EDISON

Exploration watch

Drilling returns to the Falklands

'Exploration watch' is a regular Edison publication focusing on upcoming exploration activity and the impact on notable E&Ps. In this inaugural edition, we look at the upcoming campaign in the North Falklands Basin where the first well, Zebedee, is due to spud in March 2015. This campaign, targeting c 350-600mmbbl, is often referred to as 'exploration'; however, it includes a significant element of low-risk exploration together with an appraisal opportunity, especially for those looking to expand on the existing Sea Lion footprint. With Sea Lion development FID expected in 2016, appraisal and low-risk exploration elements of the upcoming Zebedee, Chatham and Jayne East wells could all add high-value barrels to the existing 393mmboe of contingent resources identified to date. The biggest exploration targets, however, lie 40km to the south of Sea Lion where the Isobel/Elaine complex could be as big again as Sea Lion. The Falklands has seen no exploration drilling for over two years, so this campaign will be a welcome return for investors interested in what is still essentially a frontier region.

Appraisal and low-risk exploration included

The high-value barrels being targeted include the low-risk Zebedee fan (50mmbbl with CoS >50%) and the appraisal element of Chatham, where the absence of a gas cap could see 60mmbbl of oil added to Sea Lion resources. We consider that these targets could contribute around half of the potential value of the campaign to the operating companies. On the flip side, we have higher risk exploration. All four wells carry higher-risk exploration elements, especially deeper plays than those proven up to date at Sea Lion and its satellites. The biggest of these by some margin is Isobel Deep, which lies 40km to the south of Sea Lion with FOGL estimating an impressive 240mmbbl of resources for Isobel Deep and Isobel. With shallower stacked fans also prospective, it is not difficult to see how the surrounding Isobel/Elaine complex could be as big as Sea Lion, albeit we are many wells away from understanding this fully.

Greatest upside for FOGL and Rockhopper

Our 'Exploration watch' is largely focused on the rocks. However, we will also, where appropriate, try to link upcoming exploration activity with share price implications. For the upcoming North Falklands Basin campaign, investors in all three of the participating companies, Premier Oil, Rockhopper and FOGL, could be looking at significant upside. This is especially the case for those with stakes in the two juniors, which are being largely carried by Premier throughout the campaign. We estimate that EV/share on a risked basis for the coming campaign will match current share prices for both Rockhopper and FOGL, while for Premier holders the campaign still represents a sizeable 25% of the share price (and a substantial 70% of its 2015 exploration budget).

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COMPANIES IN THIS REPORT

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Falkland Oil & Gas
Premier Oil
Rockhopper Exploration

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EXPLORATION WATCH
A periodic look ahead from our in-house Petroleum Engineer, Elaine Reynolds, looking at interesting exploration activities with significant potential impact on E&P equities.

Drilling returns to the Falklands

Drilling is due to return to the Falklands in early March after an absence of just over two years. The previous drilling campaign resulted in the discovery of 393mmbbl in Sea Lion and its satellites in the North Falklands Basin (NFB), while the South & East Falklands Basin produced the Darwin gas/condensate discovery in addition to proving the presence of wet gas at Loligo and Scotia. Now the fifth-generation deep-water rig Eirik Raude is on its way to the region to drill six exploration wells in a campaign likely to last until the end of the year. Four of these wells, Zebedee, Isobel Deep, Jayne East and Chatham, will focus on the North Falklands Basin (NFB), with a view to testing the extension of the play proven by Sea Lion and de-risking an undrilled deeper play in the south of the licence area. Here we look at these wells in more detail and assess their potential impact.

Who's playing, who's not, and what does it mean?

Having discovered Sea Lion in 2010, Rockhopper is returning for further drilling in the NFB, this time joined by operator Premier and partner FOGL. The JV will drill Zebedee, Isobel Deep and Jayne East together, with final well Chatham being drilled by Rockhopper and Premier only. Remaining NFB operator Argos Resources will again not be able to take a slot in the drilling campaign, having failed to secure a farm out to provide funding.

