

California Carbon Capture and Storage Review Panel



CCS: PROPERTY LAW AND LIABILITY ISSUES

Jerry R. Fish
Stoel Rives LLP
April 22, 2010

Outline of Topics

- Real Property Rights Required for CCS
- Who Owns the Pore Space?
- Potential Liabilities from CCS
- Legislative Approaches in Other States

Property Rights Required

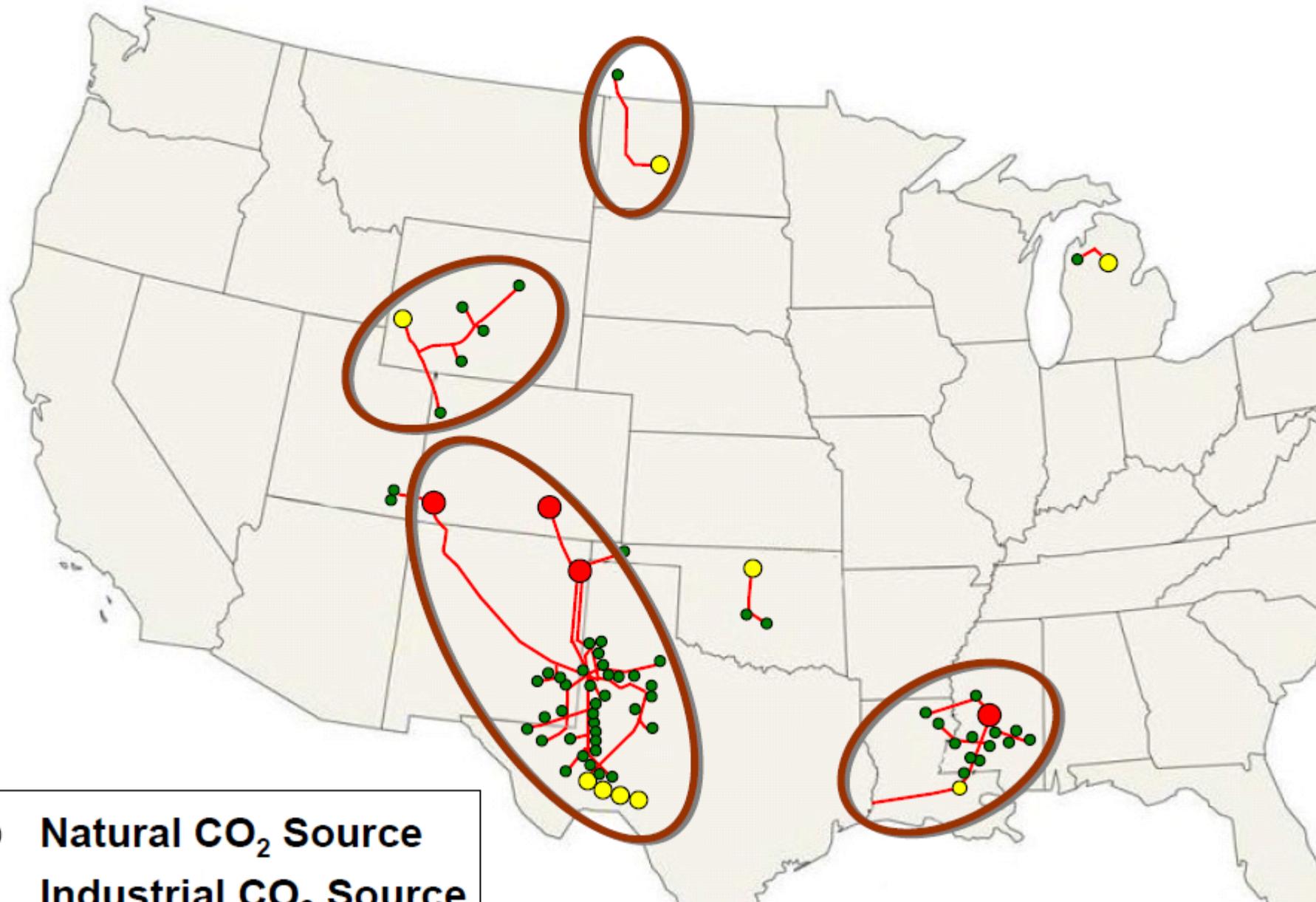


- Pipeline to sequestration site.
- Pads for injection wells.
- Rights for monitoring, surveys
- Rights to Inject CO₂ into pore space
- Rights for an expanding CO₂ plume
- Rights to displace brine, minerals

Pipelines

- Pipelines Require Easements
 - Easements can be acquired by negotiation.
 - Easements can be acquired by eminent domain (where statutes allow).
 - Eminent domain statutes are strictly construed.
 - Legislation should address CO2 pipelines.

