Beaver Creek CO_2 Project (WY) Update

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Midland, Texas

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Presentation Outline

- General Field Info and History
- Brief CO_2 Project Evaluation
- Performance & Reservoir Management

Basin Outline and Field Location

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Madison Reservoir Characteristics

Geologic Characteristics

Limestone/Dolomite Matrix

Approx. Prod. Area = 974 Acres

Approx. Oil Column Height = 820’

Avg. Net Pay Thickness = 212’

Avg. Depth to Madison Top = 11,100’

Reservoir Characteristics

Porosity = 10%

Permeability = 9 md

Reservoir Temp = 234° F

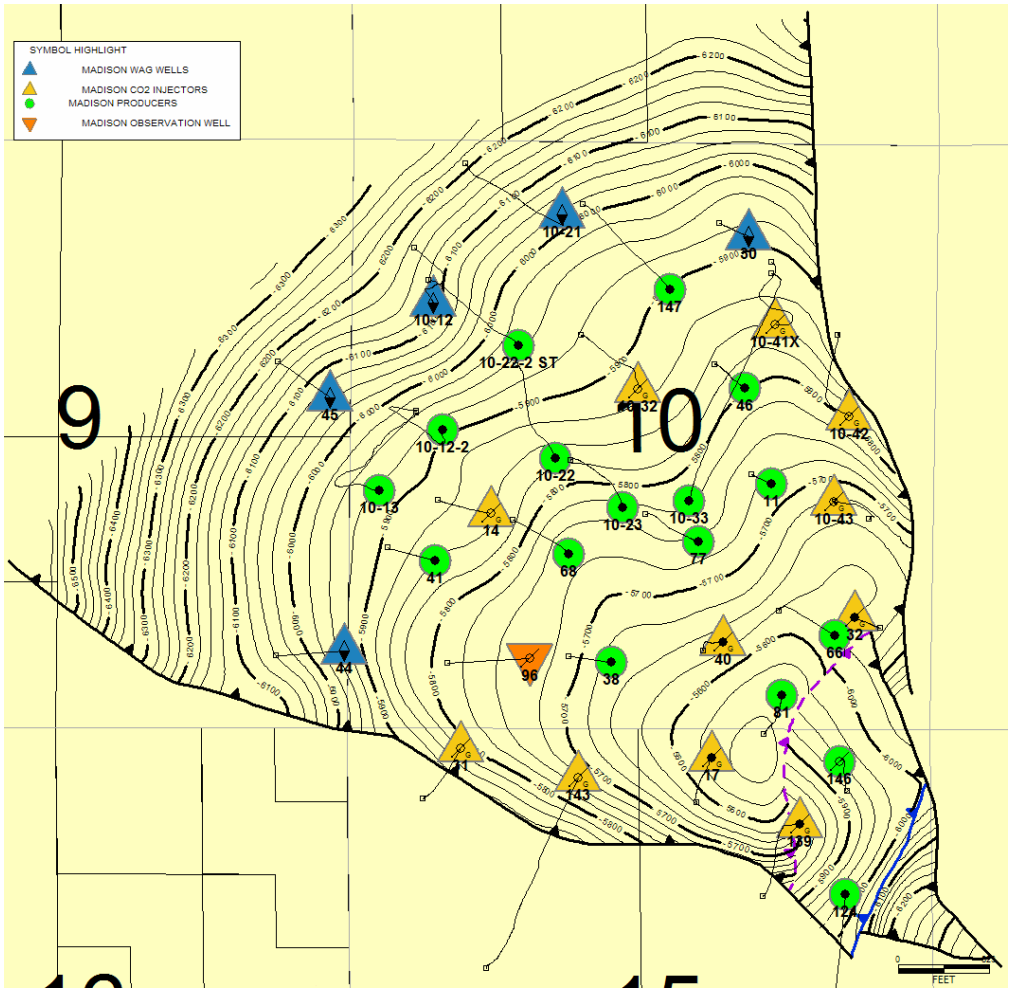
BHPi = 5301 psia

GORi = 288 scf/bbl

Bubble Pt. = 673 psia

Swi = 10%

Oil Gravity = 39.5° API



Stratigraphic Column and Typelog

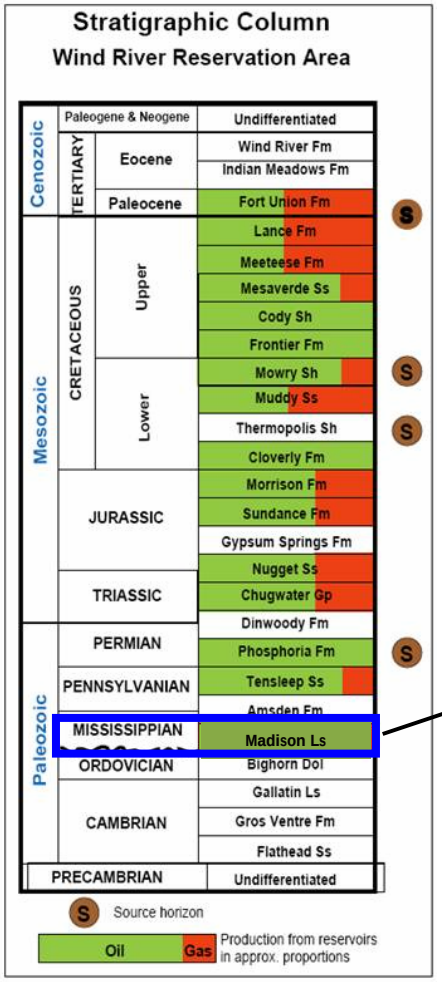
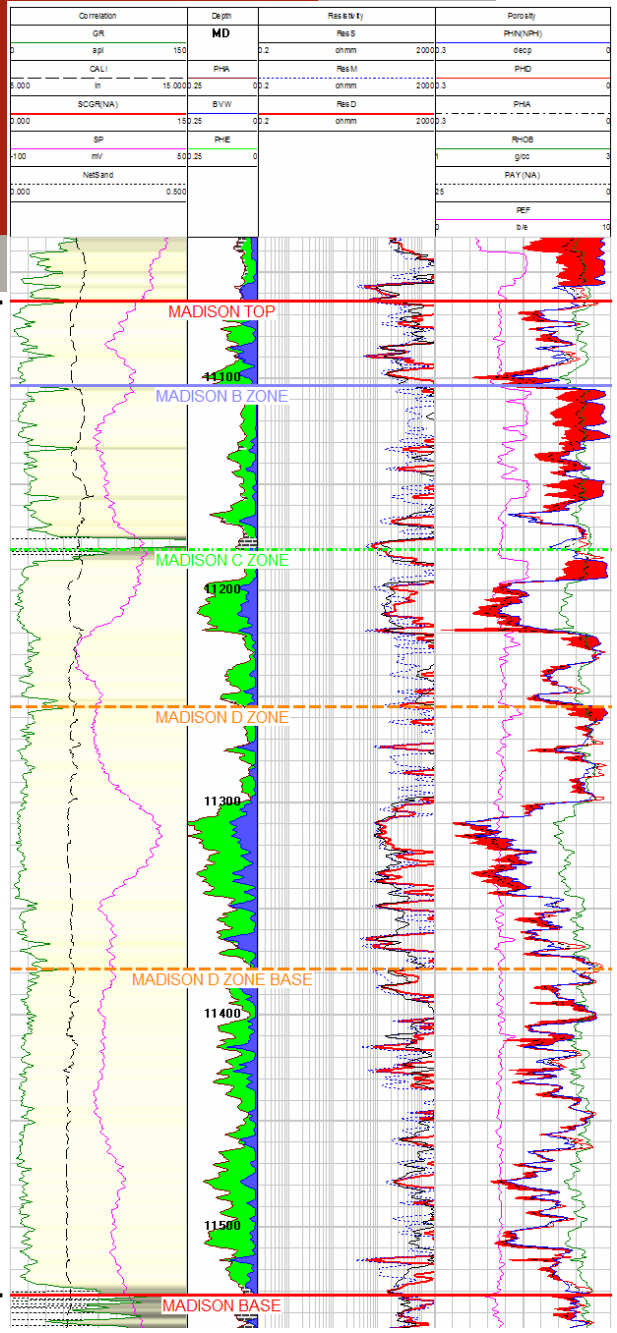


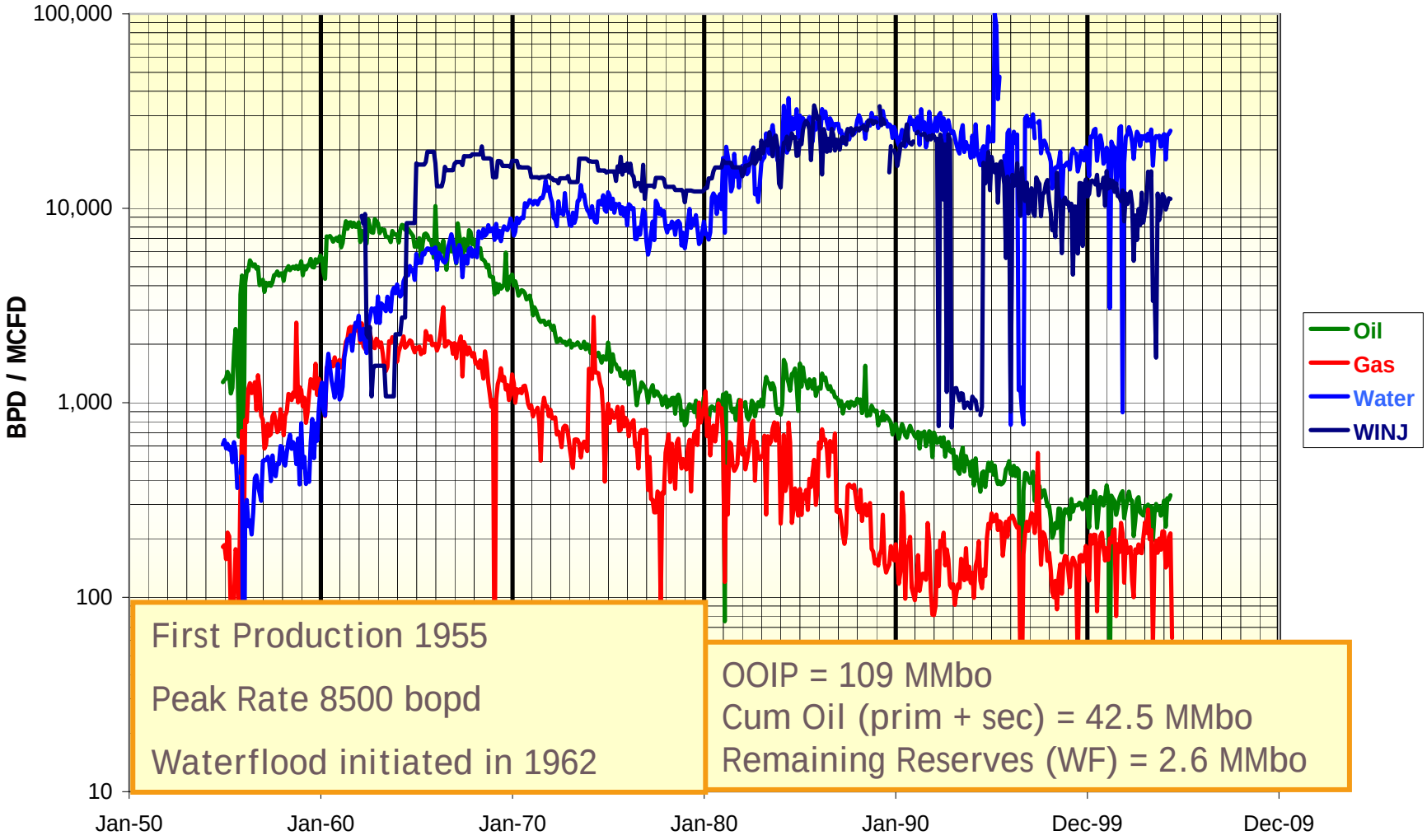
Figure WR 2.3 - Stratigraphic column for Wind River Basin (Willette, D., 1996).

