RISC

decisions with confidence

Independent Technical Specialist's Report on the coal seam gas exploration projects of Jade Gas Pty Ltd

High Grade Metals Ltd

24 June 2021

1. Executive Summary

The Directors
High Grade Metals Limited
Level 17, 500 Collins Street
Melbourne, VIC, 3000, Australia

24 June 2021

Dear Directors,

Independent Technical Specialist's Report on the coal seam gas exploration projects of Jade Gas Pty Ltd

To assist in the preparation of a prospectus for the purposes of re-compliance with Chapters 1 and 2 of the ASX Listing Rules and relisting of High Grade Metals Limited, RISC Advisory Pty Ltd ("RISC") has been requested to prepare this document, an Independent Technical Specialist's Report in relation to the Jade Gas assets.

Jade Gas Pty Ltd ("Jade") currently have one asset which is a Production Sharing Agreement (PSA) for the exploration and exploitation of Coal Bed Methane in the Tavan Tolgoi area of Mongolia.

Jade has an additional opportunity where it has established a joint venture with a coal mining company to apply for a prospecting agreement in the Baruun Naran ("BN") area also in Mongolia. RISC understands that there is a high chance of success that this opportunity will develop into a prospecting agreement.

This report documents a description of the Jade coal seam gas exploration asset/opportunity and our independent views of the Jade assets.

Table of contents

List of figures

List of tables

2. Introduction

2.1. Jade's coal seam gas exploration areas

Jade has interests in two coal seam gas exploration areas in the South Gobi Basin of Mongolia.

The first asset is the Tavan Tolgoi coal seam gas exploration area. The Tavan Tolgoi Production Sharing Agreement ("PSA") over the Tavan Tolgoi area was awarded to Erdenes Methane LLC ("Erdenes"), a state-owned entity, on or about the 6 May 2020. Jade and Erdenes established a joint venture company Methane Gas Resource LLC ("MGR") which is owned 60% by Jade and 40% by Erdenes. Erdenes then transferred 100% of the PSA to MGR, which now owns the PSA. As a result, Jade has a beneficial interest of 60% of the Tavan Tolgoi PSA (Figure 2-1).

RISC confirms that it has seen both the original PSA (in Mongolian) and an English translation of the PSA, between the Mineral Resources and Petroleum Authority of Mongolia and Erdenes. RISC also confirms that it has seen the investment agreement between Erdenes and MGR to effect the transfer of the PSA to MGR. RISC has been advised that the transfer was completed on 14 October 2020.

The second opportunity, directly adjacent to the Tavan Tolgoi asset, is in the Baruun Naran ("BN") area. Jade has a 66% participation interest in a joint venture with Khangad Exploration LLC ("Khangad"), a subsidiary of HKSE listed Mongolian Mining Corporation ("MMC"), to explore for coal seam gas over the area. The Joint Venture company, Baruun Naran Gas LLC has been tasked with applying for a prospecting agreement over the area. The application for a prospecting agreement has been delayed by the COVID-19 disruptions. RISC has not been made aware of the proposed timing of an application for a prospecting agreement over the BN area.

RISC confirms that it has seen the investment agreement between Khangad and Jade that outlines that any future PSC on the BN area will be awarded to the joint venture company.

RISC has confirmed via the Mongolian Government online tenement registry that the parties who have entered into the contractual arrangements, to which Jade is a party, hold valid title.

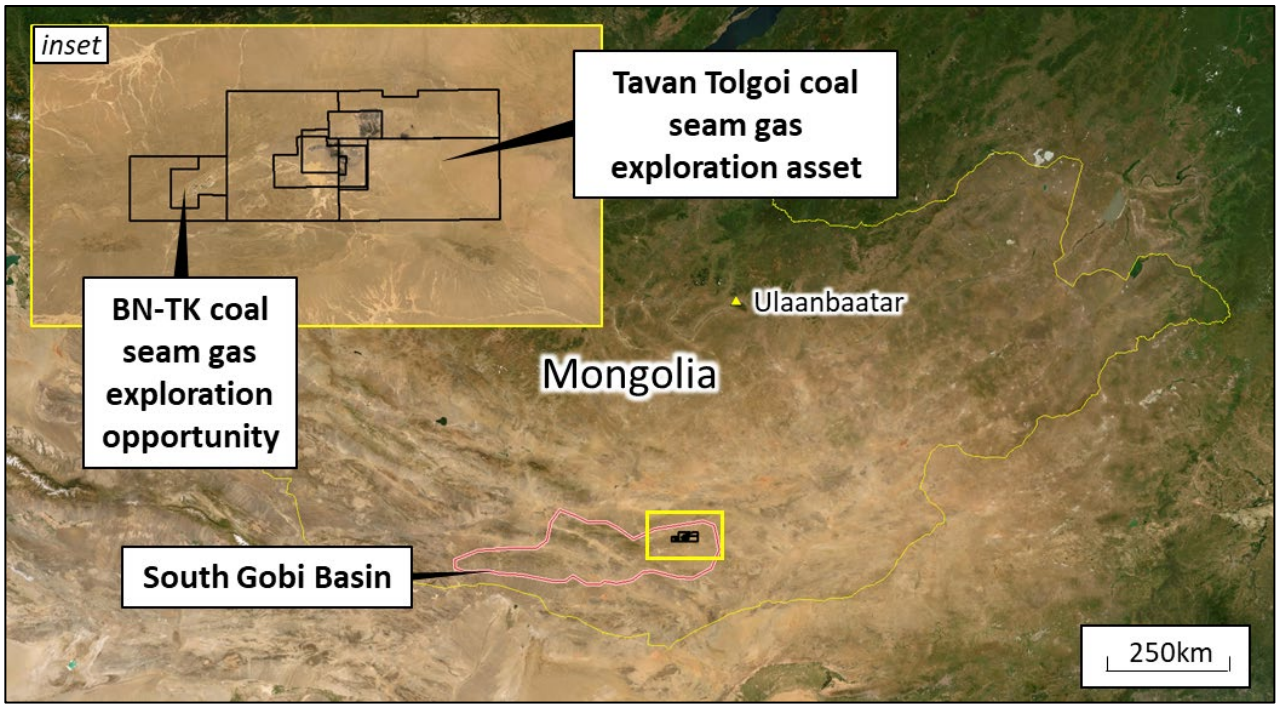

Figure 2-1: Location map of the Jade coal seam gas exploration areas

2.2. Terms of reference and basis of assessment

2.2.1. Terms of reference

This assignment has been conducted under the terms of our engagement with HGM dated 18 June 2021.

RISC will:

- Review the technical data for the Tavan Tolgoi and Baruun Naran areas and express an independent opinion as to the prospectivity for petroleum.
- Review estimates of resources as appropriate and provide independent views and opinion on the reasonableness of these estimates, and conformance with the Society of Petroleum Engineers Petroleum Resources Management System ("PRMS").
- Provide an opinion on the reasonableness of proposed work programs and commitments.
- Update and prepare and ITSR in compliances with ASIC Regulatory Guides 111 and 112
- Include a consent for the report to be included in a prospectus and to be named as technical expert in accordance with listing rule 5.41.

2.2.2. Basis of assessment

The data and information used in the preparation of this report were provided by Jade and supplemented by public domain information. RISC has relied upon the information provided by Jade. Data provided by Jade included the following:

- Updates to the Jade work and drilling program
- KOGAS CBM feasibility studies
- Draft report on the prospective resources of Tavan Tolgoi
- Baruun Naran geology PowerPoint
- Published technical papers on Mongolian coal deposits
- Tavan Tolgoi geological cross sections

- Erdenes JV agreement
- Barann Naran JV agreement
- Tavan Tolgoi Production Sharing Agreement

RISC has reviewed the resources in accordance with the Society of Petroleum Engineers internationally recognised Petroleum Resources Management System (PRMS)[1].

Unless otherwise stated, all resources presented in this report are gross (100%) quantities with an effective date of 1 January 2021. Unless otherwise stated, all costs are in real terms with a reference date of 1 January 2021.

[1] SPE/WPC/AAPG/SPEE 2018 Petroleum Resources Management System

3. Regional information

3.1. South Gobi Basin

The South Gobi Basin covers an area of 40,000 km^2 in the Gobi Desert of southern Mongolia. The basin is a complex terrane of Carboniferous to Cretaceous sediments formed in a foreland basin setting within the Central Asian Orogenic Belt. Due to the orogenic setting, the South Gobi Basin is structurally complex and deep faults segregate the basin into several sub-basins. The South Gobi Basin is host to significant bituminous coal resources in the Upper Permian section, however, the coal is not uniformly distributed throughout the basin due to the structural complexity. The presence of thick known coal deposits in the Tavan Tolgoi area make the Tavan Tolgoi coal seam gas exploration asset one of the lowest risk coal seam gas exploration target areas in the South Gobi Basin.

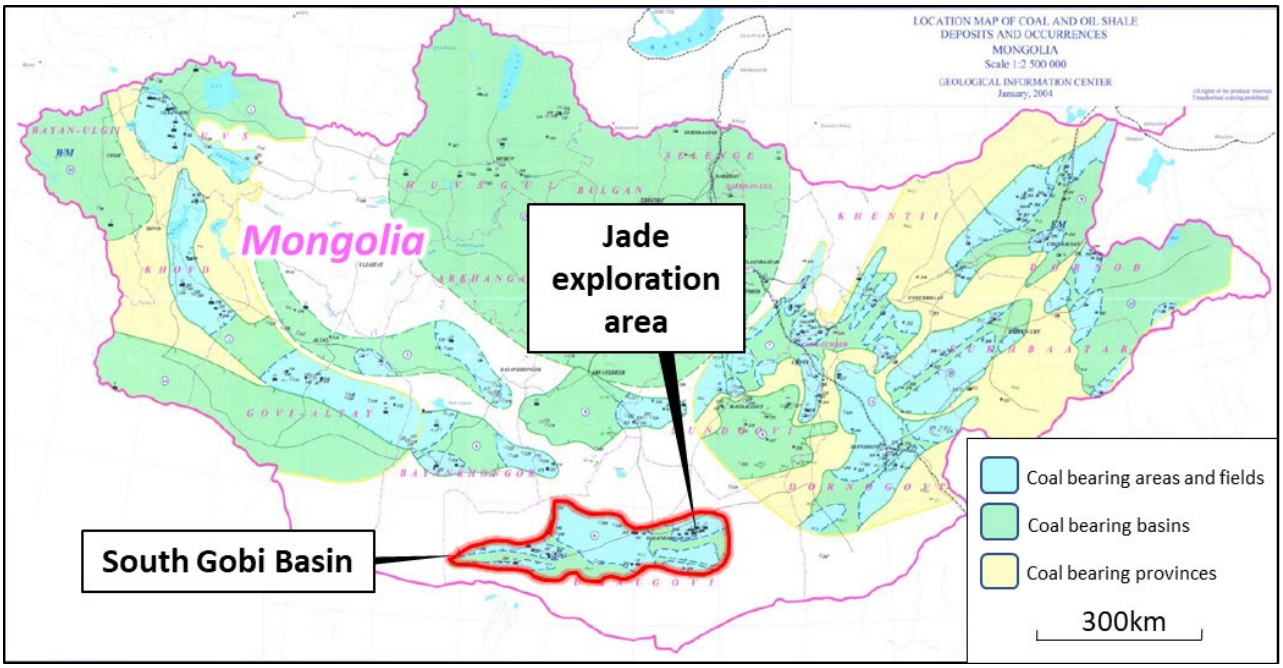

Figure 3-1: Location of the South Gobi Basin and Jade exploration area

3.2. Tavan Tolgoi area geology

The coal seams of the Tavan Tolgoi district accumulated in the Ulaan Nuur Trough, a broad syncline developed as an intra-cratonic sub-basin. A large-scale east to northeast trending fault system bounds the basin to the north and can be identified in satellite imagery. Upper Permian coals accumulated in the subsiding basin and were subsequently faulted and folded by post-depositional tectonic events. The Tavan Tolgoi coalfield is comprised of a series of east-west trending synclines and anticlines. While much of the Tavan Tolgoi is gently to moderately inclined, dips in the flanks of these structures can exceed 40°. Numerous east-west trending normal faults bisect the coalfield. Significant east-west trending thrust faults form the coalfield boundaries throughout much of Tavan Tolgoi area, bringing underlying, older volcanics and non-coal-bearing formations to the surface and truncating the coal resource areas.

