



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 11/19/2015
 Invoice #: 90060
 API#: 05-123-40734
 Supervisor: Nick

Customer: Noble Energy Inc.
 Well Name: Moser State H22-785

County: Weld
 State: Colorado
 Consultant: Charles/J.W.
 Rig Name & Number: H&P 273
 Distance To Location: 20
 Units On Location: 3106/4028/4022/3215
 Sec: 22
 Twp: 3N
 Range: 65W
 Time Requested: 16:00
 Time Arrived On Location: 14:21
 Time Left Location: 19:00

| 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.) : 848 | Cement Yield (cuft) : 1.49 |
| Total Depth (ft) : 854 | Gallons Per Sack: 7.48 |
| Open Hole Diameter (in.) : 13.50 | % Excess: 10% |
| Conductor Length (ft) : 100 | Displacement Fluid lb/gal: 8.3 |
| Conductor ID : 15.25 | BBL to Pit: 16.0 |
| Shoe Joint Length (ft) : 45 | Fluid Ahead (bbls): 60.0 |
| Landing Joint (ft) : 5 | H2O Wash Up (bbls): 20.0 |
| Max Rate: 7 | Spacer Ahead Makeup |
| Max Pressure: 1500 | DYE IN SECOND 10 BBL |

| Calculated Results | Pressure of cement in annulus |
|--|--|
| cuft of Shoe 19.53 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft) | Displacement: 62.00 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint) |
| cuft of Conductor 76.31 cuft (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft) | Pressure of cement in annulus Hydrostatic Pressure: 625.57 PSI |
| cuft of Casing 354.14 cuft (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length) | Pressure of the fluids inside casing Displacement: 346.24 psi Shoe Joint: 33.20 psi Total: 379.43 psi |
| Total Slurry Volume 449.98 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing) | Differential Pressure: 246.13 psi |
| bbls of Slurry 80.10 bbls (Total Slurry Volume) X (.1781) | Collapse PSI: 2020.00 psi Burst PSI: 3520.00 psi |
| Sacks Needed 302 sk | Total Water Needed: 195.78 bbls |
| Mix Water 53.78 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42 | |

X Jw Irwin
 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.