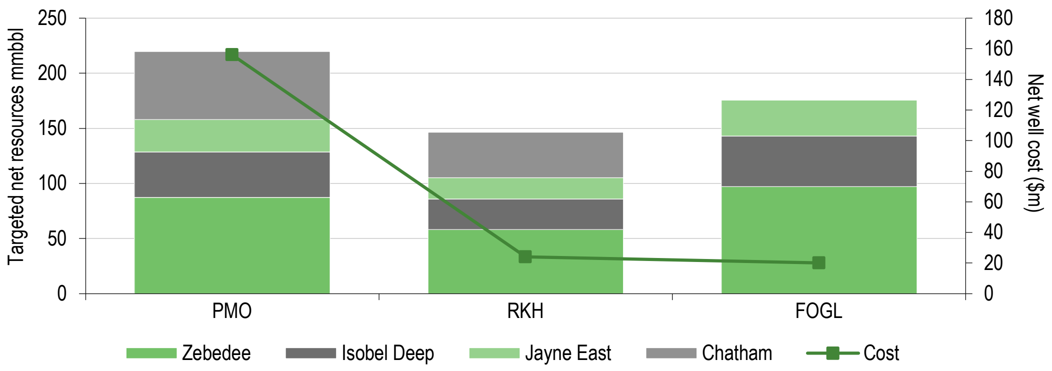
Exhibit 1: Gross resource estimates

	Premier Oil P50	Rockhopper Exploration Pmean	Falkland Oil & Gas P50
Zebedee	165*	282	281
Isobel Deep	32	72	240**
Isobel/Elaine complex	243	510	386
Jayne East	73	87	85
Chatham	79	127	

Source: Premier Oil, Rockhopper Exploration, Falkland Oil and Gas. Note: *From Premier February 2015 presentation; **Includes Isobel.

We see Zebedee and Chatham as providing the greatest value on a risked EV basis, due to the presence of low-risk exploration and appraisal elements respectively, together with their proximity to the Sea Lion development. We highlight, however, that success in the higher-risk Isobel Deep would open up the Isobel/Elaine complex, thereby accessing greater resources and requiring a standalone development potentially on a similar scale to Sea Lion.

Exhibit 2: JV targeted net resources and well cost commitments



Source: Edison, Net resources represent the average of company estimates

The bulk of the estimated drill cost of $200m will be met by Premier, with Rockhopper and FOGL contributing $25m and $20m respectively due to significant exploration carries negotiated in their farm-out deals. As a result, all three companies are fully funded for the campaign.

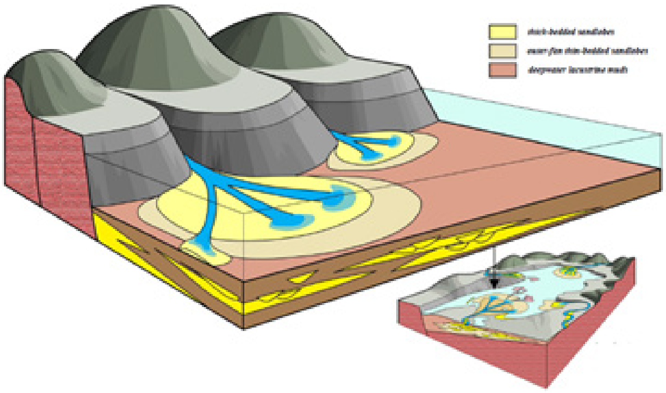
North Falkland Basin – an introduction

The NFB is a deep lacustrine basin filled with lower cretaceous highly organic shales and turbidites. Sea Lion is a turbidite or fan system that was created when rivers entering the basin deposited sand, which was then encased in mud. The resulting system of multiple stacked fans created a complex reservoir distribution in stratigraphic traps, which could only be properly identified on 3D seismic.

