



## **Frontier Carbon Solutions and School of Energy Resources-University of Wyoming Governor’s Energy Matching Funds Application**

### **Project Executive Summary Outline May 26, 2023**

1. **Applicants Name:** Frontier Carbon Solutions LLC and School of Energy Resources-University of Wyoming
2. **Formal Project Title:** Sweetwater Carbon Storage Hub (“SCS Hub”)
3. **Qualification of Applicants to Undertake the Project:** Frontier Carbon Solutions LLC (“Frontier”) is a leading carbon sequestration project developer whose principals have extensive operating experience. Frontier was an “early mover” to carbon sequestration in Wyoming, having signed >45,000 acres of pore space leases (with both private and public counterparties), filed for three Underground Injection Code (“UIC”) Class VI Permits with the Wyoming Department of Environmental Quality, and funded numerous front end engineering studies to better understand the viability of decarbonizing some of Wyoming’s most important industries. Frontier is committed to the safe and efficient development of carbon sequestration in Wyoming. Our principal asset, the SCS Hub, straddles Sweetwater, Lincoln, and Uinta Counties in the Southwestern portion of the state. Frontier has worked with local organizations, businesses, and individuals in order to ensure the responsible development of our hub.

The project team has extensive background in CCS field development projects. University of Wyoming: The School of Energy Resources (SER) at Wyoming’s Flagship and Land-grant University leads the Wyoming CarbonSAFE Phase III project near Gillette, Wyoming (in the opposite corner of the state) which constructed the first wells in Wyoming that meet UIC Class VI construction standards. UW has significant experience in all parts of a complete CarbonSAFE project.

The University of Wyoming is a major research institution with significant facilities and equipment and has developed lab facilities specifically for CCUS research. UW-SER project management will be performed by members of the Center for Economic Geology Research (CEGR), who have over 30 years of experience developing and advancing DOE-sponsored CCUS projects, including CarbonSAFE projects with similar objectives. CEGR are recognized experts in the field of CCUS, specifically in Wyoming, and will bring that experience and methodology to the benefit of the project. In addition to experience in subsurface characterization, monitoring and other CCUS-related sciences, CEGR will also manage, develop and perform the Community Benefit Plan. For the last several years, CEGR and the UW-SER have worked to expand institutional expertise in the social sciences needed to draft and implement Community Benefit Plans (CBP) and J40 initiatives. Project members working on the CBP have formal backgrounds in energy law, policy and regulations, economics, political science, and social outreach, equality and community beneficitation.

Frontier and UW-SER were recently awarded a Department of Energy CarbonSAFE Phase III project, under Infrastructure, Investment and Jobs Act (IIJA) funds, for the SCS Hub and is

requesting the Governor’s Energy Matching Funds (GEMF) to support our committed cost share. This award is the single largest award ever granted to the State under IJA funds, and will be used to expedite the first commercial-scale carbon storage hub in southwest Wyoming.

4. **Vision:** Frontier aspires to be a first mover and market leader for largescale carbon sequestration in Southwestern Wyoming and will work tirelessly with local stakeholders and individuals to responsibly develop our hub.
5. **Overall Project Goal:** To successfully construct and operate three Class VI wells and one monitor well, further legitimizing efforts for large-scale carbon sequestration in Southwestern Wyoming.
6. **Project Objectives:** Primary project objectives include:

- Construct three Class VI injection wells, the Frontier AN 1-26, Frontier J 1-15, and Frontier LCS 1-23. It is contemplated that these Class VI wells would be the first of their kind within the state of Wyoming, and among the first 10 nationally. Qualification of CO<sub>2</sub> storage in Southwestern Wyoming will be instrumental in terms of providing local industries with an avenue to successfully decarbonize and help establish Wyoming as a leader in carbon management.
- Construct one monitor well. This monitor well will be vital in our ability to successfully execute our proposed monitoring and surveillance plan.
- Acquire incremental seismic across Southwestern Wyoming. This additional seismic data will aid in our ability to identify, qualify, and develop further carbon storage resources adjacent to the SCS Hub.
- Work collaboratively with named stakeholders to continue the development of our Project.

7. **Brief Description of Scope of Work and Overall Approach:**

The SCS Hub CarbonSAFE project scope of work includes both technical and nontechnical aspects and is developed to meet our proposal milestones and SCS Hub commercialization goals. The *technical* scope of work includes: (1) completing characterization of the SCS Hub; (2) constructing three injection wells to meet research objectives and commercial injection goals; (3) completing CO<sub>2</sub> capture engineering work for a trona mining and processing facility; (4) completing a FEED assessment for in-field CO<sub>2</sub> pipelines; (5) finalizing risk assessments and the monitoring, verification, and accounting (“MVA”) and mitigation strategies, and; (6) drafting the storage field development plan (“SFDP”). The *nontechnical* scope of work includes: (1) finalization of three Class VI permit applications and thereafter obtaining all UIC Class VI permit(s) to construct in support of eventual commercial-scale operations; (2) completing regulatory site access assessments, to determine and complete environmental studies under NEPA; and (3) completing the Community Benefits Plan.

