WH IRELAND
CAPITAL MARKETS

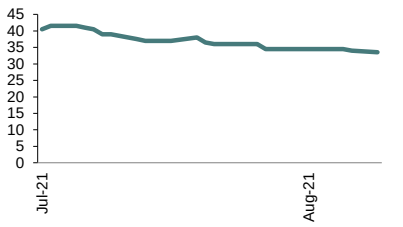
07 September 2021

CORPORATE

Share price	**32p**

Ticker	ORCA
Index	FTSE AIM
Sector	Oil & Gas
Market Cap	£21m
Shares in Issue	63.8m

Performance	
1 month:	-20%
3 months:	-
12 months:	-
High/Low	41.5p/31.8p



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Orcadian Energy

79 million barrels of proven & probable reserves

Orcadian Energy is a UK North Sea viscous oilfield developer that listed on the AIM market on 15 July 2021. The company's principal asset, the Pilot viscous oilfield, has been ascribed 78.8 million barrels of proven and probable reserves. We initiate on Orcadian Energy with a fair value estimate of 115p. Our fair value estimate is premised on a crude oil price assumption of $75/b (inflated at 1% p.a.) and the inclusion of 10% of the success-case value of the Pilot viscous oilfield.

We believe that Orcadian Energy represents a compelling investment opportunity for the following reasons:

- **2P reserves:** Sproule, a globally recognised resource and consulting advisory group, has ascribed Orcadian Energy's core asset with 78.8 million barrels of proven and probable oil reserves. We are not aware of an IPO on the AIM market since the collapse in crude oil prices in 2014 with more proven and probable oil reserves.
- **Leadership team:** Stephen Brown, CEO of Orcadian Energy, is a recognised global expert in the development of offshore viscous oil projects. Alan Hume, CFO of Orcadian Energy, has a wealth of oil & gas experience that will be relevant for creating success at Orcadian Energy.
- **Joe Darby, Chairman:** Joe Darby, Chairman of Orcadian Energy, is very well known in the international energy sector. He is particularly well known for his role, acting as CEO, in growing LASMO's production to 170,000 boe/d before successfully selling LASMO to Shell in 2001.
- **Robust oil price outlook:** We believe that the oil & gas sector is cyclical and that the sector outlook is extremely positive. In particular, we believe that the outlook for oil prices is robust, which sets a highly encouraging backdrop for the successful development of Orcadian Energy's viscous oilfields.
- **Polymer flood:** The injection of polymerised (thickened) water into viscous oil reservoirs is a proven technique – globally and in the UK North Sea – that increases the recovery of viscous oil. The company intends to apply this proven technique to optimise production from its viscous oil assets.
- **Sector leader:** In addition to the reserves of the Pilot viscous oilfield, the company's assets have been ascribed 77.8 million barrels of contingent resources (2C) and 191.4 million barrels of prospective resources – all viscous oil. We believe the company has the team and assets to become a UK leader in the development of viscous oil.
- **ESG:** The company intends to develop its assets with much of the energy being supplied by a floating wind turbine. This, combined with energy conservation and efficiency initiatives places the emissions from the Pilot development in the lowest 5% of comparable projects globally. Forecast Scope 1 & 2 emissions for Pilot are expected to be 2.6 $kgCO_2e/bbl$ – an eighth of average emissions from North Sea production.
- **Successful farmout:** We believe that Orcadian Energy will successfully secure funding to commercialise its assets because i) sector confidence is returning with strengthening oil prices ii) there is a global scarcity of conventional oilfield developments of meaningful scale iii) the company's projects will lead in ESG considerations relative to comparable projects inclusive of carbon emissions iv) the company's core project, the Pilot field, has been derisked via the drilling of 7 wells and v) confidence in the company's polymer flooding strategy has been heightened by the proven and probable reserve assessment provided by Sproule.

CONTENTS

Investment case

Orcadian Energy's core asset, the Pilot field, has been ascribed 78.8 million barrels of proven and probable reserves.

Proven and probable reserves: Orcadian Energy has been ascribed 78.8 million barrels of proven and probable oil reserves. No company, to our knowledge, has undertaken an initial public offering on AIM with more proven and probable reserves since crude oil prices collapsed in 2014 from over $100 per barrel.

Leadership team: Stephen Brown, CEO of Orcadian Energy, is a recognised global expert in the development of offshore viscous oil projects. He is particularly recognised within the UK oil & gas industry for his role, within BP, in leading the pre-project team for the Harding heavy oilfield (BP operated; produced 305 million barrels of oil equivalent) and as Operations Manager for the Andrew oil field (BP operated; produced 230 million barrels of oil equivalent) – both highly successful projects. Alan Hume, CFO of Orcadian Energy, has a wealth of oil & gas experience gained from both large-cap entities and early stage, high-growth entities. We believe that the team at Orcadian Energy, led by Mr. Brown and Mr. Hume, is particularly strong with a depth of experience that is directly relevant for the successful development of Orcadian Energy's assets.

Pilot: The Pilot viscous/heavy oilfield is the centrepiece of Orcadian Energy's asset suite. It has been ascribed, by Sproule, 78.8 million barrels of proven and probable reserves. It benefits from 7 well penetrations (of which 5 were drilled directly into the structure), coring and production testing. Orcadian Energy intends to develop the field with proven polymerised water injection technologies.

Satellite developments: Pilot is expected to form the central hub of a greater development of immediately adjacent viscous oilfields that are 100% held by Orcadian Energy. Orcadian Energy holds 77.9 million barrels of contingent resources ascribed to the Blakeney, Elke and Narwhal viscous oil discoveries. Orcadian Energy's 100% held Bowhead exploration prospect is strategically significant and has been ascribed 43.1 million barrels of best-estimate prospective resources. In total, Orcadian Energy holds viscous oil exploration prospects that have been ascribed 191.4 million barrels of best-estimate prospective resources.

Repeat developments: The entirety of the company's core assets are viscous oil assets within the same geological formation (Tay Sandstones). We believe that this favours a centralised production hub, economies of scale and repeated designs.

Polymer flood: We believe polymer flooding is an internationally proven, low-risk means of optimising production from viscous oil fields. The successful adoption of this approach in an offshore setting makes it a proven developmental approach suitable for the assets of Orcadian Energy. The mixing of polymers with water that is injected into oil reservoirs increases the viscosity of the injected water, which reduces its tendency to finger or streak towards oil producing wells. Injecting polymerised water favours a more efficient sweep effect than non-polymerised water injection, which results in higher recovery rates.

Sproule: We believe that Sproule is recognised globally as being one of the leading oil & gas reserve and resource evaluators. We believe that Sproule is, amongst other fields, particularly recognised for its longstanding expertise in polymer flooding. Sproule has provided the competent persons report in respect of the Orcadian Energy initial public offering and our valuation estimates are premised on Sproule's resource estimates.

Farmout: Ultimately, securing funding to develop its assets may be the most critical forward looking catalyst for Orcadian Energy. We believe that Orcadian Energy is likely to secure funding to progress the Pilot project to first oil because:

i) Orcadian Energy's assets have significant scale, which makes them attractive to large energy companies seeking meaningful growth opportunities.

ii) Orcadian Energy's central asset, the Pilot oil field, has been ascribed proven and probable reserves (2P) reflecting the high degree of technical and commercial robustness of that asset.

iii) We believe that Orcadian Energy's asset suite represents an exceptionally attractive farm-in opportunity because it offers a large-scale derisked asset base (2P reserves), large-scale discoveries (2C resources) and large-scale exploration potential (prospective resources).

iv) Polymer injection strategies have been proven to successfully optimise viscous oil developments in the UK North Sea and internationally.

v) Circa 5/6^{ths} of the drilling for the Pilot development is anticipated to occur after first oil. This is expected to reduce the upfront capital expenditure burden with the project self-funding much of the drilling (and a second production platform) to fully develop the Pilot field.

vi) Orcadian Energy's leadership team is recognised for its expertise in the development of UK North Sea assets, inclusive of viscous oilfields.

vii) We believe that the oil market has a structurally bullish long-term outlook and that long-term confidence is returning to the oil market.

viii) We believe that the US shale oil boom has been materially tempered due to an increased focus on profitability and value creation, in a context where US shale oil has underperformed historically, we believe, based on those metrics.

ix) The global pipeline of meaningful conventional oil projects is thin due to under-investment since 2014.

x) Orcadian Energy is developing compelling, innovative solutions to ensure that its projects set a new-high standard for low-carbon emissions from offshore polymerised oil production.

Robust economics: We estimate that the NPV10 value of the Pilot field equates to $1,004 million based a $75/b oil price assumption inflated at 1% per annum. That equates to a value of $12.74/barrel of oil (2P). We estimate that the Bowhead exploration prospect would have a higher per barrel valuation, assuming a discovery is made, due to the benefit of using the Pilot field's facilities.

Environmental considerations: Polymer flooding dramatically reduces the carbon dioxide emissions of viscous oil developments. Orcadian Energy has identified opportunities to further reduce its carbon dioxide emissions. Specifically, the company has progressed innovative design and engineering concepts involving the use of enhanced efficiency power generators, making a power connection to local wind farms and tying the Pilot project into the national electrical grid. Whereas many offshore facilities clean excess water before discharging it into the ocean, Orcadian Energy has taken measures to design production and processing facilities so that all produced water is re-injected and therefore there is no water or fluid discharge at all. We believe that Orcadian Energy is setting an extremely high environmental standard in relation to the commercialising of its assets.

Shell has provided $1.0 million of financial support to Orcadian Energy

Shell: After a due diligence process, Shell provided a $1.0 million long-term facility to Orcadian Energy in conjunction with that company entering into an offtake agreement in respect of oil produced from the Pilot field.

Oil price outlook: We have a long-term structurally bullish outlook in respect of crude oil prices. We believe that long-term confidence is returning to the oil market. We do not believe that oil can feasibly be replaced by renewable forms of energy in the mid-term.

Directors' shareholdings: Directors, and particularly, Stephen Brown, CEO, are heavily invested in the company. We believe this aligns management-shareholder interests.

Chairman: Joe Darby, Chairman, is very well known in the international energy community. Amongst many successful leadership roles, he is well-known for his role, acting as CEO, in growing LASMO's production to 170,000 barrel of oil equivalent per day. LASMO was successfully monetised via an acquisition by Eni in 2001, while Joe Darby was acting as CEO.

Big Company in the Making: We believe that the assets and the board of Orcadian Energy have the makings of a potential leader in North Sea heavy/viscous oil production.

Consolidator: For the first time in the history of the UK North Sea, under Orcadian Energy, the entirety of the most significant viscous oil discoveries on the Western Platform have been consolidated in the hands of a single operator (source: Orcadian Energy).

Past capex: Based on our estimates and applying current (low) rig rates, we estimate that to reach the current stage of development at the Pilot field (7 wells; proven & probable reserves of 78.8 million barrels) from a standing start would involve capital expenditures amounting to at least $80 million.

Oil prone licence area: 16 of the 17 wells drilled in the company's core licence area (P2244, P2320 and P2482) have encountered oil (source: Orcadian Energy).

Near-term catalysts: Forthcoming catalysts include:

i) The company submitted a detailed Concept Select Report to the OGA proposing the use of polymer flooding at Pilot in September 2020. Further work had been requested by the OGA on the back of the Concept Select Report, including core flood tests and work to reduce carbon dioxide emissions from the project. Orcadian Energy completed this work and submitted an Addendum to the CSR in July 2021, which included a floating wind turbine to provide electricity to the development. Orcadian Energy anticipates that the OGA will provide a **"letter of no objection**" pertaining to the project. That would represent an important milestone and we believe it will increase the marketability of the project, particularly in the farm-out market.

ii) A critical step in progressing the Pilot project will be the **procurement of an FPSO** to develop the Pilot field. The company has engaged a specialist in FPSOs, Crondall, to seek "Expressions of Interest" from FPSO contractors and this process is proceeding.

iii) A **farmout** is expected to represent, by far, the most significant value enhancing catalyst for Orcadian Energy. Orcadian Energy intends to pursue a farmout in parallel with operational and regulatory progress. Likewise, the company is not exclusively looking at traditional farm-in arrangements and intends to explore of host of complimentary funding arrangements (vendor

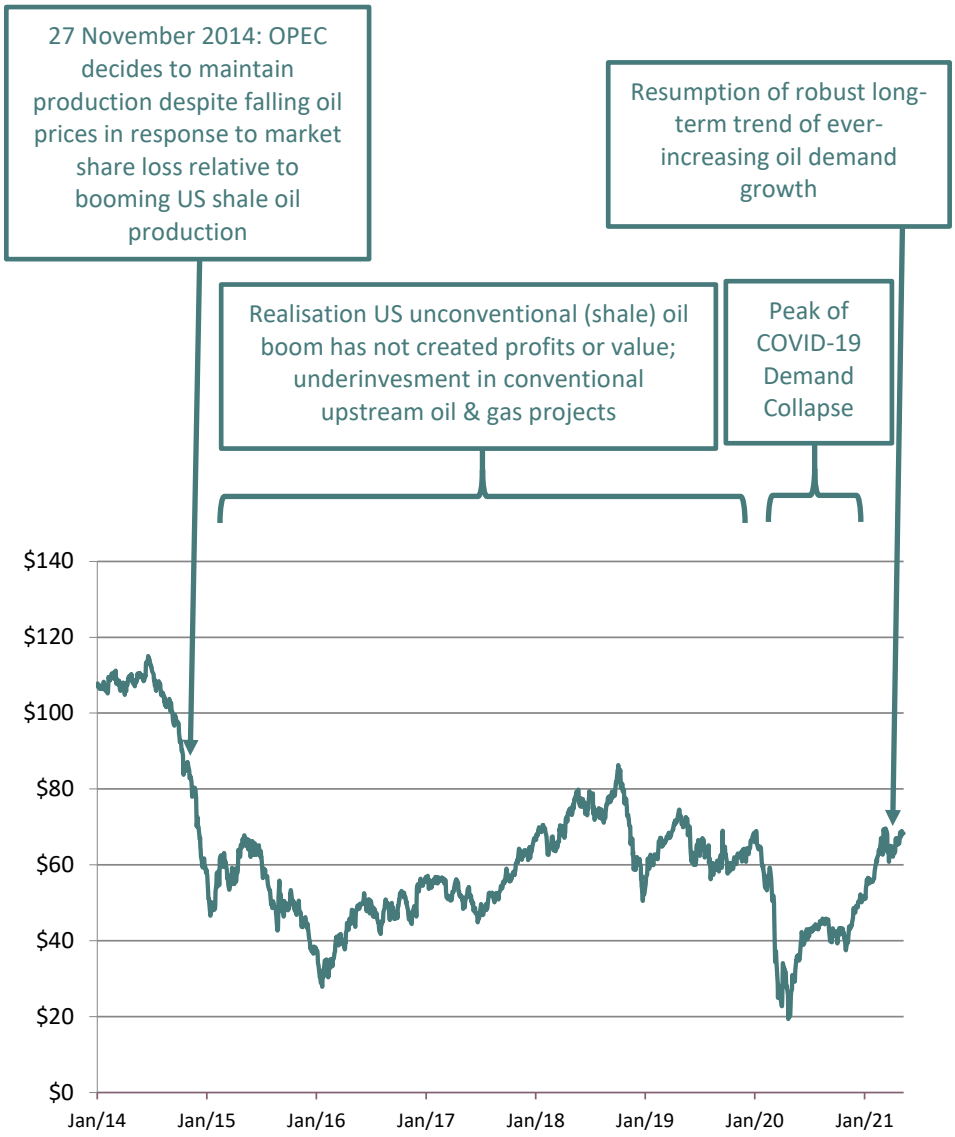
finance, debt funding, equity funding and other funding arrangements). The overall objective is to fund the company's projects in such a way that shareholder value is maximised. Importantly, Orcadian Energy does not intend to enter agreements that will commit the company to a particular course of action before the company has secured funding, in order to provide the eventual funding partner with full-flexibility to develop the field as they deem optimal.

iv) Orcadian Energy has participated in OGA led discussions regarding a Central North Sea **electrification project** and has also been in discussions with a number of offshore wind technology companies regarding the installation of a wind turbine to provide wind-sourced power supply to the project.

v) The company has licensed new **3D seismic data over the Bowhead** prospect, which will be determinant for whether or not the company decides to drill that exploration prospect. We believe that a successful outcome at Bowhead would add considerable absolute shareholder value and lower the breakeven costs of the Pilot field.

Timing the cycle: We believe that the Orcadian Energy investment thesis is highly associated with the timing of the crude oil price cycle. We believe that the timing is excellent to gain exposure to the potential value that can be created by the commercialisation of viscous crude oil. Our base-case outlook is that mid-term global economic growth will be constrained by the limited supply of crude oil. We have summarised our perception of the cyclical nature of the oil market in Figure 1.

