

Offshore Colocation Forum

Plenary #15

1 October 2025



Agenda

Item	Owner	Duration
1. Welcome	Adrian Topham	5 mins
2. H&S moment	RUK	5 mins
3. Matters arising	Ben Frei	10 mins
4. Project Colocate outcome presentation	Project team	30 mins
5. Project Anemone	Adrian Topham	25 mins
6. Monitoring Project	Forum	30 mins
7. AOB - Actions review	Adrian Topham Ben Frei	15 mins

2. Health & Safety moment





Global Human Factors Survey 2025

H&S Moment

OW-CCS Co-location Forum

01/10/2025

Background

- In the rapidly expanding offshore energy space, having a safe and competent workforce is vital for meeting climate goals and energy needs.
- This is the case for all offshore energy sectors.
- This is especially pertinent for co-located industries, where simultaneous operations require additional awareness of risks.

The role of the Global Human Factors Survey

- Wind workers conduct complex operations and maintenance activities on turbines, often in hazardous environments. Yet there is a limited understanding of human factors in the wind industry.
- The survey interrogates perceptions of human factors – from situation awareness to organisation culture – amongst frontline workers, with the aim of shaping the development of the wind workforce.



No doubt the findings of the survey will be important not just in ensuring continued improvements in worker competence and safety in the wind industry, but outcomes will be readily transferrable to other industries – particularly in the marine energy space – where they can inform safety practices in industries such as CCUS.



3. Matters arising



Matters arising

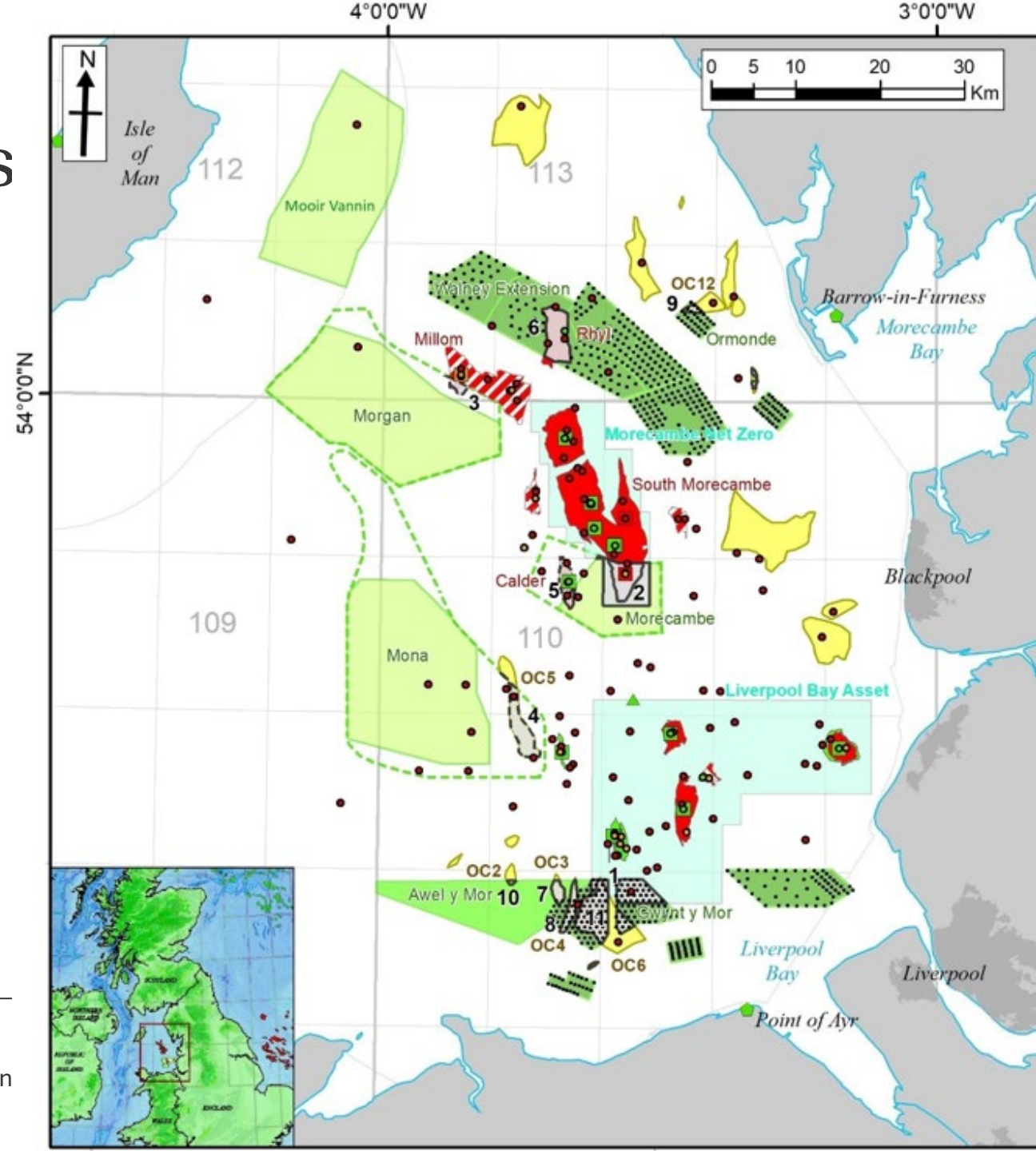
ID	Action	Due date	Owner	Status	Commentary
	OWIC to continue to engage offshore wind developers on their awareness around colocation with the view to hold a webinar alongside TCE		TCE/OWIC	Ongoing	Included as part of 2025 planning
	Secretariat to develop risk assurance / insurance questionnaire to be circulated with offshore wind and CCS developers ahead of next Plenary		TCE	Paused	Included as part of 2025 planning
	TCE to explore how it can quantify / categorise decarbonisation contribution of colocation.	N/A	TCE	Paused	
13.2	The full findings will be presented to the Forum at the next plenary (Project Colocate)		TCE	Ongoing	To be presented during plenary 15
13.3	Gain an initial understanding of colocation insurance work already underway		OWIC	Ongoing	
14.1	Share details of insurance work carried out by CES aquaculture team	31 July 2025	CES	Closed	Insurance work was found not to be relevant
14.2	Agree approach to communicating colocation lessons learnt via CCSA forums and meetings	30 August 2025	TCE/CCSA	Ongoing	Ongoing conversations taking place
14.3	Produce a 2025 communications plan for the Forum	30 September 2025	TCE/Forum	Ongoing	Ongoing work with agency
14.4	Set up a conversation between the technology team and TCE to initiate the conversation regarding monitoring technology	31 July 2025	NSTA	Closed	Ongoing conversations taking place
14.5	Determine who the correct contact is to support market engagement regarding monitoring technology	31 July 2025	CCSA	Ongoing	
14.6	Explore how to engage the wider market regarding ongoing monitoring innovation work	31 August 2025	TCE/CCSA	Ongoing	
14.7	Send out next plenary invite once suitable start time is confirmed	31 July 2025	TCE	Closed	

