

Southeast Regional Carbon Sequestration Partnership (SECARB)



**Gasification Technologies
Council**

Gasification Workshop
Tulsa, OK
June 18, 2008

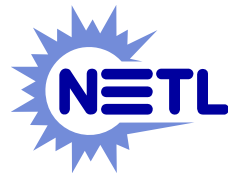
Kenneth J. Nemeth
SECARB Principal Investigator

SECARB Partnership

Acknowledgement

This report is based upon work supported by the Department of Energy – National Energy Technology Laboratory under DE-FC26-04NT42590

Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.



SECARB Partnership Objectives

- Characterize the potential carbon sequestration sinks in the Southeast
- Conduct field verification studies in the most promising geologic formations in the region
- Advance the state of the art in monitoring, measurement and verification techniques and instrumentation
- Develop sequestration technologies and characterize geologic sinks for future readiness

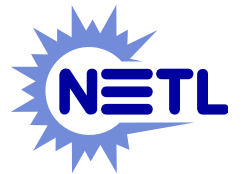


SECARB Regional and National Involvement

Regional Involvement

100+ participants attend 3rd Annual SECARB Briefing

- Member States (Executive, Legislative and Regulatory)
- Industry and Electric Utilities
- Universities and National Laboratories
- NGOs and Trade Associations



Sequestration Activities in the Southeast

Phase I – Regional Characterization and Selection of Most Promising Field Demonstrations (2004-2005)

- General Characterization of Regional Geology
- Nomination of 4 Phase II Small-Scale Projects

Phase II – Small-Scale CO₂ Injection Demonstrations (2005-2009)

- Continued Characterization of Regional Geology
- Two Coal Seam Projects
- Two Saline Tests

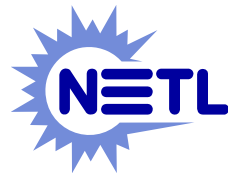
Preparation for Phase III Large-Scale CO₂ Injections (Phase III Injections begin 2009)



Monitoring, Measurement & Verification

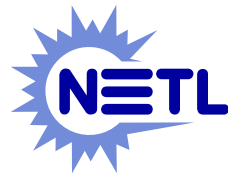
Appropriately planned and implemented MMV is the pathway to public acceptance. This is a high priority for SECARB:

- Assure operator & public safety
- Support regulatory and institutional framework and public outreach
- Support long-term management, liability, and compliance considerations
- Help address siting criteria for future CCS coal-fired power plants and other industrial point sources



