



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 9/1/2015
Invoice #: 80632
API#: 05-123-41730
Foreman: JASON KELEHER

Customer: Noble Energy Inc.
Well Name: WELLS RANCH AE32-655

County: Weld
State: Colorado
Sec: 32
Twp: 6N
Range: 62W
Consultant: STETSON
Rig Name & Number: H&P 321
Distance To Location: 24
Units On Location: 4031-3103/ 4034-3213
Time Requested: 730
Time Arrived On Location: 630
Time Left Location: 1100

WELL DATA

Casing Size OD (in) : 9.625
Casing Weight (lb) : 36.00
Casing Depth (ft) : 596
Total Depth (ft) : 636
Open Hole Diameter (in.) : 13.50
Conductor Length (ft) : 80
Conductor ID : 15.25
Shoe Joint Length (ft) : 42
Landing Joint (ft) : 35

Max Rate: 6
Max Pressure: 1000

Cement Data

Cement Name: BFN III
Cement Density (lb/gal) : 14.2
Cement Yield (cuft) : 1.49
Gallons Per Sack: 7.48
% Excess: 40%
Displacement Fluid lb/gal: 8.3
BBL to Pit: 18.0
Fluid Ahead (bbls): 40.0
H2O Wash Up (bbls): 20.0

Spacer Ahead Makeup
40 BBL WATER DYE IN 2ND 10

Casing ID

8.921

Casing Grade

J-55 only used

Calculated Results

cuft of Shoe 18.32 cuft

(Casing ID Squared) X (.005454) X (Shoe Joint ft)

cuft of Conductor 61.05 cuft

(Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)

cuft of Casing 353.22 cuft

(Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)

Total Slurry Volume 432.58 cuft

(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)

bbls of Slurry 77.04 bbls

(Total Slurry Volume) X (.1781)

Sacks Needed 290 sk

(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

Mix Water 51.71 bbls

(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement: 45.54 bbls

(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

Pressure of cement in annulus

Hydrostatic Pressure: 439.84 PSI

Pressure of the fluids inside casing

Displacement: 238.89 psi

Shoe Joint: 31.13 psi

Total 270.02 psi

Differential Pressure: 169.82 psi

Collapse PSI: 2020.00 psi

Burst PSI: 3520.00 psi

Total Water Needed: 157.24 bbls

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.

X 9-1-15
Date