Longleaf CCS Hub

CarbonSAFE Phase III

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LONGLEAF
CCS HUB

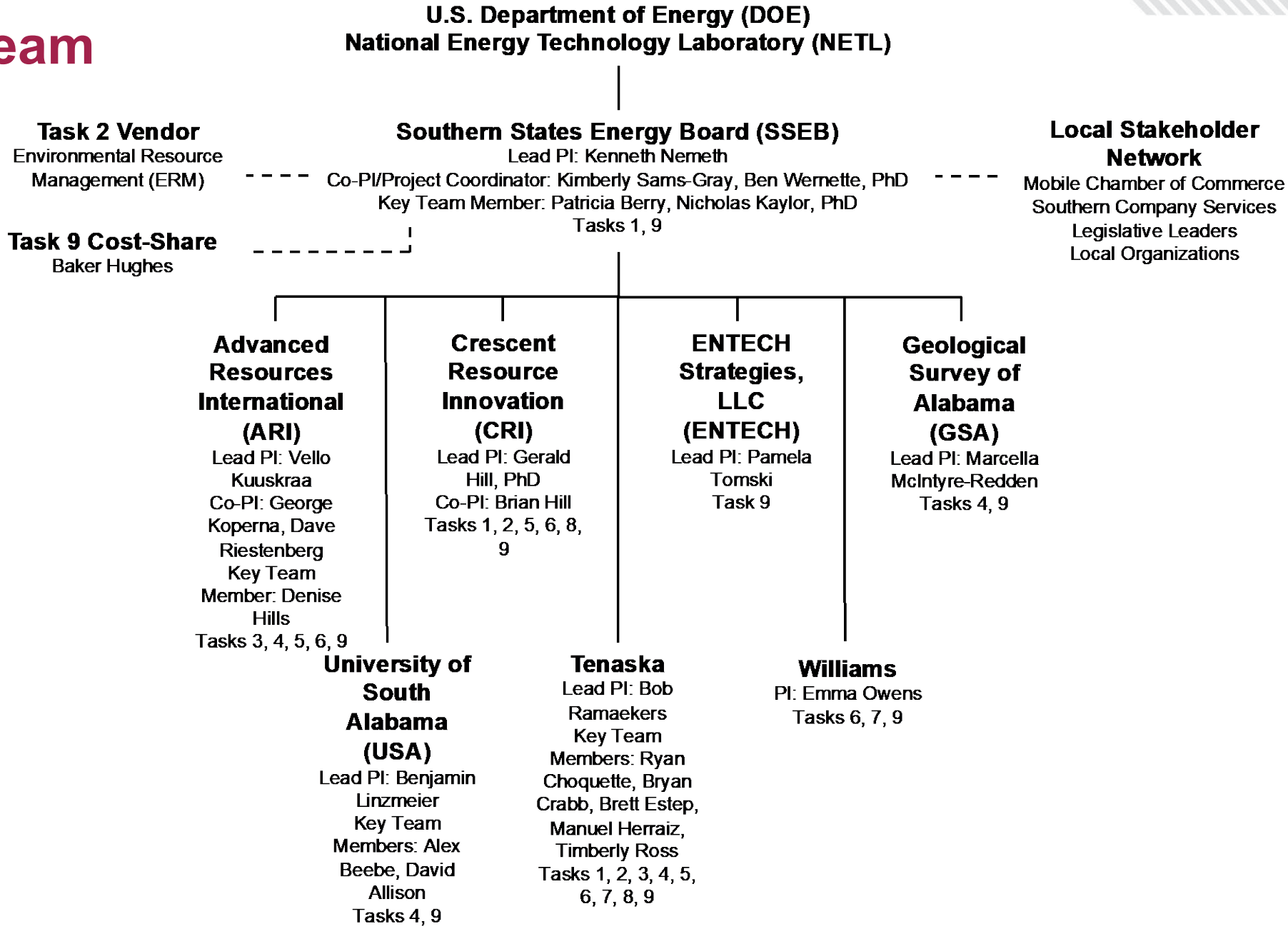
Disclaimer

Longleaf CCS Overview

- Storage site near Bucks in northern Mobile County, AL that has appropriate geology and proximity to CO_2 emitters
- Development started in 2022
- Class VI application submitted to U.S. EPA in 2023
- Phase III CarbonSAFE award that brings together a diverse project team
  - Southern States Energy Board (award recipient), Tenaska, Advanced Resources International, Crescent Resource Innovation, ENTECH Strategies, the Geological Survey of Alabama, the University of South Alabama and Williams
  - Baker Hughes Oil Field Services and Environmental Resources Management participate as vendors, Southern Company Services is the Project Industry Network lead

Project Period of Performance: 36 months
Funding: $23,908,597 ($5,924,074 cost-share)