SECARB Coal Seam Tests - Overview

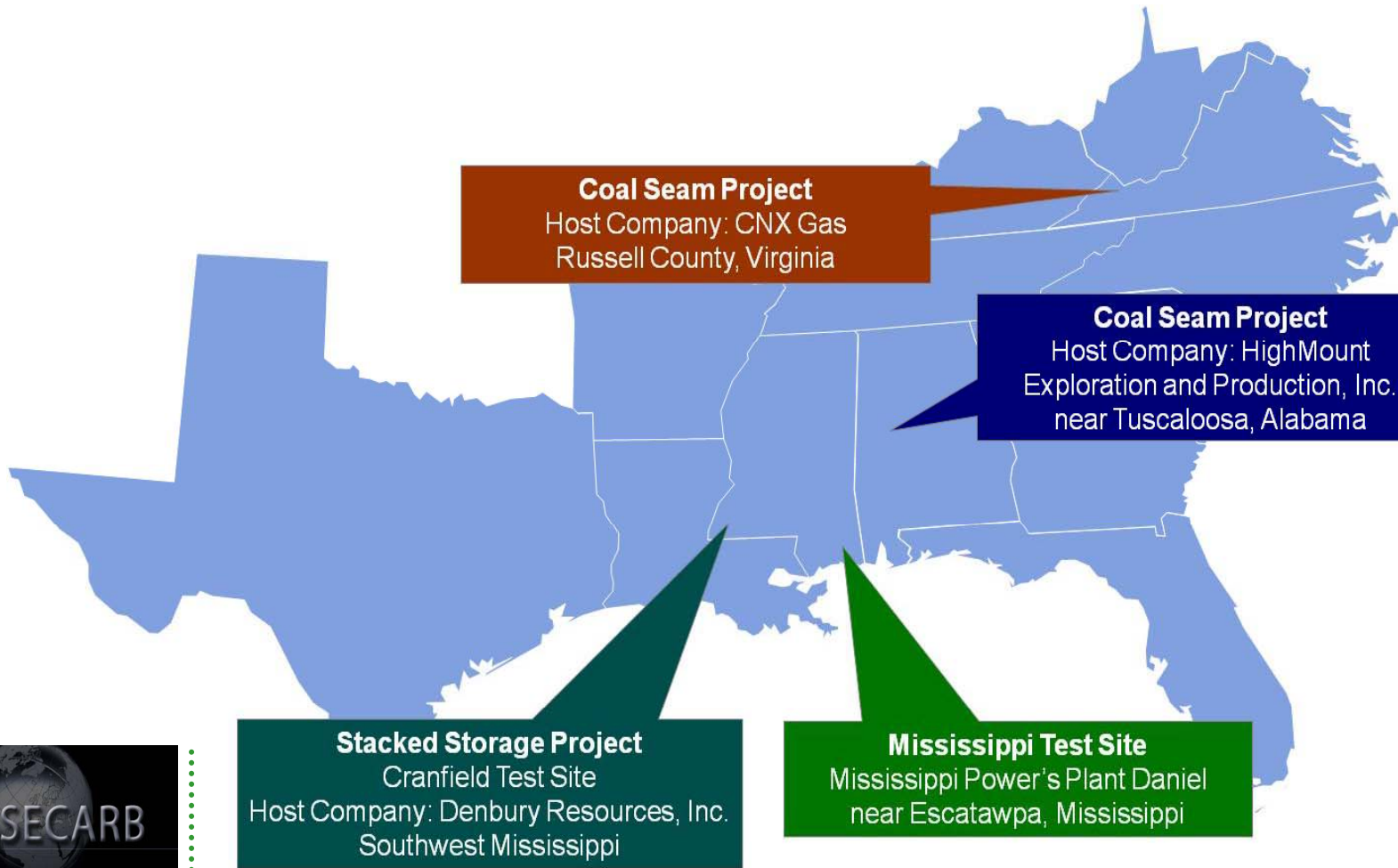
- Phase II Field Test 2a: Small volume CO₂ injection in Central Appalachian Basin coalbed methane well – 1000 ton injection starting Fall 2008
- Phase II Field Test 2b: Small volume CO₂ injection in Black Warrior Basin coalbed methane well – 1000 ton injection following FT-2a experiment
- Phase II Central Appalachian Basin characterization to assess large volume injection potential – Planning for large scale injection 2010 or 2011



SECARB Saline Tests - Overview

- Phase II Field Test 1: CO₂ MMV in an Enhanced Oil Recovery (EOR) setting at Cranfield Unit – Monitor CO₂ injection starting July 2008
- Phase II Field Test 3: Small volume saline injection at large coal-fired power plant (Plant Daniel) – 3000 ton injection starting in October 2008
- Phase III Early Test: Large volume saline injection “down-dip” of EOR activity at Cranfield Unit – 1.5 million ton injection starting in January 2009
- Phase III Anthropogenic Test: Large volume saline injection with power plant capture & separation source – 100,000 to 250,000 ton per year injection starting after 2010



