



2. Project description

2.1 Introduction

This chapter describes changes to the Project (Mine) subsequent to the EIS. These changes are described in detail in SEIS Volume 4 Appendix B Updated Mine Project Description, and summarised in Section 2.2. Changes to the Project (Mine) Offsite infrastructure are summarised in Section 2.3.

The fundamental components of the Project (Mine) are as follows:

- Open cut mine
- Underground mine
- Mine infrastructure areas (MIAs)
- Coal handling and processing plant
- Out-of-pit dumps
- Raw water and waste water management infrastructure
- Offsite infrastructure, including
 - Workers accommodation village
 - Airport
 - Industrial development area
 - Water supply infrastructure

2.2 Updated mine plan

Table 1 summarises changes to the Project (Mine) subsequent to the EIS, reflected in an updated mine plan (refer Figure 1). The Project (Mine) for the SEIS is described in more detail in Volume 4 Appendix B Updated Mine Project Description. The main changes to the Project (Mine) are as follows:

- Revision of mine stage planning (refer to Volume 4 Appendix B Updated Mine Project Description)
- Consolidation of open cut pits from 16 pits (Pit A through Pit P) to 6 pits (Pit B through Pit G)
- Revision of underground mining to increase to five underground areas
- Separation and distribution of central MIA into five multiple, smaller MIAs
- Rearrangement of Project (Mine) offsite infrastructure (refer to Section 2.3)

The EIS mine stage plan reflecting commencement of construction in 2013, produce first coal in 2014 and begin rehabilitation in 2102. The SEIS mine stage plan was amended to commence in 2014, produce first coal in 2016 and begin rehabilitation in 2071. The overall effect is a decrease mine life from 90 years in the EIS to 60 years in the SEIS.

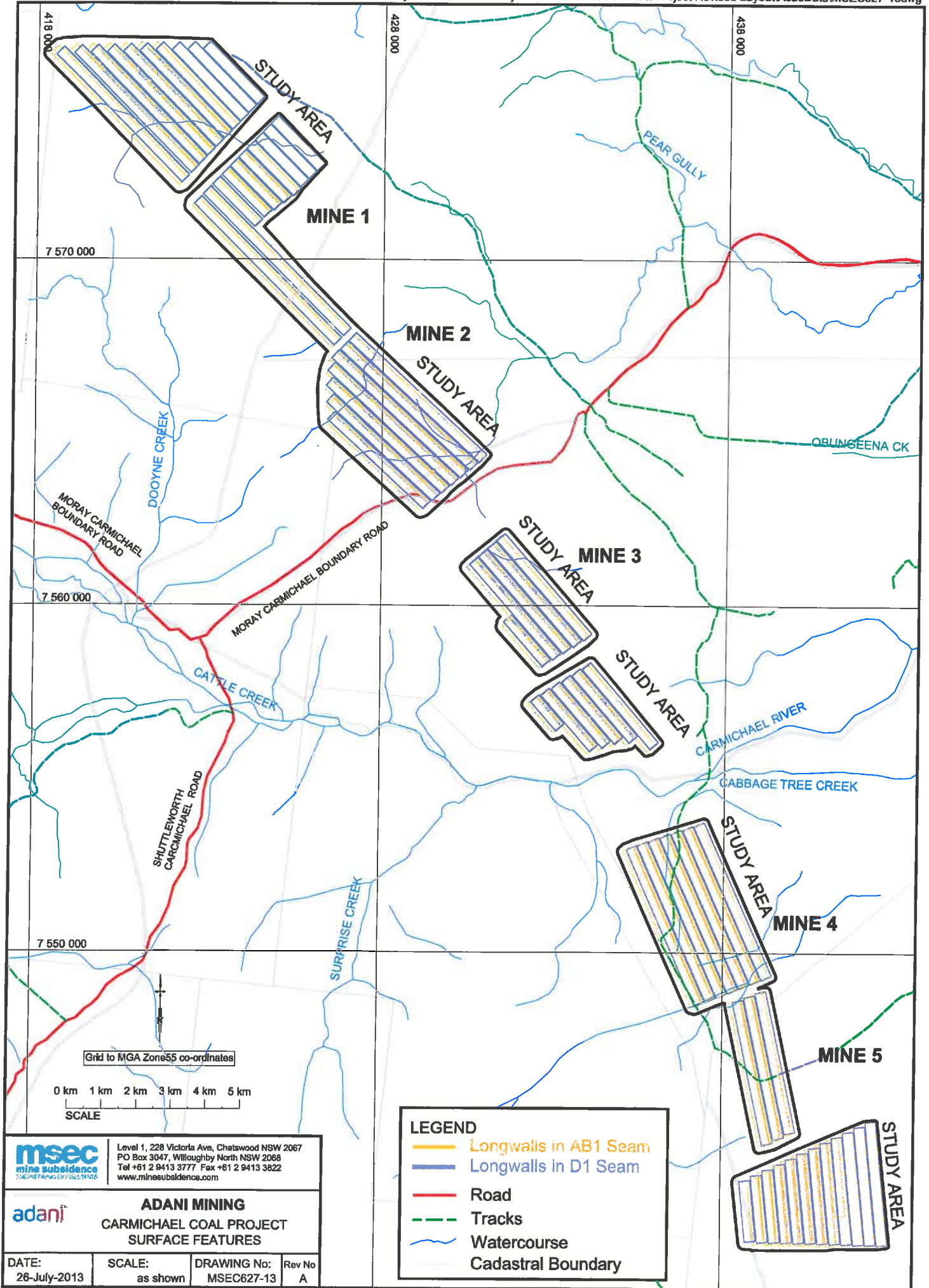


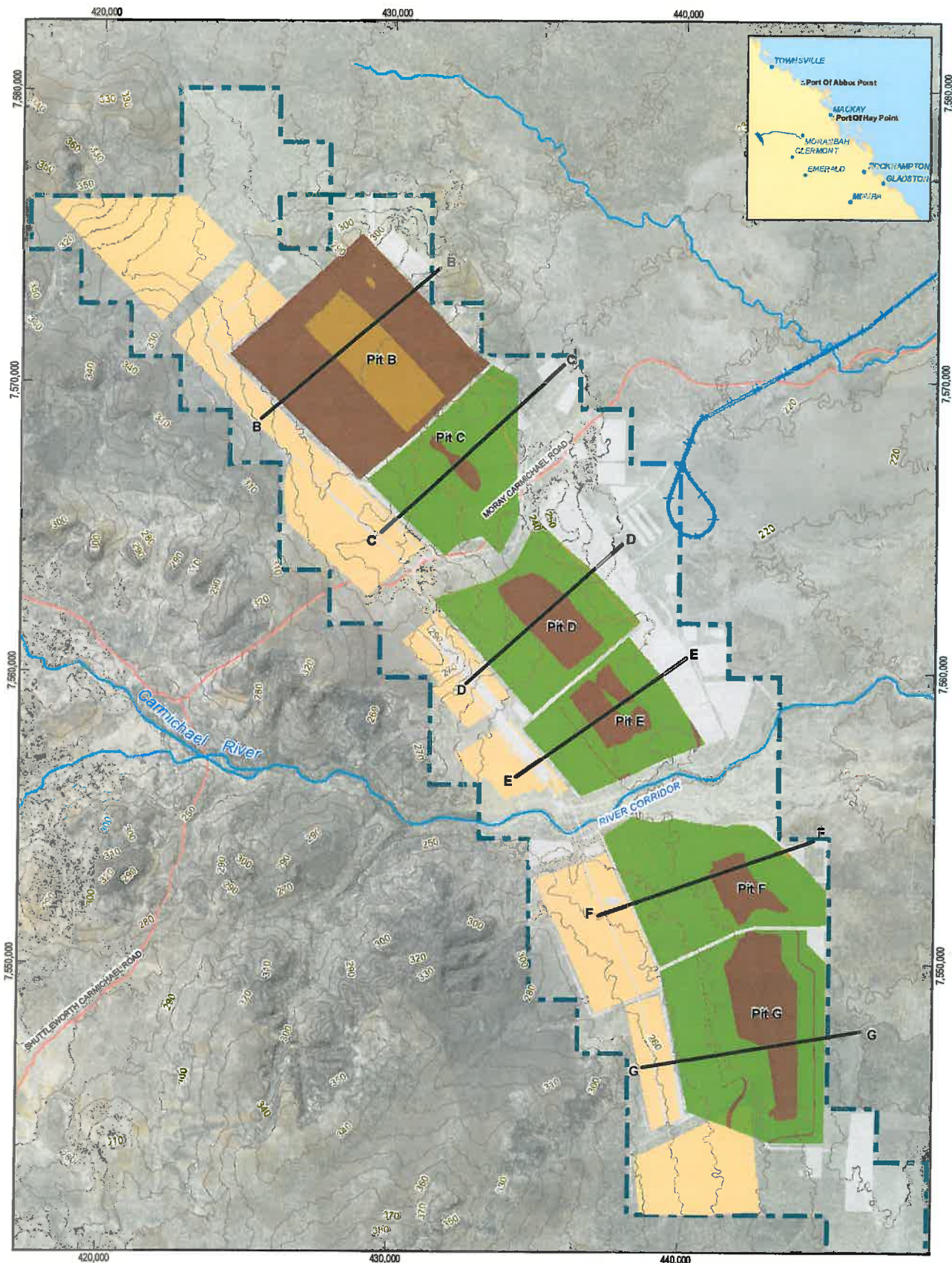
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Pit A through Pit K, north of Carmichael River, were consolidated into Pit B through Pit E. Pit L through Pit O, south of the Carmichael River, were consolidated into Pit F and G. Underground mining comprises the balance of operational areas, effectively replacing open cut pits A and P.