Figure *1* WHI Assessment of Commodity Price Cycle (Brent; $/b)



Source: WHI; Capital IQ

Risks and Key Uncertainties

General risks for almost all investments in the oil & gas sector include: i) commodity price risks, ii) risks related to the estimation of future production, iii) risks related to capital and operating costs, iv) operational risks, v) funding risks, vi) the risk of delays, vii) adverse changes to the tax system, viii) the risk that the regulatory regime changes adversely, ix) exploration risks and x) environmental risks.

In addition to the risks noted above, investors should be aware of the following specific risks in relation to Orcadian Energy:

1) The Orcadian Energy investment thesis is aligned with our structurally bullish long-term outlook in respect of oil, there is a risk that oil prices weaken rather than strengthen.

2) In our opinion, the main risk in relation to Orcadian Energy's outlook relates to funding its core projects to first oil production.

Valuation

Fair Value Estimate

Our fair value estimate for Orcadian Energy is 115p/sh, which reflects a crude oil price assumption of $75/b (inflated at 1% p.a.) and includes 10% of the success case value of the Pilot field.

Our valuation estimates are premised on the inclusion of 10% of the proven and probable reserve (2P) values of the Pilot field.

The basis of our mid-case valuation is provided in Table 1.

Table *1* Orcadian Energy - WHI Valuation of Orcadian Energy

	Working Interest (%)	Assumed Gross Resource Scale (mmb)	Full Success Case Value USD ($M)	Full Success Case Value GBP (£mn)	Full Success Case Value per Share (p/share)	% in FV (%)	WHI Fair Value Estimate USD ($M)	WHI Fair Value Estimate GBP (£mn)	WHI Fair Value Estimate per Share (p/share)	Value $/boe ($/boe)
Oil & Gas Assets										
Pilot	*100%*	78.8	1,004.1	717.2	1,127.2	*10.0%*	100.4	71.7	112.7	12.74
Bowhead	*100%*	43.1	662.0	472.9	743.1	*0.0%*	-	-	-	15.38
Narwhal, Elke & Blakeney	*100%*	77.9	687.9	491.4	772.2	*0.0%*	-	-	-	8.84
Total Oil & Gas Assets		**199.7**	**2,354.0**	**1,681.4**	**2,642.5**	**n.a.**	**100.4**	**71.7**	**112.7**	
Adjustments										
Shell funding facility			(1.0)	(0.7)	(1.1)		(1.0)	(0.7)	(1.1)	
Funds raised at IPO 15 July 2021			3.2	2.3	3.6		3.2	2.3	3.6	
Other debts			-	-	-		-	-	-	
Total of Adjustments			**2.2**	**1.6**	**2.5**		**2.2**	**1.6**	**2.5**	
Fair Value Estimate			**2,356.2**	**1,683.0**	**2,645.0**		**102.6**	**73.3**	**115.2**	

Key assumptions:

Values are based on after-tax discounted cash flow models using a 10% discount rate

Assumes 63.6m shares outstanding

Long term Brent oil price: $75/b (inflated at 1% p.a.); USD/GBP = 1.40

Source: WHI estimates, WHI Assumptions

Source: WH Ireland Research

Valuation Approach

We value Orcadian Energy by applying a sum of the parts approach.

The after-tax cash flows for each of the company's core assets has been modelled to which we have applied a 10% discount rate to determine the present value of each asset, or NPV10 value. This is a "full-success-case-value". This value reflects the best-estimate, success-case asset value for each asset. It assumes that each asset is funded and developed to first oil. We then reduce the full-success-case-value of each asset to reflect both geological and commercial risks by applying a risking factor to determine an estimate of the fair value of the asset in its current stage of development and funding.

We encourage potential investors to appreciate that the risking factors we have applied are based on arbitrary judgements based on the risks we have identified.

We then adjust our asset valuation for balance sheet items, namely, cash and debt.

Key Macro Assumptions

Our key macro level assumptions are provided in Table 2.

Table 2 Key macro assumptions

	Unit	WHI Estimate
Brent crude oil price assumption	$/b	75
Brent crude oil price inflation rate p.a.	%	1%
USD:GBP	ratio	1.40
Project discount rate	%	10%

Source: WHI

Asset Overview

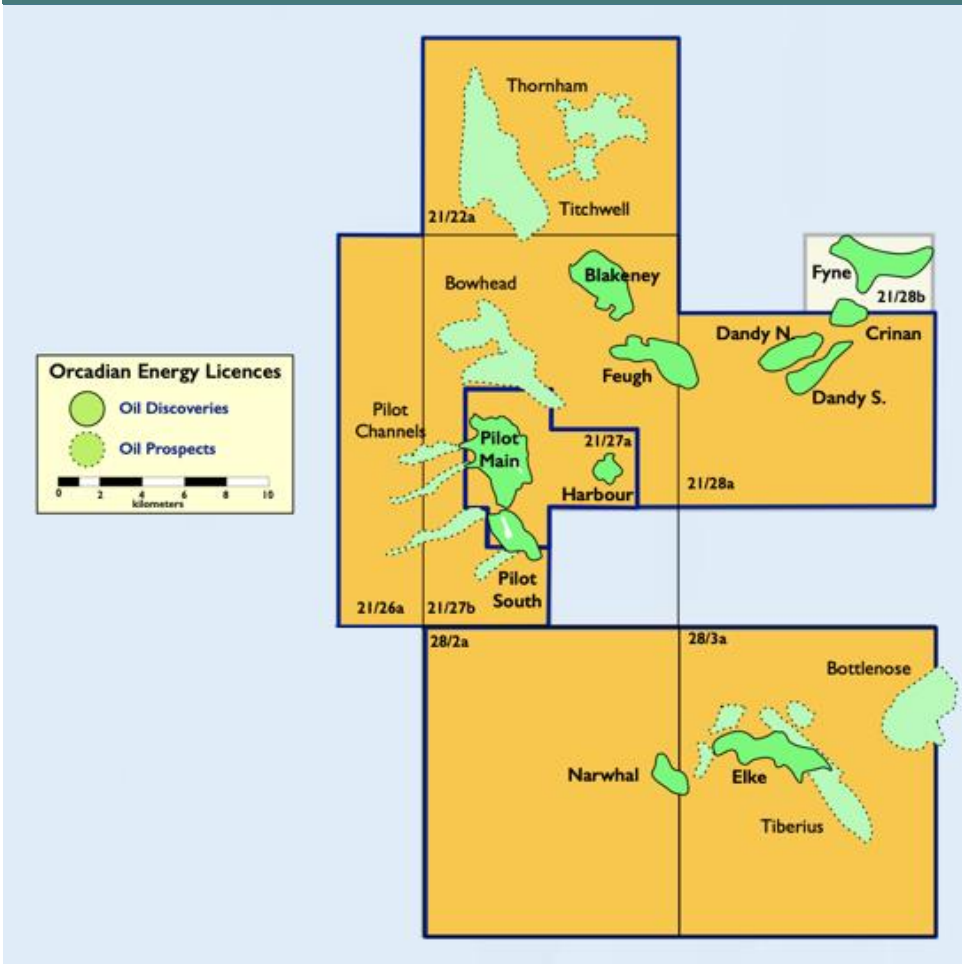
A regional map showing the geographic locations of Orcadian Energy's licence areas is provided in Figure 2.

Figure *2* Locations of Orcadian Energy's Licence Areas

Source: Orcadian Energy

A map showing the locations of Orcadian Energy's discovered and prospective assets on its Western Platform Licences is provided in Figure 3.

Figure *3* Orcadian Energy's Discovered and Prospective Assets.



Source: Orcadian Energy

Orcadian Energy's core assets are all viscous oil assets. The company intends to implement a polymer flood strategy which is a proven technique to optimise production from viscous oilfields.

The best-estimate resource assessments of the company's core assets are provided in Table 1.

Table *3* Core Asset Resource Assessments

	Resource Type	Unit	Best Estimate	Source
Pilot	Proven and probable reserves (2P)	mmb oil	78.8	Sproule
Bowhead	Best-estimate prospective	mmb oil	43.1	Sproule
Elke & Narwhal	Best-estimate contingent resource (2C)	mmb oil	52.7	Sproule
Blakeney	Best-estimate contingent resource (2C)	mmb oil	25.1	Sproule
Total		mmb oil	199.7	

Source: WH Ireland Research

The Pilot field is the most important asset within the company's portfolio. It is the largest of the company's assets and is also the most appraised of the company's assets, with a total of 7 wells drilled into and adjacent to the Pilot structure.

The Pilot field has been ascribed proven and probable reserves (2P) by Sproule, which reflects the high degree of commercial and technical robustness of the development plan for that asset.

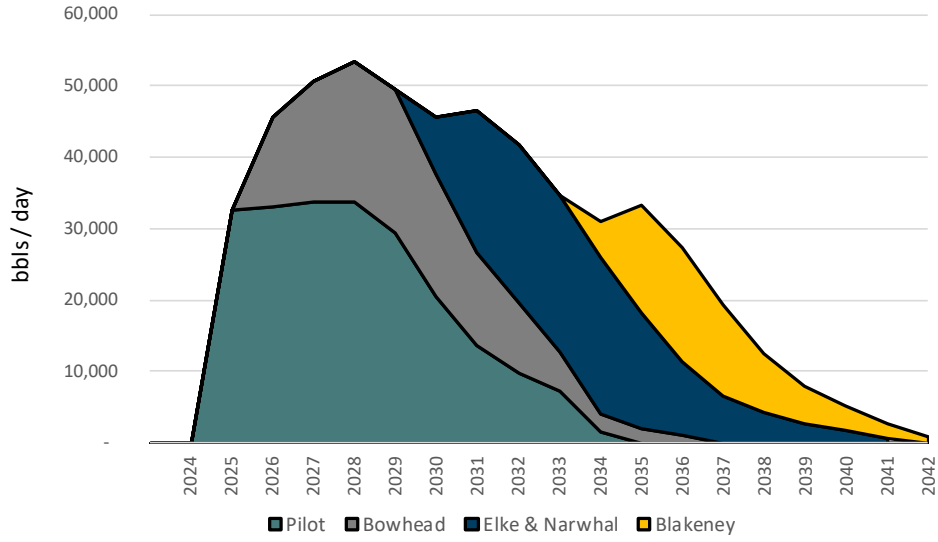
The oil from the entirety of the company's viscous oil assets is expected to be produced via a single Floating Production Storage and Offloading (FPSO) vessel.

Pilot represents the centrepiece of Orcadian Energy's assets. Orcadian Energy's other assets can be developed in a number of ways around Pilot. The scale of the Bowhead exploration prospect and its proximity to Pilot make it, in our opinion, of a heightened strategic and economic interest.

Orcadian Energy currently has no commitment to drill the Bowhead prospect. If the company elects to drill Bowhead and if it is a success, we believe it would be the second field the company brings on production, after Pilot.

We have assumed in our analysis that the project is scaled up to maximise economies of scale and to bring forward the value potential of the company's assets. Our assumed production profile, based on the resource assessments of Sproule, is provided in Figure 4.

Figure *4* Assumed developmental profile of Orcadian Energy's assets



Source: WHI; Sproule

Core Asset – Pilot

Pilot - Overview

Orcadian Energy holds a 100% interest in the Pilot field, having been awarded the related licence (P2244) in 2014 (28th licensing round).

Pilot has been ascribed 78.8 million barrels of proven and probable (2P) reserves by Sproule.

The Pilot field contains heavy viscous oil with API densities of 12°-17° and with viscosities ranging from 160 cP to 1,200 cP. The Pilot reservoir is of an exceptionally high quality, with porosities of 30-36% and permeabilities of 2-8 Darcies. The geological structure of Pilot is a straightforward 3-way structural closure with a pinch-out to the west.

The Pilot field consists of the main discovery, Pilot Main, and an extension of the field to the south, Pilot South.

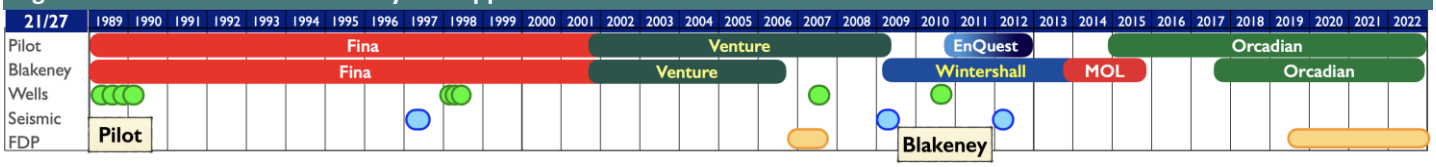
The field is relatively shallow, with an oil-water contact at 2,724 feet (830 meters).

Pilot - History

Pilot was discovered by Fina, with partners Mobil, Repsol and Amerada Hess, in 1989. The Pilot field has been extensively appraised: it has been penetrated by 5 wells and 2 sidetracks and it has been extensively cored. A horizontal well drilled into the most viscous part of the reservoir (well 21/27a-5x) produced at a rate of 1,850 barrels of oil per day on a short-term test with an electrical submersible pump. 2 additional appraisal wells were drilled outside of the oil bearing structure at Pilot for a total of 7 appraisal wells.

A timeline of the work undertaken at Pilot is provided in Figure 5.

Figure 5 Timeline of Pilot Discovery and Appraisal Work



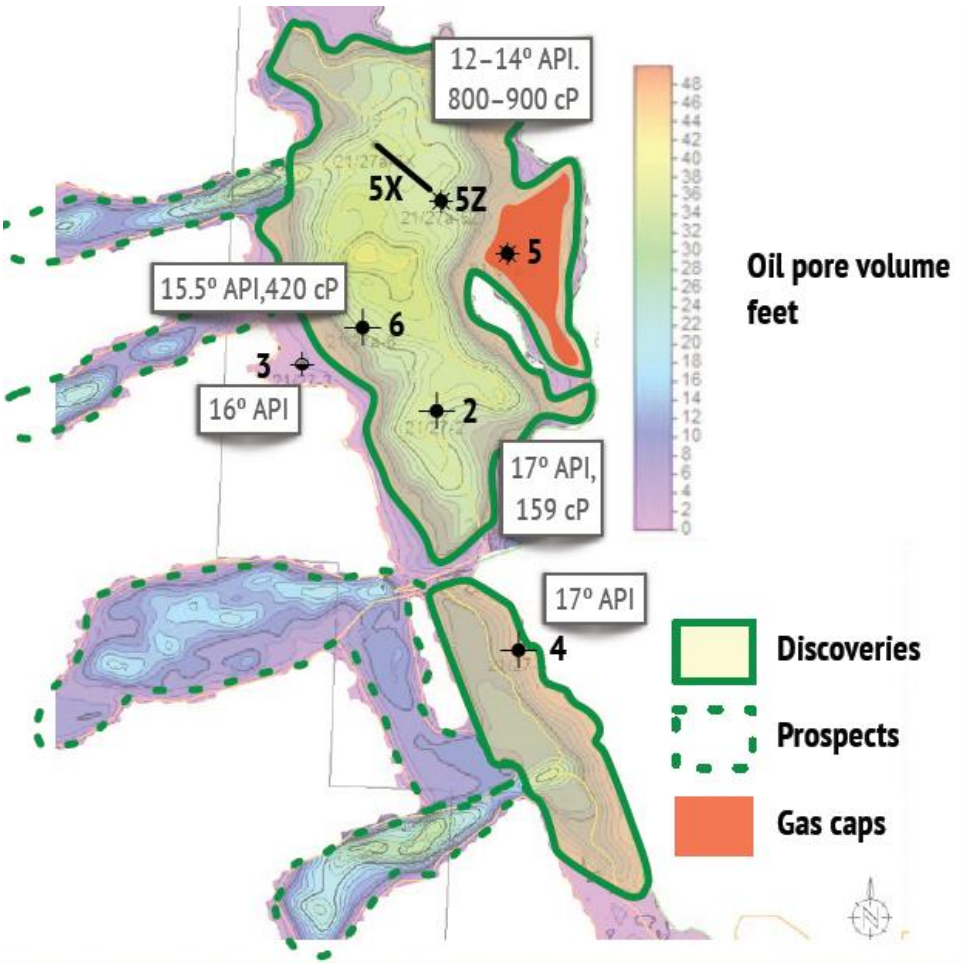
Source: Orcadian Energy

Based on our estimates and applying current (low) rig rates, we estimate that to reach the Pilot field's current stage of development (7 wells; proven & probable reserves of 78.8 million barrels) from a standing start would involve capital expenditures amounting to at least $80 million.

Pilot - Geology

The Pilot oil field is a combined structural and stratigraphic trap, with the volumetrically more important stratigraphic element created by the updip pinch-out of the main reservoir sandstone. The Pilot field lies within excellent Tay Sandstones of Eocene Age. A hydrocarbon pore volume map of the Pilot field showing the thickness of the porosity within the oil bearing reservoir is provided in Figure 6.

