The Beaver Creek Field
Madison CO₂ Project - Spring 2009 Update
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Beaver Creek Field
Madison CO₂ Flood Project

Presentation Overview

Geographic Setting
Geologic and Reservoir setting
Field History
Final Project Design
Project Construction
Flood Status & Response
CO₂ Floods in Wyoming

- Devon Beaver Creek Field
- Anadarko Patrick Draw Monel Unit
- Anadarko Salt Creek Field
- Merit Energy Wertz/Lost Soldier
Beaver Creek Madison Structure

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

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'

Active Oil Producer
Active Water Injector
Type Log
Madison Log Section
GR/Bulk Density

BCU #127 Well
Top @ 11224’ MD
Bottom @ 11723’ MD
Beaver Creek Madison
Pre-CO₂ Flood Production History

Discovered January 1954
Waterflood initiated in 1959
Cum Oil = 42.5 MMbo (39% OOIP)
Developed with 36 completions

OOIP = 109 MMbo
Cum Oil = 42.5 MMbo (39% OOIP)
Developed with 36 completions
Flood Plan
Peripheral CO$_2$-WAG

14 Injectors:
- 8 WAG injectors
- 6 CO2 injectors

16 Producers

12 Shut-in or producing from other formation or TA

Detail:
- 3 well conversion (prod->Inj):
  44, 146, 143
- 8 old producers:
  11, 38, 41, 46, 68, 147, 66, 81
- 2 shut-in:
  14, 96
- 6 old injectors:
  40, 17, 30, 32, 45, 139
- 7 new producers:
  D, E, F, G, H, I, J, L
- 4 new injectors:
  A, B, C, K
- 1 Injector reactivation:
  31
- 1 Producer reactivation:
  77

Low confidence inside this area
Flood Preparation Work Requirements

- Convert 2 wells from producer to injector
- Rework or recomplete 9 producers & 7 injectors
- Drill 7 new producers & 5 new injectors
- Construct Production & Injection Facilities
- Install New Flowlines for Producers & Injectors
- Build CO2 Supply Pipeline
Where Are We At Today?

Construction & Wellwork
- CO₂ source pipeline completed & tested Spring 2008
- Injection facilities completed Spring 2008
- Production facilities completed Fall 2008
- Drilling, completion and other wellwork completed Fall 2008
- Recycle compressors installed and on line Spring 2009

CO₂ Flood Process
- CO₂ Injection initiated July 3, 2008
- 10.7 Bcfg injected to date
- Flood response observed in 7 of the 16 producers
- CO₂ indications observed in 9 of the 16 producers
- Continued monitoring of production data and adjusting our flood
  - Flow rate adjustments
  - Gas distribution adjustments
Madison CO₂ Flood Production

Initiated CO₂ Injection 7/3/08

Pre-Flood
320 Bopd
32000 Bwpd

Current Rate
1200 Bopd
22000 Bwpd

Oil Cut Increase from 1% to 5%
Madison CO₂ Injection Response
6/09 Oil Production Increase
Madison CO₂ Injection Response
6/09 Produced Gas CO₂ %

[Map showing well locations with data points for CO₂ injection and production dates]
BCU 10-41 Injection Wellhead
2 Well Pad Location
BCU 10-33 & BCU 10-41
CO₂ Injection Header
8” CO₂ Supply Pipeline Delivery Point
CO₂ Recycle Compression
Recycle Compression Facility
Storage Tanks / Dehydration
Production Facility Building
Managing Start-up Operations

[Image of a man pointing to a piece of equipment in a room]

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Thank You.