The MIAs will support the overburden and coal vehicle fleets for the life of the Project (Mine). Each will include a permanent heavy vehicle workshop, warehouse, 3.5 ML diesel storage and additional lubricant storage. The coal handling and processing plant coal stockpiles remain in the original location of the central MIA.

Changes to the Project (Mine) Offsite infrastructure is described in Section 2.3.





LEGEND

Local road	Mine Footprint	Final Landform
Watercourse	Contour (10m)	Woodland
Project (Mine)		Woodland & Pasture
Mine (Onsite)		Pasture
		Existing RE's (Woodland & Pasture where disturbed)

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1:185,000 (at A4)
0 2 4 8
Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55



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Adani Mining Pty Ltd
Carmichael Coal Mine and Rail Project
Rehabilitation Report
Plan view of the conceptual
final land use strategy

Job Number 41-26422
Revision B
Date 10-02-2014

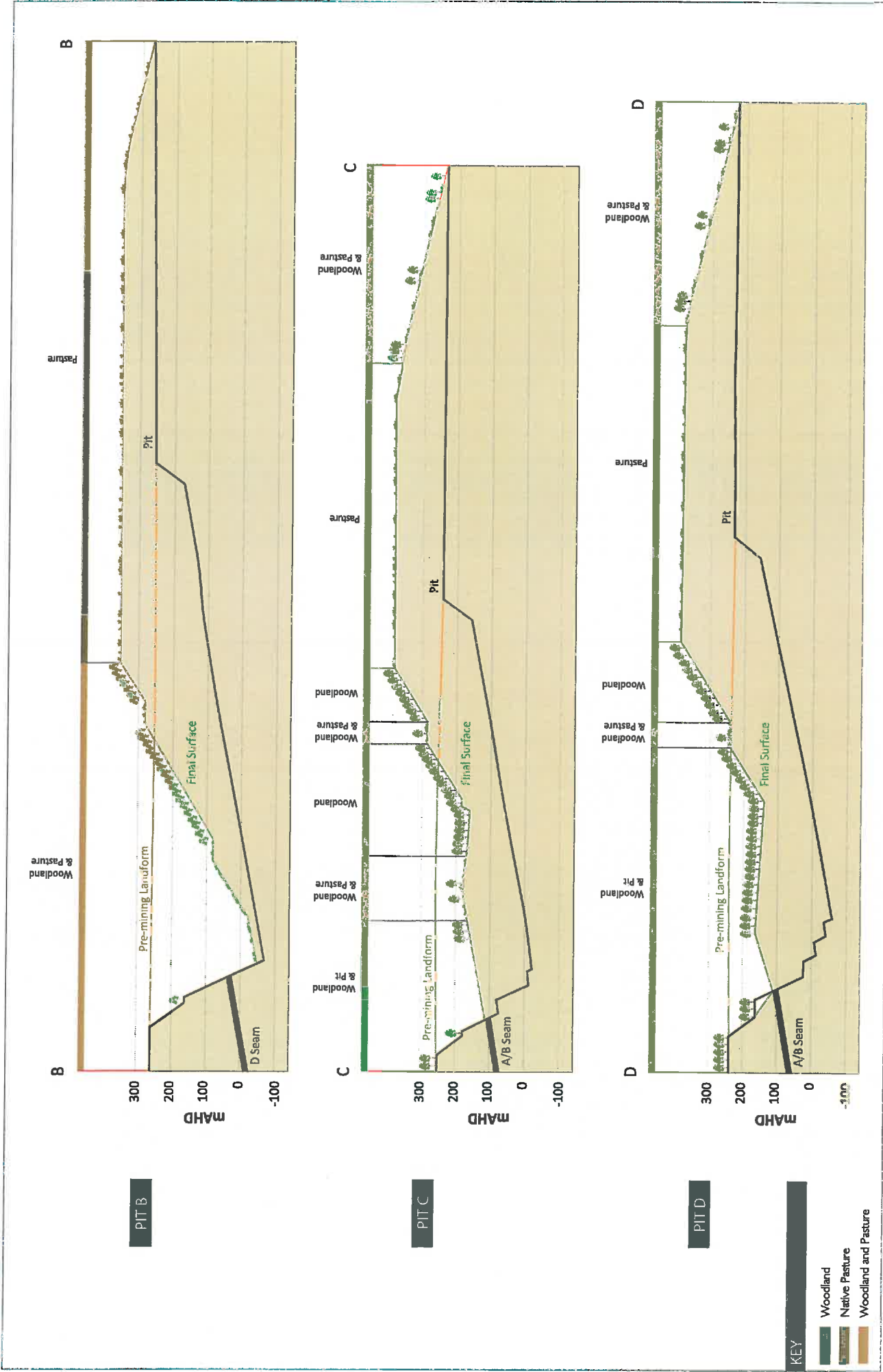
Figure 4-3

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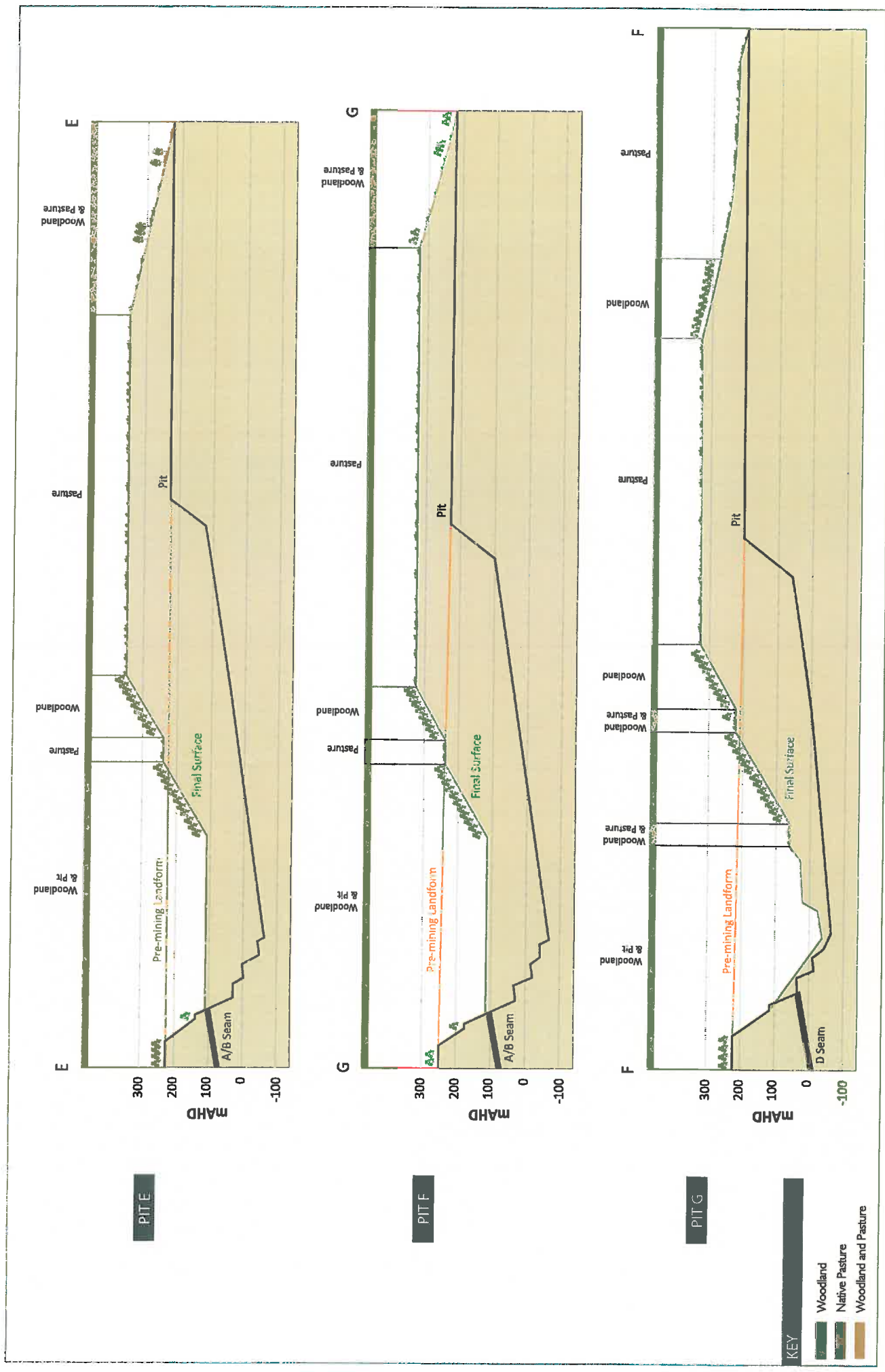
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Data Source: GA: 10m contour, Road, River / Watercourse (2007); DME:EPC1690 (2010), EPC1080 (2011); Adani: Alignment, Office(2013), Mine Domains, Final Landform (2014); Digital Globe: Satellite (2009). Created by: MS



