The Hussar Project-Potential for Hydrocarbon & Helium Exploitation

Commercial In Confidence

A report commissioned by Westmarket Oil & Gas Pty Ltd

By

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In relation to prospective resources described in this report, the estimated quantities of petroleum that may potentially be recovered by the application of a future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further exploration appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable hydrocarbons.

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Hussar Petroleum & Helium Project Officer Basin Western Australia

Overview

The Hussar Project will be a test of a very large Neoproterozoic sub-salt basal petroleum & Helium prospect in the Officer Basin centred upon the proposed re-entry and deepening of a well drilled in 1982, Hussar-1. An undrilled to date seismically defined sub-salt basal Neoproterozoic aerial closure of an estimated 200 km^2 has potential to host a multi-TCF resource of gaseous hydrocarbons with high concentrations of Helium, similar to the gas flow tested at Mt Kitty 1 and Magee 1 in the Amadeus Basin of the Northern Territory. Overlying salt formations are regarded as being essential to trap Helium in any reasonable concentration during the long geological periods necessary for Helium to be generated by the decay of radiogenic minerals in basement granitoids. An estimate of potentially recoverable Helium in the gaseous state at surface based on reasonable assumptions is 105 BCFG at P50 (SPE PMRS) subject to, *inter alia*, the drilling and testing of the prospect and the unrisked Prospective Resources are as follows:

Note : The estimated quantities of petroleum that may potentially be recovered by the application of a future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further exploration appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable hydrocarbons. There is considerable uncertainty with a lack of close relevant wells so the range of outcomes is, accordingly, quite high.

Unrisked Prospective Resources	P10	P50	P90
Gas (TCFG)	22	4.2	0.55
Helium (BCFG)	1,600	105	8.2

A Special Prospecting Authority with Acreage Option (No. STP-SPA-0095PA) over the c. 3,000 km^2 area of interest has been applied for as an urgent priority with the focus on a closely spaced AEM PTP aerial survey as the submitted work programme. SPA AO applications must substantively involve new or much more detailed surveys and there has been already a reasonably detailed 2.5 km line spacing gravity survey plus there are sparse existing seismic data so an AEM PTP survey at 2 km line spacing is planned subject to the granting of the SPA AO application. After this survey has been flown, a subsequent Petroleum Exploration Permit should be applied for with the focus on the first firm two year work programme on the synthesis & analysis of the AEM PTP data, the existing gravity and any reprocessed seismic data available as well as additional seismic acquisition and analysis into the basement subsalt structural model.

Regional Setting

The Officer Basin, within Western Austrlalia, is a little known 300,000 km^2 inland frontier basin, is part of the Centralian Superbasin, a large intracratonic sedimentary basin which occupied a large area of central, southern and western Australia during much of the Neoproterozoic Era (~830–540 Ma). This superbasin was disrupted by two periods of uplift and mountain building, the latest Neoproterozoic Petermann Orogeny and Palaeozoic Alice Springs Orogeny, to leave remnants including the Amadeus, Georgina, Ngalia, and Officer basins. Almost invariably, where drilled and/or having sufficient seismic to interpret successfully there is a basal sandstone/clastic unit overlying Mesoproterozoic granitoid basement rocks, in turn overlain by major salt/evaporite sedimentary units-prerequisites for the generation and trapping of Helium.

Elements of the Centralian Superbasin relating to sub-salt reservoirs, although of different ages, are similar in general geology to the hugely productive Sichuan and the Ghaba and Fahud salt basins in Oman. Historically, the bulk of the world's Helium has been derived from sub-salt clastic reservoirs sitting on basement granitoids in eight oil and gas fields located on the Four Corners Platform of northwestern New Mexico since 1943. Almost 950 MMCF helium have been produced from reservoirs of Permian,

Pennsylvanian, Mississippian, and Devonian age on the Four Corners Platform in San Juan County. The concentration of helium in gases produced from these reservoirs ranges from 3 to 7.5 percent, coupled with a relatively high nitrogen content.

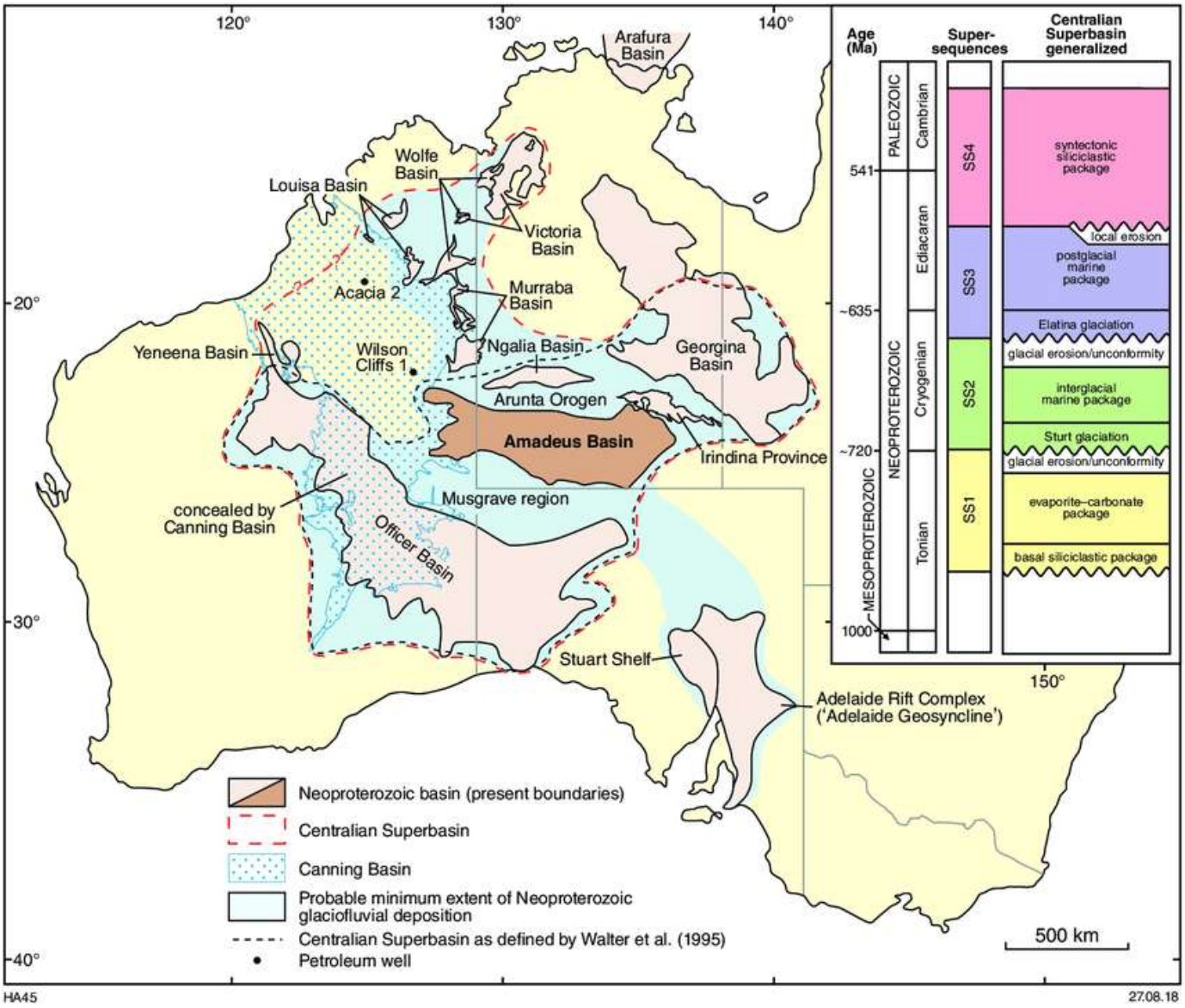
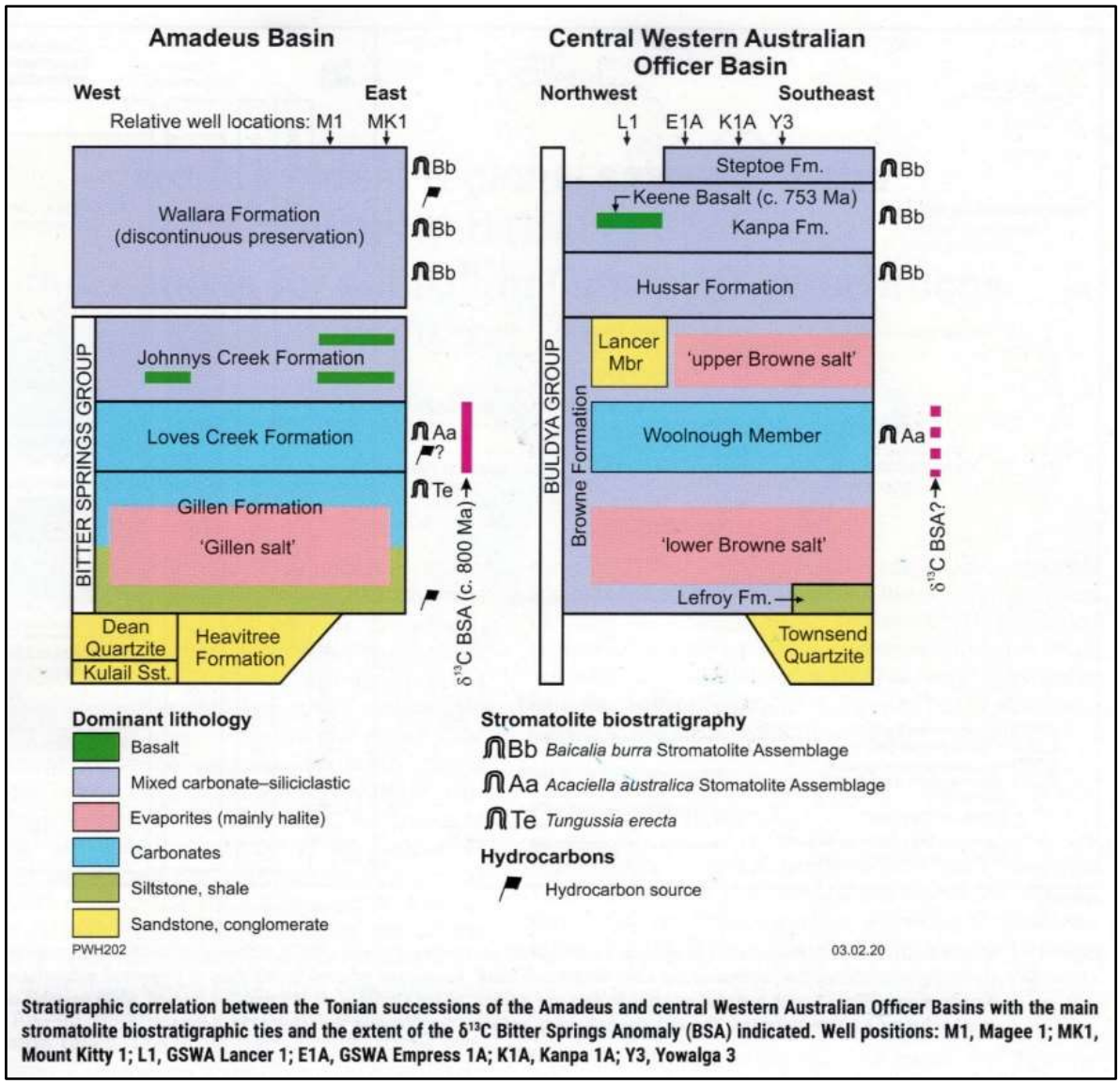


