



QGC

ATP 645 PARTIAL RELINQUISHMENT REPORT

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1 Introduction

1.1 Tenure Information

Authority to Prospect (ATP) 645 is currently held solely by BNG (Surat) Pty Limited (BNG) and comprises 275 sub-blocks in 11 graticular blocks.

ATP 645 was granted to BNG on 17 March 2011 under the *Petroleum Act 1923*, for a four-year term commencing 1 January 2000, over an initial area of 775 sub-blocks in 31 graticular blocks. The ATP was next renewed under the same Act for a further four-year term commencing 1 January 2004 over 600 sub-blocks in 24 graticular blocks.

ATP 645 was then renewed under the *Petroleum and Gas (Production and Safety) Act 2004* (P&G Act) for a term of 12 years commencing 1 January 2008 over 475 sub-blocks in 19 graticular blocks comprised of three four-year periods. On 31 July 2014, the DNRM granted a two-year special statutory extension, extending the second period to 31 December 2017.

Finally, on 29 November 2019, a renewal application for ATP 645 was lodged under the P&G Act for a term of 12 Years commencing on 1 January 2020 over 300 sub-blocks in 12 graticular blocks. At the time of writing, the ATP renewal application has not been approved but confirmation had been that assessment was complete and there were no ATP issues. Five Potential Commercial Area (PCA) applications were lodged on 29 November 2019 to cover the two non-contiguous areas of ATP 645. Four PCA applications were made over the northern ATP area and one covering the southern ATP area.

On 23 June 2020, due to recent changes in legislation removing size limits for PCA applications, BNG made application to amend the four PCA applications to one application over the northern part of ATP 645 and leaving the one PCA application over the southern part of ATP 645. This amendment was approved on 21 July 2020 and the northern PCA application (PCAA) now numbered PCAA 305 and the southern PCA application, PCAA 309. The northern PCA application was approved and PCA 305 was declared for 15 years from 17 September 2021 over 275 sub-blocks.

Discussions continued on the validity of PCAA 309, with additional information provided in correspondence and meetings between the Department of Resources (DoR) and QGC, as Operator for ATP 645. Finally, QGC, on behalf of BNG, accepted that the requirements for the declaration of PCA 309 could not be satisfied under current PCA guidelines and policy, and officially withdrew the PCA application on 3 February 2022. DoR confirmed the same date for the date of effect of the withdrawal. The PCAA withdrawal also confirmed that this one block of ATP 645 would be relinquished as a result that withdrawal.

This partial relinquishment report is intended to satisfy the legislative requirements for reporting this relinquishment and this partial relinquishment is the subject of this report. The area relinquished from ATP 645 is shown in Figure 1 and described in Table 1 below:

BIM	Block	Sub-blocks	# Sub-blocks	Partial Relinquishment
CHAR	3092	all	25	ATP Condition
Total			25	

Table 1: ATP 645 partial relinquishment area

1.2 General Area Information

ATP 645 is located in southeast Queensland, approximately 30km east of the town of Surat. The non-contiguous one block of ATP 645, the subject of this relinquishment report, is located approximately 70km southeast of Surat and is shown in Figure 1.

2 Geology of the Relinquished Area

The primary target in the relinquishment block of ATP 645 is the late Permian Tinowon Formation of the Bowen Basin, which has provided the most encouraging prospectivity in ATP 645 and in surrounding areas. The block is generally located over the Bowen Basin overlain by the Surat Basin.

2.1 Geology of the Bowen Basin

The Bowen Basin covers over 160,000 km² of southern and central Queensland and has a maximum sediment thickness of about 10,000 metres concentrated in two north-south trending depocentres, the Taroom Trough in the east and the Denison Trough in the west. The basin first opened as a result of an Early Permian

extensional tectonic phase. This set up a series of grabens and half-grabens into which fluvial-lacustrine sediments were deposited. This episode was also accompanied by extensive volcanics throughout the basin, but particularly along its eastern margin.

Following this extensional phase, a more passive thermal sagging phase occurred. This resulted in a basin wide marine transgression, and saw a temporary cessation of volcanic activity along the eastern margin of the basin. Sediment was dominantly sourced from the west and deposited eastward over the antecedent grabens and half-grabens. Deltaic sediments prograded into the basin from the west, filling in the various depocentres that are associated with coal deposition. The sediments deposited during this time comprise the mid-late Permian Back Creek Group, which contains a number of discrete reservoir targets such as the Tinowon Formation.

