



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

Date: 12/16/2014
 Invoice #: 55047
 API#
 Foreman: monte

Customer: Noble Energy Inc.
Well Name: Nalen State LD 12-76-1AHN

County: Weld
 State: Colorado
 Sec: 1
 Twp: 9n
 Range: 58w
 Consultant: Toby
 Rig Name & Number: H&P 273
 Distance To Location: 79.8
 Units On Location: 4028-3202 4034-3211
 Time Requested: 10:30pm
 Time Arrived On Location: 9:05
 Time Left Location: 3:00

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.) : 1,179	Cement Yield (cuft) : 1.48
Total Depth (ft) : 1231	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 20%
Conductor Length (ft) : 124	Displacement Fluid lb/gal: 40.0
Conductor ID : 15.6	BBL to Pit:
Shoe Joint Length (ft) : 43	Fluid Ahead (bbls): 40.0
Landing Joint (ft) : 24	H2O Wash Up (bbls): 20.0
Max Rate: 5	Spacer Ahead Makeup
Max Pressure: 2000	10 fresh 10 dye 20 fresh

Calculated Results	Pressure of cement in annulus
cuft of Shoe 18.66 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: 89.68 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor 101.93 cuft (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: 869.75 PSI
cuft of Casing 618.73 cuft (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume 739.33 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: #N/A psi
bbls of Slurry 131.67 bbls (Total Slurry Volume) X (.1781)	Shoe Joint: 31.72 psi
Sacks Needed 500 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total #N/A psi
Mix Water 88.97 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: #N/A psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed: 238.64 bbls

x *[Signature]*
 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.