Existing Projects & Pipeline Infrastructure



- Natural CO₂ Source
- Industrial CO₂ Source

Survey Rights

- Seismic surveys – usually authorized by mineral lease or other agreement with property owner. Liability for trespass.
- Wildlife/Environmental Surveys – usually authorized by agreement with property owner. Liability for trespass.

Surface Facilities

- Well pads, gauges, monitoring facilities, roads, pipelines, powerlines, etc.
- Generally acquired by lease or fee purchase from surface owner (CCS) or mineral owner (for EOR) or both.
- Eminent domain rights may be necessary for holdouts.

Who Owns the Pore Space?

- Scenario 1: Rights of a single landowner in pore space.
- Scenario 2: Rights among separate surface and mineral owners in pore space.
- Scenario 3: Division of rights in pore space among cotenants, oil and gas operators; royalty owners.
- How do we ***know*** who “owns” it?

Scenario 1: Single Owner

- Case law refers to ownership from the heavens to the center of the earth.
- But modern cases find ownership fades with altitude. Airplanes don't need easements. ***United States v. Causby*, 328 U.S. 256 (1946) (intrusion of airplanes into air space over property).**
- Some newer cases suggest ownership rights fade with depth; decisions vary.

Rights of the Landowner in Pore Space



Courts reach different conclusions about pore space rights depending on the facts. Liability litigation has characterized ownership.

1. Underground natural gas storage.
2. Hazardous waste injection.
3. Enhanced oil recovery (“EOR”).
4. Aquifer storage of fresh water.

Natural Gas Storage

- ***Columbia Gas Transmission Corp. v. An exclusive Natural Gas Storage Easement, 620 N.E.2d 48 (Ohio 1993)(trespass)***
 - Natural gas storage facility acquired pore space rights from property owners
 - But gas strayed onto land not acquired.
 - Ohio Supreme Court said: Trespass! Full ownership and control over pore space at depth.
 - Liability: Injunction, damages, punitive damages.

Hazardous Waste Injection



- ***Chance v. BP Chemicals, Inc.*, 670 N.E.2d 985 (Ohio 1996).**
 - Hazardous waste injection well.
 - Operator not required to show ownership of pore space in adjacent lands.
 - Waste alleged to trespass on adjacent lands.
 - Ohio Supreme Court says: No Harm, No Foul!
 - Does not interfere with reasonably foreseeable use? (how about leasing for gas storage?)

Columbia Gas vs. Chance



- Decisions seem inconsistent.
- It was the same sandstone formation!
- Court said: “oil and gas law is different.”
- Lesson: Risky to think you know how a court will rule.
- Get legislation before investing billions.