4. Project Colocate



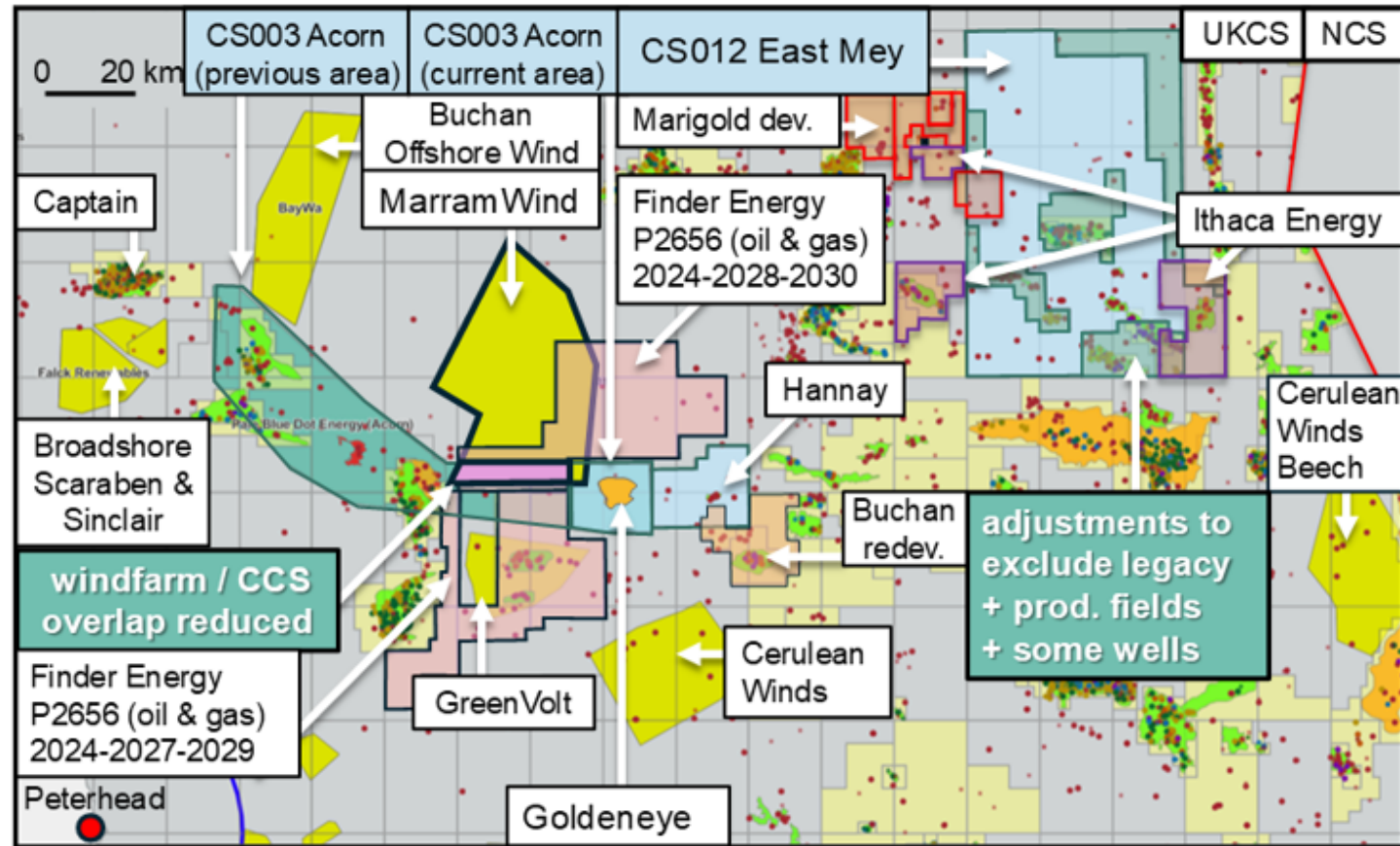
Colocation risks and access

- Risks mainly arise from drilling rig, vessel, and helicopter access within wind farms.
- 9 areas of overlap in the EIS, 2 are the planned carbon stores of Liverpool Bay and Morecambe.
- Geological risks involve fault parameters and containment uncertainties, while legacy wells pose additional concerns.



