

# Partial Relinquishment Report

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EPC1221 – Andromeda

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## 1. Summary

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This report contains a summary of activities conducted on exploration permit for coal 1221 (**EPC1221** or the **Resource Authority**) by Springsure Creek Coal Pty Ltd (the **Holder**) in the area relinquished on 6 April 2018.

The exploration rationale for the Resource Authority is that shallow occurrences of coal have been identified through previous work, including resources and reserves estimated in accordance with the JORC Code. Work on this Resource Authority is now focussed on conceptual level mine planning.

No resources were identified in the area relinquished. The area relinquished represents less prospective areas than those retained due to interpreted deteriorating thickness and coal quality, and increasing depth.

## 2. Introduction

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### 2.1 Resource Authority Information

The Resource Authority was granted on 7 April 2008 for an initial term of 5 years, and renewed for further 5 year periods. The Resource Authority expires on 6 April 2023.

The original holder and current holder is Springsure Creek Coal Pty Ltd.

There have been no transfers or assignments since grant.

There are no joint venture arrangements in place in respect of the Resource Authority.

The Resource Authority comprises 29 sub blocks after this relinquishment.

### 2.2 Retained and Relinquished Sub-Blocks

The following sub-blocks have been relinquished.

CLER3363 – E, K, P, U, Z  
CLER3364 – A, B, F, G, L, M, Q, R, V, W  
CLER3435 – E  
CLER3436 – A, B, X  
CHAR52 – C, H  
CHAR53 – V  
CHAR54 – V  
CHAR125 – A, F, L, M, N, O, P, R, S, T, U, W, X, Y, Z  
CHAR126 – A, B, C, F, G, L, Q  
CHAR197 – B, C, D, E, G, H, J, K  
CHAR198 – E, F

The following sub-blocks have been retained.

CHAR126 – H, J, K, M, N, O, R, S, T, U, V, W, X, Y, Z  
CHAR198 – A, B, C, D, G, H, J  
CHAR52 – D, J, K, O, P, U  
CHAR53 - Q

### 2.3 General Area Information

The Resource Authority is located approximately 65km by road to the east of the town of Springsure and is accessed by the Orion Ten Chain Road from the Dawson highway. The Resource Authority is approximately 15km from the Bauhinia Branch of the Blackwater rail network. A location map is provided below.

The topography is generally flat to gently dipping. The area is sparsely populated, and generally used for cropping and grazing activities.

Diagrams illustrating the location of the Resource Authority relative to its sub-blocks, constrained areas, areas mapped as potential strategic cropping land, endangered regional ecosystems and native title claim areas are provided below.