Fig.1 The Centralian Superbasin, courtesy www.researchgate.net, after Munson et al; 2013.



Stratigraphic correlation between the Tonian successions of the Amadeus and central Western Australian Officer Basins with the main stromatolite biostratigraphic ties and the extent of the $\delta^{13}C$ Bitter Springs Anomaly (BSA) indicated. Well positions: M1, Magee 1; MK1, Mount Kitty 1; L1, GSWA Lancer 1; E1A, GSWA Empress 1A; K1A, Kanpa 1A; Y3, Yowalga 3

Fig 2 Courtesy of WA DMIRS GSWA 2020 Extended Abstracts Haines & Allen pp10-13

Two wells, Magee 1 and Mt Kitty 1, drilled to basement in the Northern Territory of the Amadeus Basin produced gas to surface on test with respectively 6.2% and 9% Helium along with gaseous hydrocarbons and relatively high levels of nitrogen. Because of the fundamentally similar geology of the widespread Neoproterozoic Centralian Superbasin to the geology of these prospects, it is considered axiomatic that the sub-salt Helium prospectivity of the Western Australian Amadeus and Officer Basins is very high.

In the Amadeus Basin, within the Northern Territory and Western Australia, the two oldest sedimentary units immediately overlying the Palaeoproterozoic basement granitoids are firstly the Neoproterozoic Heavitree (or Dean) Quartzite overlain by the Bitter Springs Group inclusive of the basal Gillen Formation, a basin-wide unit of dolostone, sandstone, shale (inclusive of an organic rich black shale source rock near its base) and evaporates (salt).

In the Officer Basin, the basal sandstone unit is called the Townsend Quartzite (or further east the Pindyin Sandstone) and the equivalent of the Bitter Springs Group of the Amadeus Basin (including the basal Gillen Formation is recognised as being the Buldya Group which has the Lefroy Formation as a possible source rock for hydrocarbons immediately overlying the Townsend Quartzite and in turn is overlain by a thick layer of salt wherever these horizons have been drilled.

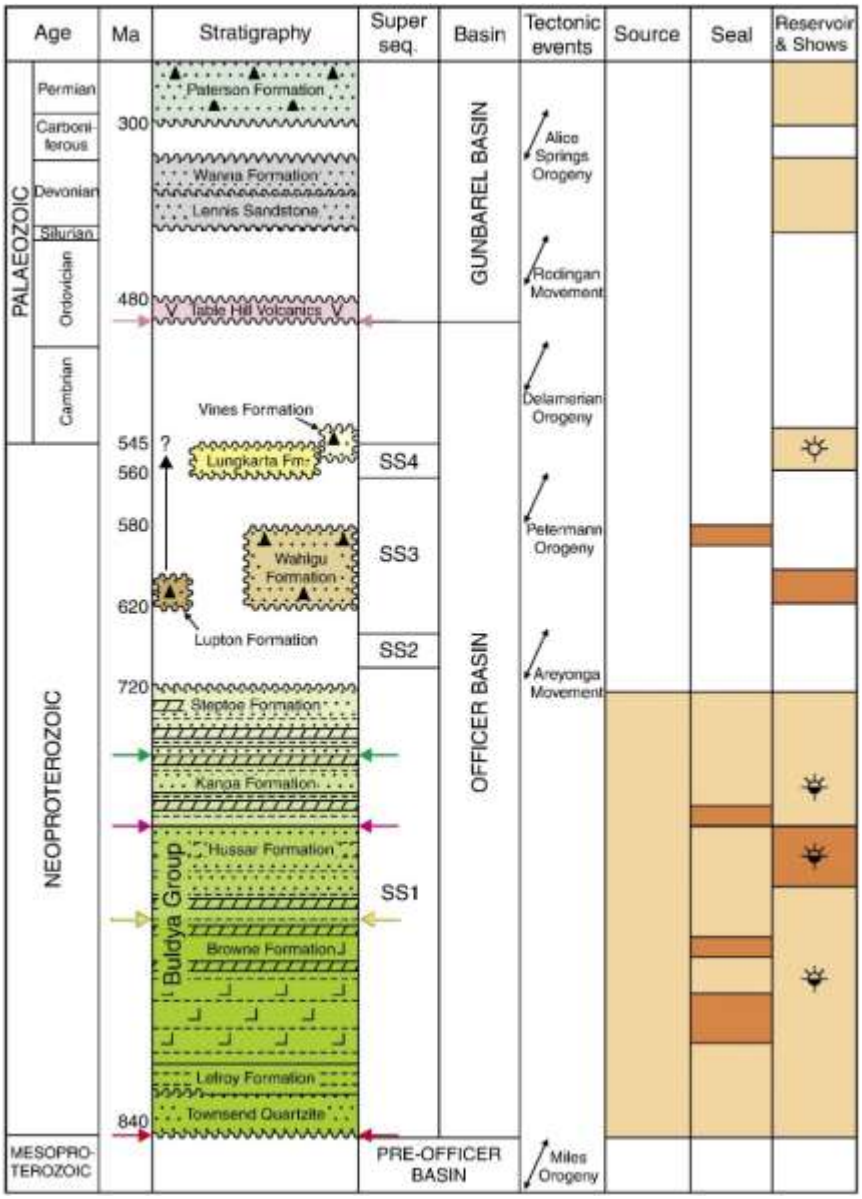


Fig. 3 Stratigraphic Table of the Officer Basin in Western Australia (GSWA Report 98, Simeonova & Lasky)

Note : The term “quartzite” usually refers to a highly metamporphosed sandstone but with the Heavitree, Dean and Townsend Quartzites, the term is mostly a misnomer, porosities of the Heavitree Quartzite have been recorded for example as high as 9% in the Magee 1 well and in the Amadeus Basin it is generally regarded as being between 200 to 1,000m thick and consists locally of mudstone, sandstone and conglomerate with the dominant lithology being a very well sorted well rounded grain quartzose sandstone. Similar considerations apply to the basal Dean Quartzite in the WA Amadeus and the basal Townsend Quartzite in the Officer Basin which is described as being a well sorted medium to coarse grained sandstone and a pebbly quartzose to feldspathic arenite.

