of the document, the Resources regulator advises that it has no specific comments regarding mine safety or mine rehabilitation in relation to the proposals*	Letter
RR	22/9/2025	Introductory Letter to 918 Panel EP	Planning Portal
RR	26/2/2026	Planning Portal submission of the draft 918 Extraction Plan	Planning Portal
RR	24/3/2026	Response on draft 918 EP and associated documentation – "*Based on the review of the document, the Resources Regulator advises that is has no specific comments regarding mine safety or mine rehabilitation matters.*" No updates to documentation required	Planning Portal
RR	24/4/2026	Notification of 918 Panel Extraction Plan submission on Planning Portal To DPHI	Email

Table 11. Aboriginal Cultural Heritage Committee (ACHC)

Who	Date	Consultation material	Mode
Western Region ACHC	17/11/2021	Introduce EP and assessments to be undertaken	Presentation
Western Region ACHC	18/05/2022	update on assessment and extraction methodology for 918-920 Extraction Plan	Presentation
Western Region ACHC	19/10/2022	Update on assessments for the 918-920 Extraction Plan	Presentation
Western Region ACHC	15/03/2023	Update on assessments for the 918-920 Extraction Plan	Presentation
Western Region ACHC	13/09/2023	Update on assessments for the 918-920 Extraction Plan	Presentation
Western Region ACHC	06/03/2023	Update on the progress of the 918-920 Extraction Plan	Presentation
Western Region ACHC	2024-2026	Update on the progress of the 918 Extraction Plan	Presentation

Table 12. Registered Aboriginal Parties (RAPs)

Who	Date	Consultation material	Mode
RAPs (12 individual groups)	16/11/2021	Provision of draft survey assessment methodology for the archaeological survey of the 918-920 EP Area	Letter
RAPs (3 individual groups)	14/12/2021	Archaeological field survey of the 918-920 EP Area	Site visit and survey
RAPs (12 individual groups)	29/09/2022	Provision of draft heritage management Plan to registered Aboriginal Groups for review and comment. Wellington Valley Wiradjuri Corporation provided agreement with the draft HMP within a review letter	Letter
RAP response	24/10/2022	Agreement of draft HMP document. Wellington Valley Wiradjuri Corporation provided agreement with the draft HMP within a review letter	Email
RAP	6/11/2025	Provision of draft 918 heritage management Plan to registered Aboriginal Groups for review and comment.	Email
RAP	7/11/2025	Agreement of draft HMP document. Wellington Valley Wiradjuri Corporation provided agreement with the draft HMP within a review letter	Email
RAP	8/12/2025	Archaeological field survey	Site visit and survey

Table 13. Lithgow City Council (LCC)

Who	Date	Consultation material	Mode
LCC	22/06/2022	Introduction to the 918-920 extraction plan area, proposed mining method, subsidence criteria, Key Component Management Plans that need to be developed in consultation with the LCC	Presentation
LCC	30/09/2022	No objection to the HMP subject to the import of the registered Aboriginal parties review.	Email
LCC	30/11/2022	Update on the 918-920 extraction Plan, described the Extraction Plan requirements and the need to consult with LCC, update on subsidence modelling and assessment outcomes, discussion and presentation on the relevant features within the EP Area, update on key Component Management Plans, presentation of archaeological sites, presence of cliffs and rock features, early subsidence monitoring program,	Presentation
LCC	20/12/2022	Provision of Draft Built Features Management Plan for comment	Email

Who	Date	Consultation material	Mode
LCC	20/12/2022	Provision of Draft Public Safety Management Plan for comment	Email
LCC	25/01/2023	Brief update on progress of the 918-920 EP, noting comments from LCC on the Heritage Management Plan	Presentation
LCC	23/02/2023	Provision of Draft Public Safety Management Plan for comment	Email
LCC	27/09/2023	Detailed presentation on the 918-920 Extraction Plan including justification for the proposed mining technique and partial extraction mining method, how the proposed method is within Clarence mining experience, adaptive management processes to be employed, proposed monitoring, subsidence assessment process and outcomes including peer review process, analysis of height of fracturing, groundwater modelling approach, environmental outcomes and EP progress update	Presentation
LCC	21/11/2023	Provision of Draft Extraction Plan Main document (Volume 1) and Graphical Plans (Volume 3)	Email
LCC	22/9/2025	Introductory Letter to 918 Panel EP	Planning Portal
LCC	26/2/2026	Planning Portal submission of the draft 918 Extraction Plan	Planning Portal
LCC	4/3/2026	Response on draft 918 EP and associated documentation – Adequately addresses DA504-00 Schedule 3 Condition 2 and no objection to the Extraction Plan. No document updates required by LCC.	Planning Portal
LCC	24/4/2026	Notification of 918 Panel Extraction Plan submission	Email

Note: Representatives from the Lithgow City Council are active members of the Clarence CCC including the LCC Development Planner and the Mayor of Lithgow

Table 14. Clarence Community Consultative Committee (CCC)

Who	Date	Consultation material	Mode
Clarence CCC	17/08/2021	Update on assessments and extraction methodology	Presentation
Clarence CCC	16/11/2021	Introduce EP and assessments to be undertaken	Presentation
Clarence CCC	15/02/2022	Update on assessments and extraction methodology	Presentation
Clarence CCC	28/03/2022	Update on 918-920 Extraction Plan assessments	Presentation
Clarence CCC	20/09/2022	update of the 918/920 Extraction Plan process, mine design layout, update on Key Component Management Plans in terms of completion status	Presentation
Clarence CCC	7/06/2023	Update on 918-920 Extraction Plan assessments	Presentation
Clarence CCC	12/09/2023	Update on 918-920 Extraction Plan assessments	Presentation
Clarence CCC	22/11/2023	Provision of Component Management Plans – Public Safety Management Plan, Built Features Management Plan, Water Management Plan, Biodiversity Management Plan, Land Management Plan, Heritage Management Plan, Subsidence Monitoring Program	Email
Clarence CCC	6/12/2023	Update on 918-920 Extraction Plan assessments	Presentation
Clarence CCC	14/12/2023	Provision of draft Extraction Plan and Volume 3 – graphical plans	Email
Clarence CCC	12/03/2023	Update on 918-920 extraction plan and general updates on other approvals.	Presentation
Clarence CCC	2024-2026	Update on 918 extraction plan and general updates on other approvals.	Presentation

Response to August 2024 NSW DCCEEW/NPWS Letter

1.1 ***Assess the project as a State Significant Development Modification to DA-504-00 with the required landowner consent from NPWS.***

1.1 Response
DA-504-00 defines second workings as "*Extraction of coal by partial extraction methods".*
The proposed second workings mining method, Panel and Pillar Partial Extraction (using Shortwall), is a partial extraction method of extracting coal.

DA-504-00 allows for the approval of second workings via the Extraction Plan process. The withdrawn 918 and 920 Panels Extraction Plan and this draft 918 Panel Extraction Plan (918 EP) has been developed using the DPE (2022) guidelines and has been submitted to DPHI for assessment and determination, in consultation with other NSW regulatory bodies.

1.2 ***Refer the project to the Commonwealth Department of Climate Change, Energy, Environment and Water for a controlled action determination under the EPBC Act.***

1.2 Response
See EPBC Referral 2024/09856 for 918 and 920 Panels as submitted in April 2024 and variation to the controlled action for 918 Panel on 17 November 2025. EPBC Referral 2024/09856 Preliminary Documentation is planned to be submitted to DCCEEW-Commonwealth after the 918 EP submission.

2.1 ***Avoid all new shortwall, longwall, or miniwall mining under Newnes Plateau shrub swamps and hanging swamps, and under major streams.***

2.1 Response
Longwall and or miniwall mining methods are not contemplated or proposed as mining methods within the 918 EP. Longwall and or mini wall mining is not proposed under Newnes Plateau shrub and hanging swamps and or under major streams.

Panel and Pillar Partial Extraction (shortwall) mining is proposed in the 918 EP.
918 EP second workings shortwall mine design avoids mining beneath all Newnes Plateau shrub swamps and hanging swamps with the exception of 0.01Ha of Paddys Creek Hanging swamp. 918 EP mine design avoids second workings beneath all Strahler 3rd order and greater streams.

3.1 ***Review proposed monitoring for adaptive management in consultation with the Independent Expert Advisory Panel for Mining (IEAPM) and NSW DCCEEW.***

3.1 Response
See 918 Panel Subsidence Monitoring Program (MSEC,2026) and IEAPM January 2026 recommendation of staged approval.

4.1 ***Investigate discrepancies between modelled and observed aquifer levels.***

4.1 Response
See (JBSG, 2026) on modelled and observed aquifer levels.

4.2 ***Independently verify the groundwater model.***

4.2 Response
The 918 EP Groundwater model was developed by JBSG (2026) and independently peer reviewed by GHD (2026b) and found to be fit-for-purpose.

4.3 ***Provide an uncertainty analysis for the groundwater model.***

4.3 Response
A null-space Monte Carlo approach has been adopted to quantify uncertainty (JBSG, 2026).

5.1 ***Improve monitoring of the Burralow Formation in consultation with the Independent Expert Advisory Panel for Mining and NSW DCCEEW.***

5.1 Response
See 918 WMP (GHD, 2026) on Burralow Formation groundwater monitoring. Consultation was undertaken with the IEAPM groundwater expert between June 2025 and November 2025 on this issue. On 11 November 2025 the IEAPM provided the below email confirmation on this matter
"We have reviewed the latest GW monitoring locations against the available access trails and agree that no more useful locations can conveniently be installed without substantial landscape impacts."

6.1 ***Centennial Clarence provides the following information to DPHI and NSW DCCEEW:***
• The baseline period/dates for all swamp or stream monitoring sites or aquifer monitoring bores affected/potentially affected by mining 918 and 920

6.1a Response
920 Panel is no longer within the scope of this document given the 918 Extraction Plan scope changes. On 8 October 2025 NSW DCCEEW requested spatial and environmental monitoring data with the submission of 918 Panel Extraction Plan and this data has been provided as part of the 918 Extraction Plan 26 February 2026 submission. See baseline period tables for swamp, stream and bore monitoring outlined in GHD 918 Water Management Plan (918 WMP).

