C12 Energy

C12 Energy and Commercial Carbon Storage Project Development

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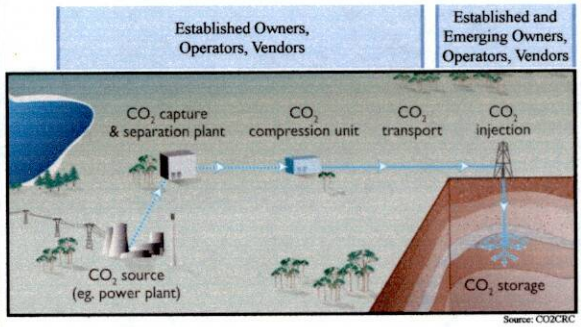

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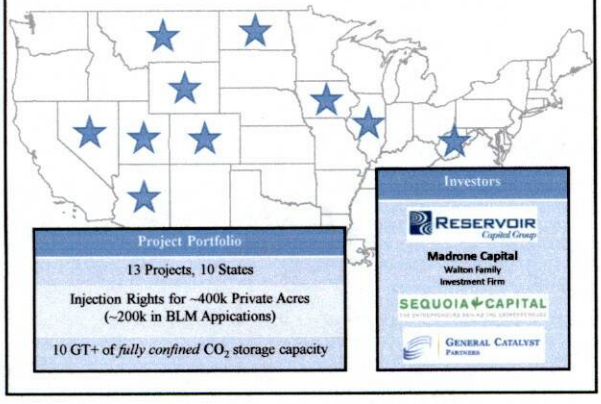

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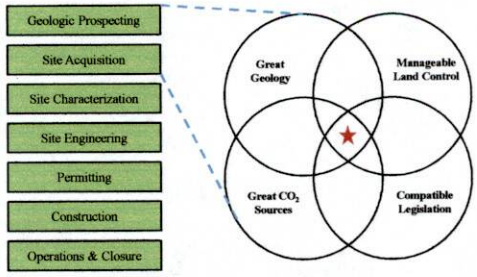
C12 Energy's Development Process

Providing CO_2 storage options for emitters.



Carbon storage project development follows the same steps as do all other energy and natural resource projects

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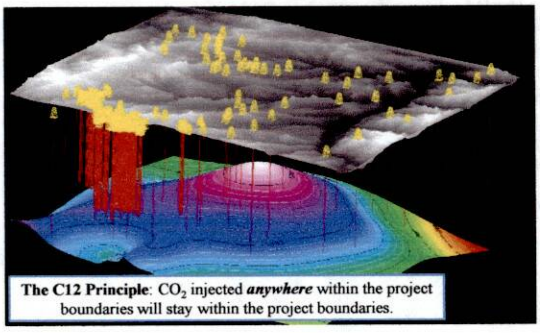

The C12 Principle: CO_2 injected ***anywhere*** within the project boundaries will stay within the project boundaries.

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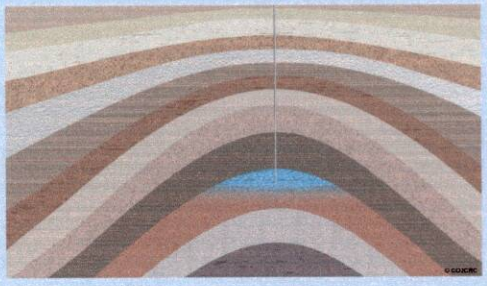
C12 Only Invests in Storage Sites that Trap CO_2 Vertically *and* Horizontally



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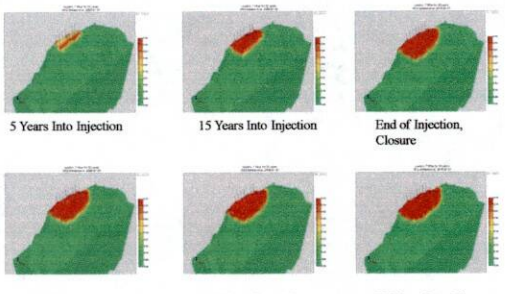
The C12 Principle at Work

