Update on activities

17 September 2018

Key points

- **SRK appointed to advance MDL 330 with using new technology - Radio frequency and microwave extraction and with a view of obtaining a contingent resource for deeper zones and the potential of insitu extraction compared to mining and surface processing**
- **Relinquishment of EPM 25795 to focus resources on MDL 330**
- **Company now reviewing at a gold project in Nevada, USA and abandons Egypt opportunity**

Greenvale Energy Limited **(ASX: GRV)** is pleased to announce that it is has appointed SRK Consulting (Australasia) Pty Ltd **(SRK**) to progress the development of the Alpha Oil Shale Project, located about 50 km south of the town of Alpha, Queensland. The Alpha Project known Resources identified to date are currently contained within MDL 330 (**Figure 1**) and are based on open cut mining and processing so are limited by depth.

The surface geology covering the project area is shown in **Figure 2**. A thin lens shaped torbanite deposit is contained within the lower part of a coal seam in the Late Permian Colinlea Sandstone of the Galilee Basin. The fluvio-deltaic Colinlea Sandstone is largely arenaceous (alluvial to upper delta plain). A very thin upper seam of no obvious economic value occurs some 20 m above the target lower seam. The lower seam is roughly in the middle of the Colinlea Sandstone believed to be about 150 m thick.

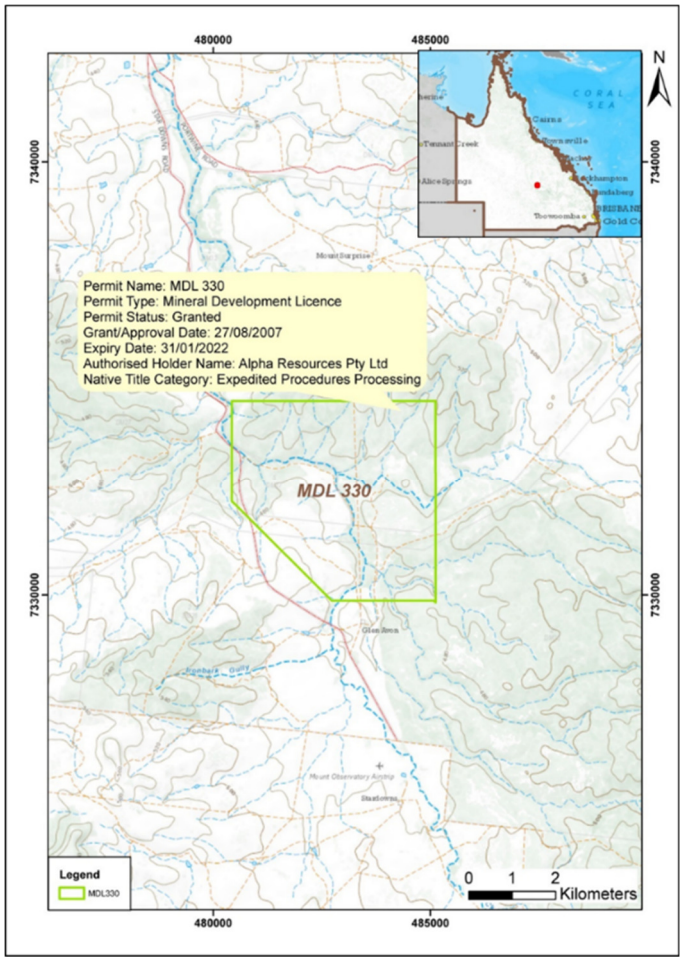

Figure 1: Location and details of MDL 330 – Alpha Oil Shale Project

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Torbanite from the Alpha deposit is composed of alginite, vitrinite, inertinite, sporinite (derived from spores and pollen) and trace cutinite (cuticles), resinite (resins, fats, waxes) clay-sized mineral matter and pyrite.

The cannel coals in the upper and lower seams are low ash coals and have similar types and abundances of organic matter, which comprises up to 90 vol% of samples. Vitrinite is the most abundant humic component, constituting 50 vol% to 75 vol% of samples (Hutton, 1995).

Hutton (1995) recognised the Alpha oil shale deposit as one of the smaller deposits with respect to total resources, but the very high yields from the torbanite compensate for this. On a weight for weight basis, one tonne of Alpha torbanite produces at least four times the volume of oil from one tonne of Rundle or Stuart oil shale and at least seven times the oil from one tonne of Julia Creek oil shale. One tonne of cannel coal produces approximately the same volume of oil as one tonne of Rundle or Stuart oil shale and slightly more oil than one tonne of Julia Creek oil shale.