EOR

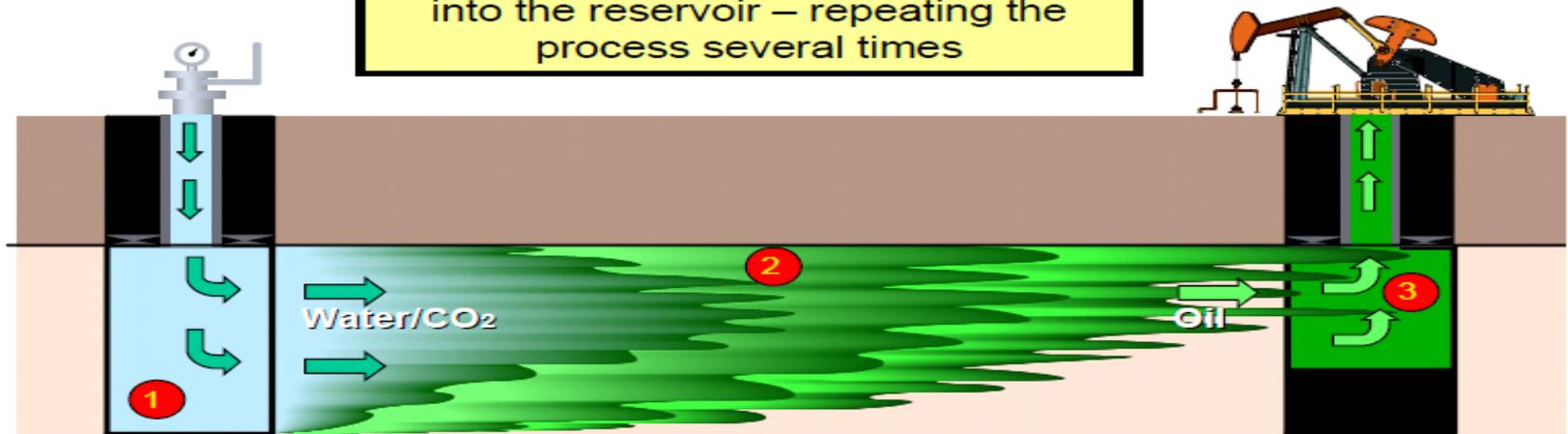
- ***Railroad Commission v. Manziel, 361 SW2d 560 (Tex 1962).***
 - Commission authorized injection of water to pressurize oil field.
 - Neighbor complained its oil wells would be flooded (neighbor not sharing in unit revenue)
 - Court held EOR is in the public interest.
 - Commission had authority to balance rights of neighbors. No trespass claim.

Enhanced Oil Recovery

How Miscible CO₂ Flooding Works

Enhanced Oil Recovery

The CO₂ produced from the reservoir is compressed and re-injected back into the reservoir – repeating the process several times



- 1 Water alternating CO₂ injection – WAG
- 2 CO₂ mixes with the oil
- 3 Recovery of oil through producing wells is increased

Aquifer Storage of Fresh Water

- ***Board of County Commissioners v. Park County Sportsmen's Ranch, LLP, 45 P.3d 693 (Colo. 2002) (Citing Chance).***
- ***Alameda County Water Dist. v. Niles Sand & Gravel, 112 Cal Rptr 846 (Cal App 1974).***
- Water is a public resource.
- Imposes “servitude” on the pore space.
- Water authorities can inject water for later withdrawal. No payment for pore space.

Scenario 1: Summary

- Though single landowner “owns” pore space, “rights” in pore space vary.
- Gas storage – pore space must be bought or leased or trespass occurs.
- EOR, Hazardous waste injection, aquifer storage: pore space may be used in the public interest without compensation.

Scenario 2: Split Estates

- Surface rights and mineral rights may be owned separately. Mineral and “non-mineral” estates.
- Mineral owner has dominant right to use pore space for mineral production, including injection of CO₂ for enhanced oil recovery, until minerals exhausted.
- Exhaustion of the mineral estate is not always clear.
- Ownership of pore space without minerals unclear, but probably would be held owned by surface estate.

Scenario 2: Split Estates



- ***Wall v. Shell Oil Co.*, 209 Cal App 2d 504 (1962).**
 - Mineral owner has right to extract valuable minerals.
 - Right to use so much of the surface as needed.
 - Mineral owner's right is dominant.
 - Surface owner cannot interfere.

Surface Owner Cannot Interfere with Minerals



- ***Cassinis*, 18 Cal. Rptr. 2d 574 (Ct. App. 1993).**
- O&G operator got state permit to inject waste salt water.
- Got permission from surface owner (assuming he owned the pore space).
- The salt water interfered with oil and gas reserves.
- Court awarded \$5 million damages to mineral owner. Trespass on mineral rights.
- Ownership of pore space not decided. But mineral owner's dominant right to use to produce was clear.
- Sequestration operators must deal with mineral owners!

Scenario 3: Multiple Owners

- Owner of reserved mineral rights often divide into fractions and sell royalties.
- These multiple owners then lease to developers.
- Developers divide interests in leases.
- Developers convey royalties from leases.
- One parcel may have many, many owners.