## 2.4 Location Map

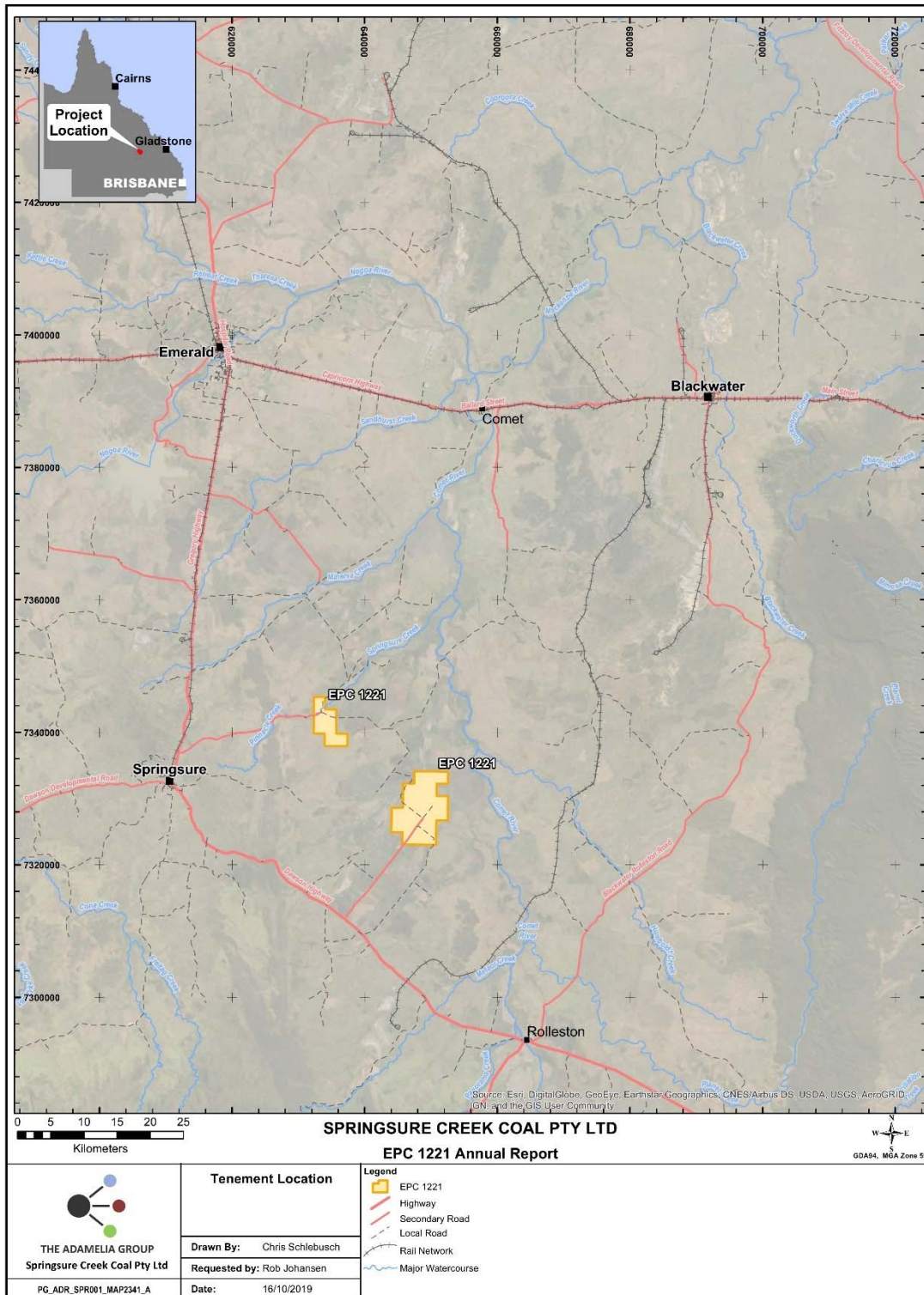


Figure 2-1: Resource Authority Location

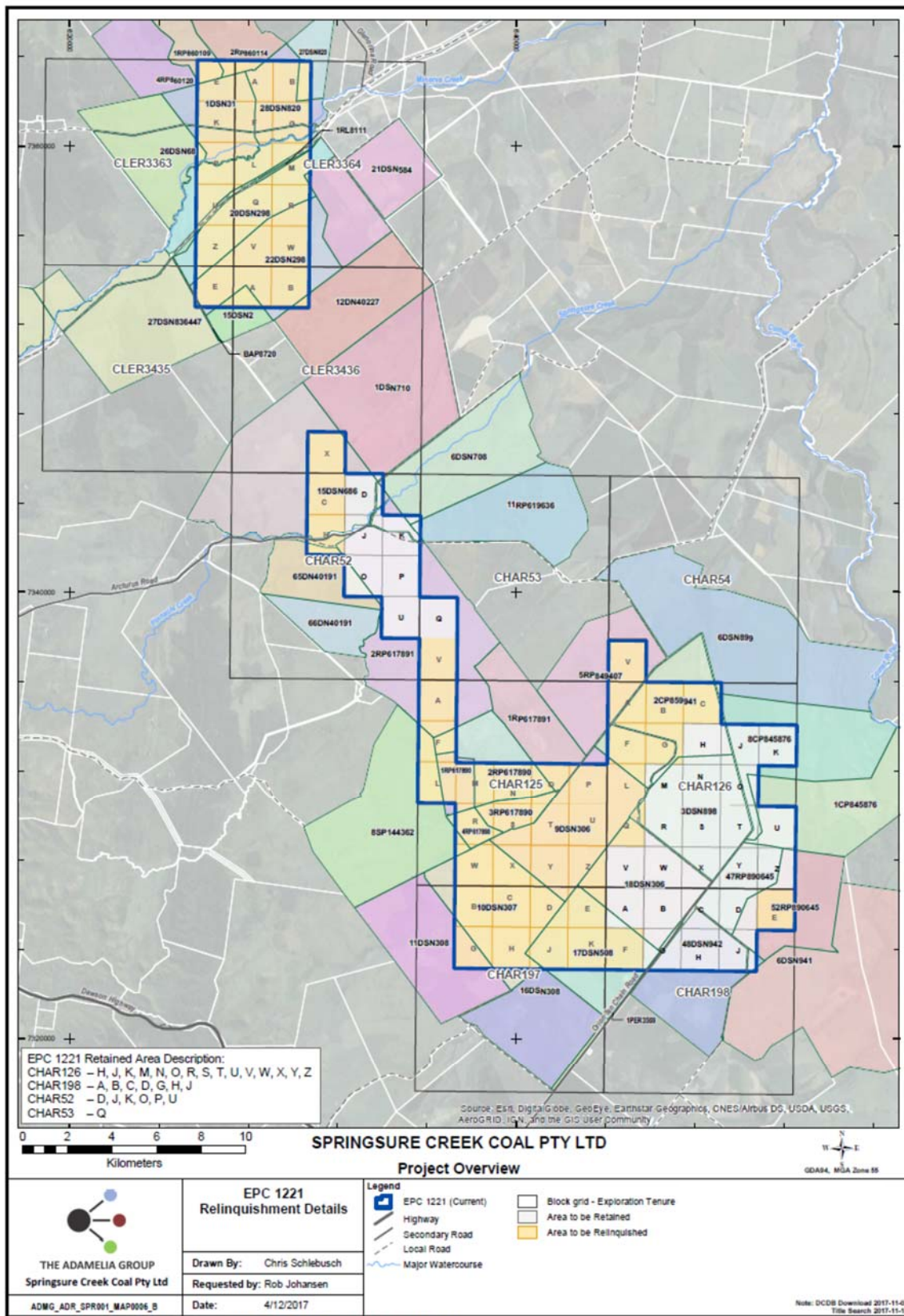


Figure 2-2: Relinquished Sub Blocks

## 2.5 Regional Geology

The following published maps relate overly the Resource Authority:

- 1:250 000 Geological Map Series - Bowen Basin Sheet - Emerald, SF55-15, 1<sup>st</sup> Edition 1969.
- 1:250 000 Geological Map Series - Bowen Basin Sheet - Springsure, SG55-3, 1<sup>st</sup> Edition 1964.
- 1:100 000 Land Map Series - 8550 Emerald.
- 1:100 000 Land Map Series - 8549 Springsure.

The Resource Authority is located within the Denison Trough morphotectonics unit of the Permo-Triassic Bowen Basin. The Bowen Basin is orientated north-northwest to south-southeast, approximately parallel to the Palaeozoic continental margin and is part of a connected group of Permo-Triassic basins in eastern Australia, which includes the Sydney and Gunnedah Basins.

Tectonically, the basin can be divided into north-northwest to south-southeast trending platforms or shelves separated by sedimentary troughs. The morpho-tectonic units from west to east are the Springsure Shelf, Denison Trough, Collinsville Shelf/Comet Platform, Taroom Trough, Connors and Auburn arches (interrupted by the Gogango Overfolded zone) and the Marlborough Trough.

Development of the basin in the early Permian was in the form of half grabens which subsequently became areas of regional crustal sag. Variations in depositional patterns and deformation styles that occur along strike suggest the possibility of northeast trending, deep seated, crustal transfer faults referred to as “transfer corridors” (Hammond, 1987).

