

SECARB Offshore Gulf of Mexico Available and Leading Practices



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Best Practices: Recent Activities

- Offshore Best Practices for CO₂ Storage & Transportation
 - SSEB and the Interstate Oil and Gas Compact Commission (IOGCC) convened an Offshore Task Force that reviewed laws and regulations for CO₂ capture and storage (2012)
 - Texas BEG prepared a report for BOEM on best management practices for offshore transportation and sub-seabed geologic storage of CO₂ (2017)
 - SSEB prepared a SOSRA T6.1 report that compared DOE/NETL onshore best practices with the BOEM best management practices for offshore CO₂ transportation and storage (2019)
 - SSEB prepared SOSRA T6.2.a report formalizing Available and Leading Practices (2019) instead of Best Practices



DOE/NETL and BOEM Best Practices Comparison

*Project Management BPM not part of DOE/NETL 2017 update; Under review at SSEB (2020)



SECARB Offshore Planned Activities

- SECARB Offshore (BP1) Action Plan to Expand Available and Leading Practices Explicitly Applicable to the Gulf of Mexico (Mar 2020)
 - Create an action plan to advance offshore practices, based upon SOSRA 6.2 and BOEM work completed
 - Include existing infrastructure, logistical & regulatory obstacles, and decommissioning requirements
- SECARB Offshore (BP2) Final Report (Mar 2023)
 - Incorporate available and leading practices into a final report on *“Assessment of Legal and Regulatory Frameworks”*



SECARB Offshore Planned Activities

INVENTORY OF AVAILABLE PRACTICES: CONCEPTUAL DESIGN

| INFRASTRUCTURE COMPONENTS | CHARACTERIZATION | | | RISK | | | | MONITORING (Atmospheric, Aqueous, | | | |
|--------------------------------------|------------------|-------------------------|--------------------------|-------------|------------|---------|--------------|-----------------------------------|------------|---------|--------------|
| | SITE SELECTION | INITIAL SITE EVALUATION | DETAILED SITE EVALUATION | DEVELOPMENT | OPERATIONS | CLOSURE | POST CLOSURE | DEVELOPMENT | OPERATIONS | CLOSURE | POST CLOSURE |
| Landside Connections | C1 | C2 | C3 | R1 | R2 | R3 | R4 | M1 | M2 | M3 | M4 |
| CO2 Transport & Corridors | C4 | C5 | C6 | R5 | R6 | R7 | R8 | M5 | M6 | M7 | M8 |
| Platforms & Sea Floor Connections | C7 | C8 | C9 | R9 | R10 | R11 | R12 | M9 | M10 | M11 | M12 |
| Well Bores & Wells | C10 | C11 | C12 | R13 | R14 | R15 | R16 | M13 | M14 | M15 | M16 |
| Geological Seals & Barriers | C13 | C14 | C15 | R17 | R18 | R19 | R20 | M17 | M18 | M19 | M20 |
| CO2 Storage & Utilization Formations | C16 | C17 | C18 | R21 | R22 | R23 | R24 | M21 | M22 | M23 | M24 |

| OUTREACH | | |
|--|--|--|
| Integrate Public Outreach with Project Management Conduct and Apply Social Characterization Develop Outreach Materials Tailored to the Audiences | Identify Outreach Goals with Project Management Establish an Outreach Program Implement and Manage the Outreach Program Needed | Identify Key Stakeholders Develop Key Messages Asses the Performance of the Outreach Program |

C16

SECARB Offshore Planned Activities

Inventory Of Available Practices – C16 CO₂ Storage and Utilization Formations

| Phase | Onshore Action | Available Practices | Comparison to Offshore |
|----------------|--|--|---|
| Site selection | Subsurface Geological Data Analysis Storage Reservoir | Identify storage reservoirs and injection zones within Selected Areas. Develop stratigraphic and structural framework diagrams that illustrate suitable storage reservoirs and injection zones of interest, using all available well and outcrop data. | No difference |
| Site selection | Subsurface Geological Data Analysis Confining Zone | Analyze confining zones in Selected Areas. Create stratigraphic and structural framework diagrams to illustrate areal extent, thickness, lithology, porosity, permeability, capillary pressure, and structural complexity of suitable confining zones, based on existing data. | No difference |
| Site selection | Subsurface Geological Data Analysis Trapping | Establish baseline geomechanical characteristics of targeted injection and confining zones. | No difference |
| Site selection | Subsurface Geological Data Analysis Mechanism | Evaluate trapping mechanisms for Selected Areas using available well, outcrop, and seismic data. | No difference |
| Site selection | Subsurface Geological Data Analysis Potential | Establish hydrogeological characteristics of injection and confining zones to assure reliable containment of injected CO ₂ . | No difference |
| Site selection | Subsurface Geological Data Analysis Injectivity | Perform initial estimate of injectivity of candidate injection zones in Selected Areas, using available production history data, hydrologic test data, and analyses of core plugs. | No difference |
| Site selection | Model development - Modeling parameters | Identify types of models and modeling parameters needed to characterize the storage reservoir, confining zone, and fluid properties for Selected Areas. | No difference |
| Site selection | Model development - Data Requirements and cost | Identify data requirements to optimize modeling results; conduct cost vs. benefit analysis to determine value of acquiring new data. | Data acquisition costs offshore tend to be significantly higher; data tends to be lower density due to higher cost |
| Site selection | Model development - Boundary conditions/uncertainty | Identify and characterize uncertainties in modeling results; select boundary conditions which minimize uncertainties in modeling results. | No difference |
| Site selection | Model development - Existing seismic data | If available, integrate existing seismic data in development of static and dynamic models for Selected Areas. | Offshore seismic data tends to be easier to work with due to no need for topographic corrections and easier avoidance of obstacles. |

SECARB Offshore Planned Activities

MATRIX OF LEADING PRACTICES: CONCEPTUAL DESIGN

| Project Management | | | | | | | | | | | | |
|--------------------------------------|------------------|-------------------------|--------------------------|-------------|------------|---------|--------------|-------------|------------|---------|--------------|--|
| INFRASTRUCTURE COMPONENTS | CHARACTERIZATION | | | RISK | | | | MONITORING | | | | |
| | SITE SELECTION | INITIAL SITE EVALUATION | DETAILED SITE EVALUATION | DEVELOPMENT | OPERATIONS | CLOSURE | POST-CLOSURE | DEVELOPMENT | OPERATIONS | CLOSURE | POST-CLOSURE | |
| Landside Connections | C1 | C2 | C3 | R1 | R2 | R3 | R4 | M1 | M2 | M3 | M4 | |
| CO2 Transport & Corridors | C4 | C5 | C6 | R5 | R6 | R7 | R8 | M5 | M6 | M7 | M8 | |
| Platforms & Sea Floor Connections | C7 | C8 | C9 | R9 | R10 | R11 | R12 | M9 | M10 | M11 | M12 | |
| Well Bores & Wells | C10 | C11 | C12 | R13 | R14 | R15 | R16 | M13 | M14 | M15 | M16 | |
| Geological Seals & Barriers | C13 | C14 | C15 | R17 | R18 | R19 | R20 | M17 | M18 | M19 | M20 | |
| CO2 Storage & Utilization Formations | C16 | C17 | C18 | R21 | R22 | R23 | R24 | M21 | M22 | M23 | M24 | |

Outreach and Education

| | | | |
|---|---|--|--|
|  Onshore to Offshore Relationship Very little to no difference |  Onshore to Offshore Relationship Small differences |  Onshore to Offshore Relationship Major differences |  Onshore to Offshore Relationship Not contemplated in Onshore |
|---|---|--|--|

THANK YOU!



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