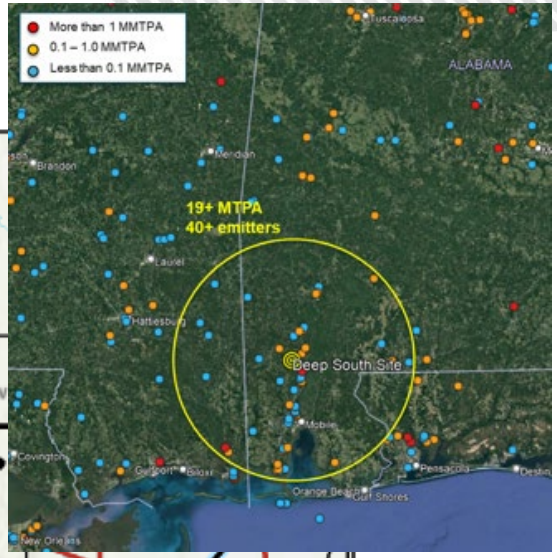
Project Team

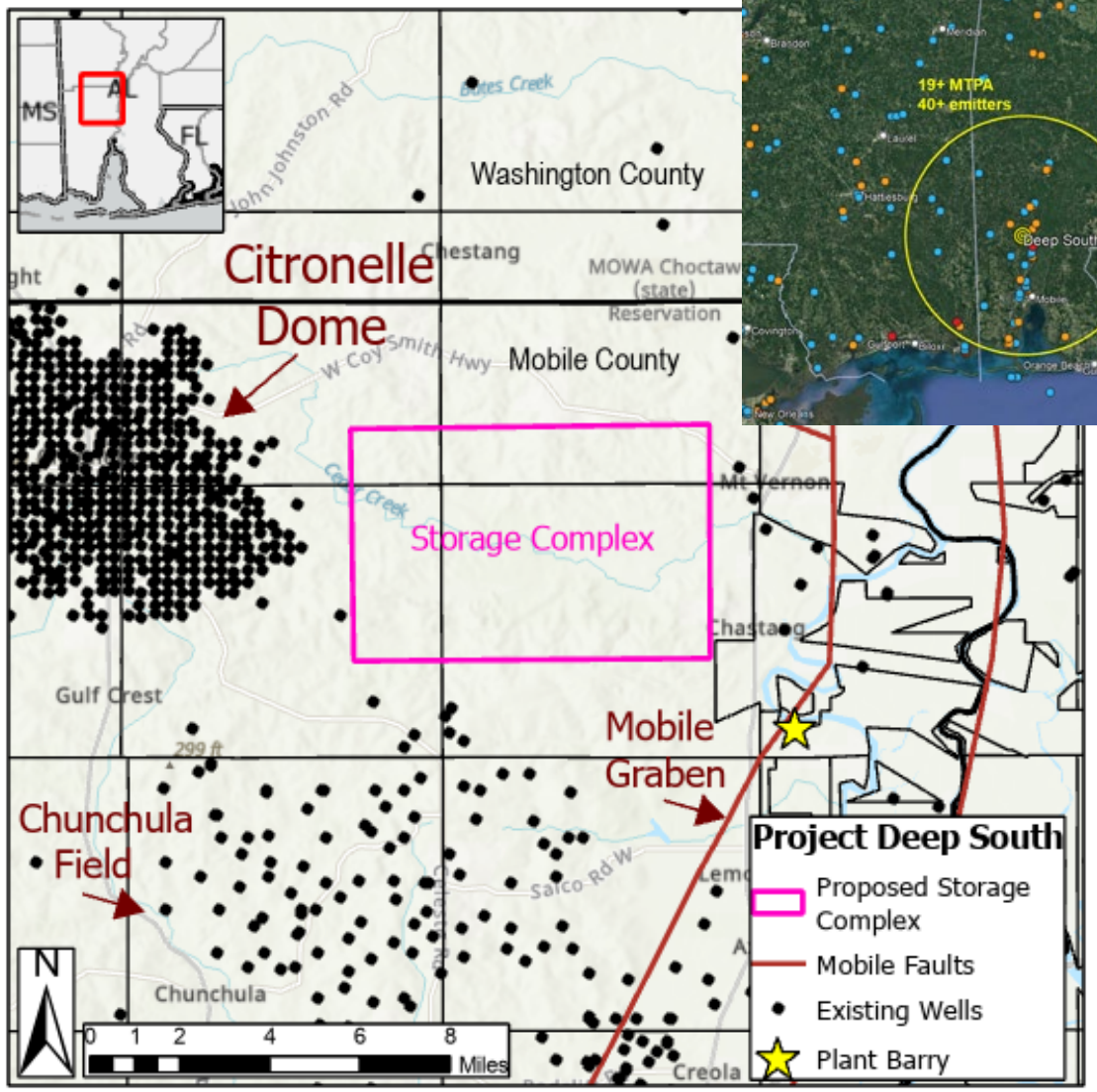


Project Location

- The proposed storage complex site is located north of Mobile, Alabama
- The complex will provide storage options for CO_2 emissions captured from regional emitters along the Mobile River corridor and to the south
- Near the SECARB Phase III Citronelle injection demonstration
- Well characterized saline aquifers and confining system

Regional emitters in the Gulf South that may wish to explore opportunities to decarbonize.





Map of the Longleaf CCS storage complex in northern Mobile County.