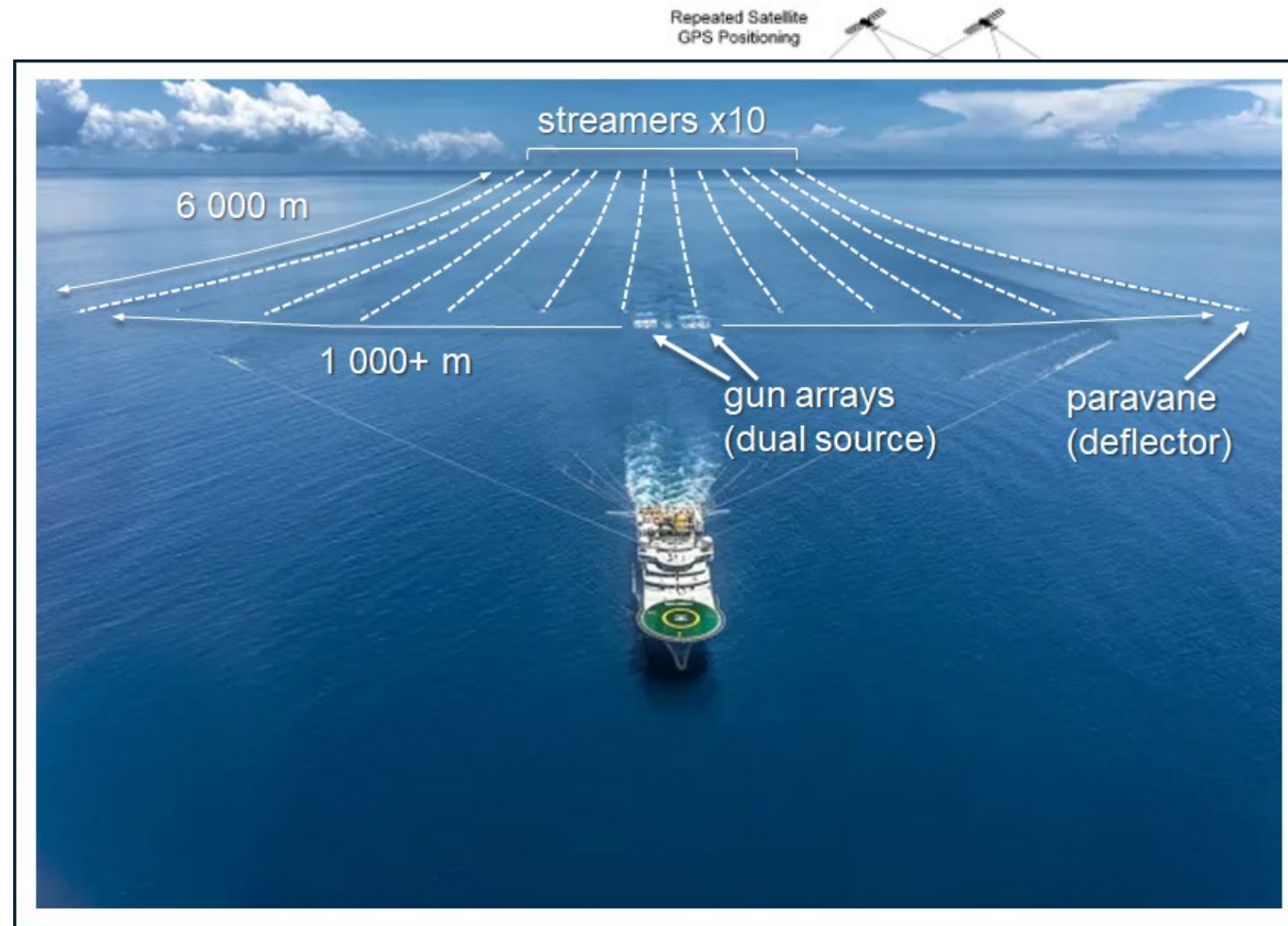
Colocation risks and access challenges

- OMF overlaps exist with the planned carbon stores of Acorn and East Mey relating to windfarms and oil & gas fields and developments.
- Safe access corridors and buffer zones are recommended but alone will be insufficient to mitigate all geological and legacy well risks.



Monitoring, measurement, and verification (MMV) technologies

- Less invasive MMV techniques than towed streamer time-lapse 3D seismic reviewed including short streamer, seafloor sampling, microgravity, DAS, sparse and full-scale OBN surveys.