Figure *6* Pilot - Map Showing Height of Hydrocarbon Pore Volume



Source: Orcadian Energy

As seen in Figure 6, a small gas cap is developed in local structural culminations. We believe that these gas caps are of limited significance.

As seen in Figure 6, there are four west-east orientated incised feeder channels connected to the main pilot structure. These channels have been mapped from seismic images; however, they have yet to be drilled. Despite the channels being in direct pressure communication with the main pilot structure, it has been assumed that the Pilot Channels are undiscovered exploration prospects, representing upside.

Pilot - Reserve Assessment

Sproule has ascribed 78.8 million barrels of proven and probable (2P) reserves to the Pilot field. This is shown in Table 4.

Table 4 Pilot Proven and Probable Resources

	Unit	Best Estimate	Source
Pilot Main oil in place	mmb	230.0	Sproule
Pilot South oil in place	mmb	33.0	Sproule
Pilot total oil in place	mmb	263.0	Sproule
Recovery factor	mmb	30%	Sproule
Proven and probable reserves (2P)	**mmb**	**78.8**	**Sproule**

Source: Orcadian Energy; Sproule

Pilot - Development Plan

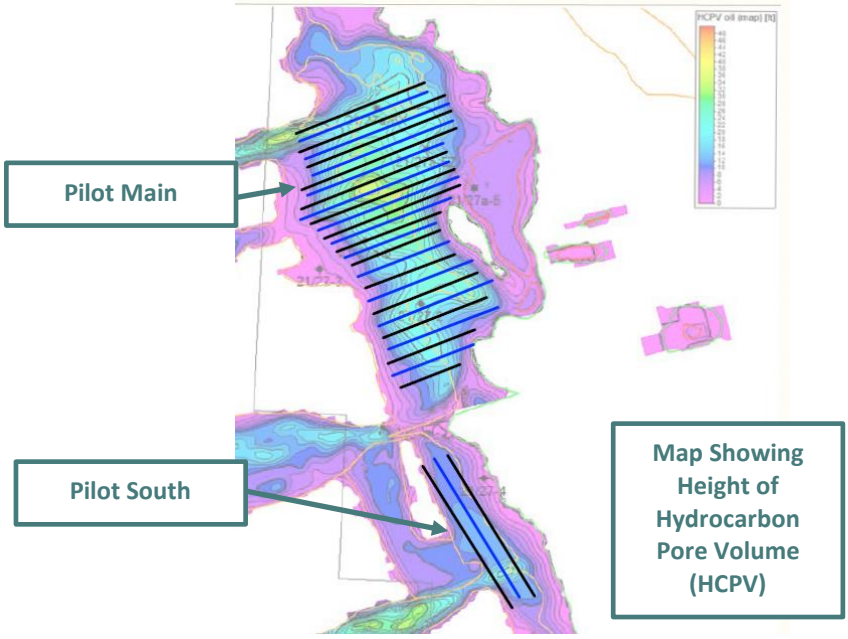
The company plans to develop its viscous oilfields, inclusive of Pilot, using polymer flood technology. The selection of this technology has been driven by the suitability of Orcadian Energy's viscous oil assets for that strategy and by the success of polymer flooding in the Captain field, in the UK North Sea, and internationally.

The injection of polymerised water into the Pilot field is expected to result in a recovery rate of 30% (Table 4).

We believe that the most analogous UK North Sea oilfield is the Captain field, which is expected to achieve a recovery factor of 39%. The Captain field was largely developed by Chevron and is now operated by Ithaca Energy. We note that the recovery factor at the Captain Field would be higher if a polymer flood strategy had been applied as part of the initial development strategy, as planned for the Pilot Field, rather than as a secondary strategy.

The subsurface development plan is provided in Figure 7. Horizontal injector wells are shown in blue and horizontal producer wells are shown in black in Figure 7.

Figure 7 Pilot Subsurface Developmental Plan



Source: Orcadian Energy

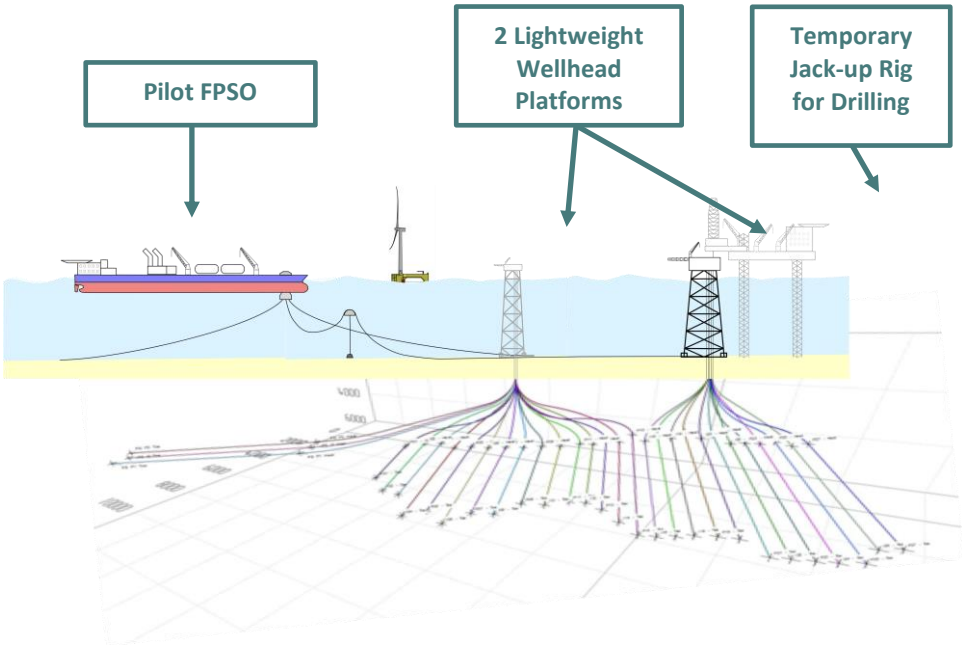
Orcadian Energy plans to develop the Pilot field through the installation of two lightweight wellhead platforms each with 20 slots, to drill horizontal wells at 100-meter spacing in the northerly part of the field where the oil is more viscous and at 150-meter spacing in the southerly part of the field where the oil is less viscous.

Process equipment, water desalination and polymer storage facilities are expected to be installed on a custom equipped Floating Production Storage and Offloading (FPSO) vessel. Securing an FPSO vessel to develop the assets of Orcadian Energy will be critical as many design parameters will relate to the specifics of the chosen vessel. Orcadian Energy has engaged Crondall Energy to secure a suitable FPSO on the best terms possible.

Energy will be generated from a 12MW floating wind turbine which also incorporates 2MW of wave power, this will be backed up by gas-fired reciprocating engines on the FPSO. Excess associated gas will be injected into a well drilled into the Pilot East gas cap and this well can supplement associated gas when renewable power is not available.

Drilling services are expected to be provided by a leased jack-up rig located over the wellhead platforms during the drilling campaign. The produced fluids will be piped directly to the FPSO for separation, water treatment, storage and export. The development schematic is provided in Figure 8.

Figure *8* Pilot development scheme

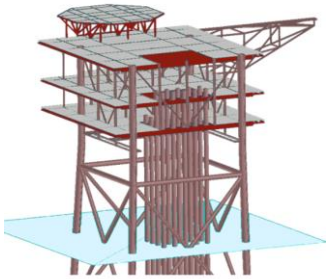


Source: Orcadian Energy

All production is expected to flow through the two normally unmanned facilities platforms, which will each have a slug catcher, polymer mixing systems and variable frequency drives for the production wells located on separate decks, as shown schematically in Figure 9.

Importantly, circa 5/6ths of the drilling for Pilot is anticipated to occur after first oil and the second platform is anticipated to be constructed after first oil. As a result, a significant proportion of the projects capital expenditure will be self-funded.

Figure *9* Pilot lightweight normally unmanned platforms (2x)



Source: Orcadian Energy

As part of the front end engineering and design (FEED) process, Orcadian Energy intends to finalize the design of the water-oil separation process and expects to apply a method that has been proven successful elsewhere, namely, a wash tank technology for dewatering/desalting the oil. To confirm this selection, Orcadian Energy intends to conduct tests, with the technology supplier Sulzer, to ensure that this approach is optimal for the Pilot field. The water separation process will be designed to bring the oil to sales specification.

Based on the success of offshore polymer injection strategies elsewhere, namely, at the Captain field, the company intends to source liquid emulsion based polymer (vs. bringing powder onto the FPSO for mixing there).

Orcadian Energy has determined that it can reduce the amount of required polymer and thereby lower operating costs by reducing the salinity of the injection water. The company intends to install pressurised membrane filtration and reverse osmosis units on the FPSO for the purpose of desalination of the injection water prior to it being mixed with the polymer.

Orcadian Energy has selected to study further the deployment of viscous oil downhole pumping technology that is in use in a number of fields globally. Orcadian Energy intends to design customised, large-scale units based on proven pump technologies.

Relative to its expected proven and probable recovery factor of 30%, Sproule believes that a higher recovery factor could be achieved from:

i) The enhancement of polymer products such that a higher viscosity of the injected water could be achieved with the same polymer concentration.

ii) The enhancement of water desalination such that a higher effective downhole water viscosity could be achieved with the same polymer concentration.

Pilot - Valuation

A summary of our economic valuation of Pilot is provided in Table 5.

Table 5 Pilot Field – Summary of Key Assumptions

	Unit	Source	WHI Estimate
Long-term Brent crude oil price	$/b	WHI	75.0
Discount to Brent	$/b	Sproule	0.0
Realised long-term crude oil price	$/b	WHI	75.0
Long-term commodity price inflation per annum	%	WHI	1%
Estimated oil production	mmb	Sproule (2P)	78.8
# Producer wells	#	Orcadian	18
# Injector wells	#	Orcadian	16
# Wells total	#	Orcadian	34
Drilling costs	$M	Sproule	537
Downhole pumps, subsea and tie-back costs	$M	Sproule	388
FPSO cost	$M	Sproule	575
Total capex	$M	Sproule	1,553
Total capex/barrel	$/b	Sproule	19.70
Total capex before first oil is achieved (before self-funding)	$M	Orcadian	1,000
Abandonment costs	$M	Sproule	134
Abex/barrel	$/b	Sproule	1.70
Average life of field opex / barrel	$/b	Sproule	16.0
Year of first oil production	Year	WHI	2025

Source: Orcadian Energy; Sproule, WH Ireland

A summary of our key economic estimates is provided in Table 6.

Table 6 Pilot Field – Summary of Economic Estimates

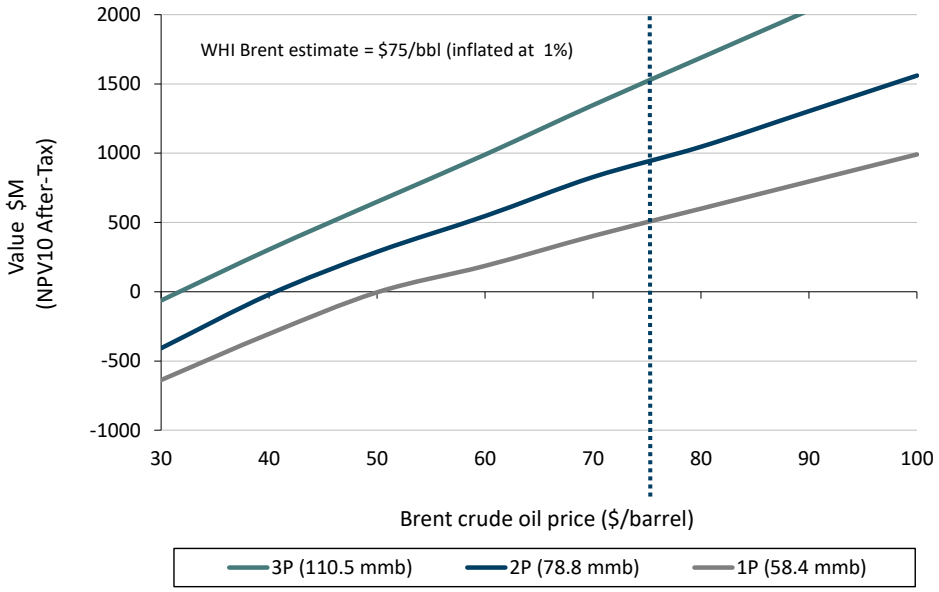
	Unit	Source	WHI Estimate
Net present value before-tax	$M	WHI	1655
Net present value after-tax	$M	WHI	1004
NPV per barrel before-tax	$/b	WHI	21.00
NPV per barrel after-tax	$/b	WHI	12.74
Internal rate of return after tax	%	WHI	40%
% ofsuccess-case value in WHI fair value estimate	%	WHI	10%
WHI fair value estimate	$M	WHI	100
WHI fair value estimate in GBP	£M	WHI	72

Source: WH Ireland

Pilot - Sensitivity Analysis

A sensitivity analysis for the best estimate (2P), downside (1P) and upside (3P) cases, as determined by Sproule, for various crude oil prices is provided in Figure 10.

Figure *10* Pilot – Sensitivity Analysis



Source: WH Ireland

Core Asset – Bowhead, Exploration Prospect

Bowhead - Overview

Orcadian Energy holds a 100% interest in the Bowhead prospect, having been awarded the related licence (P2320) in 2017 (29th licensing round).

The relevant licence (P2320) also contains the Blakeney, Feugh, Dandy and Crinan discoveries. The licence (P2320) also contains the channel extensions of the Pilot field, which extend from the west of that field and represent additional exploration targets.

The Bowhead prospect is an analogue to the Pilot discovery and exhibits a similar seismic response to that seen on Pilot.

Based on Sproule's assessment, the Bowhead exploration prospect has a 49% chance of success.

Orcadian Energy is working on further derisking of the Bowhead exploration prospect and has licensed newly reprocessed seismic data and engaged Axis to interpret this new seismic data. Orcadian Energy intends to make a commitment to drill an exploration well or not (drill or drop) after assessing this newly reprocessed seismic data.

We believe that Bowhead's scale and its immediate proximity to the Pilot field would make it an extremely commercially attractive development. From another perspective, a joint development of Pilot and Bowhead would necessarily have i) a lower breakeven oil price and ii) higher IRRs.

We believe that a straightforward vertical well could be drilled into the Bowhead prospect for circa £8M. We believe that it could be beneficial, under a success case, to drill a deviated sidetrack well from the vertical discovery well, which would involve additional costs.

Bowhead - History

The relevant blocks were first drilled in 1971 by Mobil, multiple wells have been drilled into the blocks since then, resulting in the noted discoveries.

Bowhead - Geology

The Bowhead prospect is a Tay Sandstone stratigraphic trap. The field's prospectivity is premised in large part on a Class II AVO (amplitude vs. offset) anomaly. The AVO anomaly is used to define the prospect.

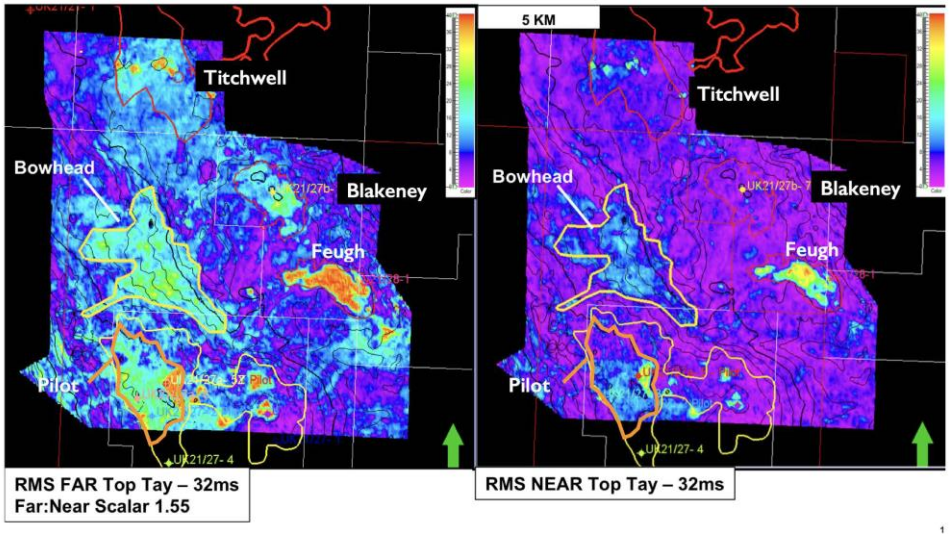
The scale of the AVO anomaly conforms to the structure. This heightens the prospectivity of the prospect because it implies that the AVO anomaly conforms to an oil-water contact.

The Bowhead prospect sits immediately along-strike from Pilot.

The Bowhead prospect is separated from the Pilot prospect by a salt swell.

As with the Pilot discovery, the turbiditic Tay Sandstone pinches out to the west. A structural closure is produced by an embayment feature.

Figure *11* Bowhead Prospect



Source: Orcadian Energy

Sproule's analysis of the geological risks in respect of the Bowhead prospect is provided in Table 7.

