

Stacked Storage Field Project



Bureau of Economic Geology
at the Jackson School of Geosciences,
University of Texas at Austin

MMV : DIAL, LLNL LBNL, Schlumberger
Operator and CO₂ Source: TBD

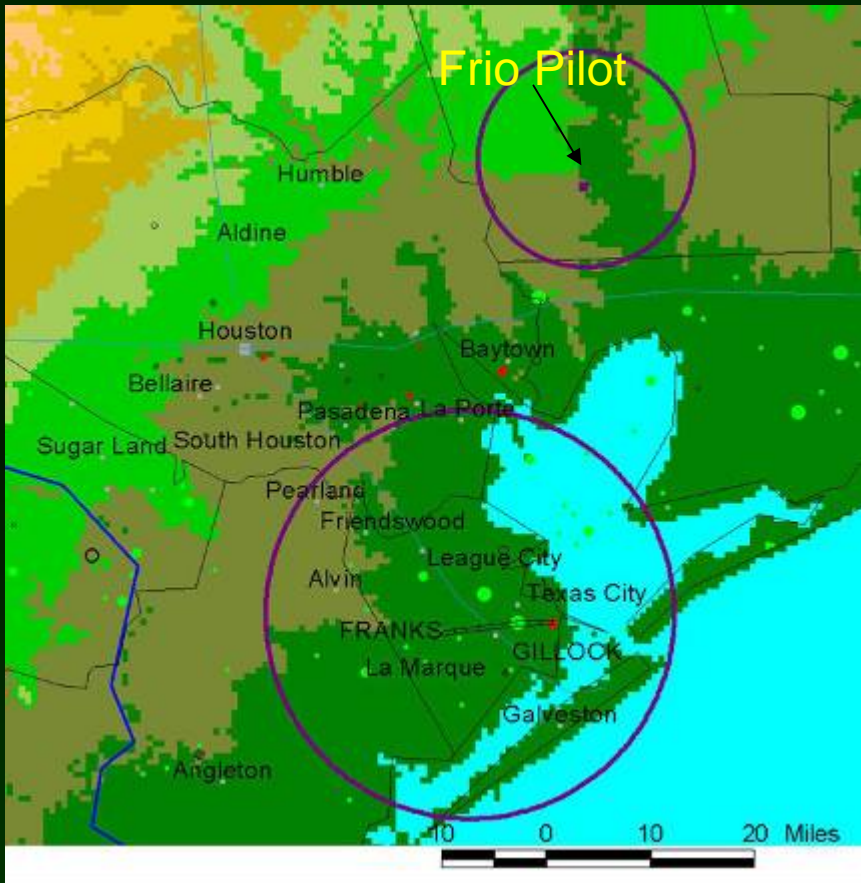
Technology Gaps – Stacked Storage Field Test Objectives

- Explore options for monitoring permanence at full implementation – define the gold standard for MMV
- Data to support risk assessment
 - Stress conditions during large injection
 - Displacement of brine
 - Impacts at surface – deformation and tilt
- Improved economic modeling – measure recovery efficiency for current technologies Gulf Coast case specific reservoir
- Dual permit for EOR + disposal

Stakeholders in Stacked Storage Pilot

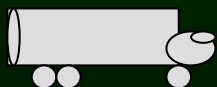
- Demonstration that provides value to participants with overlapping objectives:
 - US carbon storage program – effectiveness and safety of CCS
 - GCCC industry partners – new markets for products, emissions trading, IP
 - Operator – maximize production

Prospective Source-sink Matches for Stacked Storage

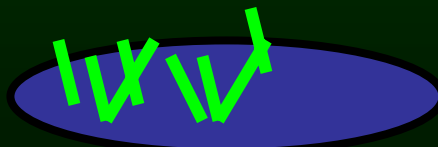


- Source – numerous Texas City refineries, Praxair hydrogen plant
- Sinks – two reservoirs; Smith Energy, Hunt Petroleum, capacity 4 million tons in stacked structural closures, excellent data
- 5-8 mile pipeline
- Coastal lowland, stacked sinks

