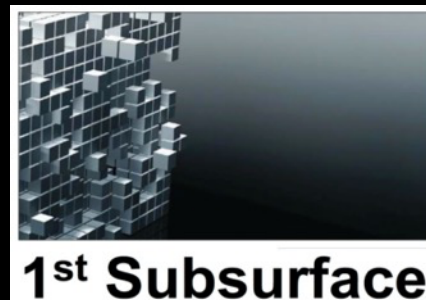


So many discoveries, too few developments

Blocks 30/1, 2 & 3

Mike Cooper, Ben Duncan, Matthew Belshaw & Rose Leadbetter

Devex 2020

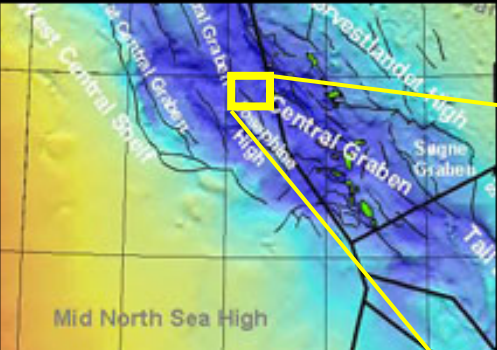


The North Sea is Dying

Radical and Urgent Change is Required.....