However there has been no serious exploration for subsalt traps and in particular for Helium in those traps. All of the only 13 exploration wells drilled to date in the WA portion of the Officer Basin (one well every 23,000 km^2 !) have targeted hydrocarbons only in the Lungkarta, Kanpa, Hussar and Browne Formations. Only two wells in the whole Officer Basin in WA and SA have penetrated to basement through the subsalt Townsend/Pindyin Quartzite target reservoirs, ie Kutjara 1 and Mulyawara 1 in SA; porosity in these reservoirs ranged from 5-30% on uncorrected raw CNL logs and in the Kutjara 1 well, Total Gas units recorded on the composite log ranged up to 10,000 units. A maximum reading of 100 units was recorded in the Mulyawara 1 Pindyan Sandstone subsalt target.

Two other wells in WA, Kanpa 1 and Lancer 1, penetrated the Mesoproterozoic below the Neoproterozoic and the Townsend/Pindyin Quartzite was missing entirely.GSWA stratigraphic wells, Lancer 1 & Empress 1A reached Mesoproterzoic granitoid basement beneath Lower Browne Formation salt but lacked sufficient subsalt clastic reservoir lithologies and were not drilled on structural closures.

Thin, organic rich source rocks mature into the oil window are present in the Browne, Hussar, Kanpa and Steptoe Formations with potential for major oil-generation phases during the latest Neoproterozoic, Cambrian and Permo-Triassic. The GSWA thinks the Lefroy Formation at the base of the Buldya Group may be the equivalent of the Gillen Formation black shale unit which is the source rock of the Amadeus Basin which has produced hydrocarbons at Mt Kitty 1, Magee 1 and Dukas 1 in the Amadeus Basin in the Northern Territory.(pers.comm. P.Haines GSWA Feb. 2020)

There is a strong case then, by analogy with the Amadeus Basin, that in the Hussar Prospect and others of its ilk in the SA portion of the Officer Basin, gaseous hydrocarbons will be found along with Helium but with relatively high nitrogen contents similar to most other worldwide subsalt Helium and hydrocarbon reservoirs and in particular with the subsalt gases encountered at Magee 1 and Mt Kitty 1.

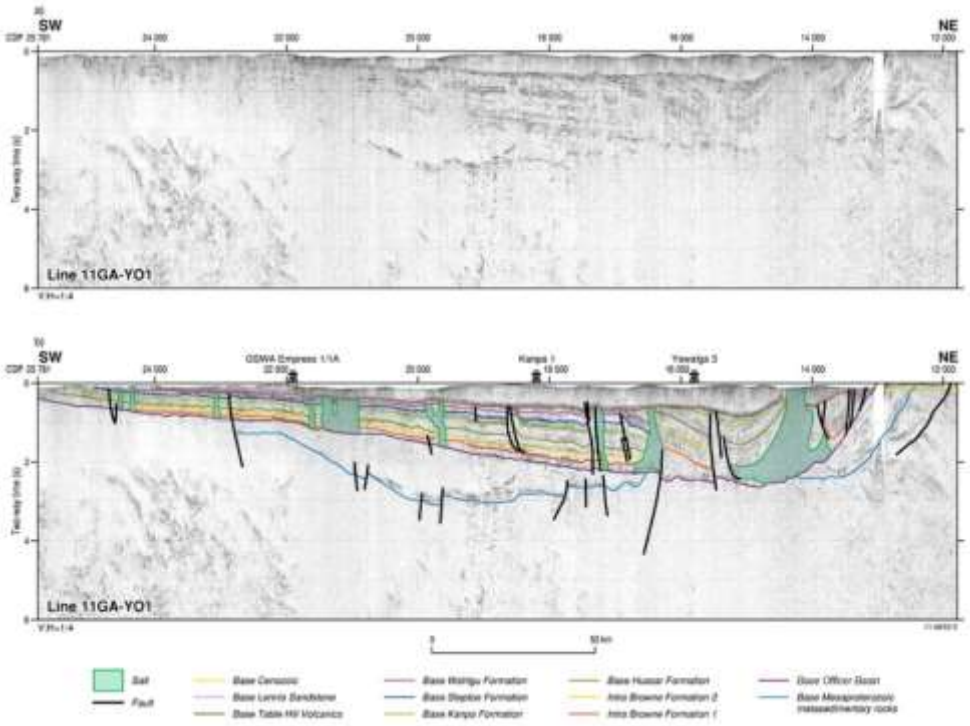


Fig 4. Seismic slice SW to NE of the Officer Basin illustrating the extensive salt tectonics derived from the Browne Formation immediately overlying the targeted Townsend Quartzite (Courtesy of The APPEA Journal 52(2) 670-670)

Halotectonics, (the movement of plastic salt by isostatic equilibrium kinetics), have been instrumental in much of the Neoproterozoic and post Neoproterozoic structuring in the Officer Basin but it is structuring in the basement granitoids (which do not contain any salt) that will be instrumental in trapping subsalt hydrocarbons and Helium-such structures are little known due to the paucity of modern seismic and detailed gravity survey information. Some of the structures interpreted have penetrated from near basement to the surface, a scenario to be avoided in any targeting of subsalt petroleum and Helium drilling.

It is clear that the existing aeromagnetic coverage at 400m line spacing, although quite modern and high quality does not lend itself to 1Vd structural definition of the basal Neoproterozoic section. “Over much of the Officer Basin the flat-lying Permian and Cretaceous cover mask the deeper signal from the Officer Basin. That is the case in the Hussar area. Just east of Lake Disappointment you can see a lot of nice folded

structures in the Officer Basin, probably related to salt tectonics, where the cover is absent, or thin."(Pers.Comm. PJ Haines GSWA 20.02.11)

Petrex Australian Pty Ltd held large swathes of the Hussar Project area and surrounding regions in a series of very large SPAs with SPA 33 of 284 blocks (c. 2,000 km^2) largely covering the area of this current Westmarket SPA application. Petrex have since applied for EPA 0153 bounding this current application immediately to the East, North-East and South-East. The company completed a widely spaced regional East West AEM-PTP (Airborne audio electromagnetics using passive transient pulses) survey at approximately 20 km line spacing North-South.

According to the national Geoscience Australia body, "depending on the system used and the subsurface conditions, AEM techniques can detect variations in the conductivity of the ground to a depth of several hundred metres. The conductivity response in the ground is commonly caused by the presence of electrically conductive materials such as salt or saline water, graphite, clays and sulfide minerals. Depending on the system used and the subsurface conditions, AEM techniques can detect variations in the electrical conductivity of the ground to a depth of several hundred metres, sometimes up to 2000 metres in particularly favourable conditions." https://www.ga.gov.au/scientific-topics/disciplines/geophysics/airborne-electromagnetics

It is a reasonable assumption that, although useful in mapping structures shallower than 2,000m, such a technique will have little benefit in mapping structures deeper than 2,000m. The AEM PTP method however, developed by Pinemont https://www.totaldepth.com.au/wp-content/uploads/2015/06/A4-Pinemont-Brochure-Type1-Oil-updated.pdf) and applied in Australia by Total Depth, (**https://www.totaldepth.com.au/)** however, is a passive method, measuring EM responses developed by upward movements of fluids producing Redox reactions resulting in voltaic potentials and it is the EM developed by these mechanisms that is measured by the airborne AEM PTP survey tool. This method has been shown to be effective at over 3,000m and will be flown over the SPA AO application area at a much closer line spacing than the regional 18 km spacing survey flown in the area by PETREX in 2018/19.

Local Factors Hussar Project

The regional seismic grid in the Hussar Project area is sparse with typical spacing of over 50 km and of 1980 to 1983 vintages. (See Fig.5). Locally at the Hussar 1 well location, a few additional line kms of 2D seismic were shot in 1984 with wide spacing of 5 km plus (See Fig. 6) which, although amply demonstrating that at top Browne Formation level, Hussar 1 was drilled off an ideal crestal location, renders any detailed structural analysis at any level well-nigh impossible.

A subtle but discernible approximately 200 km^2 closure has been mapped in the vicinity of the well Hussar 1 at the basal Neoproterozoic. Existing 1Vd based on 400m line spacing aeromagnetics show that *"over much of the Officer Basin the flat-lying Permian and Cretaceous cover mask the deeper signal from Officer Basin. That is the case in the Hussar area"*. (Pers.Comm. Haines, Peter, 11 Feb 2020) It is clear then, due to the paucity of seismic, in the absence of any wells drilled to basement in the local area and with the potential for there to be major salt diapirs in the area that additional aeromagnetic 1Vd data, and analysis will be of little use.