The Permian stratigraphy of the Tavan Tolgoi area is presented in Figure 3-2. The Upper Permian coal bearing stratigraphy and known coal seams (labelled as 0 to XIII) have a gross thickness in the Ulaan Nuur Trough of approximately 965 m.

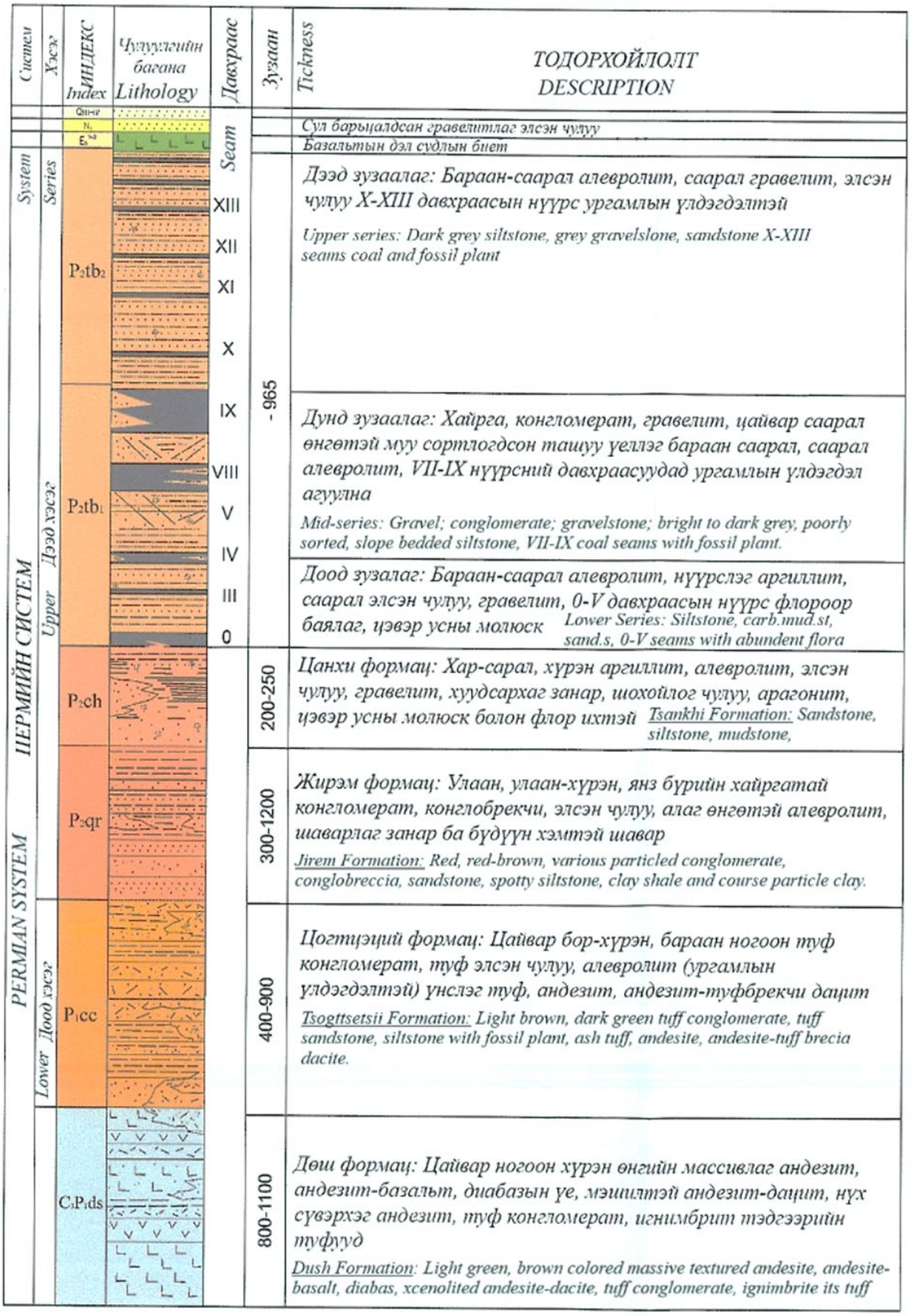

Figure 3-2: Late Permian Tavan Tolgoi group stratigraphy

Due to the significant historical coal exploration in the area, and the excellent outcrop of geology on the surface, there is a detailed understanding of coal distribution in the area. The detailed geological map of the Tavan Tolgoi area is presented on Figure 3-3. The geological map shows bedding dips and areas of known coal at the surface. The legend to the geological map and associated cross sections is presented in Figure 3-4.

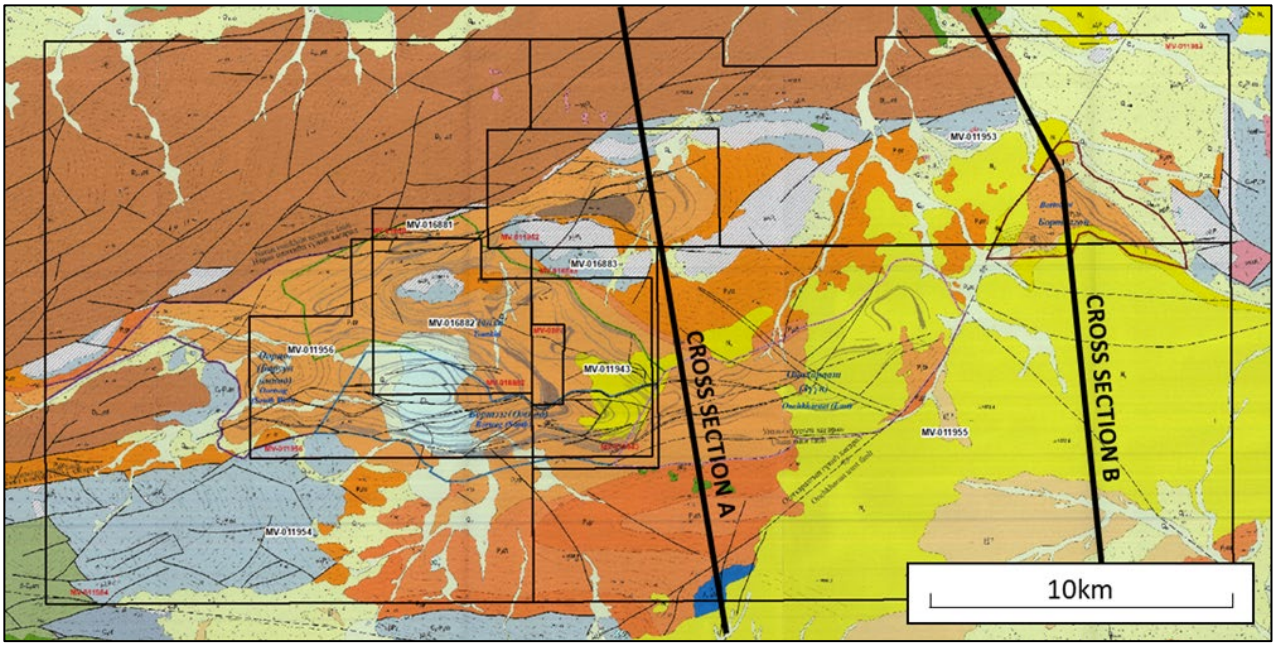

Figure 3-3: Geological map of the Tavan Tolgoi area

Two representative cross sections through the area, highlighted on the geological map, are presented in Figure 3-5 and Figure 3-6. The section of known coal bearing stratigraphy is labelled as P_2tb.

RISC estimate the depth of gas productive coal seams is between 300 m and 1000 m below ground level. At shallower depths the gas content of the coal is small (sub-commercial) due to low pressure. At greater depths the permeability of the coal is too low for commercial production.

Given the very steep dips present in both the Tavan Tolgoi and the BN-TK areas, RISC has calculated prospective areas of the coal seam gas potential from the distribution of coal seams known from surface control.