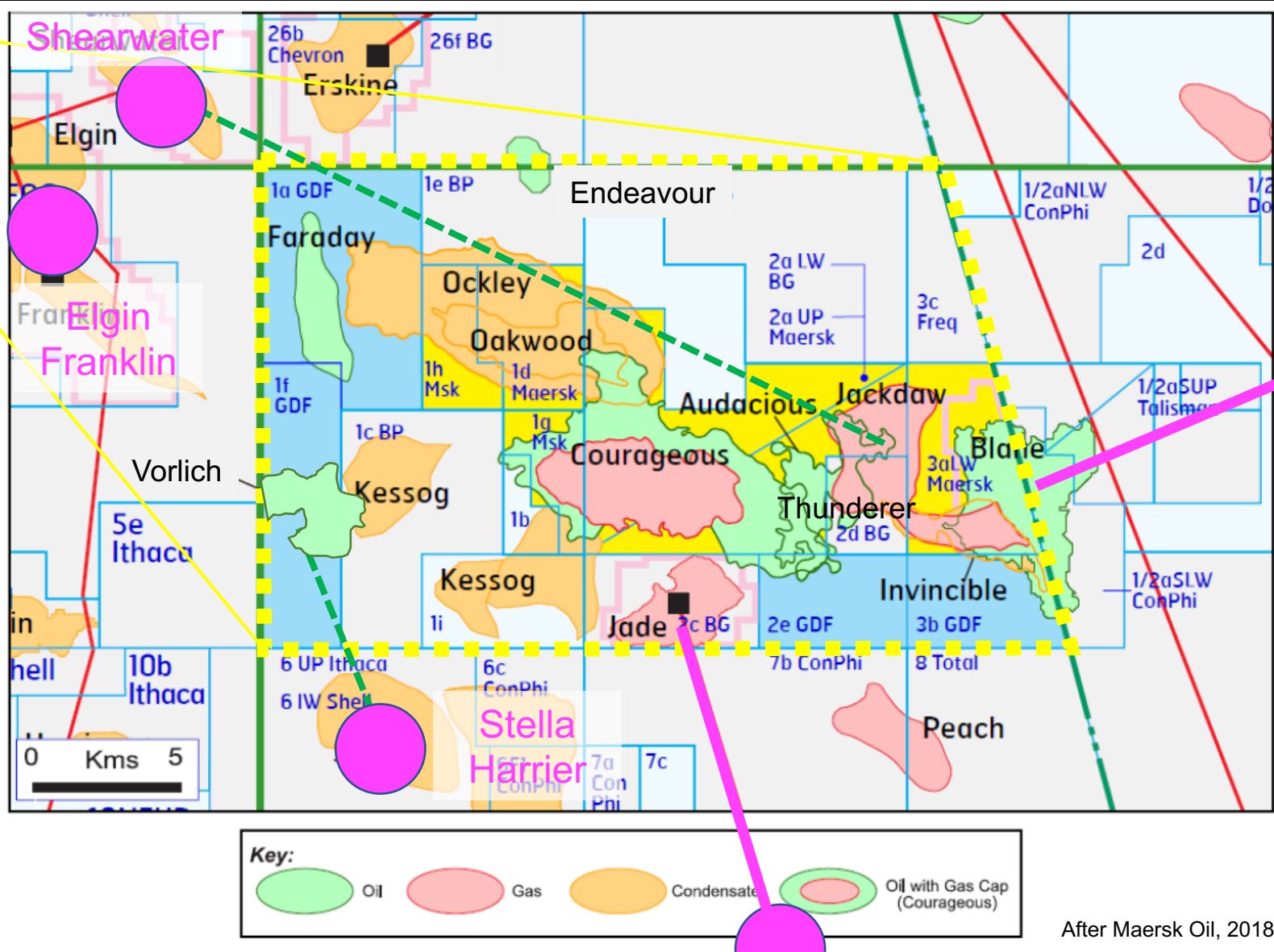


Location Map & Study Area – UK blocks 30/1, 30/2 & 30/3

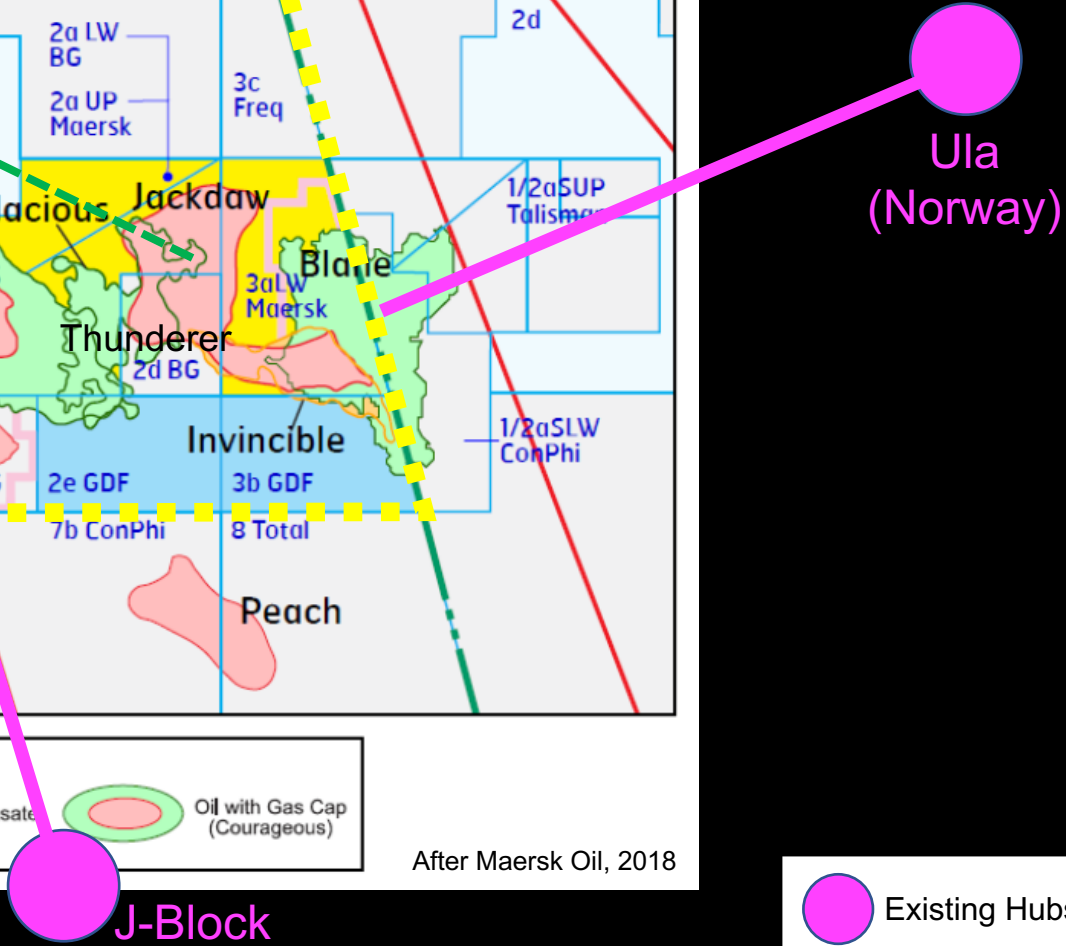


Unsanctioned
Potential
in Q30N

750 mmbbls



After Maersk Oil, 2018



Existing Hubs

Q30N Reservoirs

System	Series	Group	Formation	Member	Lithology
Quaternary		Nordland			
Neogene	Pliocene	Westray	Lark		
	Miocene				
Paleogene	Oligocene	Stronesay	Horda		
	Eocene			Tay	
	Paleocene	Moray	Balder		
			Sele	Forties	
		Montrose	Lista	Mey	
			Maureen		
		Cretaceous	Upper	Chalk	Ekofisk
Tor					
Hod					
Herring					
Hidra					
Lower	Cromer Knoll		Rodby		
			Valhall		
Jurassic	Upper	Humber	Kimmeridge Clay		
			Heather	Fulmar	
	Middle	Fladen	Pentland		
Triassic	Upper	Heron	Skagerrak	Jonathan Mdst	
				Joanne Sst	
	Middle			Julius Mdst	
				Judy Sst	
Lower			Smith Bank		
	Permian		Zechstein	Shearwater Salt	
Devonian		Upper	Rotliegendes	Auk	
	Old Red		Buchan		

← Blane, Courageous, Vorlich, Audacious & Endeavour

← Ockley

← Jackdaw, Kessog, Conqueror, Oakwood & Faraday

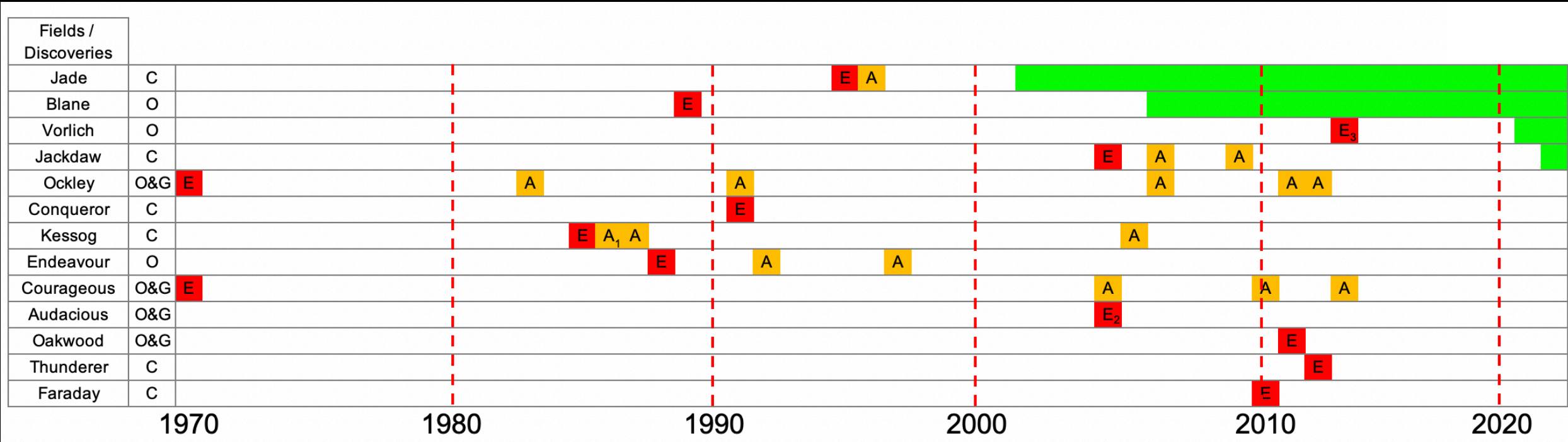
← Jade, Kessog & Thunderer

Blane – Producing

Vorlich - Project

Only highlighted primary reservoir

Wells Timeline



Only 2 wells dry across the 3 blocks

22 wells on unsanctioned discoveries

~£500mm investment to date

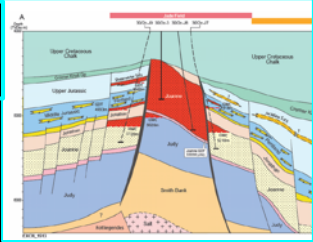
E	Exploration
A	Appraisal

1. Two appraisal wells drilled on Kessog in 1986
2. Jackdaw and Audacious discovered by the same well
3. Vorlich appraised in same year as discovery

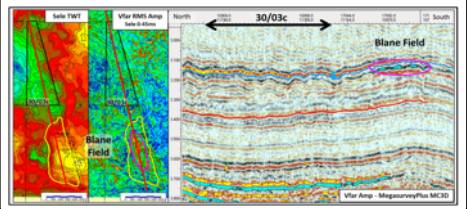
Fields & discoveries (from TROVE CNS)

Producing

Jade
(52 mmbbls to date)



Blane
(22 mmbbls to date)