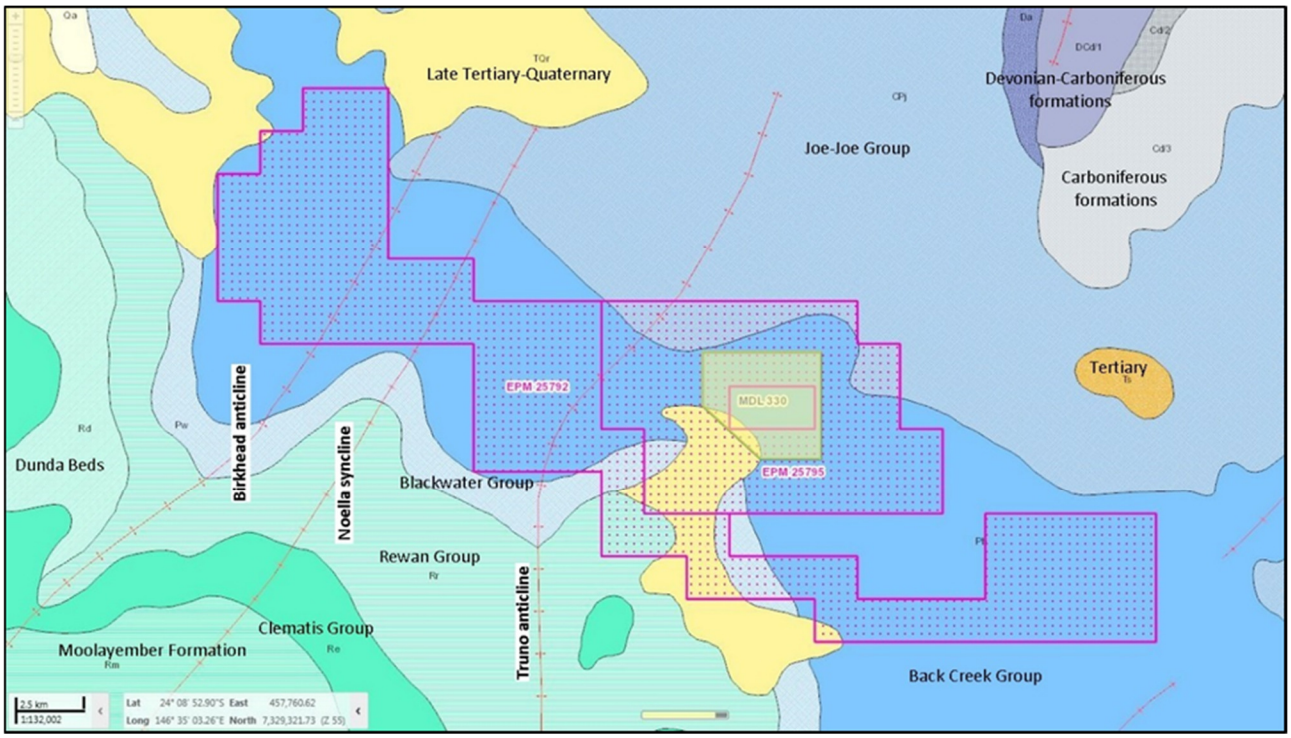

Figure 2: Surface geology in the region of the Alpha oil shale project

The key features of the development plan are focussed on lowering the initial project capital costs and achieving the lowest possible oil recovery costs. To achieve this, the development program will focus on Radio Frequency (RF) microwave extraction. The RF process is nothing like underground coal gasification which is done by burning coal seam in an uncontrolled manner in a restricted chamber at reasonably high pressures. RF is low pressure microwave heating and is environmentally benign.

Radio frequency/critical fluid (**RF/CF**) is a patent technology that combines radio frequency heating and critical liquid driving. Critical fluid technology uses the powerful solvent properties of gases compressed at their critical point. Each solvent has a unique critical point, defined by the temperature and pressure at

which the liquid and vapor phases become identical. Critical fluids have a useful combination of liquid-like density and solvency, and gas-like viscosity, diffusivity, compressibility and lack of surface tension. These fluids rapidly penetrate substrates and dissolve a wide range of chemicals and compounds. Furthermore, the critical region is characterized by an ability to control solvent power with only minor changes in temperature and pressure.

The oil industry equipment drills and sends radio frequency antenna or transmitter to the oil shale. The ray energy from antenna or transmitter heats the oil shale, and critical CO2 drives the oil to well, then the oil is pumped to ground to condensate and storage. The CO2 is separated and pumped to well to use again.

