



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 9/1/2015
Invoice # 90034
API# 05-123-41725
Supervisor Nick

Customer: Noble Energy Inc.
Well Name: Wells Ranch AE 32-635

County: Weld
State: Colorado
Sec: 32
Twp: 6N
Range: 62W
Consultant: Bo Cousins
Rig Name & Number: H&P 343
Distance To Location: 60
Units On Location: 3102/4028/4022/3215
Time Requested: 4:00
Time Arrived On Location: 2:00
Time Left Location: 6:20

| 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.) : 619 | Cement Yield (cuft) : 1.49 |
| Total Depth (ft) : 629 | Gallons Per Sack: 7.48 |
| Open Hole Diameter (in.) : 13.50 | % Excess: 25% |
| Conductor Length (ft) : 104 | Displacement Fluid lb/gal: 8.3 |
| Conductor ID : 15.25 | BBL to Pit: 16.0 |
| 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 |

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|--|---|
| Casing ID 8.921 | Casing Grade J-55 only used |
| Calculated Results | Displacement: 44.40 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: 456.64 PSI |
| cuft of Casing 239.98 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length) | Pressure of the fluids inside casing |
| Total Slurry Volume 422.23 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing) | Displacement: 248.36 psi |
| bbls of Slurry 75.20 bbls (Total Slurry Volume) X (.1781) | Shoe Joint: 31.72 psi |
| Sacks Needed 283 sk | Total 280.08 psi |
| Mix Water 50.40 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42 | Differential Pressure: 176.55 psi |
| | Collapse PSI: 2020.00 psi |
| | Burst PSI: 3520.00 psi |
| | Total Water Needed: 154.80 bbls |
| 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. | |



Noble Energy Inc.
Wells Ranch AE 32-635

INVOICE #
LOCATION
Supervisor
Date

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|----------|
| 90034 |
| Weld |
| Nick |
| 9/1/2015 |

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DESCRIPTION OF JOB EVENTS

| | |
|---|----------------|
| X | Jw Irish |
| | Work Performed |

X W. S. S.
Title _____

X 9-1-15
Date