

## Regulatory Story

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**Empyrean Energy PLC** - EME Oil Migration Study Completed - Block 29/11  
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**18 June 2018**

**Empyrean Energy PLC ("Empyrean" or the "Company")**

### **Oil Migration Study Completed - Block 29/11 Offshore China**

- **Large Jade and Topaz prospects interpreted to be potentially filled from at least two different pathways**
- **Large Pearl prospect interpreted to be filled via a pathway from the large oil field to the North**
- **Proven Baiyun Sag East ("BSE") basin interpreted to have oil migration pathway to Block 29/11**
- **3D seismic data identified a new small sag that has been named Baiyun Sag North ("BSN") and is located entirely within Block 29/11 between the Jade and Topaz prospects**
- **A convincing "seismic tie" with additional migration pathways has been established between the 2013 CNOOC Limited ("CNOOC") oil discovery LH 23-1d-1, immediately west of Block 29/11, and the Jade prospect**
- **The Study has established valid drilling targets that are of significant size with relatively low geological risk**

Empyrean Energy (EME: AIM), the oil and gas development company with interests in China, Indonesia and the United States, is pleased to announce that a comprehensive oil migration study ("the Study") encompassing China Block 29/11, for which it holds 100% exploration rights, has now been completed and has established potential oil migration pathways into the Jade, Topaz and Pearl prospects.

The Study was supported by geoscientists from CNOOC (Shenzhen branch) who shared the comprehensive viewpoints of their previous study in this area.

The Study established the maturity profile of source rock, and confirmed that the source rock in the BSE area was at peak maturity when oil expulsion commenced. The main implications for Block 29/11 prospectivity are interpreted to be very positive with the entire source rock within BSE interpreted to have produced hydrocarbons. In addition, any potential oil accumulation in Block 29/11 prospects are expected to be light and therefore similar to the oil discoveries around Block 29/11 that range from 33-38 API.

The Study also validated the interpreted oil migration pathways from the known oil sources of the Enping Formation (Paleocene aged) within the BSE into the several oil discoveries made by CNOOC to the immediate West and South of Block 29/11 since 2010, and thus provided strong evidence of a prolific petroleum system in the area. At the same time, the Study interprets effective migration pathways from BSE towards the northern flank of the Baiyun uplift where the Jade and Topaz prospects are located.

In addition, 28km<sup>2</sup> of 3D seismic data that was acquired outside Block 29/11 over the 2013 CNOOC oil discovery LH 23-1d-1 which is located 8km west of the Jade prospect, has helped confirm potential "fill-and-spill" pathways to the Jade structure from the oil discovery. Whilst early exploration techniques such as this are no guarantee of exploration success, the Company believes that this form of "seismic tie" to a nearby known discovery helps to reduce the risks associated with exploration and provides an improved understanding of the geology in the basin and within Block 29/11.

Comprehensive interpretation of the 2017 3D seismic data has helped map a new sub-basin called Baiyun Sag North. BSN is located between the Jade and Topaz prospects and is located entirely within Block 29/11. The Study confirms a potential effective migration pathway from BSN into the Jade and Topaz prospects.

The Study also indicates that the Pearl prospect is potentially located in a migration shadow for oil migrating from BSE or BSN. As a result, further work has been done focussing on the possibility of migration from the Huizhou Sag located NW of Block 29/11. The Liuhua 11-1 field complex that contained an estimated 1.1 billion barrels of oil is located immediately North of Block 29/11 and has been interpreted to have received oil from Huizhou Sag. Additional work completed now indicates that the Pearl prospect is located favourably for receiving oil charge from Huizhou Sag.

**Empyrean CEO Tom Kelly commented,** "The findings from this oil migration study are very promising with effective potential oil migration pathways established into all three of our prospects on Block 29/11. Interpretation of the potential effective migration pathways from the established kitchen area - Baiyun Sag East - as well as from the new kitchen area - Baiyun Sag North - into Block 29/11 helps increase our overall understanding of the geology of the block and the Jade and Topaz prospects in particular. The additional work has also confirmed a potential oil migration pathway from the Liuhua 11-1 field complex to the Pearl prospect.