Conceptual final landuse plan
Adani Mining Pty Ltd
Figure 4.2 (sheet 1)



Conceptual final landuse plan
Adani Mining Pty Ltd
Figure 4.2 (sheet 2)

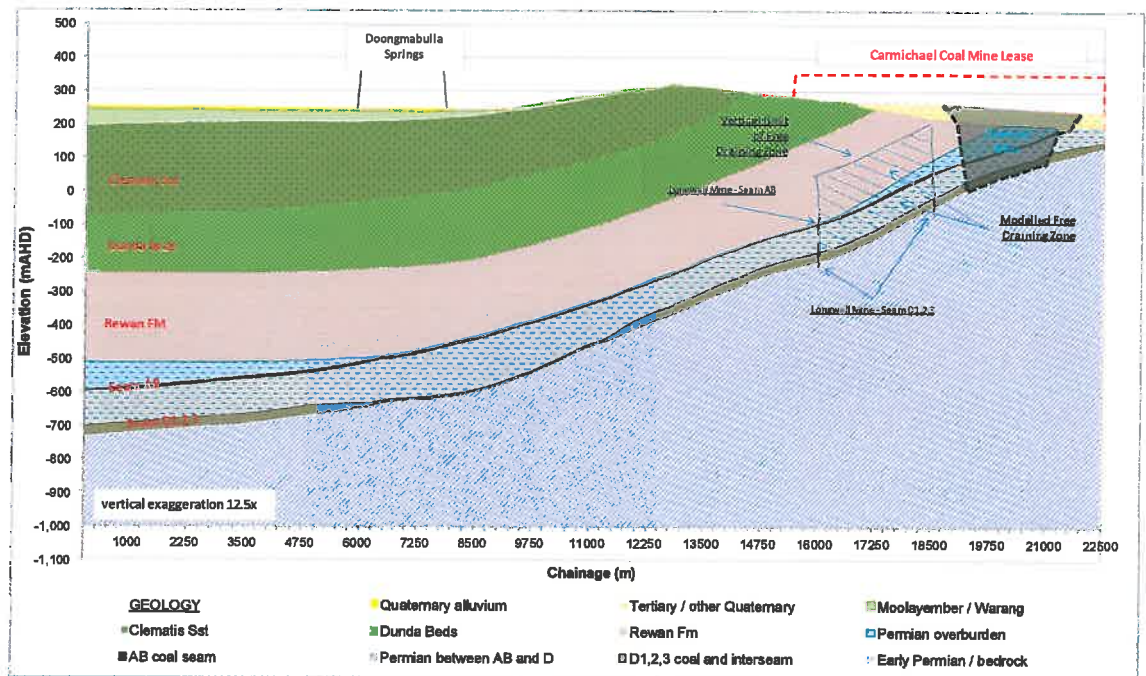


the two bore sites described above. This maximum thickness has been reduced to 7 metres to the west of the Mine Area (i.e. in the upper parts of the Carmichael River catchment) based on an assumption that the thickness of such deposits will increase as one moves downslope away from the top of a catchment. Interpolation has been used to derive the layer thickness between the edge of the extent and the areas defined as having the maximum thickness.

The Tertiary unit (which could also include other Quaternary deposits not falling within the extent of the Wondoola Beds) has then been mapped as all other Tertiary or younger deposits, using information on the base of the Tertiary strata supplied by Xenith (within the EPC).

In the earlier version of the groundwater model reported in the EIS (GHD 2012) the Rewan Group was simulated as a single model layer (model layer 6) and thus the historic model used for steady-state calibration comprised eleven layers. Model layer 6 was then split into two separate layers to allow better representation of the horizons within the Free Draining Zone which is likely to develop above the proposed longwall panels (MSEC, 2012, see Figure 28). The current SEIS groundwater model instead includes two layers for the Rewan Group in the historic steady state model and thus no structural changes are required for the subsequent predictive modelling work.

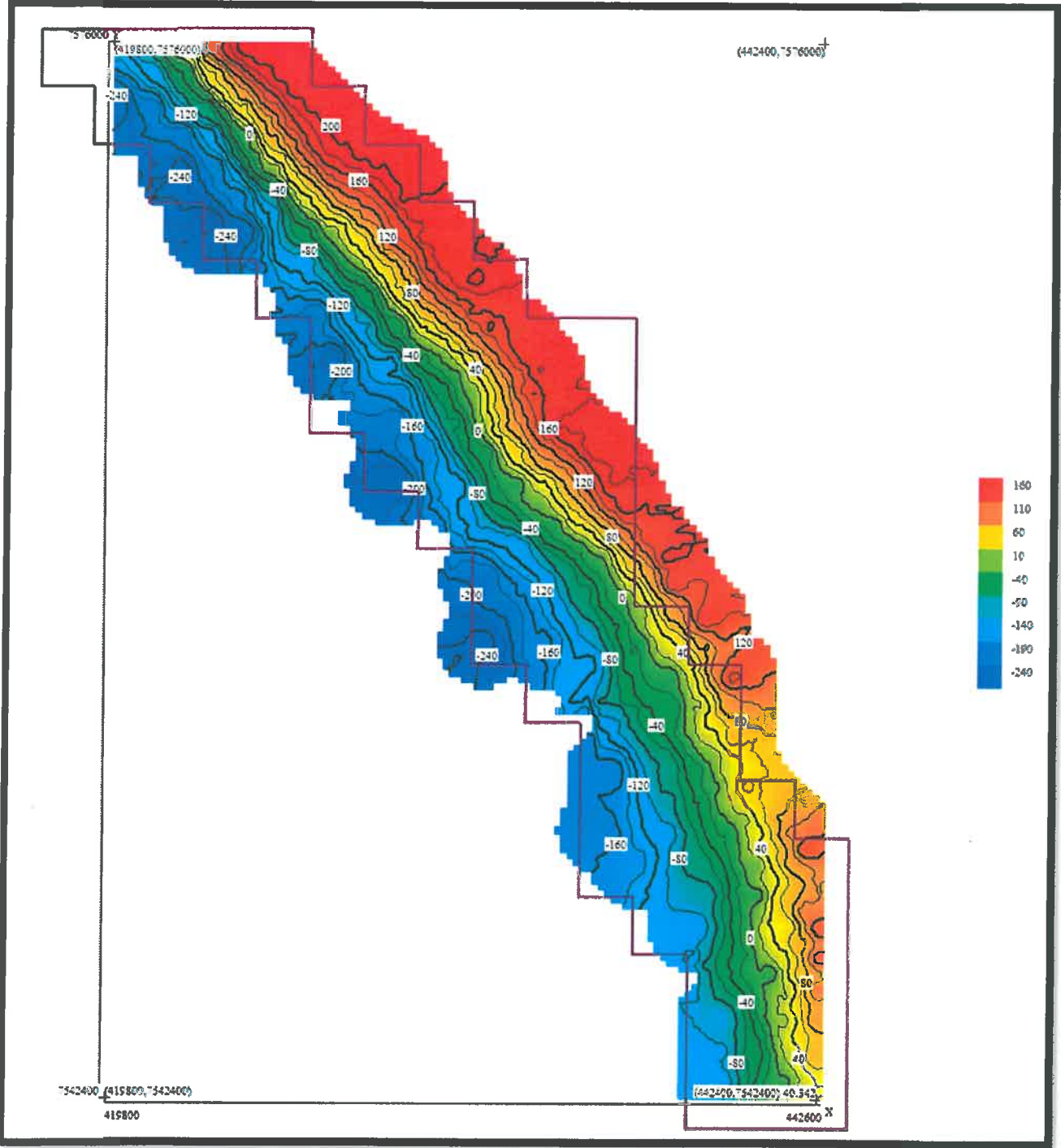
Figure 28 Geological cross-section and extent of free draining zone



Layer 12 (Early Permian and older units) are simulated throughout the entire model domain with its base set at a constant elevation of -1,000 mAHD. The layer is therefore 'flat-bottomed' and roughly 100 m thick in the deepest part of the basin. Due to the layer's flat bottom and hence variable thickness it has been parameterised with variable hydraulic conductivity (k_h) so as to maintain a constant transmissivity, which was then adjusted during model calibration.

m to 400 m.

Figure 9 Carmichael Deposit: D3_1 Structure roof from drilling and mapping data





completed by the Proponent in conjunction with support consultants. While the overall mine concept and mining and infrastructure components are unlikely to change, further geological exploration and geotechnical investigations may result in a number of operational refinements throughout the life of the mine.