Figure 3-4: Legend to the Tavan Tolgoi geological map and cross sections

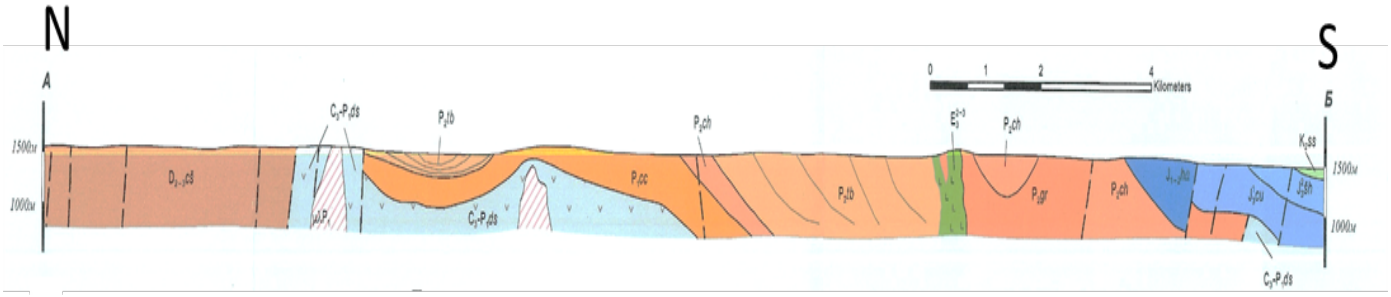

Figure 3-5: Geological Cross Section A through the Tavan Tolgoi area

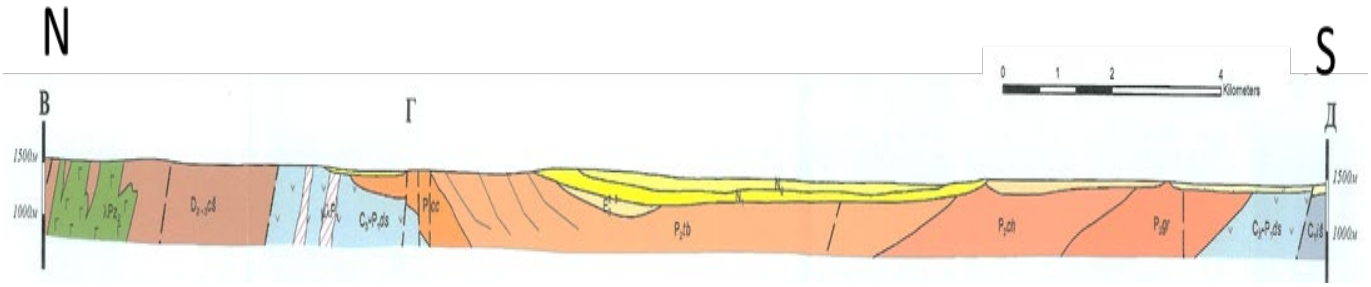

Figure 3-6: Geological Cross Section B through the Tavan Tolgoi area

3.3. Coal bed methane exploration in the South Gobi Basin

Coal seam gas exploration within the South Gobi Basin is at a very early stage and key resource parameters such as gas content and gas composition are limited. Saturation, permeability, in-situ stress, pressure and temperature data are not publicly reported from any wells drilled within the basin.

4. Tavan Tolgoi asset

4.1. Introduction

Jade has a 60% beneficial interest in a PSA for coal bed methane exploration and exploitation over the Tavan Tolgoi area. Prior to the award of the PSA, the joint venture held eight prospecting agreements over the Tavan Tolgoi area. Of the eight prospecting agreements, the MV-011943 area has not been included in the PSA, (Table 4-1).

Table 4-1: Prospecting agreement areas within the Tavan Tolgoi coal seam gas exploration asset

Prospecting Agreement	Area km^2	RISC calculated area km^2	Included in the PSA
MV-016881	5.57	5.57	5.57
MV-016882	24.47	24.47	24.47
MV-016883	7.00	7.00	7.00
MV-011943	20.56[1]	20.40	Not included
MV-011953	128.61	128.60	128.60
MV-011954	229.02	229.02	229.02
MV-011955	238.06	238.06	238.06
MV-011956	31.51	31.51	31.51
Total area	**684.8km^2**	**684.64km^2**	**664.24km^2**

Notes:

[1] Area not provided but calculated by RISC from Total area number minus all the other agreement areas provided

The PSA area totals 664.24km^2, the location of the PSA area is provided in Figure 4-1.

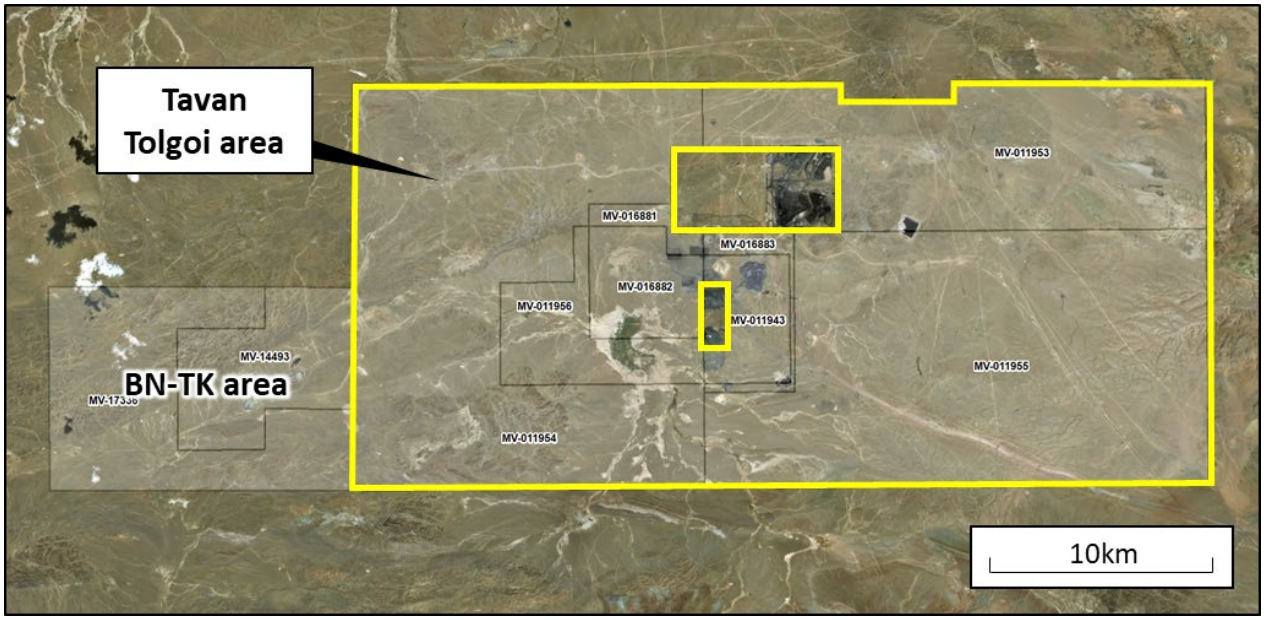

Figure 4-1: Location of the Tavan Tolgoi PSA area

RISC has reviewed the PSA terms and can confirm they are generally in line with other petroleum producing regimes, are comparable to other PSA terms in Mongolia, and can be considered in line with industry standards. Key terms of the PSA are presented in Table 4-2.

Table 4-2: Tavan Tolgoi PSA terms

Initial term	10 years (in phases of 4 years + 3 years + 3 years)
Signature bonus	US$ 50k
Training bonus	US$ 100k/year
Royalty	Industry standard[2]
Production split	Industry standard[3]
Minimum work program commitments	Annual

[2] Royalty rates typically range from 0-15%
[3] Production splits typically range from 20-50%, but in some regimes gov't take can exceed 50%.

An operating coal mine exists within the centre of the Tavan Tolgoi area. The location of coal mine activity as depicted by satellite imagery is shown in Figure 4-2. A 500 m buffer has been indicated around the areas interpreted as current mining activity from satellite imagery.

A co-operation agreement has been negotiated and executed which addresses overlapping tenure between the coal mining operations and activities within the PSA.

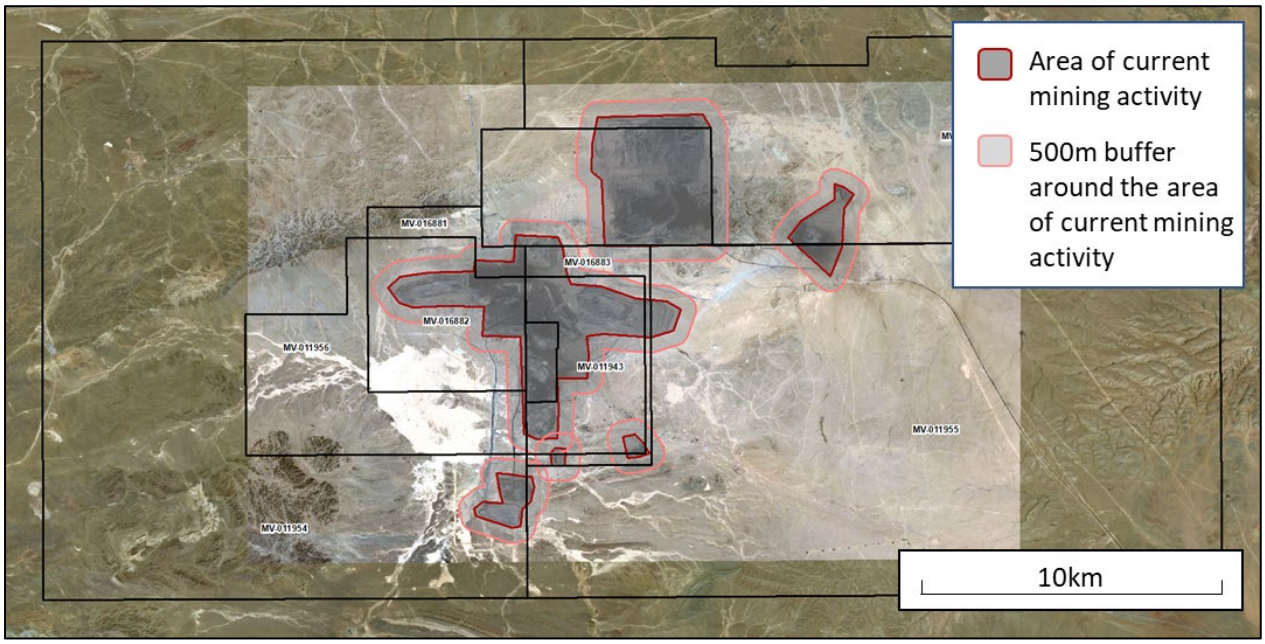

Figure 4-2: Tavan Tolgoi coal mine activity

4.2. Data

There are 3 boreholes (M-01, M-05 and M-06) within the Tavan Tolgoi coal mining licence drilled by KOGAS in 2014 to a depth of approximately 800 m below ground level. Data from these 3 boreholes includes thickness of the coal seams. Gas content information is only available from the M-05 well, however, no information is supplied documenting how the gas content measurements were conducted. No desorption curves or isotherm are available, and there is no description of the measurement methodology and correction for gas lost.

In addition to the KOGAS wells, Jade drilled 8 wells in 2019 to target depths of between 500 m and 800 m to determine net coal measurements in the area to the west of the Tavan Tolgoi mine. The location of the wells is provided on Figure 4-3.

4.3. Resources estimate

Estimating the prospective resource of the asset is challenging due to the paucity of existing data on coal seam gas potential. Permeability data and gas adsorption isotherm data are not yet available.

The excellent surface control of known coal seams allows an area of prospective coal seam gas in the area to be defined. The area of proven and potential coal in the prospecting agreement areas is provided in Figure 4-4.

The areas depicted on Figure 4-4 have been calculated and are provided in Table 4-3. A total of 21% of the total area (139 km^2) is areas of proven coal. Surface access to 21 km^2 of that area is currently complicated by mining activity but has been used in the estimation of prospective resource.

