

GRIZZELL LEASE VOLUMETRIC CALCULATIONS

Parameters:

Area	(A)	=	160 acres
Porosity	(θ)	=	10.5%
Formation Height	(h)	=	33 ft.
Initial Water Saturation	(S_{wi})	=	25%
Oil Formation Volume Factor	(B_{oi})	=	1.35 RB/STB

Original Oil In Place

$$Np = \left[\frac{7758(A)(\theta)(h)(1 - S_{wi})}{B_{oi}} \right]$$

$$Np = \left[\frac{7758(160)(0.105)(33)(1 - 0.25)}{1.35} \right]$$

OOIP = 2,389 MBO

Recovery Calculations

Ultimate Primary Recovery	=	415.2 MBO
Primary Recovery	=	413.7 MBO
Remaining Primary	=	1.5 MBO
Primary RF	=	17.3 %

Expected Secondary Recovery	=	100.0 MBO
Secondary RF	=	4.2 %
Secondary to Primary RF	=	25.0 %

$$\text{Total RF} = \left[\frac{(413.7 + 100.0)}{2389} \right] = 21.5\%$$

BEFORE AN EXAMINER OF THE OIL
CONSERVATION DIVISION

EXHIBIT NO. 4
CASE NO. : 12785
Submitted by: Apache Corporation
Hearing Date: January 10, 2002