7 Mt/yr CO_2 Injection for 30 Years at the Loudon Anticline (Fayette County, IL)



5 Years Into Injection | 15 Years Into Injection | End of Injection, Closure

50 Years Post-Closure | 100 Years Post-Closure | 500 Years Post-Closure

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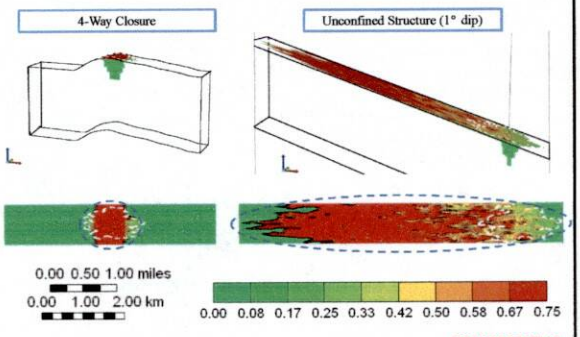
Injected CO_2 Will Otherwise Spread Over Great Distances



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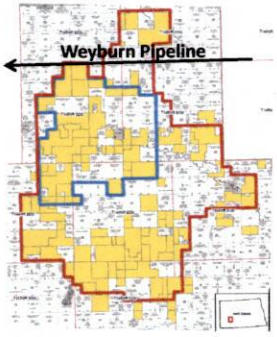
Dunn County Project Site



- 90,000 Acre Project Area
  - Large enough to inject approximately 300 Mtons CO_2 (10Mtons/yr)
- 57,000 Acres Signed
  - 60+ Landowners Signed
  - 60% threshold under ND law reached

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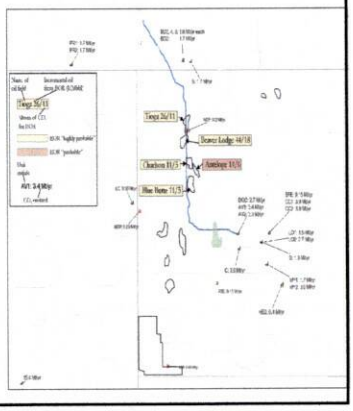
EOR in Western North Dakota

- Beaver Lodge
  - Incremental Oil from EOR: 44 MMbbl
  - CO_2 for EOR: 18 Mtons
- Tioga
  - Incremental Oil from EOR: 26 MMbbl
  - CO2 for EOR: 11 Mtons
- Antelope
  - Incremental Oil from EOR: 14 MMbbl
  - CO_2 for EOR: 6 Mtons
- Blue Butte
  - Incremental Oil from EOR: 11 MMbbl
  - CO_2 for EOR: 5 Mtons
- Charlson
  - Incremental Oil from EOR: 11 MMbbl
  - CO_2 for EOR: 5 Mtons



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Dunn County Carbon Dioxide Storage Project

Before the North Dakota Energy Development and Transmission Committee

October 3, 2011

Barclay Rogers
Director of Development, C12 Energy
Contact: barclay.rogers@c12energy.com; 415-407-6614

C12 Energy

1 Introduction

Mr. Chairman, and members of the committee, thank you for the opportunity to speak to you today. My name is Barclay Rogers, and I am the Director of Development for C12 Energy. I am joined by Daniel Enderton, our Director of Government Affairs.

We are developing a CO_2 storage project in Dunn County because it will enable enhanced oil recovery in the state and will provide a viable compliance option in the event that CO_2 regulation is imposed in the future. In much the same way that the legislature enabled CO_2 storage project development by passing an excellent law in the form of Chapter 38-22, we are developing CO_2 storage projects to facilitate further development of North Dakota's abundant energy resources, in particular coal and oil.

