SECARB Regional Partnership (USA)  
Sharing Knowledge from an CCS Integrated Field Test  

Adapting to New CO2 Injection Well Regulations  

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Presented by:  
Gerald R. Hill, Ph.D.  
Senior Technical Advisor  
Southern States Energy Board
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Adapting CCS to Existing and New Regulations

OUTLINE

- General Regulatory Requirements for an Integrated CCS Project in the U.S.
- CO2 Reporting and Permitting Requirements
- Injection Well Permitting for CCS Projects in the U.S.
- Existing Class V Experimental Technologies Permit vs New Class VI CO2 Storage Permit
- Conclusions
Information is based upon general requirements in the U.S. coupled with actual field experience

SECARB Integrated Pilot Project

The 25 MW CO\textsubscript{2} capture unit at Alabama Power’s (Southern Co.) Plant Barry became operational in June 2011.

A newly built 12 mile CO\textsubscript{2} pipeline will transport CO\textsubscript{2} from Plant Barry to the Citronelle Dome.

From 100 to 300 thousand metric tons of CO\textsubscript{2} will be injected into the Paluxy saline formation over 2 to 3 years.

Advanced Resources and supporting researchers will conduct 3 years of monitoring after CO\textsubscript{2} injection and then close the site.
General Requirements for CCS Projects in U.S.

- Must comply with the National Environmental Policy Act (NEPA) if Federal action is required; many states have similar “SEPA” programs.

- U.S. Army Corps of Engineers oversees wetlands; States oversee storm-water management

- U.S. Fish & Wildlife oversees threatened & endangered species

- State Historical Preservation Offices (SHPO) oversee cultural and archeological resources
NEPA/Permitting at SECARB’s Integrated Project

- UIC Class V permit application
  - Submitted to Alabama Dept. of Env. Quality December 2010
  - Updated March 2011
  - Revise for EPA August 2011

- Environmental Assessment (EA)
  - Mitigation
    - 3 mi of wetlands (wetland mitigation planned)
    - 23 gopher tortoise burrows
  - Consultation
    - Fish & Wildlife Service for the gopher tortoise
    - Corp of Engineers for wetlands
    - SHPO (State cultural/archeological assets)
    - Storm-water construction (BMPs)

NEPA Finding of No Significant Impact (FONSI)
Directional drilling required to avoid disturbing Gopher Tortoise habitat

Images Courtesy Southern Company
CO2 Reporting and Permitting Requirements

- Mandatory Reporting of Greenhouse Gases (40 CFR part 98) for “direct greenhouse gas emitters, … and facilities that inject CO2 underground for sequestration or other reasons.” Generally 25,000 TPY reporting threshold.

- There are no Federal standards on the emission of GHG from large, stationary sources. States have discretion in making decisions on “GHG air permit programs.”

- Texas refused to incorporate GHG into its air permitting program and sued U.S. EPA
Injection Well Permitting for CCS Projects in U.S.

- U.S. Environmental Protection Agency (EPA) oversees U.S. drinking water (USDW) via the Underground Injection Control (UIC) permit program
- States can be granted “primacy” and issue UIC permits
- State Oil & Gas Boards have primacy for CO2-EOR and oversee drilling and extraction in producing formations
CO2 and Classes of UIC Permits

- **Class II – Oil & Gas Injection Wells**
  
  State Oil & Gas Boards have primacy for CO2-EOR and oversee drilling and extraction in producing formations.

- **Class V – Experimental Technology Wells**
  
  13 June 2011: “EPA does not consider it appropriate to permit CO2 injection wells that are testing the injectivity or appropriateness of an individual formation (e.g., as a prelude to a commercial-scale operation) as Class V experimental technology wells. Such wells should be permitted as Class VI wells.”

- **Class VI – New (Dec. 2011) for CO2 Storage**
  
  15 Sept 2011: The “transitional period” during which States were able to use existing UIC authorities (e.g., Class I or Class V) to permit GS projects has ended (75 FR 77243).
EPA developed specific criteria for Class VI wells

- Extensive site characterization requirements
- Well construction using materials that are compatible with and can withstand contact with CO2 over the life of the GS project
- Comprehensive monitoring of all aspects of well integrity, CO2 injection and storage, and groundwater quality during the injection operation and the post-injection site care period
- Financial responsibility requirements to assure the availability of funds for the life (including post-injection site care and emergency response) of the GS project.
No action on the UIC permit from December 2010 until March 2011 awaiting results from characterization well assessment

146.88(c): “The owner or operator must fill the annulus between the tubing and the long string casing with a non-corrosive fluid approved by the Director. The owner or operator must maintain on the annulus a pressure that exceeds the operating injection pressure, unless the Director determines that such requirement might harm the integrity of the well or endanger USDWs.”
Conclusions

- Preparation of the UIC Class V Experimental Technology draft permit was delayed in December 2010 in order to review the new Class VI regulations.

- No action on the UIC permit from December 2010 until March 2011 awaiting results from characterization well assessment.

- During June and July 2011 EPA and State regulators reviewed the permit application to determine if it would proceed as Class V (State primacy) or Class VI (issued by EPA).

- During July and August 2011 State regulators reviewed information in support of a request to maintain an annulus pressure of 200 psi versus exceeding the injection pressure.

- During September 2011 more questions have been raised by EPA adding uncertainty to when the permit will be issued.
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Questions?

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Gerald R. Hill, Ph.D.
Senior Technical Advisor
Southern States Energy Board
hill@sseb.org