Proposed Agreement between California Energy Commission and Terralog Technologies

Title: Characterization of Wilmington Graben for Large Scale CO2 Geologic Storage
Amount: $500,000.00
Term: 30 months
Contact: Cheryl Closson
Committee Meeting: 9/1/2010

Funding

FY	Program	Area	Initiative	Budget	This Project	Remaining Balance	
10	Electric	ETSI	ARRA	$9,623,697	$500,000	$8,289,343	86%

Recommendation

Approve this agreement with Terralog Technologies USA, Inc. (Terralog) for a 30-month, $500,000.00 cost share grant to supplement the contractor's American Recovery and Reinvestment Act of 2009 (ARRA) award. Under DE-FOA-0000033, Terralog was awarded $4,819,813 in U.S. Department of Energy (DOE) ARRA funds and is providing $704,953 in additional match funding to characterize the offshore Wilmington Graben near Los Angeles for large-scale carbon dioxide (CO2) geologic storage. The total budget for the project is $6,024,766.

Issue

Growing concerns about greenhouse gas emissions and global warming drive an increasing need for power plants and other industrial facilities to significantly reduce CO2 emissions into the atmosphere. The Los Angeles Basin presents a very unique and special combination of high need and significant opportunity for large-scale geologic storage of CO2. With its significant population and historical and geologic setting as one of the most prolific oil and gas producing basins in the United States, this region is home to more than a dozen major power plants and oil refineries, which produce more than five million metric tons of fossil fuel-related CO2 emissions each year. The Wilmington Graben contains more than 5,000 feet of thick Pliocene and Miocene sediments with saline aquifers that may be suitable for geologic storage of CO2. However, the area has not been fully characterized to determine if conditions would allow large-scale CO2 storage.

Background

The offshore Wilmington Graben is a large submerged geologic structural basin that is bounded by faults and filled with turbidite sediments. The study area is estimated to potentially have more than 50 million tons of CO2 storage capacity that could be used to reduce greenhouse gas emissions from local power plants. While geologically isolated from the onshore area, the Wilmington Graben is easily accessible via directional drilling from the onshore oil fields and existing oil and gas infrastructure.

Both the City of Los Angeles and the Port of Long Beach have significant interest and efforts underway to reduce greenhouse gas emissions, while still supporting the business of energy development and port commerce. As part of its climate action work, the City of Los Angeles initiated the ongoing Terminal

Island Renewable Energy and Carbon Sequestration Project and already obtained a permit for construction of a CO2 injection well in the North Wilmington Graben area. A full characterization of the Wilmington Graben, as proposed by this Terralog project, will help establish a better understanding of and broaden options for large-scale CO2 geologic storage in the Los Angeles Basin as well as in other similar geologic regimes.

Federal Funding:
Under the provisions of ARRA and Funding Opportunity DE-FOA-0000033 for Site Characterization of Promising Geologic Formations for CO2 Storage, Terralog was awarded $4,819,813 to characterize the Wilmington Graben for large scale CO2 geologic storage. The total budget for the project is $6,024,766. This total includes $1,204,953 that Terralog must provide to meet the 20 percent cost share requirement set by the DOE. The DOE award to Terralog is a grant award with a 24-month performance period.

Energy Commission Cost Share:
Terralog submitted an application to the Energy Commission's Public Interest Energy Research Program (PIER) for cost share funding under PON-09-002 for their ARRA DE-FOA-0000033 project and is recommended by staff to receive a cost share award in the amount of $500,000 in accordance with the terms of PON-09-002.

Relationship to West Coast Regional Carbon Sequestration Partnership (WESTCARB):
This research effort is not formally part of WESTCARB. However, the project activities are of direct interest to WESTCARB and Terralog has committed to sharing with WESTCARB all characterization data developed by the project for inclusion in the National Carbon Explorer interactive map that identifies CO2 storage locations.

Proposed Work

The project will proceed in two phases over two years. The Pliocene and Miocene Formations in the Wilmington Graben will be characterized and documented through a comprehensive research effort that will include: 1) evaluation of existing two-dimensional and three-dimensional seismic data for the region, with some additional new data acquisition; 2) detailed evaluation of well logs from historical exploration wells in the area, compared and tied to more extensive onshore well data; 3) drilling, coring, and testing two new stratigraphic wells in the graben; 4) development of three-dimensional geologic models, geomechanical models, and CO2 injection models; 5) comprehensive evaluation of storage capacity, seals, and risk assessment; and, 6) project documentation and interaction with WESTCARB and DOE.

Throughout the two-year process, the project will coordinate and collaborate closely with ongoing characterization efforts underway at the United States Geological Survey, Cal State University Long Beach, WESTCARB, and PIER. The expected results for this project will establish and document the potential for more than 50 million tons of CO2 storage in a high need area.

The total budget for this project is $6,024,766. The proposed PIER funding to Terralog would be used to offset drilling, travel and labor costs. In general, the budget is broken down as follows:

85% - Drilling costs for two deep wells and related services
6% - Direct Labor, Fringe Benefits, and Travel
5% - Contractor Costs

4% - Overhead/Indirect Costs

Justification and Goals

This project "[will] advance energy science or technologies of value to California citizens..." (Public Resources Code 25620.(c)), and is part of a "full range of research, development, and demonstration activities that . . . are not adequately provided for by competitive and regulated markets (Public Resources Code 25620.1.(a)).

In addition, the California Global Warming Solutions Act (AB 32) seeks to reduce greenhouse gas emissions to 1990 levels by 2020. DOE identified geologic sequestration of carbon dioxide as one of the most promising techniques to help achieve such goals in the short term. California in particular has very significant potential to store CO2 in sedimentary basins throughout the state, close to very large sources of CO2 emissions. Projects to better characterize and validate this potential will not only contribute to the achieving the goals of AB 32, but will also help develop local infrastructure, education, and expertise in this critical environmental industry.

This will be accomplished by:

- Evaluating and quantifying the CO2 sequestration potential in geologic formations within the offshore Wilmington Graben in southern California.