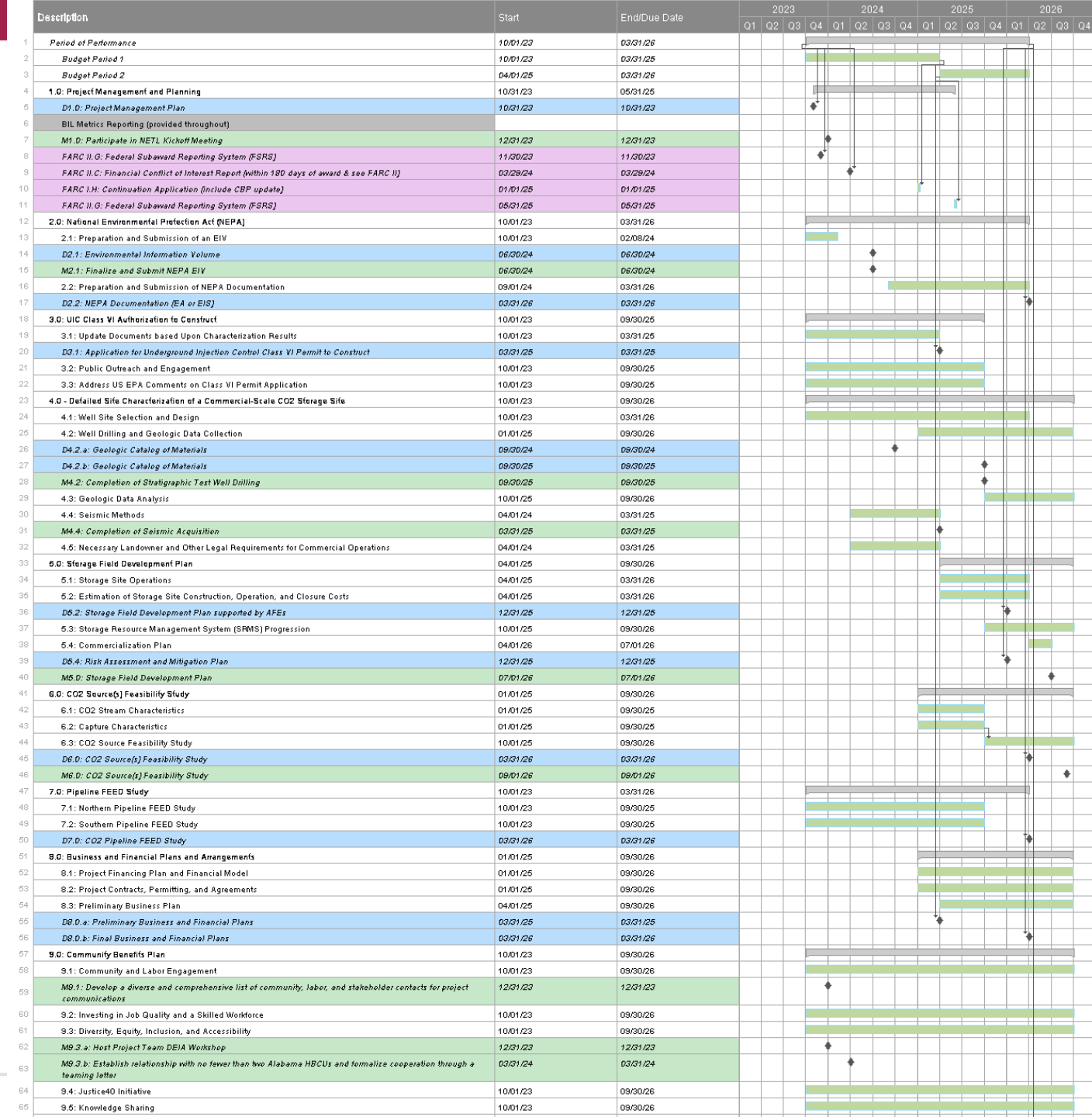
Objectives and Accomplishments

Project Objectives	Accomplishments to Date
Rigorously characterize the subsurface for large-scale storage	Seismic data collected last week of July 2024; stratigraphic test well planned for BP2
Execute a comprehensive community benefits plan	Over 100 separate meetings, March 2024 kickoff event, student engagement event July 31, 2024
Finalize Paluxy Class VI UIC well permits	Completeness review finished in November 2023; Draft permits anticipated in June 2025
Identify CO_2 sources and transportation routes	Discussions with emitters ongoing, preliminary pipeline route identified
Facilitate storage field development	Advancing Class VI permit with EPA Region 4
Develop risk assessment	Initial risk assessment finalized July 2024
Complete NEPA EIV for the integrated project	EIV submitted July 1, 2024

Schedule

- Period of Performance: October 1, 2023, to September 30, 2026
- Project Team kickoff meeting on December 19, 2023
- DOE-NETL kickoff meeting on January 17, 2024
- BP1 activities include coordinating the Class VI permits, completing the EIV, executing the CBP, and acquiring seismic data