• All reference swamp(s), stream(s) or bore(s) proposed for comparison of stream flows or aquifer levels after mining of 918 and 920 occurs, and

6.1b Response
920 Panel no longer within the scope of this document given the 918 Extraction Plan scope changes. See 918 WMP (GHD, 2026) and 918 BMP (RPS, 2026).

• Before-after control-impact (BACI) assessment of past impacts, and a BACI design to enable objective assessment of impact to swamps, streams, and bores above shortwalls 918 and 920.

6.1c Response
Reporting and assessment of past impacts contained within the Clarence Colliery Annual Reviews and 4 monthly Subsidence Management Status Reports.
See 918 BMP (RPS, 2026) on BACI design.

7.1 ***Conduct an independent investigation into the 900D line subsidence exceedances as a compliance action.***

7.1 Response
On 26 July 2022 Centennial submitted to NPWS and the Resources Regulator a subsidence exceedance notification letter on the 900D line. Correspondence has been undertaken with these parties subsequent to this initial notification. On Wednesday 11 December 2024 Centennial hosted the EPA, DPHI, NPWS and BCS (now CPHR) on a site inspection which included surface inspection of the 900D line and Pagoda Swamp.

7.2 ***Review Centennial Clarence's notification protocol to ensure appropriate communication lines are in place and acted upon when required.***

7.2 Response
918 EP and associated management plans outline Clarence's personnel responsibilities and notification requirements.

7.3 Ensure future works are compliant with all aspects of the development consent – both subsidence limits and notification of impacted landowners.

7.3 Response
DA-504-00 and the 918 EP and associated management plans outline subsidence compliance reporting and notification requirements.

Response to Jan 2026 IEAPM letter for the proposed 918 Panel EP

	Recommendation	Response
1	The Applicant could improve how boundary conditions and predicted surface subsidence profiles are presented	SCT (2026) report is updated with model outcomes addressing the boundary conditions and resulting subsidence profiles
2	The Applicant could conduct a sensitivity analysis of the 2D numerical model to better understand potential sources of inaccuracy and their respective contribution to model uncertainty. Some, but not all, types of model uncertainty were discussed at videoconference held on 15 December 2025. In particular, the Applicant could adjust the modulus and to leave the pillar dimensions unchanged to better understand how modulus impacts model sensitivity.	SCT (2026) report updated with model results including a sensitivity analysis for key model assumptions of massive strata and lower bound of intact Young's Modulus. Additionally, the updated model includes a reduction in coal modulus to account for 3D pillar geometry loading in 2D.
3	The sensitivity analysis could then inform a more appropriate uncertainty for subsidence predictions derived from the 2D model compared to the current uncertainty attributed over simplistically to "+/-20mm tolerance due to natural variability and survey tolerance" (SCT Report CLR5894, Executive Summary).	Sensitivity analysis undertaken and +/-20mm tolerance due to natural variability and survey tolerance in SCT (2026) report retained due to updated model and sensitivity analysis producing subsidence less than original subsidence predictions and Airly experience of subsidence within 20mm of model predictions.
4	A pragmatic and effective approach could be to take the best endeavour predicted values and use them as a guide for adopting a staged approach to developing the mine design. The staged approach provides the opportunity to arrive at the final mine design by starting with a sufficiently conservative design and using incremental monitored outcomes to develop this design to a stage where there is an acceptable risk that performance measures will not be exceeded.	Staged assessment and approval approach is proposed in 918 EP to allow single sub-panel extraction and a subsequent hold point prior to double shortwall extraction (i.e. 918B2 extraction) commencement to allow for incremental subsidence and environmental monitoring of 918A and 918B1 extraction, comparison with and subsidence predictions and contours with ability to adjust the 918B2 sub-panel width or for DPHI to not approve 918B2 sub-panel.
5	The Applicant could simplify the central pillar design until an experience base is established.	Central pillar (also known as the 918 spine pillars) design from 1ct to 19ct is already built and unable to change. 19ct to 21ct includes gradual increases in spine pillar widths and therefore the inbye spine pillar design after 21ct as recommended by SCT (2026). Spine Pillar design is as per SCT (2026) report.

	Recommendation	Response
6	The Applicant could install appropriate pillar monitoring in 918 Panel between 918A and 918B Panels to understand the magnitude and distribution of pillar stress for single and double longwall extraction. This could provide additional critical information to inform if 918B Panel is extracted, its width and analysis of long-term pillar stability.	See MSEC (2026) Subsidence Monitoring Program includes; Underground geotechnical monitoring including pillar monitoring Note: IEAPM erroneous use of longwall terminology, assume IEAPM implied *neighbouring shortwallsi.e. 918A and 918B2 extraction rather than the single 918B1 shortwall*
7	Should the Applicant resubmit a new EP application, the Department could consider a staged assessment approach whereby 918A and 918B1 are determined and, subject to satisfactory confirmation of subsidence predictions and pillar monitoring, then determine 918B2 panel if there remains a low likelihood of exceeding the long-term subsidence performance measure of 100 mm.	This response is contained within the 918 EP submission. Staged assessment and approval approach included within main EP document and MSEC (2026) 918 Subsidence Monitoring Program.

Response to April 2026 NSW DCCEEW/NPWS Letter Recommendations and other matters raised

Recommendation responses

1.1 Provide evidence of an extraction plan being the appropriate approval pathway for this mine layout that includes a change in mining method.

Recommendation Response
DA504-00 defines second workings as "*Extraction of coal by partial extraction methods".* The proposed second workings mining method, Panel and Pillar Partial Extraction (using Shortwall), is a partial extraction method of extracting coal. DA504-00 specifies subsidence protection zones for first workings and partial extraction rather than an approved mine layout. The proposed 918 second workings mine layout are wholly contained within the partial extraction subsidence protection zone.

DA504-00 allows for the approval of second workings via the Extraction Plan process. The withdrawn 918 and 920 Panels Extraction Plan and this draft 918 Panel Extraction Plan (918 EP) has been developed using the DPE (2022) guidelines and has been submitted to DPHI for assessment and determination, in consultation with other NSW regulatory bodies, stakeholders and the Independent Expert Advisory Panel for Mining.

2.1 Amend the extraction plan area to avoid secondary extraction using the shortwall technique under Paddy's Creek Hanging Swamp, Identified major lineaments and other highly sensitive environments on Gardens of Stone State Conservation Area

Recommendation Response
The 918 and 920 Panel Extraction Plan was withdrawn in 2024 and significant mine design changes have been made for significant natural features avoidance.

The 918 EP second workings shortwall mine design avoids mining beneath all Newnes Plateau shrub swamps and hanging swamps with the exception of 0.01 Ha of Paddys Creek Hanging swamp. 918 EP mine design avoids second workings beneath including all Strahler third order and greater streams.

There are no major geological structure lineaments projected within the 918 second workings.

See SCT Response Letter (CLR5894c) for further detail.

3.1 Refer the subsidence predictions for the proposed 918 shortwalls, along with more recent records of subsidence exceedances, to the Independent Expert Advisory Panel for Mining for independent assessment.

Recommendation Response
Since the submission of the 918 and 920 Panel Extraction Plan in April 2024 and its subsequent Extraction Plan withdrawal and mine design changes the IEAPM has been provided with and have reviewed the SCT and MSEC subsidence reports culminating in the provision of the December 2025 IEAPM recommendation report to DPHI.

See SCT Response Letter (CLR5894c) for further detail.

Further opportunity for IEAPM involvement is possible after the submission of the final Extraction Plan to the DPHI as the panel has been involved throughout the 918 Panels Extraction Plan's development.

3.2 Revise subsidence assessments for the 918 panels to incorporate the recent subsidence exceedance of 93mm measured on the surface subsidence monitoring line ("D line") because of the extraction of panels 908, 910 and 906.
Recommendation Response

SCT (Appendix 4) and MSEC (Appendix 5) assessments incorporate the D line subsidence monitoring data.

See SCT Response Letter (CLR5894c)for further detail.

3.3 Further investigate the more recent subsidence exceedances along D line before any approval of the extraction plan for the 918 panels.
Recommendation Response

On 26 July 2022 Centennial submitted to NPWS and the Resources Regulator a Subsidence Management Plan (SMP) exceedance notification letter on the 900D line. Correspondence has been undertaken with these parties subsequent to this initial notification. On Wednesday 11 December 2024 Centennial hosted the EPA, DPHI, NPWS and BCS (now CPHR) on a site inspection which included surface inspection of the 900D line and Pagoda Swamp. There is no exceedance to DA504-00 consent conditions.

See SCT Response Letter (CLR5894c) for further detail.

4.1 Amend the extraction plan area to avoid any secondary extraction under Paddy's Creek Hanging Swamp.
Recommendation Response
The 918 and 920 Panel Extraction Plan was withdrawn in 2024 and significant changes have been made for natural feature avoidance at the expense of NSW coal resource recovery. Clarence Colliery is approved under DA504-00 to undertake first workings and partial extraction beneath these natural features.

The 918 EP second workings shortwall mine design avoids mining beneath all Newnes Plateau shrub swamps and hanging swamps with the exception of 0.01Ha of Paddys Creek Hanging swamp. Due to the proposed staged approval of the 918 Extraction Plan, the 918B2 sub-panel design, which is the only sub-panel that contains the Paddys Creek Hanging swamp, is not planned to be approved by DPHI until the 918A and 918B1 sub-panel extraction is completed and compliance to design predictions are provided and assessed.

See JBSG Response Letter (68229_L03Rev0) for a further detailed response.

5.1 Seek advice from the Independent Expert Advisory Panel for Mining regarding the potential impacts of the proposed extraction on water resources, especially in relation to concerns of inadequate monitoring and subjective monitoring interpretations
Recommendation Response

Since the submission of the 918 and 920 Panel Extraction Plan in April 2024 and its subsequent Extraction Plan withdrawal and mine design changes the IEAPM has been provided with the SCT geotechnical report, existing and proposed surface and groundwater monitoring and have reviewed the SCT and MSEC subsidence predictions reports culminating in the provision of the December 2025 IEAPM recommendation report to DPHI.