Palaeocene

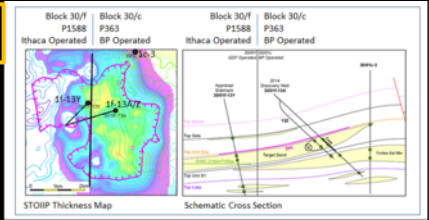
Cretaceous

Jurassic

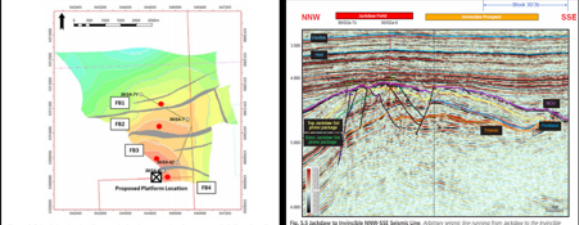
Triassic

Project

Vorlich

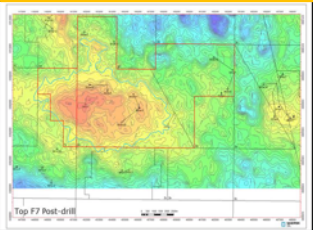


Jackdaw

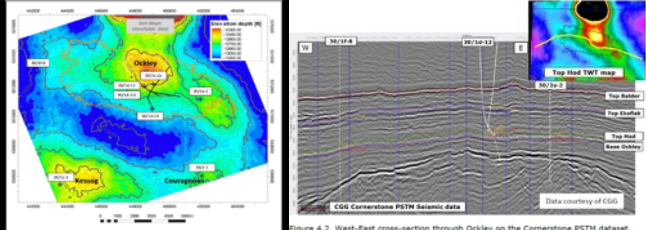


Multi-Well Discoveries

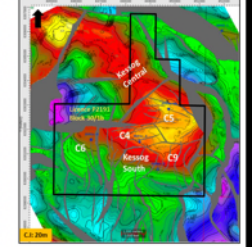
Courageous



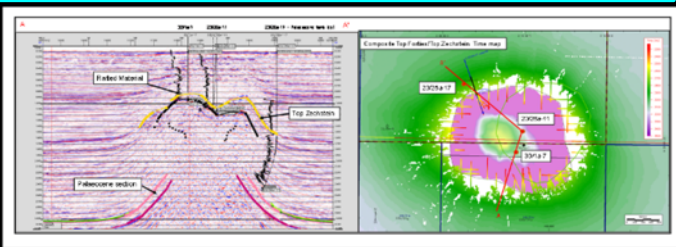
Ockley



Kessog



Endeavour

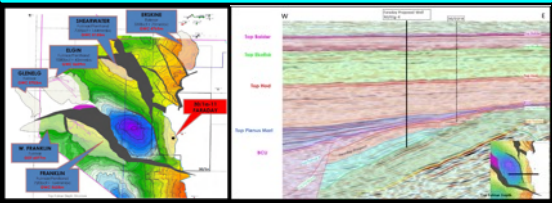


Single Well Discoveries

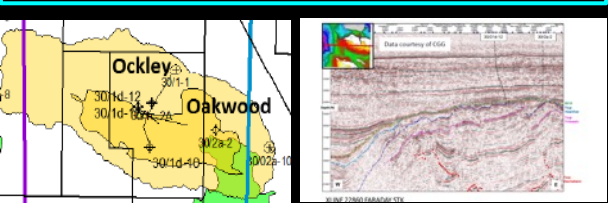
Audacious



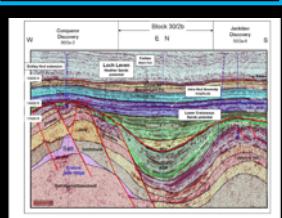
Faraday



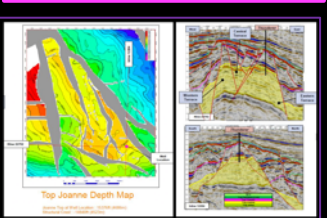
Oakwood



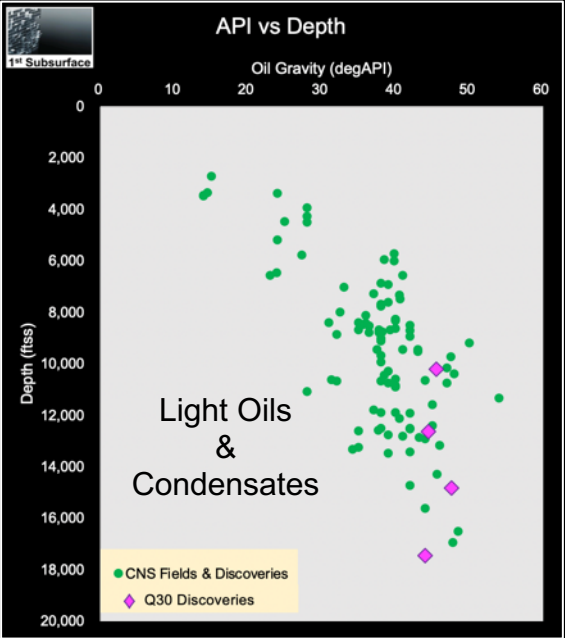
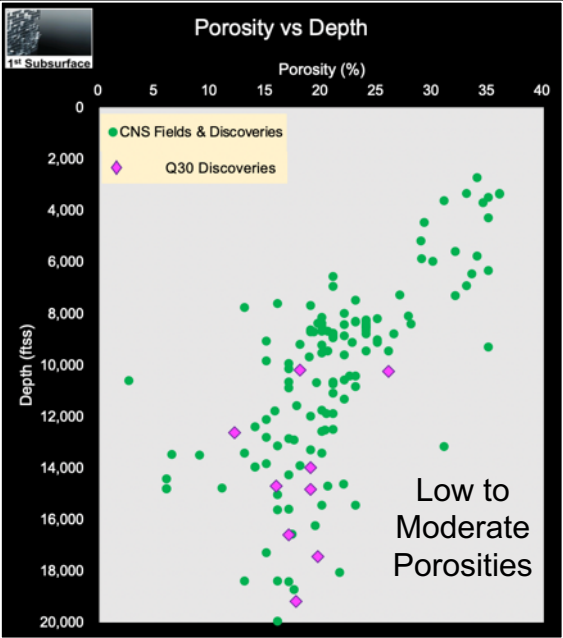
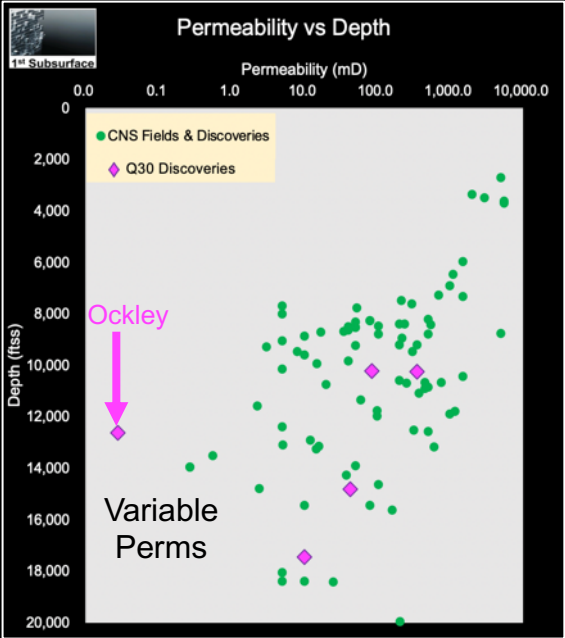
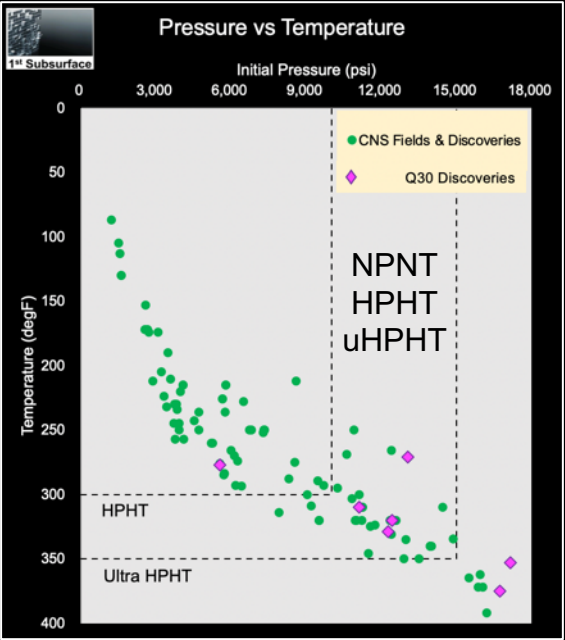
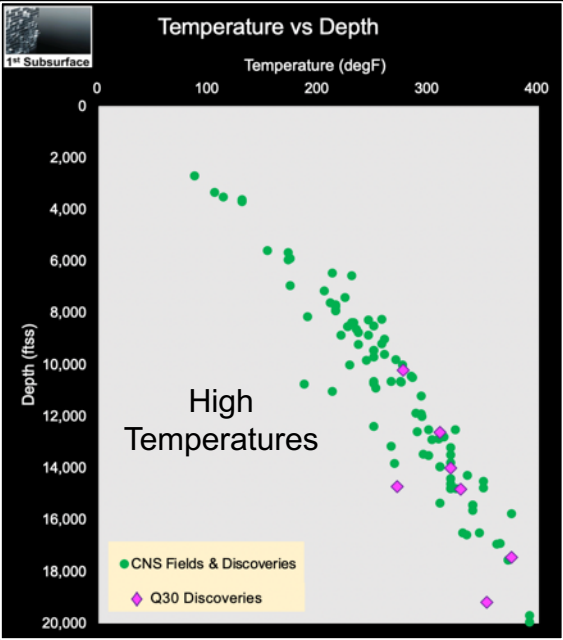
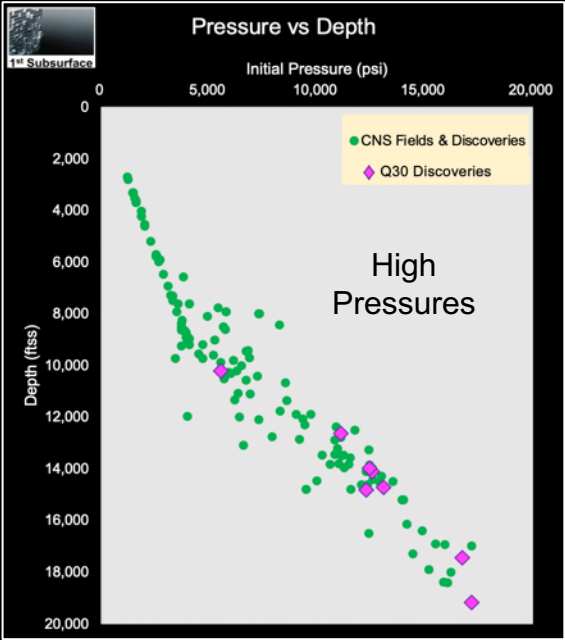
Conqueror