Madison is subdivided into 4 zones, with the "D" zone being the primary producing zone



Beaver Creek Madison

Production History



CO_2 Project Evaluation

Initial Screening
Phase I: 2005

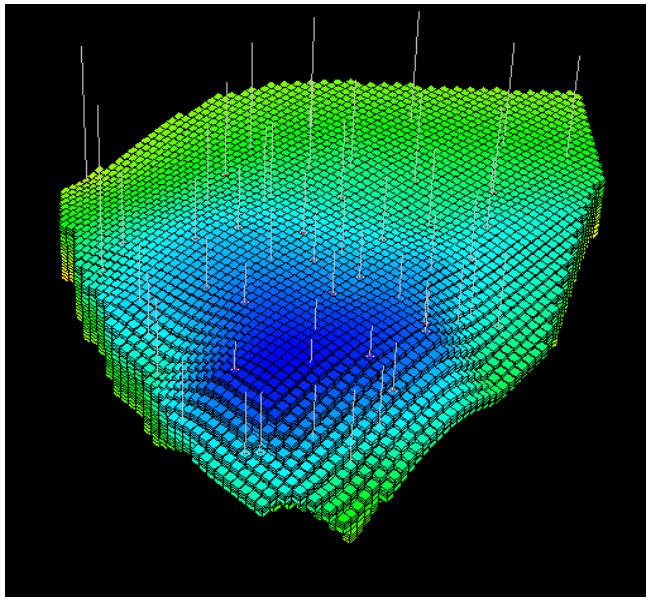
- Analogs & Screening
- Basic Reservoir & Geology Study
- Risk & Economics

Testing & Sector Model
Phase II: 2006

- Perform Testing (MMP, MCM, PVT, Core, etc.)
- Build Sector Model
- Update Risk & Economics

Full Field Model
Phase III: 2007

- Full Field Simulation
- Develop Flood Strategy
- Finalize Economics (D&C, Facilities, CO_2 Purchase)



Execution
Phase IV: 2007-2008

- Finalize Flood Strategy
- Contract CO_2 & Build Pipeline
- Drill & Complete
- Facilities & Recycle Plant

Execution Phase

- Build CO_2 supply pipeline
- Construct production & injection recycling facilities
- Drill 7 new producers & 5 new injectors
- Install new flowlines for producers & injectors
- Rework or recomplete 9 producers & 7 injectors
- Convert 2 wells from producer to injector

Madison CO_2 Flood

Original EOR Flood Strategy

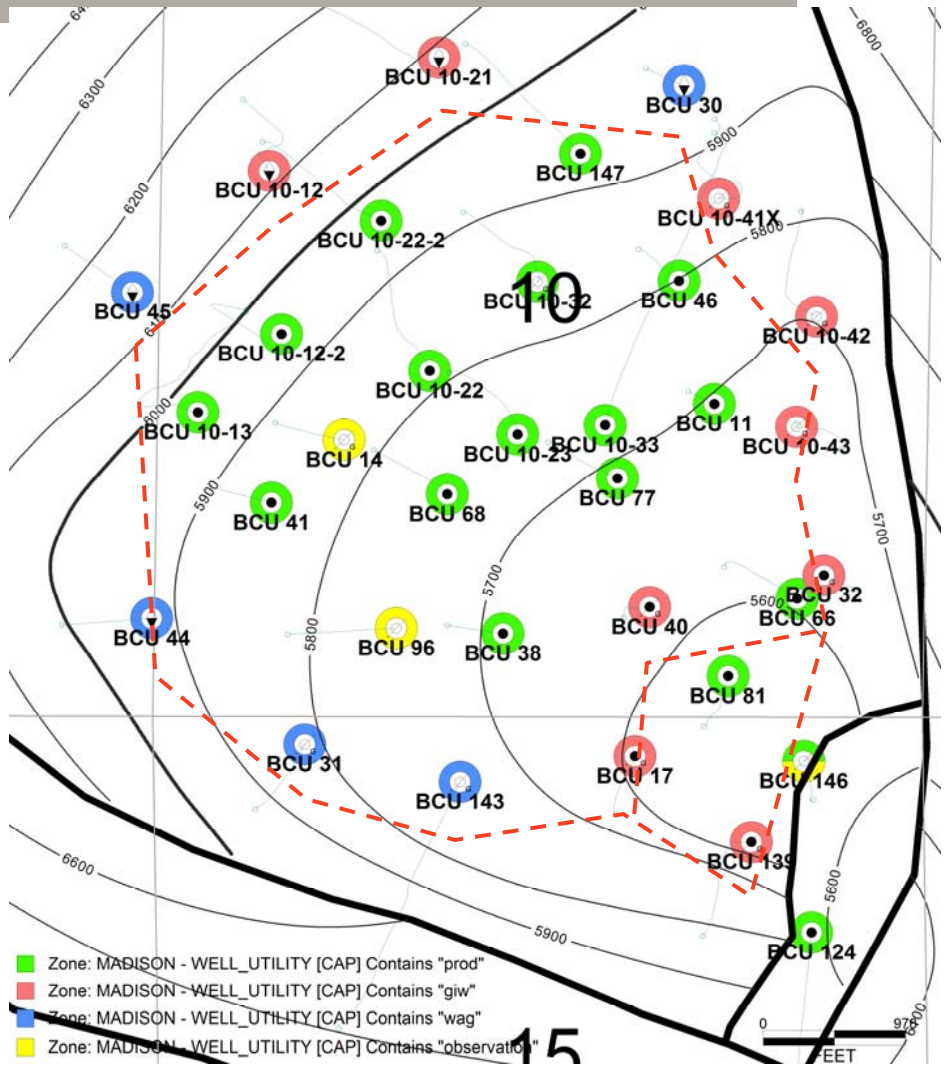
- CO2 Injector
- WAG Injector
- Producer
- Observation

