

BOEM Bureau of Ocean Energy Management

Carbon Sequestration on the Outer Continental Shelf

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Department of the Interior Offshore CS Authority

- Section 40307 of Bipartisan Infrastructure Law (BIL) amended the Outer Continental Shelf Lands Act (OCSLA) to authorize the Secretary of the Interior to grant a lease, easement, or right-of-way on the Outer Continental Shelf for activities that "provide for, support, or are directly related to the injection of a carbon dioxide stream into sub-seabed geologic formations for the purpose of long-term carbon sequestration."
- Additionally, the law directs, "Not later than 1 year after the date of enactment of this Act [November 14, 2022], the Secretary of the Interior shall promulgate regulations to carry out the amendments made by this section."



Rulemaking Summary

- Joint Bureau of Ocean Energy Management (BOEM) Bureau of Safety and Environmental Enforcement (BSEE) rulemaking is underway
- Rulemaking team established relying on existing expertise throughout the bureaus
- Extensive outreach underway
- Topics under consideration for the rulemaking include:
 - Financial and economic considerations
 - Pre-lease exploration
 - Leasing
 - Site characterization
 - Plans
 - Environmental considerations
 - Risk assessment and management

- Monitoring and reporting
- Liability
- Well and infrastructure qualification
- Operations, facilities, and pipelines
- Emergency response and mitigation
- Decommissioning

• Leasing Considerations:

- BOEM will conduct pre-leasing analyses to determine lease areas
- Lease spacing and correlative rights
- $_{\circ}$ Conservation of pore space
- Long-Term Liability
- o What are the market drivers?

o Potential Research:

- Lease spacing considerations on the OCS:
 - How much buffer is appropriate between lease areas to prevent pressure front overlap/interference across leases?



Depleted Reservoirs

- Potential for greater available pressure margins

- Abundant geologic, geophysical, engineering and production data

- Proven trap and seal

Numerous legacy wellsSmaller storage capacity

Saline Aquifer

Large potential storage capacityFewer legacy wells

- Abundant geologic, geophysical, engineering and production data

- Multiple Stacked Reservoirs

Unknown seal integritySmaller available pressure margin



Geologic Considerations

- GOM extensive, world-class data
- High porosity and permeability
- Over 23,000 depleted reservoirs



Analysis identified 100 largest producing reservoirs

Distance to shore and water depth refined the list to 21 Reservoirs in 9 fields.





GOM – 21 Depleted Reservoirs / 9 Fields

https://www.boem.gov/about-boem/regulations-guidance/carbon-sequestration



Geologic Considerations:

Depleted O&G Reservoirs vs. Saline Reservoirs vs. Basaltic Reservoirs

Legacy Wells:

o Potential leakage pathways? Can there be too many? Re-entry?

o Potential Research:

- Injection Pilot Project to full-scale Demonstration Project
 - Consider starting with a depleted O&G reservoir
- Environmental Monitoring
- CO₂ Release Project/Modeling



Environmental Considerations

Environmental Considerations:

- Environmental Impacts from CO₂ Leakage Risk Assessments, CO₂ Blowouts, Legacy Wells, Pipeline Ruptures, Geologic Leakage
- "Baseline" Environmental Conditions
- o Monitoring Plume. Water Column? Atmosphere? Frequency?
- o Cumulative Impacts?
- Transportation Vessel vs. Pipeline

o Potential Research:

- What are the important considerations for establishing "baseline" conditions in the OCS environment?
- What needs to be monitored and what are the appropriate monitoring protocols and frequency?
- Transportation



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