By the Late Permian, a compressional phase led to foreland loading on the eastern margin of the basin. This event cut the basin off from the open sea, and resulted in rapid infilling of dominantly coastal plain to alluvial plain facies. Substantial amounts of coal were cyclically deposited throughout the basin. Renewed igneous activity brought about by the tectonic reactivation, several tuffaceous sediments are deposited during this time. By the middle to late Triassic, the basin was filled with sediments although continued diastrophism was experienced resulting in further deformation of the rocks.

The southern half of the Bowen Basin, where ATP 645 and the relinquishment block are located, is overlain by the Surat Basin which most notably contains the Walloon Coal Measures underpinning supply to the various LNG projects.

Within the Back Creek Group, there are a number of discrete reservoir targets that are economic producers or form exploration targets on the Roma Shelf, such as the Lorelle Sandstone and the Tinowon Formation. The former is absent from the relinquishment block and only the latter will be described here:

Tinowon Formation: The late Permian Tinowon Formation is divided into two distinct depositional sequences, the lower Tinowon/Wallabella Coal Member and the upper Tinowon. Both units represent separate transgressive successions separated

by a sequence boundary at the top of the lower Tinowon/Wallabella Coal Member. Across the Roma Shelf, these intervals represent fluvial-alluvial deposition however moving basinward, indications of marine influence are seen with deposition interpreted to tend more coastal plain into the Taroom Trough. The upper Tinowon is the most prolific gas producing interval on the Roma Shelf with the largest gas fields in the province being reservoirised in this interval. The lower Tinowon is productive but its prevalence as an economic producer is limited due mainly to localised depositional trends and generally poorer reservoir quality than the upper Tinowon.

ATP 645 is located on the southwestern flank of the Taroom Trough with strata dipping gently down to the east. Drilling in the tenure area since the early-2000's has focussed on testing Tight Gas Sand (TGS) play potential of the Permian Back Creek Group and Kianga Formations with all wells drilled outside of any known conventional structure or stratigraphic trapping feature. Prior to grant of ATP 645, a number of deep wells were drilled during the 1980's in the relinquishment block, with unstimulated flow tests recovering gas cut mud. These wells provide crucial support to the regionally pervasive nature of the gas-bearing reservoirs of the Back Creek Group and the tight gas potential of the western flank of the southern Taroom Trough.

The key legacy well in the relinquishment block is the Inglestone #1 well, drilled in 1982 to test the Triassic Rewan Formation and Back Creek Group reservoirs, which are now correlated as Tinowon Formation. The well intersected sands in the Tinowon and had gas shows while drilling through the interval. A number of DSTs were performed but beset by mechanical issues, gas cut mud was recovered, which in the absence of reservoir stimulation is an encouraging indicator for tight gas sands. The relinquishment block contains three wells, besides Inglestone #1, drilled between 1966 and 1987, with presence of the Tinowon Formation confirmed and unstimulated flow tests showing encouraging indications of tight gas sand reservoirs, especially in Kinkabilla #1.

3 Authorised Activities and Results

Authorised activity conducted under ATP 645 and ATP 632 (registered within the Bowen Basin TGS Project Area on 2 August 2021) included drilling 7 wells and

acquired 4,151km of 2D seismic during exploration for **deep gas** resources in the Bowen Basin since 2010. Viewed in combination with previous conventional petroleum exploration drilling, new and legacy seismic, and by extension of data from adjacent areas, QGC has identified two prospective natural underground reservoir intervals in ATP 645 (Figure 2). These are the Permian aged Tinowon Formation and Lorelle Sandstone, both part of the Back Creek Group. Only the Tinowon Formation reservoir is present in the area of relinquishment block CHAR 3092, which is the primary target in ATP 645 and to date has provided the most encouraging prospectivity in ATP 645 and surrounding areas.

Two key wells were drilled into the Tinowon Formation (Fm) in CHAR 3092 block and were targeting reservoirs on a structural nose. These horizons were interpreted using the 2D dataset in the Bowen Basin and reflect a structural high above (Kianga Fm) and below (Wallabella Coal Cycle) the Tinowon Fm shown in Figure 3. Based on the mapping, the traps would have to be combination structural and stratigraphic traps, although this interpretation is uncertain on the 2D lines available.