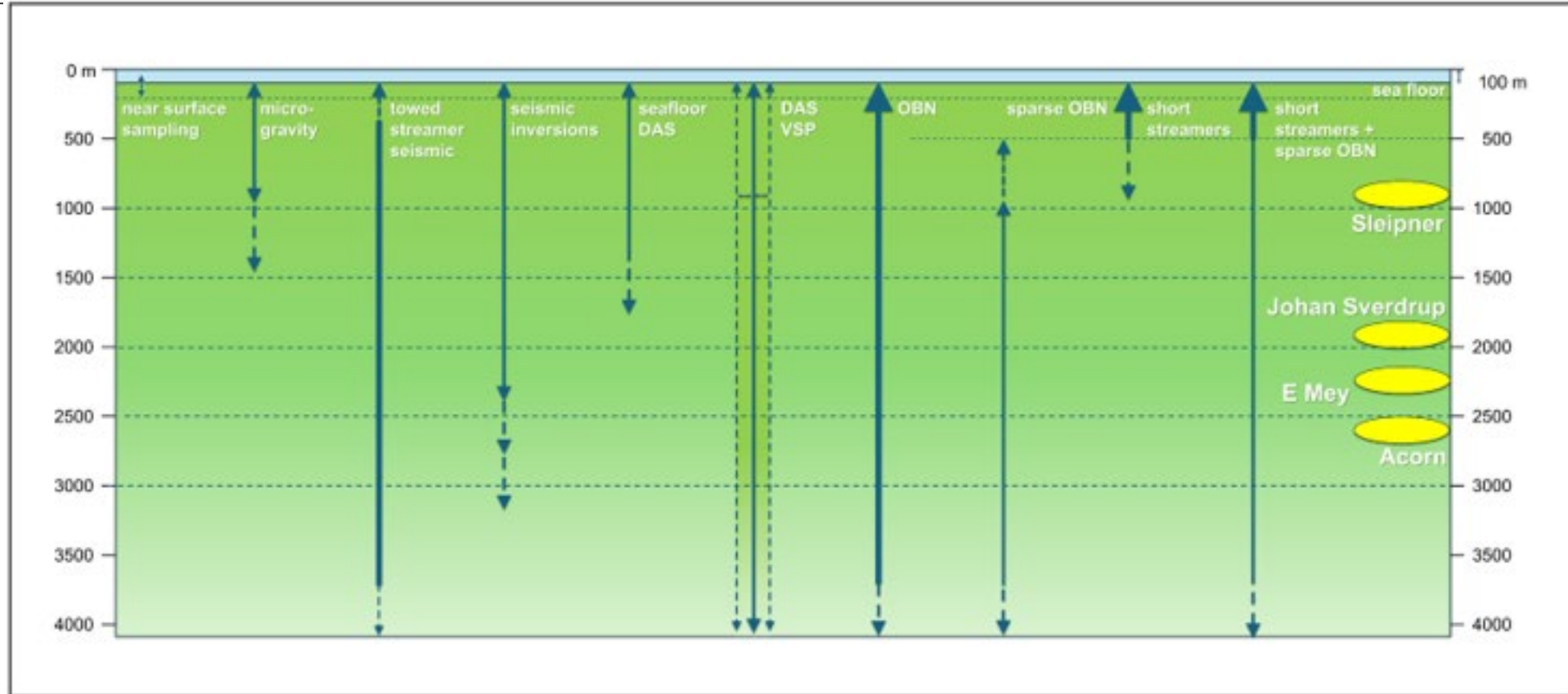
Monitoring, measurement, and verification technologies

- Smaller, agile vessels and autonomous surface vessels are proposed for deployment to reduce interference with wind farm operations.
- But operational access to windfarm areas by vessels and by drilling rigs for well remediation may still be constrained.

Recommended MMV Techniques		Colocation Conflicts			Alternative MMV / (Comment)
		Vessel-req.	Drilling-rig req.	Heli. req. (platform)	
Core-plan	Time-lapse surface 3D seismic	Y			Acquisition: OBN/OBC, Spotlight, S-DAS; Tech.: gravity
	Time-lapse surface gravity	Y, ROV+			(What is the extent of travel for an ROV? Usually needs a 'mother' survey vessel)
	Surface microseismic	Y, ROV+			
	time-lapse downhole seismic (VSP, DAS)		Y		(Horizontal drilling? Access corridor?)
	Injection well: Wellhead & downhole P & T gauges, etc.		Y	Y?	(Horizontal drilling? Access corridor?)
	Monitoring well: Wellhead & downhole P & T gauges, etc.		Y	Y?	(Horizontal drilling? Access corridor?)
Shal.	Time-lapse shallow seismic (HR/UHR)	Y			(OWTG spacing? Turbine exclusion zone? Through-going access pathway?)
Surface	Time-lapse seabed bathymetry (MBES/SSS/SAS)	Y, ROV+			
	Environmental: seabed & water column sampling, ecosystem studies	Y, ROV+			(extent of ROV/AUV/MASS? 'mother' survey vessel)

Monitoring, measurement, and verification technologies

- MMV technologies arranged by effective depth of investigation.
- Time-lapse seismic surveys likely to underpin CO2 plume migration (conformance) monitoring for OMF (East Mey 2200 m and Acorn 2500 m)



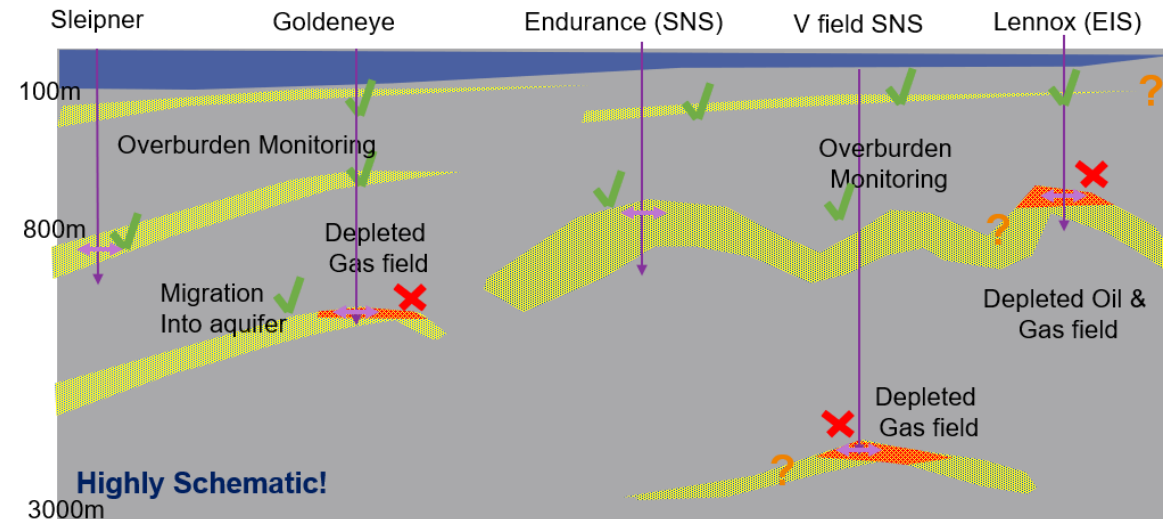
Mitigation strategies and access solutions

- Consider designing wide access corridors within offshore wind farms post-carbon storage site development to allow safe access for helicopters and drilling rigs to injection, monitoring, and legacy wells.
- Consider exclusion distances and alternative seismic acquisition methods to reduce interference.