Table *7* Bowhead Analysis of Chance of Geological Success

Risk factor	Chance of Success
Source	100%
Migration and timing	100%
Trap	100%
Reservoir presence	90%
Reservoir quality	78%
Seal and preservation	70%
Geological chance of success	49%

Source: Sproule

Bowhead - Prospective Resource Assessment

The best estimate resource potential of Bowhead, as determined by Sproule, is provided in Table 8.

Table *8* Bowhead Prospective Resources

	Unit	Best Estimate	Source
Bowhead prospective oil in place (P50)	mmb	123.0	Sproule
Recovery factor	mmb	35%	Sproule
Best estimate prospective resources (2C)	**mmb**	**43.1**	**Sproule**

Source: Orcadian Energy; Sproule

Bowhead - Development Plan

Although a definitive field development plan has not been elaborated for Bowhead given it has not been drilled, we believe its development would simply mirror the Pilot development with shared facilities on the Pilot FPSO.

We believe the integration of Bowhead, or not, into the Pilot development scheme will be determinant for the greater Pilot project. This is because, if a Bowhead exploration well is drilled and is successful, developing the resulting discovery would be, in our opinion, a commercial priority.

Bowhead - Valuation

A summary of our economic valuation of Bowhead is provided in Table 9.

Table *9* Bowhead Prospect – Summary of Key Assumptions

	Unit	Source	WHI Estimate
Long-term Brent crude oil price	$/b	WHI	75.0
Discount to Brent	$/b	Sproule	0.0
Realised long-term crude oil price	$/b	WHI	75.0
Long-term commodity price inflation per annum	%	WHI	1%
Estimated oil production (Prospective)	mmb	Sproule	43.1
# Producer wells	#	WHI	10
# Injector wells	#	WHI	9
# Wells total	#	WHI	19
Total capex	$M	WHI	595
Total capex/barrel	$/b	WHI	13.82
Abandonment costs	$M	WHI	48.6
Abex/barrel	$/b	WHI	1.13
Average life of field opex / barrel	$/b	WHI	11.64
Year of first oil production	Year	WHI	2026

Source: Orcadian Energy; Sproule, WH Ireland

A summary of our key economic estimates of Bowhead is provided in Table 10.

Table *10* Bowhead Prospect – Summary of Economic Estimates

	Unit	Source	WHI Estimate
Net present value before-tax	$M	WHI	1077
Net present value after-tax	$M	WHI	662
NPV per barrel before-tax	$/b	WHI	25.01
NPV per barrel after-tax	$/b	WHI	15.38
Internal rate of return after tax (greater project)	%	WHI	47%
% ofsuccess-case value in WHI fair value estimate	%	WHI	0%
WHI fair value estimate	$M	WHI	-
WHI fair value estimate in GBP	£M	WHI	-

Source: WH Ireland

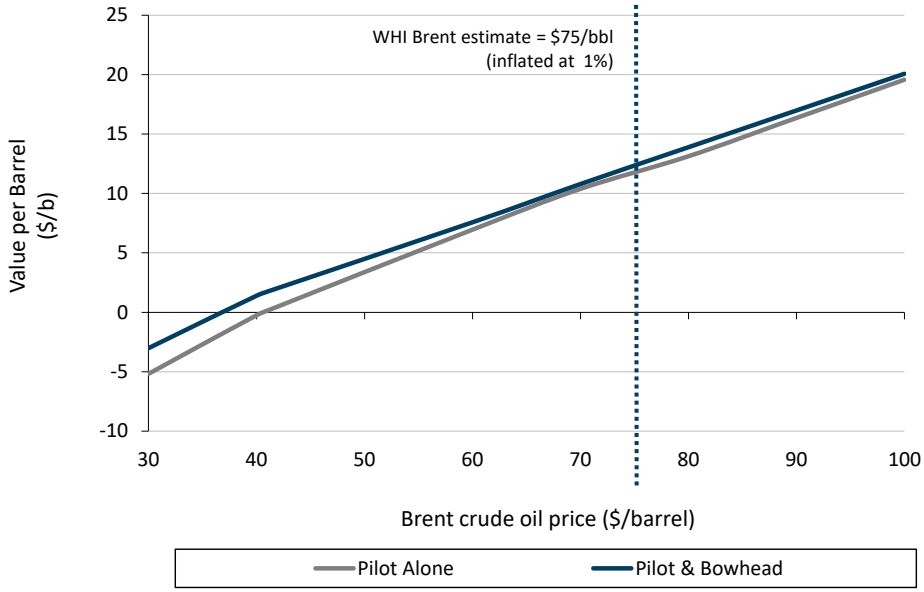
Bowhead - Sensitivity Analysis

Based on our analysis, the benefits of developing Bowhead, assuming it is an exploration success, relative to developing Pilot on a standalone basis are as follows:

i) The absolute value of the project would increase by $662 million.

ii) The IRR of the project would increase from 40% to 47%.
iii) The economic (NPV10 after-tax) breakeven oil price of the project would fall by circa $4/barrel as seen in Figure 12.

Figure *12* NPV per barrel with and without Bowhead



Source: WHI

Core Asset – Elke & Narwhal

Elke & Narwhal - Overview

Orcadian Energy holds a 100% interest in the Elke & Narwhal Fields, having been awarded the related licence (P2482) in 2019 (31st licensing round).

Elke and Narwhal have been ascribed 52.7 million barrels of best-estimate contingent resources (2C) by Sproule.

The Elke and Narwhal fields are in immediate proximity to one another and both in the same Tay Formation. For that reason, from an economic perspective they are generally considered as a single developmental unit. Sproule has assessed the resource potential of the fields on the basis that they are developed conjointly.

Elke & Narwhal - History

The Narwhal field was discovered by well 28/2-1, which was drilled by ARCO in 1993. Elke was discovered by well 28/3-1B drilled by Murphy in 2000. Elke and Narwhal have each been penetrated by a single well.

No production test in respect of either fields has been completed. Oil samples recovered from the Elke discovery well had an API density of 12° and average viscosities ranging from 300 to 800 cP. Oil samples recovered from the Narwhal discovery well had an API density of 14°API and an average viscosity of 1,260 cP.

Over the course of 2003-2004, Petrofac entered into discussions to acquire a 100% interest in the Elke discovery. The negotiations were successfully led by Steve Brown (current CEO of Orcadian Energy), who at the time was Petrofac's head of business development, and Richard Hall, also of Petrofac, who had drilled the discovery well with Murphy. In 2010, Enquest, which was formed through the merger of Petrofac and Lundin Petroleum's UK North Sea assets, was listed on the London Stock Exchange. Petrofac's assets, which become the assets of Enquest, included the Elke discovery at the time of the listing. Over the course of 2015 to 2017, Orcadian Energy agreed to purchase Elke & Narwhal from Enquest. Although the deal was signed, the transaction did not close because it required Orcadian Energy to fund a well for the UK Oil & Gas Authority (OGA) to approve the assignments, and at the time it was too early in the company's development to prioritise an appraisal well on Elke. In 2019, Orcadian Energy was awarded licence P2482 by the UK Oil & Gas Authority. (source: Orcadian Energy)

In 2007, Venture drilled the 28/2a-2 Narwhal appraisal well on 2D seismic data. The well found excellent sands but no oil.

Elke & Narwhal - Geology

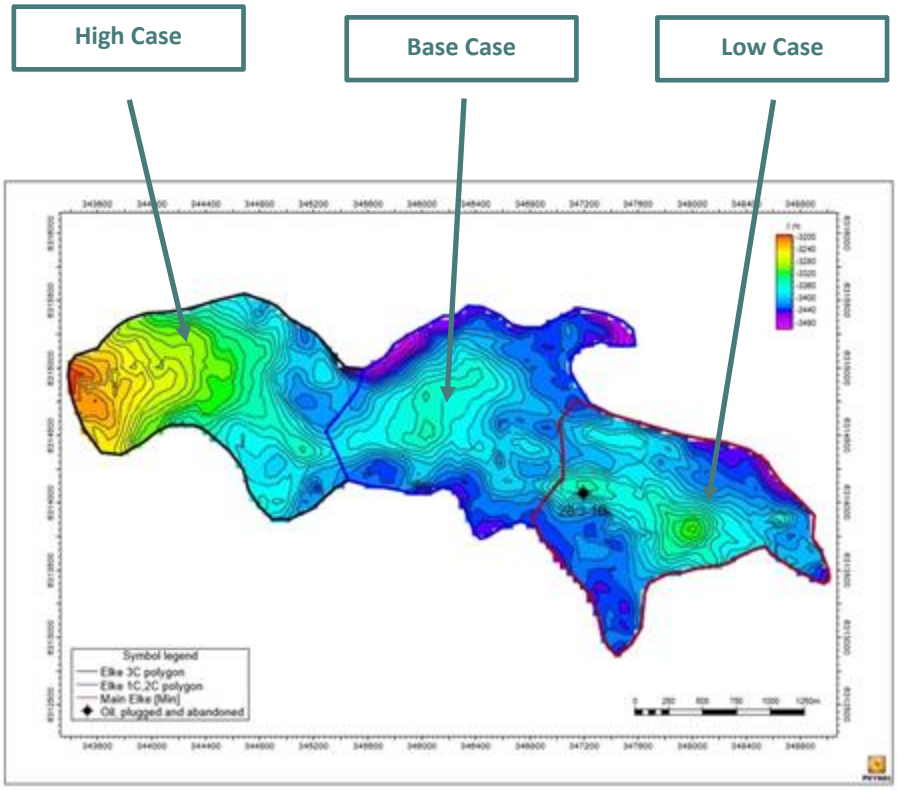
The Elke and Narwhal fields are both within the Tay Formation of Eocene Age.

The Elke field consists of three structural culminations separated by gentle saddles. The Elke field benefits from excellent reservoir quality. The reservoir lies at around 3,400 feet (1,004 meters), making it relatively shallow. The sands are poorly consolidated. The discovery well determined the field has a porosity of 36%, a permeability of 3 Darcies and an oil saturation of 86%. The field has a clear oil water contact at 3,458 feet (1,054 meters). The oil bearing reservoir is essentially entirely productive.

The high, best estimate and low cases for Elke relate to the extent to which the structure extends to the west relative to the discovery well. This is shown in Figure 13. Note the most westerly areas of the structure relate to the high-case resource volumes, which are corroborated by a strong AVO seismic amplitude anomaly. According to Sproule, the

uncertainty related to Elke relates to depth mapping (seismic data analysis) and reservoir continuity.

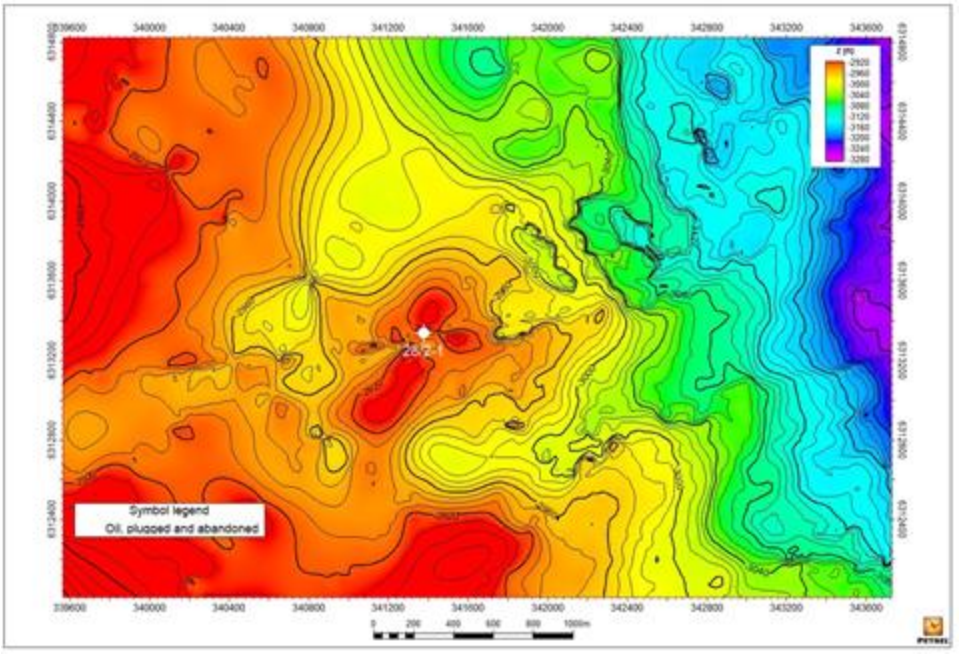
Figure *13* Elke Structural Map – Top of Tay Formation



Source: Sproule

The Narwhal accumulation is a four-way closure penetrated by the 28/2-1 (Figure 14). Based on the Narwhal discovery well, the reservoir sands have a porosity of 34%, high permeabilities measured in Darcies (rather than milliDarcies) and an oil saturation of 80%.

Figure *14* Narwhal Structural Map – Top of Tay Formation



Source: Sproule

Elke & Narwhal - Contingent Resource Assessment

Table *11* Elke & Narwhal Contingent Resource Assessment

	Unit	Best Estimate	Source
Elke - oil in place	mmb	130.0	Sproule
Narwhal - oil in place	mmb	26.0	Sproule
Total - oil in place	mmb	156.0	Sproule
Recovery factor	mmb	34%	Sproule
Best estimate contingent resources (2C)	**mmb**	**52.7**	**Sproule**

Source: Orcadian Energy; Sproule

Sproule has ascribed contingent resources to both Elke and Narwhal. Sproule has indicated that the resource developments of Elke and Narwhal are contingent on i) corporate commitment to commercialise the fields, which they believe is conditional on the successful development of the Pilot field and the further elaboration of a detailed development plan and ii) economic factors, inclusive of the economic success of the Pilot field development.

Elke & Narwhal - Development Plan

The Elke and Narwhal fields would be developed in tandem using a pair of wellhead platforms tied back to the Pilot FPSO. The facilities for Elke and Narwhal will essentially mirror the facilities of Pilot.

The development plan for Elke consists of producing the field with 13 horizontal producers and 11 horizontal wells dedicated to polymerised water injection. The Narwhal field is anticipated to be developed with 4 horizontal producers and 3 horizontal wells dedicated to polymerised water injection. It is planned that the wells are drilled from a jack-up that will depart once the drilling program is completed.

The timing of the development and of first oil at Elke and Narwhal are points of uncertainty. The success of the Bowhead exploration prospect, would, in our opinion, affect the developmental strategy and timing of Elke and Narwhal.

Elke & Narwhal - Valuation

For the purposes of our valuation we have assumed that the development of Elke, Narwhal and Blakeney (25.1 million barrels of best-estimate contingent resources; described in the next section) represent a single economic unit.

We have applied the valuation estimates of Sproule (based on their $70/b Brent oil price case) in our analysis.

Table *12* Elke, Narwhal & Blakeney – Summary of Key Assumptions

	Unit	Source	WHI Estimate
Long-term Brent crude oil price	$/b	WHI	75.0
Discount to Brent	$/b	Sproule	0.0
Realised long-term crude oil price	$/b	Sproule	75.0
Long-term commodity price inflation per annum	%	Sproule	1%
Best-estimate contingent resource	mmb	Sproule	77.9
# Producer wells	#	Sproule	30
# Injector wells	#	Sproule	24
# Wells total	#	Sproule	54
Total capex	$M	Sproule	1777
Total capex/barrel	$/b	Sproule	22.83
Abandonment costs	$M	Sproule	170.4
Abex/barrel	$/b	Sproule	2.19
Average life of field opex / barrel	$/b	Sproule	17.1
Year of first oil production	Year	Sproule	2031

Source: Orcadian Energy; Sproule, WH Ireland

A summary of our key economic estimates is provided in Table 13.

Table *13* Elke, Narwhal & Blakeney – Summary of Economic Estimates

	Unit	Source	WHI Estimate
Net present value after-tax	$M	Sproule	688
NPV per barrel after-tax	$/b	Sproule	8.84
% ofsuccess-case value in WHI fair value estimate	%	WHI	0%
WHI fair value estimate	$M	WHI	-
WHI fair value estimate in GBP	£M	WHI	-

Source: WH Ireland

Core Asset – Blakeney

Blakeney - Overview

Orcadian Energy holds a 100% interest in the Blakeney field, having been awarded the related licence (P2320) in 2017 (29th licensing round).

Blakeney has been ascribed 25.1 million barrels of best-estimate contingent resource (2C) reserves by Sproule.