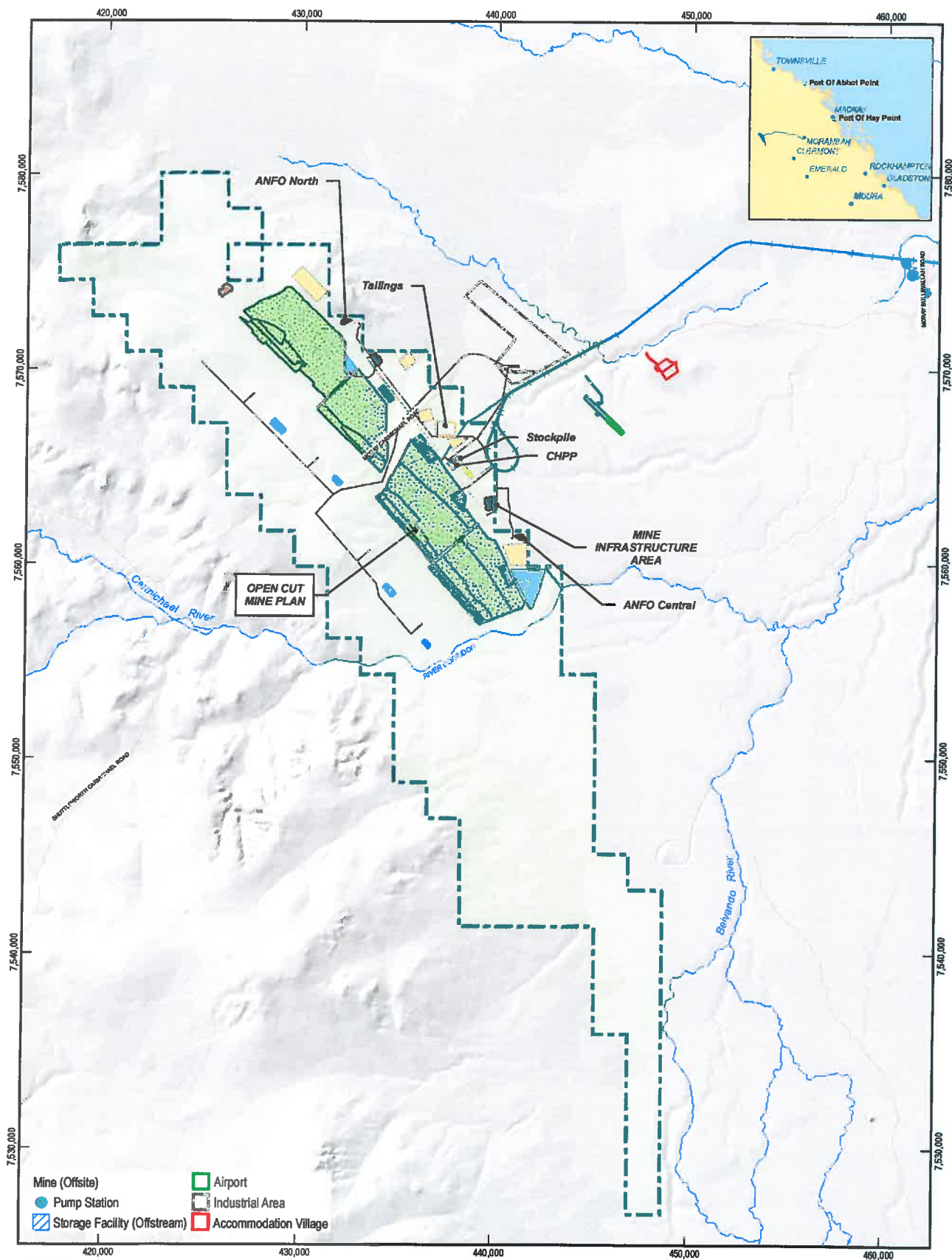
2.2 Coal seam physical characteristics

The technical feasibility of the Project (Mine) is dependent on the environmental, geological, geotechnical, hydrological and hydrogeological characteristics of the Project Area. Mine resource characteristics include the geology and location of varying qualities, quantities and depths of coal deposits, the surface water and groundwater features of the site, the location of the coal sub-crop and the geotechnical characteristics of the coal seam strata and overburden. The location and structure of the resource dictates the Project (Mine) layout, however, as the resource is further defined through continued exploration, the Project (Mine) layout may also be reviewed and amended accordingly.

The geological data used to support the mine plan is based on the Galilee Project – in situ JORC Coal Resources Estimate (Xenith Consulting, April 2013). This model has been developed in Mincom's Minescape software, and is underpinned by a total of 416 holes that were used to construct the geological model; 196 chip holes, 165 cored holes and 55 line of oxidation holes. A total of 157 holes were used as JORC points of observation and the topographic surface uses data from a detailed LiDAR survey commissioned by Adani in August 2011 that contains two data points per square metre. Adani has an ongoing exploration programme from which the geological model will be progressively updated.

The coal deposit underlies almost 100 percent of EPC1690. The results of the geological model show the coal seams gradually dip to the west at between 2 degrees and 6 degrees and the seams sub-crop along the eastern boundary of the Project (Mine). Four faults have been interpreted with vertical throws between 20 m and 40 m, trending in a general east - west direction. This orientation is concurrent with the trends seen elsewhere in the Galilee Basin. Mine planning has taken into account the impact and position of these faults through avoiding mine layout across the fault zones.

The overburden thickness to the shallowest coal seams ranges from 50 m of weathered Tertiary and upper Permian material in the east of the tenement, to over 400 m of weathered Triassic age Dunda beds and Rewan formation in the west. The seams are contained within the Permian coal measures, which are overlain across the total area by a poorly consolidated to unconsolidated cover of Tertiary materials, averaging 74 m in thickness but ranging to over 150 m in some areas. Figure 2 shows a generalised mine stratigraphic column.



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Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1984, Zone 55



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Adani Mining Pty Ltd
Carmichael Coal Mine and Rail Project SEIS

Job Number 41-28422
Revision B
Date 23-10-2013

Mine Stage - Year 2016

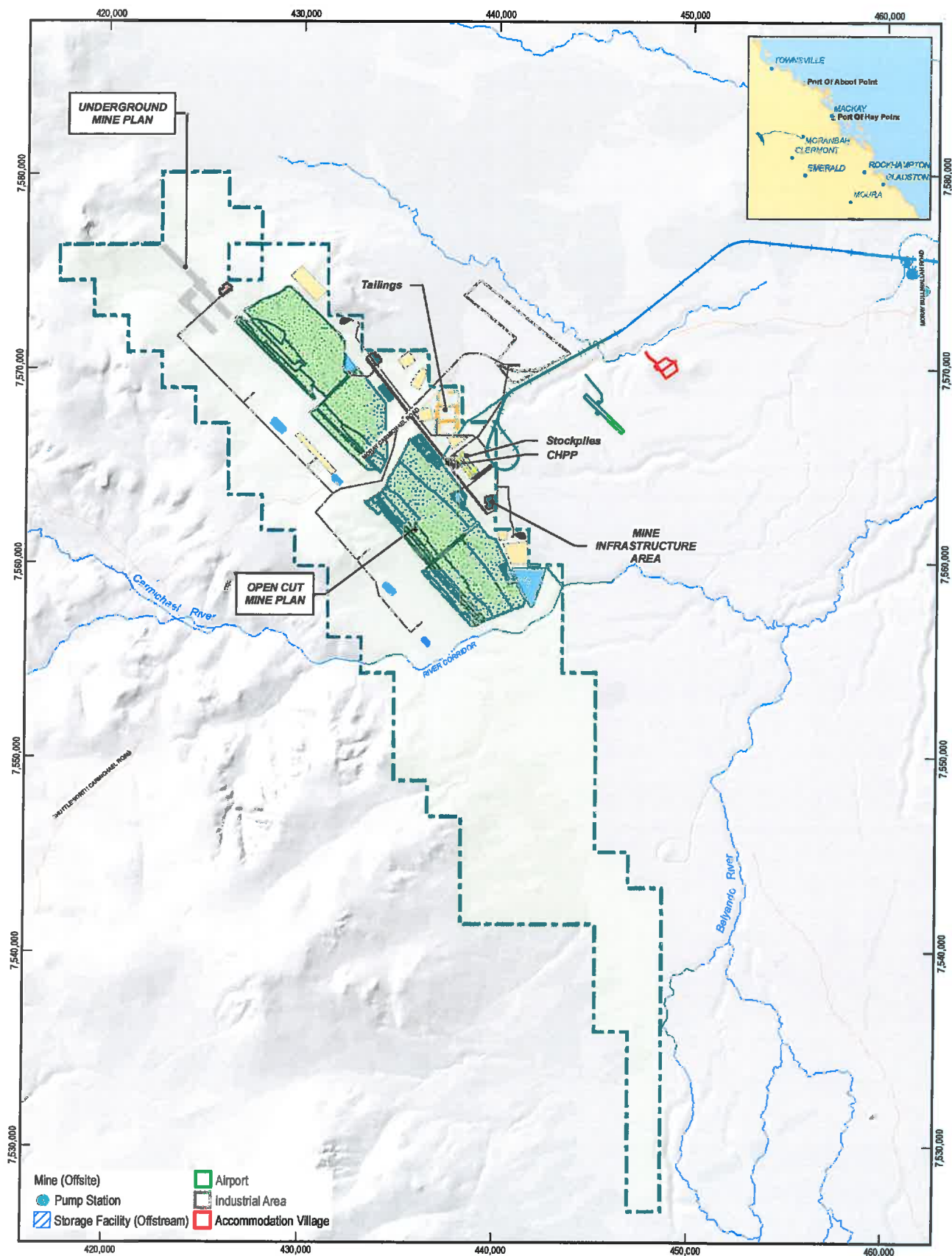
Figure 9

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Data Source: GA: Road, River / Watercourse (2007); DME:EPC1690 (2010), EPC1080 (2011); Adani: Alignment, Offsets(2013), Mine Layout / Infrastructure (2013); Created by: MS