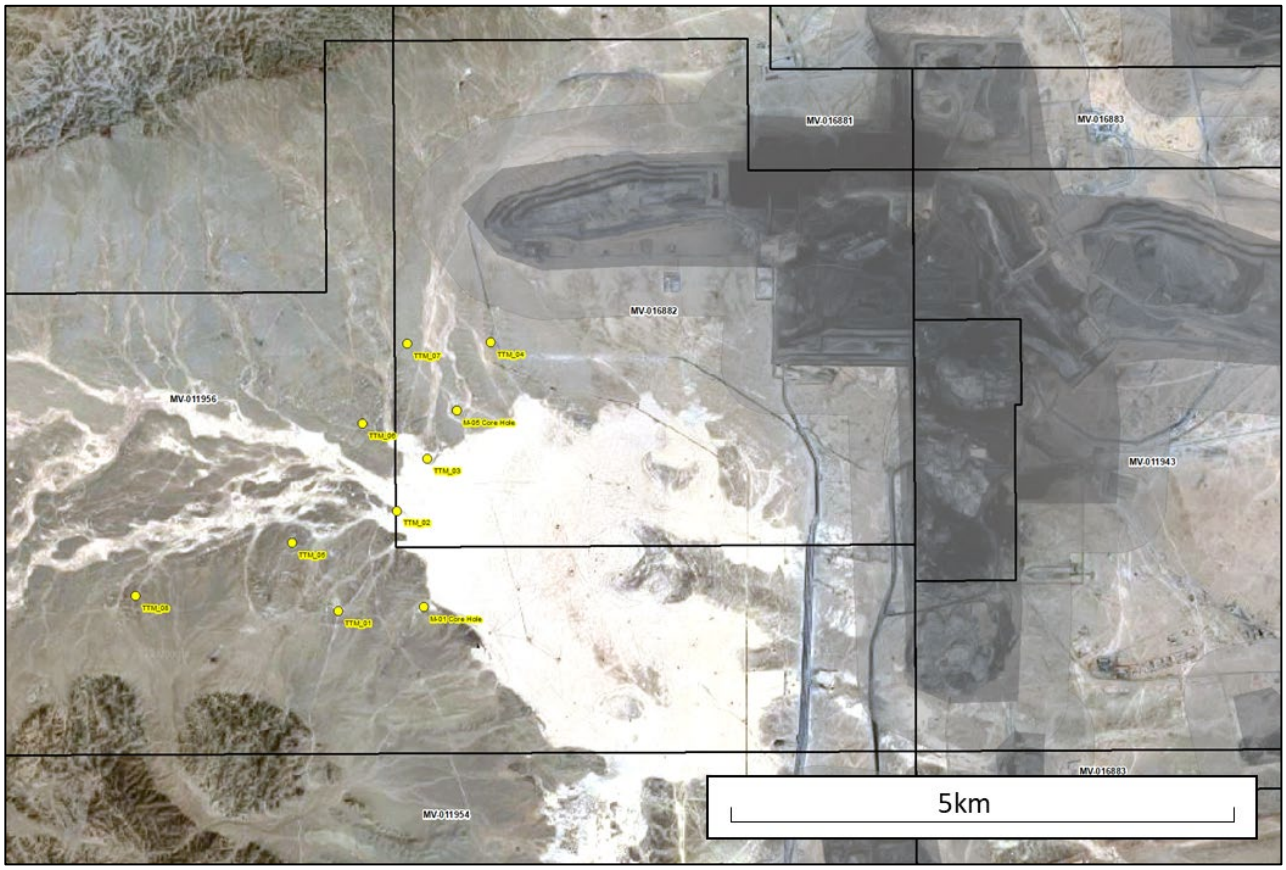

Figure 4-3: Location of the Jade wells and existing KOGAS wells in the Tavan Tolgoi coal seam gas exploration area

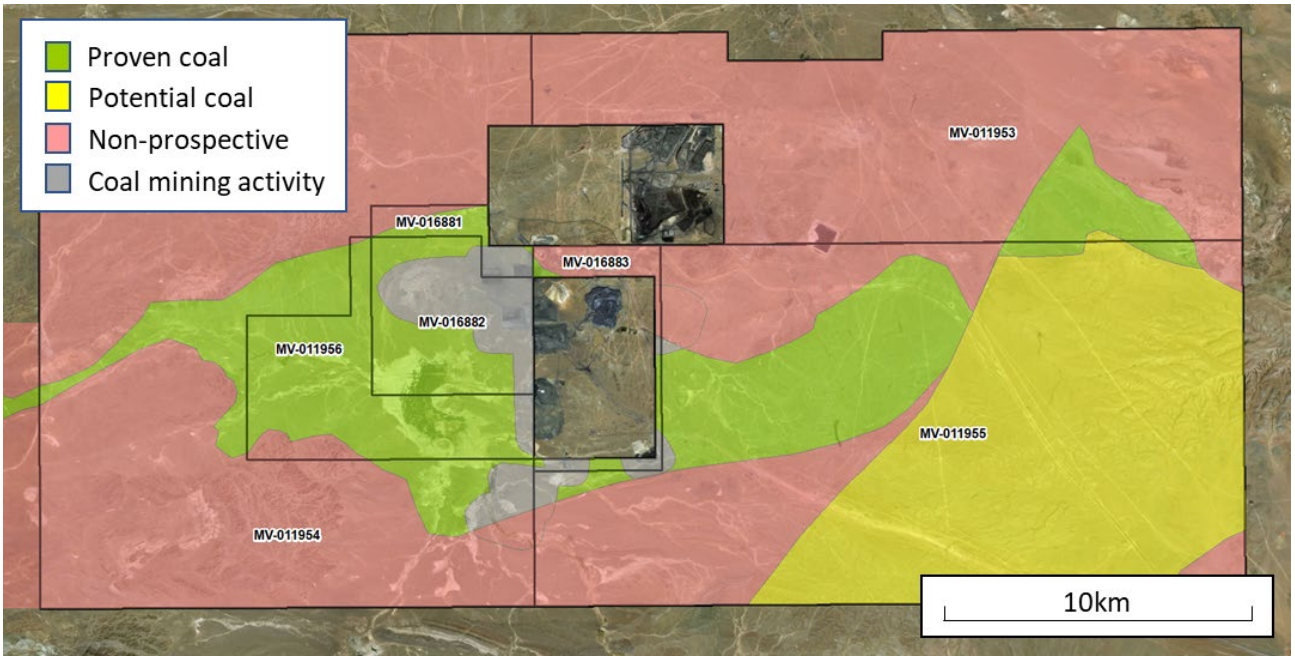

Figure 4-4: The distribution of proven and potential coal in the Tavan Tolgoi coal seam gas exploration area

Table 4-3: The distribution of proven and potential coal in the Tavan Tolgoi coal seam gas exploration area

Area (description)	Area (km^2)	% of total area
Total area of the PSA	664	100%
Area considered non-prospective	400	60%
Area with proven coal (outside the area of coal mine activity)	118	18%
Area with proven coal (inside the area of coal mine activity)	21	3%
Area with potential coal	125	19%

Jade have used a best estimate area of 222 km^2 in their estimate of GIIP. The other input parameters for Jade's GIIP estimate are provided in Table 4-4.

Table 4-4: Jade GIIP calculation input parameters for the Tavan Tolgoi area

Input	Unit	Low	Best	High	Distribution
Area	km^2	134	222	367	lognormal
Net coal	m	40	85	200	lognormal
Coal density	g/cm3	1.42	1.53	1.69	lognormal
Gas content	cm3/g	3	5	12	lognormal
Ash content	%	16	20	44	lognormal
Moisture content	decimal	0.003	0.0064	0.009	normal
GIIP (Bscf)		**1,710**	**4,570**	**12,280**	

RISC considers the input parameters used by Jade for their gas in-place estimate are reasonable, although this must be caveated by the lack of data for coal seam gas potential currently available on the asset.

Net coal seam thickness has been calculated from the Tavan Tolgoi M-05 and M-06 borehole using the logs to determine the top and base of the coal seams. Independent of depth, the total thickness is 47 m and 128 m using a 3 m and 5 m thickness cut off. Based on the number of coal seams, Jade have estimated a range in net coal thickness of 40 to 200m, with a best estimate of 85 m.

Coal density, gas content, ash content and moisture content have all been estimated from the M-05 borehole data. M-05 contains 11 coal seams deeper than 300 m, five of which are greater than 3 m thick, and three of which have enough gas content to be productive for coal seam gas. The gas content range predicted by Jade is supported by gas recovered from wellsite gas adsorption laboratory analysis by Elixir in their Nomgon-1 CSG core hole. This core hole is 80 km south of Tavan Tolgoi and measured raw gas from 2.4 cm3/g to 7.5 cm3/g, with an average raw gas content of 5.3 cm3/g[4].

Jade have accounted for the lack of recovery information currently available over the asset by applying a chance of geological success to the play. Jade estimate a 27% chance of geological success. The biggest risk is the coal characteristics given the lack of current data on coal permeability and cleat data.

Jade has estimated gas in-place across the area of between 1.7 Tscf to 12.3 Tscf with a best-case estimate of 4.6 Tscf.

Gas recovery factors have been estimated between 25-60% with a best estimate of 40%. This best-estimate recovery factor is based on the drilling of 4,043 wells with an ultimate recovery per well of 0.45 Bscf, (Table 4-5).

[4] Elixir Energy ASX announcement. 26 February 2020. Coal seam gas discovery at Nomgon-1

Table 4-5: Jade estimate of ultimate recovery in the Tavan Tolgoi area

	Low	Best	High
Area (km^2)	134	222	367
GIIP (Bscf)	1,710	4,570	12,280
Recovery Factor (%)	25%	40%	60%
Ultimate Recovery (Bscf)	427.5	1,828	7,368
Number of wells	2,121	4,043	7,325
Ultimate recovery / well	0.20	0.45	1.01
Well density (wells per km^2)	15.8	18.2	20.0
Well spacing (m)	251	234	224

RISC considers the calculated well spacing for the recovery estimate of between 224 m and 251 m is very tight. The tightest example of coal seam gas development well spacing we have found globally is 300 m. Some coal seam gas developments in the Powder River Basin, Wyoming and the Ordos Basin, China are in the order of 300-400 m well spacing. Typically, well spacing in coal seam gas plays is closer to 750 m or 1000 m. Development in the Walloon coal seam gas play in Queensland Australia is typically 750 m, (Figure 4-5). Development in the Bowen Basin coal seam gas play in Queensland, Australia is typically 1000 m.