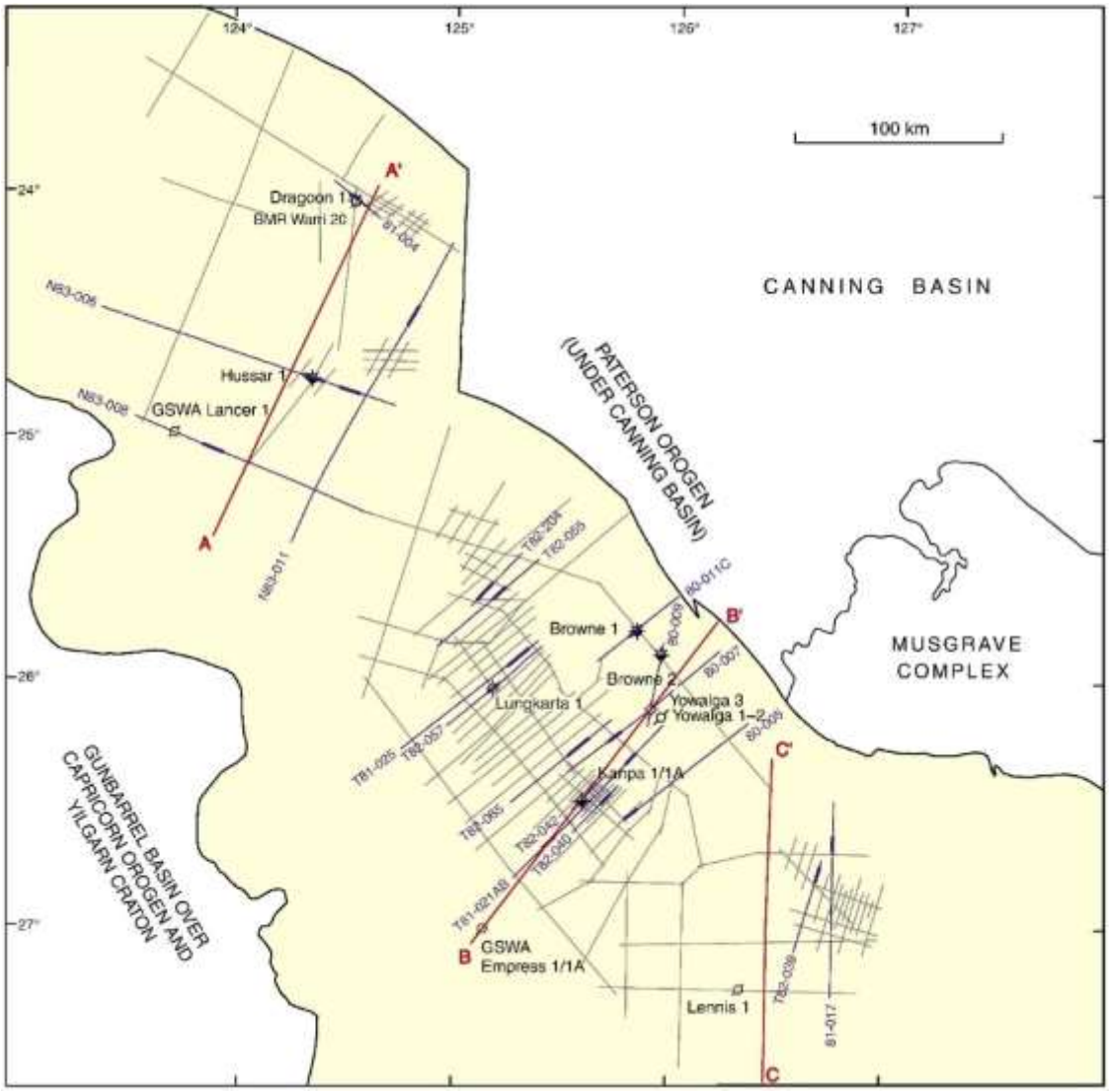


Fig.5 Regional Seismic Grid, central Officer Basin (Courtesy GSWA report 98, Simeonova and Lasky 2005)

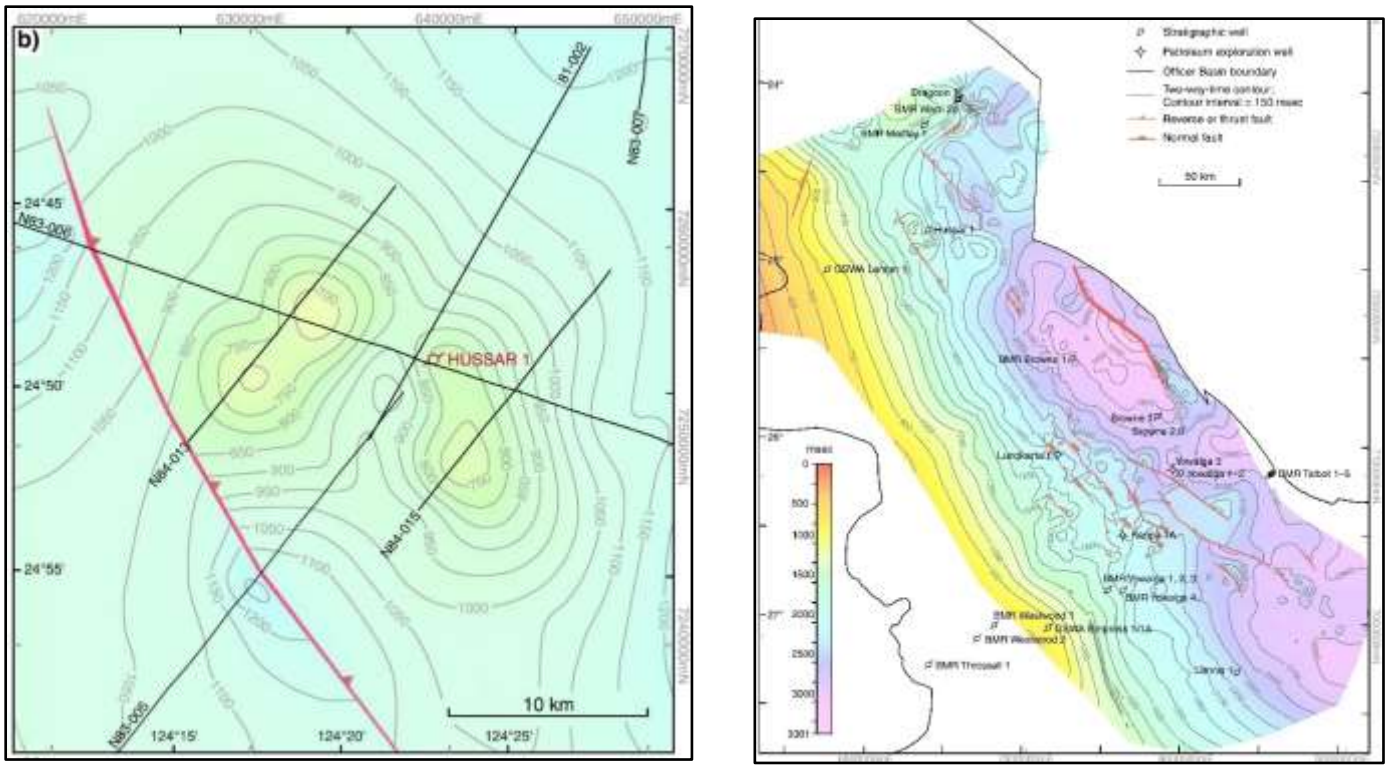


Fig. 6 Local 2D Seismic Grid, Top Hussar Formation, (left) and base Neoprotoerozic (right) (Courtesy GSWA Report 98, 2005, Simeonova & Lasky

Land 2D seismic is very expensive, may involve considerable surface disruption and has the potential, unless very closely planned and supervised, of environmental and perhaps even heritage site disturbances. Although it will be a necessary pre-cursor of any serious attempt for sub-salt drilling in the area of Hussar 1, the mapped area of existing seismic closure of the Hussar subsalt structure is c.200 km^2 and for accurate pre-drilling definition may require sequential acquisition of up to 500 line km of new 2D seismic at an approximate cost of c. $6 million. Such a sequentially progressive campaign is best executed within the legislative framework of a Petroleum Exploration Permit over a time frame considerably longer than the 6 month window of an SPA.

Based on the known factors in play, it is recommended that the Westmarket SPA application is centred on the acquisition of data from a reasonably detailed Total Depth AEM PTP airborne survey, the proposal for which is detailed in Appendix One.

Plate 1 : Outcropping Heavitree Quartzite (Equivalent to the Dean Quartzite in the Officer Basin); Amadeus Basin, Western Australia, courtesy of the Geological Survey of Western Australia

<u>Hussar 1 Well Analysis-Potential Volumetrics</u>

Hussar 1 was drilled to a TD of 2,040m in 1982 by a consortium of Eagle Corporation, News Corporation and Swan Resources. At the time of drilling there was only one seismic line but later campaigns during 1983-1984 confirm that Hussar 1 was not drilled on the crest of the anticlinal closure in the targeted formations. It is however, subject to casing integrity and design, a potential candidate for re-entry and deepening by a directional deviation to the crest of the basal Townsend sub-salt targeted for Helium.