Blakeney - History

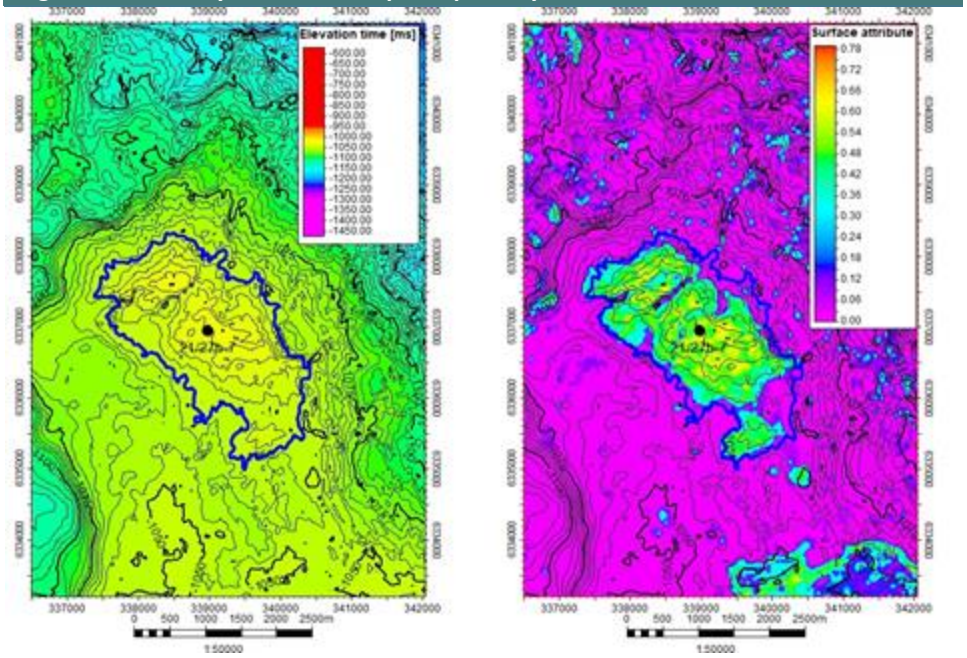
Wintershall discovered the Blakeney field in 2010 with the 21/27b-7 well. Oil and water samples were obtained from the 21/27b-7 well. Oil recovered from the discovery well had an API density of 14.5° and an average viscosity of 291 cP. A production test was not undertaken at the field.

Blakeney - Geology

The Blakeney field is a four-way dip closed structure. The Blakeney accumulation lies within the Tay sandstone of Eocene Age.

A structural map of the Blakeney field is provided in Figure 15.

Figure *15* Blakeney Structural Map – Top of Tay Formation



Source: Orcadian Energy

Blakeney - Reserve Assessment

Sproule has ascribed contingent resources to Blakeney. Sproule has indicated that the resource development of Blakeney is contingent on i) corporate commitment to commercialise the fields, which they believe is conditional on the successful development of the Pilot field and the further elaboration of a detailed development plan and ii) economic factors, inclusive of the economic success of the Pilot field development.

Table *14* Blakeney Contingent Resource Assessment

	Unit	Best Estimate	Source
Blakeney - oil in place	mmb	91.0	Sproule
Recovery factor	mmb	28%	Sproule
Best estimate contingent resources (2C)	**mmb**	**25.1**	**Sproule**

Source: Orcadian Energy; Sproule

Blakeney - Development Plan

The Blakeney field development plan is anticipated to mirror that of the Pilot field and share the same FPSO.

Blakeney - Valuation

We have assumed that Elke, Narwhal and Blakeney are developed as a single economic unit and have included the value of Blakeney in that unit. This is aligned with approach taken by Sproule.

Additional Upside – Satellite Fields & Additional Exploration

In addition to the discovered resources that have been ascribed reserves or resources by Sproule, Table 15 provides a summary of the additional oil discoveries within Orcadian Energy's licences that have the most potential commercial value, in our opinion.

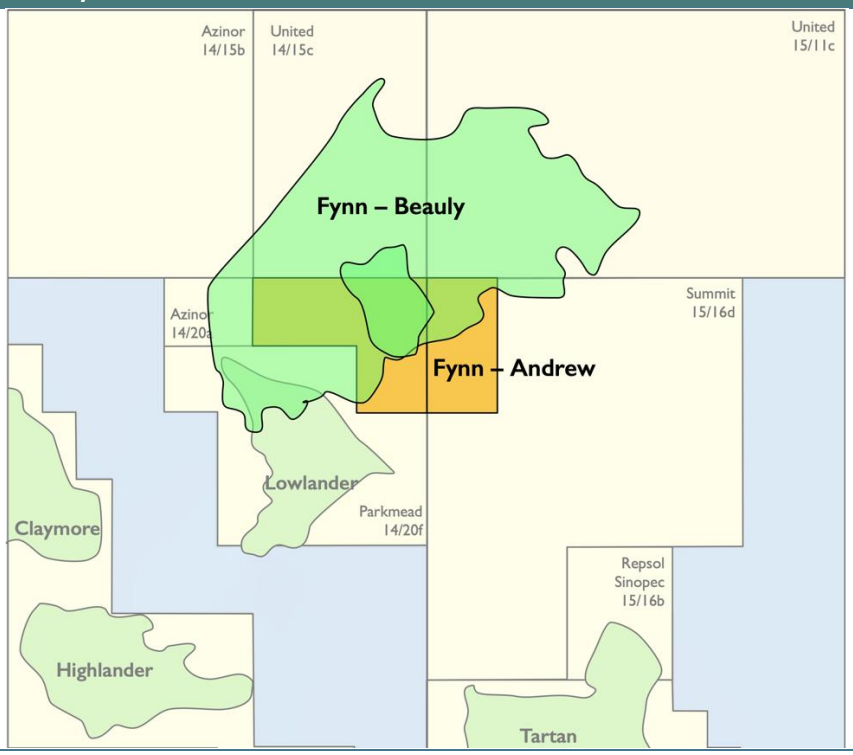
Table *15* Summary of Additional Discovered Fields in Orcadian Energy's Portfolio

Field	Orcadian Net Interest Estimated Recoverable Resource Scale *(mmb; oil; net)*	Resource Classification	Source	*%* Orcadian	Licence
Harbour	2	Technically recoverable resources	Sproule	100%	P2244
Fynn (Andrew)	5	Technically recoverable resources	Sproule	50%	P2516
Fynn (Beauly)	24	Technically recoverable resources	Sproule	50%	P2516
Feugh	6	Technically recoverable resources	Sproule	100%	P2320
Dandy and Crinan	2	Technically recoverable resources	Sproule	100%	P2320
Total	**39**				

Source: WH Ireland Research

The Fynn Beauly and Fynn Andrew discoveries are shown in Figure 16. As seen in Figure 16, both discoveries extend beyond the licence boundaries held by Orcadian Energy. The Parkmead Group holds the remaining 50% of Orcadian Energy's P2516 licence. Viscous oil was recovered from Fynn Beauly. Fynn Andrew was not sampled and may contain lighter oil.

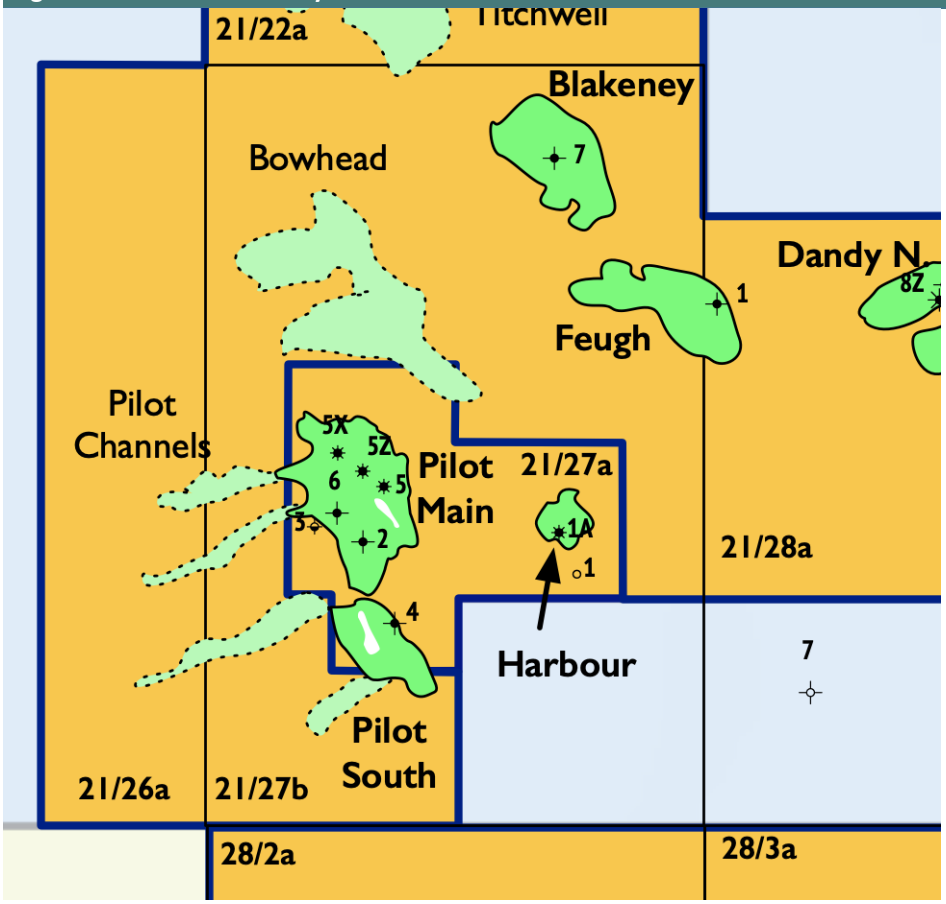
Figure *16* Fynn Discoveries



Source: Orcadian Energy

The Harbour oil discovery (Figure 17) is adjacent to the Pilot field within the same block. It too lies within the Tay Formation and it contains viscous oil. The successful discovery of the Harbour oil field encouraged further drilling in the area resulting in the successful Pilot discovery.

Figure *17* Harbour Discovery



Source: Sproule

Selected additional exploration potential of the company's portfolio that we have not explicitly valued is provided in Table 16.

Table *16* Summary of Additional Exploration Potential in Orcadian Energy's Portfolio

Field	Best-Estimate Prospective Resource *(mmb; oil)*	Resource Classification	Source	% Orcadian	Licence
Pilot Channels	29.1	Best Estimate Prospectie Resource	Sproule	100%	P2244
Elke Extension	60.6	Best Estimate Prospectie Resource	Sproule	100%	P2482
Tiberius	28.4	Best Estimate Prospectie Resource	Sproule	100%	P2482
Bottlenose	30.4	Best Estimate Prospectie Resource	Sproule	100%	P2482
Total	**148.4**				

Source: Sproule

Background on Polymer Flooding

General Background on Polymer Flooding

Polymer flooding is a straightforward technique with a lengthy commercial history and proven results. The risks associated with polymer flooding techniques are low. Polymer flooding consists of injecting polymer-augmented water into oil reservoirs in order to improve oil recovery relative to non-polymerised water. (source: Antoine Thomas – Polymer Flooding – 2016).

Polymers increase the viscosity of water. Viscosity is a measure of a fluid's resistance to flow. Under normal atmospheric conditions, water has a viscosity of 1 centipoise (cP).

Water is commonly injected into reservoirs to maintain reservoir pressure and to push or sweep the oil to producing oil wells – both effects increase the amount of oil recovered from oil reservoirs.

Oil is relatively viscous and less mobile than water. For this reason, the water that is injected into reservoirs tends to streak towards oil production wells. As a result, injected water bypasses oil. The relative mobility of water relative to oil determines the degree to which water tends to streak or finger its way to productive wells, bypassing oil that could otherwise be produced. As water fingers towards productive wells it tends to "water out the wells" meaning that they produce more water and less oil over time.

Polymers have the effect of reducing the mobility of injected water. This changes the all-important ratio of the mobility of injected water relative to the mobility of the oil in place. As a result, fingering and streaking of the injected water towards productive wells is reduced. Polymer flooding favours an equal progression of the water-front towards producing wells. This is shown in Figure 18.

The oil-water mobility ratio is expressed mathematically in the equation:

$$\boldsymbol{Mobility\ Ratio} = \frac{\boldsymbol{Mobility\ of\ Oil}}{\boldsymbol{Mobilty\ of\ Water}}$$

$$\boldsymbol{Mobility\ Ratio} = \frac{\boldsymbol{Viscoscity\ of\ Oil} \times \boldsymbol{Effective\ Reservoir\ Permeability}}{\boldsymbol{Viscosity\ of\ Water} \times \boldsymbol{Effective\ Reservoir\ Permeability}}$$

Polymer flooding strategies are particularly effective when:

i) The oil being displaced is viscous. Heavier oil tends to be more viscous.

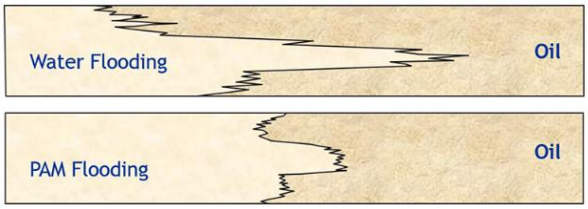
ii) There is a heightened degree of a variability in the reservoir. Polymers reduce the tendency of water to finger through the most permeable path to the productive well, favouring a broad water-front that pushes a greater amount of oil to the productive wells.

According to one expert (Antoine Thomas – Polymer Flooding – 2016) polymer injection tends to increase the recovery rate of oil in place by 10% as a rule of thumb.

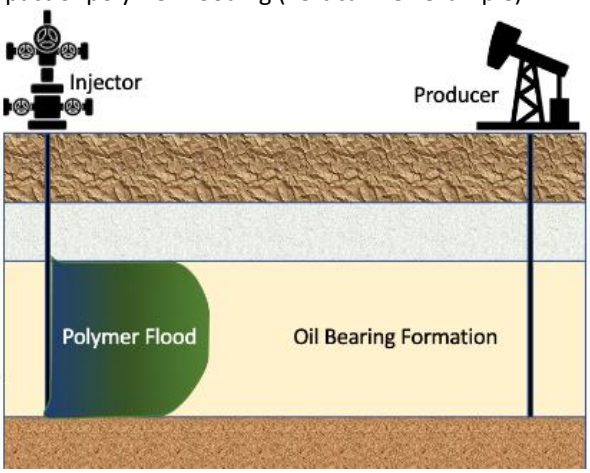
There is widespread acceptance that polymer flooding is most effective when implemented from the beginning.

Figure *18* Schematics showing the effects of waterflooding

Example #1 of impact of polymer flooding



Example #2 of impact of polymer flooding (vertical well example)



Sources: Intechopen and Creative Commons (citing: Polymer Injectivity Test Design Using Numerical Simulation, 2020, Mohamed Adel Alzaabi *et al*.)

Screening for Suitable Polymer Flooding

Source throughout: Data Analysis and Updated Screening Criteria for Polymer Flooding Based on Oilfield Data – Laila Doa Saleh, Mingzhen Wei and Baojun Bai – Society of Petroleum Engineers, Reservoir Engineering & Evaluation – February 2014

Based on the analysis of 250 polymer projects worldwide, the screening criteria for successful polymer flooding projects are as provided in Table 17.

Table *17* Screening Criteria for Polymer Flooding

Parameter		Unit	Criteria	Pilot Main
Oil gravity	>	°API	12	12-17
Oil viscosity	<	cP	5,000	160-1200
Temperature	<	°C	99	31
Porosity	>	%	4.1%	36%
Oil saturation (start; So)	>	%	21%	90%
Permeability	>	mD	0.6	2,000-8,000

Source: Society of Petroleum Engineers, Reservoir Engineering & Evaluation – February 2014

Other factors that affect the success of polymer flooding are as follows:

i) Polymers are negatively affected by high-salinity levels in the injected water. Therefore, in an offshore environment water must first be purified.

ii) Even if polymer flooding is designed to reduce the effects of reservoir heterogeneity, variability in reservoir permeability remains relevant.

Polymer Flooding at Captain Field in UK North Sea

The Captain field lies approximately 90 miles (145 km) north-east of Aberdeen, Scotland, in the Outer Moray Firth, in water depths of around 346 feet (105.5 m). Discovered in 1977 in Block 13/22a, the Captain field achieved first production in March 1997.

Figure *19* Captain Floating Production Storage and Offloading (FPSO) Vessel

Source: Ithaca Energy

For many years, the Captain field was produced via a waterflood strategy. However, significant amounts of bypassed oil remained in place due to the "coning" effect of water that rushed to productive wells, bypassing oil in place.