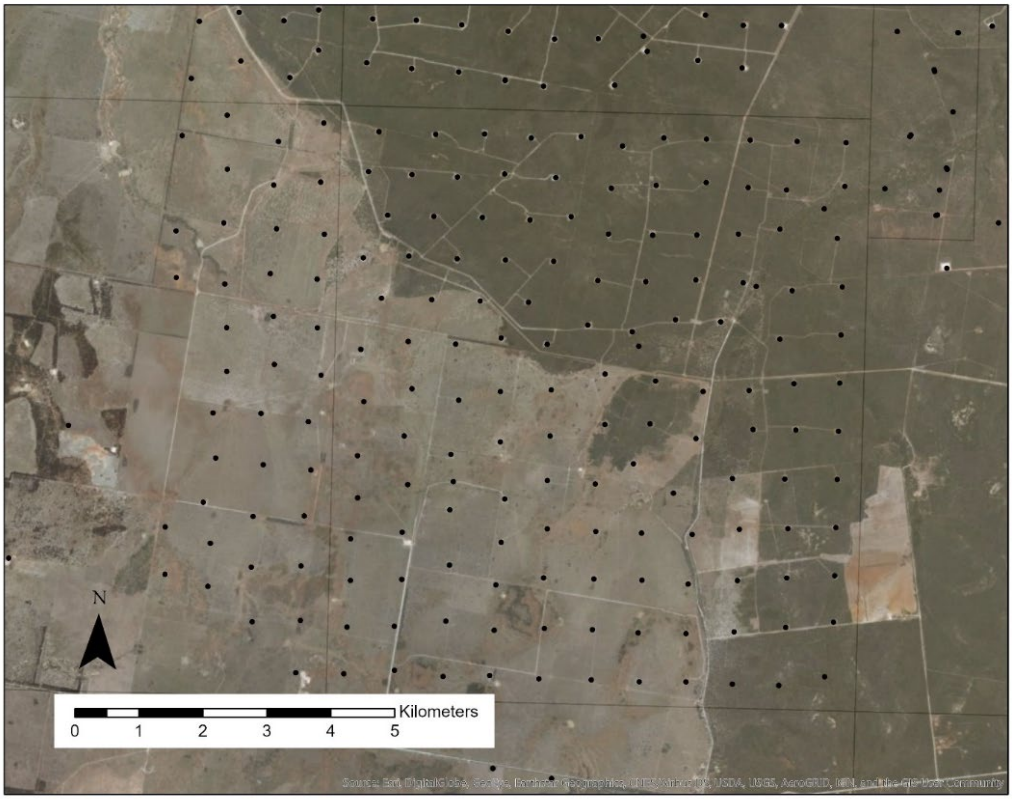

Figure 4-5: Vertical well spacing of 750m in the Condabri APLNG Walloon coal seam gas development, Queensland, Australia

An alternative approach to calculating resource potential of an area is working up from well ultimate recovery expectations and well density. The '*how many wells can fit in to this area?'* and '*how much could the wells deliver*' approach.

Given the necessity for large amounts of wells in coal seam gas developments, and the importance of recovery per well over original gas in-place estimates, RISC favors an approach on calculating prospective resources from recovery per well rather than GIIP multiplied by recovery factor.

RISC calculate the area of potential development in the permit areas to be between 158 km^2 (low) and 249 km^2 (high).

A resource range can be described by considering different estimates of ultimate recovery per well and a range of different well spacing density.

We considered a range of well spacing between 900 m (1.2 wells/km^2) and 300 m (11.1 wells/km^2), and a range of ultimate recovery per well of between 0.5 Bscf and 2 Bscf, both ranges typical of well spacing and recoveries per well in coal seam gas projects around the world.

These ranges were then multiplied probabilistically to produce a low, best and high estimate of ultimate recovery for the area as presented in Table 4-6.

Using this method RISC estimates a total prospective resource range of between 0.2 Tscf (low) and 3.1 Tscf (high) with a best-case estimate of ultimate recovery of 1.0 Tscf.

Table 4-6: RISC estimate of ultimate recovery for the Tavan Tolgoi coal seam gas exploration asset

	Low	Best	High	Distribution
Prospective coal seam gas area (km^2)	158	203	249	Pert
Well spacing density (m)	900	600	300	Input
Wells per (km^2)	1.2	2.8	11.1	Pert
Estimate of ultimate recovery per well (Bscf)	0.5	1.0	2.0	Pert
Prospective resource[5,6] range (Bscf)	**216**	**1,044**	**3,062**	**Probabilistic output**

4.4. Sunk costs

Prior the award of the PSA, Jade previously held the Tavan Tolgoi asset under 8 prospecting agreements. Under the terms of the prospecting agreements, Jade was required to drill a total of 5000 m within the license area. A total of 8 holes totaling 5,200 m were drilled by Jade in 2019 at a total cost of approximately US$ 1 million (A$ 1.45 million).

4.5. Work programs and commitments

The Tavan Tolgoi PSA license term is for 10-years broken into three phases. The first phase of the PSA is for 4 years and carries a minimum work program expenditure of US$ 5.5 million, as shown in Table 4-7.

Table 4-7: Tavan Tolgoi PSA minimum work program

Phase	Year	Indicative work program	Minimum expenditure
1	1	2-3 exploration wells (300m-900m deep) and market research	US$ 1 million
	2	Core and sample analysis	US$ 1.5 million
	3	3-4 appraisal wells	US$ 1.5 million
	4	Production plant build and initial development	US$ 1.5 million

[5] Prospective resources are undiscovered and 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.

[6] Resources are reported on a Gross basis. Jade has a 60% beneficial in MGR, however the Net outcome for MGR is dependent upon the sharing requirements of the PSA, which vary according to production rate and are therefore currently indeterminate.

Jade has indicated an expanded initial 2-year work program to RISC, as indicated in Table 4-8. Indicatively Jade intends to have complied with the minimum requirements of the PSA within the first 2 years.

Table 4-8 Jade proposed work program for Tavan Tolgoi PSA

Year	Proposed work program	Proposed expenditure
1	Project Evaluation/Laboratory analysis/Field work	US$ 0.2 million
	6 exploration wells (500-900 m deep)	US$ 0.8 million
	Program extension and Contingency	US$ 0.7 million
	Commercial Studies, Administration and other	US$ 1.2 million
	Total Year 1	**US$2.2 – 2.9 million**
2	Project Evaluation/Laboratory analysis/Field work	US$ 0.1 million
	Further exploration/appraisal wells (500-900 m deep)	US$ 0.7 million
	Program extension and Contingency	US$ 0.8 million
	Commercial Studies, Administration and other	US$ 1.0 million
	Total Year 2	**US$ 1.8 – 2.6 million**

5. Baruun Naran (BN) area

5.1. Introduction

Jade originally entered into an agreement with Khangad Exploration to form a joint venture to explore for coal seam gas under the Baruun Naran (MV-14493) and Tsaikhar Khudag (MV-17336) coal mining license areas, collectively referred to as the BN-TK area, directly to the west of the Tavan Tolgoi area (Figure 5-1). Jade has a 66% interest in the joint venture entity, Baruun Naran Gas LLC ("BN Gas").

The intent was for BN Gas to apply for prospecting agreements over the two coal mining licenses in the BN-TK area. However, in late 2020 Jade was made aware that a 3rd party PSC already exists over the TK license area, held by Elixir Energy. As a result BN Gas is not able to apply for a Prospecting Agreement over the TK license area (MV-17336).

RISC understands that BN Gas still intends to apply for a Prospecting Agreement over the BN area and will carry out the same planned work program once this is agreed. Terms and conditions, and contract obligations of the proposed Prospecting Agreement are not yet available.

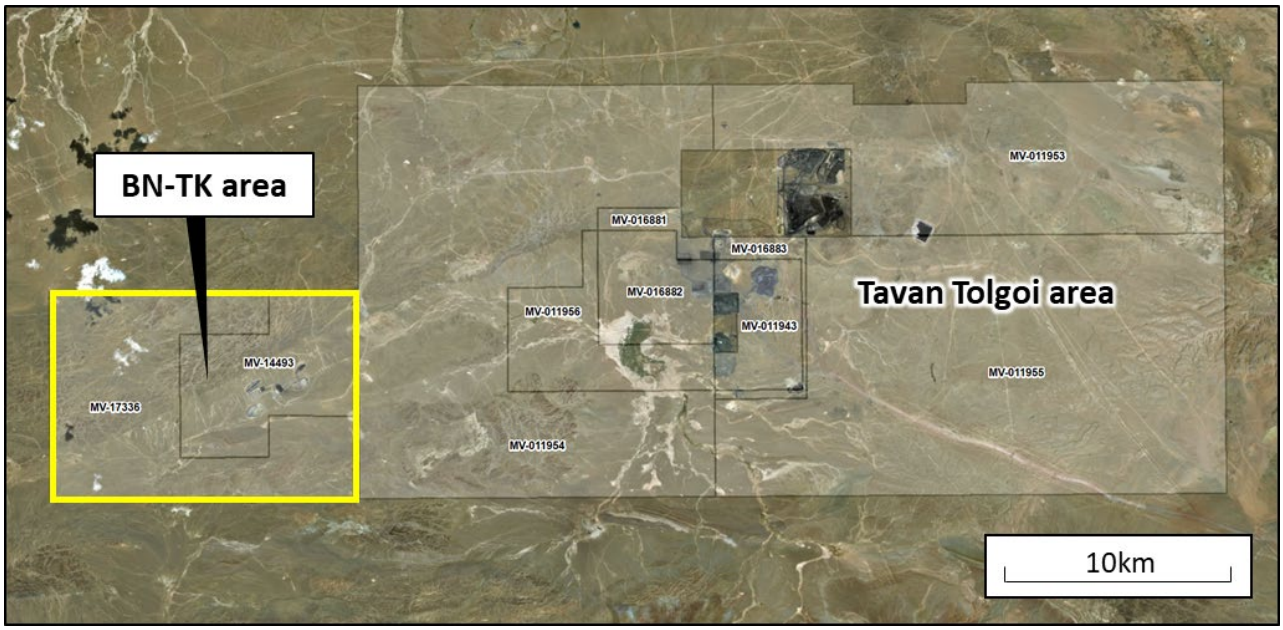

Figure 5-1: Location of the BN-TK area

An operating coal mine exists within the proposed Prospecting Agreement area, as shown by satellite imagery in Figure 5-2. The coal mine activity will impact the Baruun Naran (MV-14493) area. A 500 m buffer has been indicated around the areas interpreted as current activity from satellite imagery.

RISC anticipates that a co-operation agreement addressing overlapping tenure, similar to that executed for the Tavan Tolgoi area, will be negotiated and entered into by the parties.

5.2. Data

A significant amount of borehole and seismic data has been acquired over the BN-TK area for coal exploration. Two significant programs of borehole drilling have been undertaken by QGC between 2005-2010 and the Mongolian Mining Corporation (MMC) between 2011-2012, (Figure 5-3).

A grid of 2D seismic data has also been acquired over the project area in 2011 by MMC.