Kinkabilla #1 and Kinkabilla Creek #1 (TD in Kianga) were drilled at or near the crest of the structure and Inglestone #1 was drilled downdip of the same structure and still has strong shows within the Tinowon Fm. In Kinkabilla #1 (Figure 4), there are gas shows of ~150-200GU in the Tinowon sands ('Dunk sand' equivalent) and coals above the Wallabella Coal Measures. However, well test in Kinkabilla #1 targeted the Rewan Fm at 2941m – 2969m and 2921m – 2929m and no data aside from wireline data was recorded for the Tinowon Fm. Inglestone #1 (Figure 5) has some hydrocarbon shows in the Tinowon sands ('Dunk sand' equivalent) and coals that overlie the Wallabella Coal Measures. The Inglestone #1 well ran a DST in the Tinowon Fm and Wallabella Coal Measures at the following intervals:

- DST #4 3413.9m – 3442.8m: "609.5m of water cushion plus 140.2m of slightly gas cut mud. After 8 minutes packer failed"
- DST#5 3403.4m – 3444m: "Misrun – due to enlarged hole packers would not seal"

Inglestone#1 had no successful test due to packer issues and other targets are Evergreen and Rewan Formations.

There is no gas-water-contact (GWC) observed in the Inglestone #1 well indicating that a contact is below the Inglestone #1 penetration and possibly outside of the closure. With so few penetrations and no intercepted water contact, it's difficult to know if the trap is a conventional structural trap or a similar stratigraphic trap, we are invoking in the Overston 3D seismic area of the northern ATP 645 blocks.

Using regional wells, we can identify the development of a sand in the relinquishment block directly above the Wallabella Coal Measures, just as we can in the Overston 3D area of the northern ATP 645 blocks. We have been able to tie this to a peak in the Overston 3D seismic area as shown Figure 6 to a similar peak in the 2D seismic which ties to the sand that has developed on top of the Wallabella Coal in CHAR 3092. We are correlating this signature as similar environment and timing of deposition as the "Dunk sand" in the Overston 3D seismic area of the northern ATP 645 blocks. We can establish the presence of a sand above the Wallabella in the 2D but to understand the reservoir geometry and characterisation is challenging given the current 2D data set and legacy well penetrations.

4 Reports Submitted

As no new activity has occurred on the relinquishment block, no new reports have been submitted.

5 Hazard Information

There are no hazards in relation to authorised activities carried out in the relinquished area.

6 Volume of Water and Petroleum Produced

No petroleum or water has been produced from this part of ATP 645.

7 Petroleum Data

All data and reporting have been lodged with DoR as no new drilling or seismic acquisition/reprocessing were conducted on the relinquished area of ATP 645.

8 Conclusions and Reason for Relinquishment

QGC is relinquishing one graticular block described in this report in accordance with the ATP conditions, as a PCA application was unsuccessful in this location as the supporting information was inadequate in meeting the current requirements of PCA policy and guidelines.

While gas in place has been demonstrated in the relinquishment block in Inglestone #1, there has yet to be significant gas flow to surface from the Tinowon Formation there and with the lack of reservoir stimulation, this is not an unexpected outcome. The Tinowon Formation sand can be mapped in the northern portion of ATP 645 and onto the regional 2D seismic grid beyond the tenure boundary but there is a lack of suitable quality seismic to map the extension into the relinquishment block.

Further work is required to improve confidence in mapping the Tinowon Formation in and around the relinquishment block. Encouraging indications of the ability to utilise seismic for reservoir characterisation have been seen but further drilling is required to provide further calibration of the seismic response and allow extrapolation to demonstrate the materiality of the play.

In summary, there is a challenge in maturing an economic play by improving characterisation of the tight gas sand reservoirs to allow identification of sweet spots and consideration of drilling and completion techniques that may unlock deliverability in tight sands.

