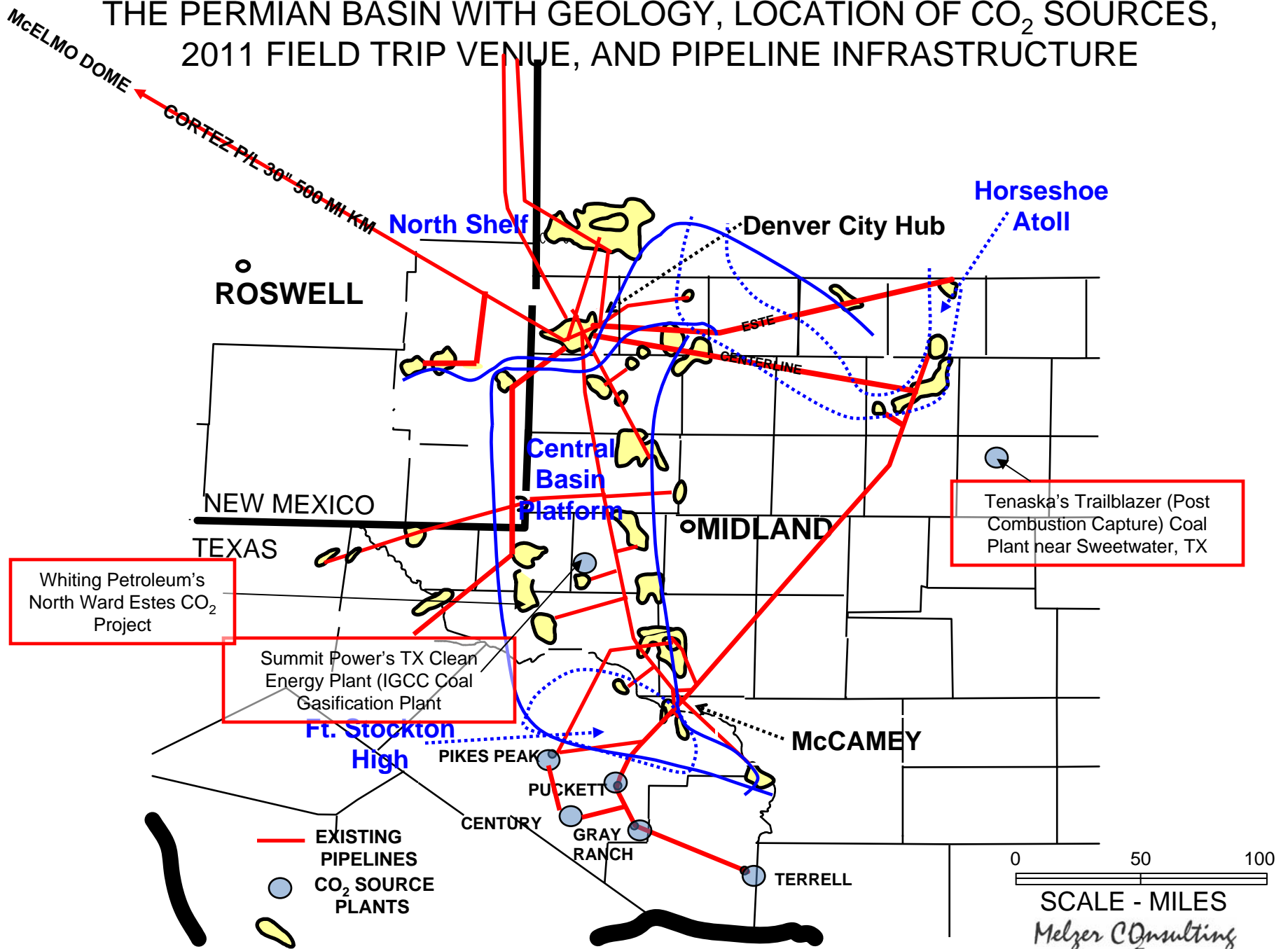


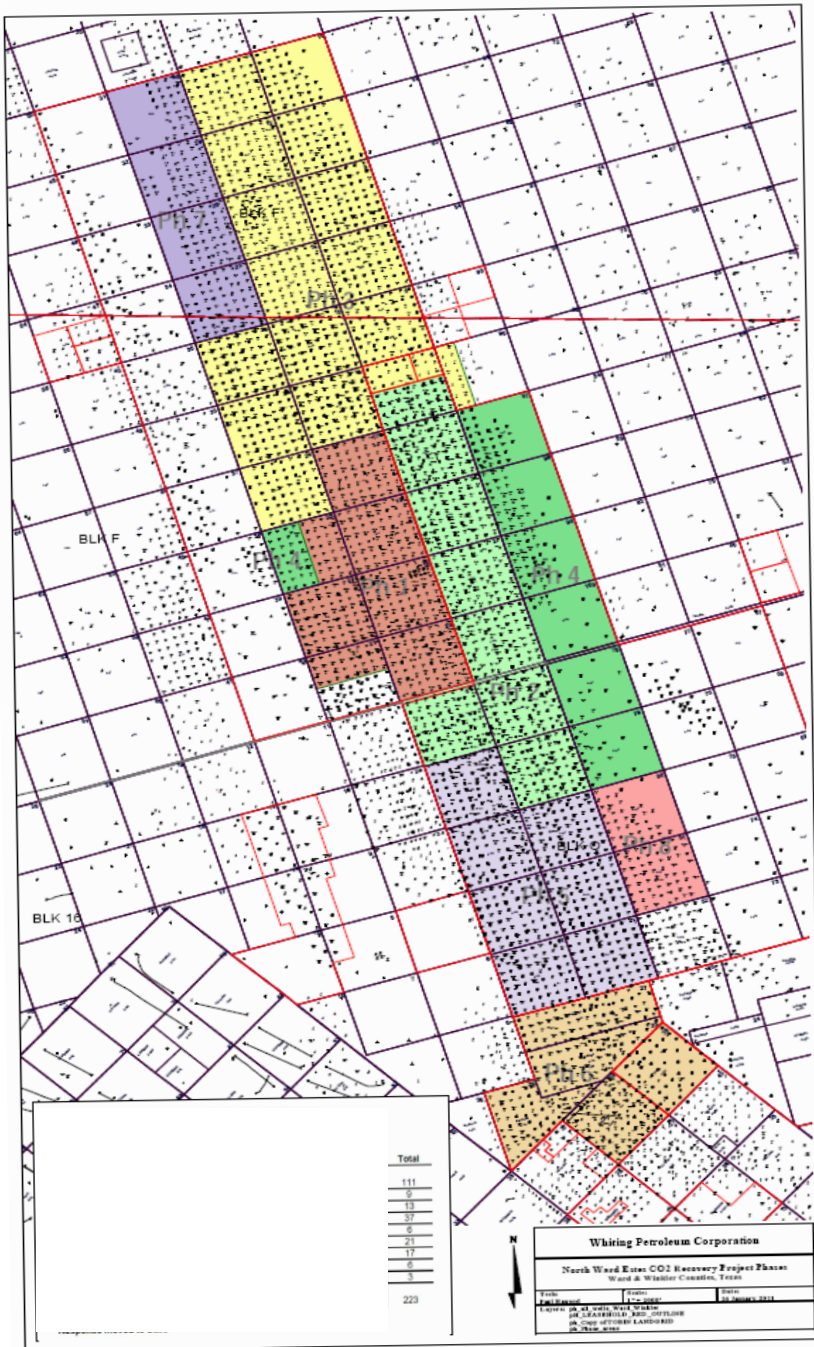


2011 CO<sub>2</sub> Flooding Conference  
Field Trip to the North Ward Estes  
CO<sub>2</sub> Flood and Facilities  
(Whiting Petroleum Host)

*December 7, 2011*

# THE PERMIAN BASIN WITH GEOLOGY, LOCATION OF CO<sub>2</sub> SOURCES, 2011 FIELD TRIP VENUE, AND PIPELINE INFRASTRUCTURE





## North Ward-Estes Field: Yates / 7 Rivers / Queen

Discovered: 1929

Acreage: ~42,400 Acres

Fine-grained Sandstones to Siltstones Separated By Dense Dolomite

Tidal Flat to Lagoonal Depositional Environment

Cum Oil Production To Date: ~366 Million Bbls

Initial Conditions:

Bubble Point: 1,400psi

Oil Formation Volume Factor: 1.2 RB/STB

Oil Viscosity: 1.4cp

Solution GOR: 500 scf/STB

Oil Gravity: 37° API

Average Reservoir Properties:

Depth: 2,600ft

Net Pay: 60ft

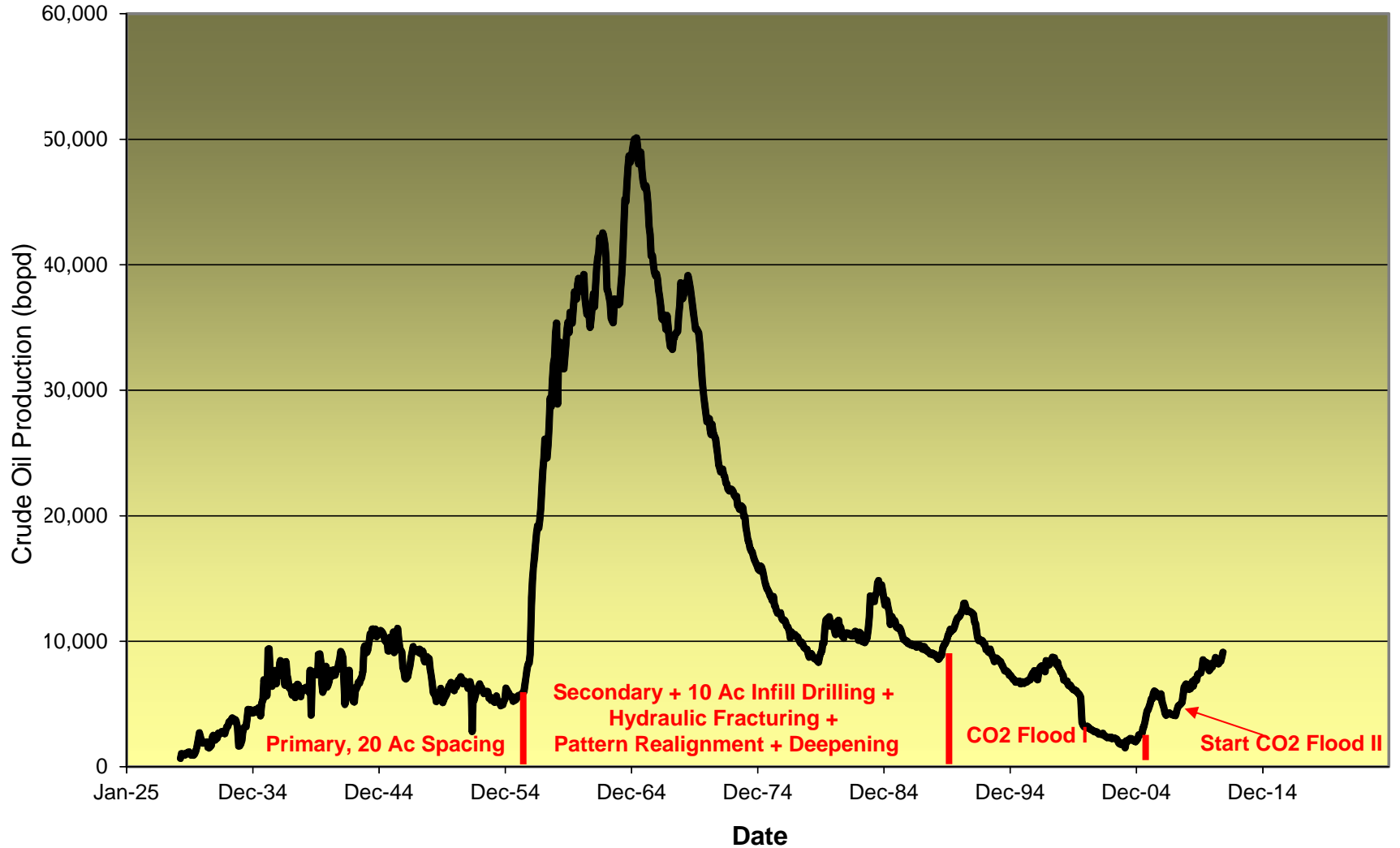
Porosity: 18%

Permeability: 15md

Dykstra-Parsons Coefficient: 0.85

Reservoir Temp: 83° F

# North Ward-Estes Oil Production



# CO<sub>2</sub> Recycle Plant Control Room



# Injection Well Skid (Rigged for Wagging)



# Production Well with Gas (CO<sub>2</sub>) Lift