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Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56



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Adani Mining Pty Ltd
Carmichael Coal Mine and Rail Project SEIS

Job Number 41-26422
Revision B
Date 23-10-2013

Mine Stage - Year 2019

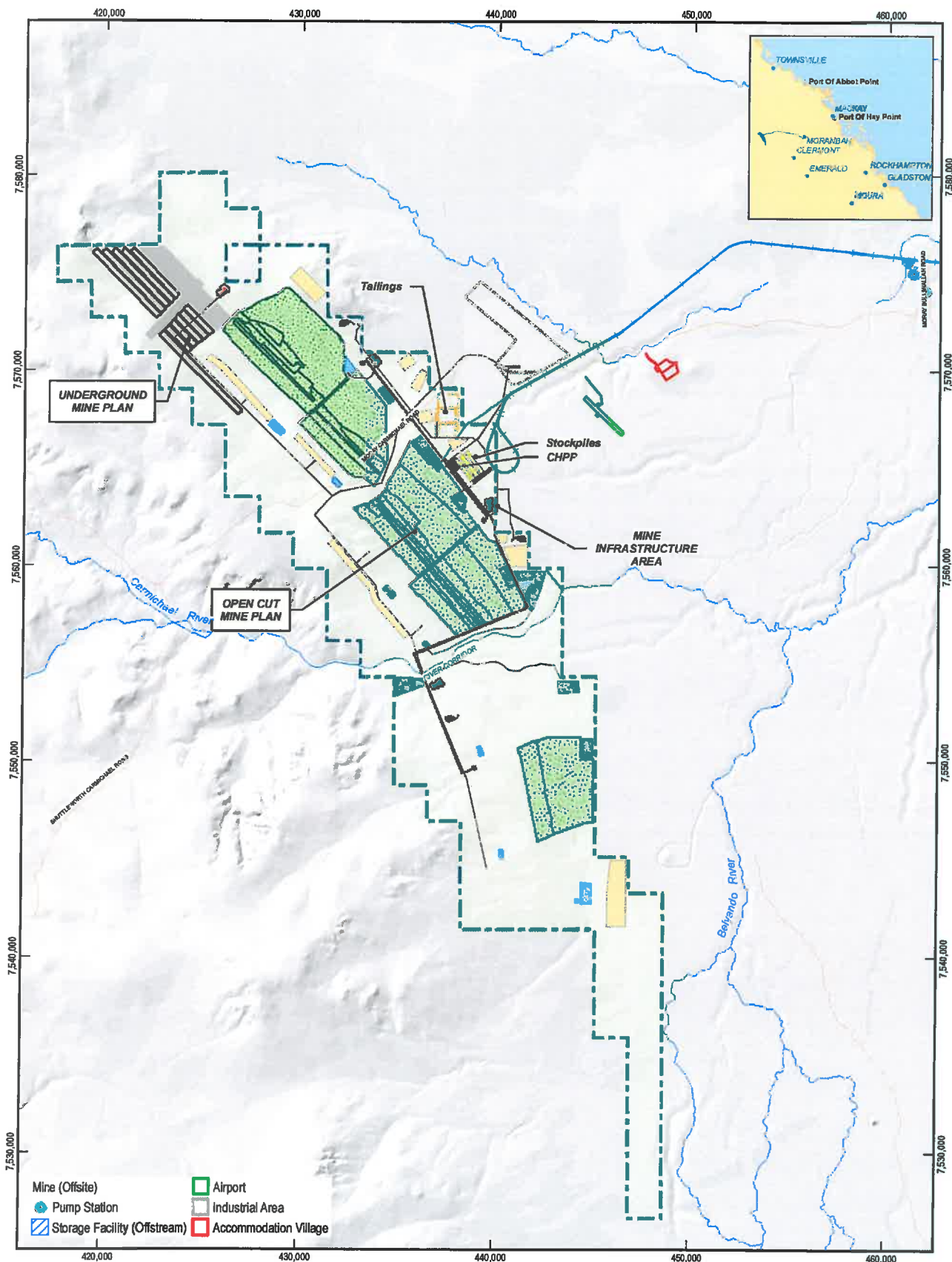
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Data Source: GA: Road, River / Watercourse (2007); DME:EPC1890 (2010); EPC1080 (2011); Adani: Alignment, Offsite (2013), Mine Layout / Infrastructure (2013); Created by: MS



- Mine (Offsite) ■ Airport ■
 Pump Station ■ Industrial Area ■
 Storage Facility (Offstream) ■ Accommodation Village ■

- LEGEND**
 Local Road — Rail (West) — Open Cut Blocks ■ Mine Infrastructure ■
 River / Watercourse — Mine (Onsite) ■ Water Management Dams ■ Stockpiles ■
 Overland Conveyors — Mine Infrastructure Area ■ Tailings Cell ■
 Top Soil Storage ■

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 Horizontal Datum: Geocentric Datum of Australia (GDA)
 Grid: Map Grid of Australia 1994, Zone 55



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Adani Mining Pty Ltd
 Carmichael Coal Mine and Rail Project SEIS

Job Number 41-26422
 Revision B
 Date 23-10-2013

Mine Layout Progress Plot
 Year 2020 - 2024

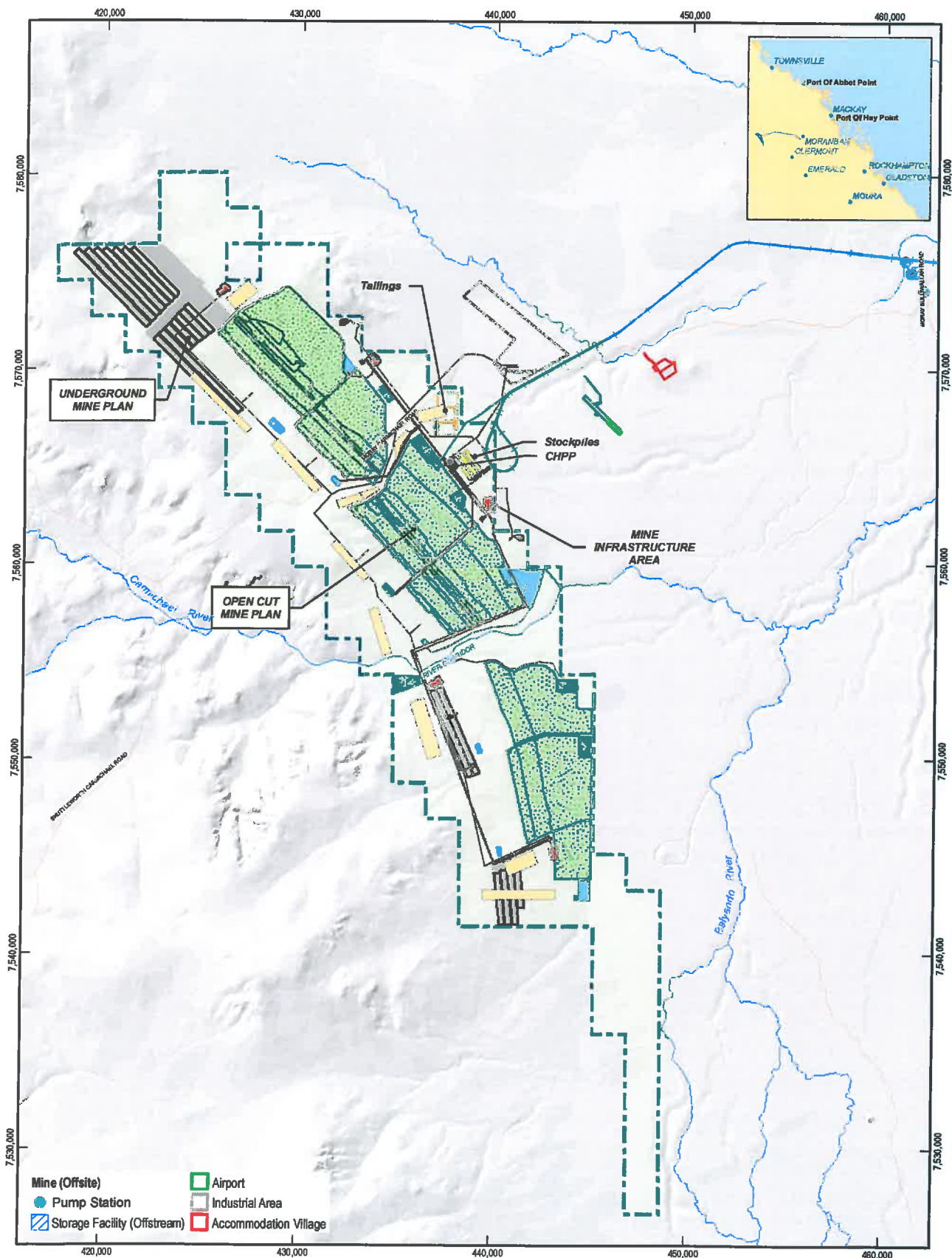
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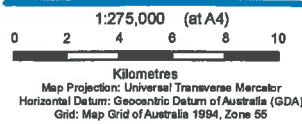
Data Source: GA: Road, River / Watercourse (2007); DME:EPC1690 (2010), EPC1080 (2011); Adani: Alignment, Offsite(2013), Mine Layout / Infrastructure (2013); Created by: MS