The Denison Trough is one of two major depocenters in the Bowen Basin. This deep north-northwest trending trough contains a thickness of up to 6.5 km of marine and terrestrial sediments which are gently folded into a series of north-south trending en-echelon anticlines and synclines.

The Denison Trough has undergone extensive structural reorganisation since the early to mid-Permian resulting in a moderately faulted trough with a complex tectonic history. The tectonic history of the Denison Trough is characterised by an initial period of extension through to the mid Triassic with a subsequent compression in the early Cretaceous and the early-mid Tertiary, with a final extensional event in the mid Tertiary.

Faulting has a predominant north-south or north-northwest orientation, with normal faults common on the western margin of the Denison Trough. Later reactivation and inversion of these normal faults is also common, as in the case of the Albinia/Merivale fault, located a few kilometres to the east of the eastern boundary of the Resource Authority.

Sediments deposited during the initial stages of basin development consist of predominantly quartz-rich sediments derived from the uplifted continental basement. These sediments have accumulated in the early Permian and form the syn-rift Reids Dome Beds. This succession is approximately 4,000 m thick and consists of alluvial fan, talus slope, braided stream, meandering stream, lacustrine, delta, fan delta and marginal marine depositional systems.

Rapid lateral facies changes are common throughout the Reids Dome Beds and overlying Cattle Creek Group. The uppermost parts of both units exhibit characteristics of a marine transgression. Post-rift

thermal subsidence occurred during the late early to early late Permian depositing mainly offshore marine shelf to coastal plain type sediments. This phase of sedimentation includes the Cattle Creek Group, Aldebaran Sandstone, Freitag Formation and Catherine Sandstone. Feldspar-rich sediments derived from the Roma granites dominated the sediment supply during this time.

Sedimentation during the final passive thermal sag phase of basin development occurred during the late Permian to middle Triassic and is marked by a resurgence of volcanic activity. The infilling of the basin with volcanic detritus occur red as a series of progradational pulses, with the establishment of an alluvial plain by the late Permian. As compression continued, reddened alluvial strata replaced coal-bearing facies until the late Triassic when compression climaxed and erosion of the basin fill commenced.

## 2.6 Local Geology and Mineralisation

The Resource Authority is dominated by two northwest trending broad anticlines and by a broad north trending syncline, with an anticline structure (Yandina / Arcturus Anticline) in the eastern portion of the Resource Authority while the other forms the southern extension of the Springsure Anticline in the north of the tenement. The currently targeted resource deposit within the Resource Authority occupies the northern nose of the Yandina / Arcturus Anticline feature in the southeast section of the Resource Authority.

The potential for significant coal deposits exists within two formations located on the tenement:

- The primary focus to date within the Resource Authority has been on the Bandanna Formation, with shallow open-cut potential in the Aries, Castor and Pollux, Orion 1, Orion 2 and Pisces Upper seams. The lower Bandanna Formation seams (Orion and Pisces seams) are generally thinner and more lensoidal than the upper seams. Figure 2-3 shows a schematic of the Bandanna Formation seams that show economic potential. This focus has now shifted to the Pollux seam, being the only seam with underground mining potential.