Thunderer

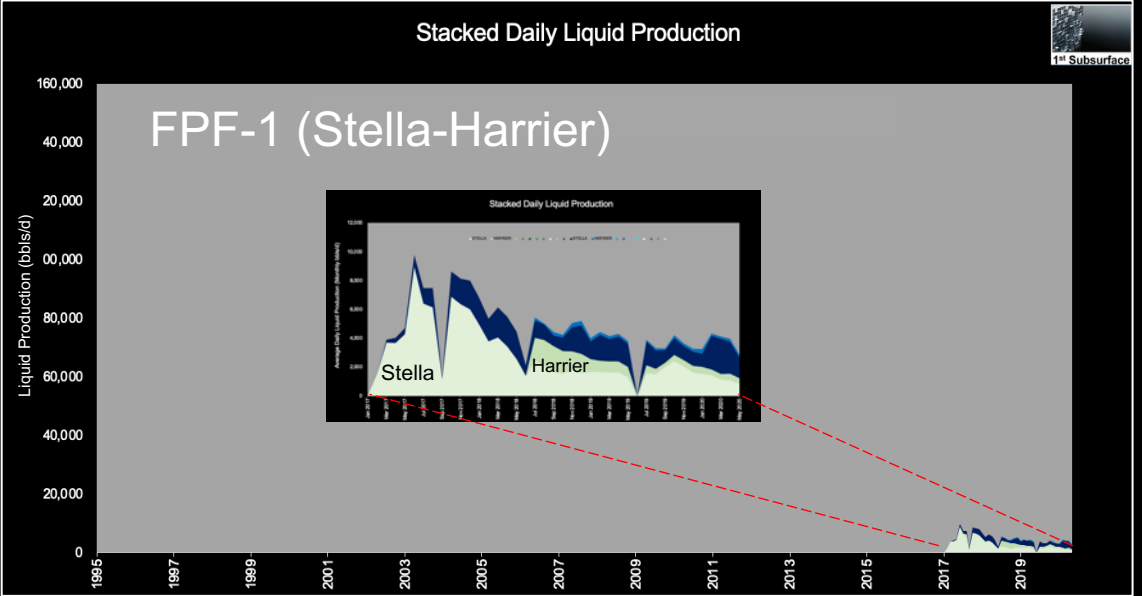
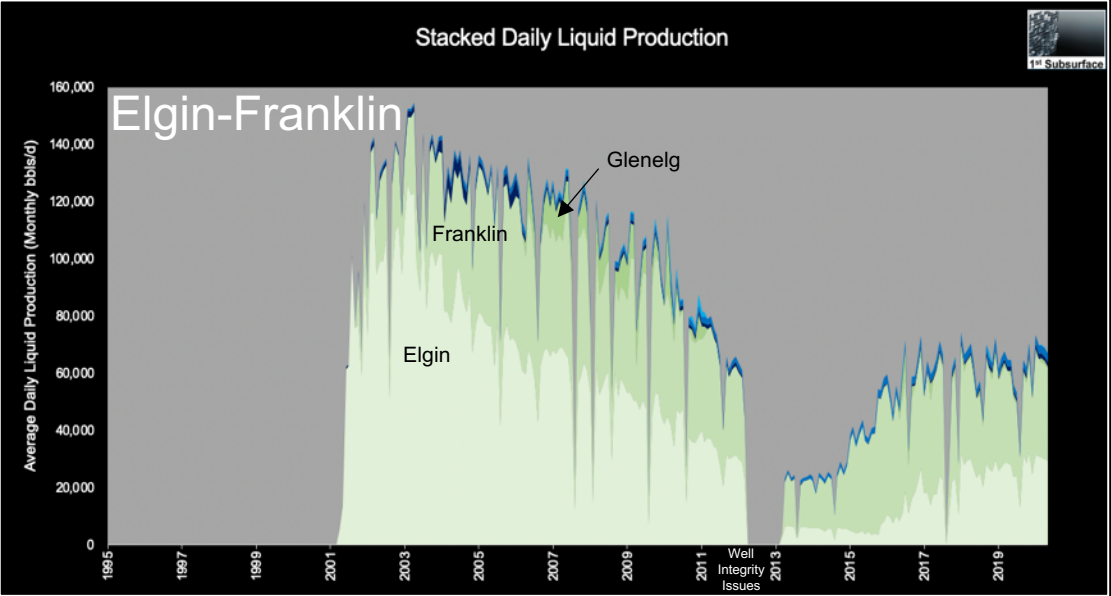
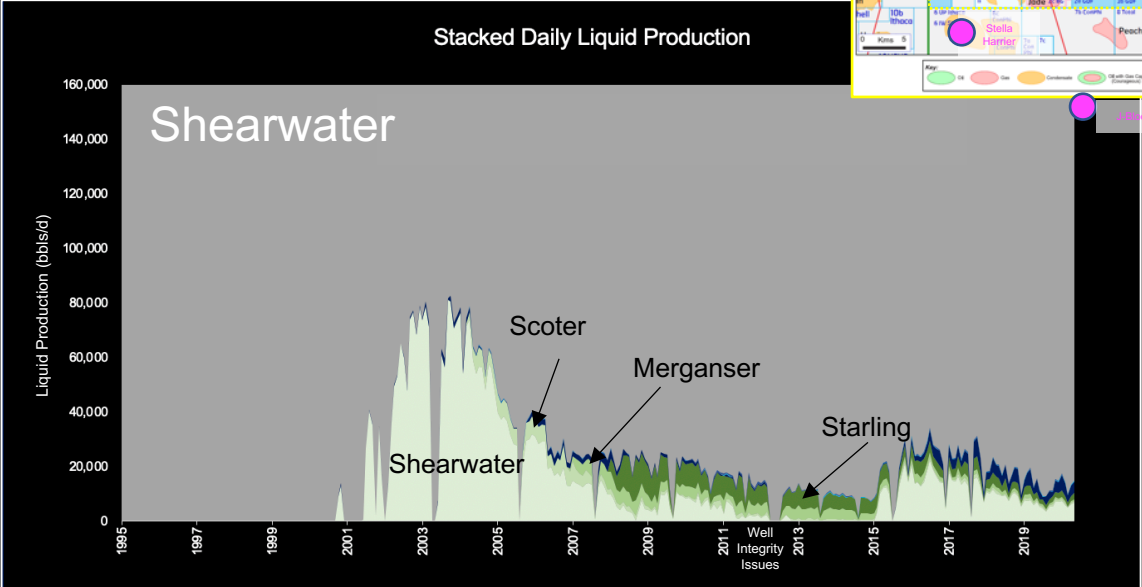
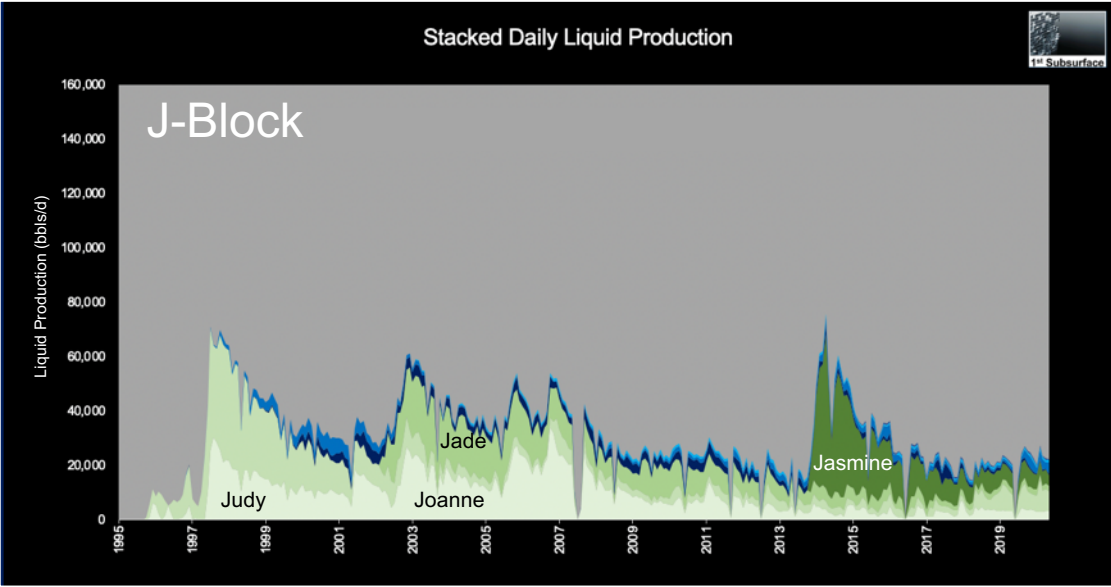
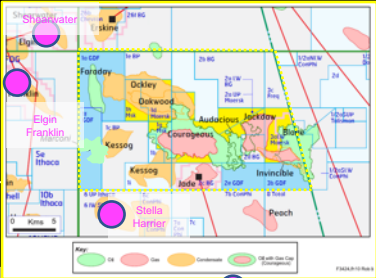