Flood Strategy

Combo Peripheral + Gravity Stable

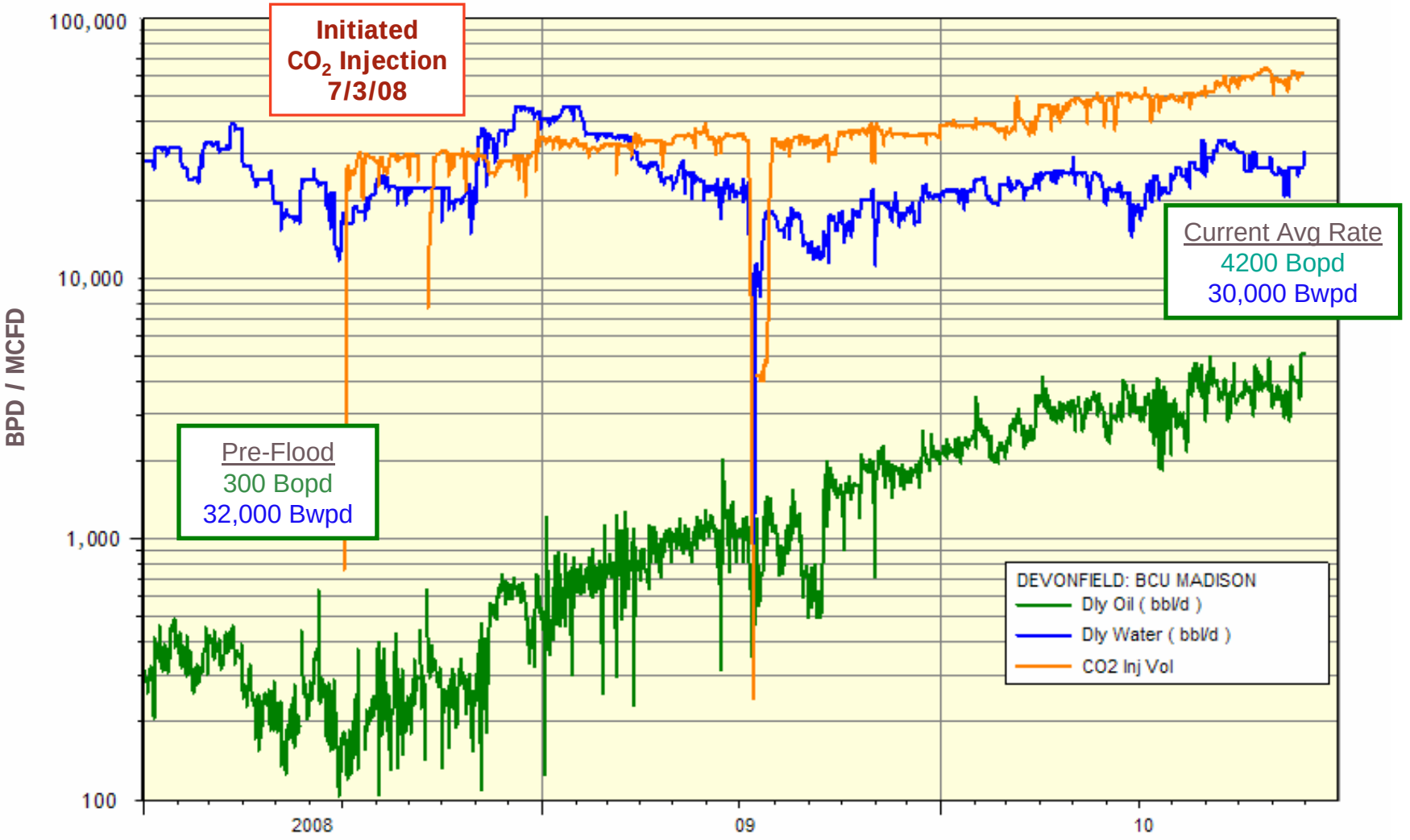
Best Modeled Recovery

Most Flexible Well Plan



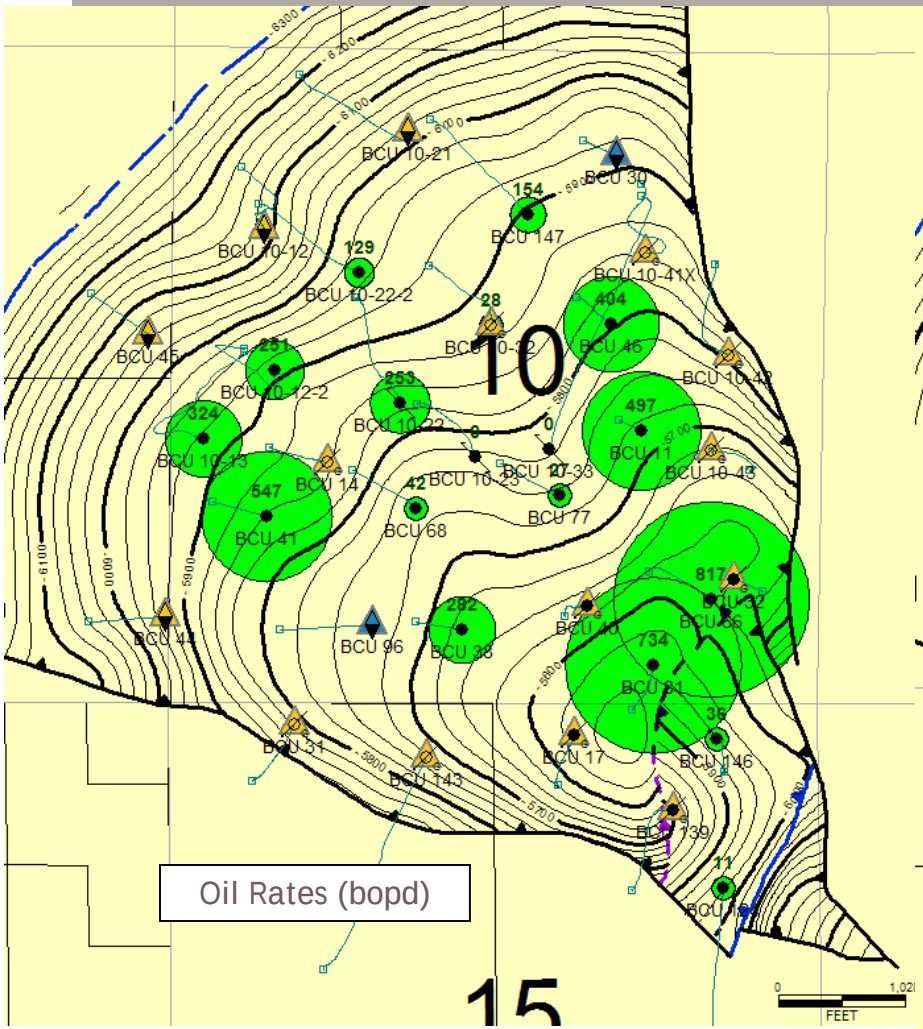
Madison CO_2 Flood

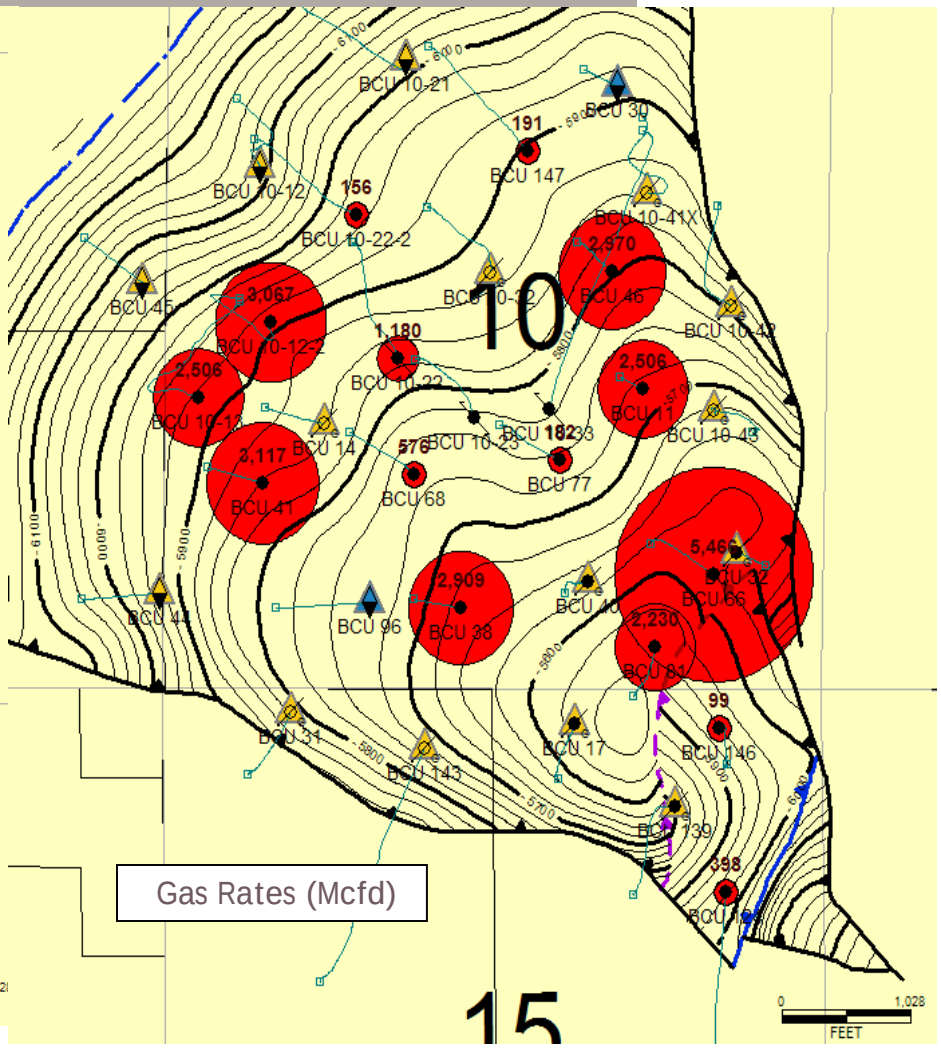
Production Results



Madison CO_2 Flood

Current Oil & Gas Rates by Well





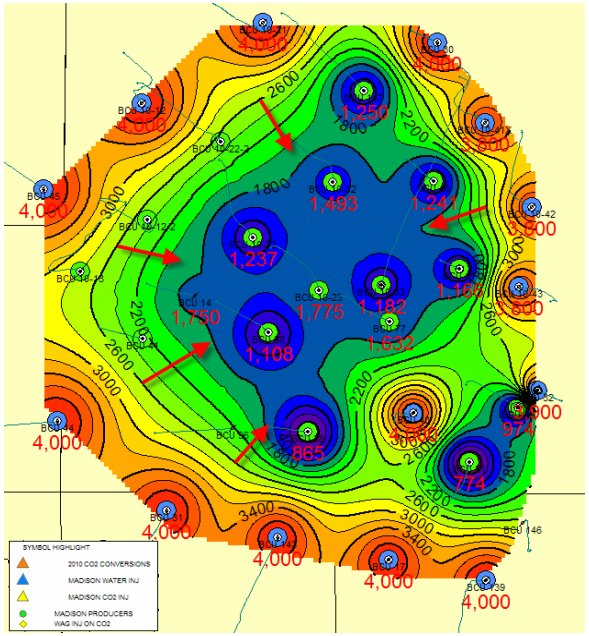
Madison CO_2 Flood

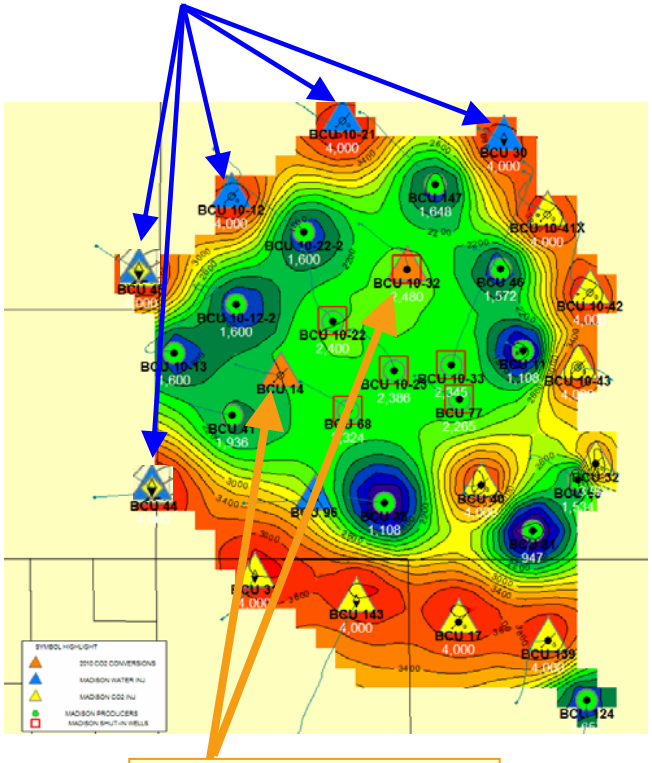
Managing Reservoir Pressure

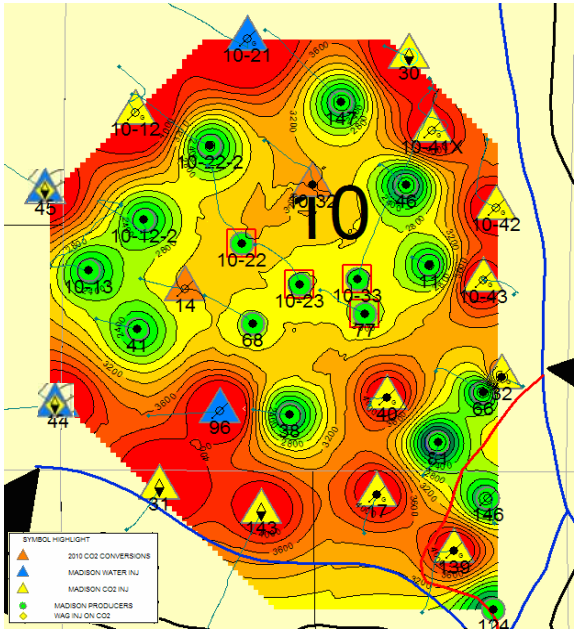
Maintain Reservoir Pressure > 2600 psi MMP