	Description	Start	End/Due Date
1	*Period of Performance*	*10/01/23*	*03/31/26*
2	*Budget Period 1*	*10/01/23*	*03/31/25*
3	*Budget Period 2*	*04/01/25*	*03/31/26*
4	**1.0: Project Management and Planning**	10/31/23	05/31/25
5	*D1.0: Project Management Plan*	*10/31/23*	*10/31/23*
6	BIL Metrics Reporting (provided throughout)		
7	*M1.0: Participate in NETL Kickoff Meeting*	*12/31/23*	*12/31/23*
8	*FARC II.G: Federal Subaward Reporting System (FSRS)*	*11/30/23*	*11/30/23*
9	*FARC II.C: Financial Conflict of Interest Report (within 180 days of award & see FARC II)*	*03/29/24*	*03/29/24*
10	*FARC I.H: Continuation Application (include CBP update)*	*01/01/25*	*01/01/25*
11	*FARC II.G: Federal Subaward Reporting System (FSRS)*	*05/31/25*	*05/31/25*
12	**2.0: National Environmental Protection Act (NEPA)**	10/01/23	03/31/26
13	2.1: Preparation and Submission of an EIV	10/01/23	02/08/24
14	*D2.1: Environmental Information Volume*	*06/30/24*	*06/30/24*
15	*M2.1: Finalize and Submit NEPA EIV*	*06/30/24*	*06/30/24*
16	2.2: Preparation and Submission of NEPA Documentation	09/01/24	03/31/26
17	*D2.2: NEPA Documentation (EA or EIS)*	*03/31/26*	*03/31/26*
18	**3.0: UIC Class VI Authorization to Construct**	10/01/23	09/30/25
19	3.1: Update Documents based Upon Characterization Results	10/01/23	03/31/25
20	*D3.1: Application for Underground Injection Control Class VI Permit to Construct*	*03/31/25*	*03/31/25*
21	3.2: Public Outreach and Engagement	10/01/23	09/30/25
22	3.3: Address US EPA Comments on Class VI Permit Application	10/01/23	09/30/25
23	**4.0 - Detailed Site Characterization of a Commercial-Scale CO2 Storage Site**	10/01/23	09/30/26
24	4.1: Well Site Selection and Design	10/01/23	03/31/26
25	4.2: Well Drilling and Geologic Data Collection	01/01/25	09/30/26
26	*D4.2.a: Geologic Catalog of Materials*	*09/30/24*	*09/30/24*
27	*D4.2.b: Geologic Catalog of Materials*	*09/30/25*	*09/30/25*
28	*M4.2: Completion of Stratigraphic Test Well Drilling*	*09/30/25*	*09/30/25*
29	4.3: Geologic Data Analysis	10/01/25	09/30/26
30	4.4: Seismic Methods	04/01/24	03/31/25
31	*M4.4: Completion of Seismic Acquisition*	*03/31/25*	*03/31/25*
32	4.5: Necessary Landowner and Other Legal Requirements for Commercial Operations	04/01/24	03/31/25
33	**5.0: Storage Field Development Plan**	04/01/25	09/30/26
34	5.1: Storage Site Operations	04/01/25	03/31/26
35	5.2: Estimation of Storage Site Construction, Operation, and Closure Costs	04/01/25	03/31/26
36	*D5.2: Storage Field Development Plan supported by AFEs*	*12/31/25*	*12/31/25*
37	5.3: Storage Resource Management System (SRMS) Progression	10/01/25	09/30/26
38	5.4: Commercialization Plan	04/01/26	07/01/26
39	*D5.4: Risk Assessment and Mitigation Plan*	*12/31/25*	*12/31/25*
40	*M5.0: Storage Field Development Plan*	*07/01/26*	*07/01/26*
41	**6.0: CO2 Source(s) Feasibility Study**	01/01/25	09/30/26
42	6.1: CO2 Stream Characteristics	01/01/25	09/30/25
43	6.2: Capture Characteristics	01/01/25	09/30/25
44	6.3: CO2 Source Feasibility Study	10/01/25	09/30/26
45	*D6.0: CO2 Source(s) Feasibility Study*	*03/31/26*	*03/31/26*
46	*M6.0: CO2 Source(s) Feasibility Study*	*09/01/26*	*09/01/26*
47	**7.0: Pipeline FEED Study**	10/01/23	03/31/26
48	7.1: Northern Pipeline FEED Study	10/01/23	09/30/25
49	7.2: Southern Pipeline FEED Study	10/01/23	09/30/25
50	*D7.0: CO2 Pipeline FEED Study*	*03/31/26*	*03/31/26*
51	**8.0: Business and Financial Plans and Arrangements**	01/01/25	09/30/26
52	8.1: Project Financing Plan and Financial Model	01/01/25	09/30/26
53	8.2: Project Contracts, Permitting, and Agreements	01/01/25	09/30/26
54	8.3: Preliminary Business Plan	04/01/25	09/30/26
55	*D8.0.a: Preliminary Business and Financial Plans*	*03/31/25*	*03/31/25*
56	*D8.0.b: Final Business and Financial Plans*	*03/31/26*	*03/31/26*
57	**9.0: Community Benefits Plan**	10/01/23	09/30/26
58	9.1: Community and Labor Engagement	10/01/23	09/30/26
59	*M9.1: Develop a diverse and comprehensive list of community, labor, and stakeholder contacts for project communications*	*12/31/23*	*12/31/23*
60	9.2: Investing in Job Quality and a Skilled Workforce	10/01/23	09/30/26
61	9.3: Diversity, Equity, Inclusion, and Accessibility	10/01/23	09/30/26
62	*M9.3.a: Host Project Team DEIA Workshop*	*12/31/23*	*12/31/23*
63	*M9.3.b: Establish relationship with no fewer than two Alabama HBCUs and formalize cooperation through a teaming letter*	*03/31/24*	*03/31/24*
64	9.4: Justice40 Initiative	10/01/23	09/30/26
65	9.5: Knowledge Sharing	10/01/23	09/30/26



CO_2 Sources

- Over 19 MMTs of CO_2 emitted from over 28 industrial sources in area
- Diverse industrial sources participating in the project and regional demand

Regional emitters that have agreed to participate in project activities.

Company	Industry	CO_2 Emissions Tons/Yr	Letter of Support
Calvert	Steel	500,000	Received
Calysta	Sustainable Protein	500,000	Received
Plant Barry	Power Generation	1,500,000	Received
Williams	Natural Gas Processing	100,000	Received