Reservoir & Fluid Properties (from TROVE CNS)

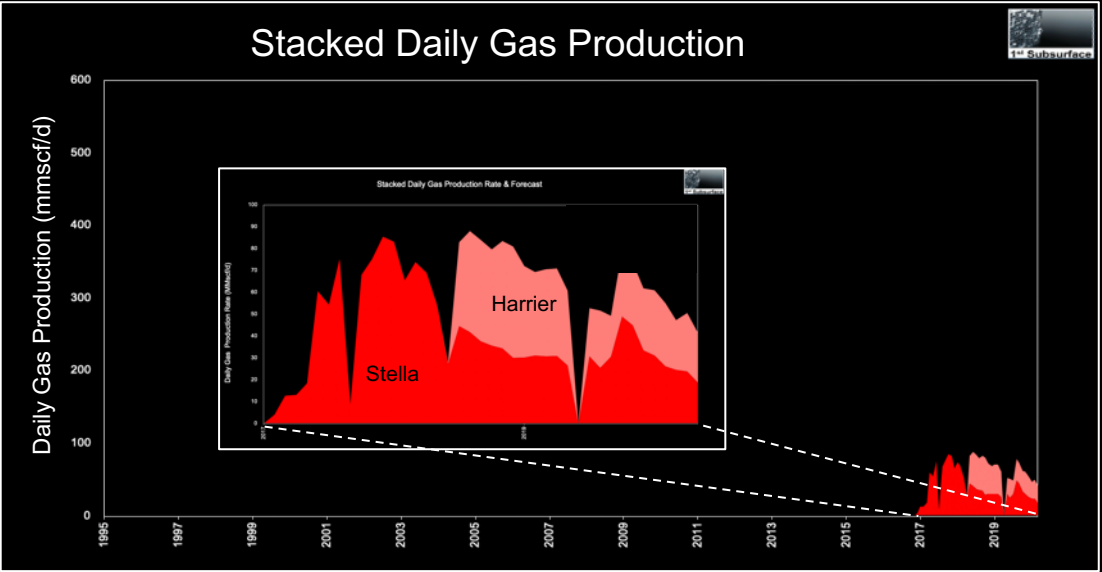
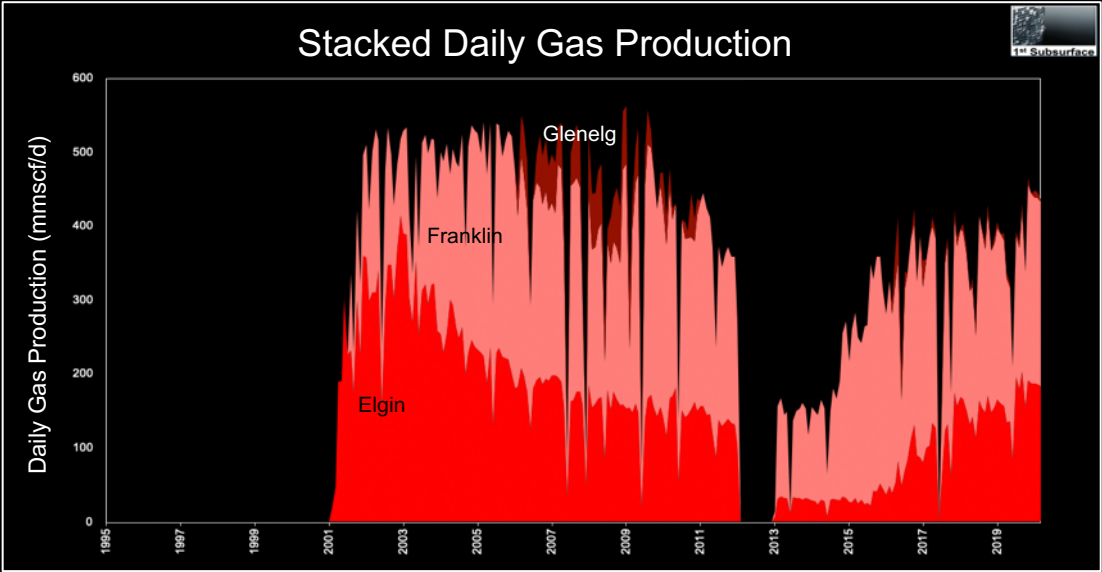
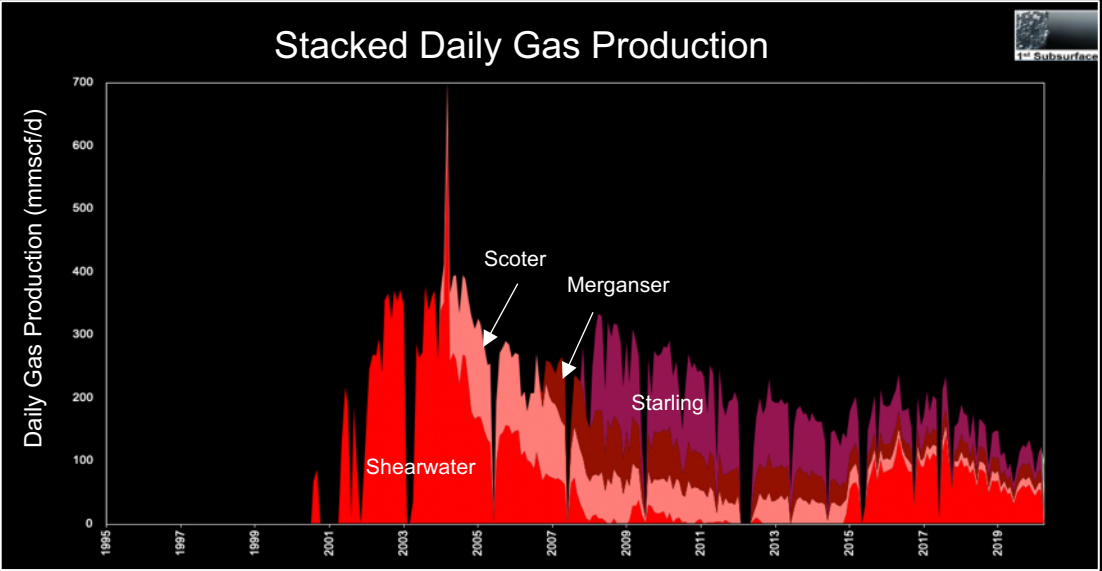
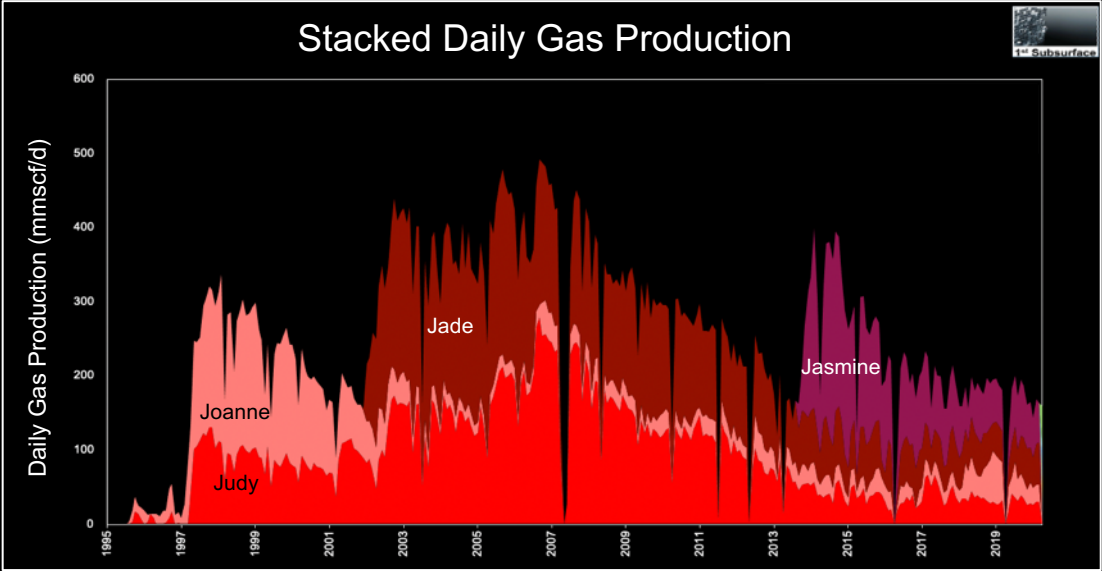