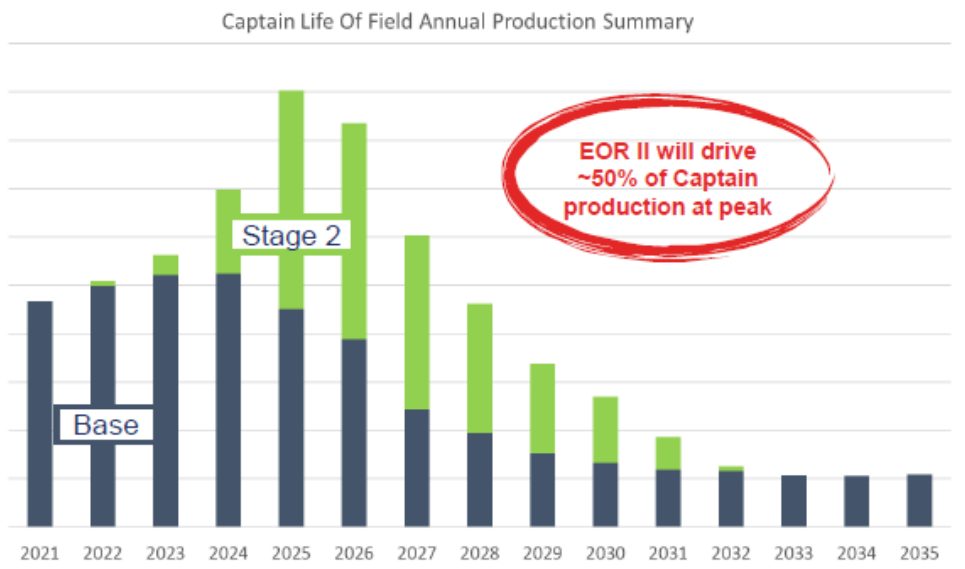
"Operational approval of the Captain EOR project progresses the application of a technology that has demonstrated an improved recovery rate, which can now be applied to other fields" – Greta Lydecker, Chevron Upstream Europe Managing Director – 2018

In 2018, Chevron, then-operator of the Captain field, received Field Development Plan approval from the UK Oil & Gas Authority to undertake a polymer flood project at the Captain field. This project was intended to produce bypassed oil and oil that would otherwise not be produced.

Although polymer flooding is applied extensively around the world, it was initially applied in onshore situations. This was the first large-scale polymer injection project undertaken in the UK North Sea.

Due to the success of the polymer flooding strategy at the Captain field, Ithaca Energy, the current operator of the Captain field, announced, in 2021, that it intends to make a circa £400M investment in a Phase 2 polymer project to recover an additional 40 million barrels of oil equivalent of incremental resources from the field. According to Ithaca Energy, first oil from the Phase 2 polymer flood is expected in early 2023, before reaching peak production in 2025/2026 (Figure 20).

Figure *20* Expected impact of stage-2 polymer flood at Captain field



Source: Ithaca Energy

The Captain reservoir is a massive, blocky sandstone with relatively heavy oil. The key parameters of the Captain reservoir are provided below.

Table *18* Captain Oil and Reservoir Parameters

Parameter	Unit	Captain
Oil gravity	°API	19-22
Oil viscosity	cP	47-150
Temperature	°C	31
Porosity	%	31%
Oil saturation (start; So)	%	91%
Permeability	mD	5,000

Source: Articles published by SPE and Geological Society

Importantly, the Captain field proved the following operational challenges can be overcome in a UK North Sea context:

i) There is no surface discharge of water at the Captain field.

ii) The field produces relatively heavy oil via paired producer and injector wells, which are spaced 250m apart.

The Captain Field has an estimated oil in place of 1,000 million barrels (*source: The Captain Field – S.J. Pinnock et. Al. – Geological Society – 2003*).

If the Captain Field were produced only with a water flood strategy, the expected recovery rate would be 30%. (*source: UK Oil & Gas Authority*).

The expected incremental recovery factor from the Phase-1 polymer flood at the Captain field is 5% (*source: UK Oil & Gas Authority*).

The expected incremental recovery factor from the Phase-2 polymer flood at the Captain field is 4% (*Source: Ithaca Energy*).

All in all, the recovery factor from the Captain field is expected to be 39%. The recovery factor would be higher if polymer flooding was applied as the initial strategy rather than as a secondary injection strategy.

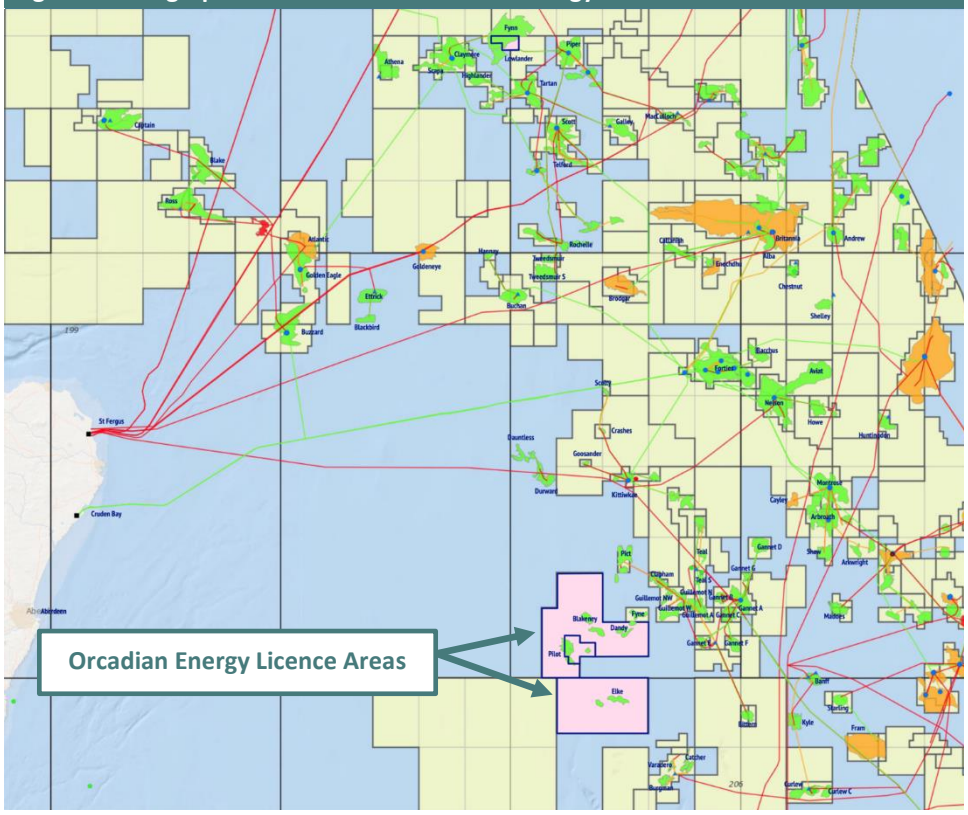
The Captain field comprises a wellhead platform and a bridge-linked platform connected to a floating production, storage and offloading vessel (FPSO). The Captain field produces from 36 wells and it has 12 injector wells.

Regional Geology

Orcadian Energy's asset base is regionally concentrated and focused on one geological strata, the Tay Formation of Eocene Age.

The geographic locations of Orcadian Energy's key licence areas relative to the northeast Scottish coastline are provided in Figure 21.

Figure *21* Geographical Locations of Orcadian Energy's Licence Areas

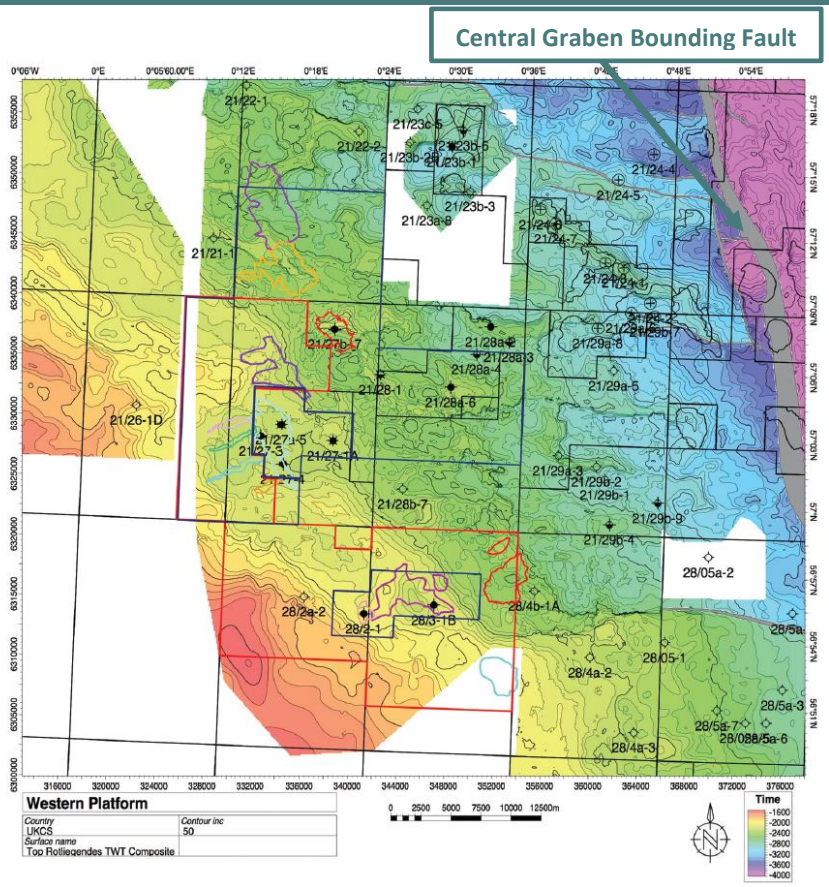


Source: Orcadian Energy

Regional Setting

The area sits on the Western Platform/Western Central Shelf within the Central North Sea to the west of the main Central Graben basin-bounding fault (Figure 22).

Figure *22* Regional Setting, Structural Map (Top Rotliegend Group; Lower Permian)



Source: Orcadian Energy

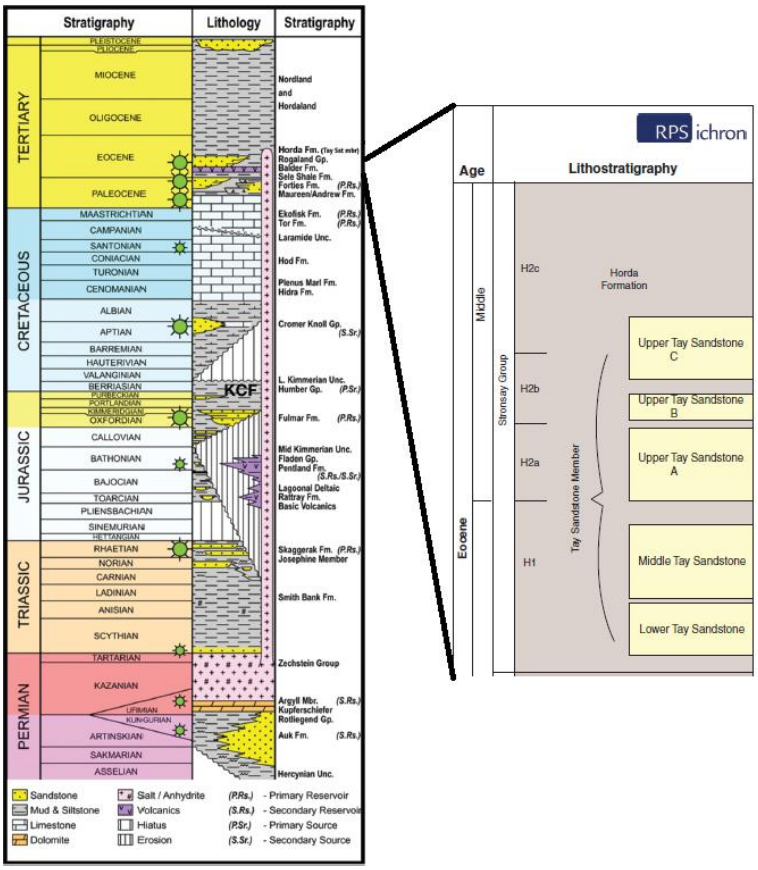
The Western Platform forms the largely unfaulted rift shoulder to the Jurassic aged Central Graben rifting event. During the Tertiary, uplift much further to the west associated with the opening of the North Atlantic created a major siliciclastic (sand) sediment source. This resulted in a series of progradations of sediments from the west during the Palaeocene and Eocene periods, concurrent with the sedimentation of the Central Graben.

As is common elsewhere in the North Sea, the area has been heavily affected by halokinesis as a result of the deposition of evaporates (salt) during the Upper Permian (Zechstein Group). This created mini basins during the Triassic.

Stratigraphy and Sub-Regional Geology

The regional stratigraphy is shown in Figure 23.

Figure *23* Regional Stratigraphy



Source: Orcadian Energy

In the case of the Pilot, Blakeney and Feugh area, turbidites are interpreted to have been ponded by the development of low-relief salt swells.

To the south at Elke and Narwhal, the Tay Sandstones filled younger channels cut into older channels. Based on seismic response, it appears that the channel fill contains both sandstone and mudstone.

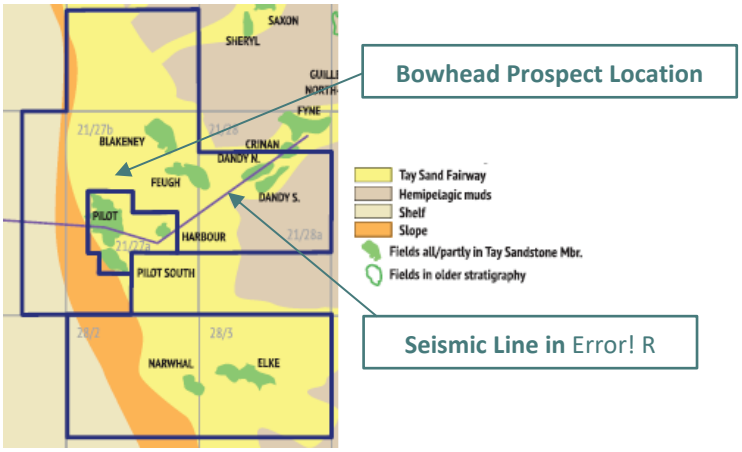
Tay Sandstone

The Pilot, Elke, Narwhal and Blakeney oil discoveries as well as the Bowhead prospect lie within the Tay Sandstones on the Western Platform located to the west of the Central Graben. The Tay Sandstones are of Middle Eocene age and were deposited in a deep marine environment. The sands were deposited as turbidite flows sourced from a shelf immediately to the west.

The Tay Sandstone reservoirs are generally shallow. Pilot lies at depths of about 2,700 feet (822 meters) and Narwhal, Elke and Blakeney lie at depths of about 3,300 feet (1,006 meters).

The locations of the company's oil discoveries, all in the Tay Sandstone, are shown in Figure 24.

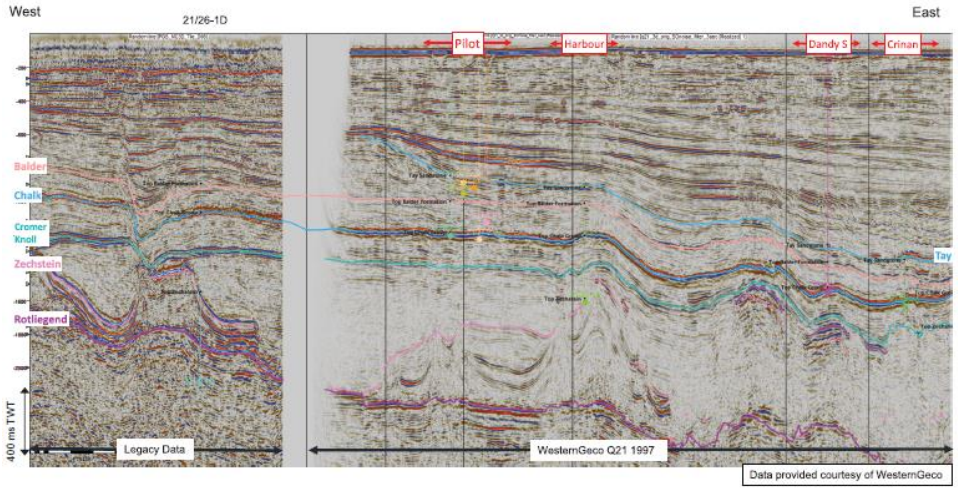
Figure *24* Locations of Orcadian Energy's Discovered Oilfields



Source: Orcadian Energy

The seismic line cutting across Figure 24 is shown in Figure 25.