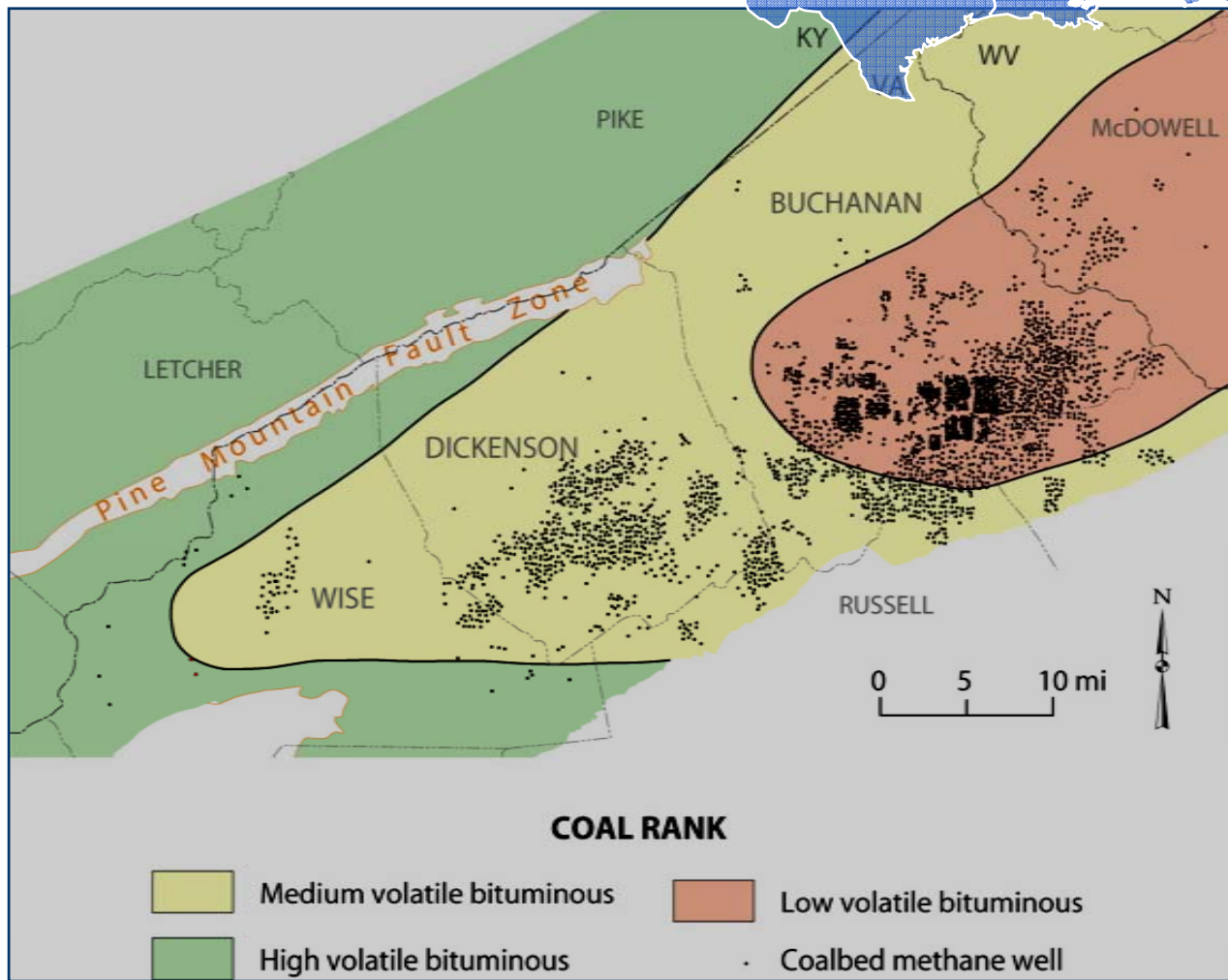
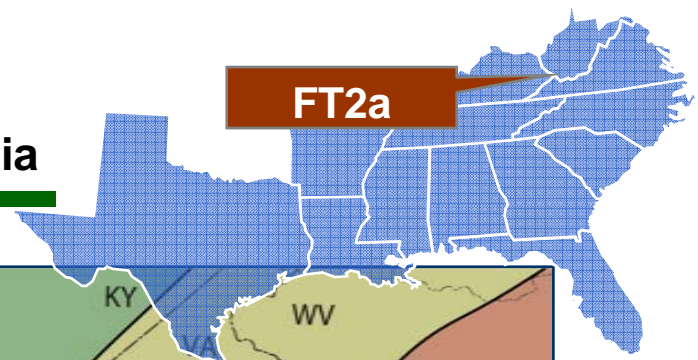