Development prospect of RF/CF technology is bright due to its many advantages as follows:

- high oil recovery rate. By using RF/CF technology, 4-5 units power is produced by consuming 1-unit power. It has higher economic benefits than ICP technology (In-situ Retorting Technology), which produces 3.5 units power by consuming 1-unit power;
- the oil industry equipment is used to drill oil well in oil shale. RF antenna or transmitter is sent down to the underground and emits ray to heat the oil shale;
- crude oil is extracted and driven to well by injecting critical CO_2;
- CO_2 is separated and reinjected into well to recycle using. At the same time, oil and gas can be refined to gasoline, fuel oil and other products;
- oil and gas can be extracted in only few months, it is quicker that the other in-situ technology, which may need many years;
- the heating power can be adjusted easily and can provide a great variety of the products;
- this technology can be used in the extraction of shale oil, sand oil and heavy oil, and it has no residual and will not pollute the groundwater.
- selective heating mode. It will heat the specified field quickly to the required temperature.

The known deposit is fully contained within MDL 330 (**Figure 3**). Figure 3 shows the Fisher assay oil yield data for the deposit main seam. The general strike of the deposit is southeast with a dip of about 4 degrees. The torbanite deposit is rich in hydrocarbon yield, so deep overburden is likely to be uneconomic to remove. **Figure 4** shows the depth structure contours to the top of the main oil shale seam.

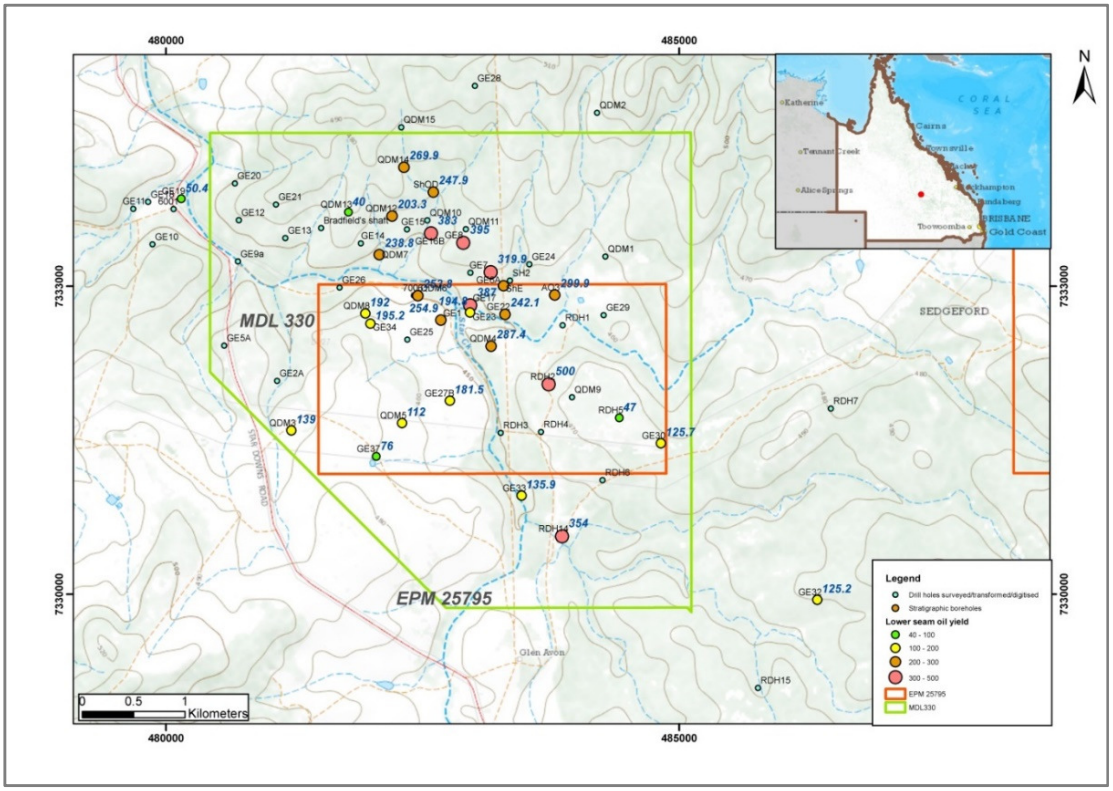

Figure 3: Lower seam oil yield data (note the limited area of high yield even within MDL 330)

