



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 9/9/2015  
 Invoice #: 90038  
 API#: 05-123-41788  
 Supervisor: Nick

**Customer:** Noble Energy Inc.  
**Well Name:** Wells Ranch AE 32-615

County: Weld  
 State: Colorado  
 Sec: 32  
 Twp: 6N  
 Range: 62W

Consultant: Michael Pino  
 Rig Name & Number: H&P 273  
 Distance To Location: 60  
 Units On Location: 3102/4028/4022/3215  
 Time Requested: 18:00  
 Time Arrived On Location: 16:30  
 Time Left Location: 23:45

WELL DATA	Cement Data
Casing Size OD (in) : 9.625	Cement Name: BFN III
Casing Weight (lb) : 36.00	Cement Density (lb/gal) : 14.2
Casing Depth (ft.) : 630	Cement Yield (cuft) : 1.49
Total Depth (ft) : 637	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 25%
Conductor Length (ft) : 104	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit: 18.0
Shoe Joint Length (ft) : 43	Fluid Ahead (bbls): 40.0
Landing Joint (ft) : 5	H2O Wash Up (bbls): 20.0
Max Rate: 7	Spacer Ahead Makeup
Max Pressure: 1500	DYE IN SECOND 10 BBL

Casing ID: 8.921 Casing Grade: J-55 only used

Calculated Results	Pressure of cement in annulus
<b>cuft of Shoe</b> 18.66 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	<b>Displacement:</b> 45.10 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
<b>cuft of Conductor</b> 79.37 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	<b>Hydrostatic Pressure:</b> 464.75 PSI
<b>cuft of Casing</b> 329.81 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length )	<b>Pressure of the fluids inside casing</b>
<b>Total Slurry Volume</b> 427.84 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	<b>Displacement:</b> 253.10 psi
<b>bbls of Slurry</b> 76.20 bbls (Total Slurry Volume) X (.1781)	<b>Shoe Joint:</b> 31.72 psi
<b>Sacks Needed</b> 287 sk	<b>Total</b> 284.82 psi
<b>Mix Water</b> 51.11 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Differential Pressure:</b> 179.93 psi
	<b>Collapse PSI:</b> 2020.00 psi
	<b>Burst PSI:</b> 3520.00 psi
	<b>Total Water Needed:</b> 156.21 bbls

Authorization To Proceed

Customers hereby acknowledges and specifically agrees to the terms and condition on this work order, including, without limitation, the provisions on this work order.