- Mine (Offsite)**
- Pump Station
 - Storage Facility (Offstream)
- Airport**
- Industrial Area
 - Accommodation Village

- LEGEND**
- Local Road
 - Rail (West)
 - Mine (Onsite)
 - Overland Conveyors
 - Open Cut Blocks
 - Water Management Dams
 - Mine Infrastructure Area
 - Mine Infrastructure
 - Stockpiles
 - Tailings Cell
 - Top Soil Storage

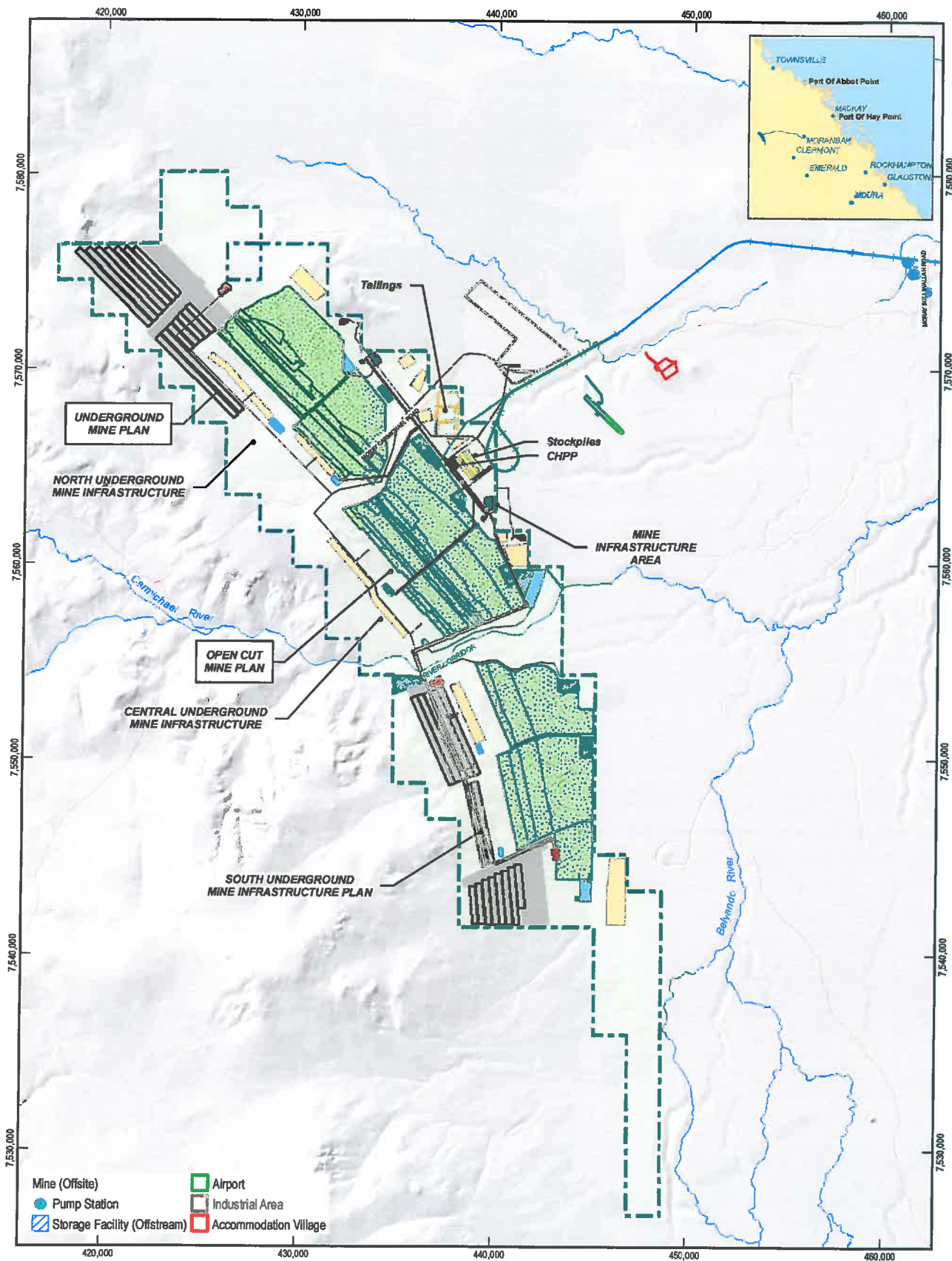
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Adani Mining Pty Ltd
Carmichael Coal Mine and Rail Project SEIS
Mine Layout Progress Plot
Year 2025 - 2029

Job Number 41-26422
Revision C
Date 17-10-2013

Figure 14



LEGEND

- Local Road
- Rail (West)
- Open Cut Blocks
- Mine Infrastructure
- River / Watercourse
- Mine (Onsite)
- Water Management Dams
- Stockpiles
- Overland Conveyors
- Mine Infrastructure Area
- Tailings Cell
- Top Soil Storage

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Kilometres

Map Projection: Universal Transverse Mercator

Horizontal Datum: Geocentric Datum of Australia (GDA)

Grid: Map Grid of Australia 1984, Zone 55



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Adani Mining Pty Ltd
Carmichael Coal Mine and Rail Project SEIS

Job Number 41-26422
Revision B
Date 23-10-2013

Mine Stage - Year 2030 - 2034

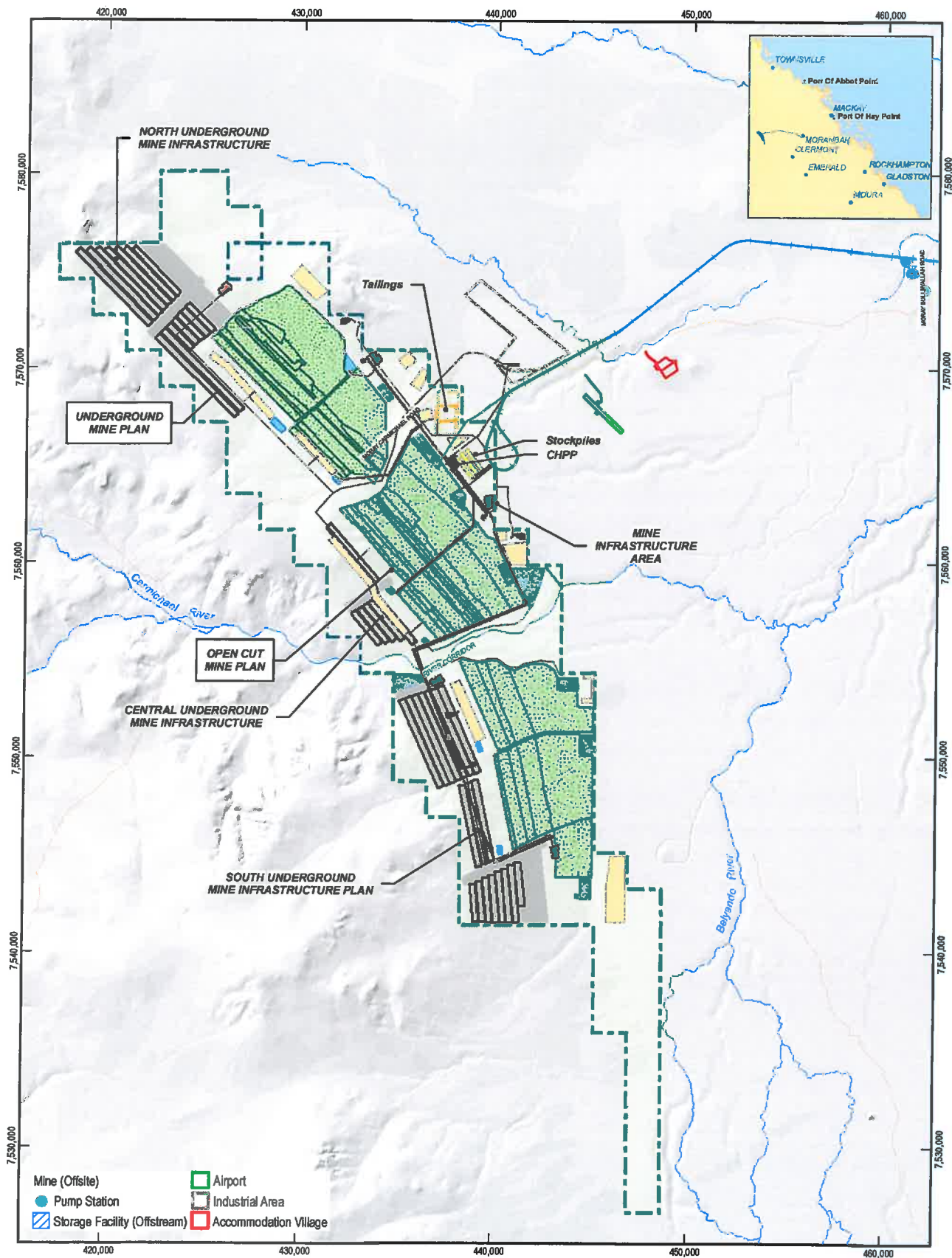
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LEGEND

- Local Road
- Rail (West)
- Mine (Onsite)
- Overland Conveyors
- Open Cut Blocks
- Water Management Dams
- Mine Infrastructure Area
- Stockpiles
- Tailings Cell
- Top Soil Storage