Began WAG in 5 Down-dip Injectors

Current Reservoir Pressure >3000 psi







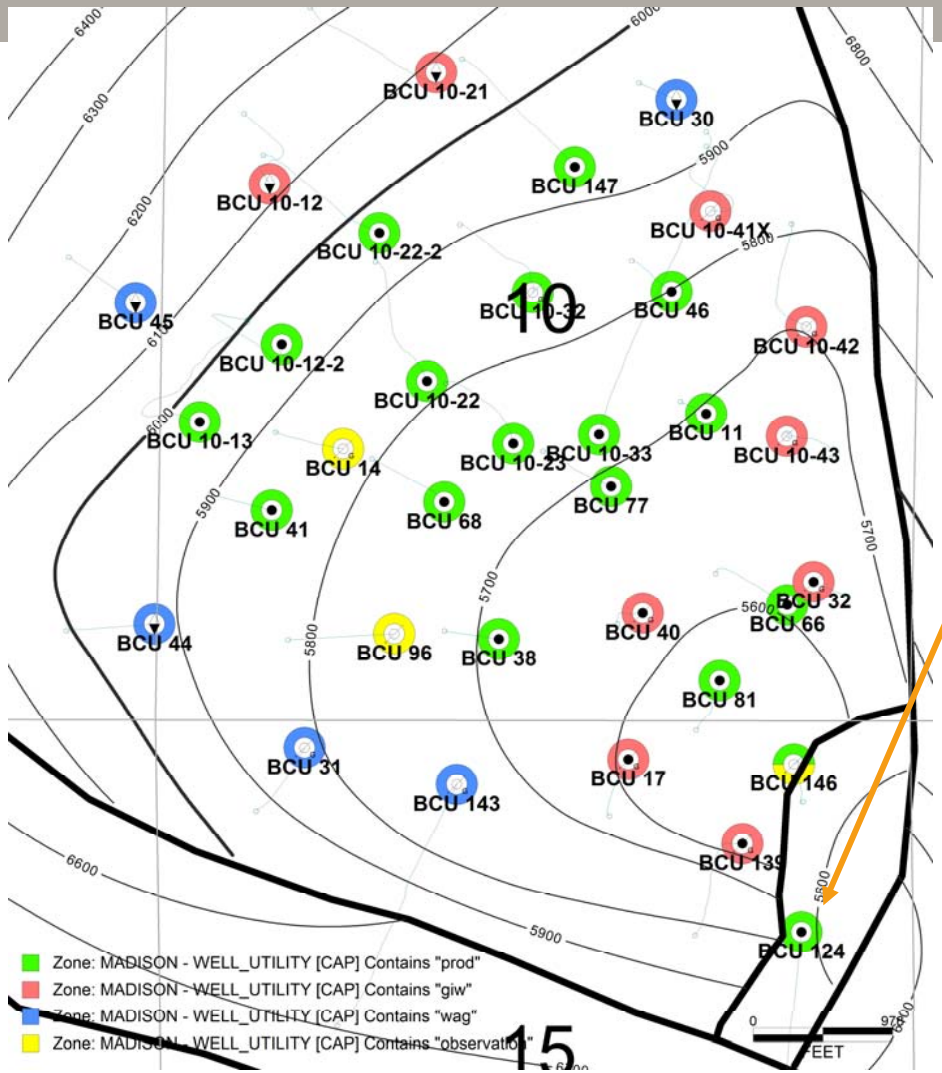
Choked Back / SI Interior Producers

Converted 2 Wells to Injection

Balance Injection with Production

Madison CO_2 Flood

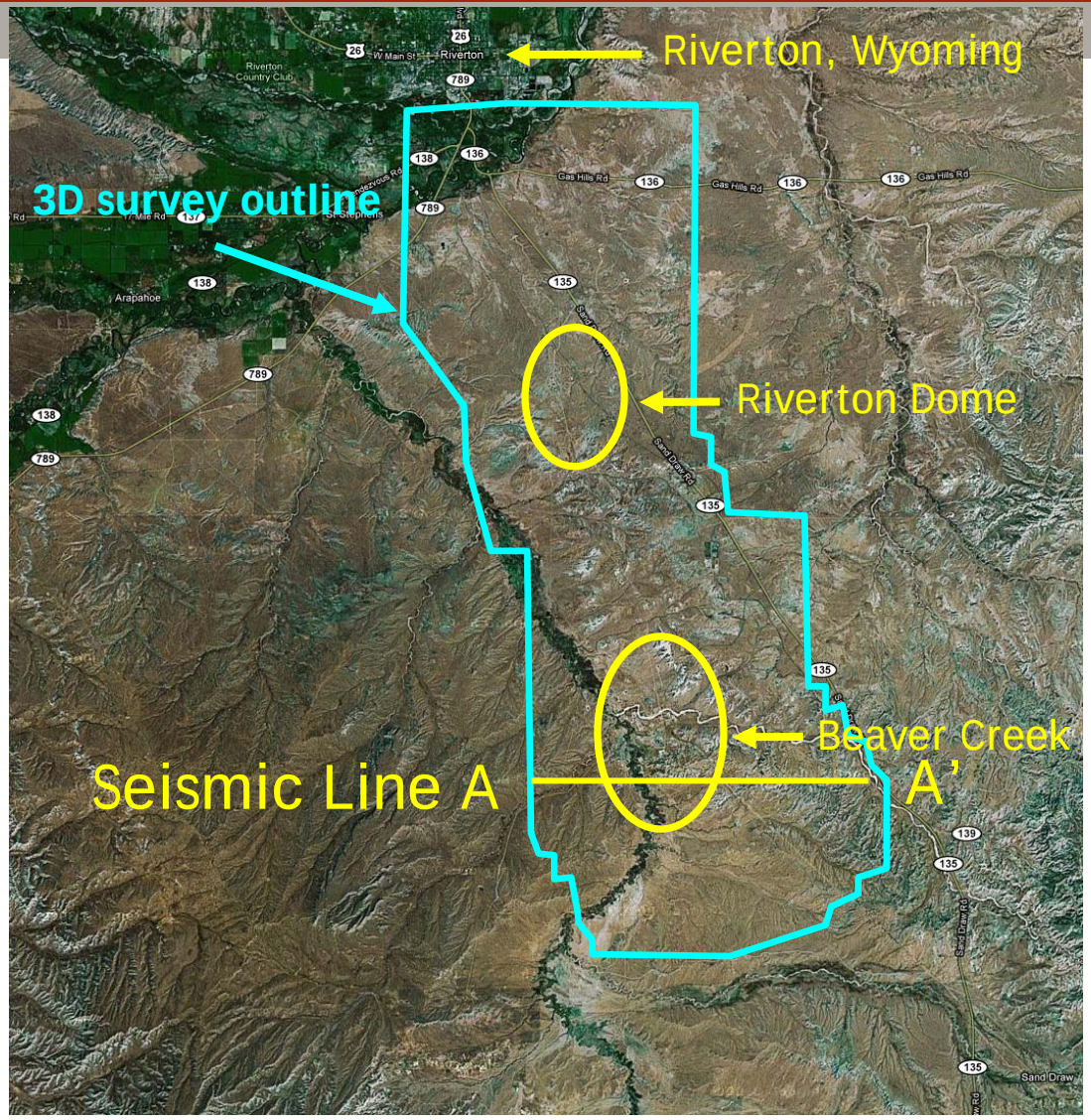
Reservoir Management