See 918 WMP (GHD, 2026) on Burralow Formation groundwater monitoring. Consultation was undertaken with the IEAPM groundwater expert between June 2025 and November 2025 on this issue. On 11 November 2025 the IEAPM provided the below email confirmation on this matter
"We have reviewed the latest GW monitoring locations against the available access trails and agree that no more useful locations can conveniently be installed without substantial landscape impacts."

See JBSG Response Letter (68229_L03Rev0) for a further detailed response.

Further opportunity for IEAPM assessment and advice on Water Resources is possible after the submission of the final Extraction Plan to the DPHI.

6.1 Implement the recommendations of the Independent Auditor (MCW Environmental 2021)

Recommendation Response
This recommendation has been addressed through the implementation of actions arising from MCW 2020 Independent Environmental Audit (IEA) and Centennial's 2021 Action Plan. Actions relevant to this recommendation have been completed and integrated into existing environmental management processes.

6.2 Provide:

a. the baseline period/dates for all swamp or stream monitoring sites or aquifer monitoring bores affected/potentially affected by mining 918

b. all reference swamp(s), stream(s) or bore(s) proposed for comparison of stream flows or aquifer levels after mining of 918 occurs, and

c. a before-after control-impact (BACI) assessment of past impacts, and a BACI design to enable objective assessment of impact to swamps, streams and bores above shortwalls 918.

Recommendation Response
a -On 8 October 2025 NSW DCCEEW and subsequently NPWS in February 2026 requested spatial and environmental monitoring data with the submission of 918 Panel Extraction Plan and this data has been provided as part of the 918 Extraction Plan 26 February 2026 submission.

See baseline period tables for swamp, stream and bore monitoring outlined in GHD 918 Water Management Plan (918 WMP).

b –See 918 WMP (GHD, 2026) and 918 BMP (RPS, 2026).

c – Reporting and assessment of impacts contained within the Clarence Colliery Annual Reviews and 4 monthly Subsidence Management Status Reports. See 918 BMP (RPS, 2026) on BACI design.

7.1 Apply the monitoring methods listed in Apx Table 16 of the Biodiversity Management Plan as the primary monitoring program for the project, not just if there is a 'condition RED'.

Recommendation Response

Survey methods for Blue Mountains Water Skink and Giant Dragonfly as described in Section 5.3.1, Table 16 have been applied to the regular monitoring program as outlined in Section 5.2, Table 15. These species are associated with Management Unit 1, which is more sensitive to changes compared to units 2, 3 and 4.

Biodiversity monitored under Management Units 2, 3, and 4 have not been moved from Investigative Monitoring (Section 5.3.1, Table 16) to the routine biodiversity Monitoring Program (Section 5.2, Table 15).

Management Units 2 and 3 contain habitats that are considered to be facultative ecosystems. These habitats are by nature, less sensitive to partial extraction mining activities when compared to Management Unit 1 (Swamps). Given the low levels of subsidence predicted, the risk of adverse impacts on these forested communities are considered to be low and therefore only investigate monitoring in the event of a 'condition RED' is considered justified in this instance.

In regard to Management Unit 4 (Montane Heath), the mining layout has been designed to avoid undermining the cliff, pagoda and major rock outcrop features in the area, which form part of this Management Unit. In addition to this, the very low-level subsidence effects that are predicted (MSEC, 2026) are not considered to adversely impact these biodiversity features. Steep slopes also form part of Management Unit 4, and again it is considered that these features will not be adversely impacted by undermining (MSEC,2026). Given the predicted very low-level impacts, investigative monitoring in the event of a 'condition RED' is again considered justified for biodiversity associated with Management Unit 4.

918 Panel ecological monitoring locations and types of monitoring were reviewed by the IEAPM in November 2025 and feedback was provided.

8.1 Only use eDNA monitoring to supplement the other fauna survey methods listed in Apx Table 16 of the Biodiversity Management Plan.

Recommendation Response

Giant Dragonfly and Blue Mountains Water Skink monitoring programs have been moved from Table 16 to Table 15.

Under this change, Giant Dragonfly and Blue Mountains Water Skink will be monitored using more active methods (opportunistic searches and trapping, respectively) with eDNA used to supplement active monitoring methods. The Giant Dragonfly and Blue Mountains Water Skink eDNA locations were selected in consultation with the IEAPM.

9.1 Add more biodiversity monitoring sites in Newnes Plateau shrub and hanging swamps

Recommendation Response

Between the withdrawal of the 918 and 920 Panels Extraction Plan and the 918 Panel Extraction Plan submission ecological monitoring locations and types of monitoring were reviewed by the IEAPM. Two additional BAM plots were installed in the Management Unit 1, eDNA sampling has been introduced at the request of IEAPM, Giant Dragonfly and Blue Mountains Water Skink fauna monitoring has been undertaken, three additional swamp piezometers have been installed and 11 additional real-time subsidence monitoring units have been proposed adjacent to the swamps nearby the 918 second workings sub-panels.

9.2 Apply the monitoring techniques listed in Table 16 to biodiversity monitoring sites

Recommendation Response

See additions to 918 BMP (RPS, 2026) as per comments above in Recommendation response 7.1 and 8.1.

9.3 Include the locations, methods used, and monitoring history of all reference / control sites in the Biodiversity Management Plan.

Recommendation Response

Controls c1, c2 and c3 are BAM plots and have been described under Appendix 3, section 13.1

Control sites have been previously established in nearby Boad(Barrier) swamp and monitored for Giant Dragonfly and Blue Mountains Water Skink for the adjacent Centennial Coal operation, Springvale Mine. Co-ordinates for these locations have been added to section 5.2.1 and 5.2.2.

Control sites for aquatic monitoring have previously been established in Carne Creek East, Dingo Creek and Dingo Creek East. Co-ordinates have been added to Section 3.3.

10.1 Provide detail of intended methods to compare baseline datasets to monitoring datasets.

Recommendation Response

See additions to 918 BMP (RPS, 2026) Section 5.2.1 and 5.2.3.

10.2 Include biodiversity performance measures, triggers, and actions in the TARP that directly relate to biodiversity monitoring

Recommendation Response

See additions to 918 BMP (RPS, 2026) Section 5.2.1 and 5.2.3.

Response to Schedule B DCCEEW/NPWS Errors, misinformation, misquotation and omissions

DCCEEW/NPWS	Type of error	Centennial Response
Letter quoted date of request being received 30 March 2026.	Typographical Error	Draft 918 Extraction Plan provided to CPHR and NPWS for comment on the Planning Portal on 26 February 2026.
"The proposed method of shortwall mining has not previously been used in Australia (IESC 2023)"	Misinformation (and likely misquotation)	The likely appropriate quote from the IESC (2023) Underground Coal Mine Subsidence Information Guideline is detailed below. *"Shortwall mining is not currently practised in Australia, although it was carried out several decades ago and there are some current proposals from the Western Coalfield of New South Wales to reintroduce a form of shortwall mining."* (IESC, 2023) Shortwall mining has been previously undertaken at numerous underground coal mines within states of Australia, including NSW, as well as internationally.
3a *"untested nature of shortwall mining in Australia"*	Misinformation	Shortwall mining has been previously undertaken at numerous underground coal mines within states of Australia, including

		NSW. Therefore it has been tested and at multiple mine sites was fully integrated.
3b. Subsidence exceedances at Clarence Colliery the recent high subsidence exceedances (maximum subsidence of 193mm across panels 906-910 - breaching the DA 504-000 Approval) have not been notified to NPWS/DCCEEW or placed on the DPHI Major Project website for the Clarence Colliery Mine	Misinformation	Subsidence monitoring Line D >100mm subsidence monitoring is not contained within DA504-00, therefore is not a breach of that consent.
It is noted that the wording of the variation relating to removing second workings in panel 918 beneath sensitive water-depended ecosystems is misleading since second workings in panel 918B2 are still proposed underneath Paddys Creek Hanging Swamp	Omission	See Page 1 and Table 1 of the associated controlled action variation application. The variation application documentation is clear on the 0.01Ha within the second workings footprint of EPBC listed Temperate Highland Peat Swamps on Sandstone community.
5. Many proposed piezometers are yet to be installed	Misinformation	All proposed piezometers applicable to the 918 Panel Extraction Plan are installed.

24 April 2026

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Peter Corbett
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CLR5894c

Dear Peter

COMMENTS IN RESPONSE TO THE NSW DCCEEW CLARENCE 918 EXTRACTION PLAN RESPONSE DOCUMENT

Centennial Coal Pty Ltd submitted a draft Clarence 918 Panel Extraction Plan and supporting documentation to the NSW government on 26 February 2026. The NSW DCCEEW (including NPWS) provided a response to the draft 918 Extraction Plan documentation DOC26/141474-1 dated 17 Apri 2026. Centennial Coal have engaged SCT to provide a response to geotechnically relevant statements and recommendations in the NSW DCCEEW review document. Our response is included in this document.

The DCCEEW response to Centennial's drafts Clarence 918 Panel Extraction Plan submission highlighted some technical misconceptions that require clarification. These overarching technical misconceptions are clarified in the following points.

- Longwall, miniwall and partial extraction including shortwall and pillar extraction describe methods of extracting coal. Key components of difference include:
    - Method of cutting the coal: continuous miner or shearer.
    - Active face support from goafing: by hydraulic supports along a face or in a breaker line.
    - Coal transport from face to main conveyor: by AFC (Armoured Face Conveyor), FCT (Flexible Conveyor Train) or shuttle car.
- The mining method does not influence the resulting subsidence. Conventional subsidence is primarily determined by panel geometry i.e. void width, extraction height, pillar width and depth of cover.

- The key factors that define pillar compression subsidence include total pillar width, abutment load and modulus (stiffness) of the strata. Abutment load on the spine and barriers pillars is increased with an increase in the number of adjacent panels.