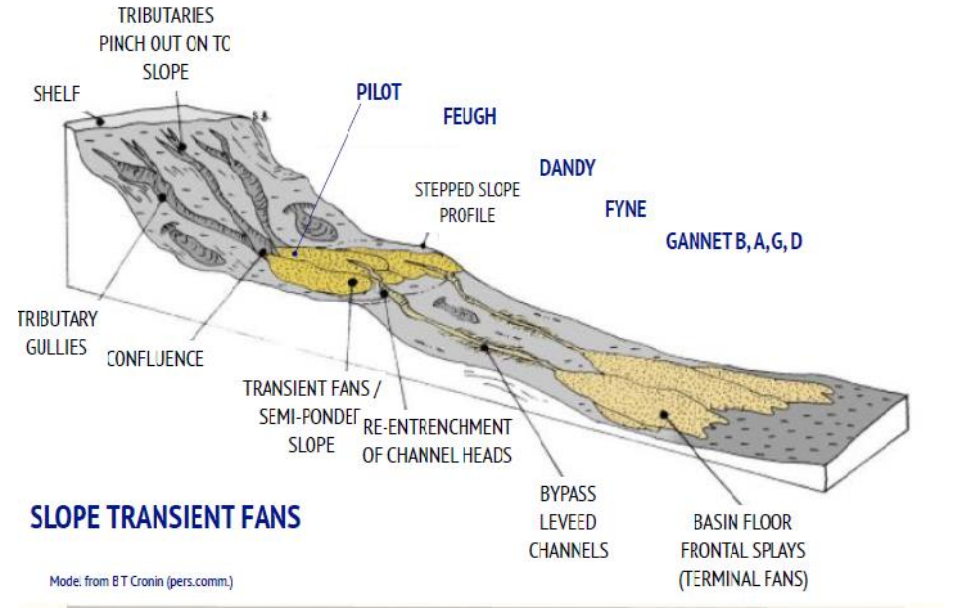
Figure *25* Sub-regional Seismic Cross Section



Source: Orcadian Energy

The depositional environment of the Pilot reservoir as shown in Figure 26 is also instructive to understand the regional geology of the Tay Formation.

Figure *26* Depositional Environment of Tay Sandstones



Source: Orcadian Energy

Petroleum System

Seal:

The Tay Sandstone is overlain by the sealing shales of the Hordaland and Nordland groups.

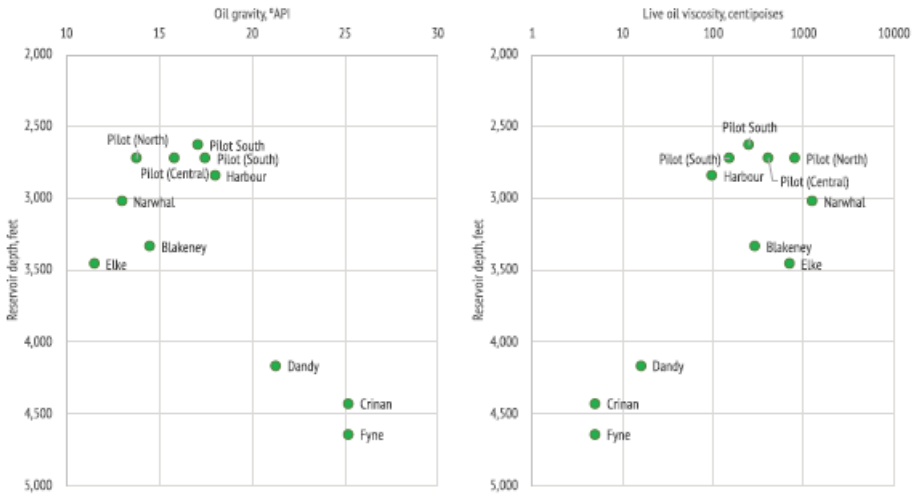
Oil and Migration:

The oil of the region's oil discoveries is sourced from the Upper Jurassic Kimmeridge Clay Formation. The nearest source rocks are 35 kilometres eastwards of the Pilot Field. Oil migrated via faults and fractures in the western margin of the Central Graben. From there, oil enters directly into the Tay Sandstones.

The oilfields in the region contain bio-degraded oil.

Regional oil gravity varies from 19° API in the Harbour discovery to 12° API in the northern end of the Pilot Field. Regionally, the shallower the oil, the more it is viscous and heavy, as seen in Figure 27.

Figure *27* Regional Density-Depth and Viscosity-Depth Plots



Source: Orcadian Energy

Trap:

Both stratigraphic and structural traps are proven in the area.

Reservoir:

The Tay Sandstones throughout the area generally exhibit very good reservoir properties with high porosities and permeabilities.

The reservoirs of the area are typically massive clean sand bodies in which shales are absent. However, in the more distal discoveries such as Fyne, Dandy and Crinan, the sandstone quality deteriorates and becomes more interbedded, resulting in lower net-to-gross reservoir ratios.

Reservoirs consisting of Tay Sandstones are, in general, of a very high-quality; nevertheless, there are differences in the reservoir qualities of each discovery and this is discussed in detail in respect of each field.

Oil and Reservoir Parameters

A summary of Orcadian Energy's oil and reservoir parameters is provided in Table 19.

Table *19* Summary of Oil and Reservoir Parameters

Parameter	Unit	Pilot Main	Pilot South	Blakeney	Elke	Narwhal
Reservoir						
Depth to crest	ft	2,560	2,560	3,263	3,358	2,942
Depth of gas-oil contact	ft	2,698	n.a.	n.a.	n.a.	n.a.
Depth of oil-water contact	ft	2,724	2,631	3,336	3,458	3,022
Max oil column	ft	63	n.a.	73	100	80
Max gas column	ft	20	n.a.	n.a.	n.a.	n.a.
Gross thickenss	ft	70	50	150	195	175
Average porosity	%	36%	30%	34%	34%	34%
Average net to gross	%	99%	98%	100%	97%	99%
Average permeability	mD	2,000-8,000	2,000-8,000	up to 13,000	3,000-4,000	n.a.
Temperature	°C	31	31	41	45	32
Initial Pressure	psi	1,228	n.a.	1,487	1,558	1,320
Hydrocarbons						
Average hydrocarbon saturatic	%	90	90	90	89	80
Oil gravity	°API	12-17	17	14.5	12	14
Gas/oil ratio	cf/b	83	83	95	122	55
Formation volume factor	FVF	1.03	n.a.	1.08	n.a.	n.a.
Oil viscosity	cP	160-1200	160	291	300-800	1,260
Expected production						
STOOIP	mmb	230.0	33.0	91.0	130.0	26.4
Expected recovery factor	%	30%		28%	34%	34%
Recoverable resources	mmb	78.8		25.1	43.8	8.9
Resource category		2P	2P	2C	2C	2C

Source: Orcadian Energy; The Pilot, Elke, Blakeney, Narwhal, Harbour and Feugh Fields (Stephen A Brown et al. – Geological Society – 2020); Sproule CPR

Licence Considerations

UK Oil & Gas Authority Licencing Regime

Except in special circumstances, production licences run for three successive periods or Terms. These Terms are commonly associated with a particular activity:

i) **Initial Term:** Exploration activity is typically undertaken during this term. The licence will expire at the end of the Initial Term unless the Licensee has completed an Initial Work Programme. Typically 50% of the acreage is surrendered at the end of the Initial Term.

ii) **Second Term:** There is no work programme in relation to the Second Term. Instead, a licence typically expires at the end of the Second Term unless the Oil & Gas Authority has agreed a Field Development Plan or, in exceptional cases, a licence extension. The approval of a Field Development Plan also represents a commitment on the part of the licence holders to execute the project. Therefore, the Oil & Gas Authority must be satisfied that the licence holders are able to fund the project through to completion for them to approve the Field Development Plan.

iii) **Third Term:** The Third Term is the project execution and production period.

In the case of Offshore Innovate Licences, the Initial Term is subdivided into three phases, with the work programme being correspondingly divided:

i) **Phase A:** Phase A is a period for carrying out geotechnical studies and geophysical reprocessing.

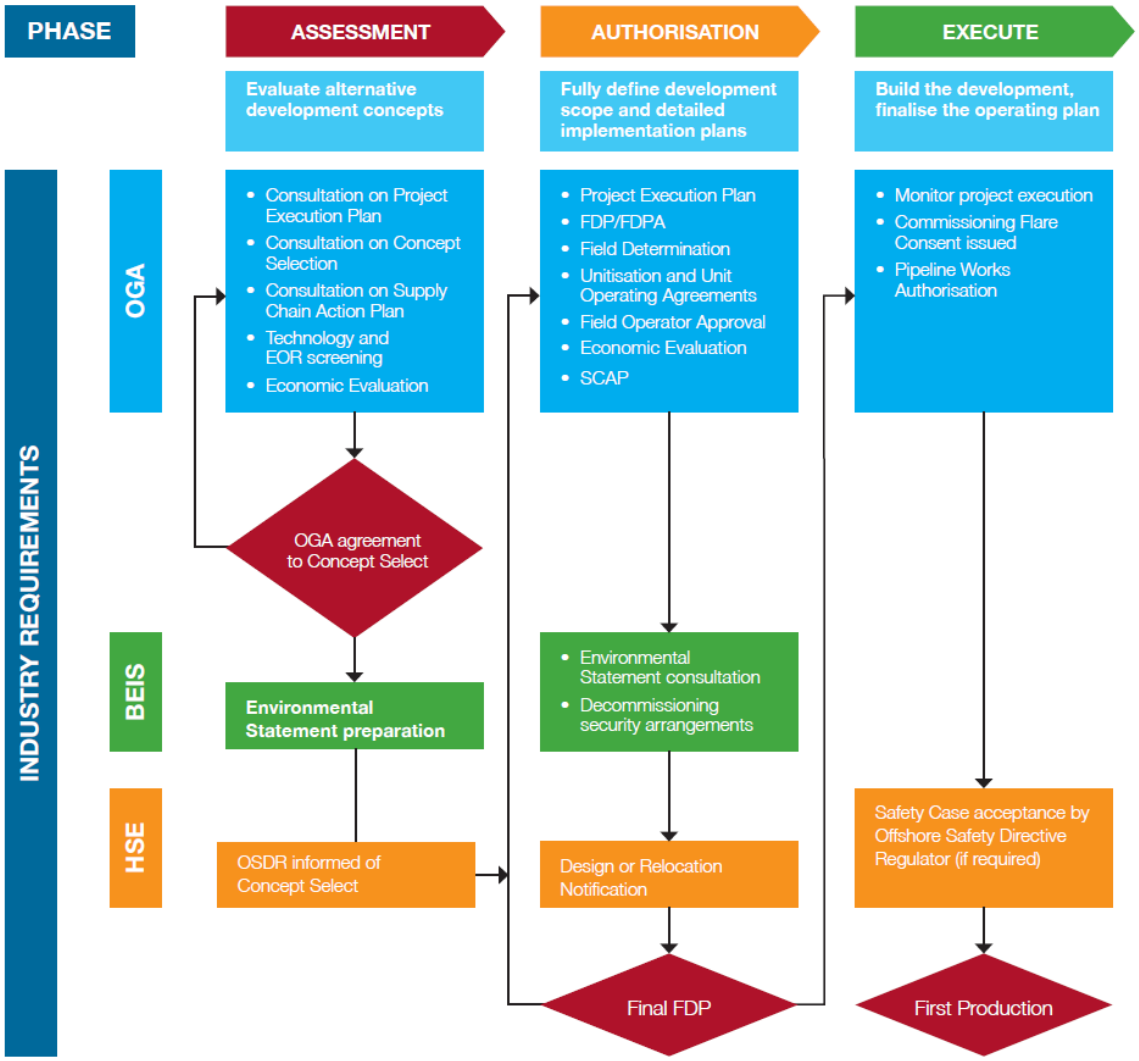
ii) **Phase B:** Phase B is a period for undertaking seismic surveys and acquiring other geophysical data.

iii) **Phase C:** Phase C is a period for drilling.

Phases A and B are optional and depend on the applicants' plans; however, for the Initial Term every work programme must contain a Phase C or a drilling programme.

The field development roadmap in Figure 28 provides an outline of the three main stages of the Oil & Gas Authority's field development process.

Figure *28* Field Development Roadmap



Source: UK Oil & Gas Authority

Orcadian Energy's assets by licence are provided in Table 20:

Table *20* Orcadian Energy's Assets by Licence

Licence	% Held	Core Assets	Upside & Satellite Fields
P2244	100%	Pilot	Harbour & Pilot Channels
P2320	100%	Blakeney; Bowhead (prospect)	Feugh, Dandy & Crinan
P2482	100%	Narwhal & Elke	Elke Extensions; Tiberius (propspect); Bottlenose (prospect)
P2516	50%		Fynn-Beauly; Fynn-Andrew

Source: Orcadian Energy

The licence status of each of Orcadian's licences is provided in Table 21.

Table *21* Status of Orcadian Energy's Licences

Licence	Term / Phase	Phase End	Term End	Key Works in Current Term
P2244	Second Term	n.a.	30 Nov. 2022	FDP Submission
P2320	First Term - Phase A	14 May 2022	14 May 2024	3D Seismic Acquisition over Bowhead & Pilot
P2482	First Term - Phase A	14 Jul. 2022	14 Jul. 2027	Geological & geophysical analysis
P2516	First Term - Phase A	30 Nov. 2023	30 Nov. 2026	Geological & geophysical analysis

Source: Orcadian Energy

Additional background information in respect of each licence is provided below:

P2244: Orcadian Energy intends to secure a farm-out and to support the farminor to deliver a Field Development Plan to the Oil & Gas Authority. The company's strategy is to progress work programmes that do not restrict future developmental and operational choices. This is because Orcadian Energy believes that i) the Farminor will want control over key engineering and design decisions and because ii) the Field Development Plan may in due course reflect the specific parameters of the FPSO vessel that is secured to produce the field. In light of the two key preconditions for the Oil & Gas Authority to approve a Field Development Plan, namely, the provision of project funding and the submission of a Field Development Plan, we believe that Orcadian Energy may well, in due course, request a licence extension.

Orcadian Energy's objective is to secure a development partner to participate in the project at the equity level – and to fund Orcadian's remaining interest in the project. In parallel, the company intends to secure an alliance of contractors (service companies and supply chain companies) to deliver a fully financed Field Development Plan. The processes are interrelated and there is flexibility to adapt the arrangement to achieve optimal outcomes.

Although we expect this to be a preoccupation of Orcadian Energy, we believe that a licence extension should not be problematic. We have seen in several instances that the Oil & Gas Authority has already provided licence extensions to accommodate the effects of COVID-19. In general, we have observed that the Oil & Gas Authority has supported operators and has provided licence extensions so long as the operators are acting in good faith and can show significant licence work is being progressed.

Orcadian Energy has submitted a concept select report to the Oil & Gas Authority in respect of which the company is completing a polymer coreflood analysis, a polymer flood risk analysis and emissions reduction studies.

P2320: Orcadian Energy has committed to acquire new seismic data over the Bowhead prospect and the Pilot discovery. The seismic will allow the company to make a drill-or-drop decision. If the company decides not to drill Bowhead, the licence would lapse. The company has until May 2022 to make a commitment to drill a well in the licence, or drop it.

P2482: Orcadian Energy is due to enter Phase B of this licence in July 2022. At which point, the company must commit to shoot 40km^2 of 3D seismic and acquire 120km^2 of 3D seismic. The company has until July 2025 to complete this work and to make a commitment to drill a well in the licence, or drop it. It is possible that opportunistically the company might agree to commit $1M to a seismic acquisition in 2022. This could take advantage of the opportunity to secure participation in a larger shoot which would lower the acquisition costs of the seismic.

P2516: In-house analysis will be undertaken until November 2023 when a drilling decision must be made.

Environmental Considerations

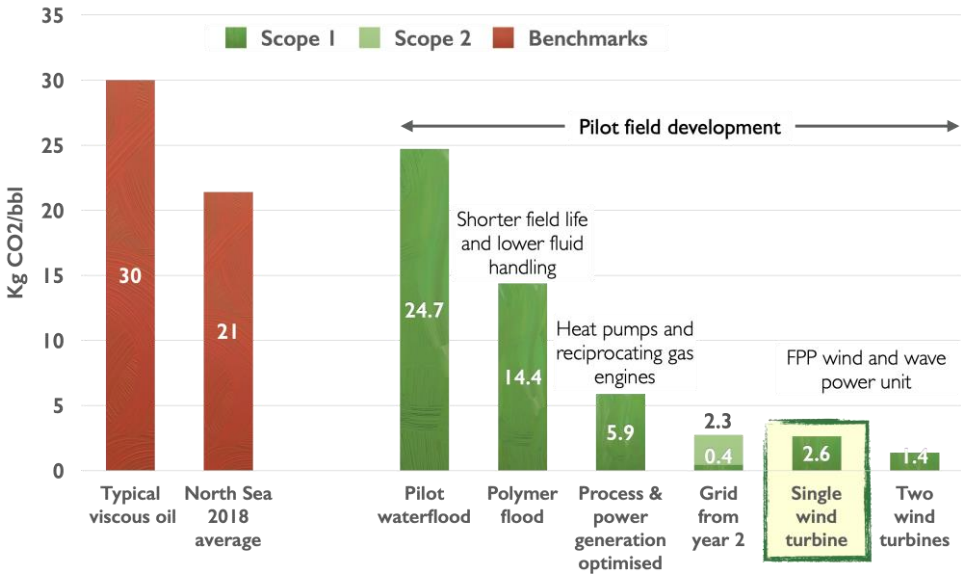
Orcadian Energy is fully committed to supporting the OGA in its work to enable the achievement of the UK government's commitment to reach net zero emissions by 2050.