Environment/Storage/Economic Field Project: MMV design



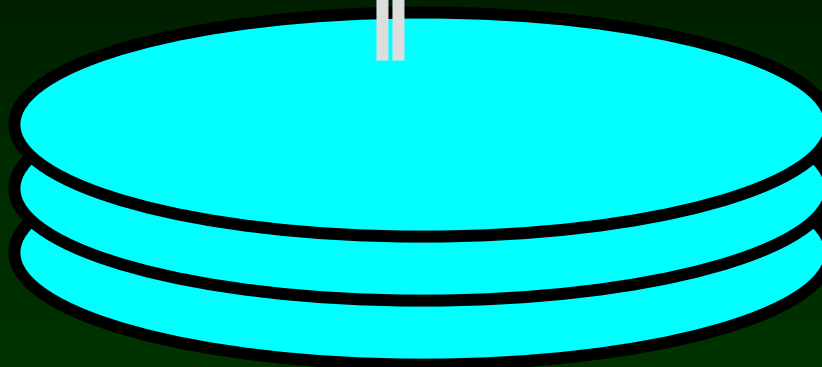
Trucked or low
pressure piped CO₂



Wetlands protection – land
surface elevation, risk
assessment in high water table
site



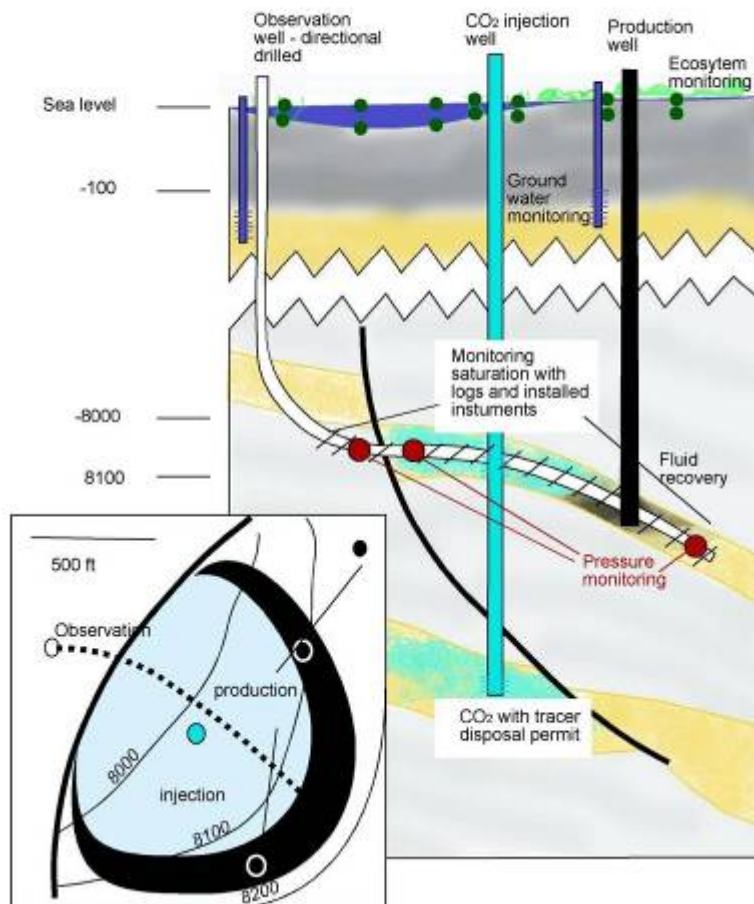
EOR economics, well leakage risk,
long and short term trapping in
reservoir by dissolution in water
and oil and two phase trapping



Storage in brine – predicting
foot print, permanence,
fluid displacement
interaction with faults,
ultimate fate of injectate.