9 Figures

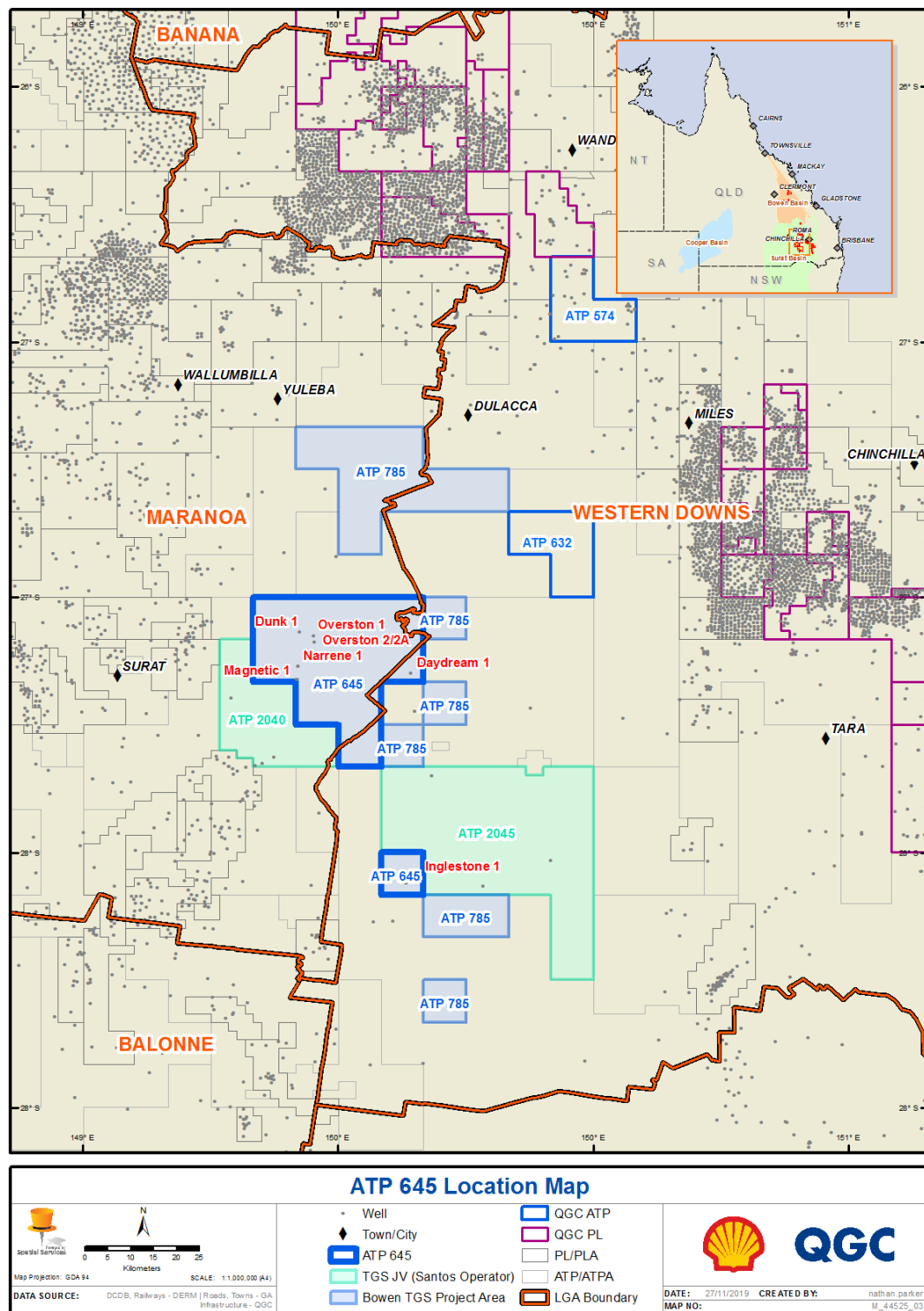


Figure 1: Location map showing ATP 645 and CHAR3092 block relinquished on 3 February 2022