906-910 Panel subsidence over D Line has been thoroughly investigated and is well understood (Appendix 1 Section 5.2 of SCT (2026) report).

The mine geometry for 918 panel is more conservative than 906-910 for three reasons:

- The spine pillar width is greater for 918 Panel, reducing the abutment load.
- The extraction height is thinner in 918 Pane due to a thinner seam height.
- 906-910 has 6 adjacent panels while 918 Panel only has two adjacent panels. This means that there is more abutment load being distributed onto the barrier and spine pillars, with the total mine geometry becoming larger, and less load distributed outside the panel extents.

The extraction of 918a and 918b panels should only be compared with the extraction of 910a and 910b panels to compare a like number of panels, not the complete 910 through to 906. The measured survey data for 910 panel (which also included some additional subsidence of 908 panel) was less than 100mm. In consideration of the subsidence mechanisms for subcritical panels described above, Table 1 shows the panel geometry data that support the 918 panel as the more conservative panel.

Table 1: Comparative risk of increased subsidence based on panel geometry

Panel	Spine Pillar Width	Panel Void Width	Depth Range	Comparative Design Risk
918	84-90m	75m	227-294m	More conservative
910	61m	82m	150-325m	Less conservative

The uncertainty assessment conducted in Appendix 1 Section 6 of SCT (2026) report shows that it is not within the realm of rock properties for 918 Panel geometry to exceed 100mm, as measured and inferred from geotechnical testing and geophysics.

Section 2 Paragraph 7 *– states that "NSW DCCEEW considers that the information provided in the extraction plan on the shortwall mining technique does not adequately consider risk of subsidence interactions with geological structures, and the effects of non-conventional subsidence on the incised drainage lines associated with Bungleboori and Paddy's Creeks. It is noted that SCT (2026) have estimated valley closure of 110mm in the vicinity of Pagoda Swamp because of the 906-910 panels (which are a more conservative extraction technique than the shortwall mining technique proposed for the 918 panels). This puts closure levels close to those responsible for impacts (complete pool drainage) in the southern coalfield (MSEC 2013) – see Figure 1."*

As discussed in the response above, 906-910 panels do not exhibit a more conservative mining method than 918 panel.

Subsidence interaction with geological structures is considered in:

- The assessment of pillar stability in Section 7.3 of SCT (2026) report.
- Fault hydraulic connectivity in Section 8.5 of the SCT (2026) report.
- Comparison of the more conservative experience at Pagoda Swamp in Section 8.6 of the SCT (2026) report.

Non-conventional subsidence is considered at detail by MSEC in its prediction of subsidence effects and impact assessment in Section 5.3.2 in MSEC (2026) report. Specifically, the MSEC (2026) report states:

- For Bungleboori Creek and tributaries: "The predicted compressive strains due to the valley closure effects are 0.3 mm/m or less along both streams" and "Non-conventional strains due to valley closure are not expected to develop given the low-level vertical subsidence that is predicted to occur." (in Section 5.3.2 of MSEC (2026).
- For Lower Nine Mile Shrub Swamp, Lower Nine Mile Hanging Swamp, Paddy's Creek Shrub Swamp and Paddy's Creek Hanging Swamp: "As discussed in Section 5.3.2, the potential for non-conventional valley closure and upsidence movements is considered to be low given the low-level predicted vertical subsidence that is predicted to occur." (in Section 5.9.2 of MSEC (2026).

Referring to Figure 1 in the DCCEEW response document on the "Upsidence and valley closure levels associated with Type 3 pool impacts (complete pool drainage) in the southern coalfields. Source: MSEC (2013)", the predicted subsidence effects for 918 Panel of 70mm maximum vertical subsidence, 0.3mm/m valley closure and the low likelihood of upsidence, places the relationship close to the x and y axis on Figure 1 – substantially below the Southern Coalfield experience of Type 3 impacts.

Section 2 Paragraph 8 *– state that "There is no knowledge base on the threshold levels of subsidence required to promote/activate impacts associated with geological structures using the proposed shortwall extraction technique. SCT (2026) identify several faults transecting Panel 918 and the interaction of subsidence with lineaments has previously been identified (e.g. MSEC 2019) as causing serious impacts up to ~2km from previous longwall mining on the Newnes Plateau."*

There is significant experience of mining through similar Katoomba Seam level structures at Clarence Mine with similar panel void widths in double sided lifting . The Clarence Mine experience shows that mining through the structures has not produced measurable impacts to the upper water table (see Section 8.2.2 of SCT (2026) Report) or to the Pagoda Swamp (see Section 8.5 of SCT (2026) Report).

The stated Newnes Plateau example of Longwall mining experience cannot be compared with the proposed Partial Panel and Pillar (using shortwall) mining of 918 Panel. Longwall mining produces surface subsidence on the Newnes Plateau of up to 1500mm. The predicted subsidence for 918 Panel is less than 80mm.

- The above-mentioned mining methods all produce the same subsidence, for the same panel geometry, at the same location. For example, any mining method with a void width of 80m, extraction height of 3m, pillar width of 60m and depth of cover of 250m, all produce the same subsidence for the same geology. There are secondary factors that can influence subsidence; however these factors are not influenced by the mining method and act to refine the subsidence magnitude and shape.

- Given the mining method is technically not relevant, empirical subsidence experience can be drawn from similar mining geometries. Similar and highly relevant mining geometries from Clarence and Airly Mine are discussed in detail in Section 9.1 of the SCT (2026) report, pp 44-56.

1. SPECIFIC RESPONSES TO COMMENTS IN ATTACHMENT B – NSW DCCEEW DETAILED COMMENTS

Section 2 Paragraph 5 *– states that "For there to be no subsidence (or minimal subsidence) using this technique, the rock above the void will have to span the full width (i.e. up to 83m) and distance of the longwall (up to ~1km) and remain stable in-perpetuity – and even if it did, then there is still potential for subsidence to exceed the approved threshold of 100mm subsidence for DA 504-000. It is noted that the most recent report by SCT (2026) has identified maximum subsidence of 193mm across panels 906-910 which is almost double the allowable subsidence under DA 504-000 (despite using a more conservative mining extraction technique than the shortwalls proposed for the 918 panels)."*

This is incorrect. The subsidence mechanisms are discussed in Appendix 1 Section 1.2 of SCT (2026) report. Panel and Pillar Partial Extraction using shortwalls and double-sided lifted pillar extraction are designed and experienced to cave.

Caving is predicted to reach 60-90m above the mining horizon for 918 panel (Section 9.2.2 in SCT (2026) report).

Key points drawn out of Appendix 1 Section 1.2 of SCT (2026) report are highlighted below.

- Subsidence consists of two mechanisms contributing to the subsidence: sag subsidence and pillar compression. The caving component of subsidence is called "sag" subsidence. The "pillar compression" component of subsidence is due to abutment load compression of the pillar.

- The ground caves above both pillar extraction panels and shortwall panels. For subcritical panel geometries with effectively full void extraction, like 918, 908 and 910 panels, the caving (sag) component only contributes a small amount of subsidence for each individual panel.

- The maximum subsidence for multiple subcritical panels is primarily controlled by pillar compression subsidence. Pillar compression subsidence is more complex than just the compression of the coal pillar. The compression of the strata above and below the coal pillar contributes to the majority of pillar compression subsidence.

The predicted 918 Panel caving height of about 60-90m above the mining horizon is below the Mt York Claystone and below the base of the upper water table. As Section 8.5 of the SCT (2026) report states:

> *Given the height of caving and the height of depressurisation being below the Mt York Claystone, the faults and lineaments are anticipated to provide water recharge to the lower groundwater table and have a low risk of reducing the pore pressure in the upper water table.*

Section 2 Paragraph 9 *– states that "It is also recommended that secondary extraction using the shortwall technique does not occur under the major lineaments identified by SCT (2026) and JBSG (2026), since these lineaments connect to the swamps and streams in this area of the Newnes Plateau."*

There is no classification of major lineaments in the SCT (2026) report. The faults mapped in the Katoomba Seam in 906-910 Panels are classified similarly to the faults inferred to intersect 918 Panel. The structures identified to intersect 918 panel are inferred to have up to 2m in throw, which is consistent with Clarence's substantial experience of mining through similar structures.

Mining into a structure or lineament does not correlate with impacts to swamps and streams. Sections 8.2.2 and 8.6 in the SCT (2026) report illustrates that mining of 906-910 panels and the 800s panels has not reduced the water level in the upper water table.

MSEC (2026) report states a low risk of non-conventional subsidence impacting creeks and swamps (Sections 5.3.2 and 5.9.2 in MSEC (2026) report).

Section 3b, paragraph 3 *- states that "At the junction of 609 and 609B panels, the 609 and 609B area was flooded in 2010-2011 and subsidence increased sharply to approximately 100mm, before stabilizing at 115mm from 2014 onwards."*

Flooding is discussed in Section 9.2.5.2 of the SCT (2026) report. Flooding is the trigger to accelerate remnant pillar failure, changing the abutment load distribution and increasing subsidence.

The nature of extraction of 918 panel is such that there are no remnant pillars. Therefore, flooding in 918 panel is not anticipated to increase the subsidence due to the mine approach having no remnant pillars or stooks and the spine and barrier pillars have a substantial FOS.

Section 3c, paragraph 1 *– states that "Centennial Coal have presented evidence that directly undermining lineaments in the strata overlying Lithgow Coal seam can cause changes to standing water levels in swamps overlying the lineaments (Centennial Coal 2016, 2019)."*

Section 3c, paragraph 2 *– states that "This is discussed by the IESC when reviewing the Angus Place Mine extension project (2020),"*

Longwall extraction experience is not relevant to Panel and Pillar partial extraction using the shortwall mining method.

Refer to previous explanation above on subsidence interaction between structure and swamps.