The well reached TD in massive halite (salt) in the top of the Browne Formation so one of the essential requirements for a Helium reservoir is proven to be present, ie a thick salt layer overlying the potential Helium reservoir sitting immediately on top of basement.

Significant gas shows and bitumen were reported in Hussar 1. Gas chromatograph readings greater than 1,000 ppm were recorded over the intervals 1,140-1,258m and 1,200-1,222m. Bitumens in shales were identified in the core sample from 1,823.2m and probably in cuttings from 1,4110-1,415m, 1,695- 1,600m and 1,650-1.655m. Log analysis over 1,138m to 1,195m showed 36-40% water saturation (Swc) and so could contain hydrocarbons but this was not reflected in DSTs.

The approximate depth to the base of the Townsend Quartzite target is close to 3,200m, so probably into the gas window and a re-entry and deepening with a directional leg making appreciable savings yet to be determined.

Potential Resource Size

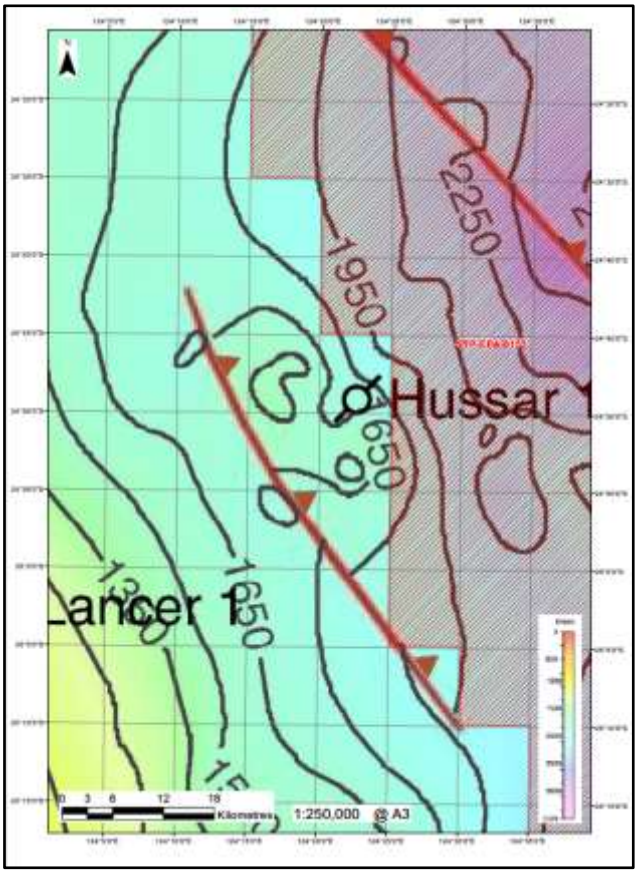


Fig.7 TWT Contours Base Neoproterozoic (Subsalt) Hussar Prospect Officer Basin (Courtesy GSWA Report 98, 2005 Simeonova & Lasky.

The seismically defined closure on the seismic grid according to the maps provided by the Geological Survey of Western Australia in their Report 98, (Simeonova and Lasky) appears to be approximately 200 km^2 with a depth of approximately 3,200m (See Fig.7)

Unrisked Prospective Resource Calculations	P10	P50	P90
Area Acres (A)	55,000	49,400	30,000
Height ft. (h)	642	320	257
Porosity (Φ)	7.5%	5%	2.5%
Water Saturation (Swc)	15%	25%	5o%
Gas Expansion Factor (GEF)	263	263	263
Helium content (% He)	7.5%	2.5%	1.5%
Recovery (% recovery)	85%	60%	50%

It is necessary to make various assumptions to arrive at an estimate of potentially recoverable resources in place but the application of the GIIP=43,560*Ah*φ(1-Swc)/Eg (or multiplied by the GEF) formula and assuming at SPE PMRS P50 level, a total aerial closure of 200 km^2, (49,400 acres) based on GSWA mapped seismic closure, a modest 5% porosity, a layer cake model of an equally modest 100m (320 ft) thickness of the basal Townsend Quartzite, (outcrop mapping has recorded thicknesses of up to 370m) an Swc of 25% and an FVF Bg of 0.003 (or a GEF of 263), the total volume of gas in place at surface pressures and temperatures would be c.7 TCFG and at a 60% recovery factor then, c.4.2 TCFG of recoverable gas volume resources. The application of a modest 2.5% Helium content would translate to recoverable Helium resources at surface of c.105 BCFG Helium.

Similar calculations with adjusted assumptions at P10 and P90 then give Prospective (Recoverable) SPE PMRS Resources then of :

Unrisked Prospective Resources	P10	P50	P90
Gas (TCFG)	22	4.2	0.55
Helium (BCFG)	1,600	105	8.2

Note: The wide range of Resources reflects the general relative paucity of comparative data in the Officer Basin compared to the known Helium reservoirs in the Amadeus Basin.

The hydrocarbons, based on similar geological environments in the Amadeus Basin (where drill tested) and in common with those Helium reservoirs in the “Four Corners” in the USA, is likely to be a mix of hydrocarbons, nitrogen, hydrogen and minor amounts of Co_2 and the hydrocarbon content versus nitrogen content is usually relatively low compared to conventional (ie non-subsalt, non-Helium) more conventional reservoirs. It should be noted that there is no absolute certainty at this stage of investigation as to the source rocks thought to source hydrocarbons in this area have been heated to a sufficient temperature for long enough to produce large volumes of gas; ie some of the hydrocarbons may be in liquid or condensate form from source rocks partially but not wholly in the gas window by virtue of their burial history.

As previously noted above however, gas chromatograph readings greater than 1,000 ppm were recorded over the intervals 1,140-1,258m and 1,200-1,222m in the Hussar well from horizons well above (ie less mature) in the overlying Buldya Group, and in particular the Lefroy and Browne Formations, the latter in which gas shows have been recorded during drilling.

In the Officer Basin in South Australia, two wells recorded gas shows in the subsalt Pindyan Sandstone, (the equivalent of the Townsend Quartzite in Western Australia), ie in the Kutjara 1 well, Total Gas units recorded on the composite log ranged up to 200 units (up to 10,000 units in overlying formations) and a maximum reading of 100 units was recorded in the Mulyawara 1 Pindyan Sandstone subsalt target. So there is reasonably conclusive evidence that the source rocks feeding hydrocarbons into the subsalt Townsend Quartzite target reservoir have at least partially entered the gas window even if not possibly entirely within the gas window.

Illustration of small-scale "mini"LNG plant

Hydrocarbon and Helium Commercialisation

The Hussar Project is located c.300 km from the eastern end of the 8 TJ/day (c. 8 MMCDFGD) Yamarna gas pipeline at the Gruyere mine site operated by Gold Road Resources. Currently this is the closest gas pipeline. The cost of constructing a 6" pipeline to join that pipeline and backfill the grid would be c. $90 million.

Depending on the gas flow required the Yamarna pipeline may not have sufficient capacity but certainly there is already a surveyed approved easement joining to the main Goldfields pipeline with a capacity of c. 200 MMCFGD and a second twinned pipeline from Gruyere to the main Goldfields pipeline could be constructed with a minimum of fuss. This route is a viable option for the commercialisation of any hydrocarbon gases produced at Hussar.

However, it is not the intention of the operators of the Hussar Project to export any hydrocarbons and Helium but to sell the products at the wellhead to industry leading Helium supply companies such as BOC/Linde who would design, install and commission an appropriate nitrogen/hydrocarbon/Helium separation and extraction plant.

A pre-feasibility study commissioned by Central Petroleum Limited and based on the commercial exploitation of subsalt hydrocarbons & Helium from the Heavitree Formation at Mt Kitty and Magee prospects in the Amadeus Basin was released to the ASX on 19th April, 2011. The report by Dr Mike Clark, (METTS) and Dr Duncan Seddon, studied the gas compositions of recorded Heavitree gas from the Magee 1 well and anticipated gas composition of the at the time, yet to be drilled Mt Kitty 1 well and focused on the in-situ separation and extraction in the field of hydrocarbons and Helium into a series of value added products, ie LPG, 99.995% A-grade liquid Helium, and LNG by using a proportion of the dry gases present to provide power to the plant.
This report is attached as Appendix Two.

The key conclusions from this 2011 report were based on a 20 MMCFGD production profile and included :

a. Plant costs of c.AU$420 million;
b. Pre-tax revenue of AU$98 to 143 million;
c. A project NPV at an 8% discount rate of between AU$111 to 556 million;
d. 30% CAPEX savings if plant components constructed in SE Asia instead of the USA;

It is not possible of course to accurately predict the composition and quantity of hydrocarbons, Helium and nitrogen at any subsalt reservoirs of the Hussar Project but the analogy with Mt Kitty and Magee wells is a reasonable model to work with, subject to success given the analogous gross geology of the Amadeus Basin and the Officer Basin. If the gases are similar at Hussar to Mt Kitty and Magee, then the model proposed by Clarke and Seddon would be a good starting point for pre-feasibility studies; especially as the products including cryogenically stored Helium, LPG and cryogenically cooled LNG produced by modular plants could all be trucked out to various markets.