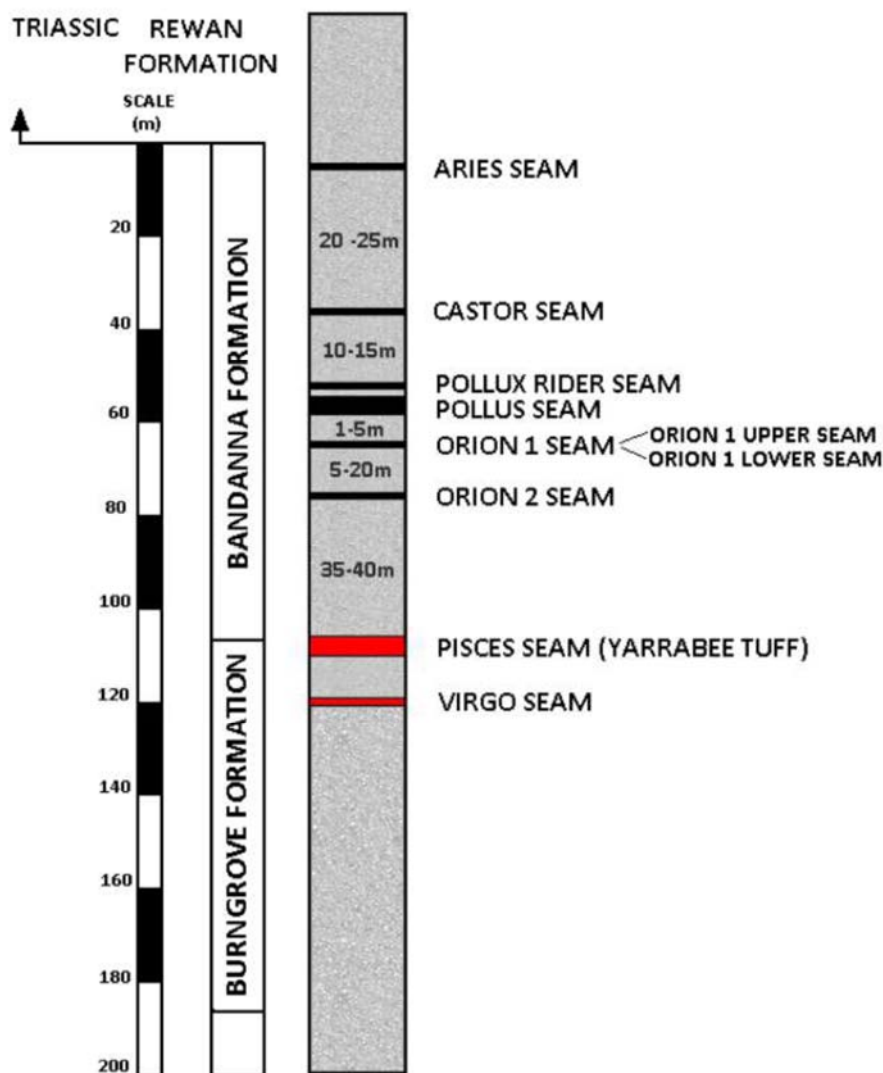


Figure 2-3: Stratigraphic Column showing Bandanna Formation Seams

- The secondary focus is the Mantuan Formation which is much deeper, however it may represent an underground mining opportunity, with seams occurring as a twin seam with a potential composite 10 metres thickness. No work was carried out in respect of the Mantuan Formation in the Reporting Period.

The Resource Authority is overlain by up to 140 metres of Quaternary and Tertiary sands and basalts. The surface geology consists of Quaternary alluvial deposits and volcanics. Underlying these surface rocks lay the Rewan formation sediments. The Rewan formation conformably overlies the coal bearing Bandanna Formation.

The sediments of the Rewan Formation are encountered throughout the Resource Authority and overlie the Bandanna Formation. The Rewan formation is a terrestrial flood plain deposit, consisting of meandering stream channel deposits and associated flood-basin siltstones and sandstones.

The conformably overlying Triassic Rewan formation is absent over much of the area, with the area generally characterized by a thin (1-24 metres) covering of Tertiary unconsolidated sands and clays, with occasional basalt in the reported resource domain.

The source of the Rewan Formation sediments was similar to that of the underlying coal measures, though a reduced organic content resulted in a ferric illite diagenetic suite of alteration, with early stage siderite diagenesis. This has given the sediments of the Rewan Formation a distinctive red and green tint, with green tints predominating at the base of the formation.

The Bandanna formation is characterised by up to 131 metres of lithic-feldspathic sandstones and siltstones, the formation can contain coal seams of up to 7 metres in thickness, with a maximum single seam thickness encountered within the Resource Authority to date of 3.59 metres (Pollux). Laterally continuous, the seams are generally clean, barring the basal Pisces Seam which is characterised by the presence of the Yarrabee Tuff, a regional marker bed. Up to 52km of Bandanna formation sub-crop is estimated to be contained within the Resource Authority.