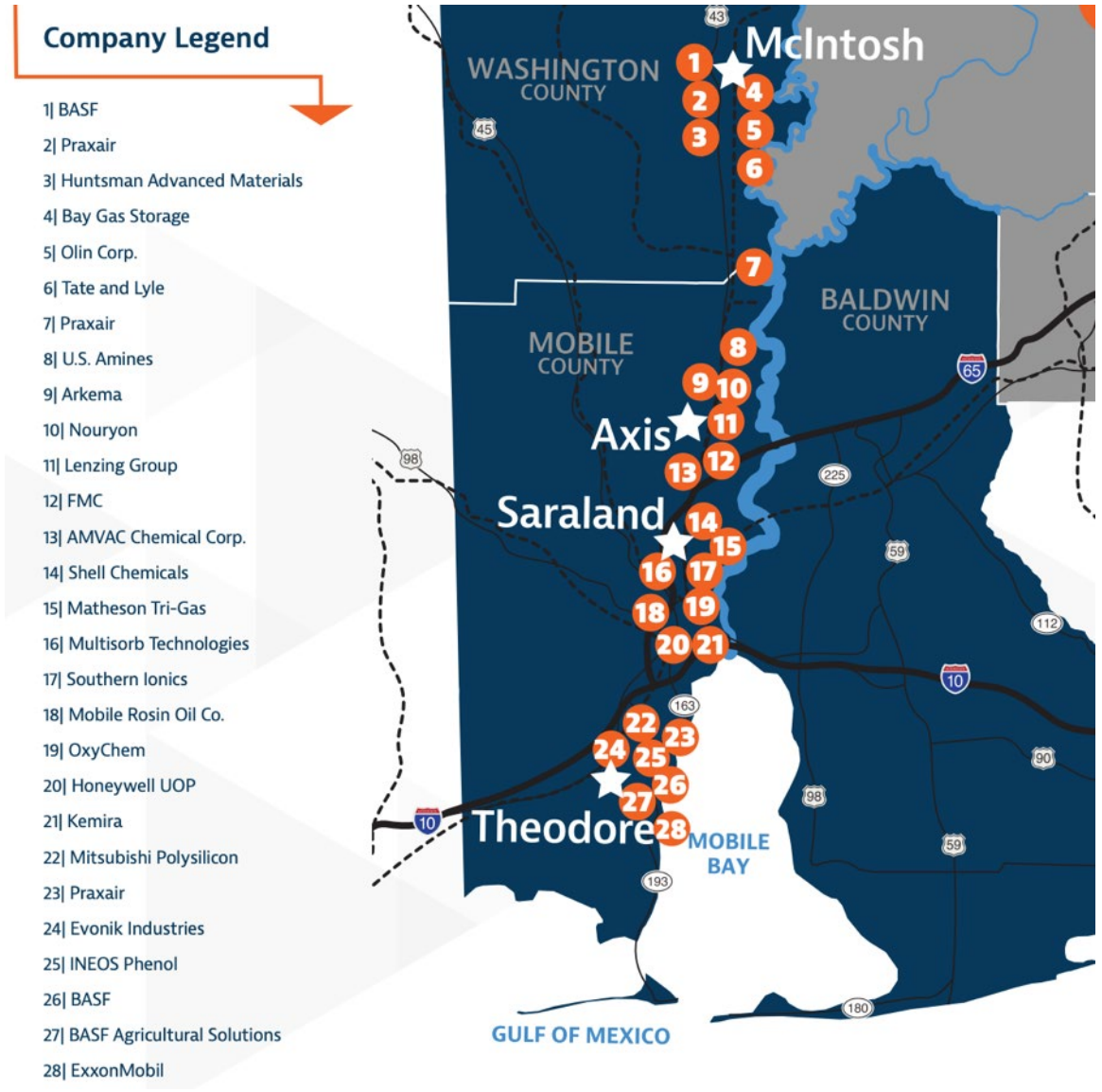
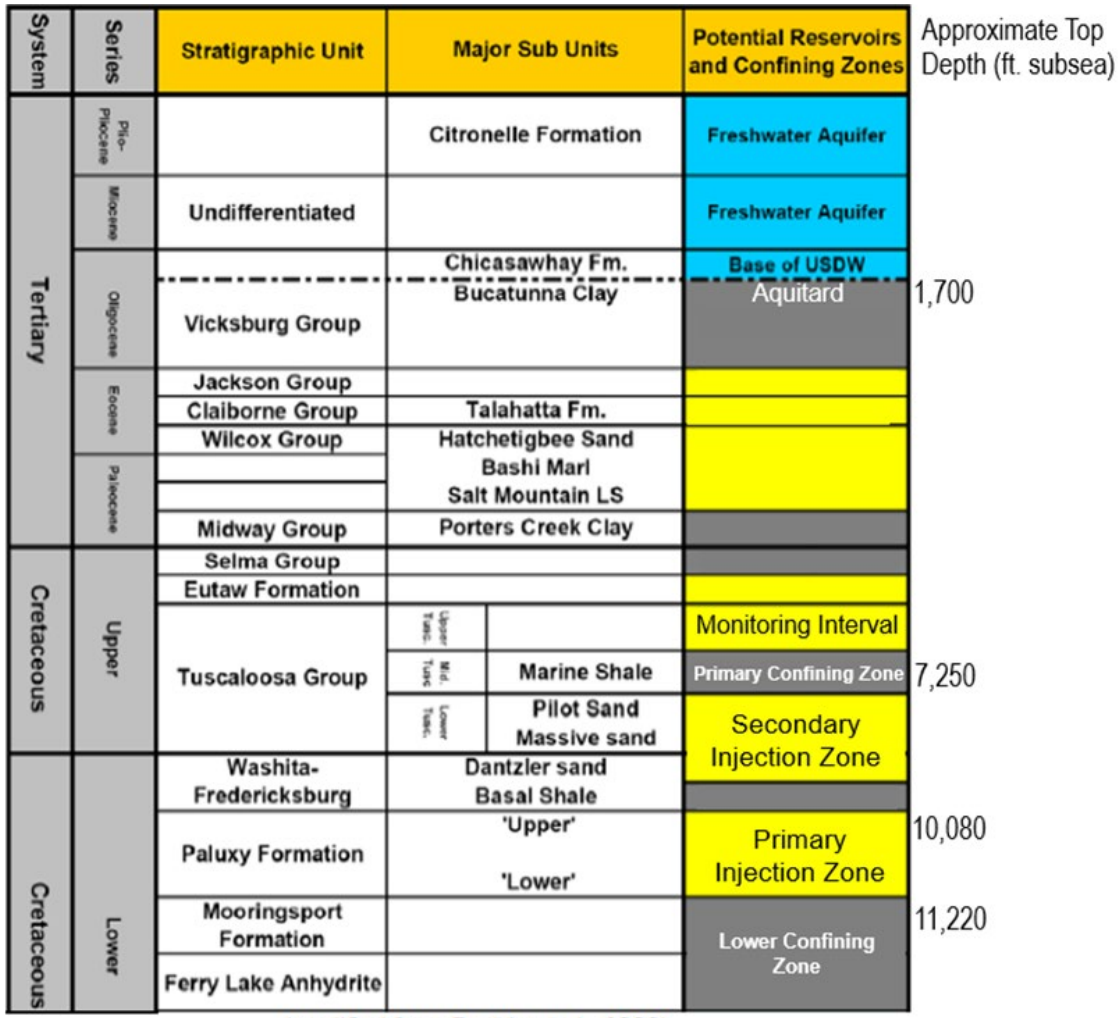


Illustration of the MAST chemical corridor, and the potential demand for decarbonization solutions.