In the case of Helium it could be brought to Perth or Esperance as an appropriate very high value export product by ship to other ports in Australia or SE Asia. LPG produced could well be utilised in country mining centres and towns as a portable fuel supply as could LNG which could be converted to CNG for heavy transport fuel such as trucks and trains or used as base load fuel supplies for electrical generation in country centres. The key considerations here are :

1. The gas composition of any successful subsalt reservoir discovery;

2. The size of the resources;

3. The fuel requirements of any separation and extraction plant;

4. The economics of hooking up to an existing gas grid some 300 km away versus the production and export by trucking of liquid products and the attendant complications and expense of liquefaction.

Since the Clarke/Seddon report was produced there have been enormous strides in the successful design of modular gas separation and liquefaction plants as well as readily transportable relatively small trucking containers but early enquiries by Wesmarket indicate that there is strong interest from various international Helium suppliers in the purchase of all product at wellhead and such suppliers taking on the task of such separation, extraction, liquefaction and containerisation of the various product lines potentially available.

A second major development since this report has been the ongoing and significant escalation in both the price of gaseous hydrocarbons and Helium; this trend shows no sign of diminishing.

The economics of in-situ extraction and export versus piping gas into the existing grid can not be definitively arrived at until the Hussar Prospect is far better defined and of course, a successful discovery has been made.

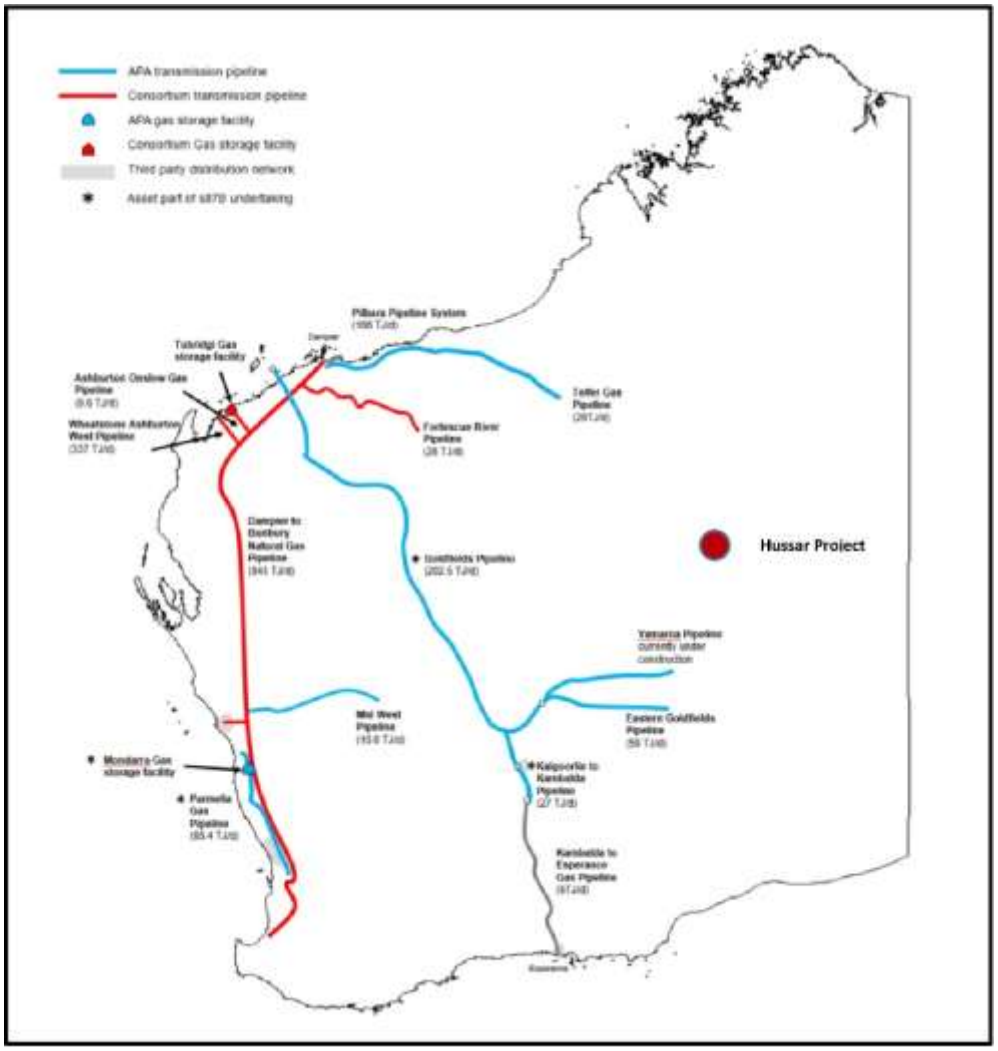


Fig.8 Approximate location of the Hussar Project in relation to the Yamarna gas pipeline (Courtesy of https://www.aemc.gov.au/energy-rules/national-gas-rules/gas-scheme-register/wa-yamarna-gas-pipeline)

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Image of an application of the SABRE Helium cooled hybrid air/rocket engine (Courtesy of Reaction Engineering, UK)

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20192; 2Lynxnet, 13873 Park Center Rd., Suite 400N, Herndon, VA 20171; 3U.S. Geological Survey, Kipling St & 6th Street, Denver, CO 80226

Structural and stratigraphic architecture of Australia's frontier onshore sedimentary basins: the Western Officer and Southern Carnarvon basins, Western Australia
Lidena Carr [A] , Russell Korsch [A] , Arthur Mory [B] , Roger Hocking [B] , Sarah Marshall [A] , Ross Costelloe [A] , Josef Holzschuh [A] and Jenny Maher [A] + Author Affiliations *The APPEA Journal* 52(2) 670-670
https://doi.org/10.1071/AJ11084 Published: 2012

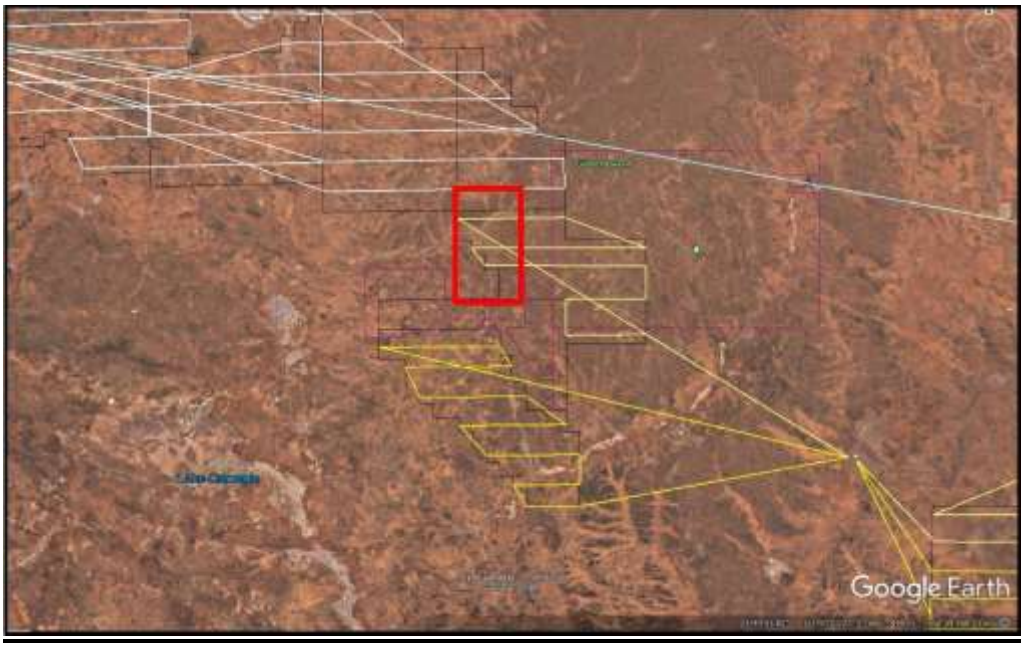
Volumetric Method to Estimate Volume in Place and Reserves, DrillingFormulas.com, April 2016 Petroleum Engineering.