Unexpected production response in the BCU #124

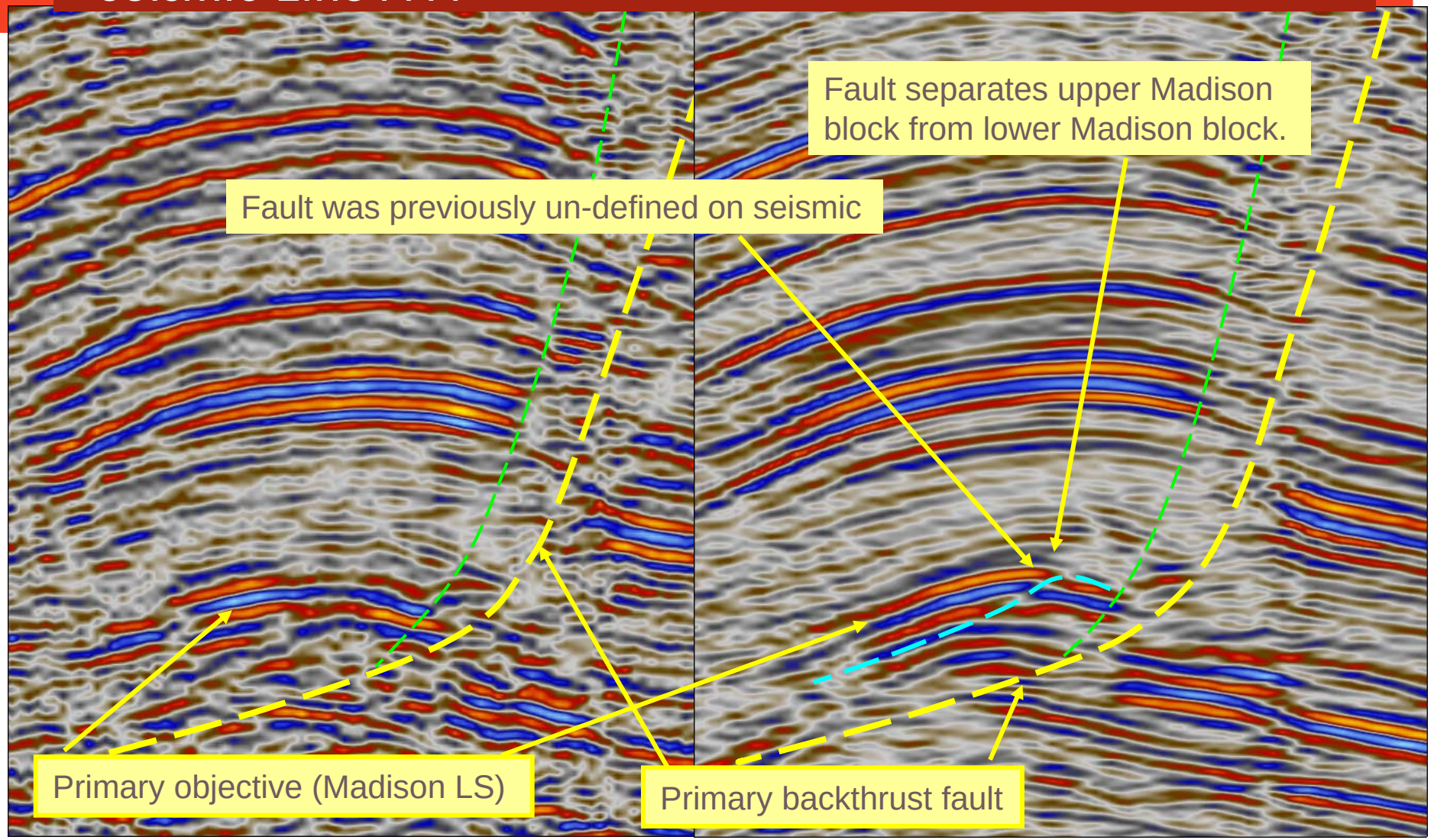
Re-evaluated Seismic & Geo-Model

Beaver Creek Seismic Coverage



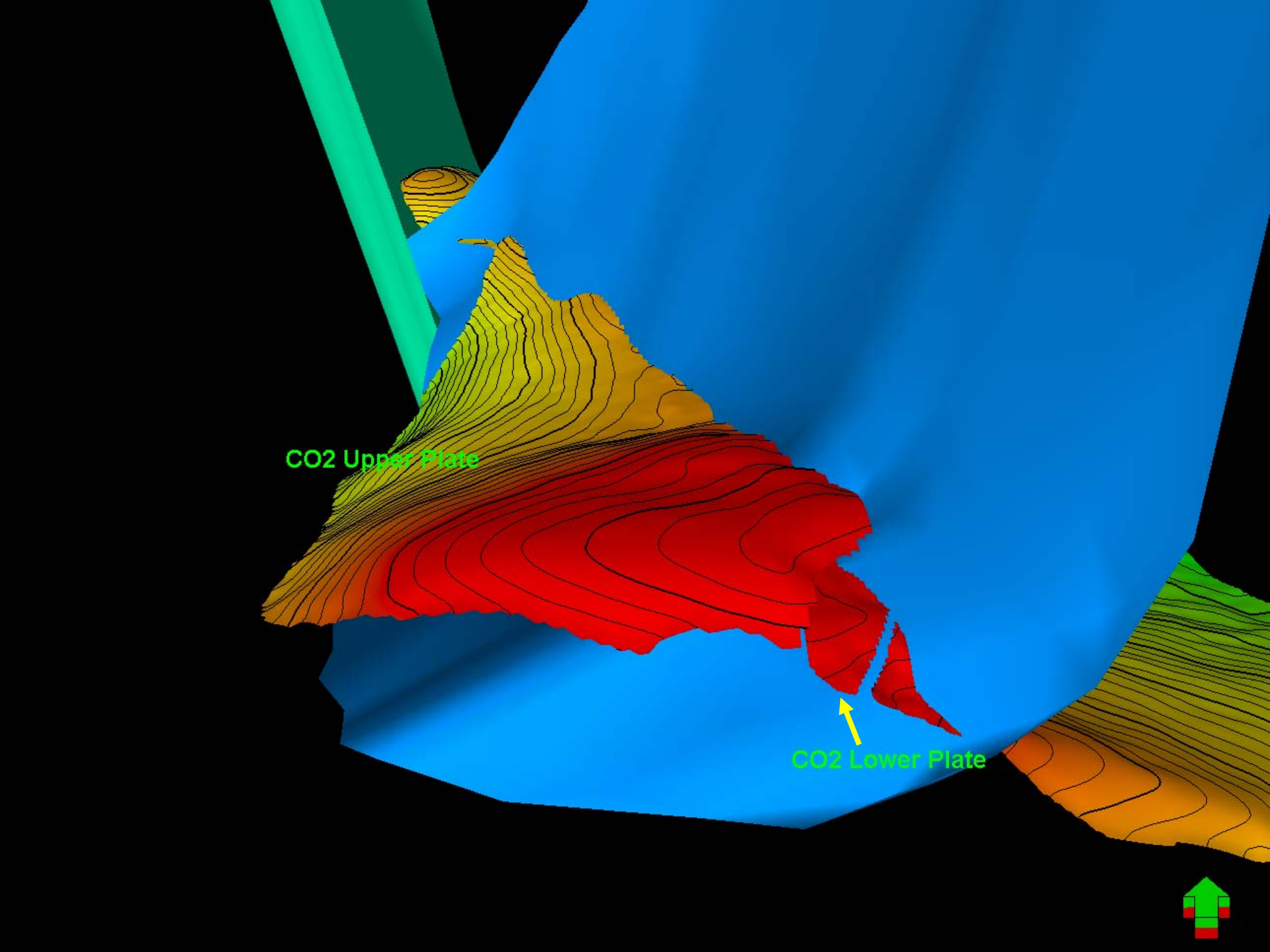
Original 3D vs. Reprocessed 3D

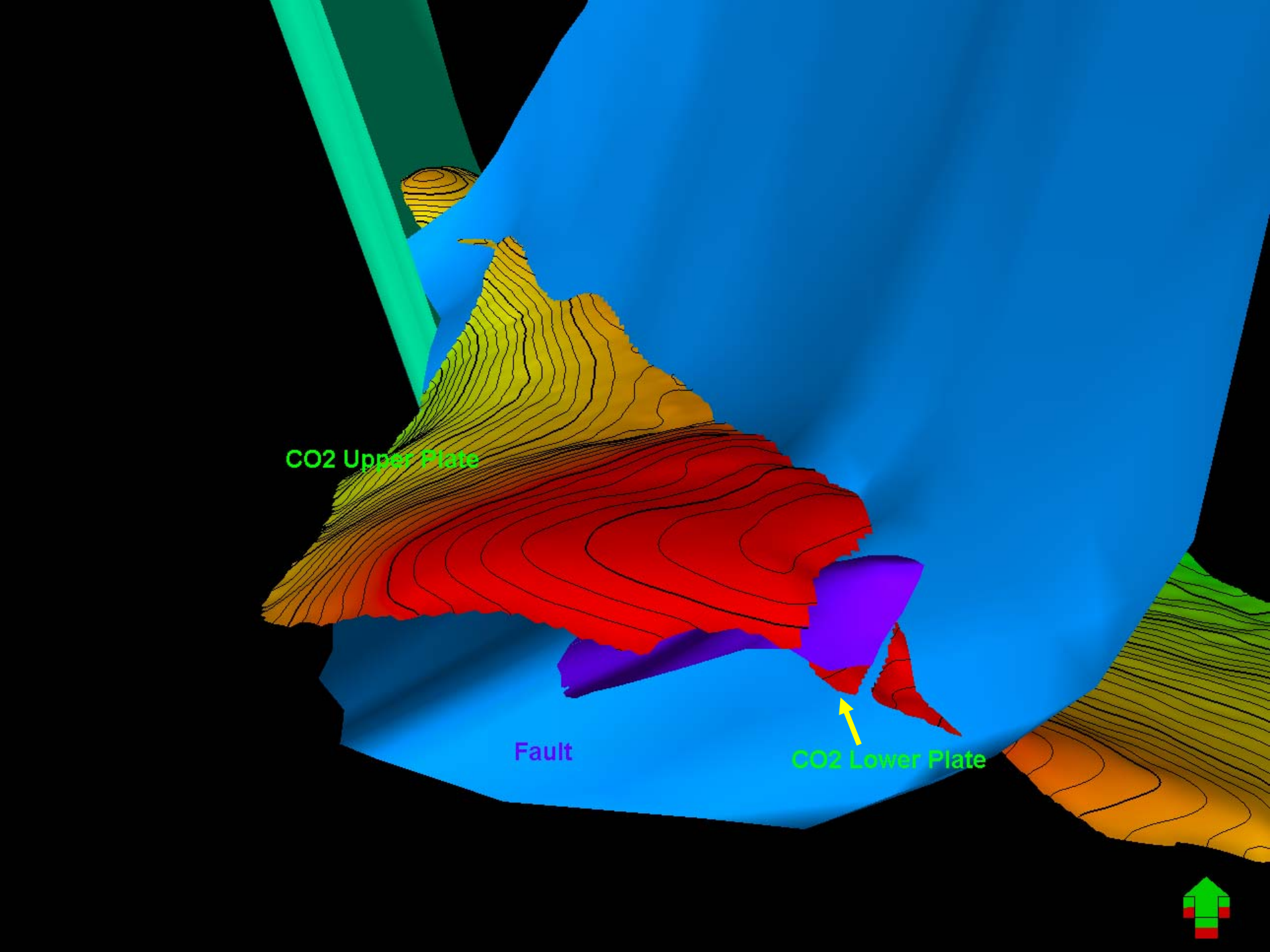
Seismic Line A-A’