Existing Hubs

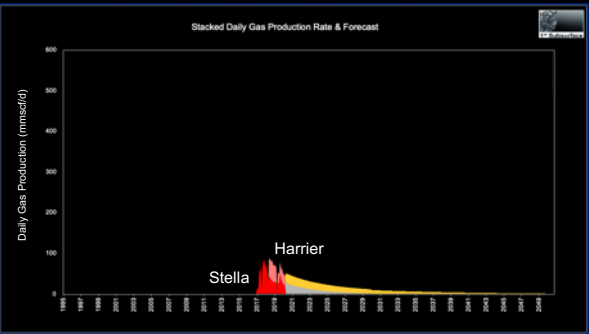
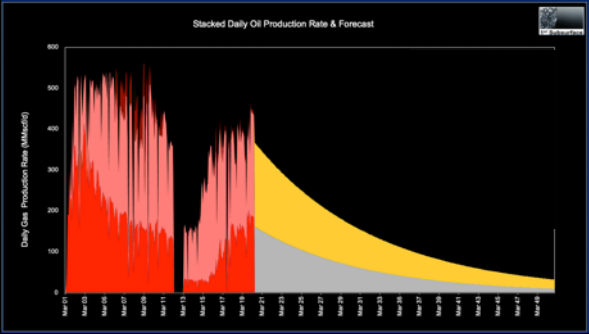
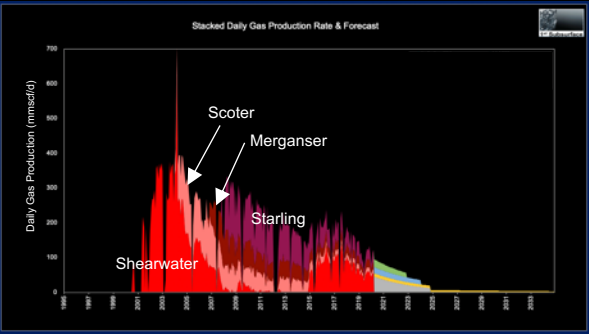
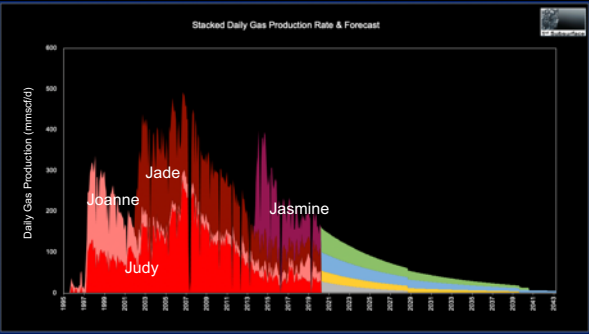
Existing hubs - Liquids (From TROVE Production Analysis)



Existing hubs - Gas (From TROVE Production Analysis)



Existing hubs – Forecast (From TROVE Production Analysis)



“Do-nothing” hub production forecasts

Access to Existing Infrastructure (ICOP)

Hub	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Elgin-Franklin					Isabella? Faraday? Courageous?					
Judy				Talbot? Isabella? Austen?						
Shearwater		Fram		Arran, Columbus		Pierce Blowdown?				
FPF-1		Gas constrained (Vorlich)			Austen?					

Source: Operator ICOP webpages

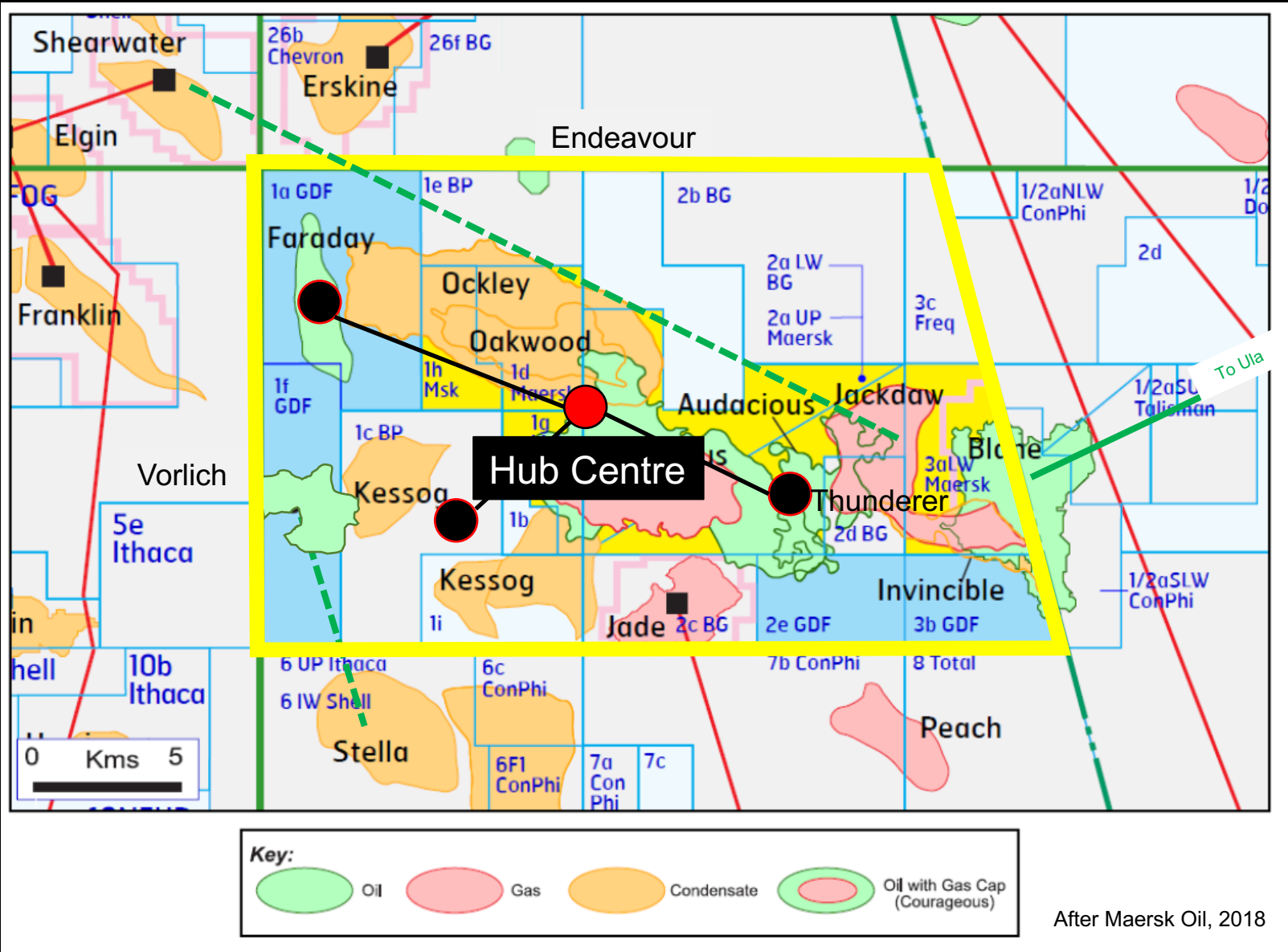
Ullage reported to exist by existing hubs (keen to attract new third party business)

