



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 9/8/2015
 Invoice # 90036
 API# 05-123-41727
 Supervisor Nick

Customer: Noble Energy Inc.
 Well Name: Wells Ranch AE 32-640

County: Weld Consultant: Johnny Sanchez
 State: Colorado Rig Name & Number: H&P 343
 Distance To Location: 60
 Sec: 32 Units On Location: 3102/4028/4022/3215
 Twp: 6N Time Requested: 7:00
 Range: 62W Time Arrived On Location: 5:45
 Time Left Location: 10:30

WELL DATA	Cement Data
Casing Size OD (in) : <u>9.625</u>	Cement Name: <u>BFN III</u>
Casing Weight (lb) : <u>36.00</u>	Cement Density (lb/gal) : <u>14.2</u>
Casing Depth (ft.) : <u>628</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>638</u>	Gallons Per Sack: <u>7.48</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>20%</u>
Conductor Length (ft) : <u>104</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.25</u>	BBL to Pit: <u>17.0</u>
Shoe Joint Length (ft) : <u>43</u>	Fluid Ahead (bbls): <u>40.0</u>
Landing Joint (ft) : <u>5</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate: <u>7</u>	Spacer Ahead Makeup
Max Pressure: <u>1500</u>	DYE IN SECOND 10 BBL

Calculated Results	Pressure of cement in annulus
Casing ID <u>8.921</u> Casing Grade <u>J-55 only used</u>	Displacement: 45.20 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Shoe 18.66 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Pressure of cement in annulus
cuft of Conductor 79.37 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: 463.28 PSI
cuft of Casing 244.47 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume 342.50 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 252.24 psi
bbls of Slurry 73.20 bbls (Total Slurry Volume) X (.1781)	Shoe Joint: 31.72 psi
Sacks Needed 276 sk	Total 283.96 psi
Mix Water 49.15 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: 179.31 psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed: 154.35 bbls

X Johnny Sanchez
 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.