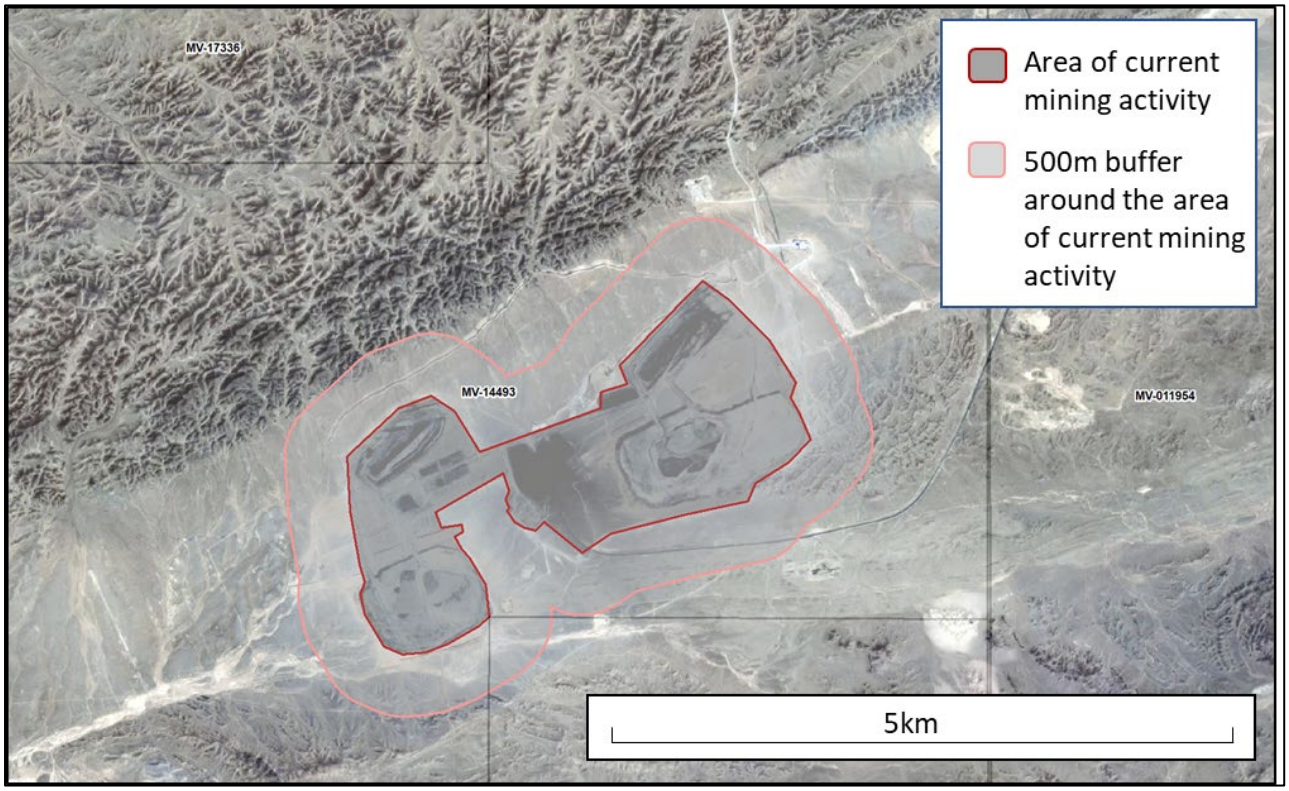

Figure 5-2: BN-TK area coal mine activity

The borehole data, seismic data and excellent geological outcrop of the area make for an excellent understanding of the subsurface.

Figure 5-4 shows a cross section through the BN-TK area. The coal seams exist over an area of approximately 1.2 km north to south, and 6km northeast to southwest. The cross section, presented at true vertical scale, shows the very steep dips of the coal seams in the area.

Borehole and seismic data over the BN-TK area has not been provided to RISC.

The geological map of the BN-TK area indicating the distribution of known coal bearing section (labelled on the map as P_2tb) is provided in Figure 5-5.

5.3. Resources estimate

Estimating the prospective resource of the project area is challenging due to the paucity of existing data on coal seam gas potential. Permeability data and gas adsorption isotherm data are not yet available.

The excellent surface control of known coal seams allows an area of prospective coal seam gas in the area to be defined. The area of proven coal in the BN-TK area is provided in Figure 5-6.

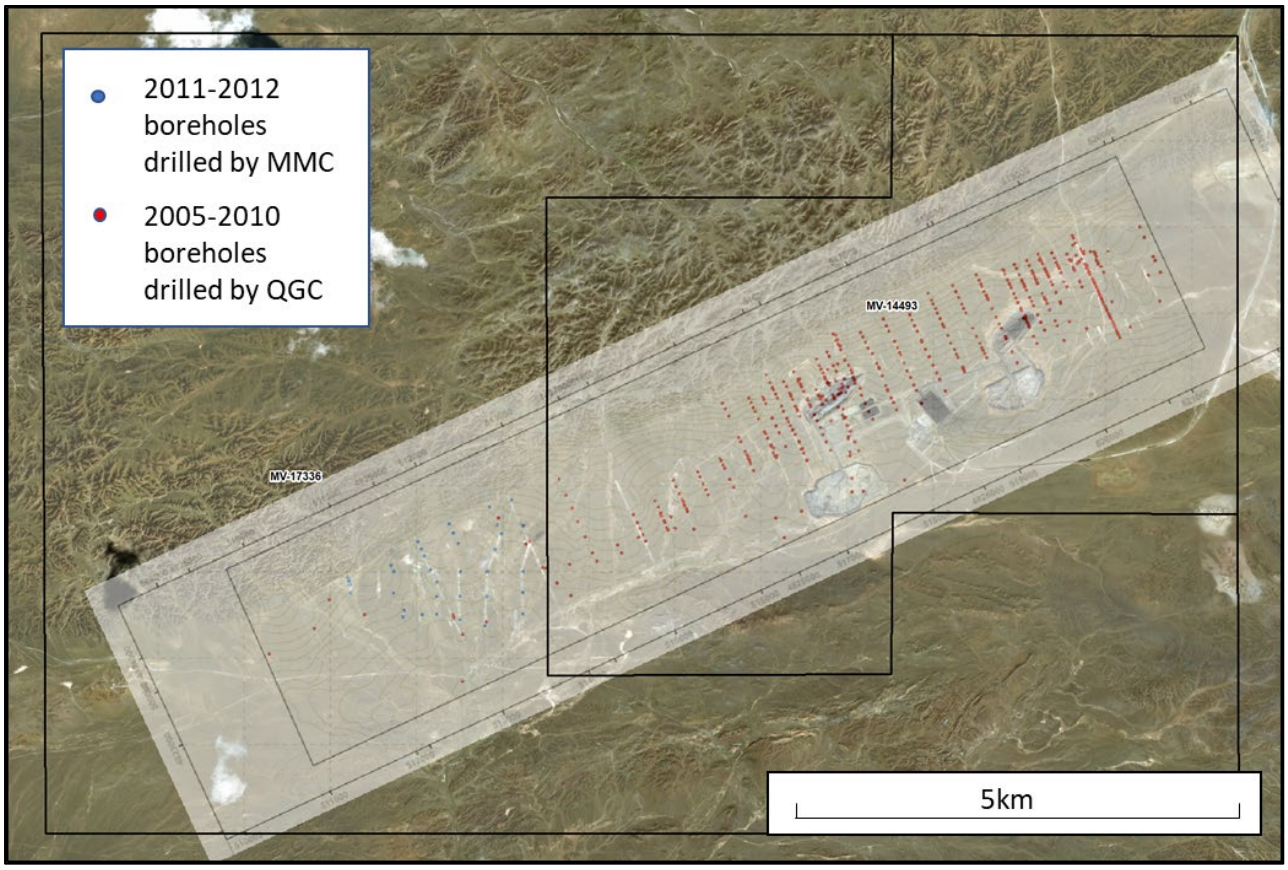

Figure 5-3: Location of boreholes drilled in the BN-TK area.