2 Introduction to C12 Energy

C12 Energy (C12) is a developer, owner, and operator of geologic CO_2 storage facilities. Our business is to manage CO_2 streams to provide dispatchable CO_2 for enhanced oil and gas recovery operations as well as provide permanent storage options for coal-burning facilities. The development of new carbon storage projects will facilitate enhanced oil recovery as well as bolster the competitiveness of coal in a world of regulated CO_2 emissions.

C12 is currently developing 13 projects across 10 different states, including a project here in North Dakota. We have acquired injection rights to over 400,000 acres of privately owned pore space and have submitted applications for over 200,000 acres of pore space managed by the Bureau of Land Management (BLM). We have partnered with nearly 80 landowners with approximately 60,000 acres of land in Dunn County, and will soon be seeking a permit for a major CO_2 storage project from the North Dakota Industrial Commission.

C12 is a commercial enterprise privately financed by some of the nation's leading private equity firms, include Reservoir Capital, Sequoia Capital, Madrone Capital, and General Catalyst Partners.

3 CO_2 Storage Project Development

Storage project development starts with identifying and acquiring the rights to reservoirs suitable for the long-term storage of CO_2. At C12, we follow the simple principle that one must define a project boundary such that any CO_2 injected within a boundary will stay within that boundary in perpetuity. The simplest, safest, and most cost-effective approach to satisfying this principle is to utilize a geologic structure such as an anticline that we know will trap fluids in the subsurface for millions of years, as experience from oil and gas have taught us (think of an upside-down bowl under water trapping a bubble of air).

We take pride in including landowners as part of our projects by working with them directly to educate and compensate them for the rights to use their pore space. By way of example,

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landowners at out Dunn County project stand to make between $25-$50 per acre per year during injection for a commercial-scale CO_2 storage project, which would generate additional income of $20,000-$40,000 per year for a period of approximately 30 years for an average-sized landowner in the project area.

Once sites are identified and acquired, we continue to development them through characterization, engineering, permitting, construction, and operation – a process exactly analogous to other natural resource project development industries. We have commenced the process of preparing a permit application for the Dunn County project, and look forward to filing that application with the NDIC in the next few months.

4 The Dunn County Project

Our Dunn County project is based near the town of Halliday, approximately 60 miles northeast of Dickinson. The project spans nearly 90,000 acres, and has the capacity to store the CO_2 emissions from 1 or more large coal-fired power plants or other CO_2 sources. The injection target is the Dakota Sands (sometimes referred to as the Inya Kara formation), which is approximately 5,000 feet beneath the surface. The Dakota Sands sit approximately 3,000 feet below the drinking water aquifer in the region, and approximately 5,000 feet above the oil bearing formations (e.g., the Bakken). Given its superior injection properties (i.e., excellent porosity and permeability), the Dakota Sands is often used for brine disposal.

As members of this committee are well aware, there are several existing coal-burning stations in this area, including Antelope Valley, Coal Creek, Milton Young, Leland Olds, and others. In addition, the Dakota Gasification Synfuels plant, which has been very successful in selling its CO_2 for enhanced oil recovery purposes in Saskatchewan, lies about 30 miles to the east of the project area. We understand that there are other proposed coal-fired facilities in the region.

As the members of the committee are also well aware, several oil fields that have been identified as prime candidates for enhanced oil recovery lie to the west of the project area. The estimated recoverable oil from enhanced oil recovery for some of the key fields in the region exceeds 100 MMbbl with field estimates as follows:

- Beaver Lodge: 44 MMbbl
- Tioga: 26 MMbbl
- Antelope: 14 MMbbl
- Blue Butte: 11 MMbbl
- Charlson: 11 MMbbl

We are developing the Dunn County project to ensure that North Dakota's energy resources – in particular, its coal and oil -- are used to greatest effect under all regulatory environments. We will unlock 100 MMbbl of additional oil by providing a source of stable, secure CO2 for enhanced oil recovery purposes. And we will ensure that North Dakota's coal-burning facilities have a viable compliance option in the event that CO_2 emissions are

regulated in the future. I am happy to answer any of your questions. Thank you.

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