



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 9/8/2015
 Invoice #: 90037
 API#: 05-123-41726
 Supervisor: Nick

Customer: Noble Energy Inc.
Well Name: Wells Ranch AE 32-665

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

Consultant: Josh
 Rig Name & Number: H&P 343
 Distance To Location: 60
 Units On Location: 3102/4028/4022/3215
 Time Requested: 23:00
 Time Arrived On Location: 20:30
 Time Left Location: 1:30

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) : 627	Cement Yield (cuft) : 1.49
Total Depth (ft) : 637	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 30%
Conductor Length (ft) : 110	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit: 25.0
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
cuft of Shoe 18.66 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: 45.10 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor 83.94 cuft (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: 462.54 PSI
cuft of Casing 380.83 cuft (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume 448.06 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 251.81 psi
bbls of Slurry 79.80 bbls (Total Slurry Volume) X (.1781)	Shoe Joint: 31.72 psi
Sacks Needed 301 sk	Total 283.53 psi
Mix Water 53.61 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: 179.01 psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed: 158.71 bbls

X
 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.