Preliminary Pre-feasibility Study on Low Volume Commercial Extraction of Helium for Central Petroleum Limited, Dr Michael Clarke (METTS) and Dr Duncan Seddon (Duncan Seddon & Associates), CTP 19 April, 2010. https://www.asx.com.au/asxpdf/20100419/pdf/31pv185mf32s70.pdf

Well Completion Reports Katjara 1 (2011 Rodinia Oil) and Mulyawara 1 (2011 Rodinia Oil) Courtesy of the South Australian Department of Energy and Mining http://www.energymining.sa.gov.au/

APPENDIX ONE

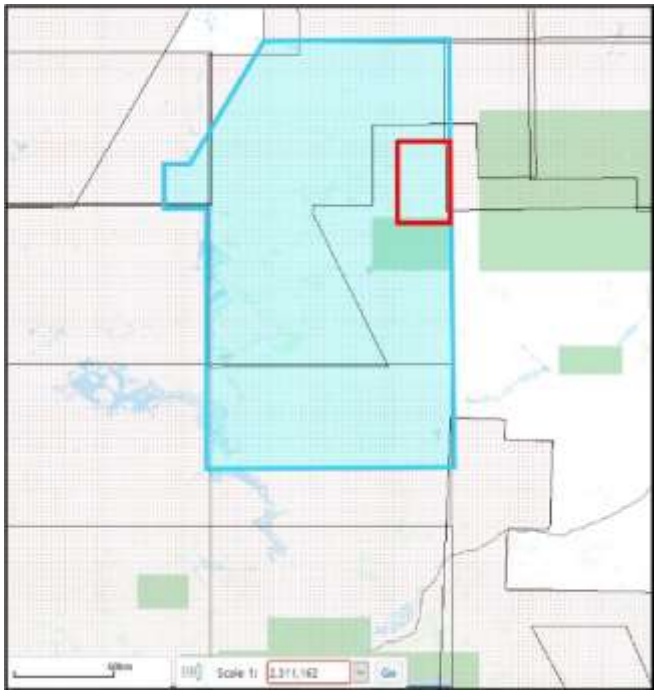
Existing and Planned Airborne Surveys



Google Earth Image of the PETREX 2018/19AEM PTP 18 km spacing flight lines (Courtesy WAPIMS)

This survey covered the current SPA application area but only at 18 km line spacing and did not penetrate below a maximum depth of 2,000m. The interpreted depth to the targeted Townsend Quartzite target for Westmarket is c.3,200m. The current SPA application approximate outline is shown in red.

2018 GSWA Gravity Survey

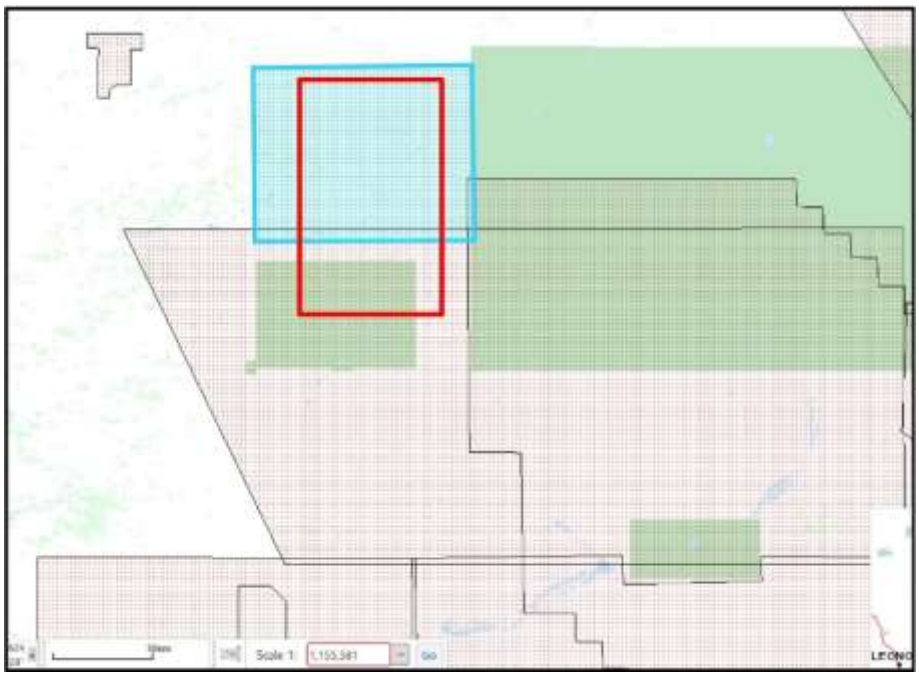


Little Sandy Desert 2018 East 2,500m Airborne Gravity Survey
Current Hussar Application in red

The proposed SPA is also covered by the GSWA Little Sandy Desert East Survey #71316, airborne gravity survey spaced at 2,500m at 180^0. No depth to basement interpretation has been done to date on this data and this should be done as part of any Petroleum Exploration Permit work programme. The area of this Little Sandy Desert survey and the approximate area of the SPA application are shown above.

1988 500m Line Spacing CRA Aeromagnetic Survey #60723
1989 400m Line Spacing CRA Aeromagnetic Survey #60724

The northern portion of the Hussar SPA application area is covered by a CRA 1989 400m line spacing aeromagnetic survey #60724 (Nanthona) and the southern portion by a CRA 1988 500m line spacing aeromagnetic survey (Officer Basin Stage One). However it is believed that neither of these surveys are capable of imaging basement structures due to the influence of more magnetic sediments much higher in the pile.



The approximate area of the Hussar SPA application is outlined in red.
The CRA 400m line spacing Nanthona survey area is shaded in dotted blue and the southerly CRA 500m line spacing survey area is dotted in red.

Discussion

- There has been no modelling of the depth to basement of the 2018 GSWA gravity survey by the government nor any such reports submitted; but this process will not qualify for the award of an SPA and the current 2.5 km line spacing of the Little Sandy Desert 2018 survey is sufficient for depth to basement modelling;

- The aeromagnetic surveys completed to date are not of much use at all in mapping the basement structures as over much of the Officer Basin the flat-lying Permian and Cretaceous cover mask the deeper signal from Officer Basin. That is the case in the Hussar area;

- The AEM PTP survey tool can penetrate more than 3,000m from surface and as a passive receiver, measures a geophysical response to reduction and oxidation (REDOX) activity associated with upward fluid flow; (this may be within the Townsend Quartizite under a salt seal) and/or higher in the sedimentary pile); this is often the result of outgassing from a hydrocarbon accumulation or in response to the upward flow of hydrothermal fluids.

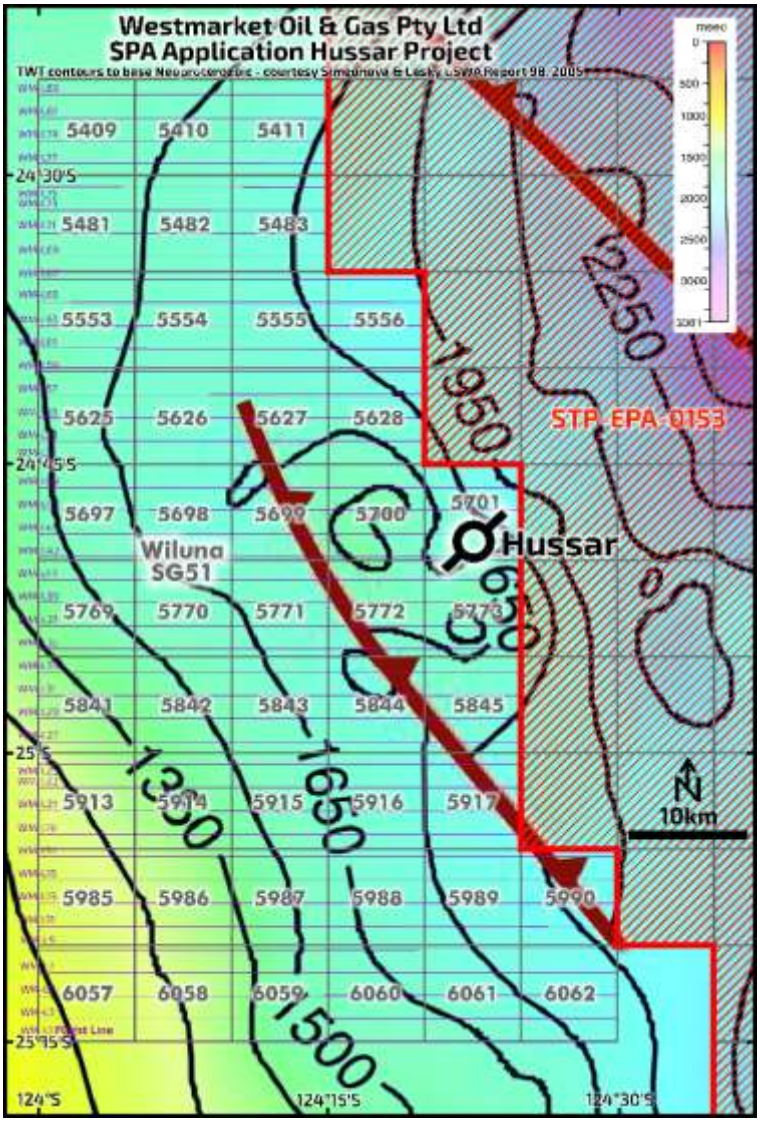
  The technique may also be useful in determining the integrity of any salt seal that may be present; is effectively an 'E' field version of the audio frequency magnetics (AFMAG) system. Consequently, this patented technology **is** very portable, lightweight and lends itself to economical and rapid airborne surveys.