Exhibit 3: Eirik Raude

Source: Rockhopper Exploration

Exhibit 4: Sea Lion geological model – reservoir



Source: Rockhopper Exploration

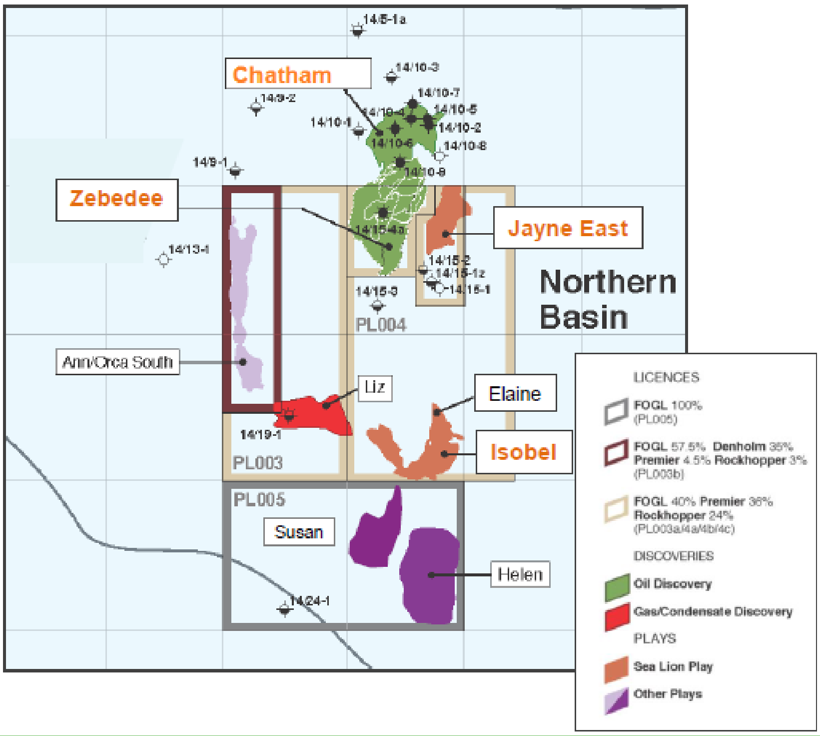
In the case of Sea Lion, it also resulted in extensive appraisal drilling, with eight appraisal wells drilled following the discovery well to better understand the field. Rockhopper identified the canyon feeder systems as originating from the eastern flank with fans of many kilometres of areal extent originating from those feeders. The 2010 exploration well 14/10-2 was located in the north-east of Sea Lion and this is where the first phase of the development will be focused. This has also been to the benefit of upcoming wells Zebedee and Jayne East, which are easterly fed fans de-risked by drilling success at Sea Lion and the satellite discoveries.

2015 exploration campaign

The previous drilling campaign, carried out in the NFB throughout 2010 and 2011, established the presence of oil and gas in the F2 sands in PL032 and PL04. The 2015 exploration programme is designed to predominantly test the extension of this F2 play to the south of Sea Lion and into the underexplored deeper fairway in the underlying F3 sands. It was originally envisaged that the first two wells would be drilled in the NFB, followed by two wells in the South and East basins before returning to drill the final two wells in the NFB. It is possible that this may be altered to drilling all four of the NFB wells consecutively, followed by the two South and East Basin wells, which has the advantage of minimising the cost of rig moves. Under this schedule, Zebedee will be drilled first, followed by Isobel Deep, Jayne East and finally Chatham. For the first three of these wells, operator Premier (PMO, 36%) and Rockhopper, (RKH, 24%), will be joined by Falkland Oil and Gas (FOGL), which holds 40% WI in the PL04 licences as a result of its 2013 takeover of Desire Petroleum. Indeed, FOGL has the greatest exposure to the 2015 drilling programme as it is participating in five out of the six firm wells in the schedule and is the only company active across both basins in the Falklands. The final confirmed NFB well, Chatham, will be drilled by PMO (60%) and RKH (40%).

