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Sea Lion Field as an Exploration Analogy for PL001

Apex Spectral Fluid Mobility Studies in the North Falkland Basin

JHI Associates holds the exploration license for Block PL001 in the North Falkland Basin, having acquired these rights from the previous license holder, Argos Resources. Located to the east and directly adjacent to PL001 is the Sea Lion field discovered by Premier Oil and Rockhopper Exploration in 2010. These companies successfully appraised the field by drilling eight additional wells. Estimated Recoverable Resources for Sea Lion field are over 500 million barrels of oil. Rockhopper made three additional oil discoveries in 2015-16: Zebedee, Isobel Deep, and Isobel-Elaine. Currently the Sea Lion field is operated by Navitas Petroleum (65%) with their partner Rockhopper (35%) and is undergoing environmental review prior to the partners making a final investment decision and applying for a field development plan. The Sea Lion partners expect to take the FID on the $1.3 billion, 100,000 bopd project in 2025.

In November of 2021, JHI commissioned Apex Spectral to conduct an ADF® fluid mobility field study over the Sea Lion field. JHI acquired full 3D seismic coverage of the Sea Lion field when it acquired Argos Resources. The objective of this study was to determine whether ADF® could successfully image the Sea Lion field and if successful, could these findings be extrapolated into PL001 to the west and by analogy be used to de-risk exploration prospects in PL001. All well logs and full 3D seismic coverage covering both PL001, and the Sea Lion field area were made available to Apex for ADF® seismic processing and subsequent imaging.

The Sea Lion ADF® field study demonstrated that this technique correctly identified seven appraisal wells that contained oil pays while also showing that two dry holes (14/5-1 and 14/10-1) might have been avoided by relying on the ADF® response at these locations. However, one false anomaly was indicated, related to the 14/10-8 well which exhibits an anomalously thick stacked sand section which is water wet but has very high permeability.

If the ADF® response indicates areas of better reservoir development (porosity and permeability) the results of the field study can be further interpreted to indicate areas where appraisal wells might have been positioned to take advantage of potentially higher borehole deliverability.

Based on the results of the Sea Lion field study, JHI extended the ADF® analysis across the eastern portion of PL001. The results of this work indicate that ADF® could have been used to avoid the drilling of two dry holes by the previous operators in PL001 (14/9-1 and 14/9-2) while redirecting exploration attention to other potential hub-class prospects not previously identified using conventional amplitude analysis. These undrilled prospects tie into oil shows observed in the previous dry holes and now target up-dip locations in the same formations that will soon be put into production at the Sea Lion Field.

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