



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 8/8/2017
 Invoice #: 666178
 API#: 05-123-43574
 Foreman: Nick Vigil

Customer: Anadarko Petroleum Corporation
Well Name: Norden 27N-14HZ

County: Weld Consultant: Brian
 State: Colorado Rig Name & Number: Cartel 88
 Sec: 14 Distance To Location: 32 Miles
 Twp: 1N Units On Location: 4023/4044/4045
 Range: 67W Time Requested: 9:30
 Time Arrived On Location: 9:00
 Time Left Location: _____

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.) : 1,873	Cement Yield (cuft) : 1.49
Total Depth (ft) : 1883	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 10%
Conductor Length (ft) : 80	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit: 0.0
Shoe Joint Length (ft) : 46	Fluid Ahead (bbls): 30.0
Landing Joint (ft) : 10	H2O Wash Up (bbls): 20.0
Max Rate: 8	Spacer Ahead Makeup
Max Pressure: 2000	Dye in second 10 bbl

Casing ID: 8.921 Casing Grade: J-55 only used

Calculated Results	Displacement: 142.02 bbls
cuft of Shoe 19.97 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor 61.05 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Pressure of cement in annulus
cuft of Casing 963.92 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Hydrostatic Pressure: 1381.71 PSI
Total Slurry Volume 1044.94 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Pressure of the fluids inside casing
bbls of Slurry 186.10 bbls (Total Slurry Volume) X (.1781)	Displacement: 787.77 psi
Sacks Needed 701 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Shoe Joint: 33.93 psi
Mix Water 124.90 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Total 821.70 psi
	Differential Pressure: 560.01 psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed: 316.91 bbls

X 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.

Norden 27N-14HZ