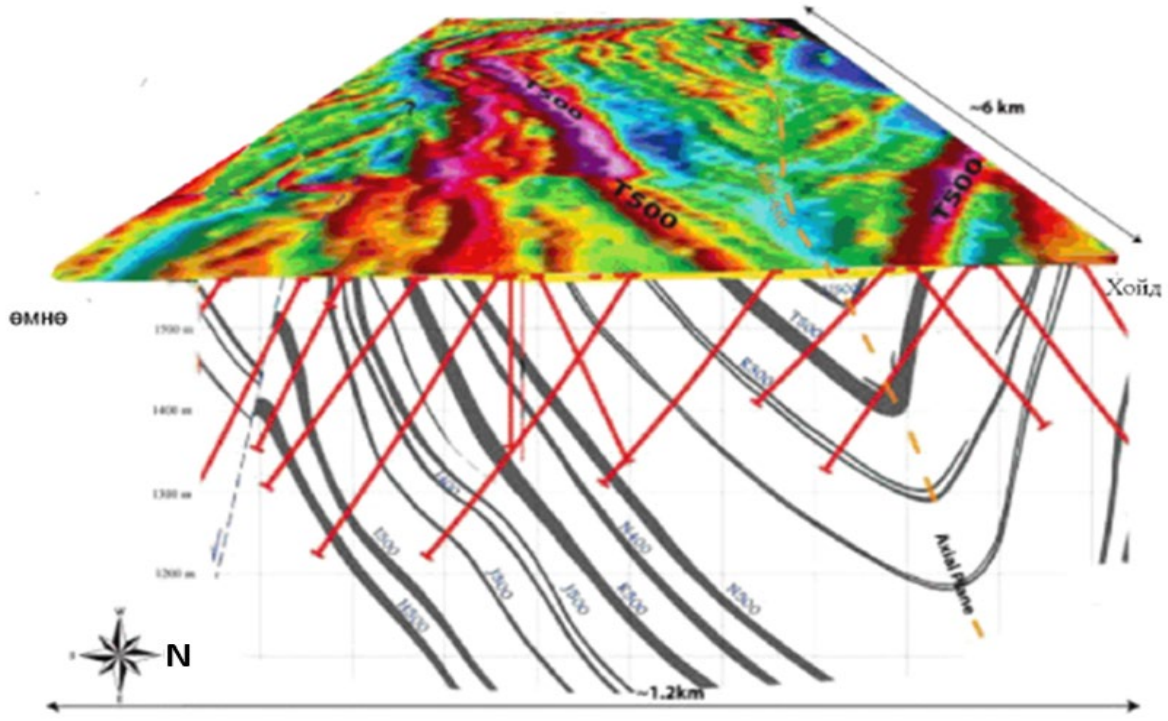

Figure 5-4: BN-TK area cross section

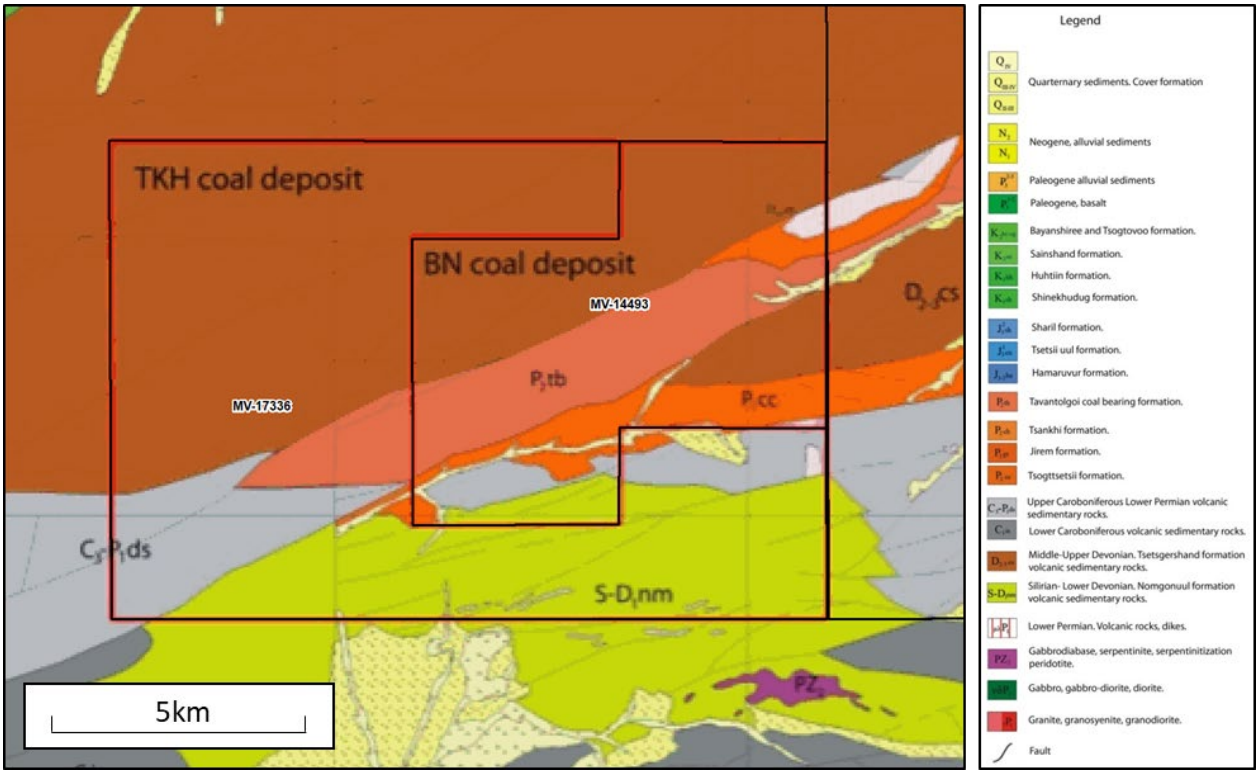

Figure 5-5: Geological map of the BN-TK area

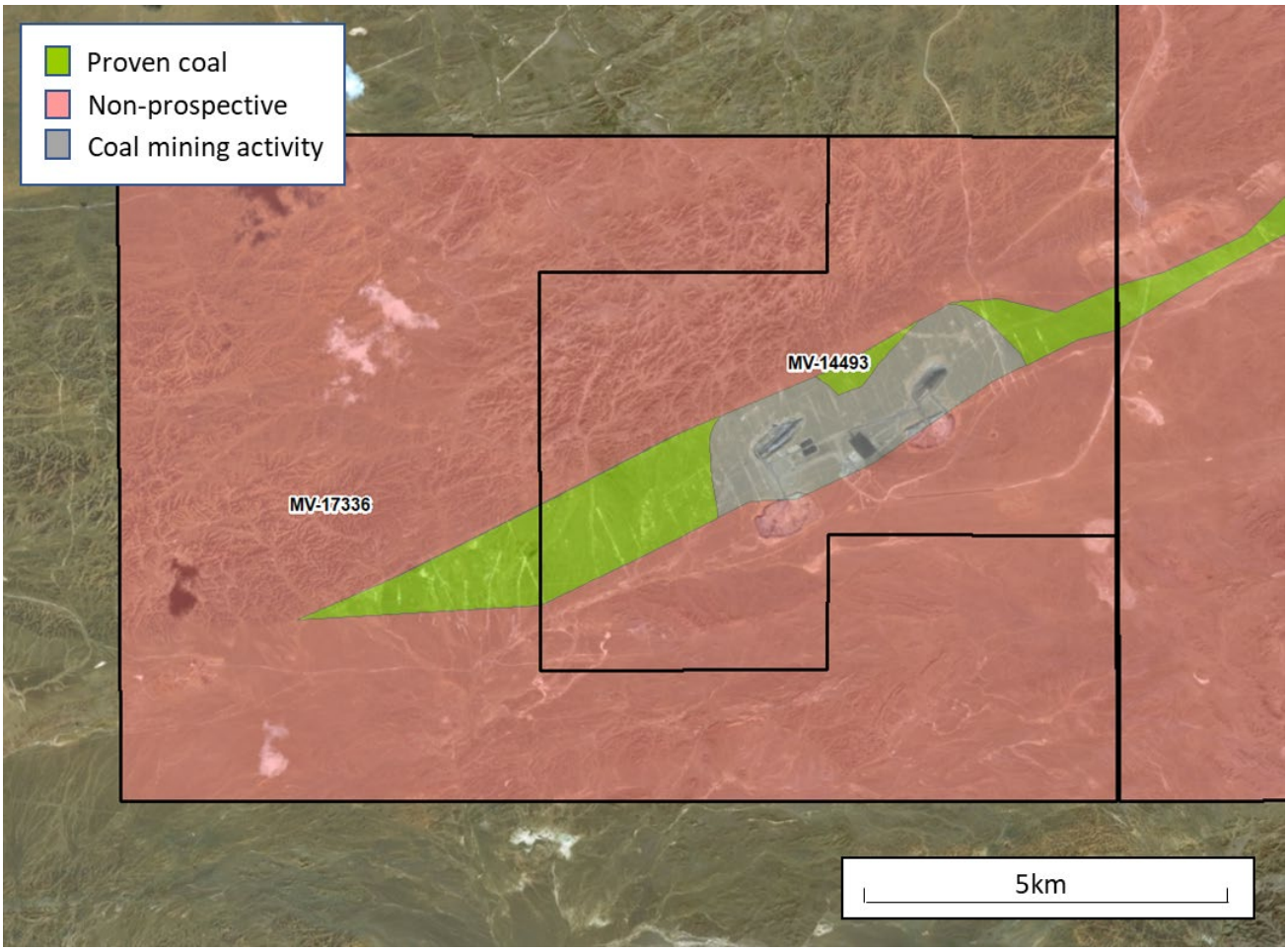

Figure 5-6: The distribution of proven coal in the BN-TK area

The areas depicted on Figure 5-6 have been calculated and are provided in Table 5-1. A total of 10% of the total area (12.7 km^2) is proven coal. Surface access to 5.5 km^2 of that area is currently complicated by mining activity but has been used in the estimation of prospective resource.

Table 5-1: The distribution of proven and potential coal in the BN-TK area

Area (description)	Area (km^2)	% of total area
Total area	128.5	100%
Area considered non-prospective	115.8	90%
Area with proven coal (outside the area of coal mine activity)	7.2	6%
Area with proven coal (inside the area of coal mine activity)	5.5	4%

Jade have not provided a GIIP or resource estimate for the BN-TK area. RISC has estimated a resource range for the area by working up from well ultimate recovery expectations and development well drilling density.

RISC calculate the area of potential development from geological surface control to be 12.7 km^2. We used a range of between 10 km^2 and 15 km^2 in our resource estimate. We considered a range of well spacing between 900 m (1.2 wells/km^2) and 300 m (11.1 wells/km^2), and a range of ultimate recovery per well of between 0.5 Bscf and 2 Bscf, both ranges typical of well spacing and recoveries per well in coal seam gas projects around the world.

These ranges were then multiplied probabilistically to produce a low, best and high estimate of ultimate recovery for the area as presented in Table 5-2.

Table 5-2: RISC estimate of ultimate recovery for the BN-TK area

	Low	Best	High	Distribution
Prospective coal seam gas area (km^2)	10.0	12.5	15.0	Pert
Well spacing density (m)	900	600	300	Input
Wells per (km^2)	1.2	2.8	11.1	Pert
Estimate of ultimate recovery per well (Bscf)	0.5	1.0	2.0	Pert
Prospective resource[7,8] range (Bscf)	**13**	**65**	**186**	**Probabilistic output**

[7] Prospective resources are undiscovered and 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.

[8] Resources are reported on a Gross basis. Jade has a 66% interest in BN Gas, however the Net outcome for BN Gas is dependent upon the sharing requirements of any future PSA, which are currently indeterminate.

Using this method RISC estimates a prospective resource range of between 13 Bscf and 186 Bscf with a best-case estimate of ultimate recovery of 65 Bscf.

5.4. Sunk costs

No sunk costs have been spent to date as the joint venture have not yet secured any prospecting agreement(s).

5.5. Work programs and commitments

The work program commitments for any prospecting agreement(s) have yet to be finalised. Jade have indicated that they expect the work commitment for the BN Prospect Agreement to be proportional to those applied to the Tavan Tolgoi prospecting agreements on a $/km^2 basis. Jade expects to commit between US$270 k and US$400 k (gross).

6. Declarations

6.1. Terms of Engagement

This report, any advice, opinions or other deliverables are provided pursuant to the Engagement Contract agreed to and executed by the Client and RISC.

6.2. Qualifications

RISC is an independent oil and gas advisory firm. The RISC staff engaged in this assignment are professionally qualified engineers, geoscientists or analysts, each with many years of relevant experience and most have in excess of 25 years.

RISC was founded in 1994 to provide independent advice to companies associated with the oil and gas industry. Today the company has approximately 40 highly experienced professional staff at offices in Perth, Brisbane, Jakarta, and London. Our services cover the entire range of the oil and gas business lifecycle and include:

- Oil and gas asset valuations, expert advice to banks for debt or equity finance;
- Exploration/portfolio management;
- Reserves assessment and certification, peer reviews;
- Field development studies and operations planning;
- Gas market advice;
- Late life management and decommissioning preparation;
- Independent Expert/Expert Witness;
- Strategy and corporate planning.

The preparation of this report has been managed by Mr Adam Craig who is an employee of RISC. Mr Craig is a highly experienced Geoscientist and Manager, with over 30 years' experience in the upstream oil & gas sector working for small and mid-size independents, as well as NOC related entities. He is a Certified Practising Geologist, a member of AAPG, PESA (2021 WA Branch President), EAGE, MAICD, and a Fellow of the Geological Society. He holds BSc in Geology from Curtin University, Western Australia and is a qualified petroleum reserves and resources evaluator (QPRRE) as defined by ASX listing rules.