Reality is that HIPPS availability, flow assurance (fluid compatibility), pipeline ullage, brownfield mods cost, age of facility & remaining field-life prior to CoP etc. adds complexity

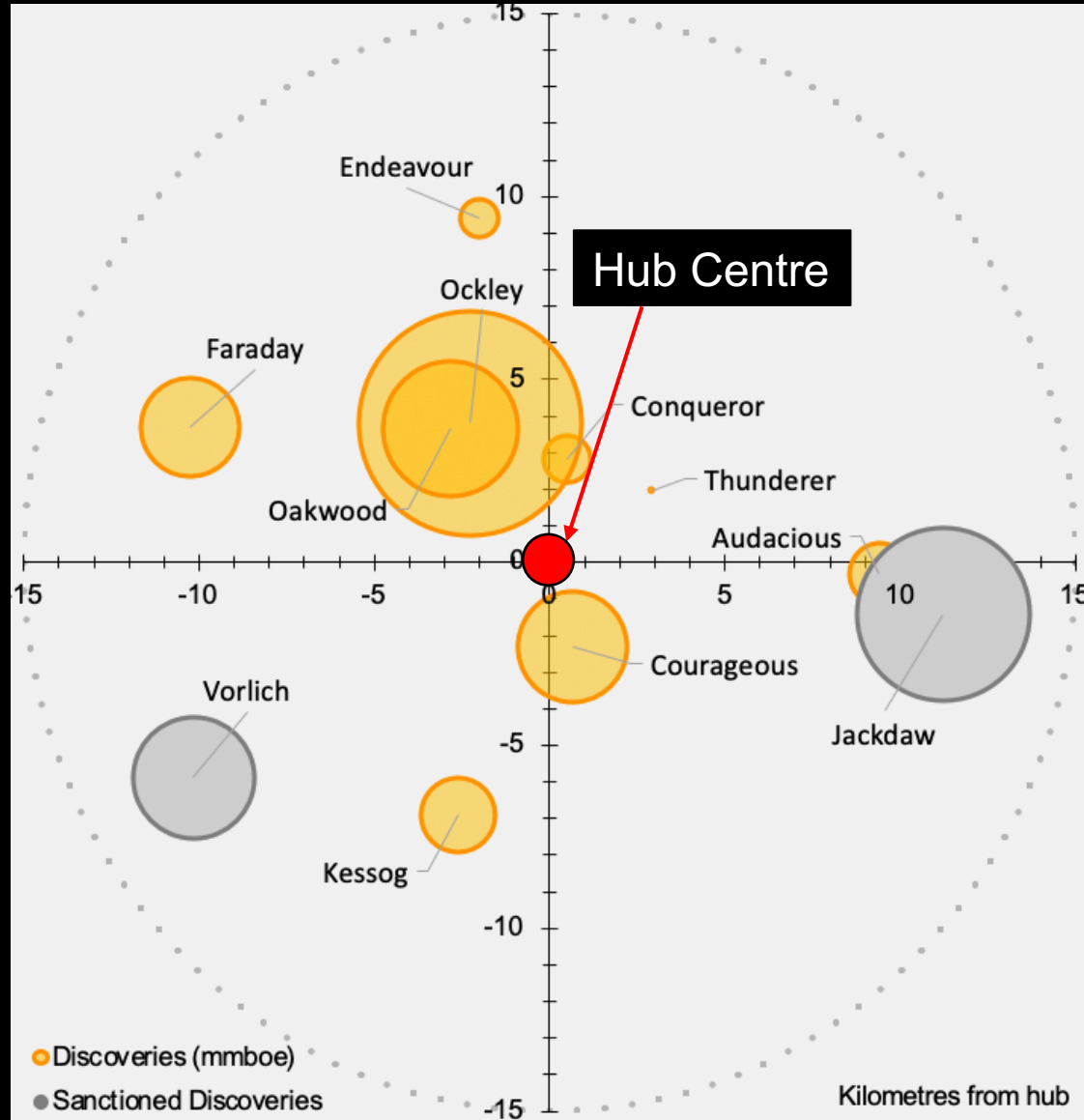
There should be ullage in pipelines and terminals

Solution Option

Area Development Proposal - a single stand-alone platform with remote drill centres