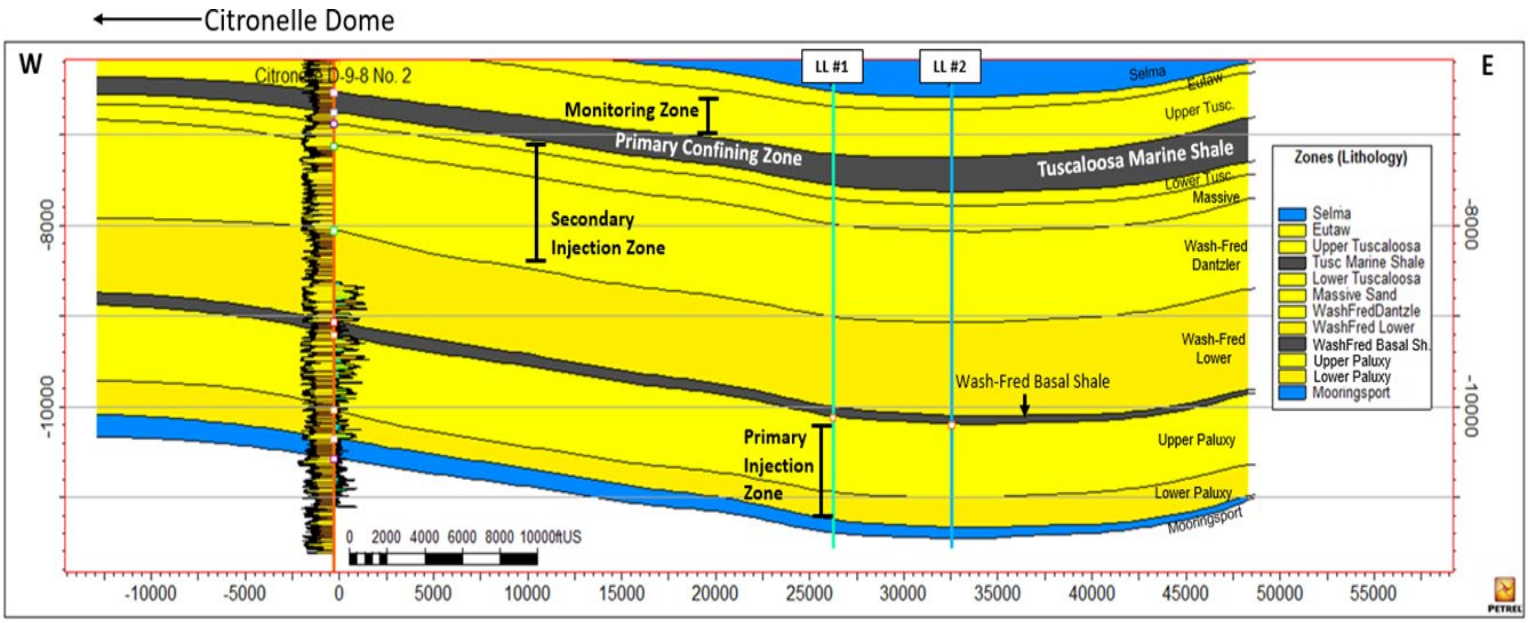
Geology

- Project will initially target the Paluxy Formation, a widespread saline aquifer comprised of porous fluvial sandstone and interfluvial mudstones
  - 470 ft of net sandstone
  - Porosity and perm of 20% and 200 mD
  - 2.3 to 7.4 million metric tons per sq. mi
  - The Tuscaloosa Marine Shale (TMS), a regionally significant sealing formation
- Saline aquifers above the Paluxy provide opportunities for expansion of storage resources

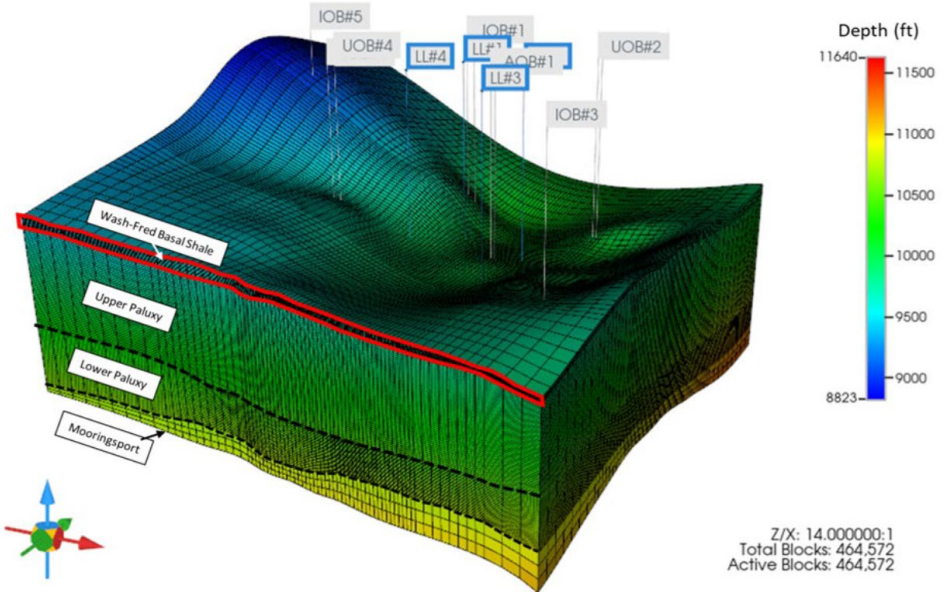


(modified from Pashin et al., 2008)