Scenario 3: Multiple Owners

- **Exxon Corp. v. West, 543 S.W.2d 667 (Tex. Civ. App. 1967).**
 - Natural gas storage developer acquires pore space.
 - Overlooks third party royalty owners.
 - Injects and commingles pipeline gas.
 - Required to pay third party royalty owners for remaining native gas.

Pore Space Ownership: Conclusions

- If a parcel has a single owner, ownership of pore space is clear, but it's unclear what rights the owner has relative to CCS.
- If a parcel has multiple surface, mineral and royalty owners, pore space rights may have to be acquired from all.
- Key consideration will be dealing with reluctant owners.

Pore Space: To Buy or Not to Buy?



- Questions:
 - Do pore space owners get compensated?
 - How to deal with owners who don't want to sell pore space?
 - How have other states answered these questions?

Pore Space: To Buy or Not to Buy?



- Precedent:
 - Pore space owners get \$ for gas storage, can be condemned.
 - Pore space owners get \$ for EOR only if they share in unit production, can be unitized.
 - Pore space owners get no \$ for aquifer storage (similar for hazardous waste wells), effectively, they are unitized by government authorization.

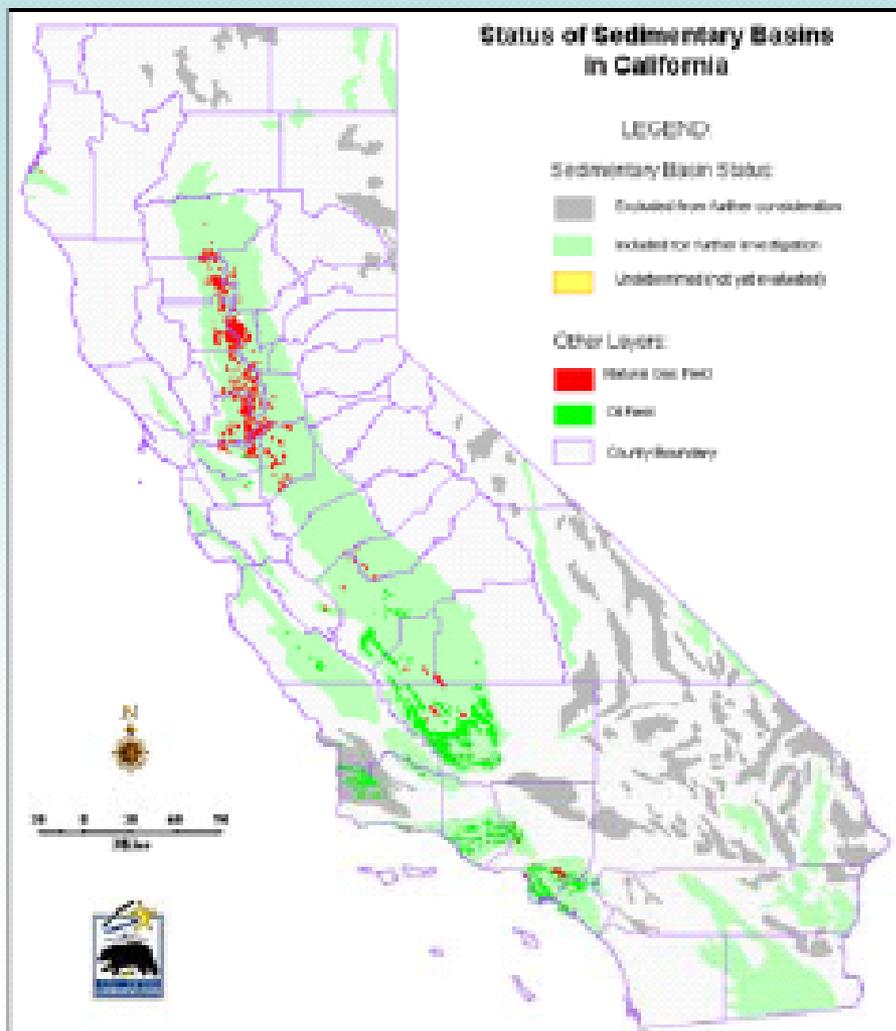
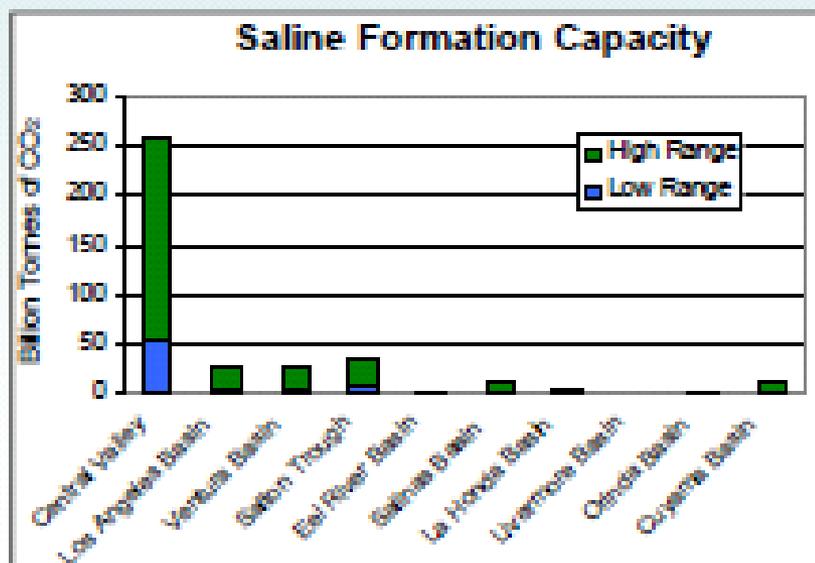
Pore Space: To Buy or Not to Buy?