The OGA has set a goal to drive the industry to net zero carbon dioxide emissions across the UKCS as quickly as possible. Importantly, Government forecasts show that oil and gas will remain an important part of our energy mix for the foreseeable future, including in a net zero emissions scenario.

Polymer flooding dramatically reduces carbon dioxide emissions for a viscous oil development. Orcadian Energy has identified opportunities to further reduce its carbon dioxide emissions. Specifically, the company has progressed innovative design and engineering concepts involving the use of enhanced efficiency power generators, making a power connection to local wind farms and/or tying the Pilot project into the national electrical grid.

The evolution in potential carbon emissions related to the development of the Pilot field is shown in Figure 29.

Figure *29* Evolution of potential carbon emissions from the Pilot field development



Source: Orcadian Energy

Whereas many offshore facilities clean excess water before discharging it into the ocean, Orcadian Energy has taken measures to design production and processing facilities that have no water or fluid discharge at all.

We believe that Orcadian Energy is setting an extremely high environmental standard in respect of commercialising the Pilot oil field and surrounding fields. We believe this is critical because it will i) ensure the company maintains the support of the UK Oil & Gas Authority, ii) increase attractiveness of the company's assets to potential farmin partners and iii) increase the attractiveness of the opportunity to investors whose investment mandate may be driven by ESG factors.

Financial, Tax & Shareholder Analysis

Cash and Debt

From 2014 to 2019, Orcadian Energy has been financed by the directors, some individual investors and by a loan from Shell Trading International Limited ("Shell").

The provision of a $1.0 million facility by Shell to secure offtake rights is reflective of the attractiveness of the crude oil expected to be produced by Pilot and its satellite fields. We understand that Shell undertook extensive due diligence on the Pilot project before making the decision to provide the facility.

Royal Dutch Shell

Pursuant to a facility agreement dated 22 July 2019 between Shell and Orcadian Energy, Shell agreed to provide Orcadian Energy with a secured term loan facility of $1.0 million. The loan was fully drawn on 23 August 2019 and remains outstanding. The interest rate on the loan is 5% per annum margin above LIBOR and is rolled up and compounded and repayable on the repayment date, being the earlier of four years from draw down and three months after first oil (the date on which the Pilot field commences commercial production). Orcadian Energy can prepay the loan, in full or in part, without penalty together with interest accrued on the amount prepaid.

In connection with the facility agreement, pursuant to an offtake agreement dated 22 July 2019 between Orcadian Energy and Shell, Shell has agreed to take delivery of all Pilot Crude Oil produced until 18 months from the time of first oil or until 12 million barrels are delivered (or the loan repaid in full).

We understand that Shell undertook extensive due diligence in respect of the Pilot field in connection with its decision to provide Orcadian Energy with a $1.0 million facility.

UK Oil & Gas Tax Regime

The marginal tax rate for profits generated from oil & gas production in the UK is 40% (for new projects such as those being advanced by Orcadian Energy). This consists of 30% pertaining to the Ring Fenced Corporation Tax and 10% pertaining to a Supplemental Charge.

The system of field allowances that reduced the amount of the Supplemental Charge has been replaced by an allowance reflecting the time value of capital invested in projects. Specifically, the Ring Fence Expenditure Supplement (RFES) assists companies that do not yet have sufficient taxable income for ring fence corporation tax purposes against which fully to set their exploration, appraisal and development costs. The RFES currently increases the value of losses carried forward from one accounting period to the next by a compounded interest rate of 10%p.a., for a maximum of 10 years, not necessarily consecutively. (source: UK HMRC)

Shareholder Structure

The company's current shareholder structure is provided below (excluding convertible loan notes). The company currently has no options or warrants outstanding.

The company has 63,755,174 shares outstanding.

The company's shareholding structure is provided in Table 22.

Table *22* Shareholder structure

Disclosable shareholders	Number of Shares	%
Stephen Brown and spouse	29,164,683	45.8%
Gregory Harding	8,191,680	12.9%
RAB Capital Holdings	5,357,143	8.4%
Alan Hume	3,808,389	6.0%
Joseph Darby	420,000	0.7%
Christian Wilms	420,000	0.7%
Other	16,268,279	25.6%
Total	**63,630,174**	**100.0%**

Source: Orcadian Energy

On 31 December 2018, 2,063,560 ordinary shares were issued for a consideration of £0.10 per share.

On 9 March 2020, 59,924 shares were issued in relation to the conversion of 2018 Convertible Loan Notes at a conversion price of £1.30 per share.

During April and May 2021, Orcadian Energy undertook a reorganisation that involved an issue of two bonus shares for every share outstanding (which tripled the number of shares outstanding); a share swap so that the shareholders of the operating company Orcadian Energy (CNS) Ltd became the shareholders of a new holding company Orcadian Energy Ltd; and finally, that company was re-registered as a PLC to enable the listing. Table 22 reflects these developments.

£330,000 was raised from Convertible Loan Notes in July 2020 and £50,000 in early 2021. These Convertible Loan Notes converted automatically into common shares at the time of the IPO at a conversion price equal to the IPO price less a 30% discount.

In March 2021, £720,000 was raised by the issue of Convertible Loan Notes. These Convertible Loan Notes converted automatically into common shares at the time of the IPO at a conversion price equal to the IPO price less a 30% discount.

Orcadian Energy listed on the AIM market of the London Stock Exchange on 15 July 2021. In conjunction with its initial public offering, the company raised £3.0m at a price of 40p per share.

Board of Directors

Joe Darby, Non-Executive Chairman

Mr. Darby was educated at the Royal School of Mines where he obtained a first class honours degree in petroleum engineering in 1969. His early career was in drilling and production operations with Amoco and Shell International culminating in reservoir engineering in The Hague, and in Shell UK, engaged mainly in reservoir simulation. After leaving Shell, he joined Thomson North Sea and was involved in the development and production of the Piper and Claymore fields in the UK North Sea. He established US and Canadian businesses for Thomson, before joining LASMO plc when it acquired Thomson North Sea in 1989. At LASMO he was appointed to the Board and later became the CEO. Under his leadership LASMO production grew to 170,000 barrels of oil equivalent per day. LASMO was acquired by Eni in 2001. Since that time, he has served on several boards as non-executive director or Chairman. These include Faroe Petroleum, where he was Chairman when the company listed, Mowlem plc, British Nuclear Fuels plc, Centurion Energy and Premier Oil, where he was the Senior Independent Non-Executive Director. He has also served on the board of Alkane Energy and was an Advisor to the board of Setanta Energy BV. He is currently Senior Independent Director at Gulfsands Petroleum plc.

Stephen Brown, Chairman and CEO

Mr. Brown graduated from Peterhouse Cambridge with a degree in Chemical Engineering in 1981, before joining BP as a petroleum engineer. At Cambridge he twice rowed for, and was President of, Cambridge University Lightweight Rowing Club. Mr. Brown has now been employed in the oil industry in a wide range of technical, strategic and executive positions for thirty-nine years. He is deeply experienced in all aspects of oil and gas field management and financing having worked as an Operator, Joint Venture partner, Contractor and Consultant. During his career he has led three oil companies, one public, one private and this one in the process of listing. In his earlier career he was responsible for two of BP's most successful North Sea developments, the Andrew and Harding oil fields. He led the pre-project team for the Harding development which selected the development concept and reservoir depletion mechanism. Harding achieved a 74% recovery factor and was one of BP’s lowest cost developments despite being one of the first heavy oil fields to be developed in the UKCS. He was Operations Manager for the Andrew field during the project execution phase, and acted as Alliance Board secretary, a position which gave him insight into the operation of the Andrew Alliance. The Andrew Alliance was an innovation in BP’s approach to project execution which delivered a step change in project performance on the Andrew development. He also initiated the formation of the Andrew Well Engineering Alliance. After leaving BP he joined Halliburton and assisted in the acquisition of the Sangu gas field in Bangladesh and the Fyne and Dandy fields in the North Sea. He then founded and managed a successful oil and gas management consultancy for five years (now part of SLR), before joining Petrofac. As VP Business Development for Petrofac Resources he developed numerous investment opportunities, including the acquisition of the Cendor field in Malaysia and the Elke field in the UKCS. He returned to BP in a consultancy role, as Procurement Vice President Corporate and Functions, before founding and listing the Canadian junior Exile Resources as CEO. He was also founder, CEO and co-owner, alongside Aker ASA, of Setanta Energy BV, a development and production company focussed on Gabon and Operator of the Roussette development project. He built the Setanta team and company and prepared the company for IPO prior to Aker’s decision to sell the company. In 2014, with Mr. Harding and others, he founded Orcadian Energy to submit a licence application for the

Pilot discovery, which Mr. Brown believed to be highly analogous to the Harding field. Mr. Brown is the CEO of Orcadian Energy.

Alan Hume, Chief Financial Officer

Mr. Hume is an experienced CFO with significant experience in the oil and gas exploration and production sector as well as the broader energy market. Mr. Hume has held senior finance and commercial roles in the oilfield services, engineering, construction and energy production sectors. Mr Hume's career started with Halliburton Manufacturing & Services in Aberdeen before moving to London and working for an engineering company. Mr Hume then moved to Stavanger to work for Rockwater, a Brown & Root company, before moving to Johannesburg to take on the role of Finance & Commercial Director for another Brown & Root company with responsibilities covering a significant part of Sub-Saharan Africa. Mr. Hume moved back to the UK to take on a senior finance role at European Marine Contractors (a joint venture between Brown & Root and Saipem) before moving to a head office role. In 2000, Mr Hume accepted a position at Edison Mission Energy, a subsidiary of American power giant Edison International, where he held financial reporting responsibility for power generation sites in Italy, Spain, Sicily, Turkey as well as the UK. After a short spell as CFO in the UAE, Mr Hume returned to the UK and has held CFO roles in private and listed companies in Canada and the UK. During this time, he had experience in bringing companies to market as well as leading acquisition and disposal activities. Mr Hume has been with Orcadian Energy since January 2018. Mr Hume is a Fellow of the Chartered Institute of Management Accountants.

Greg Harding, Technical Director

Mr Harding graduated from Imperial College, London with a degree in Chemical Engineering in 1985, before joining British Gas as a process engineer and later offshore production engineer in the North Sea Rough Field. He is a Chartered Engineer, European Engineer, and a member of the Society of Petroleum Engineers, the Energy Institute and the Institute of Chemical Engineers. His career in the oil industry covers a period of thirty-four years during which time he has worked for Operators, Non-Operating Partners and Consultants, primarily in the fields of petroleum and reservoir engineering. On leaving British Gas, Mr Harding joined Gaffney Cline & Associates where he gained a wealth of international experience in reserves assessment, subsurface development studies and asset evaluation. He then joined Union Texas Petroleum where he was the company's technical representative in the Alba Field Joint Venture, during development of one of the North Sea's early heavy oil projects. Following the takeover of Union Texas by Arco, Mr Harding joined Kerr McGee Oil and was the company's technical representative in four joint ventures including BP's Wytch Farm field where a programme of record-breaking extended reach drilling was underway. Since leaving Kerr McGee in 1999, he has been an independent reservoir engineering consultant to a number of organisations including SLR Consulting (formerly Challenge Energy) and Premier Oil. The role at SLR has involved acting as a Reservoir Engineering Expert in a number of legal cases as well as supervising the engineering aspects of numerous technical and asset evaluation studies. Over the same period, Mr Harding has made a significant contribution to the establishment of three new-start oil companies. He was Technical Director of Mercury Oil & Gas, which successfully raised seed capital to pursue production and exploration opportunities in Brazil, and was acquired by Eromanga Hydrocarbons (Australia). In the 5 years to 2013 he was Reservoir Development Manager for Setanta Energy, where he supervised subsurface and facilities development screening activities for the Roussette oilfield offshore Gabon. In 2014, he joined Mr Brown in the establishment of Orcadian Energy to submit a licence application for the Pilot Field, and has since been responsible for conceptual subsurface development planning for the field.

Christian Wilms, Non-Executive Director

Mr. Wilms graduated from RWTH Aachen, Germany in 1998 as a physicist. In the same year he joined Shell International E&P and was initially trained as a geophysicist. After three years he changed technical discipline to reservoir engineering where he worked on a heavy oil field development based on steam flood. During his more than 20 years with Shell, Mr. Wilms took on various technical and leadership roles in The Netherlands, Nigeria, Qatar, United States and the United Kingdom. In 2019 he moved to MOL Group as Senior Vice President - Subsurface & Field Development where he oversees green and brown field developments for the group including enhanced oil recovery projects based on CO2 injection and polymer surfactants. Further Mr. Wilms is accountable for Group reserves and he supports business development regarding all field development aspects. Lately carbon capture and storage (CCS) was added to his portfolio. As non-executive director, his advisory focus is on integrated field development, EOR processes and reserves. Mr Wilms is the MOL Group's principal representative at the International Association of Oil and Gas Producers.

Tim Feather, Non-Executive Director

Mr. Feather graduated in Law in 1990 from the University of Nottingham, following which he qualified as a chartered accountant with Touche Ross (now Deloitte), based in the UK and latterly in Australia. In 1995 he joined Henry Cooke Lumsden, specialising in providing corporate advice and broking services to companies on the newly formed AIM. He then co-founded a corporate broking division at Brown Shipley, one of the longest standing merchant banks in the City. In 2003 he co-led a management buy-out of that business, forming Westhouse Securities Limited, where as Head of Corporate Finance he focused on advising oil and gas and mining companies. He later joined WH Ireland plc as Corporate Finance Director. In 2018 he became Business Development Director at Sumner Group Holdings Limited, a private conglomerate with interests in mining, healthcare and technology. He became Chief Financial Officer of Sumner Group Mining plc, the mining subsidiary of the group, in 2019. He has over 25 years of public company experience and was an AIM Qualified Executive for many years.

Financial Statements

Orcadian Energy's financial statements are provided below.

Income statement (£k)

Year to 30 June	2019A	2020A
Revenue	**-**	**-**
Cash opex	-	-
Gross profit in cash	**-**	**-**
G&A costs	(99.2)	(200.2)
EBITDA	**(99.2)**	**(200.2)**
Depreciation	-	-
EBIT	**(99.2)**	**(200.2)**
Other	-	10.0
Financial expenses	(0.5)	(40.3)
Income tax	-	-
Earnings	**(99.7)**	**(230.5)**

Balance sheet (£k)

Year to June	2019A	2020A
Cash and equivalents	10.0	31.3
Debtors	82.6	78.1
Other current assets	-	-
Long-term assets	533.8	1,283.9
Total assets	**626.4**	**1,393.4**
Trade payables	206.8	250.6
Other current liabilities	0.9	-
Borrowings	70.0	953.2
Long-term deferred taxes	-	-
Other long-term liabilities	-	-
Total liabilities	277.6	1,203.7
Equity	348.7	189.6
Liabilities and equity	**626.4**	**1,393.4**

Cash flow statement (£k)

Year to June	2019A	2020A
Earnings	(99.7)	(230.5)
Depreciation	0.8	0.7
Other	0.2	40.3
Deferred tax	-	-
Cash flow from operations	**(98.7)**	**(189.5)**
Changes in working capital	153.5	48.3
Cash from operations	**54.7**	**(141.3)**
Disposals	-	-
Investments	(297.3)	(750.8)
Cash from investments	**(297.3)**	**(750.8)**
Cash from equity raised	158.3	1.5
Net cash from debt capital	0.0	913.4
Cash from financing	**223.7**	**913.4**
Net change in cash	**(18.8)**	**21.3**

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Recommendation	Total Stocks	Percentage %	Corporate	Percentage %
Corporate	60	95.2	60	100.0
Buy	3	4.8	0	0.0
Speculative Buy	0	0.0	0	0.0
Outperform	0	0.0	0	0.0
Market Perform	0	0.0	0	0.0
Underperform	0	0.0	0	0.0
Sell	0	0.0	0	0.0
Total	**63.0**	**100.0**	**60.0**	**100.0**

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Time and date of recommendation and financial instruments in the recommendation

The time and date when the production of this research recommendation is published is the date and time found in the header of the email carrying the research report.

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A draft of this research report has been shown to the company following which factual amendments have been made.

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Company/Issuer Disclosures

Company Name	Table of interest number	12-month recommendation history	Date
Orcadian Energy (ORCA)	1,2,3,4,5,7,8,10	Corporate	07.09.21

http://research.whirelandplc.com/research/regulatory.asp

Companies Mentioned

Company Name	Recommendation	Price	Price Date/Time
Orcadian Energy Plc (AIM:ORCA)	Corp	GBP 0.33	05/09/2021 16:30
Royal Dutch Shell plc (LSE:RDSA)	No Rec	GBP 20	05/09/2021 16:30
EnQuest PLC (LSE:ENQ)	No Rec	GBP 0.95	05/09/2021 16:30

Headline	Date
79 million barrels of proven & probable reserves	07.09.21

Recommendation	From	To	Analyst
Corporate	07.09.21	present	CA

Current Analyst (CA), Previous Analyst (PA)

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