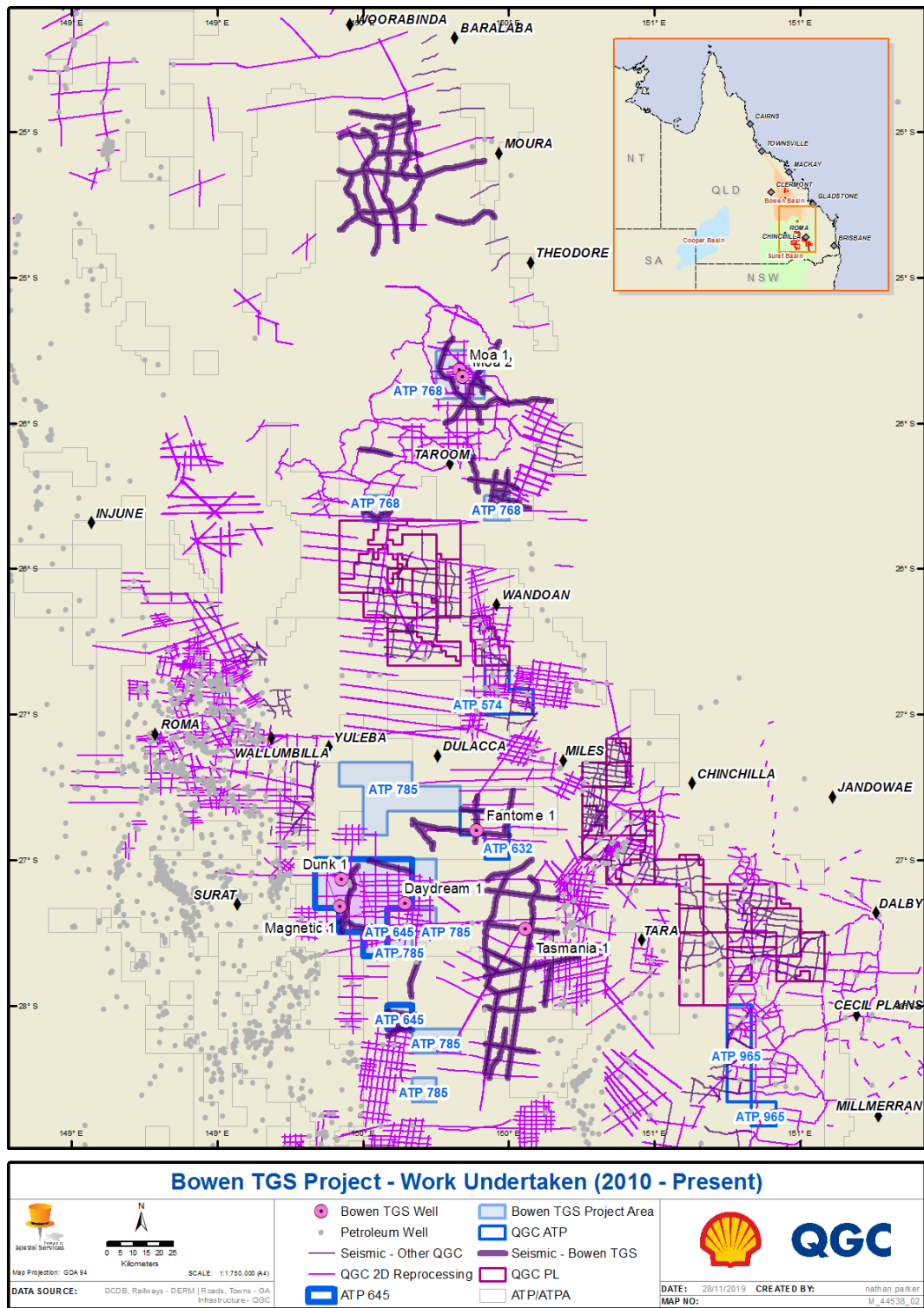


Figure 2: Work conducted under area of ATP 645 prior to partial relinquishment