8. **Named Collaborators and Roles:**

- Frontier Carbon Solutions: Primary project proponent of Frontier include Steven Lowenthal (Co-CEO), Robby Rockey (Co-CEO), and Alicia Summers (VP and Head of Engineering). Frontier’s management is backed by a fully staffed team with considerable project development, engineering and finance backgrounds. Frontier is the owner and operator of the SCS Hub, which will be the first of its kind, large-scale open-source sequestration hub to serve

multiple emitters. The hub's anchor emissions will be sourced from nearby trona mines and will have the capacity to support the decarbonization of Wyoming's entire trona industry, a critical mining industry that supplies 90% of the world's soda ash and represents the State's largest international export. The SCS Hub will also serve as a permanent storage facility for CCI's DAC installation known as Project Bison. Frontier's transportation and sequestration services will be provided for a fee per tonne of CO<sub>2</sub>.

- *University of Wyoming School of Energy Resources*. In November 2022, Frontier and UW-SER partnered as the Project Team and co-applicants on the DOE's CarbonSAFE Phase III grant application proposal. The Project Team elected to have UW-SER serve as Prime because of their expertise in project management on CarbonSAFE projects. Note Frontier is the owner and operator of the SCS Hub and does not serve in a subcontractor capacity.

## 9. Expected Outcomes:

Our expected technical outcomes include: (1) finalizing a geologic characterization of the SCS Hub; (2) drilling and constructing three Class VI injection wells to a commercial specification; (3) finalizing front end engineering studies in order to better understand the commercialization of carbon capture for facilities proximate to our area; (4) completing a front end engineering assessment for further development of CO<sub>2</sub> pipelines; (5) finalizing risk assessments and the monitoring, verification, and accounting ("MVA") and mitigation strategies, and; (6) drafting the storage field development plan ("SFDP"). Our expected nontechnical outcomes include obtaining three Class VI permits, completing regulatory site access assessments, to determine and complete environmental studies under NEPA; and completing the Community Benefits Plan.

## 10. Proposed Benefits to the State of Wyoming:

Frontier's investment in the development of Wyoming's first largescale commercial sequestration project is anticipated to have a positive economic, environmental, and social impact on the community and State. A comprehensive study to evaluate and quantify direct and indirect benefits will be conducted as part of Frontier's due diligence and project development. This is also outlined as a task to be completed in the SCS Hub CarbonSAFE proposal. Preliminary anticipated direct and indirect benefits include:

- Extending the life of the State's legacy resources such as coal, natural gas, and trona by providing a CCS solution for hard to abate industrial processes.
- Establishing a new revenue stream for Fee, State, and Federal surface owners for the use of pore space. Frontier worked with Wyoming's Office of State Lands and Investments to draft and execute its first pore space lease agreement.
- Collaborating with Wyoming's state, county, and local community stakeholders on the first CCS project to educate constituents on the growing carbon market.
- Optimizing and improving existing surrounding infrastructure.
- Creating new job opportunities through facility construction and operation. Additional job creation is anticipated through Frontier's onboarding of carbon emission partners. Frontier will look to utilize existing skillsets and will work with local programs such as Western Wyoming Community College and Wyoming Department of Workforce Services.
- Generating wages and taxes to the State and County throughout the life of the Project.



- Increasing business activity to the region via engagement with local consultants and contractors, equipment providers, hotel accommodations, restaurants, retail, and other.

**11. Budget**

The total CarbonSAFE project cost is \$50,639,935, of which \$40,504,935 is being funded by the Department of Energy. The required cost share for the DOE grant is \$10,135,000. Frontier will provide \$1,000,000 of the cost share. Therefore, Frontier and UW-SER jointly request the remaining cost share from the GEMF, in the amount of \$9,135,000. The table below provides the high-level budget for the CarbonSAFE project. UW-SER is the lead on the DOE grant and Frontier is a sub-awardee. For the GEMF request, Frontier is the lead.

Total Sources and Uses are as follows:

Subcategory	Amount			
Supplies	\$58,725			
Equipment	\$225,000			
Personnel	\$5,109,054			
Fringe Benefits	\$1,458,620			
Consultant / Contractual	\$40,940,101			
Travel	\$136,309			
Indirect Costs	\$2,585,262			
Other Direct	\$126,864			
<b>Total</b>	<b>\$50,639,935</b>			
CarbonSAFE Grant (UW SER + Frontier)	\$50,639,935			
CarbonSAFE Cost Share	\$10,135,000	20%		
<b>Total Sources</b>	<b>\$mm</b>		<b>Total Uses</b>	<b>\$mm</b>
GEMF Grant	\$9,135,000		Total CarbonSAFE Cost Share	\$10,135,000
Frontier Cash Match	\$1,000,000			
<b>Total Sources</b>	<b>\$10,135,000</b>		<b>Total Uses</b>	<b>\$10,135,000</b>