- Where to Acquire:
 - Depleted Gas Reservoirs
 - Secondary Recovery in Oil Reservoirs
 - Saline Aquifers
- How Much to Acquire: CCS projects will be big.
 - 1000 Mw Coal Plant – 5 to 8 million tpy Maybe 15 x 15 miles of pore space or more. Lots of owners.

WESTCARB Phase I – Preliminary estimate of CO₂ storage capacity in California

- Oil reservoirs – 121 fields
 - 3.4 billion tonnes
- Gas reservoirs – 128 fields
 - 1.8 billion tonnes
- Saline formations – 27 basins
 - 75-300 billion tonnes



Pore Space: To Buy or Not to Buy?



- Acquisition of pore space in oil and gas fields will be more challenging – many owners – mineral rights dominant.
- Acquisition of pore space in saline aquifers may be easier. No competing mineral value.
- Areas with large land ownerships preferred. There will be holdouts.

EOR Recoverable Oil

Table 5. Economically Recoverable Resources Under Alternative Scenarios

Basin	Scenario #2: "State-of-the-art" Moderate Oil Price/ High CO ₂ Cost* (MMBbls)	Scenario #3: "Risk Mitigation" High Equivalent Oil Price/ High CO ₂ Cost** (MMBbls)	Scenario #4: "Ample Supplies of CO ₂ " High Equivalent Oil Price/ Low CO ₂ Cost*** (MMBbls)
San Joaquin	1,060	1,380	1,780
Los Angeles	700	1,290	1,370
Coastal	70	830	830
TOTAL	1,830	3,500	3,980

*This case assumes an oil price of \$25 per barrel, a CO₂ cost of 5% of the oil price and a ROR hurdle rate of 15% (before tax).

**This case assumes an equivalent oil price of \$35 per barrel, a CO₂ cost of 5% of the oil price and a ROR hurdle rate of 15% (before tax).

***This case assumes an equivalent oil price of \$35 per barrel, a CO₂ cost of 2% of the oil price and a ROR hurdle rate of 15% (before tax).

Pore Space Model 1: Natural Gas Storage Law



- By federal and state law, gas storage companies have eminent domain rights.
- Reservoir and buffer zone are acquired by easement or lease – gas escape is trespass.
- Ownership of injected gas: stays with injector by statute in most states.
- Pipeline routes for gas storage can be condemned.
- Wells are regulated by state oil and gas agency.
- IOGCC recommends similar approach for CCS.

Pore Space Model 2: EOR

- Oil and gas leases give rights to inject fluids such as CO₂ - *but only in aid of production.*
- Leases and/or state laws give right to “unitize” for secondary recovery.
- Holdouts cannot complain about water or gas injections (usually).
- EOR not designed to sequester CO₂ – but 50% “sequestered” per cycle. Balance recycled.