SECARB Phase II Geographic Region and Field Test Site Locations



Phase II Coal Seam Project

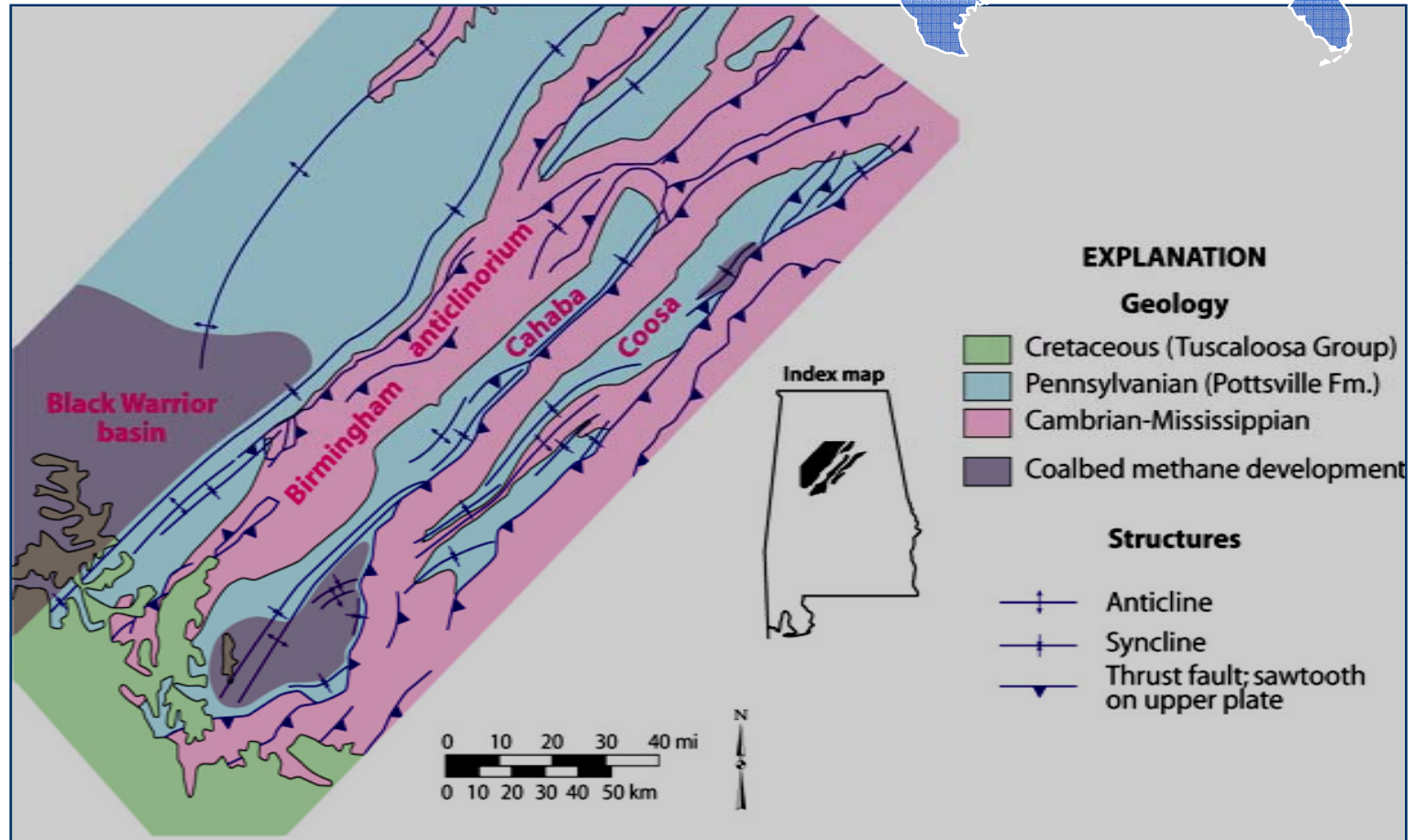
Field Test 2a: Kentucky, Virginia and West Virginia