6.3. Standard

Reserves and resources are reported in accordance with the definitions of reserves, contingent resources and prospective resources and guidelines set out in the Petroleum Resources Management System (PRMS) prepared by the Oil and Gas Reserves Committee of the Society of Petroleum Engineers (SPE) and reviewed and jointly sponsored by the American Association of Petroleum Geologists (AAPG), World Petroleum Council (WPC), Society of Petroleum Evaluation Engineers (SPEE), Society of Exploration Geophysicists (SEG), Society of Petrophysicists and Well Log Analysts (SPWLA) and European Association of Geoscientists and Engineers (EAGE), revised June 2018.

This Report has been prepared in accordance with the Australian Securities and Investment Commission (ASIC) Regulatory Guides 111 and 112.

6.4. Limitations

The assessment of petroleum assets is subject to uncertainty because it involves judgments on many variables that cannot be precisely assessed, including reserves/resources, future oil and gas production rates, the costs associated with producing these volumes, access to product markets, product prices and the potential impact of fiscal/regulatory changes.

The statements and opinions attributable to RISC are given in good faith and in the belief that such statements are neither false nor misleading. While every effort has been made to verify data and resolve apparent inconsistencies, neither RISC nor its servants accept any liability, except any liability which cannot be excluded by law, for its accuracy, nor do we warrant that our enquiries have revealed all of the matters, which an extensive examination may disclose. In particular, we have not independently verified property title, encumbrances or regulations that apply to these assets.

Our review was carried out only for the purpose referred to above and may not have relevance in other contexts.

6.5. Independence

RISC makes the following disclosures:

- RISC is independent with respect to High Grade Metals and Jade Gas, and confirms that there is no conflict of interest with any party involved in the assignment.
- Under the terms of engagement between RISC and High Grade Metals, RISC will receive a time-based fee, with no part of the fee contingent on the conclusions reached, or the content or future use of this report. Except for these fees, RISC has not received and will not receive any pecuniary or other benefit whether direct or indirect for or in connection with the preparation of this report.
- Neither RISC Directors nor any staff involved in the preparation of this report have any material interest in High Grade Metals, Jade Gas or in any of the properties described herein.

6.6. Copyright

6.7. Consent

RISC has consented to this report, in the form and context in which it appears, being included, in its entirety, in the prospectus. Neither the whole not any part of this report nor any reference to it may be included or attached to any other document, circular, resolution, letter or statement without the prior consent of RISC.

7. List of terms

The following lists, along with a brief definition, abbreviated terms that are commonly used in the oil and gas industry and which may be used in this report.

Term	Definition
1P	Equivalent to Proved reserves or Proved in-place quantities, depending on the context.
1Q	1st Quarter
2P	The sum of Proved and Probable reserves or in-place quantities, depending on the context.
2Q	2nd Quarter
2D	Two Dimensional
3D	Three Dimensional
4D	Four Dimensional – time lapsed 3D in relation to seismic
3P	The sum of Proved, Probable and Possible Reserves or in-place quantities, depending on the context.
3Q	3rd Quarter
4Q	4th Quarter
AFE	Authority for Expenditure
Bbl	US Barrel
BBL/D	US Barrels per day
BCF	Billion (10^9) cubic feet
BCM	Billion (10^9) cubic metres
BFPD	Barrels of fluid per day
BOPD	Barrels of oil per day
BTU	British Thermal Units
BOEPD	US barrels of oil equivalent per day
BWPD	Barrels of water per day
°C	Degrees Celsius
Capex	Capital expenditure
CAPM	Capital asset pricing model
CGR	Condensate Gas Ratio – usually expressed as bbl/MMscf
Contingent Resources	Those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations by application of development projects but which are not currently considered to be commercially recoverable due to one or more contingencies. Contingent Resources are a class of discovered recoverable resources as defined in the SPE-PRMS.
CO_2	Carbon dioxide
CP	Centipoise (measure of viscosity)
CPI	Consumer Price Index
DEG	Degrees
DHI	Direct hydrocarbon indicator
Discount Rate	The interest rate used to discount future cash flows into a dollars of a reference date
DST	Drill stem test
E&P	Exploration and Production
EG	Gas expansion factor. Gas volume at standard (surface) conditions/gas volume at reservoir conditions (pressure and temperature)
EIA	US Energy Information Administration
EMV	Expected Monetary Value

Term	Definition
EOR	Enhanced Oil Recovery
ESMA	European Securities and Markets Authority
ESP	Electric submersible pump
EUR	Economic ultimate recovery
Expectation	The mean of a probability distribution
F	Degrees Fahrenheit
FDP	Field Development Plan
FEED	Front End Engineering and design
FID	Final investment decision
FM	Formation
FPSO	Floating Production Storage and offtake unit
FWL	Free Water Level
FVF	Formation volume factor
GIIP	Gas Initially In Place
GJ	Giga (10^9) joules
GOC	Gas-oil contact
GOR	Gas oil ratio
GRV	Gross rock volume
GSA	Gas sales agreement
GTL	Gas To Liquid(s)
GWC	Gas water contact
H_2S	Hydrogen sulphide
HHV	Higher heating value
ID	Internal diameter
IRR	Internal Rate of Return is the discount rate that results in the NPV being equal to zero.
JV(P)	Joint Venture (Partners)
Kh	Horizontal permeability
km^2	Square kilometres
Krw	Relative permeability to water
Kv	Vertical permeability
kPa	Kilo (thousand) Pascals (measurement of pressure)
Mstb/d	Thousand Stock tank barrels per day
LIBOR	London inter-bank offered rate
LNG	Liquefied Natural Gas
LTBR	Long-Term Bond Rate
m	Metres
MDT	Modular dynamic (formation) tester
mD	Millidarcies (permeability)
MJ	Mega (10^6) Joules
MMbbl	Million US barrels
MMscf(d)	Million standard cubic feet (per day)
MMstb	Million US stock tank barrels
MOD	Money of the Day (nominal dollars) as opposed to money in real terms

Term	Definition
MOU	Memorandum of Understanding
Mscf	Thousand standard cubic feet
Mstb	Thousand US stock tank barrels
MPa	Mega (10^6) pascal (measurement of pressure)
mss	Metres subsea
MSV	Mean Success Volume
mTVDss	Metres true vertical depth subsea
MW	Megawatt
NPV	Net Present Value (of a series of cash flows)
NTG	Net to Gross (ratio)
ODT	Oil down to
OGIP	Original Gas In Place
OOIP	Original Oil in Place
Opex	Operating expenditure
OWC	Oil-water contact
P90, P50, P10	90%, 50% & 10% probabilities respectively that the stated quantities will be equalled or exceeded. The P90, P50 and P10 quantities correspond to the Proved (1P), Proved + Probable (2P) and Proved + Probable + Possible (3P) confidence levels respectively.
PBU	Pressure build-up
PJ	Peta (10^{15}) Joules
POS	Probability of Success
Possible Reserves	As defined in the SPE-PRMS, an incremental category of estimated recoverable volumes associated with a defined degree of uncertainty. Possible Reserves are those additional reserves which analysis of geoscience and engineering data suggest are less likely to be recoverable than Probable Reserves. The total quantities ultimately recovered from the project have a low probability to exceed the sum of Proved plus Probable plus Possible (3P) which is equivalent to the high estimate scenario. When probabilistic methods are used, there should be at least a 10% probability that the actual quantities recovered will equal or exceed the 3P estimate.
Probable Reserves	As defined in the SPE-PRMS, an incremental category of estimated recoverable volumes associated with a defined degree of uncertainty. Probable Reserves are those additional Reserves that are less likely to be recovered than Proved Reserves but more certain to be recovered than Possible Reserves. It is equally likely that actual remaining quantities recovered will be greater than or less than the sum of the estimated Proved plus Probable Reserves (2P). In this context, when probabilistic methods are used, there should be at least a 50% probability that the actual quantities recovered will equal or exceed the 2P estimate.
Prospective Resources	Those quantities of petroleum which are estimated, as of a given date, to be potentially recoverable from undiscovered accumulations as defined in the SPE-PRMS. These estimates have both an associated risk of discovery and a risk of development.
Proved Reserves	As defined in the SPE-PRMS, an incremental category of estimated recoverable volumes associated with a defined degree of uncertainty Proved Reserves are those quantities of petroleum, which by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be commercially recoverable, from a given date forward, from known reservoirs and under defined economic conditions, operating methods, and government regulations. If deterministic methods are used, the term reasonable certainty is intended to express a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the estimate. Often referred to as 1P, also as “Proven”.
PSC	Production Sharing Contract
PSDM	Pre-stack depth migration
PSTM	Pre-stack time migration
psia	Pounds per square inch pressure absolute
p.u.	Porosity unit e.g. porosity of 20% +/- 2 p.u. equals a porosity range of 18% to 22%

Term	Definition
PVT	Pressure, volume & temperature
QA/QC	Quality Assurance/ Control
rb/stb	Reservoir barrels per stock tank barrel under standard conditions
RFT	Repeat Formation Test
Real Terms (RT)	Real Terms (in the reference date dollars) as opposed to Nominal Terms of Money of the Day
Reserves	Reserves are those quantities of petroleum anticipated to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions. Reserves must further satisfy four criteria: they must be discovered, recoverable, commercial, and remaining (as of the evaluation date) based on the development project(s) applied. Reserves are further categorised in accordance with the level of certainty associated with the estimates and may be sub-classified based on project maturity and/or characterized by development and production status.
RT	Measured from Rotary Table or Real Terms, depending on context
SC	Service Contract
scf	Standard cubic feet (measured at 60 degrees F and 14.7 psia)
Sg	Gas saturation
Sgr	Residual gas saturation
SRD	Seismic reference datum lake level
SPE	Society of Petroleum Engineers
SPE-PRMS	Petroleum Resources Management System, prepared by the Oil and Gas Reserves Committee of the Society of Petroleum Engineers (SPE) and reviewed and jointly sponsored by the American Association of Petroleum Geologists (AAPG), World Petroleum Council (WPC), Society of Petroleum Evaluation Engineers (SPEE), Society of Exploration Geophysicists (SEG), Society of Petrophysicists and Well Log Analysts (SPWLA) and European Association of Geoscientists and Engineers (EAGE), revised June 2018.
s.u.	Fluid saturation unit. e.g. saturation of 80% +/- 10 s.u. equals a saturation range of 70% to 90%
stb	Stock tank barrels
STOIIP	Stock Tank Oil Initially In Place
Sw	Water saturation
TCM	Technical committee meeting
Tcf	Trillion (10^{12}) cubic feet
TJ	Tera (10^{12}) Joules
TLP	Tension Leg Platform
TRSSV	Tubing retrievable subsurface safety valve
TVD	True vertical depth
US$	United States dollar
US$ million	Million United States dollars
WACC	Weighted average cost of capital
WHFP	Well Head Flowing Pressure
Working interest	A company's equity interest in a project before reduction for royalties or production share owed to others under the applicable fiscal terms.
WPC	World Petroleum Council
WTI	West Texas Intermediate Crude Oil