Stacked Storage Monitoring Elements

Research Elements
Gulf Coast Stacked Storage Pilot



Ecosystem monitoring:
Sensitive chemical and
biologic parameters

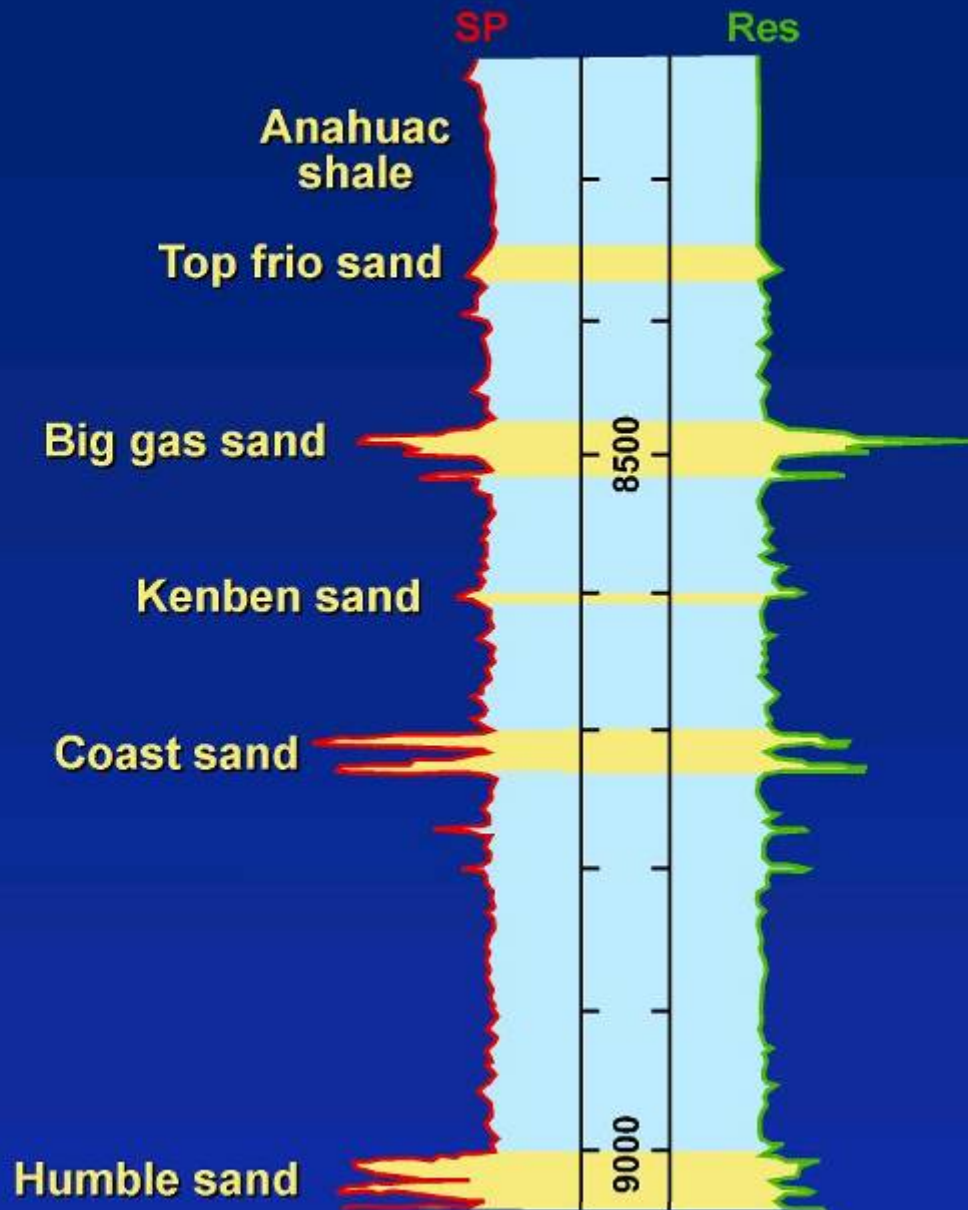