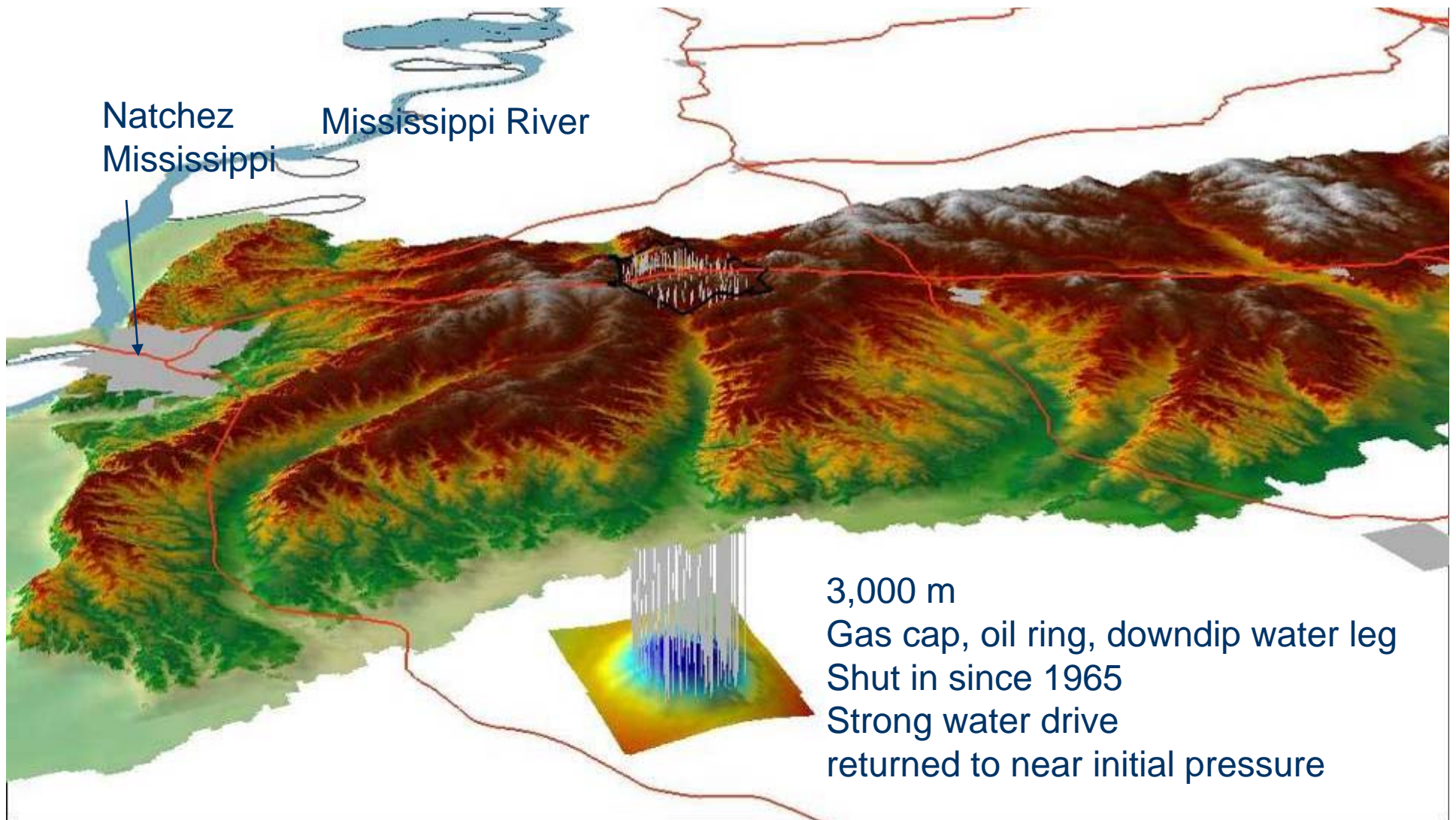
Phase II Coal Seam Project

Field Test 2b: Black Warrior Basin, Alabama

FT2b



SECARB Phase II and Phase III Early Test Cranfield unit operated by Denbury



SECARB Partnership 2008 – Cranfield Unit



**Workover rig on
Ella G. Lees #7 Well
Phase II Monitoring Well**



Phase III work area – Original well pad location



**Lone Wolf Drilling Rig
CO₂ Injector**

Phase II Activities – Plant Daniel (Mississippi Power Company)



Drill Pipe and Other Infrastructure



Rig Assembly



Coring at 6,000', 7,500', and 8,000'