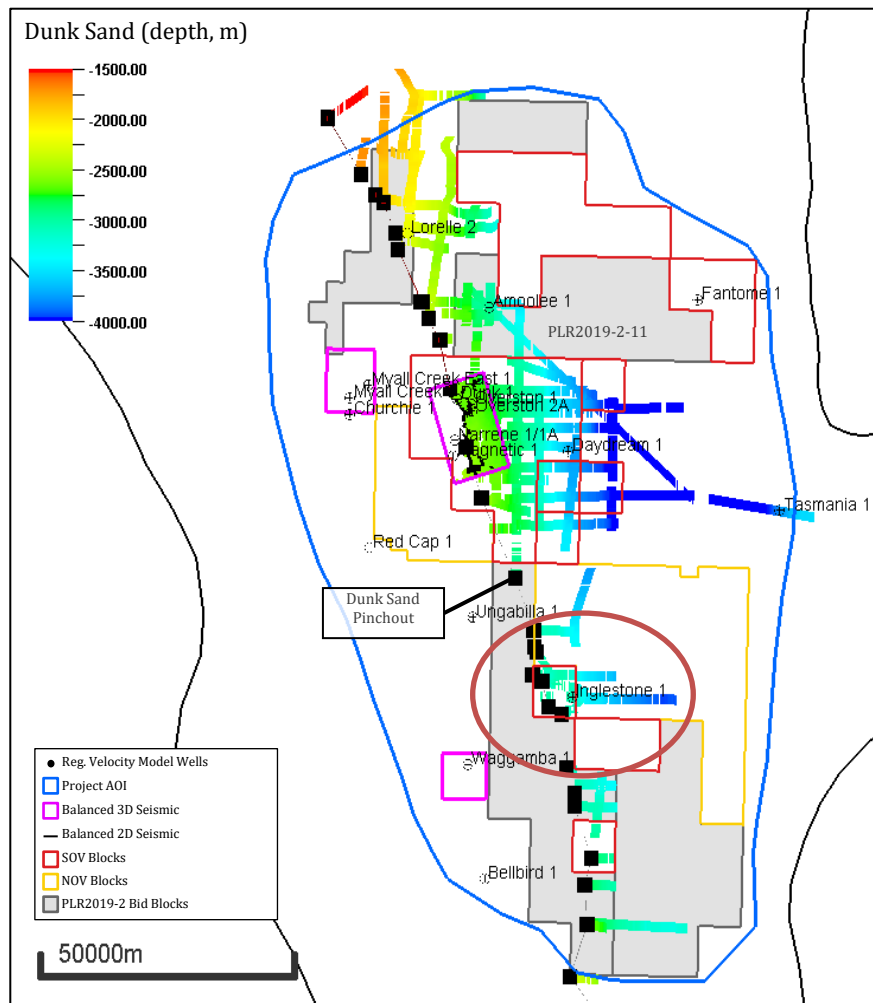


Figure 3: ATP 645 2022 relinquished area, interpreted depth to top of Tinowon “Dunk Sand” interval