Longleaf Storage Complex Geology



Storage Complex 3D Model



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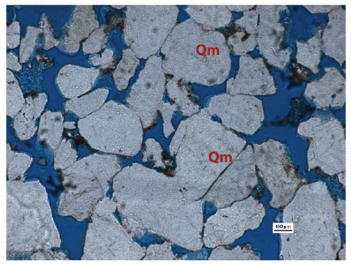
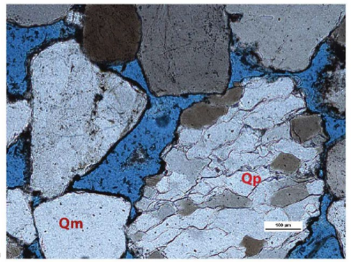
Well D-9-8 #2 at 9,449 ft. showing planar cross-bedded sandstone.



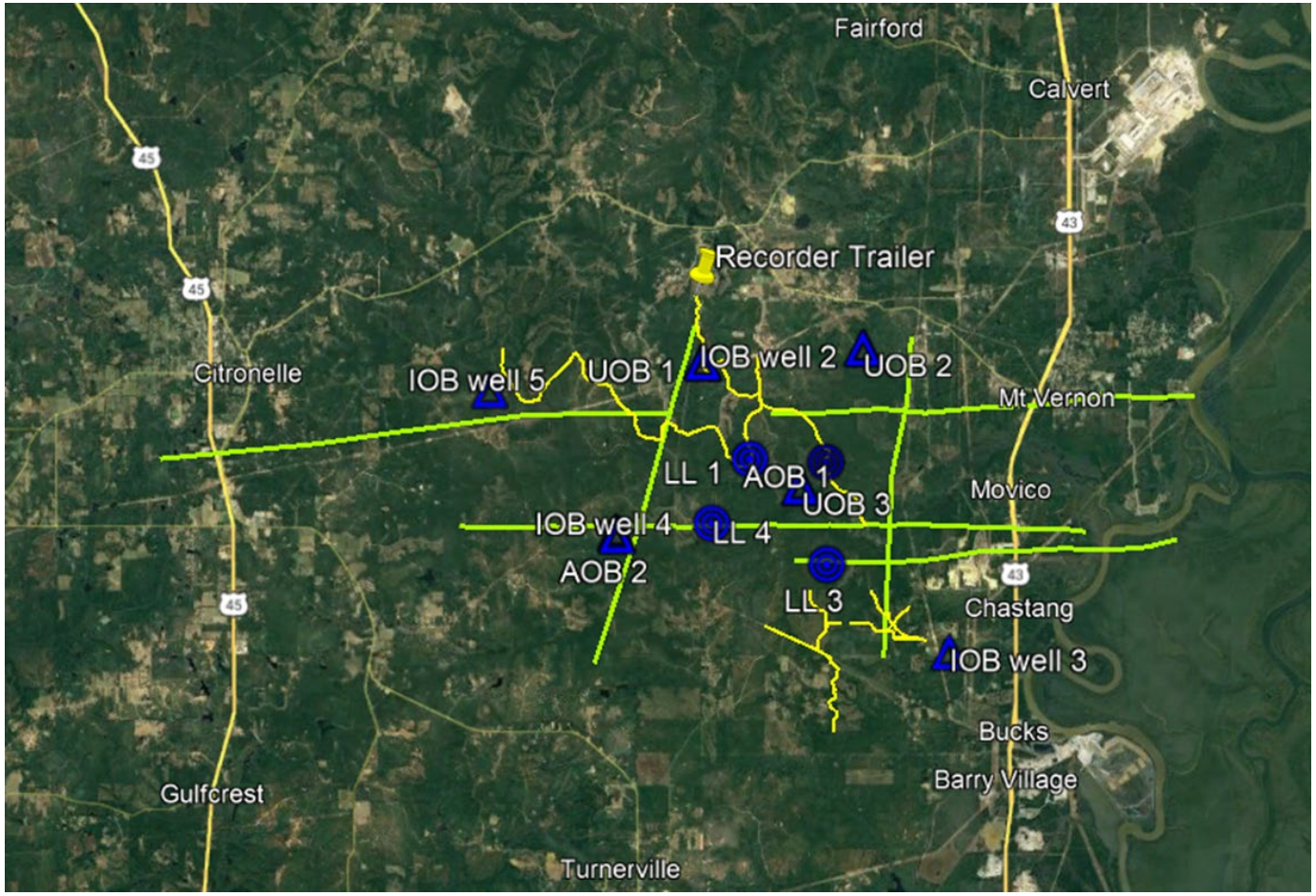


Thin section of Paluxy sandstone rom well D-9-7 #2, top photo at 9,604.35 ft; bottom photo at 9,600 ft.