In the South and East Basin, FOGL, together with operator Noble Energy and partner Edison SpA, will drill the 510mmbbl Humpback prospect in the Diomedea fan complex followed by a second well, which has yet to be selected from a number of options. Argos Resources, which holds 100% of licence PL01 to the west of Sea Lion, is not scheduled to take part in the campaign, as to date it has not been successful in securing a farm-out to fund any drilling activity.

Exhibit 5: Exploration well locations



Source: Falkland Oil & Gas

The NFB licence area benefits from extensive 3D seismic coverage and this has allowed PMO to identify the presence of 33 individual sand bodies that offer multiple stacked targets. By comparing these with the Sea Lion seismic and well results, the company believes it can successfully identify oil-bearing targets, with more than 85% of these prospects displaying the required success criteria to be oil-bearing.

The drilling programme offers low-risk, high-value prospects in Zebedee and Jayne East that can be incorporated into the later stages of the Sea Lion development in the case of success. Meanwhile, Isobel Deep, though higher risk, has the potential, together with the rest of the Isobel/Elaine complex, to be a similar size to Sea Lion. Chatham will appraise the western gas cap in Sea Lion with an additional exploration element. Each well is expected to take one month to drill at a cost of around $50m each.

Zebedee – low-risk extension on west flank

Zebedee sits immediately to the south of Sea Lion in PL04b and as such will explore fans adjacent to the existing satellite discoveries. The well will target multiple reservoirs covering the F2 and F3 sands and will also be the only well in the campaign to target the shallower F1 sands. The primary target is the Zebedee fan on the west flank, which is an easterly-fed fan that is believed to share the same feeder as Casper South. As such the Zebedee fan has been de-risked and has been assigned a high CoS of 52% by RKH. The remaining targets in the F1 and F2 sands carry a higher risk, with the fluid phase and reservoir quality the main risks in the deeper horizons.

Isobel Deep – another Sea Lion?

Isobel Deep sits in an untested area of PL04 around 40km to the south of Sea Lion, and the prospect could unlock the greatest potential of all the wells in the NFB drilling schedule. From seismic, the prospect is interpreted to be a lookalike to Sea Lion and on a similar scale. The objective will be Isobel Deep, a large fan in the F3 sequence that is sourced from a basement terrace in the south-east. Although the fan underlies up to eight further stacked fans, including Elaine, the well has been designed to test Isobel Deep only. This fan is the best developed on seismic and success here will prove the concept for the remaining fans. The joint venture has therefore agreed to target the well to focus on gaining a better understanding of the sands and looking to establish that the same quality sands exist here as encountered in Sea Lion. The key risk here is whether a sealing fault to the canyon feeder system is present. The JV believes it can see evidence of this from seismic; however, this can only be established by drilling a well. The untested nature of this section of the basin is reflected in the higher risk assigned to the well, with the CoS expected to be less than 20%.

Jayne East – low-risk extension on east flank

Jayne East is in PL04c to the south of Sea Lion and east of Zebedee, and is planned to target five separate fans across the F2 and F3 sequences. The primary objective is to test the F2 sands on the east flank of the syncline, including the known Beverley and Casper South fans, which are oil and gas bearing on the west flank. The Zebedee fan will also be tested. The two deeper exploration targets are in the F3 and are expected to have a separately sealed deeper hydrocarbon column. CoS for the F2 fans are assessed by RKH as reasonably high for an exploration well at 29-36%, while the F3 targets carry a lower CoS of 10-13%. PMO also considers the well to be low risk.

Chatham – gas cap appraisal

Chatham is primarily an appraisal of the western flank of Sea Lion to determine the presence or absence of a gas cap. This is of importance as if no gas is present in the well, around a further 60mmbbl can be added to the Sea Lion resources. If, however, the gas cap is confirmed here, the location (though not the well) could potentially be used for future gas injection. The secondary exploration target is a deeper northerly-fed F3 channel complex, which has play-opening potential if it is successful in finding reservoir with decent quality sands.

