



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 4/19/2015
 Invoice # 80032
 API# 05-123-40631
 Foreman: Calvin Reimers

Customer: Noble Energy Inc.
Well Name: Christine LC 27-765

County: Weld Consultant: _____
 State: Colorado Rig Name & Number: H&P 326
 Distance To Location: 66 Miles
 Sec: 34 Units On Location: 4023-3104/4020-3212
 Twp: 9N Time Requested: 1030pm
 Range: 59W Time Arrived On Location: 1010pm
 Time Left Location: 145am

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>634</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>673</u>	Gallons Per Sack: <u>7.48</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>25%</u>
Conductor Length (ft) : <u>100</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>16</u>	BBL to Pit: <u>13.0</u>
Shoe Joint Length (ft) : <u>45</u>	Fluid Ahead (bbls): <u>40.0</u>
Landing Joint (ft) : <u>34</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate: <u>7</u>	Spacer Ahead Makeup
Max Pressure: <u>2500</u>	<u>40bbls With Dye in 2nd 10bbls</u>

Casing ID 8.921 Casing Grade J-55 only used

Calculated Results	Pressure of cement in annulus
cuft of Shoe <u>19.67</u> cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: <u>48.09</u> bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor <u>89.10</u> cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: <u>467.40</u> PSI
cuft of Casing <u>325.98</u> cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume <u>434.74</u> cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: <u>253.65</u> psi
bbls of Slurry <u>77.43</u> bbls (Total Slurry Volume) X (.1781)	Shoe Joint: <u>33.43</u> psi
Sacks Needed <u>292</u> sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total <u>287.08</u> psi
Mix Water <u>51.96</u> bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: <u>180.32</u> psi
	Collapse PSI: <u>2020.00</u> psi
	Burst PSI: <u>3520.00</u> psi
	Total Water Needed: <u>160.05</u> bbls

Mary Stapleton
 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.