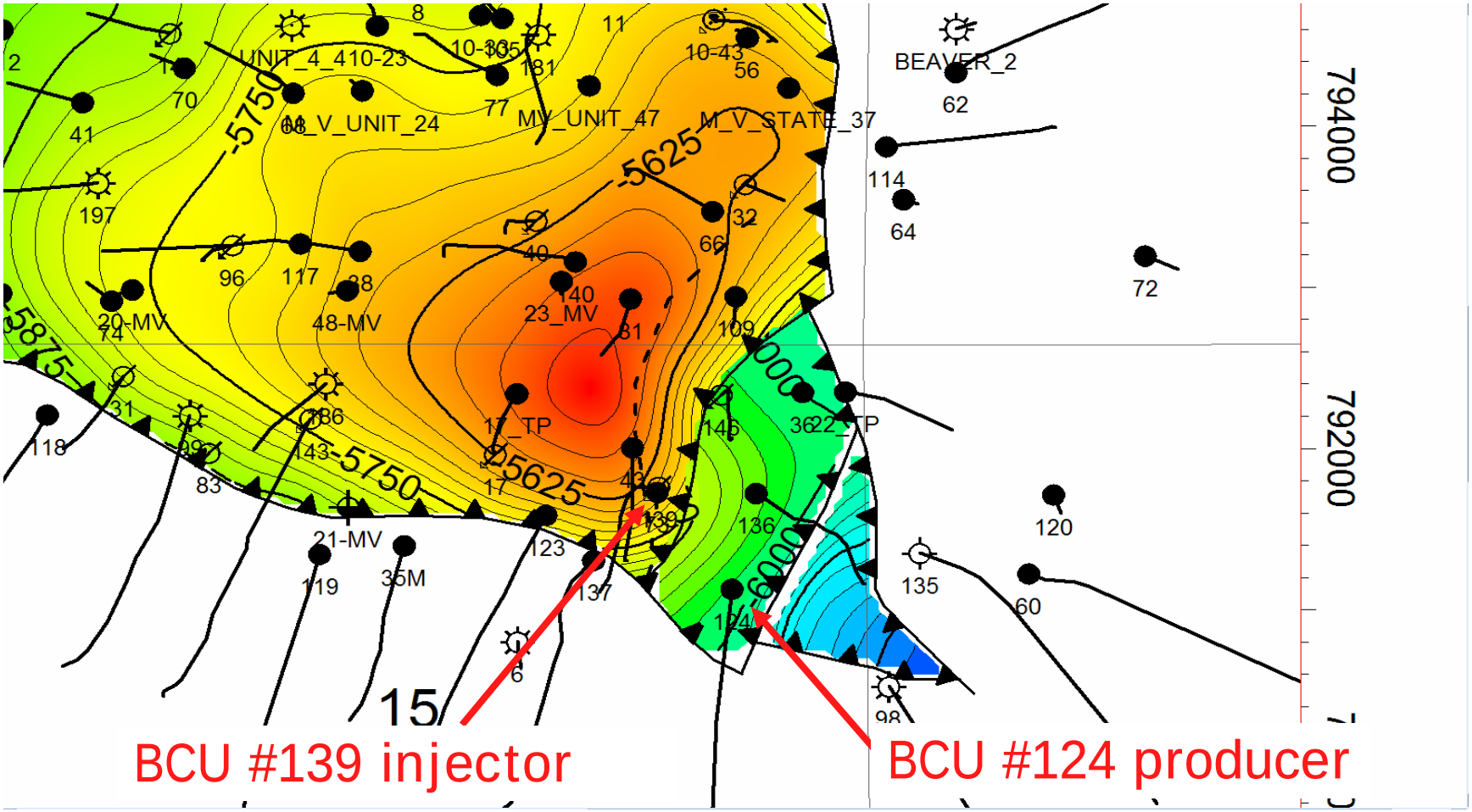
Original Vector processing

Excel processing using DMI PSTM

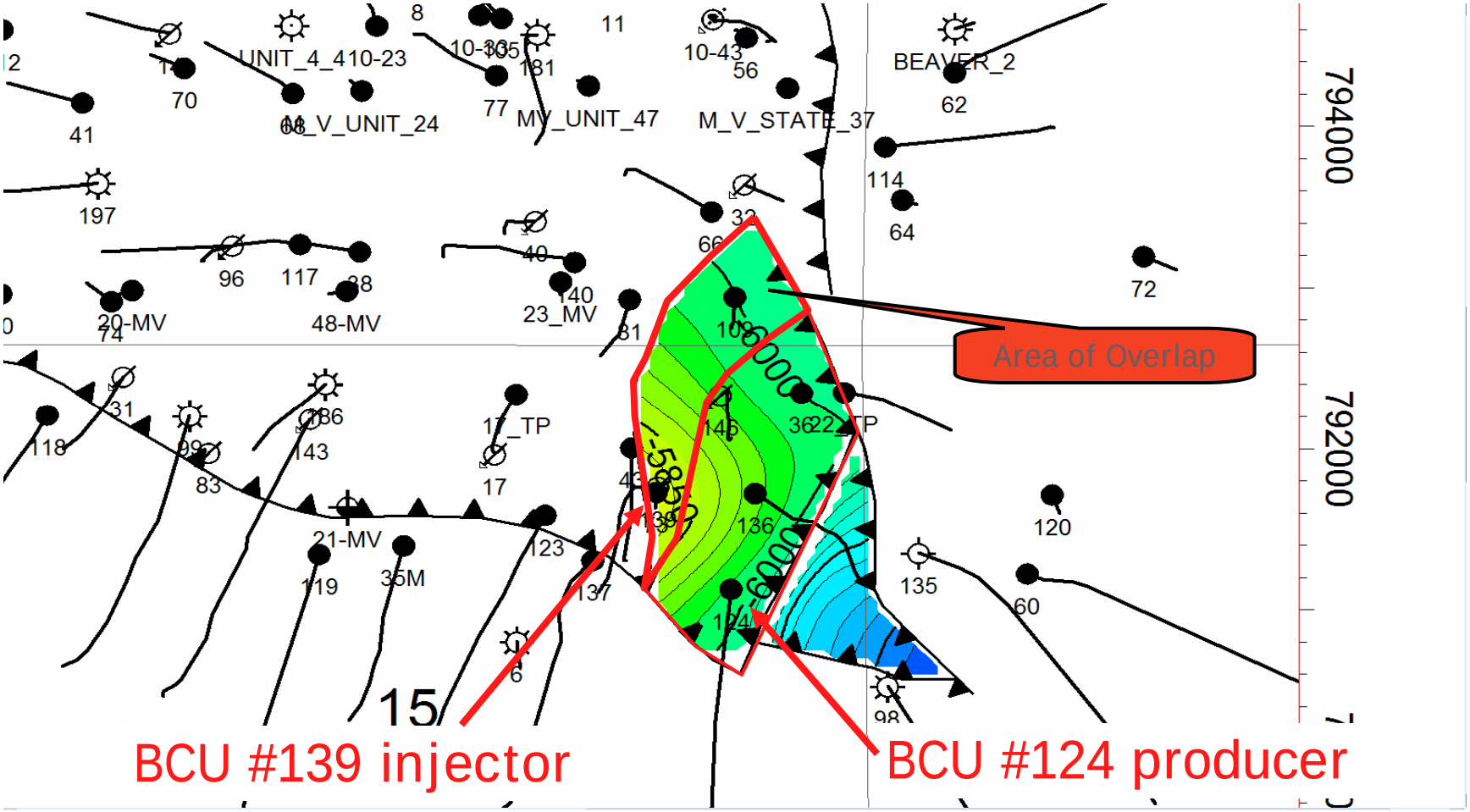

CO2 Upper Plate
CO2 Lower Plate


CO2 Upper Plate
Fault
CO2 Lower Plate

Well 124 responds to CO_2 injection well 139

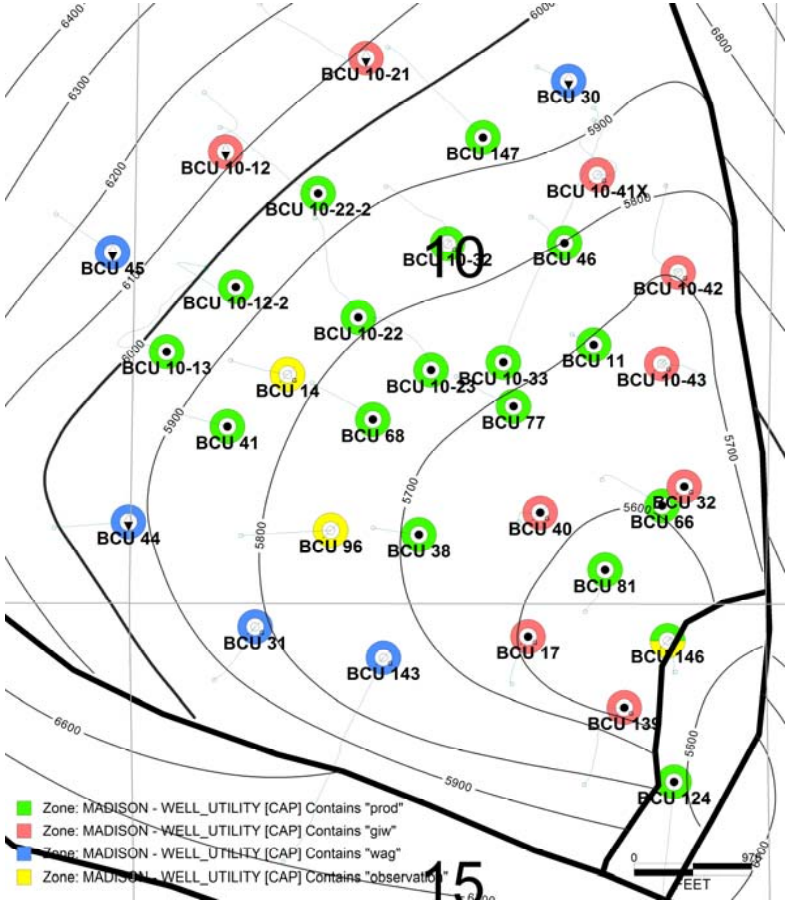


The Madison CO_2 zone is in the lower SE plate at both wells

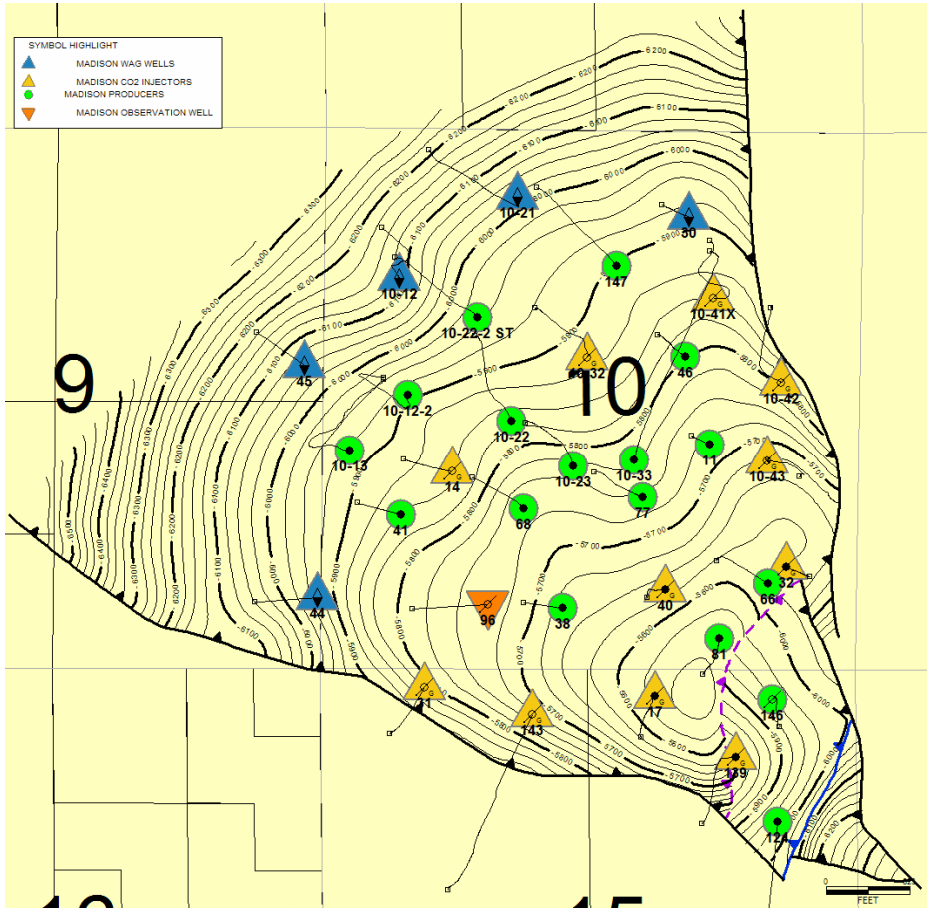


Madison Structure Map

Old Madison Structure Map