  The PETREX AEM PTP survey flown at 18 km line spacing has proven to be an effective method of outlining likely areas of hydrocarbon accumulations, so in this region, has well demonstrated its perceived effectiveness, subject to further seismic and drilling.

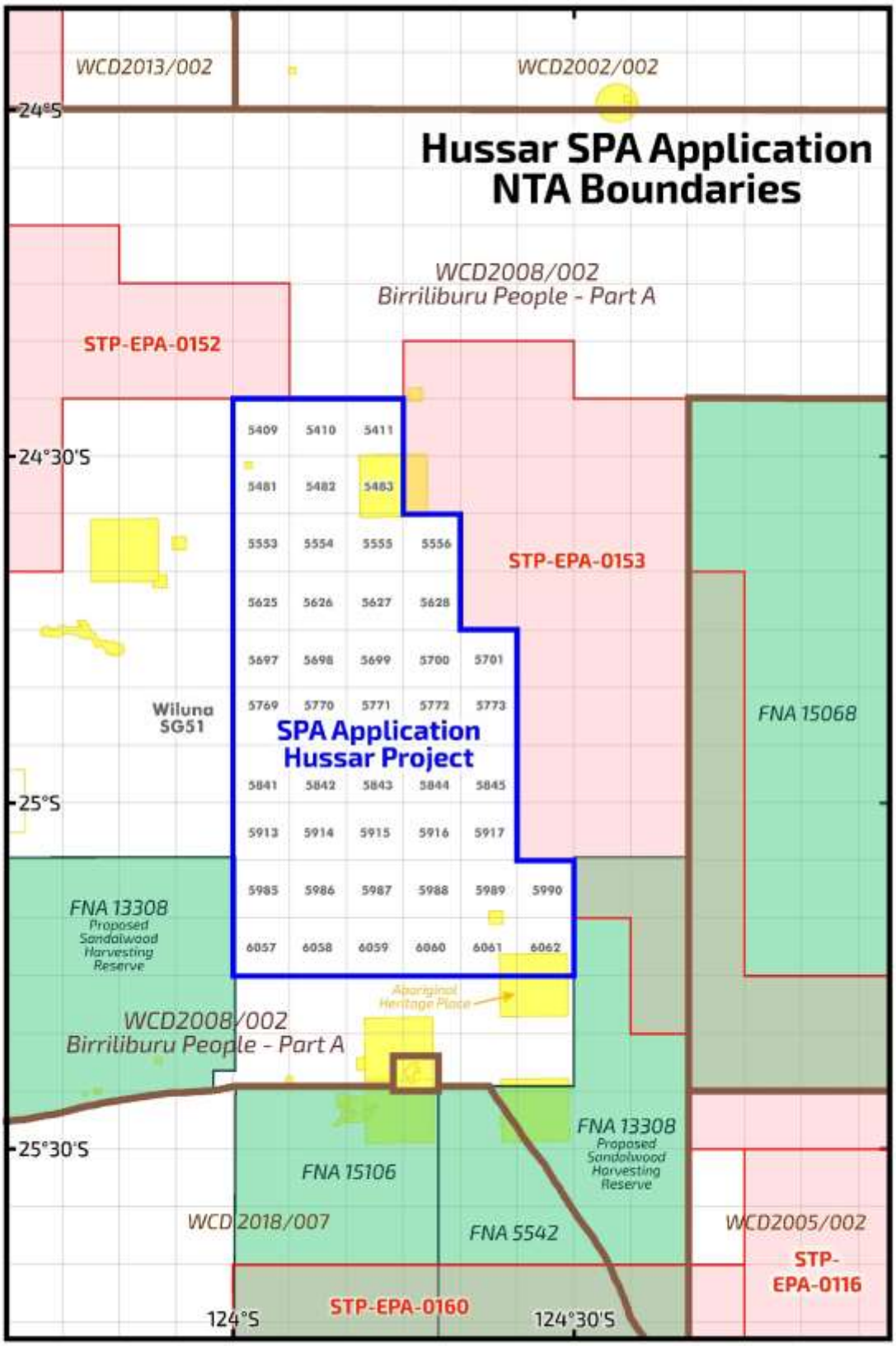
- It is not practicable to conduct seismic within the 6 month window of a granted SPA and seismic is prohibitively expensive unless there is some reasonably accurate basement depth and structural mapping completed first.

STP SPA-0095PA

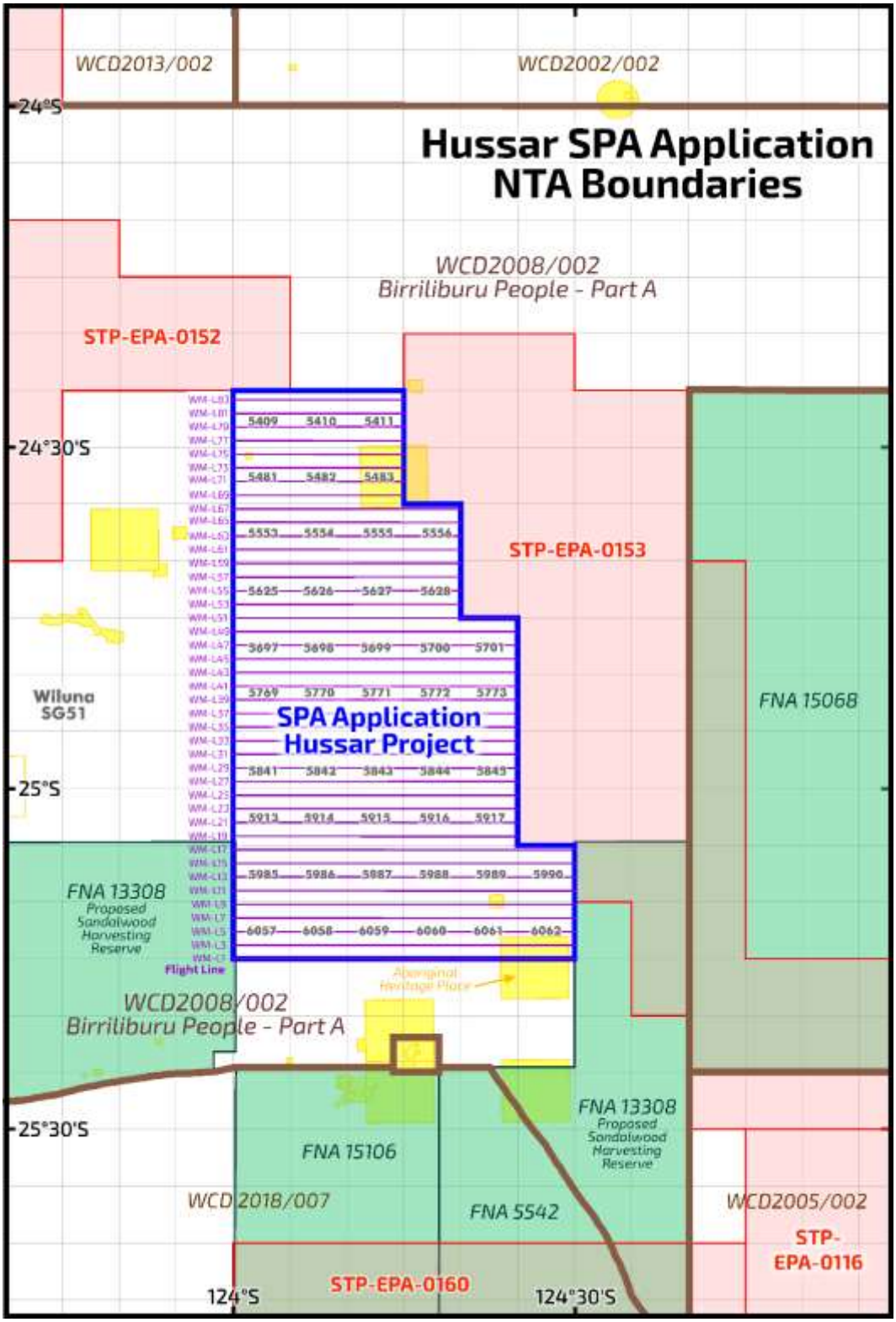
This survey is planned to be undertaken at 2 km line spacing resulting in approximately 80 times the resolution of the previous Petrex survey conducted at 18 km line spacing.



Flight lines (2km line spacing) of proposed AEM PTP



Cultural boundaries of importance



Flight lines and cultural/NTA/land use reserves

APPENDIX TWO

Preliminary Pre-feasibility Study on Low Volume Commercial Extraction of Helium for Central Petroleum Limited, Dr Michael Clarke (METTS) and Dr Duncan Seddon (Duncan Seddon & Associates), CTP 19 April, 2010. Report in full publically announced.

Follows a link to the relevant announcement with full report appended :

https://www.asx.com.au/asxpdf/20100419/pdf/31pv185mf32s70.pdf