Potential follow-up wells

If the Isobel Deep well is successful, the JV has an appraisal location identified and drill-ready, which could be included in the current campaign, although we expect that any decision here will be driven by rig rate considerations. We believe the JV is paying in the region of $570,000/day for the Eirik Raude based on day rates from mid-2014 when the rig was contracted. Today the market rate for the rig is considerably lower at around $440,000/day. In view of this, although there are further drilling options available under the rig contract, we expect that any follow-up drilling in the case of success is likely to be carried out at a later date with a cheaper rig unless the Eirik Raude rates can be renegotiated. The rig is overspecified for drilling in the NFB, but is necessary to drill the deeper wells planned in the South and East Basin.

FOGL has also identified a potential future drilling target, the Susan prospect, to the south of Isobel Deep in licence PL05. The company holds 100% WI in Susan, which is situated on the east flank, in an analogous geological setting to the Sea Lion field and Isobel /Elaine prospects. Although the reservoir sequences are slightly older than those being targeted by the Isobel Deep well, success here would de-risk Susan, estimated by FOGL to contain unrisked P50 prospective resources of 340mmbbl.

Resource estimates

PMO, RKH and FOGL have each provided resource estimates for the exploration wells, and these are summarised in Exhibit 6. While all three companies are broadly in agreement in their assessment of prospective resources in Jayne East, there are clear differences in the estimates for Zebedee and Isobel Deep, where PMO and RKH's figures are considerably more conservative.

Exhibit 6: Gross resource estimates

	Premier Oil P50	Rockhopper Exploration Pmean	Falkland Oil and Gas P50
Zebedee	165*	282	281
Isobel Deep	32	72	240**
Isobel/Elaine complex	243	510	386
Jayne East	73	87	85
Chatham	79	127	

Source: Premier Oil, Rockhopper Exploration, Falkland Oil and Gas. Note: *From Premier February 2015 presentation; **includes Isobel.

Exhibit 7: Well objectives

	Zebedee	Isobel Deep	Jayne East	Chatham
1. SL western gas cap app.				✓
2. Extend F2 play south	✓		✓	
3. Deepen play into F3	✓	✓	✓	✓
4. Prove-up southern area		✓		

Source: Premier Oil

Accurately determining estimates for multiple stacked targets is more challenging than for a single reservoir, and there are inaccuracies in adding individual targets together arithmetically to provide a total. For Zebedee, PMO has therefore elected to use a different method of estimation to RKH and FOGL known as consolidation, which employs standard Monte Carlo simulation with a different summing technique to generate a resource distribution and is more commonly employed in the oil industry by the majors. This method is, however, known to produce conservative estimates and is reflected in a risked resource of 50mmbbl for Zebedee.

The PMO and RKH estimates for Isobel Deep are broadly in line, though we note that FOGL's higher estimate also includes the separate Isobel fan. We highlight it is unlikely that the JV would have committed to drill an exploration well 40km from Sea Lion to access 32mmbbl. The companies' P50 resource estimates for the whole Isobel/Elaine complex are closer in agreement at between 243mmbbl and 510mmbbl, and serve as a guide to the potential upside if Isobel Deep is successful.

On a risked EV basis, Chatham looks the most valuable to PMO and RKH, with Zebedee providing most value to FOGL. This is because these wells contain either low-risk exploration or appraisal elements and can be incorporated into the Sea Lion development if successful. We see the Zebedee fan and Chatham appraisal contributing to around half the EV of the total campaign.

