



# Bison Oil Well Cementing Tail & Lead

Customer: Noble Energy Inc.  
Well Name: Wells Ranch State AA36-633

Date: 5/3/2019  
Invoice #: 900336  
API#: 05-123-48164  
Foreman: Corey Barras

County: Weld  
State: Colorado

Sec: 16  
Twp: 2n  
Range: 64w

Consultant: Charles  
Rig Name & Number: H&P 321  
Distance To Location: 25  
Units On Location: 4033/3201-4032/3203  
Time Requested: 1930  
Time Arrived On Location: 1900  
Time Left Location:

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625 Casing Weight (lb) : 36 Casing Depth (ft.) : 1,947 Total Depth (ft) : 1957 Open Hole Diameter (in) : 13.50 Conductor Length (ft) : 80 Conductor ID : 15.25 Shoe Joint Length (ft) : 44 Landing Joint (ft) : 0</p> <p>Sacks of Tail Requested 100 HOC Tail (ft): 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: 8 Max Pressure: 1500</p>	<p><b>Lead</b></p> <p>Cement Name: Cement Density (lb/gal) : 13.5 Cement Yield (cuft) : 1.7 Gallons Per Sack 9.00 % Excess 10%</p> <p><b>Tail</b></p> <p>Cement Name: Cement Density (lb/gal) : 15.2 Cement Yield (cuft) : 1.27 Gallons Per Sack: 5.89 % Excess: 0%</p> <p>Fluid Ahead (bbls) 30.0 H2O Wash Up (bbls) 20.0</p> <p><b>Spacer Ahead Makeup</b> 30BBL WATER DYE IN 2ND 10</p>

Lead Calculated Results	Tail Calculated Results
<p>HOC of Lead 1646.22 ft Casing Depth - HOC Tail</p> <p>Volume of Lead Cement 804.56 cuft HOC of Lead X Open Hole Ann</p> <p>Volume of Conductor 61.05 cuft (Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)</p> <p>Total Volume of Lead Cement 865.61 cuft (cuft of Lead Cement) + (Cuft of Conductor)</p> <p>bbls of Lead Cement 169.58 bbls (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)</p> <p>Sacks of Lead Cement 560.10 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)</p> <p>bbls of Lead Mix Water 120.02 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42</p> <p>Displacement 147.10 bbls (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)</p> <p>Total Water Needed: 331.15 bbls</p>	<p>Tail Cement Volume In Ann 127.00 cuft (HOC Tail) X (OH Ann)</p> <p>Total Volume of Tail Cement 107.90 Cuft (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)</p> <p>bbls of Tail Cement 22.62 bbls (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)</p> <p>HOC Tail 220.78 ft (Tail Cement Volume) ÷ (OH Ann)</p> <p>Sacks of Tail Cement 100.00 sk (Total Volume of Tail Cement) ÷ (Cement Yield)</p> <p>bbls of Tail Mix Water 14.02 bbls (Sacks of Tail Cement X Gallons Per Sack) ÷ 42</p> <p>Pressure of cement in annulus Hydrostatic Pressure 585.23 PSI</p> <p>Collapse PSI: 2020.00 psi Burst PSI: 3520.00 psi</p>

X   
Authorization To Proceed

# Wells Ranch State AA36-633

— PSI — Barrels / Minute — Barrels — Lbs / Gallon