The boundary between the Bandanna formation and the overlying Rewan formation is usually defined at the colour change from light grey to the green of the Rewan formation and where carbonaceous material is rare or no longer present in the sediments. Often this change is gradual and the precise boundary difficult to locate, often being placed at the top of the uppermost coal seam for convenience.

The Black Alley Shale separates the Bandanna and Mantuan formations and is characterised by organic rich lacustrine muds, believed to have been derived in the Denison Trough area from an enclosed inland water way. Rare sandstone beds and tuffaceous horizons characterise the base of this unit.

The Mantuan formation is correlative to the basal Fort Cooper Coal Measures and consists of up to ~103m of interbedded grey/brown to green/brown lithic feldspathic sandstone and siltstone units, with common laterally continuous coal seams, often with tuffaceous partings.

The shallow marine Peawaddy formation comprises of shore face sands, with possible associated lagoonal environments hosting occasionally carbonaceous sediments.

The Catherine Sandstone and its associated correlative, the Ingelara formation, may occur as an inter-fingered unit within the tenement area, though commonly the units record a transition from shallow shelf marine environments (Ingelara formation) to shore-face environments (Catherine Sandstone). Dropstones and glendolites point to a glacio-marine origin for this unit.

The Frietag formation is characterised in the area by fine sandstones with common bioturbated siltstone beds and occasional siltstone units up to 6m in thickness.

The Aldebaran Sandstone formed in a wide range of fluvio-deltaic and shallow marine environments. Potentially containing occasional coal seams, up to 640m of coarse quartzose sandstone, shales and conglomerates have been recorded in a petroleum hole proximal to the Resource Authority.

The Resource Authority is dominated by two northwest trending broad anticlines and by a broad north trending syncline, with an anticline structure (Yandina/Arcturus Anticline) in the eastern portion of the tenement while the other forms the southern extension of the Springsure Anticline, in the north of the tenement. The Springsure Anticline occurs to the west of the tenement, with the entire northern portion of the tenement within the eastern limb of this feature.

A review of the structure in regards to the faulting and folding was conducted on the Holder's neighbouring tenement EPC 891, Springsure Creek project, as it was noted that the existing structure interpretation was based upon the basement complex and not the target coal seam formations. A number of changes were made to the existing structure interpretation as a result of this intensive review which included both historical and the Holder's exploration holes and wells and all available seismic information for the area.

There are significant Tertiary basalt flows covering a large proportion of the Resource Authority. Significantly the basalts are thin or non-existent over much of the targeted prospect area in the southeast of the Resource Authority.

The currently targeted resource within the Resource Authority that occupies the northern nose of the Yandina/Arcturus Anticline feature is located within the area of thin basalt cover in the southeast of the tenement.

## 2.7 Previous Work

Significant previous exploration work has been carried out on the Resource Authority. Work carried out in the area under previous resource authorities has been summarised in previous annual reports and is not repeated here.

Prior to the Reporting Period, the Holder carried out a significant drilling program aimed at identifying resources suitable for open cut mining, commenced the environmental approval process and initiated a feasibility study. This work was discontinued as a result of legislative changes.

Detailed descriptions of work carried out in previous reporting periods can be found in Annual Reports for the Resource Authority for years 2008 to 2015.

No exploration work was carried out in the relinquished areas.

### 3. Conclusions

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The review of data and revised modelling indicates that there is strong potential for the development of a bord and pillar mine in the Pollux seam within the Resource Area. The area of strong potential is included in the retained blocks.

The relinquished blocks do not indicate strong potential for economic coal discovery.

No resource or reserve has been identified in the relinquished sub-blocks.

The areas selected for relinquishment are the least likely sub-blocks to contain an economic resource. Extrapolation of trends from exploration activities in the retained blocks indicate that any coal in this area is likely to be deep, poor quality and occurring in seams which are too thin for economic extraction.

#### 4. Acknowledgement and Warrantee

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