Section 3c, paragraph 4 *– states that "Figure 13 of SCT (2026) now shows several projected faults transecting the 918 panel. SCT (2026) specifically stated that:*

- *Two 1-2m faults with major washout are located at the mining horizon and correlate with the location of Pagoda Swamp. It is likely that the faults form the lineament that the surface drainage and Pagoda Samp are located on."*

Experience of partial extraction and similar void widths at Clarence indicates that the presence of faults and lineaments does not correlate with impacts to surface features. Clarence experience shows no changes to upper water table. This has been discussed in Sections 8.2.2 and 8.6 in the SCT (2026) report. See commentary in responses above.

Section 3c, paragraph 8 *– states that "In addition, the extraction plan for 918 should not be approved before the subsidence exceedances identified in SCT (2023) and SCT (2026) have been thoroughly investigated by DPHI and the Expert Advisory Panel for Mining."*

The subsidence and mining geometry associated with 900 D line has been thoroughly investigated and is well understood. See Appendix 1 Section 5.2 of SCT (2026) report.

Yours sincerely

Yvette Heritage
Managing Director

2. REFERENCES

Mine Subsidence Engineering Consultants (MSEC) 2026, Clarence Colliery 918 Panel: Subsidence predictions and impact assessment report. Report no. MSEC1493 Rev B, prepared for Clarence Colliery Pty Ltd, New South Wales, 2026.

SCT, 2026. Geotechnical, subsidence and caving assessment for 918 Panel. SCT Report CLR5894_Rev 2, 24 April 2026.

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23 April 2026

Peter Corbett
Clarence Colliery Pty Ltd
Via email: peter.corbett@centennialcoal.com.au

Advice on Response to NSW DCCEEW (NSW CPHR and NSW NPWS) comments on the Extraction Plan for 918 Panel: Groundwater Assessment

Dear Peter,

Introduction

JBS&G Australia Pty Ltd (JBS&G) are currently engaged to Clarence Colliery Pty Ltd (Clarence) to prepare a Groundwater Assessment, including numerical groundwater model, in support of the Extraction Plan for development and extraction of 918 Panel at Clarence Colliery (JBS&G, 2026).

This letter presents advice on the response to comments received from Conservation Programs, Heritage and Regulation Group (NSW CPHR) and National Parks and Wildlife Service (NSW NPWS) of the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) on the Groundwater Assessment of the Extraction Plan for 918 Panel at Clarence Colliery (NSW DCCEEW, 2026).

This letter has been prepared in accordance with our request for variation (Reference No. JBS&G68229/082a, dated 20 April 2025; accepted 21 April 2026, Reference No. CL274551) to our original proposal (Reference No. JBS&G68229-163401/P01Rev0, dated 24 October 2024; accepted 4 March 2025, Reference No. CL266673).

Response to Comments

JBS&G's approach to this letter has been to quote a relevant comment, followed by JBS&G's response.

Comments have been made if they relate to JBS&G's area of expertise (groundwater and surface water), specifically Section 5 of NSW DCCEEW (2026). JBS&G have been advised that Clarence and/or their consultants will provide a response to other matters.

5. NSW DCCEEW lacks confidence in groundwater modelling

Issue NSW DCCEEW 5.01) "The extraction plan for Panels 918 & 920 were accompanied by a groundwater model report (JBS&G 2023) which had not been validated. While significant efforts have been made to develop and revise the groundwater model, the calibration of modelled groundwater to real (observed) groundwater levels remains poor.."

The Groundwater Model Report of the 918-920 Extraction Plan (JBS&G, 2023) documents construction, calibration and simulations incorporating parameter uncertainty using a numerical groundwater model in MODFLOW-USG (USGS, 2013 and GSI Environmental, 2022). The history of model development, which commenced in 2017, and was built upon work by the CSIRO originating in 2007 at the adjacent Springvale Mine, is presented in Section 4.2 of JBS&G (2023).

In accordance with the requirements of the NSW Aquifer Interference Policy (NSW DCCEEW, 2012), the model at the time (918-920 Extraction Plan) was subject to third party review against the Australian Groundwater Modelling Guidelines (Barnett et. al., 2012) and found to be 'fit for purpose'.

The comment by NSW DCCEEW that "*…accompanied by a groundwater model report (JBS&G 2023) which had not been validate*d." is not accurate.

The Groundwater Assessment of the Extraction Plan for 918 Panel (JBS&G, 2026) is based on the same model (refer Section 4.1 of JBS&G (2026) for updated history of model development). The model was again subject to third party review and was again found to be 'fit for purpose'.

Issue NSW DCCEEW 5.02) "The groundwater model does not adequately model the Burralow aquifers that support the Newnes Plateau shrub swamps and hanging swamps. Only dedicated piezometers measuring the Burralow Formation aquifers can do this and Centennial Coal appear to have only two such monitoring bores (CLRP41A & CLRP41R measuring the Burralow Formation at ~55m) in the vicinity of the 918 panels.".

The numerical groundwater model is the model. Monitoring piezometers are not the model, however, are used to test (calibrate/history match) the model, including the Conceptual Model.

Figure 1 is an excerpt of Figure 3.10b of JBS&G (2026), which presents the Groundwater Monitoring Network in the vicinity of 918 Panel.

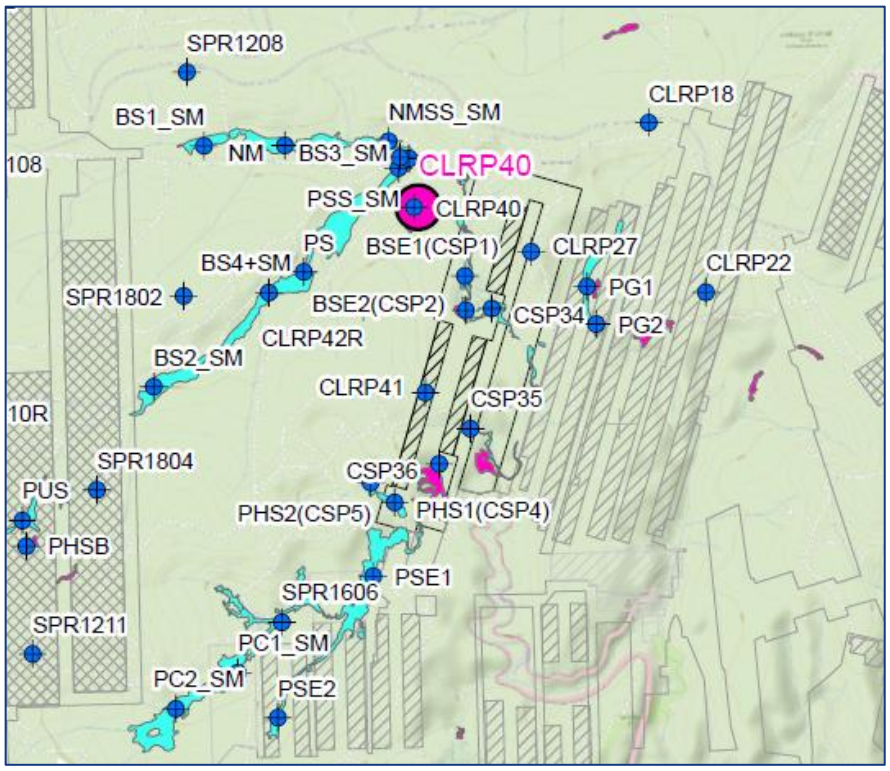

Figure 1: Groundwater Monitoring Network in the vicinity of 918 Panel (excerpt of Figure 3.10b of JBS&G (2026))

From **Figure 1**, there are multiple monitoring piezometers in the vicinity of 918 Panel. These exist in both the Burralow Formation and the Banks Wall Sandstone.

Figure 2 is an excerpt of Figure 3.4c of JBS&G (2026), which presents surface geology (highest active layer) in the groundwater model in the vicinity of 918 Panel.

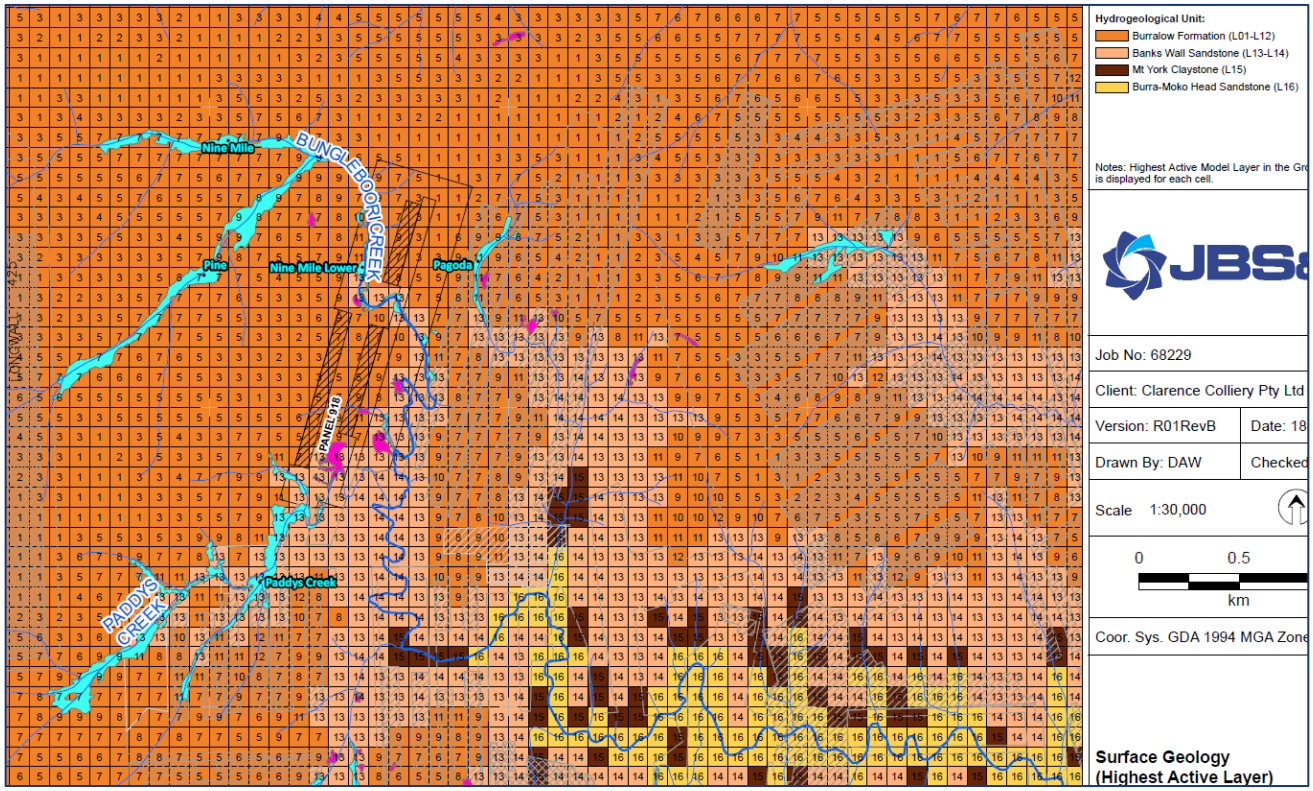

Figure 2: Surface Geology (Highest Active Layer) in the vicinity of 918 Panel (excerpt of Figure 3.4c of JBS&G (2026))

Comparing **Figure 1** to **Figure 2**, Nine Mile and Pine Swamp reside in the Burralow Formation in the groundwater model, as does Pagoda Swamp (PG1). The upper parts of Paddys Creek Swamp (PC2) are also underlain by the Burralow Formation in the model.