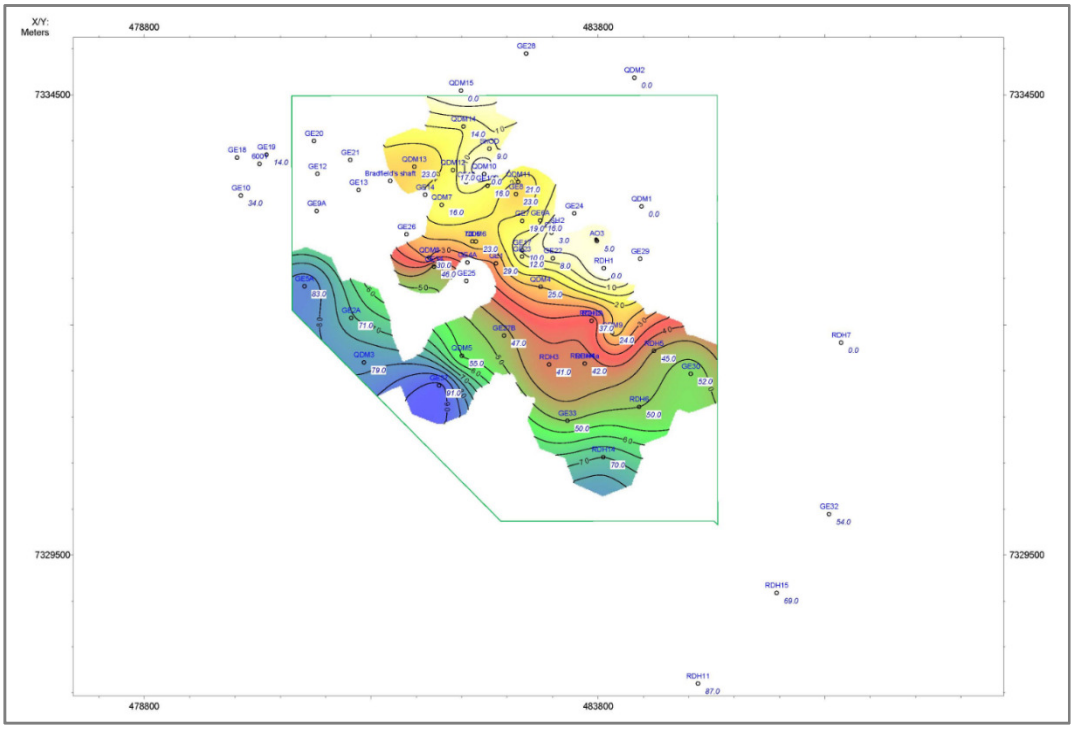

Figure 4: Lower seam structure map based on overburden MD (based on current understanding of seam intersections)

The key areas of SRK study will comprise:

1. documentation and digital cataloguing of all project data;
2. magnetic and gravity modelling to define compartments that can be aligned to the drill hole data;
3. geophysical log digital capture combined with improved seam correlations and analysis of the petrophysical data;
4. potential for insitu (Radio Frequency) RF microwave extraction via lateral wells and the definition of additional deeper Resources;
5. sampling activated carbon products and oil extraction characteristics including geochemistry of the torbanites versus the cannel coal to better understand the extraction characteristics related to the RF microwave extraction process. SRK will carry out further sampling and geochemical analysis of available samples to define the RF extraction characteristics; and
6. contingent Resources estimation will then be made based on deeper zones and the potential of insitu extraction compared to mining and surface processing.

The work is expected to be completed within 3 months time frame depending on access to data, available samples and laboratory timing.

Relinquishment of EPM 25795

Following the work previously undertaken by SRK, the Board has chosen to relinquish its interest in EPM 25795. The decision reflected SRK's assessment of the low perspectivity of this application for tenement and the high level of commitment required under the terms of the licence by the Queensland Department of Mines. It also means that the Company can focus its resources and efforts on MDL 330.

Update on investment opportunities

Following extensive negotiations with the vendor of the project in Egypt, the Board has decided not to pursue the joint venture investment opportunity in Egypt at this point in time. The key reason for this decision was due to the terms proposed by the vendor which in particular would have required the Company to provide funding based on an accelerated timetable. The Board does not believe the current terms proposed by the vendor are in interest of the shareholders of the Company. The Board remains optimistic and encouraged by the geological prospectivity in Egypt.

The Board has also re-opened discussions with the owner of a gold project in Nevada United States of America and are looking to consummate a heads of agreement prior to the end of this month. Further details will be provided as soon as they become available.

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