"We have been rigorous with the pre-drill subsurface data and exploration tools available to us and we believe that the detailed and comprehensive technical work we have completed to date significantly reduces the geological risks to a point where we have established excellent drilling targets that are of significant size with relatively low geological risk."

**\*\*ENDS\*\***

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The information contained in this announcement was completed and reviewed by the Company's Executive Director (Technical), Mr Gajendra (Gaz) Bisht, who has over 28 years' experience as a petroleum geoscientist.

**Notes to Editors**

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**About Empyrean Energy Plc (LON: EME)**

Empyrean is a London AIM listed oil and gas explorer with three potentially high impact new projects. Empyrean has a 1,800km<sup>2</sup> offshore oil permit located in the Pearl River Mouth Basin, China where it has completed 3D seismic in Q3, 2017 to further mature two large oil prospects, Jade and Topaz. Processing and interpretation is underway and preliminary internal interpretation of the raw seismic data has confirmed the structural validity of the Jade and Topaz prospects and also identified a third significant target named Pearl, which is located north of Topaz. The permit is directly South East of the billion barrel+ Lihua Oil Field operated by CNOOC Limited and two recent discoveries to the permits West and South further enhance the merit of Jade and Topaz. Empyrean is operator and holds 100% of the exploration rights through to commercial discovery where CNOOC Limited have a back-in right to 51%.

Empyrean also has a 10% interest in West Natuna Exploration Limited that holds 100% of the Duyung PSC in offshore Indonesia and is targeting the Mako Shallow Gas Discovery that has an independently verified 2C and 3C gas resource of between 430-650 Bcf recoverable gas. Successful testing operations were recently completed at the Mako South-1 Well with 10.9 million cubic feet of gas flow and better than expected reservoir quality and multi Darcy permeability. The operator is currently analysing data with a view to providing a development plan.

Empyrean also has a joint venture with ASX listed Sacgasco Limited on a suite of projects in the Sacramento Basin, onshore California, USA. The package includes two mature, multi-Tcf gas

prospects, 'Dempsey' and 'Alvares', and an Area of Mutual Interest (the "Dempsey Trend AMI") that includes at least three already identified, large Dempsey-style follow up prospects. Dempsey is a large structure mapped with 3D seismic and interpreted by Sacgasco to have the potential to hold a prospective resource of over 1 Tcf of gas in up to seven stacked target reservoirs. The joint venture has completed drilling of a 2,970 metre (9,747 fee) combined appraisal and exploration well; Dempsey 1-15, to evaluate this prospect. Wireline logs confirmed numerous zones for production testing.

Aside from compelling technical merit, the Dempsey-1 well location sits next to existing gas metering and surface infrastructure that is owned by the joint venture. This will allow for any gas discovery to be tested and connected into the local pipeline at relatively low cost and in an accelerated timeframe. This early potential for short-term cash flow in the event of a commercial discovery would be significant for the joint venture and for the state of California where gas demand is high and approximately 90% of consumption is imported from other states. Gas produced in the Sacramento Basin currently prices at a 10-15% premium to Henry Hub Gas Prices. The joint venture is currently testing the Dempsey Prospect.

Alvares is a large structure mapped with 2D seismic and interpreted by Sacgasco to hold prospective resources of over 2 Tcf estimated potential recoverable gas. A well drilled by American Hunter Exploration Limited in 1982 for deeper oil intersected 5,000ft of gas shows. No valid flow test was conducted due to equipment limitations and the deeper oil target failing. However minor gas flows to surface were recorded even with these limitations. The possibility of using the existing well bore to sidetrack and get a valid flow test, thus reducing costs will be examined.

The Dempsey Trend AMI is an Area of Mutual Interest extending to approximately 250,000 acres and containing the Dempsey prospect (described above) as well as at least three other, Dempsey-style prospects which have been identified on existing seismic.

[www.empyreanenergy.com](http://www.empyreanenergy.com)

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