TROVE Hub Analysis - Unsanctioned Discoveries

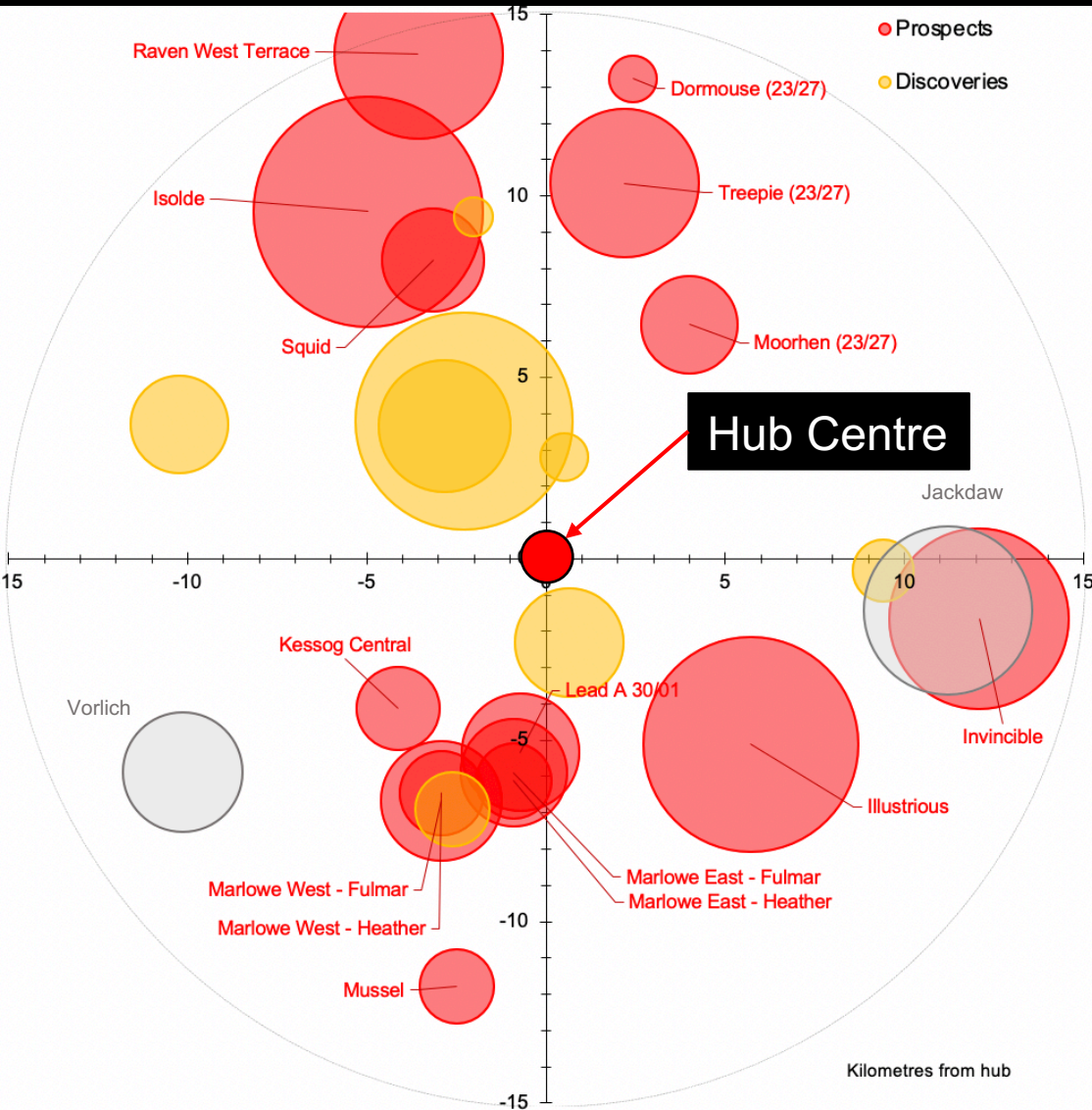


8 Potential Developments

Closest Discoveries	Distance (km)	Resource (mmboe)	Fluid Type
Courageous	2	25	Oil & Gas
Conqueror	3	5	Gas Condensate
Thunderer	4	0.1	Gas Condensate
Ockley	4	97	Oil & Gas
Oakwood	5	36	Oil & Gas
Kessog	7	12	Gas Condensate
Audacious	9	8	Oil & Gas
Endeavour	10	3	Oil
Faraday	11	20	Gas Condensate

Thunderer is OGA Discovery DISC-0099 but is clearly too small to be considered for development. Updip potential remains.
 Ockley has large in-place volumes but uncertainty on recoverable reserves. Quoted number from relinquishment report
 Conqueror - assumed 5 mmboe

TROVE Hub Analysis - Both Discoveries & Prospects



15 Prospects & Leads

Closest Prospects / Leads	Distance (km)	Unrisked PR (mmboe)	Fluid Type
Lead A 30/01	5	29	Gas Condensate
Kessog Central	6	15	Oil
Marlowe East - Fulmar	6	24	TBC
Marlowe East - Heather	6	12	TBC
Marlowe West - Heather	7	15	TBC
Marlowe West - Fulmar	7	31	TBC
Moorhen (23/27)	8	20	TBC
Illustrious	8	96	Gas Condensate
Squid	9	22	Gas Condensate
Treepie (23/27)	11	46	TBC
Isolde	11	109	Oil
Mussel	12	12	Gas Condensate
Invincible	12	67	Gas Condensate
Dormouse (23/27)	13	5	TBC
Raven West Terrace	14	59	Gas Condensate

Above: 15km radius from chosen hub – TROVE Hub Analysis can search to any chosen radius & across international boundaries

Contingent & Prospective Resources in Q30N Emergent Hub

Name	Asset Type	Distance from Hub (km)	Fluid Type	Resource CR or Un-risked PR (mmboe)	020406080100120
Isolde	Prospect	11	Oil	109	
Ockley	Discovery	4	Oil & Gas	97	
Illustrious	Prospect	8	Gas Condensate	96	
Invincible	Prospect	12	Gas Condensate	67	
Raven West Terrace	Prospect	14	Gas Condensate	59	
Treepie (23/27)	Prospect	11	TBC	46	
Oakwood	Discovery	5	Oil & Gas	36	
Marlowe West - Fulmar	Prospect	7	TBC	31	
Lead A 30/01	Prospect	5	Gas Condensate	29	
Courageous	Discovery	2	Oil & Gas	25	
Marlowe East - Fulmar	Prospect	6	TBC	24	
Squid	Prospect	9	Gas Condensate	22	
Moorhen (23/27)	Prospect	8	TBC	20	
Faraday	Discovery	11	Gas Condensate	20	
Marlowe West - Heather	Prospect	7	TBC	15	
Kessog Central	Prospect	6	Oil	15	
Marlowe East - Heather	Prospect	6	TBC	12	
Mussel	Prospect	12	Gas Condensate	12	
Kessog	Discovery	7	Gas Condensate	12	
Audacious	Discovery	9	Oil & Gas	8	
Conqueror	Discovery	3	Gas Condensate	5	
Dormouse (23/27)	Prospect	13	TBC	5	
Endeavour	Discovery	10	Oil	3	

Smaller accumulations cut-off














	CR (mmboe)	PR (un-risked mmboe)
Discoveries	206	
Prospects		562
Total	206	768

Commercial Complexity

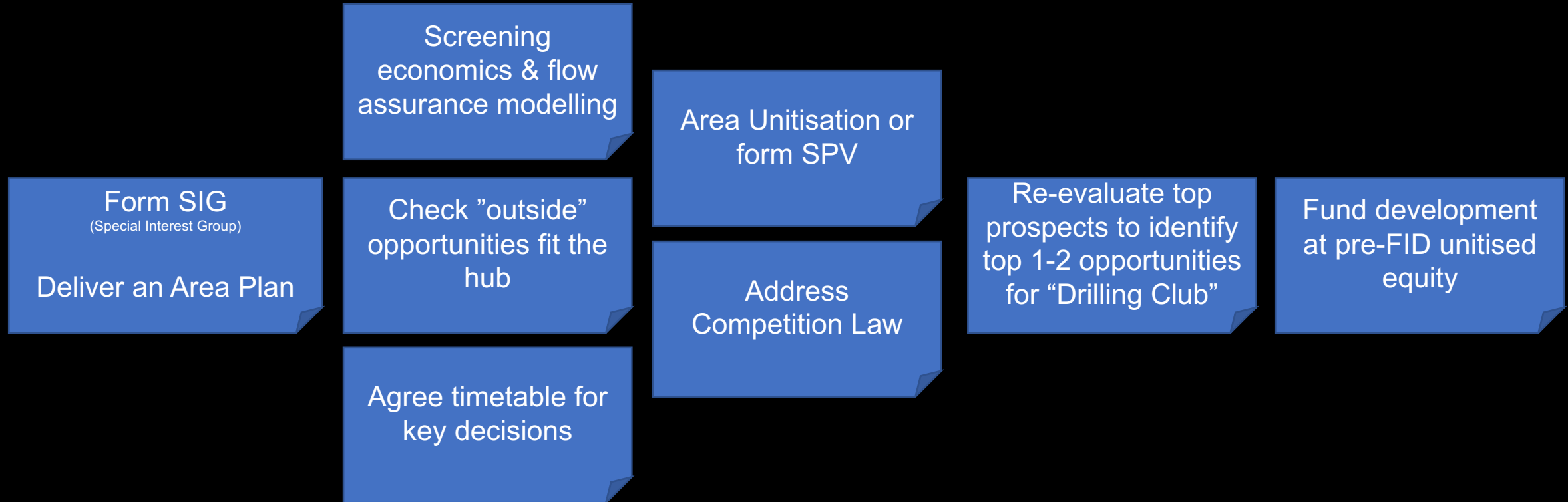
Discovery Owners

P098 Jackdaw	P111 Invincible	P363 Kessog	P672 Jade	P672 Jackdaw	P2390 Endeavour	P2397 Courageous	P2398 Illustrious	P2455 Faraday Ockley
								
								

Hub Owners

Elgin-Franklin	Shearwater	Stella-Harrier	J-Block
 			
 			 
 			
			

Suggested way forward - make the pipedream a reality



Remove Barriers

All licensees sign up to an area development plan?

OGA align licence terms/dates & could waive individual FDP processes in favour of an area development plan that maximises area recovery.

Opportunities

Rig availability (debatable in post-COVID world)

Supply chain desperate for new project work.

Multiple synchronous developments mitigates the “one producer failure scenario”. Balances risk for under/over performance

Extend life of pipelines & terminals

Time is running out!

Conclusions

Past practice: piecemeal 'cherry-picked' individual developments.

Higher-hanging fruit will not be developed with current practice.

8 unsanctioned discoveries, 15 prospects within 15km of arbitrarily chosen hub

>200 mmboe contingent resources & 560 mmboe unrisks prospective resources

Subsea tie-backs to central platform may deliver MER.

Hub Analysis, available across the entire North Sea, identifies & quantifies new hubs

Time is running out to Maximise Economic Recovery

Thank you for your attention

info@1stsom.com for further information

www.1stsom.com

TROVE Hub Analysis