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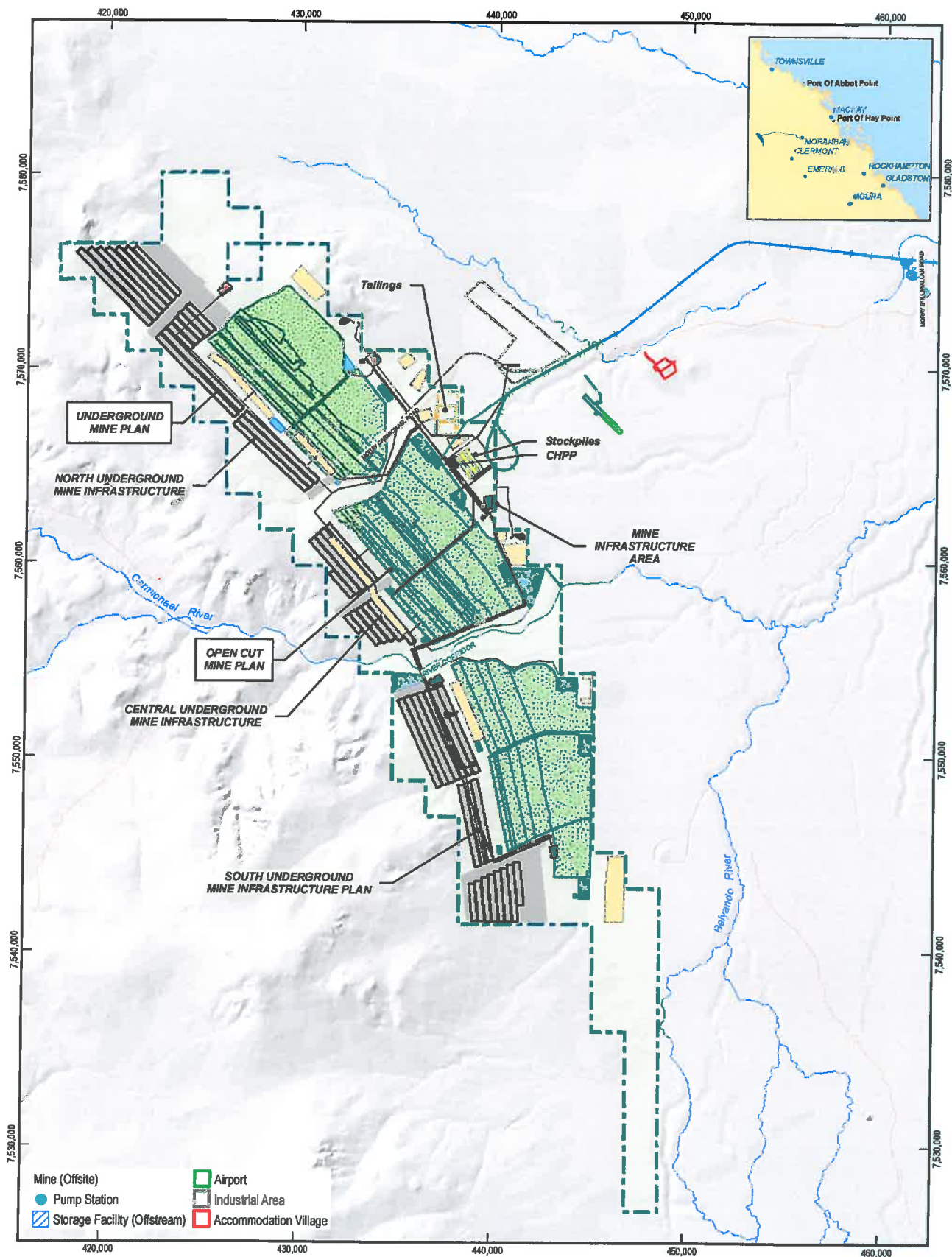
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Carmichael Coal Mine and Rail Project SEIS

Job Number 41-26422
Revision B
Date 23-10-2013

Mine Stage - Year 2035 - 2039

Figure 16

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LEGEND

- Local Road
- Rail (West)
- Mine (Onsite)
- Overland Conveyors
- Open Cut Blocks
- Water Management Dams
- Mine Infrastructure Area
- Mine Infrastructure
- Stockpiles
- Tailings Cell
- Top Soil Storage

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Kilometres
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Grid: Map Grid of Australia 1994, Zone 55



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Adani Mining Pty Ltd
Carmichael Coal Mine and Rail Project SEIS

Job Number 41-28422
Revision B
Date 23-10-2013

Mine Stage - Year 2040 - 2044

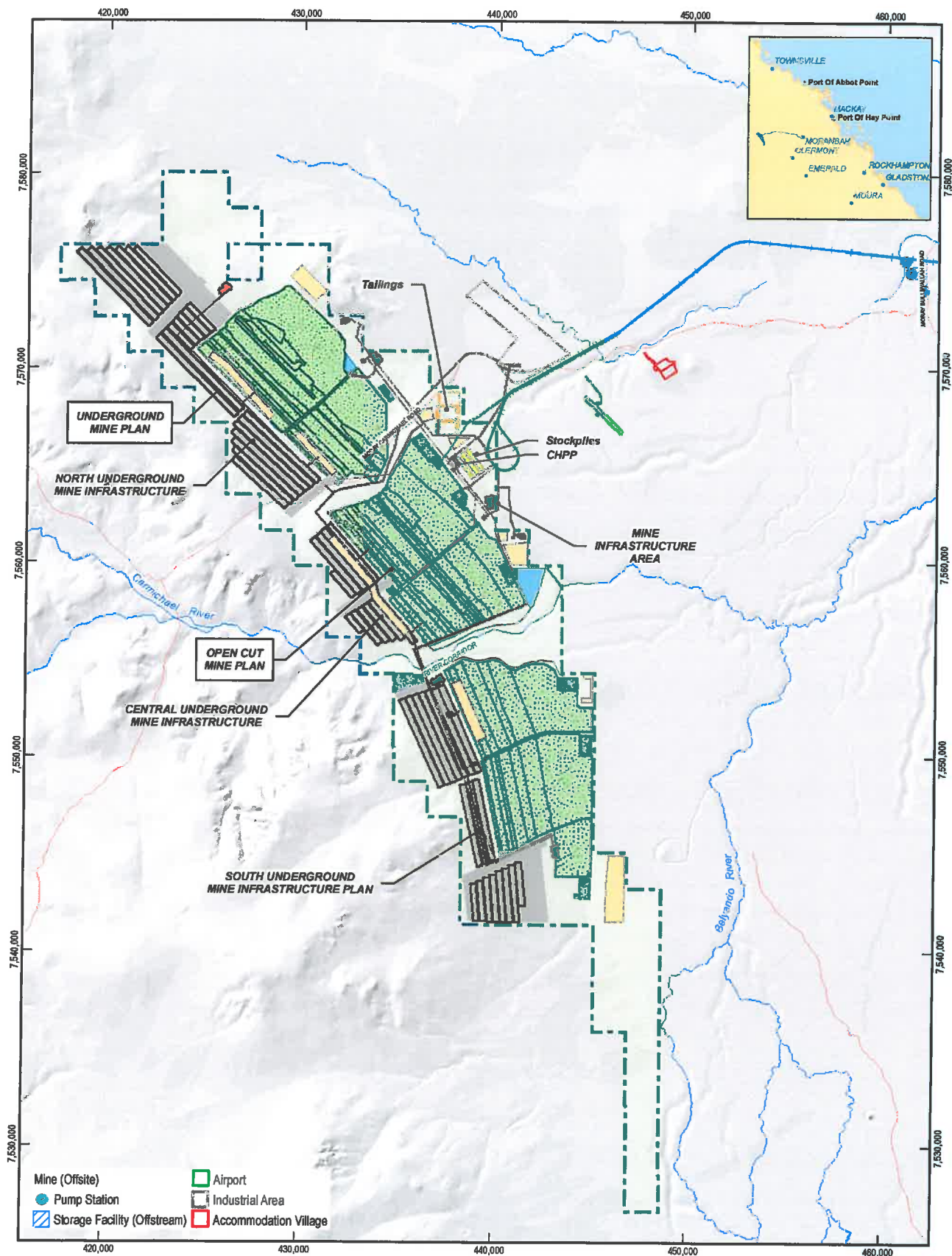
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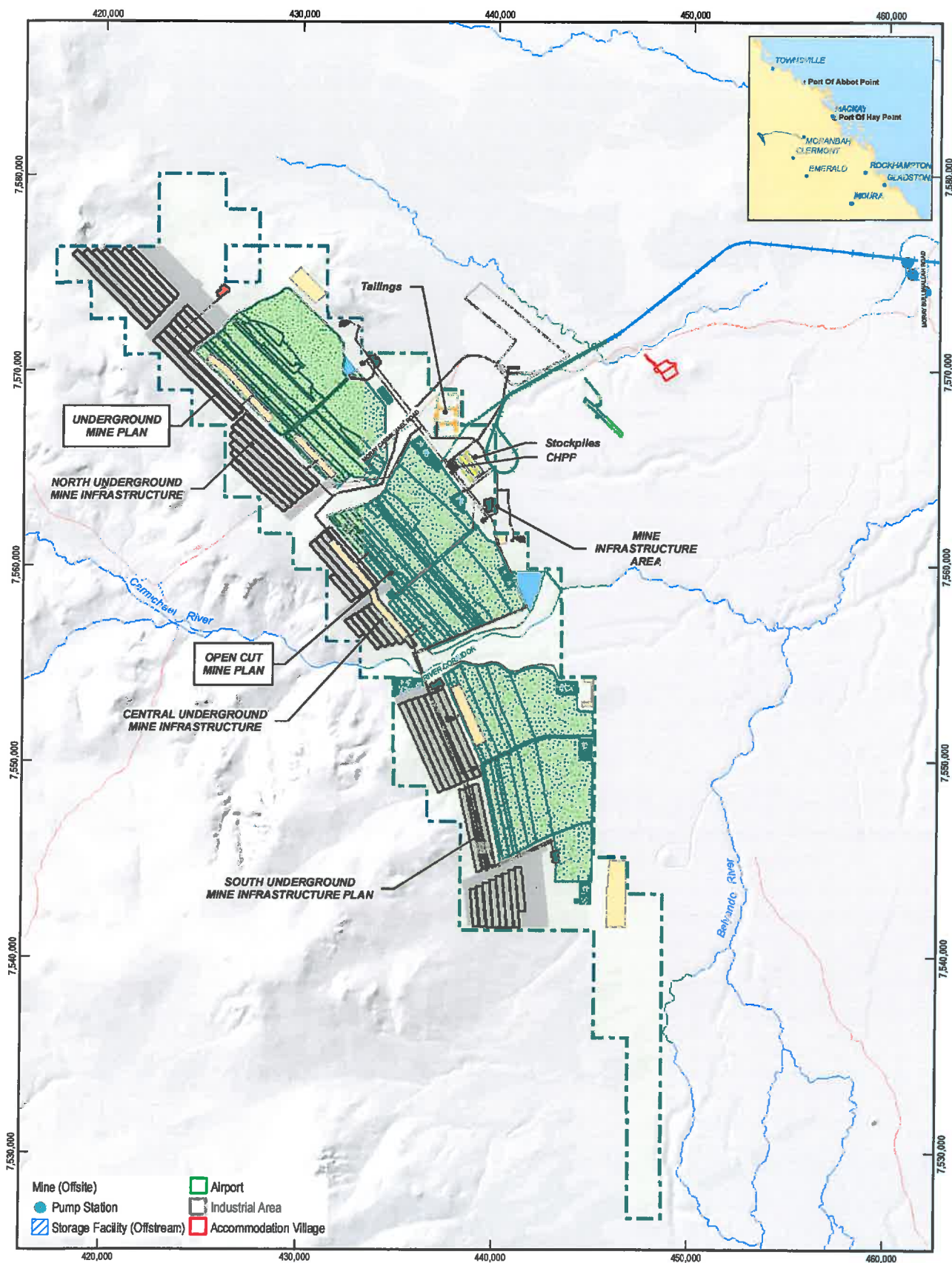
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LEGEND

