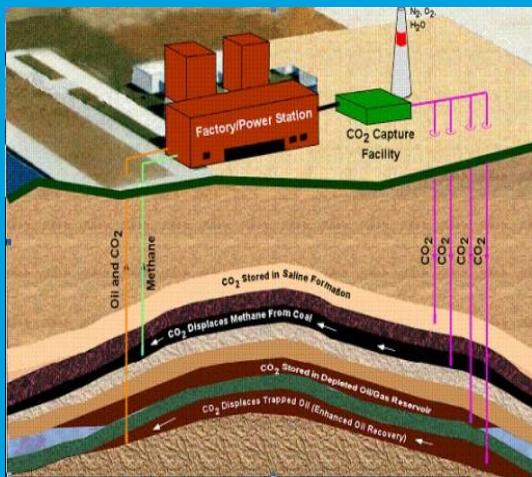


# MARSH



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## Introduction

- Regulatory Drivers for Environmental Issues
- Carbon Sequestration – What are the risks?
- Insurance Considerations for CCS
- Carbon Sequestration and Environmental Liability – A model for success.

## Regulatory Drivers for Environmental Issues

- Operational environmental liabilities.....clearly that of the operators, but.....
- One very important concept to long term CCS projects is establishing the appropriate balance for the liability regime
  - Long Term Liabilities Associated with Carbon Sequestration – Inhibitor to Growth?
  - Investors willing to sign up for unlimited (time and dollar) liability?
  - Difficult to predict long term costs associated with closure and post closure (not clear what happens after 50 year EPA term)....
  - Various proposals at the state level to accept the long term liability

## Regulatory Drivers for Environmental Issues

- Environmental Protection Agency (EPA) issued proposed rules for CO<sub>2</sub> geologic sequestration under the Safe Drinking Water Act. (currently in comment period)
- Primary driver for regulation is the potential for Geologic Sequestration to impact ground water through “gradual” means
  - Migration of CO<sub>2</sub> into aquifers
  - Impurities in the CO<sub>2</sub> causing introduction of contaminants into the formation
  - Displacement and migration of brines into fresh water aquifers
- Includes proposals for (among others) **financial responsibility requirements** to assure that funds will be available for:
  - Well plugging
  - Site care
  - Site closure
  - Emergency and remedial response

## Regulatory Drivers for Environmental Issues

- Senate Bill 1013 .....Liability released after 10 years of “post closure” monitoring for large scale pilot projects....Is this the model for the future?
- Draft Senate Proposal (Casey) for Liability Transfer
  - Proposes requirement for “liability assurance” for projects:
    - Third Party Insurance
    - Financial mechanisms
    - Trusts
    - Bonds
  - Once active portion of project is complete, bill proposes mechanism to transfer long term liability to the state or federal government!

# Carbon Sequestration

## What is it and what are the risks?

- Injection of liquid (under pressure) CO<sub>2</sub> into the subsurface
- Risks include “traditional” operational risks
  - First party risks related to the loss of property
  - Third party risks in the event that your operation causes damage to others
  - Business interruption in the event of a property loss
- Risks also include “pollution risks”
  - Catastrophic loss of carbon from the subsurface
  - Ground water damage resulting from...
    - Release of metals or organic constituents from the rock formations due to “acidifying” in the presence of carbon
    - Release of carbon into shallower formations (i.e. well casing failures)
    - Release of contaminants which are impurities in the carbon
    - Displacement of salt water into freshwater aquifers as a result of injecting the carbon.

## Carbon Sequestration

### What is it and what are the risks?

- Remediation costs associated with ground water contamination....deep formations can be very costly to remediate
- Third party liabilities resulting from property damage or bodily injury caused by geologic sequestration “pollution event”
- Cost of plug and abandonment of the operation at close exceeds expectations
- Cost of liability associated with catastrophic loss of CO<sub>2</sub>
- Financial impact to business if CO<sub>2</sub> credits are traded or banked
  - Replace first party credits
    - Reputational risk if not replaced
    - Inflation in carbon trading market results results in replacement costs higher than expected



# Carbon Sequestration

## Insurance Considerations for Carbon Sequestration

### “Traditional Risks”

- Property Policies readily available (years of experience with similar operations)
- Casualty Program Considerations
  - Is a catastrophic loss sudden and accidental?
  - Maintain sudden and accidental coverage in casualty program
  - AEGIS typically used for Power/Energy/Utility clients, but will exclude “disposal” which AEGIS defines as applying to sequestration
  - Traditional Casualty programs will not cover gradual pollution events and will not provide first party clean up coverage.



## Carbon Sequestration

### Insurance Considerations for Carbon Sequestration

- Pollution aspects of geologic sequestration are insurable
  - Traditional environmental insurance markets have forms which lend themselves to covering these gradual losses
  - Precedent for writing similar risks through insuring subsurface gas storage facilities
  - Market has responded and has underwritten pilot scale programs
  - Specialty form available which provides sudden and accidental, transportation, control of well, gradual pollution coverage and nominally financial assurance
- Commercial Insurance Market has responded
  - Chubb – Written a pilot project on traditional site liability coverage basis
  - Chartis – Written a pilot project and has developed a specific endorsement to their PLL policy addressing CCS
  - Zurich – Developed stand along broad form pollution policy which also included control of well and coverage for subsidence/earth movement

# Carbon Sequestration

## Insurance Considerations for Carbon Sequestration

Financial Assurance – Likely to be required (debate is time frame)

- Letters of Credit (LOCs)
  - Dependent on finances
  - May be difficult for smaller players to acquire
  - Impacts to cash flow
  - Collateral?
- Surety
  - Precedent for surety markets to accept risk in plug and abandonment of oil wells
  - Dependent on financials of client
  - Value of surety will be dependent on collateral and/or cost of LOC
- Insurance
  - Structured as a guaranteed fixed price contract with excess coverage for overrun
  - Forms are available (either specialty CO2 form or traditional environmental stop loss forms)
  - Debate regarding time frame of financial assurance affects ability of this to be used as an option
    - 50 Year time frame proposed by EPA is not insurable except in smaller time frames
    - 10 Year time frame in “Casey” Senate Bill is insurable



## Carbon Sequestration Model for Success

- Operations
  - Insure clean up and third party liabilities associated with pollution risks as part of annual insurance costs (multi year also available)
    - This option may also be used to meet financial assurance requirements during the operational phase.
- Closure/Post Closure
  - Transfer Closure/Post Closure to Third Party? (Optional)
    - Surrogate for this is guaranteed fixed price contracting used by DOD or in Brownfield re-development
  - Post Financial assurance with Insurance policy (policy “commutation account” will be eroded against closure/monitoring work as it is completed)
  - Insure third party liabilities with pollution policy (available for 10 year term for “pre-existing conditions”)

## Carbon Sequestration Model for Success

- Post Post Closure...
  - State transfer liability from operator via....
    - “Certificate of Completion” (see state voluntary clean up programs)
    - Memorandum of understanding with EPA similar to VCP programs
    - This type of transfer has been successfully used to attract investment to brownfields development
    - Allows investment to enter this market while bounding (not eliminating) their risk (with unlimited time and dollar liability, investment could be limited)

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