	CS <33% covered	CS >66% covered	Avoid Colocation
Existing OW – Future CS	Mixed MMV: use of towed streamers outside OW farm, OBN at edges, Spotlight within? (limiting HSSE exposure for max. coverage) [CS compromise].	Greater expense of Horizontal drilling for prospective CS? [CS compromise]. Greater expense & risk of OBN etc. (until ROV / AUV / MASS cost & development allowing deployment (& shot) vessel-access) [CS compromise] Viable MMV alternative (e.g. gravity et al.) need of seismic? (value vs cost & effort). Need of marine environment/ecosystem studies? (validity).	OW overlap of plume migration pathway [CS compromise]. OW overlap of high-risk legacy wells that cannot be assessed/remediated [CS compromise]. Full overlap – injection sites prevented [CS compromise].
Future OW – Existing / Planned CS	Increased WTG spacing: allows for 2D/HR/2.5D streamers? source vessels (VSP, S-DAS, Spotlight) and improved OBN coverage [OW compromise]. Use a 3D baseline / characterisation survey as a 2D/Spotlight baseline? (poor repeatability but a signal?) [CS compromise].	OW away from abandoned wells to allow Well-based MMV & seismic – through-going access corridors/pathways [OW compromise]. OW accepts legacy well risk (regulator/both operators/public? - not likely) [OW compromise, e.g. South Morecambe – Morecambe]. OW away from plume migration pathway [OW compromise].	Develop OW where no CS prospects or current poor prospectivity (SSG is absent? Over Permian & Carboniferous intervals) (High risk: number/density of legacy wells?)(Low storage capacity: Small shallow closures near-shore? -excludes migration-trapping targets). Develop Largest and most prospective CS sites (Low-hanging fruit, high capacity, low risk).

Scenario evaluation and future work

- Further characterization of the subsurface, assessment of CO2 detectability over time, and a clearer understanding of exclusion distances to support decision-making on colocation feasibility.
- For the case studies included in the report, rock physics studies are suggested to expand beyond main depleted fields to enhance monitoring effectiveness.



Operational modifications and planning considerations

- Reasons for amendments to overlaps vary and are not always easy to identify from published information. For example, the Acorn licence area changed due to geological reasons while the Marram wind lease area reduced due to power density considerations.
- Recommendations include avoiding oil and gas drilling into CCS reservoirs and acquiring high-resolution seismic data before wind farm installation to safeguard monitoring capabilities.
- Monitoring plans should build in the flexibility to adopt new low cost technology as this matures.
- The report highlights the importance of coordination among leasing and licensing bodies to manage spatial conflicts and maximize decarbonization benefits, noting significant CO₂ emissions savings from colocated projects.

Publication of report

- Working on comms around the project with independent agency
- Report to be published on the Colocation website
- Aiming for Oct 31st