Groundwater monitoring

Oil production –
economic success

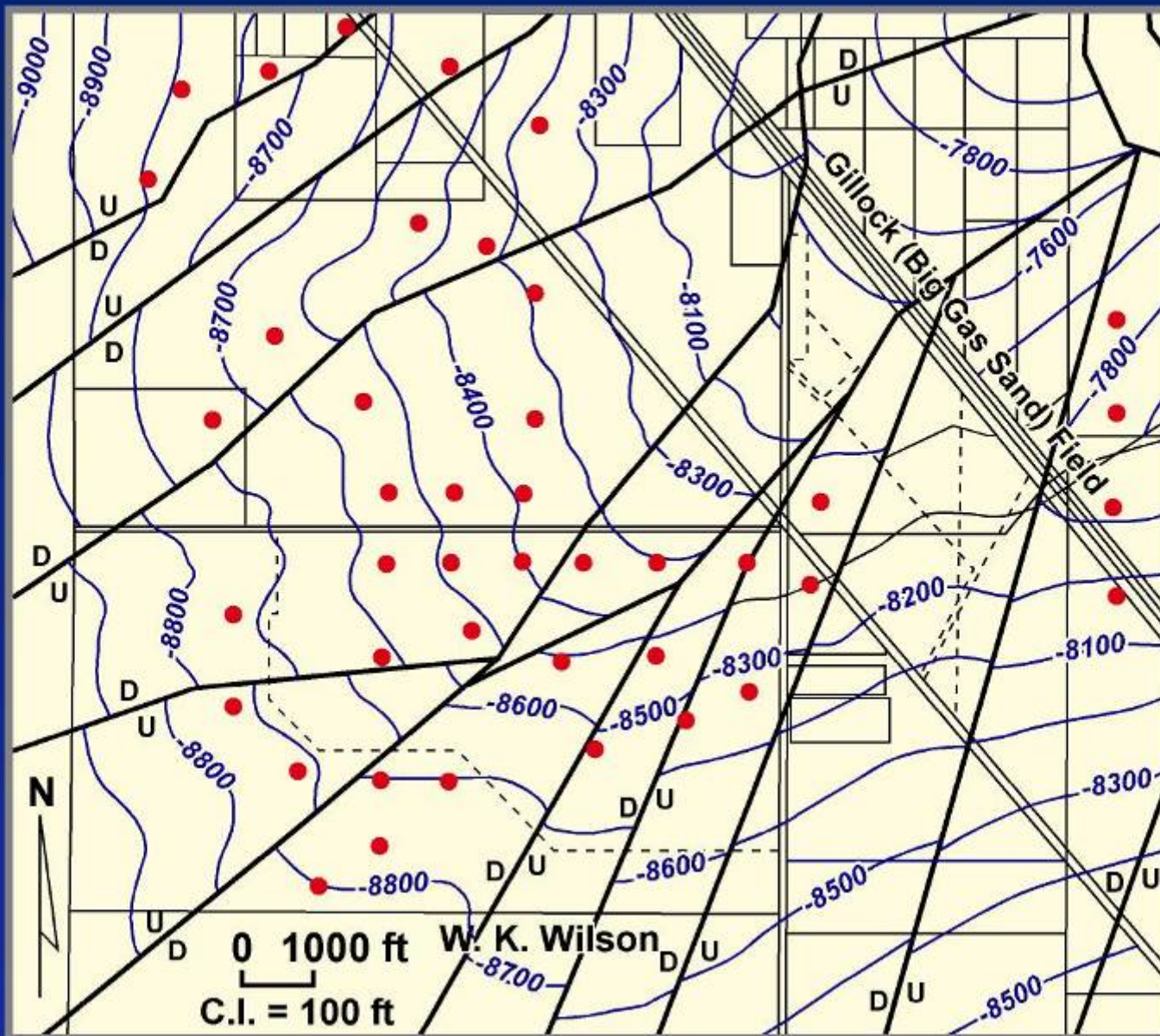
Injection horizon: pressure,
temperature, oil and CO₂
saturation during and post-
injection, instrumented slant hole