New Madison Structure Map

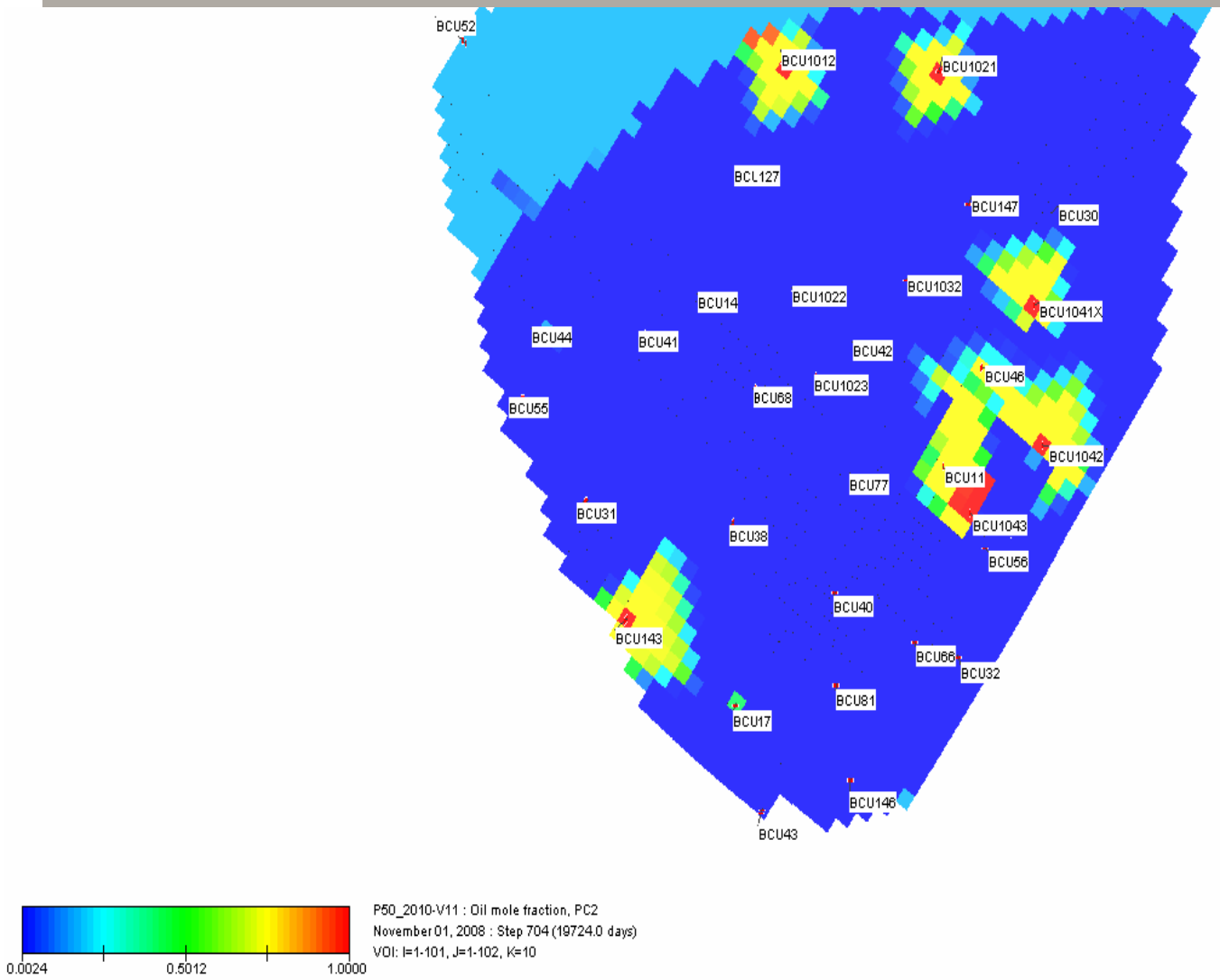


Madison CO_2 flood

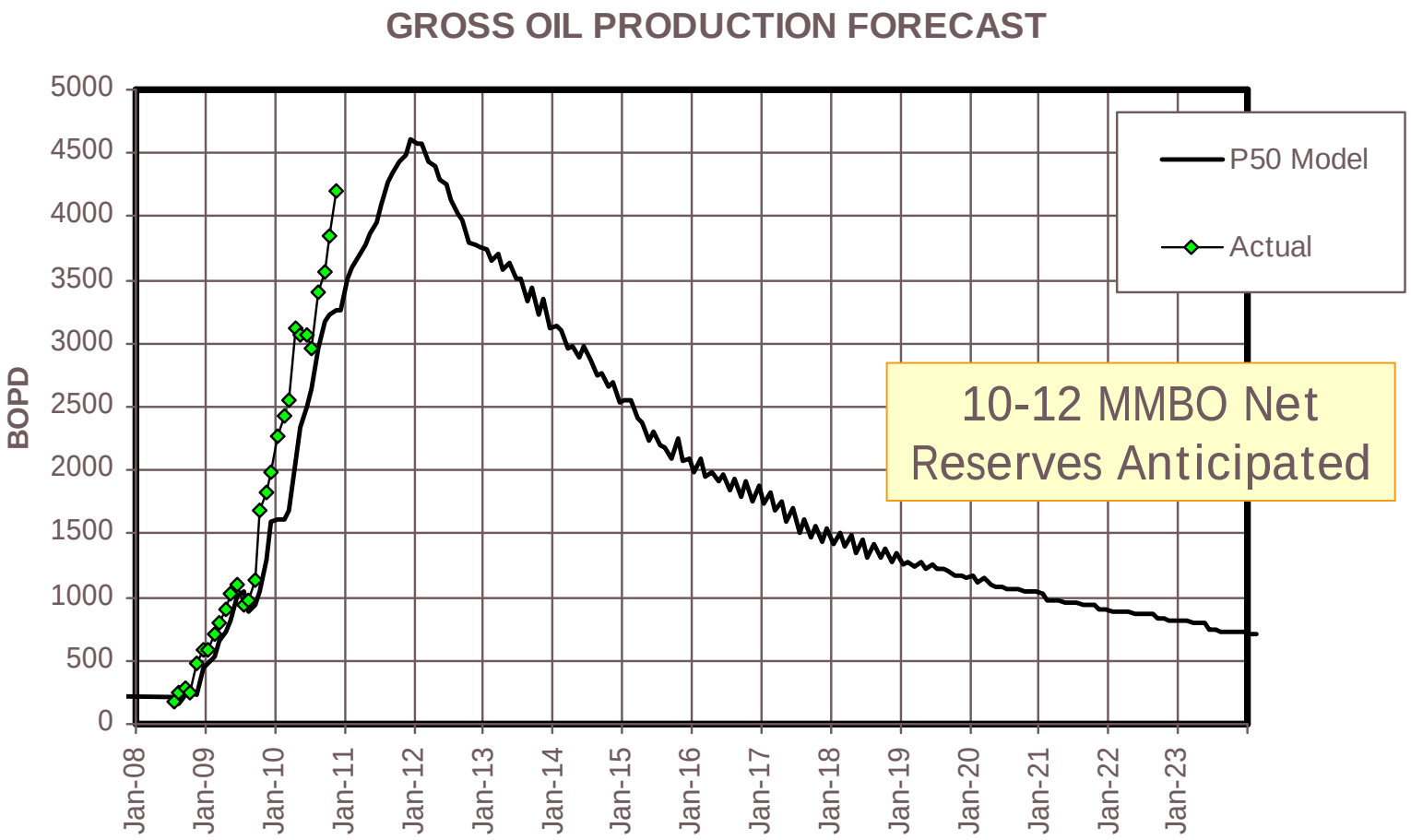
Reservoir Management

- Simulation Updates
  - History match actual CO_2 flood performance
- Optimize Flood Performance
  - Improved rate and reserve forecasting
  - Optimize reservoir and operating pressures
  - Forecast Impact of Various Operating Scenarios (Well Placement, WAG Ratio, Slug Size, CO_2 Utilization, Conformance)