GO BEYOND BOUNDARIES



Project Colocate 2023-2025

Part 1: East Irish Sea Report

Part 2: Outer Moray Firth Report

Centre for Energy Transition
University of Aberdeen
Aberdeen AB24 3FX

T +44 (0)1224 272 000
→ abdn.ac.uk/energy

5. Project Anemone

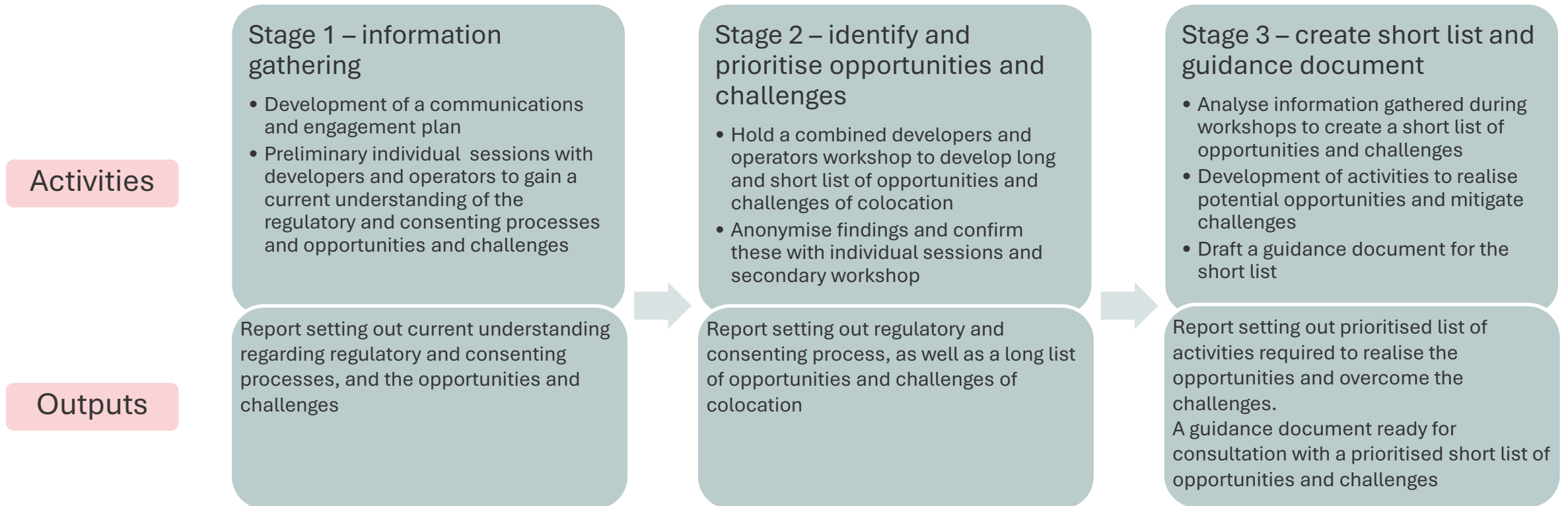


Source: Freepik

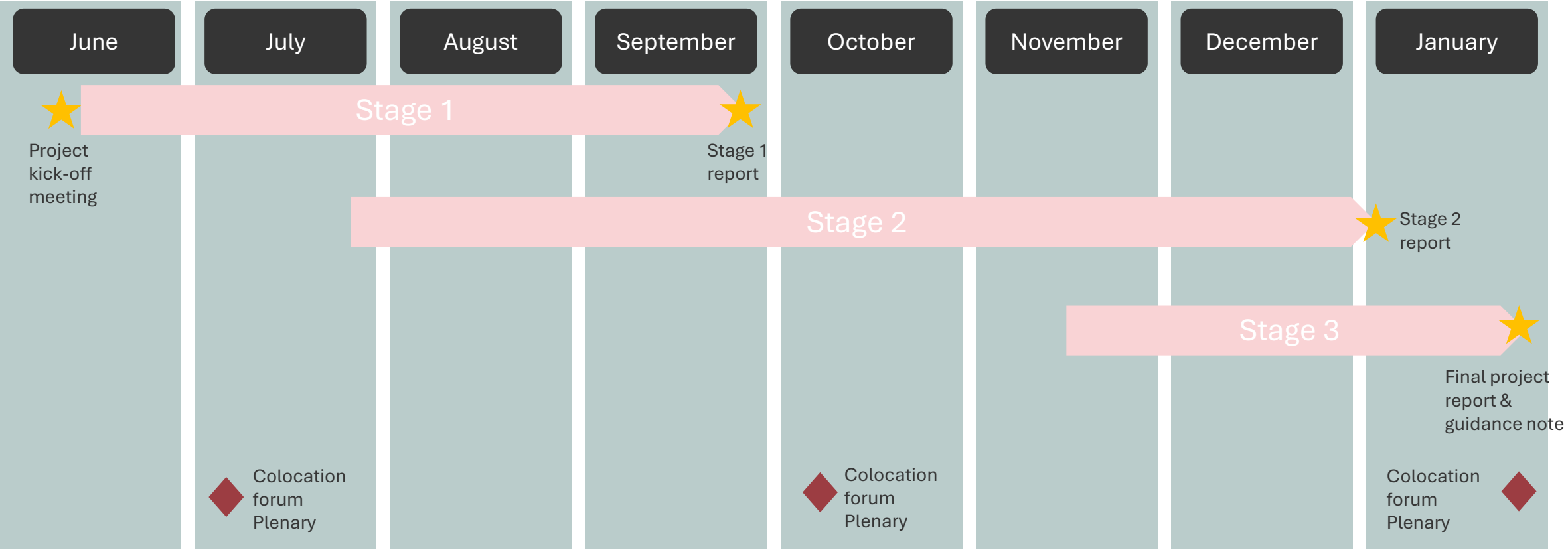
Project update

- Stage 1 engagement:
 - Forum members
(DESNZ, Defra, NSTA, CCSA...)
 - Many others too
(Ofgem, OPRED, G+, NZTC)
 - Still to meet
(TCE, CES, MMO, HSE, RUK-OWIC, AREG)
- Stage 1 report:
 - Drafting ongoing, due for approval Oct24th
 - series of charts(/'maps') for each of the stakeholder interviewed for each of the sectors
- Stage 2 planned engagement:
 - 1 for each sector (NECCUS, OEUK, OREC)
 - + 1 multi-sector
 - Input: stage 1 report, survey
 - Process: Chatham House rules, opportunities & challenges, review stage 1
 - Outcomes: list of opportunities & challenges & suggestions on consents etc.
 - Leading to a report of stage 2
- Comms for Stage 2