Impact on Sea Lion development

The results of the drilling campaign will not affect the initial development of Sea Lion (Phase 1a) as this will develop the resources from the north-east area of the field. Up to two subsequent phases requiring separate project sanction would be needed to develop any additional resources discovered:

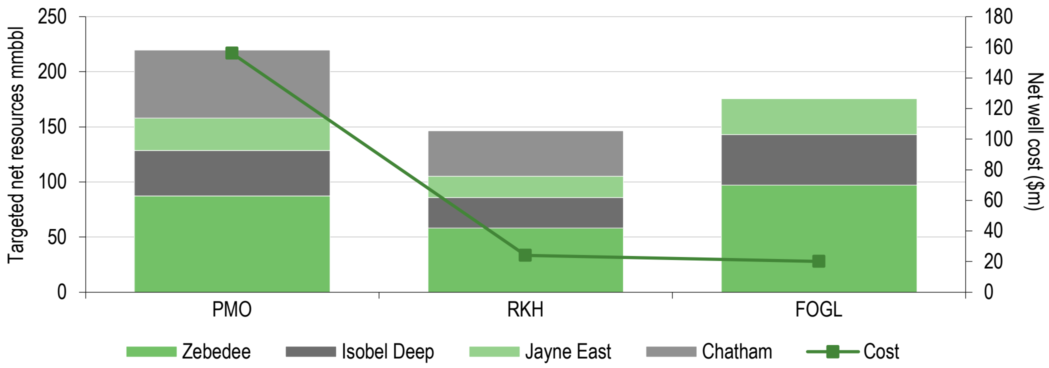
- Phase 1b will recover the remainder of the Sea Lion resources, including additional resources from Chatham if no gas cap is present in the west of Sea Lion.
- Phase 2 will bring in the satellite discoveries in PL04, including any resources discovered in Zebedee and Jayne East.

In the event of success at Isobel Deep any subsequent development would be on a standalone basis given its distance from Sea Lion.

Impact on companies

The NFB wells have the potential to make a material difference to all three companies participating in drilling in 2015.

Exhibit 8: JV targeted net resources and well cost commitments



Source: Edison Investment Research. Note: Net resources represent the average of company estimates.

Rockhopper

RKH is targeting 160mmbbl of net prospective resources across all four exploration wells. The company currently holds 2C resources of 182mmboe of which 150mmbbl are in the Falklands, so the campaign has the potential to more than double its resource base in the region. On a risked basis we estimate an EV/share for the upcoming campaign equivalent to the company's current share price, offering investors significant upside potential. This relative upside is all the greater due to the current share price of c 60p being significantly lower than the 260p seen when the company drilled its last exploration well in December 2011. By accessing the full $48m exploration carry that it is entitled to under the terms of its farm-out to Premier, RKH will only pay an estimated $25m for its share of the drill costs. With cash of $205m at September 2014 the company is fully funded for all four wells.

FOGL

FOGL currently holds net 2C resources of 85mmbbl in Sea Lion and its satellites. The company remains the most exploration-focused of those taking part, and by targeting 240mmbbl of net prospective resources across Zebedee, Isobel Deep and Jayne East, this could substantially increase its resources. Even without considering any impact from the two wells that the company will drill in the South and East Falkland Basin part of this campaign, on a risked basis we estimate an EV/share for the upcoming campaign equivalent to the company's current share price of c 30p. As with Rockhopper, FOGL's relative share price uplift is greater against its current share price when compared to the 65p seen during the drilling of its last exploration well, Scotia, in November 2012. Under the terms of its farm-in to the licences, FOGL will only pay its share of the Zebedee well, estimated at $20m. With cash of around $100m at the end of 2014 the company is fully funded for its share of the NFB wells (although further funds may be required to complete the Southern Basin campaign, subject to the well targets).

Premier

PMO holds worldwide 2P and 2C reserves and resources of 794mmbbl, so this campaign is targeting around an additional 25% of its existing resource base. The company has also stated that the wells have the potential to triple its resources in the Falklands. The company is covering the bulk of the cost of the drilling campaign at around $155m out of an estimated total cost of $200m, which accounts for a significant 70% of its 2015 exploration budget.

Argos Resources

Argos Resources is the only operator yet to drill on its acreage in the Falklands. Although the company has identified 52 prospects and unrisked estimated prospective resources of 3.1bnbbl, it has been unable to attract a farm-in partner to fund any drilling activity and will again be unable to participate in the drilling campaign.

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