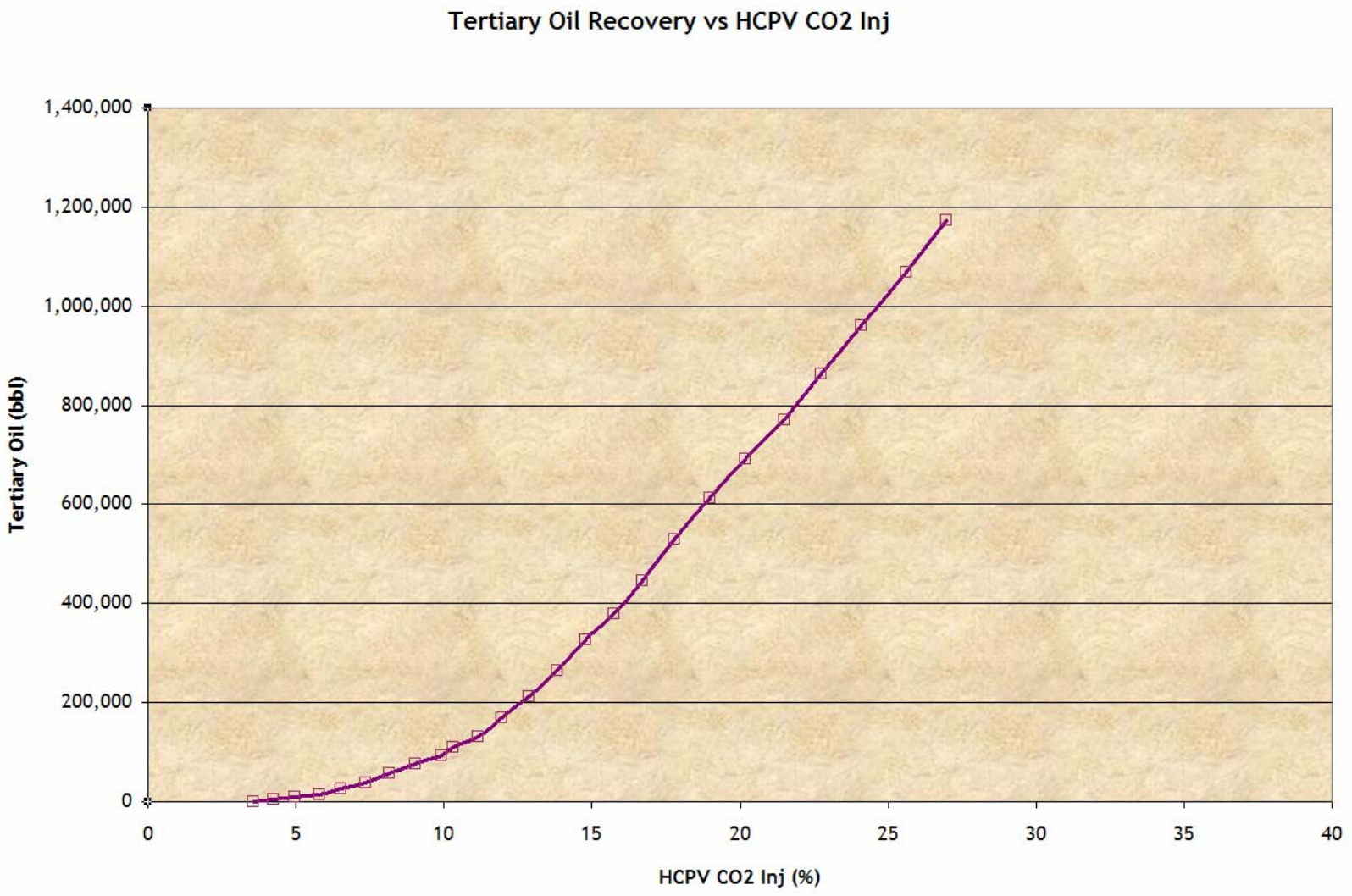
Reservoir Simulation Update



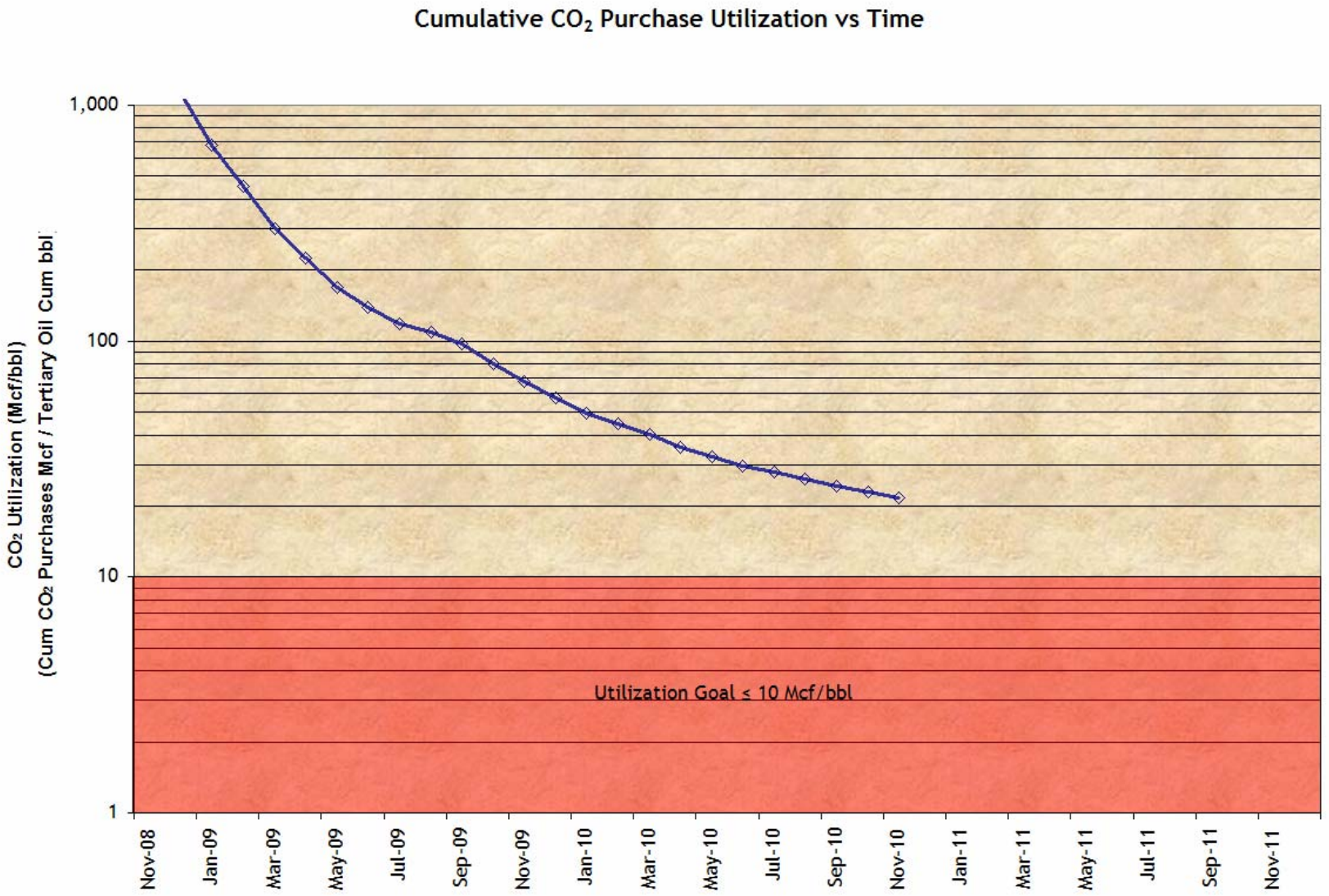
Actual vs. Modeled Oil Production



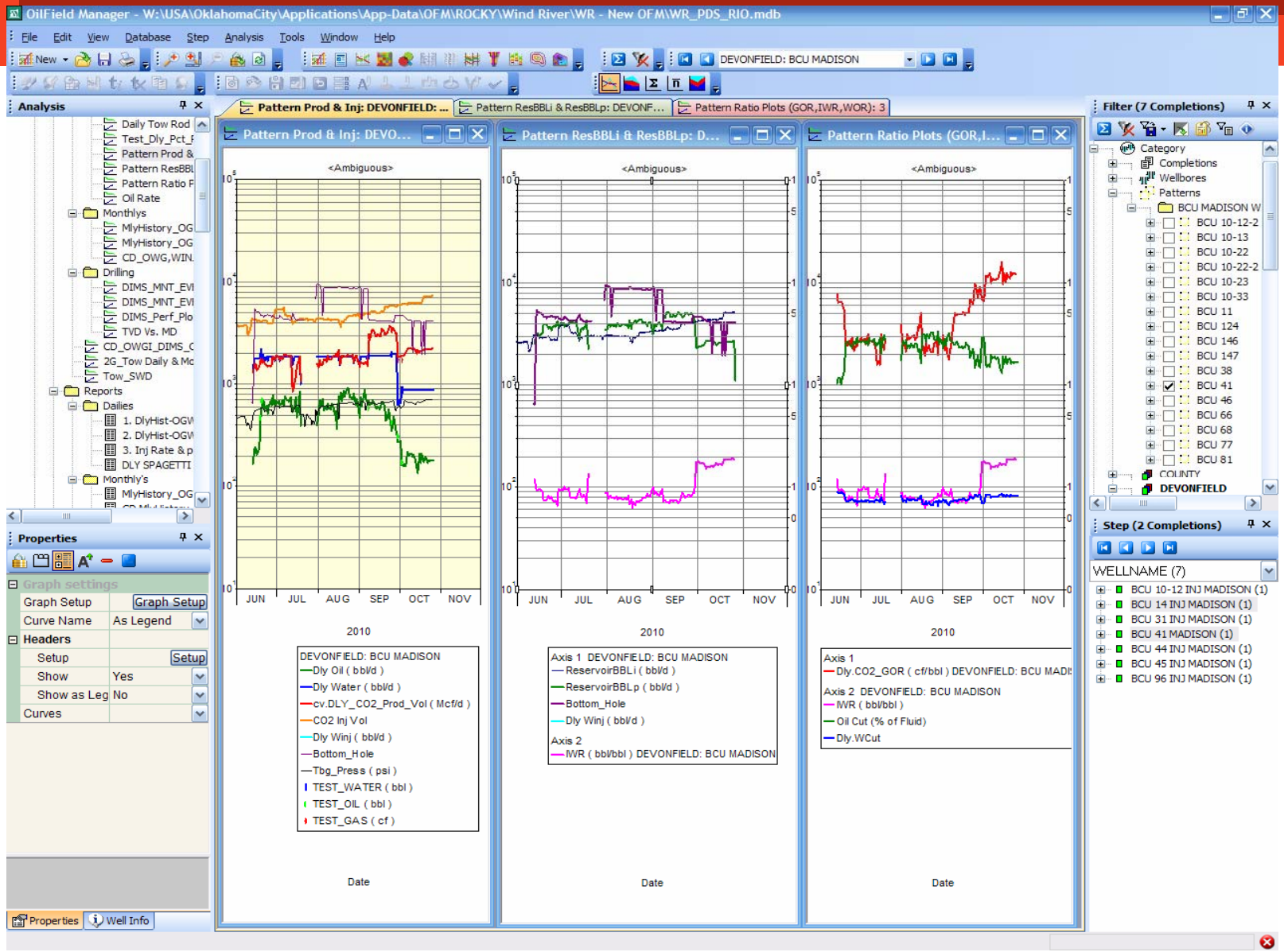
Tertiary Recovery



CO_2 Utilization



Continued Reservoir Monitoring



Thank You.

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