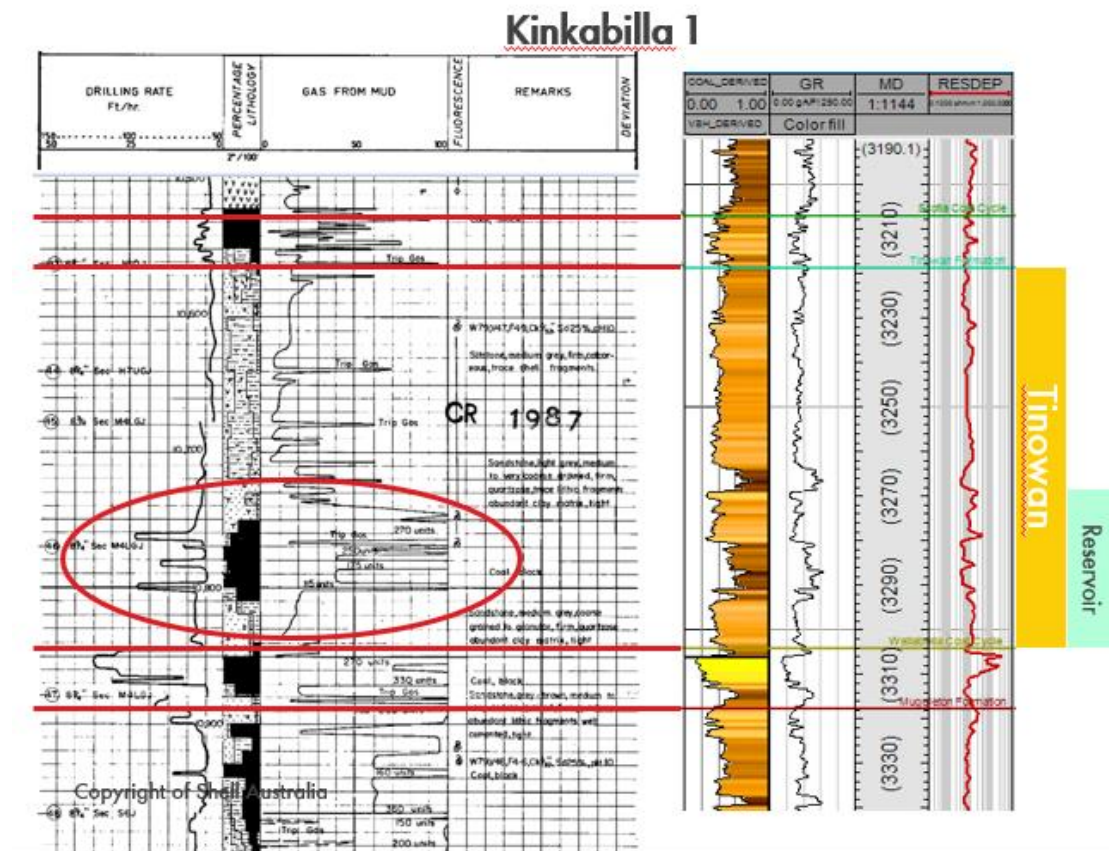


Figure 4: Drilling data from Kinkabilla#1, highlighting gas shows in Tinowon sands ('Dunk' equivalent) and coals above the Wallabella Coal Measures

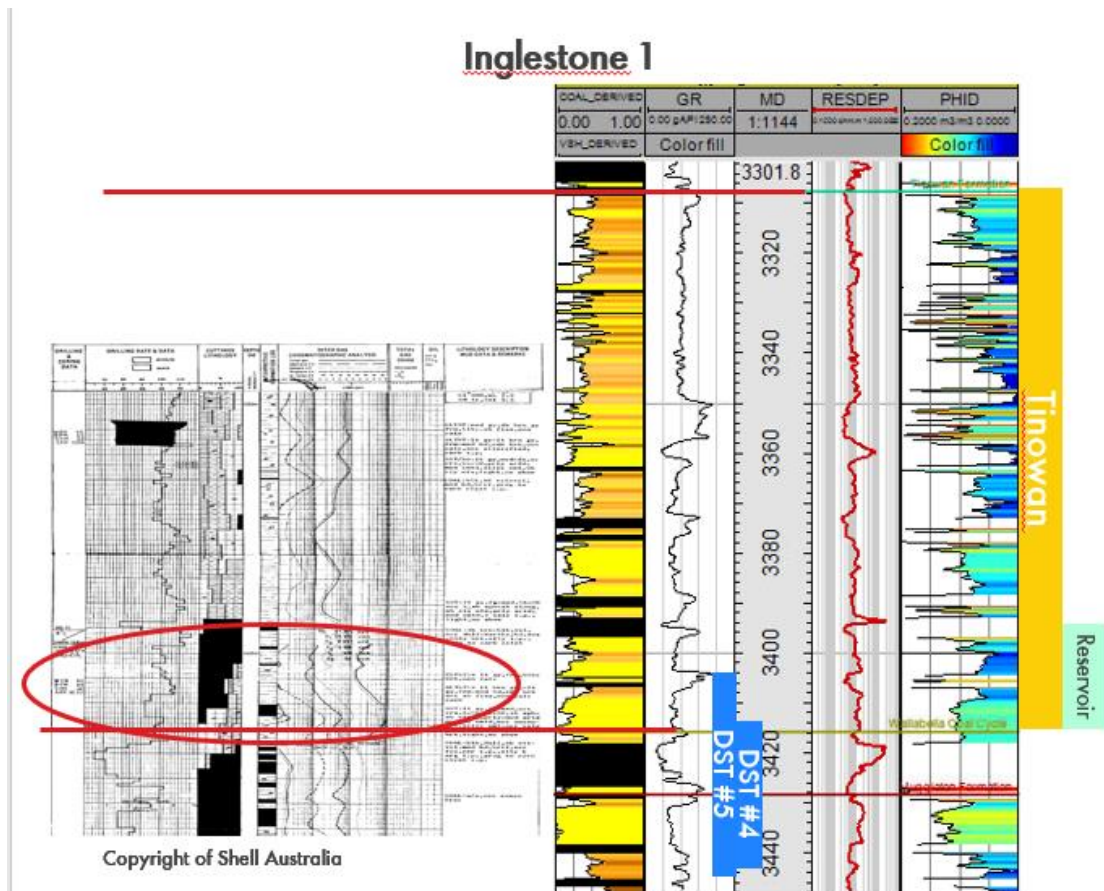


Figure 5: Drilling data from Inglestone#1, highlighting gas shows in Tinowon sands ('Dunk' equivalent) and coals above the Wallabella Coal Measures