Wyoming: Ownership of Pore Space HB 89 (2008)



- Pore space is owned by the surface owner, but can be severed.
- Deeds before 2008 will be so interpreted unless someone can prove otherwise.
- Mineral estate remains dominant.
- No provision for condemnation.

Wyoming: Acquisition of Pore Space HB 80 (2009)



- Unitization to aggregate pore space.
- Must acquire 75% to 80% voluntarily.
- Must generate and allocate economic benefits to landowners.
- Must benefit the use and production of Wyoming energy resources.
- Landowners not liable for CO2 effects.

Montana: Ownership of Pore Space SB 498 (2009)



- If ownership of the “geologic storage reservoir” cannot be determined from deeds, “presumed” to be owned by the surface owner.
- The mineral estate remains dominant.
- No provision for condemnation.

Montana: Acquisition of Pore Space SB 498 (2009)



- Unitization to aggregate pore space.
- Must acquire 60% voluntarily.
- Does not address compensation.
- Does not limit to use in connection with production of Montana resources.
- May convert EOR or natural gas storage to carbon sequestration (true of most new state statutes).

North Dakota: Ownership of Pore Space SB 2139 (2009)



- Pore space belongs to the surface owner.
- Unlike in MT and WY, pore space **may not** be severed from surface rights. Leasing is permissible.
- Mineral estate remains dominant.

North Dakota: Acquisition of Pore Space SB 2095 (2009)



- Amalgamation of property interests.
- Must make a good faith effort to obtain consent from all pore space owners.
- Need consent from owners of at least 60% of the reservoir's storage capacity.

EOR/CCS

Property Law Summary



- No problem with property rights for EOR so long as injections stop when oil and gas production stops.
- Pore space acquired through leases and unitization.
- But if EOR operators seek credit for CCS, regulation may extend CO2 management period after end of production. Mineral leases may expire.
- Property rights become uncertain. Surface owners may expect payment.
- New lease or easement may be required. Some minerals remain; their value is a challenge.

EOR/CCS

Property Law Summary



- As EOR transitions to pure CCS, legislation is needed to:
 - Clarify ownership of pore space.
 - Provide unitization or condemnation to acquire rights and extend rights to sequestration.
 - Clarify ownership and liability for sequestered CO₂.
 - Deal with status of remaining minerals.

Alternate Model for Saline Aquifers?



- State has jurisdiction over aquifers.
- May include right to permit CCS operations.
- Permit gives protection from claims of subsurface trespass. But surface rights still needed for wells, monitoring, surveys.
- Still must deal with liability for mineral rights interference and negligent operations.

Challenges to Aquifer Storage Model



- Landowners get no financial reward; more likely to be opposed to CCS.
- Landowners know the same pore space has market value for natural gas storage.
- Number of landowners affected may be large.
- Need surface access to a broad area for seismic and environmental surveys, pipelines, wells, facilities, and monitoring.

CCS Liabilities

- Trespass/Nuisance/Negligence/Statutory
 - Precludes other uses (natural gas storage).
 - Mineral production may be affected.
 - Escaping CO₂ may affect aquifers.
 - Injections may cause minor seismicity.
 - Escaping CO₂ may affect crops.
 - Migrating fluids may have more dissolved metals.
 - Escaping CO₂ may affect statutory credits/climate.

CCS Liabilities/Damages

- Injunction – a major problem for multi-billion dollar facilities.
- Damages - must deal with potential damages to minerals, aquifers, crops, loss of property value, mental stress. Consider statutory weighing of policies as in *Manziel*.
- Many states are creating a fund for and procedures to transfer post closure liability.

Legislative Concepts

- Clarify pore space ownership.
- Provide for unitization for EOR, transition to CCS.
- Decide approach to saline aquifers (trend is unitization).
- Provide eminent domain for surface facilities.
- Provide for continued operation/limited injunctions.
- Provide fund for remediation/reclamation.
- Provide fund for, and transfer of, post closure liability.

Thank you!

Contact Information:

*Jerry R. Fish, Partner
Stoel Rives, LLP
900 SW Fifth Ave.
Portland, OR 97204
(503) 294-9620
jrfish@stoel.com*