Rig Mobilization

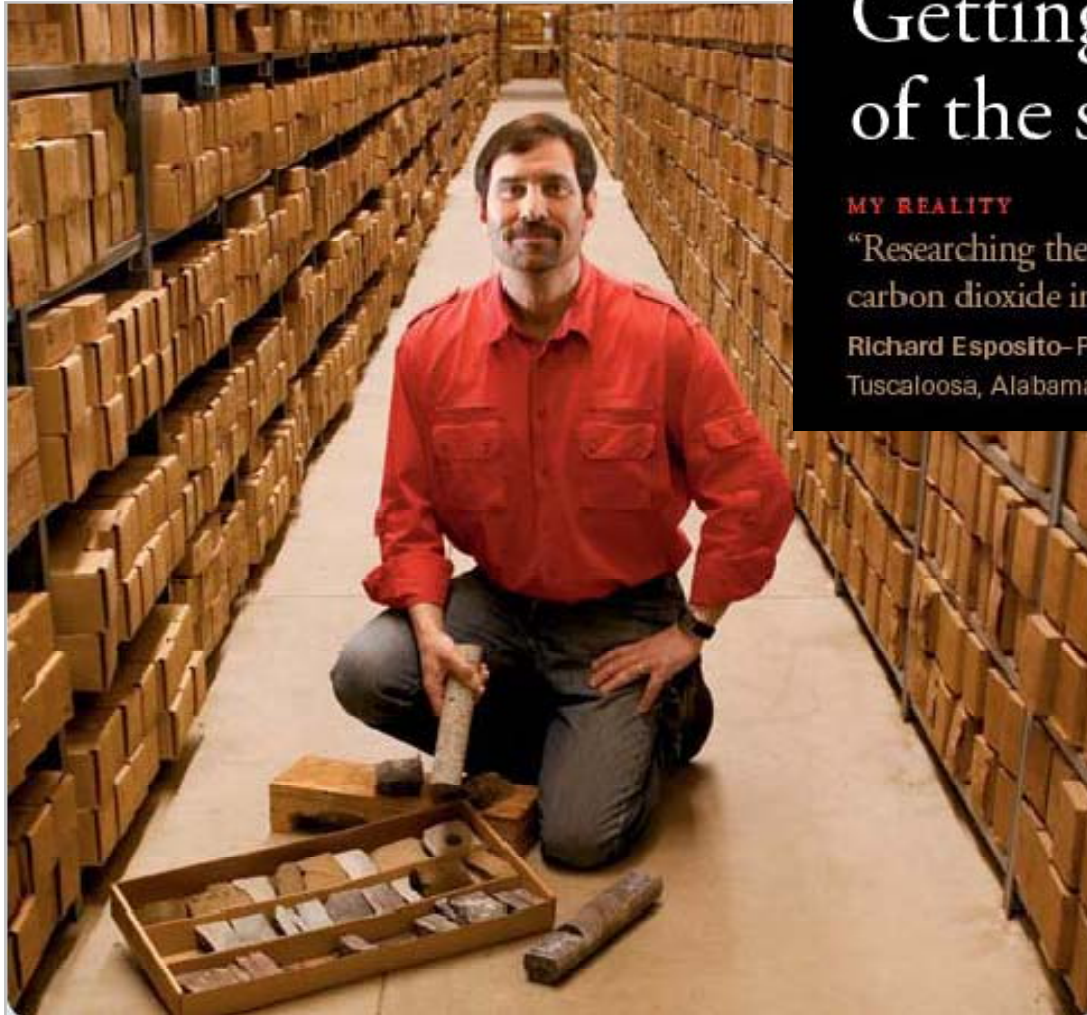
SECARB Phase III Anthropogenic Test

Unique opportunity to demonstrate storage and MMV at a coal coal-fired power plant

- Seek to transfer lessons learned from Cranfield test and apply lessons learned at a power plant site
- Will help determine appropriate MMV techniques and protocols as they apply to a power plant site (what works/what doesn't)
- Defines business and legal issues that make a power plant site unique, i.e., demonstration in light of electrical reliability and cost of commercialization



Southern Company 2007 Annual Report

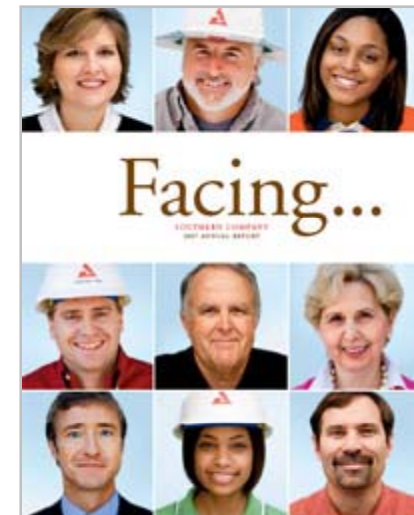


Getting at the core of the solution.

MY REALITY

“Researching the viability of injecting and permanently storing carbon dioxide in underground geologic formations.”

Richard Esposito—Principal Research Geologist, Southern Company
Tuscaloosa, Alabama



Southeast Regional Carbon Sequestration Partnership (SECARB)

Kenneth J. Nemeth
SECARB
Principal Investigator
nemeth@sseb.org