With respect to vibrating wire piezometers, these are presented in Section 4.12.4.4 of JBS&G (2026).

Issue NSW DCCEEW 5.03) "Other relevant bores in the area that should be incorporated into groundwater modelling are:

- *CLRP27R (shallowest bore is Piezo #5 measuring the Banks Wall Sandstone at 90m)*
- *CLRP40 (standpipe measuring the Banks Wall Sandstone at 70m).".*

Figure 4.28a of JBS&G (2026) presents comparison of observed and modelled groundwater elevation in CLRP27R and CLRP40 as well as others. Figure 4.28a is replicated as **Figure 3**, below, for the purpose of reference.

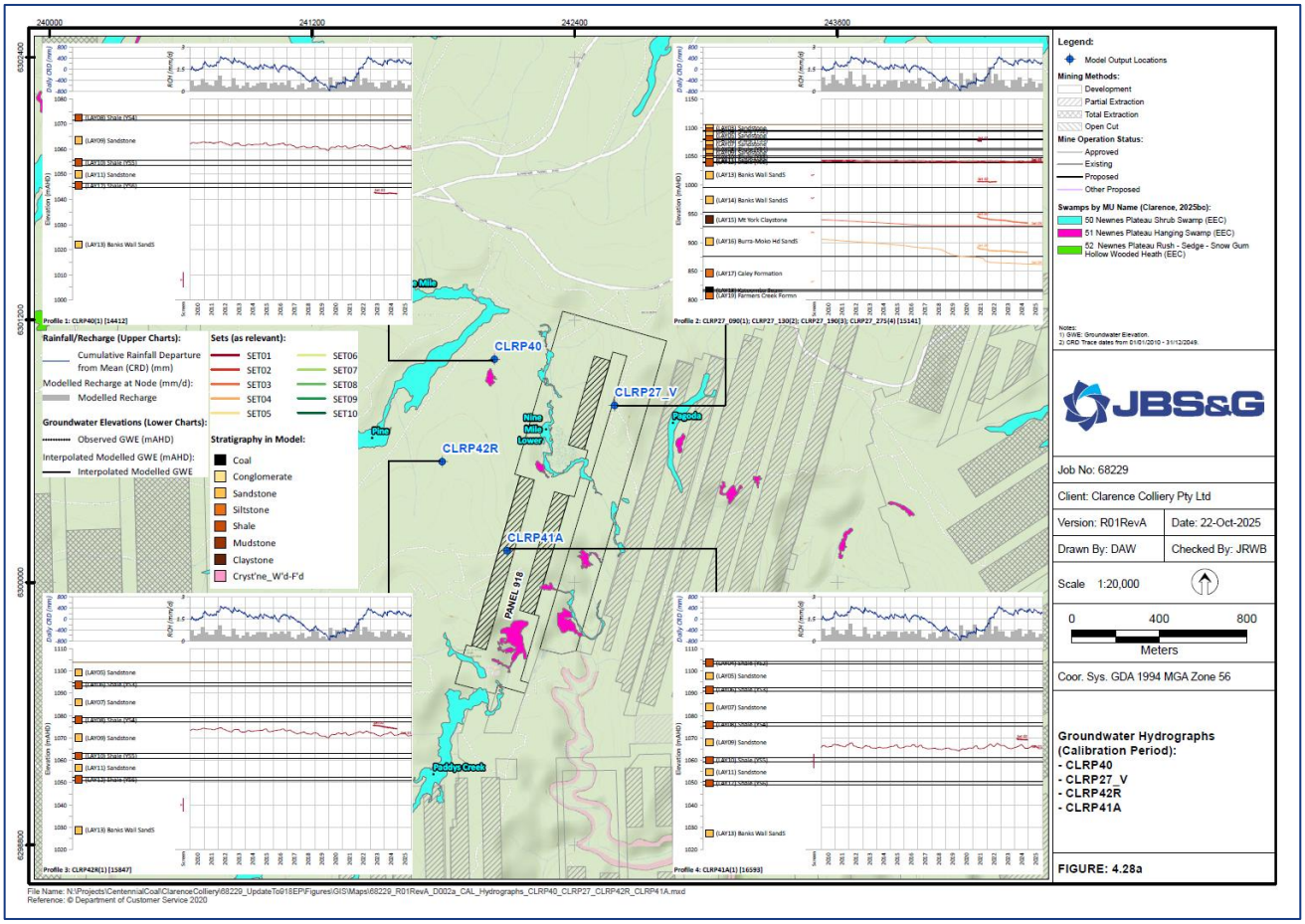

Figure 3: Groundwater Hydrographs (Calibration Period) (after Figure 4.28a of JBS&G (2026))

Issue NSW DCCEEW 5.04) "There are no piezometers directly monitoring the Burralow aquifers that feed the swamps in the Bungleboori and Paddys Creek catchments[2] (including Paddy's Creek Hanging Swamp).

Footnote 2. McHugh (2018) has previously identified the various aquifers that feed into these swamps with seven such identified aquitards in total (YS6, YS5a, YS5, YS4, YS3, YS2 and YS1). It is unclear which, if any, of these aquifers are monitored by CLRP41A & CLRP41R, which will likely be directly impacted if/when panel 918A is extracted.".

The Conceptual Model for the Newnes Plateau is presented in Section 3.5.3 of JBS&G (2026).

Relevant portions of that section are replicated below, for the purpose of reference.

"The conceptual model for 918 Panel is as follows:

- There are three groundwater systems:
    - a perched system upon which most THPSS shrub and hanging swamps reside, including Nine Mile Swamp, Pine Swamp and the upstream portion of Paddys Creek Swamp and Pagoda Swamp
    - a shallow groundwater system variably exists within the Banks Wall Sandstone, maintained by the Mt York Claystone, which exists below the Banks Wall Sandstone and acts as a regionally significant aquitard
        - Some THPSS shrub and hanging swamps reside on this system, including the mid and lower portion of Paddys Creek Swamp, Lower Nine Mile Swamp and downstream portion of Pagoda Swamp.

…

- Model Mining Method 1 – development (non-goafing)
- Model Mining Method 2 – extraction (partial extraction, principally single-sided pillar lifting; nongoafing)
- Model Mining Method 3 – extraction (panel and pillar partial extraction (PPPE) and double-sided pillar lifting with extraction ratios between 55% and 65%; limited goafing)
- Model Mining Method 4 – extraction (total pillar extraction with extraction ratios greater than 80%; full goafing)
- Model Mining Method 5 – extraction (longwall extraction, with extraction ratios greater than 85%; full goafing)
- Model Mining Method 6 – extraction (backfilling of open cut)"

As presented in JBS&G (2026), the numerical groundwater model assumes goafing will occur with Model Mining Method 3 (PPPE). From Section 4.11.4 of JBS&G (2026):

"For extraction (Model Mining Method 3, which is PPPE and double-sided lifting at Clarence Colliery), the subsidence model used was extraction (Model Mining Method 4 – Total Extraction). In a previous version of the numerical groundwater model, an adjustment to panel width was applied to PPPE cells. That adjustment was not applied in this version of the model (conservative)."

Issue NSW DCCEEW 5.08) "NSW DCCEEW's comments on the previous iteration of the groundwater model (DOC24/357218, Date 9 May 2014 [sic 2024]*) were that:*

- *Based on JSB&G's Figure 4.28, the model appears to overestimate observed aquifer levels with discrepancies in modelled and observed levels at times being >50m. Since other areas of the extraction plan suggest that the Burralow Formation is ~50m thick in this area, this could potentially mean that the modelled water level could either be in the Burralow formation or outside of the Burralow formation. As such it provides very limited value in assessing the potential (modelled) impact of the prosed mining at Clarence on aquifers within the Burralow Formation (or elsewhere in the modelling domain).*"

As was responded to at the time (JBS&G, 2024), and remains the case in JBS&G (2026), Figure 4.25 in Section 4.12.4.3 of JBS&G (2026) (equivalent to Figure 4.28 of JBS&G (2023)) presents three groups of piezometers: being Swamp Standpipe Piezometers, Shallow or Regional Standpipe Piezometers and Vibrating Wire Piezometers.

Observed versus Modelled Heads (mAHD) is closely matched for swamp piezometers. As explained in JBS&G (2026) (and in JBS&G (2023), at the time), for vibrating wire piezometers, "From Figure 4.26, the distribution of weighted residual for Group 3 (Vibrating Wire Piezometers) is more negative than positive. As discussed in JBS&G (2025ab), and presented further below, this is due to initiation of decline in groundwater elevation at depth (in response to mine dewatering) earlier than observed. This issue is not significant, however."

Groundwater hydrographs are presented in Section 4.12.4.4 of JBS&G (2026) at multiple locations. For swamp piezometers, observed and modelled groundwater elevations are closely matched.