Project Anemone outline

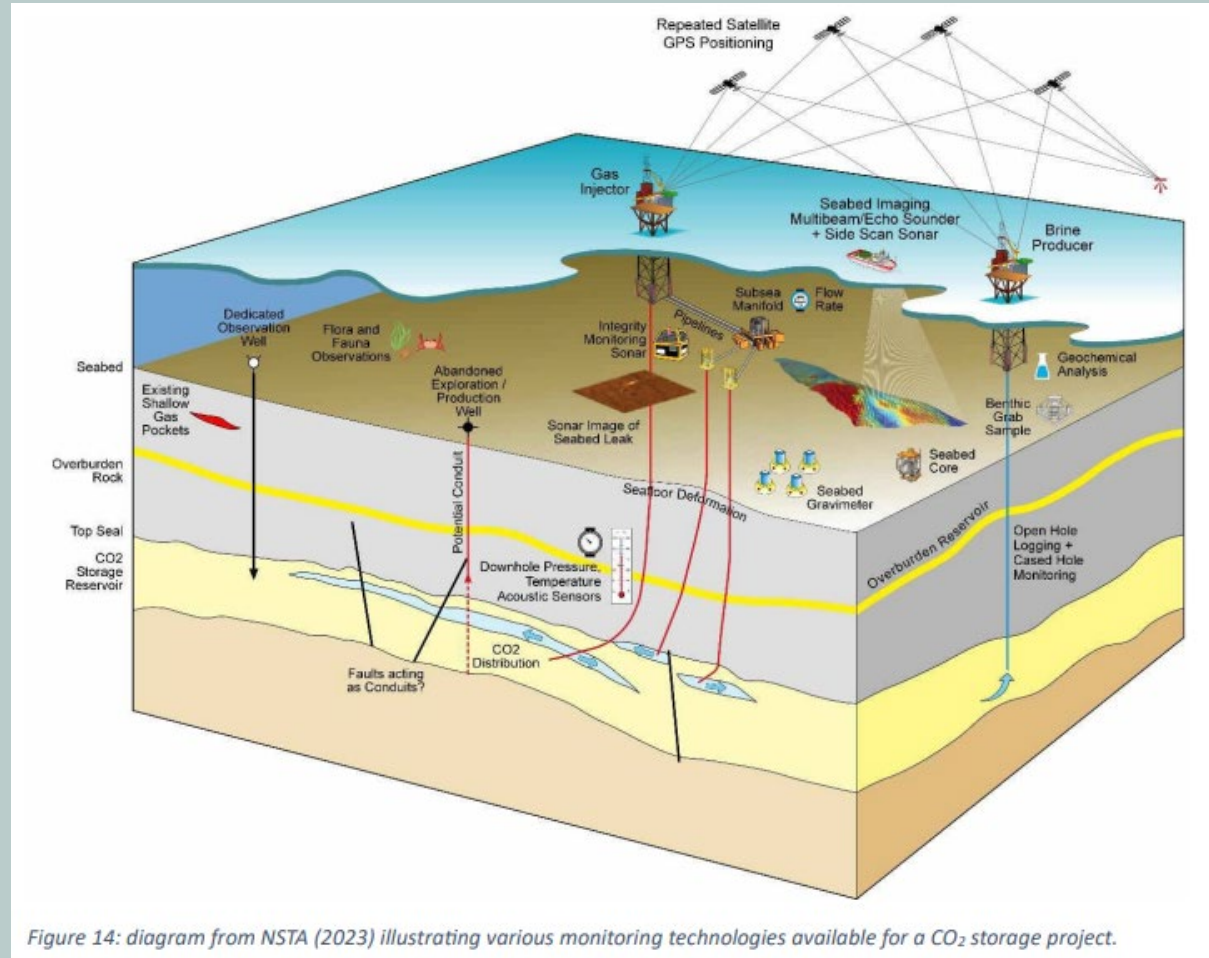


Indicative timeline



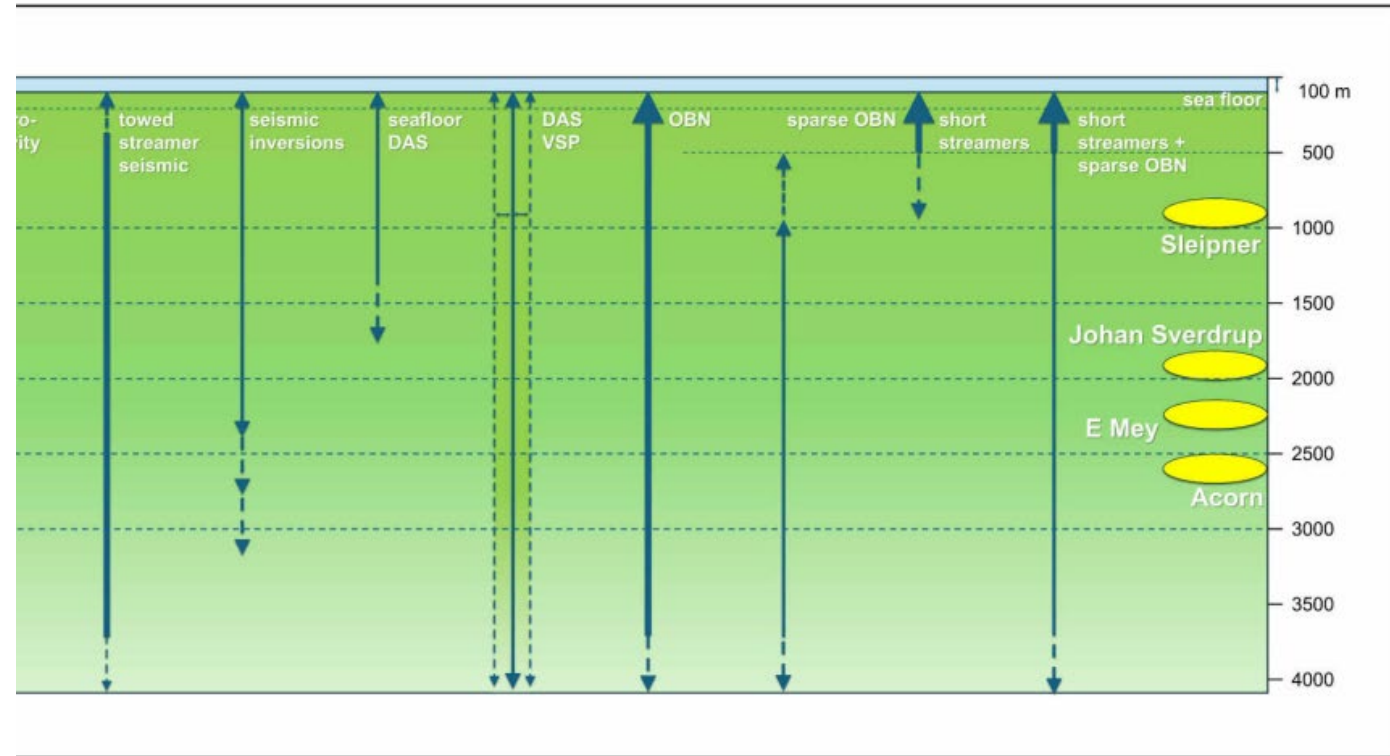
*timelines subject to change

6. Monitoring Project

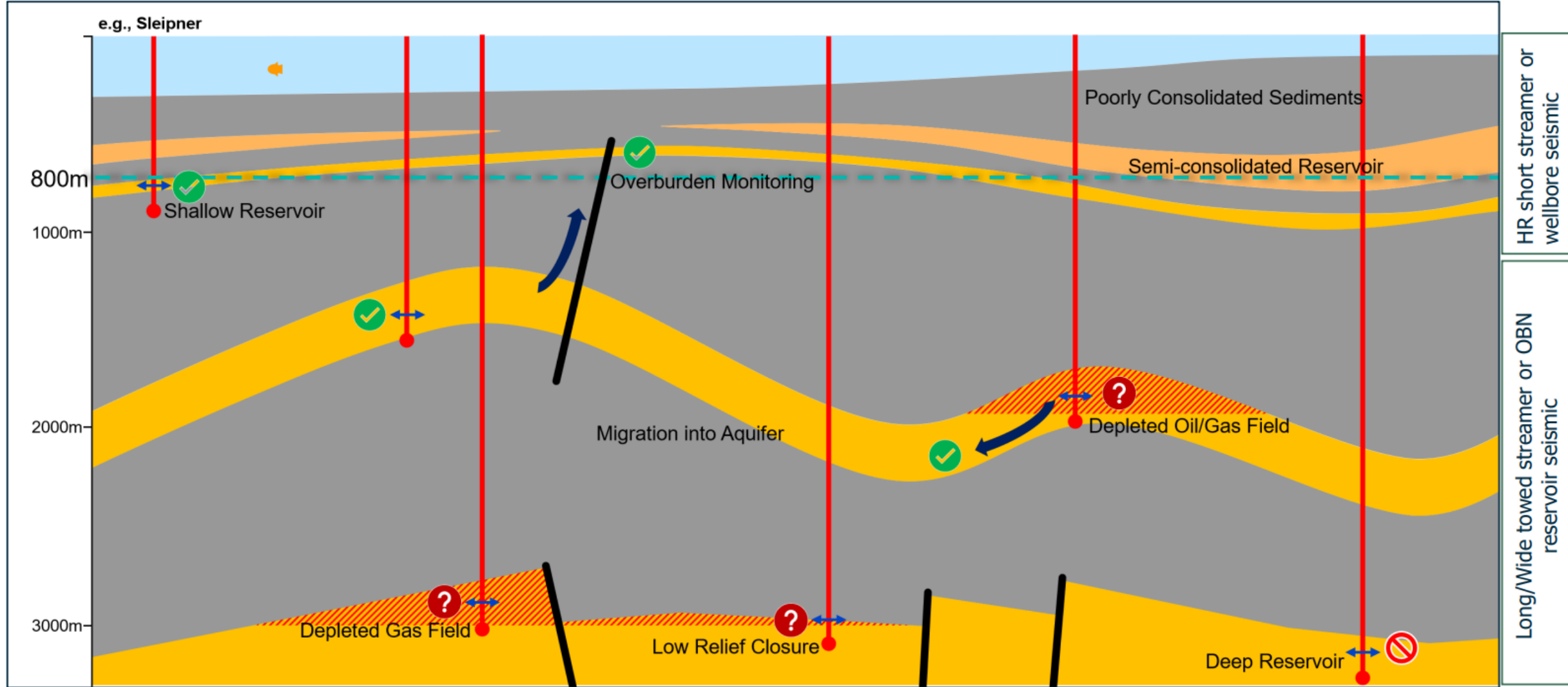


Identify less invasive MMV techniques

- Could alternative MMV enable colocation?
 - Supply chain technology developments
 - Purposes for monitoring
 - Timing of monitoring
 - Colocation



Where can seismic monitoring help?



Monitoring project draft aims

- Supply chain technology developments:
 - Tier 1 vs lower TRL research
- Purposes for monitoring:
 - conformance vs containment monitoring in particular
- Timing of monitoring:
 - baseline structural/property measurements vs tie-lapse fluid movement measurements
- Colocation:
 - colocatable monitoring solutions (with seabed obstacles) vs corrective measures intervention

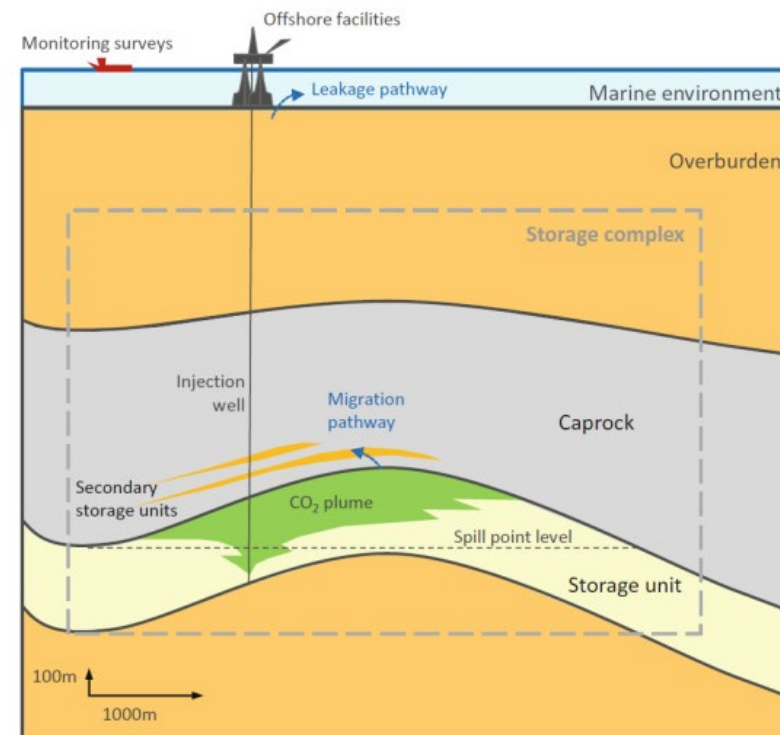


Figure 11: From Ringrose (2020), a schematic cross-section illustrating CO₂ injection into a deep geological storage site in an offshore setting and defining the CO₂ storage unit and storage complex.

AOB



AOB

- Actions review
- Next meeting date
- Next H&S moment owner