



**Bison Oil Well Cementing
Single Cement Surface Pipe**

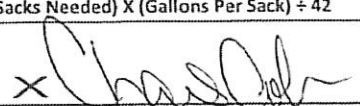
Date: 7/23/2015
Invoice # 90017
API# 05-123-41529
Supervisor Nick

Customer: Noble Energy Inc.
Well Name: 70 Ranch State BB 18-681

County: Weld
State: Colorado
Sec: 17
Twp: 5N
Range: 63W

Consultant: Martin Suarez
Rig Name & Number: H&P 273
Distance To Location: 60
Units On Location: 3102/4028/4031/3211
Time Requested: 16:30
Time Arrived On Location: 15:40
Time Left Location: 19:45

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) : 764	Cement Yield (cuft) : 1.49
Total Depth (ft) : 770	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 20%
Conductor Length (ft) : 100	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit: 20.0
Shoe Joint Length (ft) : 44	Fluid Ahead (bbls): 50.0
Landing Joint (ft) : 29	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		Displacement: 55.50 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)	
cuft of Shoe	19.10	cuft	Pressure of cement in annulus
(Casing ID Squared) X (.005454) X (Shoe Joint ft)			
cuft of Conductor	76.31	cuft	Hydrostatic Pressure: 563.30 PSI
(Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)			
cuft of Casing	314.47	cuft	Pressure of the fluids inside casing
(Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)			
Total Slurry Volume	409.88	cuft	Displacement: 310.27 psi
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)			
bbls of Slurry	87.60	bbls	Shoe Joint: 32.46 psi
(Total Slurry Volume) X (.1781)			
Sacks Needed	330	sk	Total 342.73 psi
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)			
Mix Water	58.77	bbls	Differential Pressure: 220.57 psi
(Sacks Needed) X (Gallons Per Sack) ÷ 42			
		Collapse PSI: 2020.00 psi	
Authorization to Proceed		Burst PSI: 3520.00 psi	
		Total Water Needed: 184.27 bbls	
Customers hereby acknowledges and specifically agrees to the terms and condition on this work order, including, without limitation, the provisions on this work order.			



Customer
Well Name

Noble Energy Inc.
70 Ranch State BB 18-681

INVOICE #	LOCATION	Supervisor	Date
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90017
Weld
Nick
7/23/2015

DESCRIPTION OF JOB EVENTS

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