Issue NSW DCCEEW 5.09) "…

- *There has been no systematic assessment of exactly where the disagreements between modelled and observed aquifer levels occur. The legend for Figure 4.28 simply cites groups of piezometers (Group 1, 2 & 3) but originally did not provide a spatial location to see how many of these are directly related to Clarence workings or whether any may already have been impacted by earlier mining, either at Clarence or elsewhere on the Newnes Plateau.".*

As presented in JBS&G (2024), Observed versus Modelled Heads and Observed versus Residual are typical figure types in groundwater modelling. Those plot types are presented in JBS&G (2026) as well.

- Lateral groundwater flow direction in the perched groundwater system is a subdued reflection of surface topography, as is expected. Vertical groundwater flow direction in the perched groundwater system is vertically downward towards the shallow groundwater system; however, that vertical percolation is retarded by the presence of sequences of aquitard plies (shale) of the Burralow Formation. That retardation leads to lateral transmission of most groundwater toward outcrop (as seepage faces)."

In accordance with the above, which the numerical model groundwater implements, aquifers in the Burralow Formation will not maintain significant pressure under non-mining or mining conditions. The presence of aquitard plies (shale) of the Burralow Formation (mapped as YS1 through to YS6) acts to divert vertical percolation (recharge) laterally toward outcrop. That 'diverted recharge' supplements surface water flow in those watercourses during dry times. Accordingly, the integrity of the aquitard plies (shales) is important (and hence the selection of a low subsidence mining method), insofar as they 'focus' recharge into the watercourses within which the shrub swamps reside. For hanging swamps, they reside at and across the contacts between sandstones and the shales.

Issue NSW DCCEEW 5.05) "According to the Panel 918 Extraction Plan groundwater model report (JBS&G 2026):

> *recalibration of the model for the immediately previous version of the model considered 10,846 parameters and 31,948 observations (JBS&G, 2025ab); and*
>
> *the current version of the model (this report) considered 11,354 parameters and 26,712 observations.*

The latest version of the groundwater model therefore considers 5,236 (or 16%) fewer direct observations but has a 508 (or 5%) increase in the number of modelled parameters.".

Section 4.1 of JBS&G (2026) presents the detail of the change:

"…removed observations were 'pressure profile' observations, which were redundant with change to 3D interpolation of modelled groundwater elevation (using a custom-developed script called TARGPEST3D)."

As put, with the change to 3D interpolation of modelled groundwater elevation, 'pressure profile' observation, which were based on 'layer-by-layer' interpreted observation were redundant.

As explained in JBS&G (2026), calibration includes different expressions of physical observations. 'Pressure profiles' are an example of this. The physical observation was standing water level in a monitoring piezometer (where a standpipe piezometer) or pressure above a sensor (where a vibrating wire piezometer). Expression of that data in different forms enhances the calibration process through a tool such as PEST.

As noted in JBS&G (2026), the model was recalibrated during preparation of the Groundwater Assessment.

Issue NSW DCCEEW 5.06) "…This model has still not been validated and GHD's (2026) peer review identifies several weaknesses with the modelling approach that have not been adequately addressed.".

As presented in the response to Issue NSW DCCEEW 5.01, the model has been subject to third party review and found to be 'fit for purpose'. The matters raised by GHD, the third party model reviewer, were minor, and did not impinge on the declaration of 'fitness for purpose'.

Issue NSW DCCEEW 5.07) "In addition, the legend for Figure 4.7 (p131 of JBS&G 2026) suggests that the model assumes either 'non-goafing' or 'limited goafing' of Panels 918A, 918B1 & 918B2. This appears inconsistent with the description of the shortwall mining technique where significant goafing could be expected to occur. As noted above, the proposed mining will effectively create an underground void 75m to 83m wide, up to 2.3m in height and extend for distances (lengths) between 0.438km and 0.823km. For no goafing to occur, the strata above the void would have to span this void in perpetuity.".

Figure 4.7 of JBS&G (2026) is consistent with Figure 1.3b of JBS&G (2026), and Section 1.2 of JBS&G (2026):

"Model Mining Method used in this report are defined as follows, and illustrated in Figure 1.3.

Groundwater hydrographs are presented in Section 4.12.4.4 of JBS&G (2026), layer-by-layer model output and depth versus pressure profiles.

Section 4.12.4.4 presents systematic analysis of these output.

Issue NSW DCCEEW 5.10) "*Data provided to NPWS (PiezometerGroupings_GroundwaterModel.csv), indicates that approximately 129 piezometers have been "omitted" from JBS&G's groundwater model. No explanation has been provided for excluding these piezometers, even though some (e.g. CLRP33) appear to be relatively close to the proposed extraction of 918 and 920 panels. The selective inclusion and exclusion of piezometers in the groundwater model needs to be investigated and justified prior to any approval being given to narrow longwall panels 918 & 920.*"

As was put in the response to comments on 918-920 Panels, presented in JBS&G (2024):

"Nor was an explanation sort, which could have been simply resolved.

The request for X and Y coordinates of monitoring locations, as a Comma Separate Variable (.CSV) file, including their group numbers (refer Figure 4.19, 4.20 and Figure 4.28 of JBS&G (2023)), was assumed to be because of a lack of access to a Geographic Information System (GIS), else an ArcGIS .SHP could have been provided, namely a replicate of the content in Figure 3.6 of JBS&G (2023), which shows the location of groundwater monitoring locations used in the model.

Based on Issue 4c, JBS&G assumes that NSW DCCEEW was trying to identify locations where the difference between observed and modelled groundwater elevation was large (>50m) in Vibrating Wire Piezometers (Group 2). Those differences are presented in Section 4.12.3.3.

As explained in the response to Issue 4.c, the context of the difference is depressurisation at depth earlier than is observed. As illustrated in the hydrographs presented in Section 4.12.3.3 of JBS&G (2023) and consistent with JBS&G's statement "…is not a particular impediment with respect to the model's objectives" [Section 4.12.3.2 of JBS&G (2023)], hydrogeologic response of the deep groundwater system is different to that of the perched and shallow groundwater system upon which the THPSS reside.

The .CSV file was an excerpt from JBS&G's groundwater database and was a 'raw' file. It contains 492 entries, noting that there may be multiple sensors at an individual location, but that each get a separate entry. JBS&G's database includes groundwater works in the region (these are not monitoring piezometers), broken piezometers (where sensors have not 'settled', typically Vibrating Wire Piezometer (VWPs)), piezometers where there is ambiguity in cabling on Vibrating Wire Piezometer (VWPs), where details of screened interval (typically ridgeline standpipe piezometers) was not known, or where there were duplicates (since the groundwater model is divided into layers, there is sometimes multiple sensors relevant to a single model layer, so one is selected and the other is omitted).

If NSW DCCEEW's comment is referring to the term "OMIT" in JBS&G's groundwater database, then this term is simply there to efficiently exclude entries that don't have any data, or where there is reason to suspect that data associated with that entry is not valid.

Of the 129 entries that were omitted from the 492 entries: 34 were groundwater works that have no water level observation dataset; 4 were swamp piezometers which did not have did not have reliable data; 7 were standpipe piezometers (typically omitted because their screened interval was unknown) and 65 Vibrating Wire Piezometer sensors (these tend to be omitted because of misconfiguration of cabling, sensor malfunction and sometimes due to duplicate entries in a particular layer)."

Issue NSW DCCEEW 5.11) "*Many proposed piezometers are yet to be installed, and others have inadequate baseline data to characterise the 'natural' behaviour of the aquifers.*".

As was put in the response to comments on 918-920 Panels, presented in JBS&G (2024):

"Figure 3.6 of JBS&G (2023) presents the location of groundwater observations used in the calibration of the model. These piezometers are already installed and are being monitored.

The effects of cumulative rainfall deficit should also be reflected across all piezometers.

The response to this matter was presented in JBS&G (2024):

"JBS&G's discussion of CLRP18 and CLRP22 is presented in Section 4.12.3.3 of JBS&G (2023), Figure 4.23b. That figure is replicated as Figure 3 above, for the purpose of reference.

The discussion of Figure 4.23b in JBS&G (2023) (Figure 3) was:

"Figure 4.23b presents the multilevel hydrographs for CLRP22, CLRP18, CLRP27 and PG1. The hydrographs are clustered in the vicinity of 918-920 Panel Area.

From Figure 4.23b, CLRP18 is located to the north of the 906 Panel. There is an observation in the Banks Wall Sandstone (Layer 13) at CLRP18. The other vibrating wire piezometer sensor at CLRP18 is currently omitted due to unreliable data (JBS&G's interpretation). From Figure 4.23b, the groundwater elevation in the Banks Wall Sandstone is, again, higher than the top of the Banks Wall Sandstone, which implies confined conditions. There is a downward trend in the observed groundwater elevation in the Banks Wall Sandstone. In contrast, the modelled groundwater elevation (Layer 13) is steady.

From Figure 4.23b, CLRP22 is situated above 910 Panel. 910 Panel has been subject to double-sided lifting (Model Mining Method 3). From Figure 4.23b, there are observations at CLRP22 in the Banks Wall Sandstone (Layer 13) and the Burra-Moko Head Sandstone (Layer 16). For the Banks Wall Sandstone (Layer 13), the observed groundwater elevation is generally consistent with modelled groundwater elevation, albeit the observed level is higher than modelled. From Figure 4.23b, the modelled and observed groundwater elevation in the Burra-Moko Head Sandstone (Layer 16) is consistent.

From Figure 4.23b, swamp piezometer PG1 is located above 906 Panel. 906 Panel has been subject to single-sided lifting (Model Mining Method 2). From Figure 4.23b, the observed elevation is at ground surface, as is the modelled groundwater elevation.

From Figure 4.23b, CLRP27 is located above the 900 Panel at Clarence Colliery. A comparison of observed and modelled levels is presented above with respect to Figure 4.23a." [Section 4.12.3.3 of JBS&G (2023)]".