- | | | | |
|---------------------|---------------|--------------------------|---------------------|
| Local Road | Rail (West) | Open Cut Blocks | Mine Infrastructure |
| River / Watercourse | Mine (Onsite) | Water Management Dams | Stockpiles |
| Overland Conveyors | | Mine Infrastructure Area | Tailings Cell |
| | | | Top Soil Storage |

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Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1984, Zone 56



Adani Mining Pty Ltd
Carmichael Coal Mine and Rail Project SEIS

Job Number	41-26422
Revision	B
Date	23-10-2013

Mine Stage - Year 2061 - 2072

Figure 20

MEMO

To: Martin Watkinson, Adani Mining Pty Ltd

CC: Barry Ward, GCS Pty Ltd

From: Troy Turner, Xenith Consulting Pty Ltd

Date: 18 October 2012

Re: Carmichael Coal Project – Changes to geological interpretation of overburden in EPC1690

Adani Mining Pty Ltd ('Adani') requested that Xenith Consulting Pty Ltd ('Xenith') undertake a review of the stratigraphic relationships of the formations present in EPC 1690, the area known as the Carmichael Coal Project (CCP) area. Xenith's works were carried out with the input of Barry Ward of Geotechnical Consulting Services Pty Ltd ('GCS') in September 2012.

Project Background

In late 2011, Xenith provided a geological model to GHD Pty Ltd, dated November 2011 to use as the basis of a hydro-geological study. The geological model contained a total of 77 data points, collected from the Adani 2010 and 2011 drilling programmes, and 2009 Linc Energy Data.

In 2012 Adani have, and continue to conduct an extensive drilling programme in the CCP area and have significantly increased the data points within the model (324 total drill holes September 2012). In parallel to this studies have been carried out by external consultants to better understand and characterise the relationships between and behaviour of the geological units in the CCP area, particularly those in the overburden of the Permian coal measures.

The increased number of drill holes and additional studies has lead to reinterpretation of the stratigraphy overlaying the Permian coal measures in the CCP area.

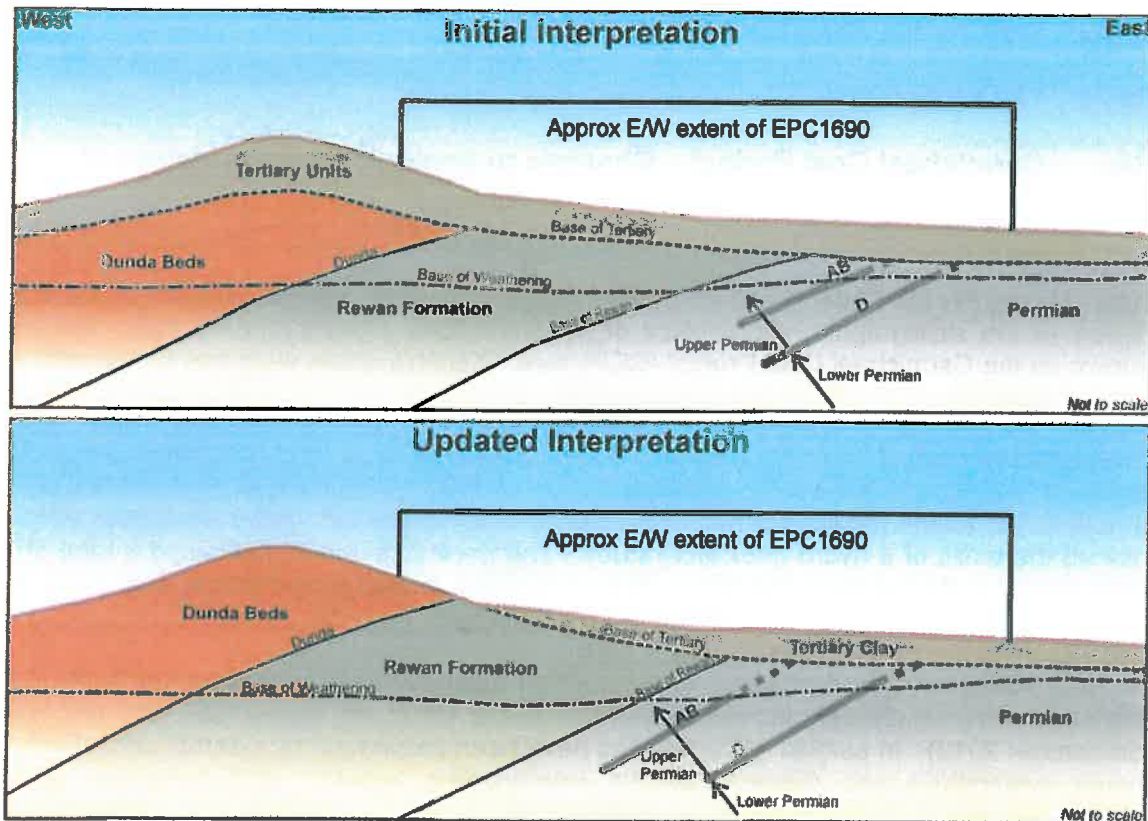
Methodology

The review of the stratigraphic units that overlay the Permian coal in the CCP area was undertaken in September 2012 by Barry Ward of GSC. GCS reviewed the core photos, lithological and geophysical logs of the drill holes from the 2011 drill programme, selected data from the 2012 drilling programme and geotechnical reports produced by other consultants. From this data GCS were able to pick the base of Dunda Beds (Triassic), base of Rewan Formation (Triassic) and base of Tertiary age units. A detailed methodology of this process can be found in the extract of the GCS report in Attachment 1.

Xenith updated the current (September 2012) geological model, created in Ventyx's Minescape software, with the data produced by GCS. Figure 1 shows a schematic of the

interpretation in initial interpretation, November 2011 and the updated interpretation, September 2012.

Figure 1: East/west cross section of interpretation of overburden relationships in CCP area in November 2011 (top) and September 2012 (lower)



The review concluded that the Tertiary cover was not laterally extensive across (east/west) the CCP area as previously thought, and the substantial thickness of clay that was originally interpreted in the west of the deposit due to a deeper weathering profile in Rewan Formation. It should also be noted that Triassic age strata are present at surface in the west of the lease.

Kind regards

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Attachment 1: Extract from GCS report 'Geotechnical Report –Open Cut Mining'