Qm- Monocrystalline Quartz Qp- Polycrystalline Quartz

Longleaf Continued Characterization

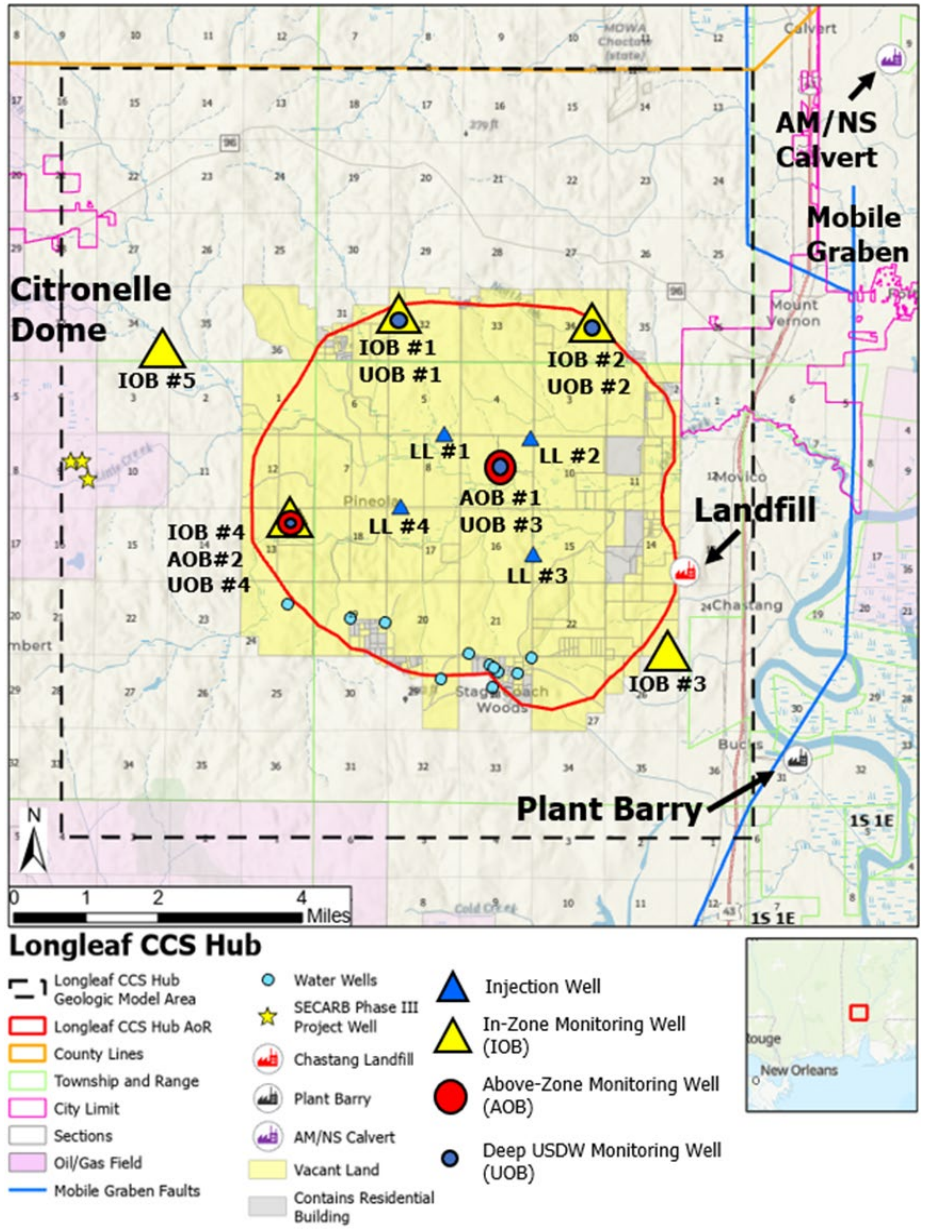
- July-August 2024 acquisition of 22.7 miles of new 2D seismic to augment legacy 2D data
- Drill stratigraphic test well in 2025 to gather data on formation and future monitoring well
- Under CarbonSAFE, seeking to expand the injection to the Massive Sand and Washita-Fredericksburg (Wash-Fred) formations, increasing storage resource to 10+ MMTs per year and more than 300 MMT over 30 years



Longleaf Class VI UIC Permitting

Four Paluxy Class VI injection wells, each capable of injecting 1.25MMt/yr (5MMt total), or 150 MMt over 30 years

- Complete application received May 2023
- NOD's addressed June and August 2023; completeness review finished November 2023
- EPA issued requests for additional information in May and July 2024
- EPA currently estimates issuing draft permits in June 2025 and public comment/review in August 2025 (*Source: EPA Tracker Dashboard, August 1, 2024*)



Community Engagement

- Knowledge of the community
- Targeted stakeholder outreach
- Clear, effective and timely communication
- Flexibility

Community Engagement

- Stakeholder engagement started in 2022
- Collection of education materials created
  - CCS 101 brochure
  - CCS 101 video
  - CCS safety video
- Website – www.longleafccs.com – launched in 2023
- Community representative added to team in 2023
- Local office opened in 2024

Launch Event

Launch Event

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Launch Event

Launch Event

Launch Event

Launch Event

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Collaborative Partnerships

- Goal to see CarbonSAFE investment establish a framework to support future collaborative endeavors
- Strategic partnerships with universities local to the project area and throughout the state
  - University of South Alabama – student engagement and involvement in project execution, subsurface modeling
  - Bishop State University – exploring adding CCS modules to existing programs
  - Tuskegee University – incorporating faculty in project field trips and exploring collaborative opportunities
  - Exploring partnership with other regional community colleges

Seismic Surveys – Outreach & Education

- Seismic surveys in vicinity of storage site in late July/early August
- Opportunities to educate various stakeholder audiences
  - College students
  - State and local stakeholders
  - Industry members
- Video footage to further educate audiences going forward

Seismic Surveys – Outreach & Education

Seismic Surveys – Outreach & Education

Coming Next: Economic Impact Study

- Study performed by University of South Alabama researcher
  - Construction of storage field
  - Construction of pipeline connecting the storage field and the CO_2 emitters
  - Operation of the pipeline and storage field
- Anticipate sharing the results later in Q3


WELLS FARGO
Viva Health
The future
has never been brighter
00:03.45

Thank You!

Contact Information

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