Issue NSW DCCEEW 5.15) "SCT (2026) discussed the behaviour of CLRP22 (but not CLRP18), concluding:

> *A multi-piezometer string is installed in Borehole CLRP22 midway along the 910 panel (as shown on Figure 11), the first panel extracted. Figure 22 shows the piezometric profile measured in Borehole CLRP22 over the period of mining these panels. Figure 23 shows the piezometric pressure in Borehole CLRP22 plotted as a function of time.*
>
> *Depressurisation at the top of the Burra Moko Head Sandstone is evident at 105m above the Katoomba seam.*
>
> *A drop in head pressure in the upper Burra Moko Head Sandstone is observed in April 2020 when 910 Panel extraction was mid-panel and just before commencement of mining in 908 panel.*
>
> *There is further reduction in pressure in the upper Burra Moko Head Sandstone as 908 Panel mines up to the piezometer.*".

Section 4.12.4.4 of JBS&G (2026) presents the groundwater hydrographs for CLRP29_V, CLRP28, CLRP18_V and CLRP22_V (Figure 4.29) as well as layer-by-layer model output and depth versus pressure profiles.

Issue NSW DCCEEW 5.16) "It is important to note that under the DA 504-000 Approval Water Resources Impact Assessment Criteria 5.

(a) significant inflows to mine workings;

…

(d) reduction in surface flows and groundwater baseflow to waterbodies including Marrangaroo Creek, Farmers Creek, Dargans Creek, Wolgan River, Dumbano Creek, Bungleboori Creek, and Wollangambe River (excluding reduction in flows associated with the proposed water transfer scheme), to the satisfaction of the Planning Secretary.".

A compliance assessment with respect to each of these criteria is presented in Section 5.2.3.1 of JBS&G (2026).

Issue NSW DCCEEW 5.17) "In a recent review of mining impacts on Marrangaroo Creek Swamp (Krogh 2026) it was noted that:

> *In many areas above previous Springvale Mine longwalls it is not only the lower aquifers in the Permian and Triassic strata that are being impacted, but also the upper Triassic strata of the Banks Wall Sandstone and Burralow Formation. These upper strata are often hydrologically connected to the endangered Newnes Plateau shrub and hanging swamp communities (e.g. see McHugh 2014, 2018; Krogh et al. 2022) and are also important in providing baseflow to the streams of the area. More recently, significant declines in aquifer levels have occurred for a large number of piezometers monitoring the Banks Wall Sandstone and Burralow Formation, especially those located directly above or within 600m of the longwalls (e.g. SPR1808, SPR1301, SPR1211, WB12101 and WB32101, PHS, SPR38, SPR37 and SPR64).*

Advice should be sought from the Independent Expert Advisory Panel for Mining regarding the observed aquifer impacts from earlier Clarence mining and the potential impacts of the proposed extraction of 918 shortwall panels on swamps, wetlands, aquifers and water resources.".

The numerical groundwater model, and the accompanying surface water model, incorporate the mechanisms to account for hydrological connection between groundwater and surface water.

As presented in Section 6.2.2, Adaptive Management, of JBS&G (2026):

"Experience in impacts to perched, shallow and deep groundwater system due to depressurisation of target coal seams and subsidence-induced change to hydraulic properties to strata overlying the target coal seam has evolved over the last decade, leading to amendment to mining methods. In the case of the Extraction Plan for 918 Panel, this comprises a low-subsidence method via the PPPE method.

For the Extraction Plan for 918 Panel, this represents a revision to that presented in an earlier version of the Extraction Plan (being 918-920 Panel Area). In the current Extraction Plan, extraction in the 918 Panel does not occur beneath THPSS shrub and hanging swamps (with the exception of Paddy's Creek Hanging Swamp which is located partly above the proposed 918B2 sub-panel); however, these exist within the 26.5o Angle of Draw."

References

Barnett B., Townley L.R., Post V., Evans R.E., Hunt R.J., Peeters L., Richardson S., Werner A.D., Knapton A. and A. Boronkay, 2012. *Australian Groundwater Modelling Guidelines – Waterlines Report Series No. 82*. National Water Commission, Canberra.

GSI Environmental, 2022. *USGS-Transport Version 1.9.0: Block-Centered Transport (BCT) Process for MODFLOW-USG*. Software manual prepared by GSI Environmental Limited. Reference No. n/a, dated 2 February 2022.

JBS&G, 2023. *918-920 Extraction Plan Groundwater Model Report*. Consultant report prepared by JBS&G Australia Pty Ltd for Clarence Colliery Pty Ltd. Reference No. JBS&G61645-149994/R01Rev0, dated 15 November 2023.

JBS&G, 2024. *Advice on Response to Agency Comments – 918-920 Extraction Plan Groundwater Model Report*. Consultant letter prepared by JBS&G Australia Pty Ltd to Clarence Colliery Pty Ltd. Reference No. JBS&G61645|160496/L04Rev0, dated 9 July 2024.

NSW DCCEEW's statement that many proposed piezometers are yet to be installed is not accurate.

The length of the monitoring dataset is variable, with some locations having observations since 2005 whereas others are quite recent. Figure 4.23 of Section 4.12.3.3 of JBS&G (2023) presents time-series observed elevation together with observation in the period 2015 through to end of 2022 in the vicinity of the 918-920 Panel Area.".

Since the time of JBS&G (2023), all recent observation data was added to groundwater hydrographs and depth versus pressure profiles presented in JBS&G (2026).

Issue NSW DCCEEW 5.12) "These issues with the modelling were not addressed/discussed in the new Panel 918 Extraction Plan."

The matters raised were responded to in JBS&G (2024) and did not require change to the approach to the presentation of outcomes of groundwater modelling.

Issue NSW DCCEEW 5.13) "Instead, JBS&G (2026) presented a figure (Figure 4.24 p173) on the Steady-State Observed (Weighted) versus Modelled Heads (mAHD) and a figure (Figure 4.25 p174) on the Observed (Weighted) versus Modelled Heads (mAHD). JBS&G (2026) used Figure 4.24 to suggest a good model calibration, however, when this Figure is compared to the previous presentation (JBS&G 2023) of observed versus modelled data, Figure 4.24 (of JBS&G 2026) clearly excludes a very large number of relevant head observations. JBS&G (2026) also did not provide a clear explanation of the "weighting" applied to the observed data points that were included.

In contrast, Figure 4.25 (of JBS&G 2026) shows the Observed (Weighted) versus Modelled Heads (mAHD) for a much larger number of observations. Based on JSB&G's Figure 4.25, the model still underestimates observed aquifer levels with discrepancies in modelled and observed levels at times being >50m (and in some cases approaching 200m). There has still been no systematic assessment or reporting of exactly where the significant disagreements between modelled and observed aquifer levels occur.

JBS&G (2026) also did not identify which piezometers were included/excluded from the most recent version of the model. The selective inclusion and exclusion of piezometers in the groundwater model can affect modelling outcomes and needs to be fully investigated and justified prior to any approval being given to Panels 918A, 918B1 & 918B2.

As a result of these concerns, NSW DCCEEW has low confidence in the groundwater model used to assess the groundwater impacts for the proposed extraction of Panel 918.".

Addressed in the response to Issue NSW DCCEEW 5.08 through NSW DCCEEW 5.11.

With respect to weighting, this is presented in Section 4.12.2 Calibration Targets of JBS&G (2026), with an equivalent section in JBS&G (2023).

With respect to confidence in the groundwater model, the NSW Aquifer Interference Policy (NSW DCCEEW, 2012) states that, with Clarence being a large coal mine development, the groundwater model has to be subject to external peer review.

Groundwater model peer review was undertaken in JBS&G (2023) and in JBS&G (2026). In both cases, the model was deemed 'fit for purpose' in accordance with the Australian Groundwater Modelling Guidelines (Barnett et. al., 2012).

Issue NSW DCCEEW 5.14) "In our previous response on the Extraction Plan for Panels 918 & 920 (DOC24/676691 dated 22 August 2024 [sic DOC24/357218, Date 9 May 2024]*), NSW DEECCW also noted that the obvious declines in aquifer levels at CLRP 18 and 22 occurred during the extraction of panels 908 and 910. In contrast, there was no decline in the CLPR2 aquifer levels (used here as a reference piezometer) which were generally rising at these times. We also noted that:*

The Gospers Mountain fire burnt through the Newnes Plateau in December 2019 and any effects of the fire on aquifer levels should be reflected across all piezometers.

JBS&G, 2026. *Extraction Plan for 918 Panel: Groundwater Assessment*. Consultant report prepared by JBS&G Australia Pty Ltd for Clarence Colliery Pty Ltd. Reference No. JBS&G68229|171726/R01Rev0, dated 13 February 2026.

NSW DCCEEW, 2026. *Clarence Coal (DA501-00) 918 Panel Extraction Plan and associated documents – comments from Conservation Programs, Heritage and Regulation Group (CPHR) and National Parks and Wildlife Service (NPWS)*. Letter prepared by the Conservation Programs, Heritage and Regulation (CPHR) and National Parks and Wildlife Service (NPWS) of the NSW Department of Climate Change, Energy, the Environment and Water to Clarence Colliery Pty Ltd. Reference No. DOC26/141474-1, dated 17 April 2026.

USGS, 2013. *MODFLOW-USG Version 1: An Unstructured Grid Version of MODFLOW for Simulating Groundwater Flow and Tightly Coupled Processes Using a Control Volume Finite-Difference Formulation*. Software manual prepared by the United States Geological Survey. Reference No. Techniques and Methods 6-A45, dated 2013.

Closing

Should you require clarification, please contact the undersigned on +61 2 8245 0300 or by email jbell@jbsg.com.au.

Yours sincerely:

Dr Justin Bell
Senior Principal Environmental Engineer
JBS&G Australia Pty Ltd

Appendix 4 – SCT (2026) Geotechnical, Subsidence and Caving Report

Appendix 5 – MSEC (2026) Subsidence Prediction and Assessment Report

Appendix 6 – JBSG (2026) 918 Panel Groundwater Report

Appendix 7 – GHD (2026) Groundwater Peer Review

Appendix 8 – JBSG(2026) Surface Water Report