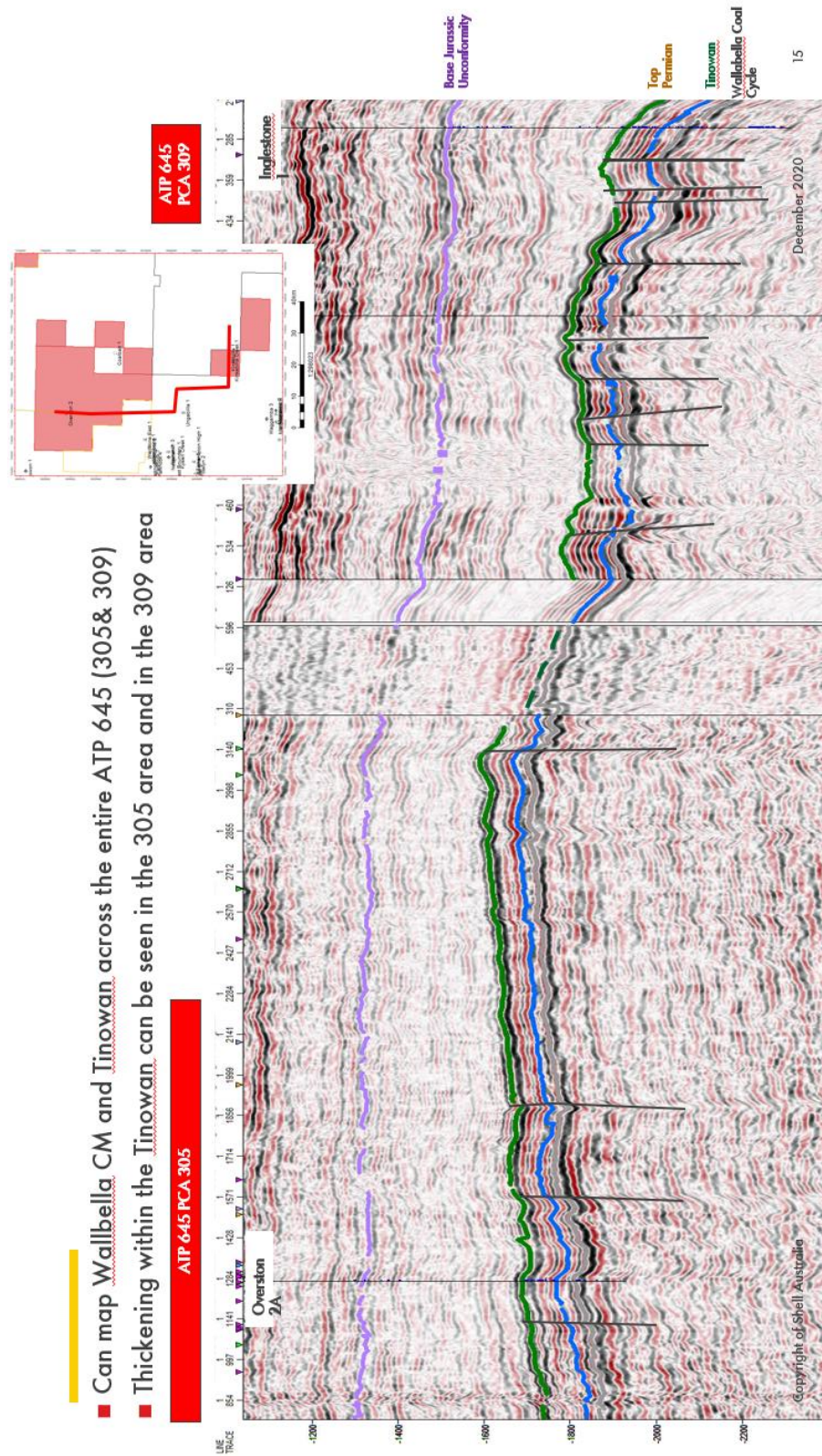


Figure 6: Seismic tie from northern blocks of ATP 645 through relinquishment block CHAR 3092(PCAA 309)