Characterization of deeper
horizon in preparation for
eventual disposal

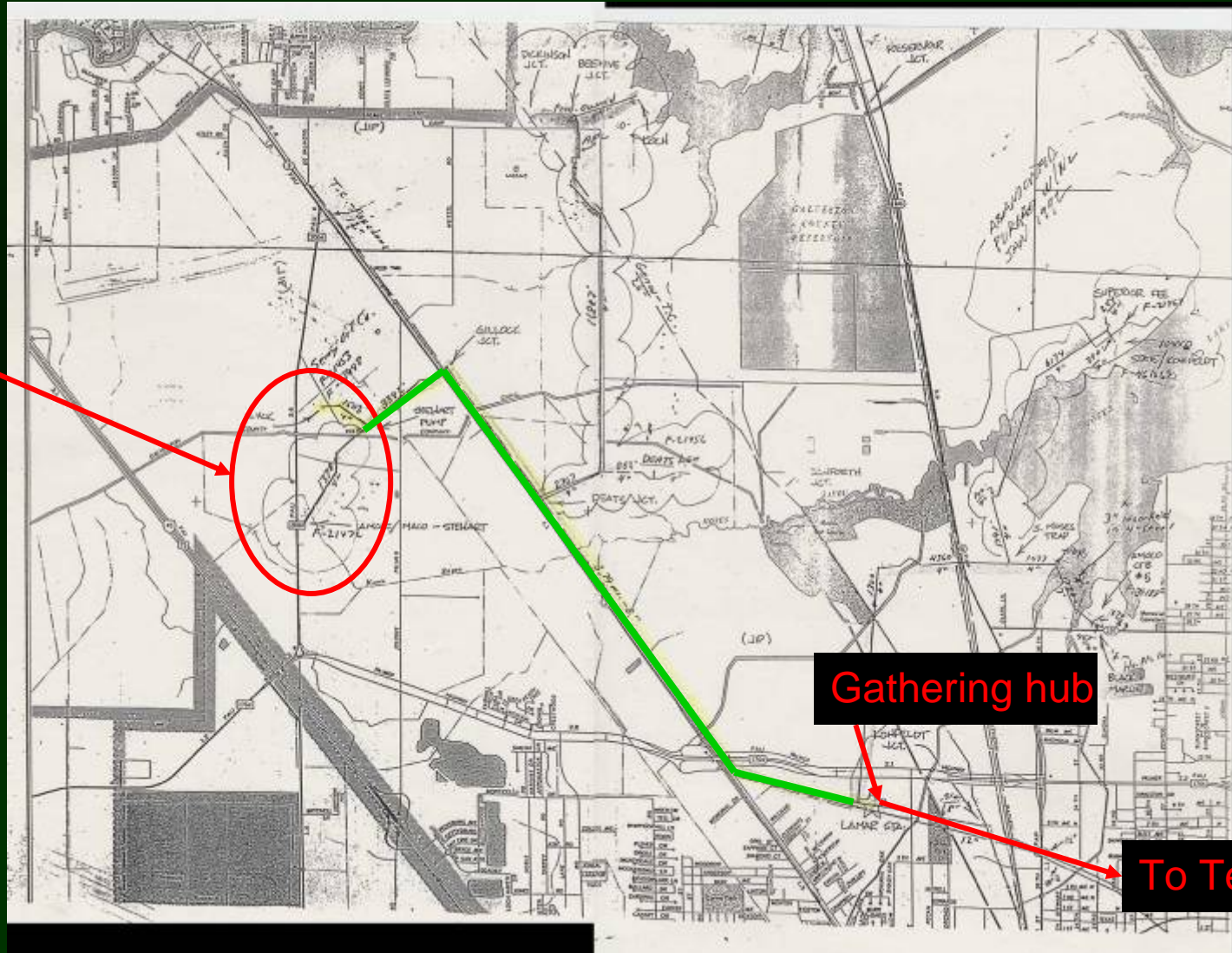
GILLOCK FIELD TYPE LOG



GILLOCK (Big Gas Sand) FIELD



Amoco Pipeline Access to Gillock Field

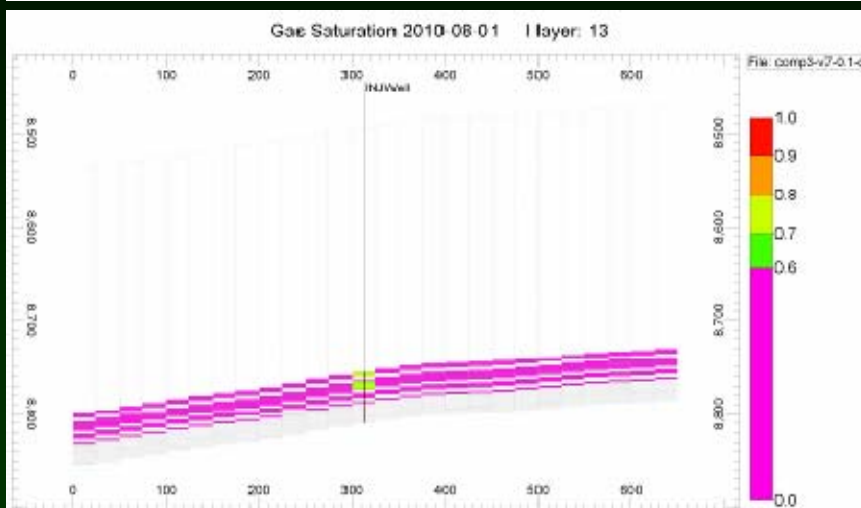
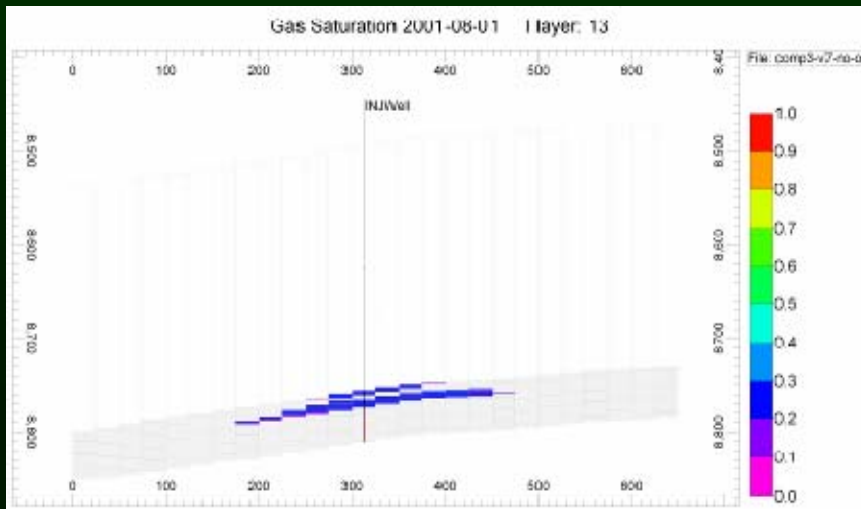


Gillock field

Gathering hub

To Texas city

Role of Oil in CO₂ Distribution



Comparing the migration of a 2 day injection (Huff and puff) in brine bearing to oil bearing formation

- Gillock Field, B7 well, Big Gas sand

Research Elements

- Demonstration in high emissions area with high injectivity
- Use of CO₂ for EOR – economic demonstration
- Assessment of impacts of injection in high water table setting
- Monitoring across a fault and through reservoir to measure CO₂ movement, oil bank formation, pressure evolution, and fluid migration.
- Development of dual use of subsurface for EOR and for disposal



Outreach Elements

- GCCC partners activities
- Technology transfer
- Workshops and symposia
- Extensive technical publications and presentations
- Public outreach – media, web, teacher training, public workshops