



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 7/19/2017
 Invoice # 666166
 API# 05-123-44748
 Foreman: Nick Vigil

Customer: Anadarko Petroleum Corporation
Well Name: RW 37N-32HZ

County: Weld
 State: Colorado
 Sec: 29
 Twp: 3N
 Range: 65W

Consultant: Lane
 Rig Name & Number: Cartel 88
 Distance To Location: 28 Miles
 Units On Location: 4023/4030/4035
 Time Requested: 5:30
 Time Arrived On Location: 5:00
 Time Left Location: 8:30

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>1,839</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>1847</u>	Gallons Per Sack: <u>7.48</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>0%</u>
Conductor Length (ft) : <u>80</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.25</u>	BBL to Pit: <u>18.0</u>
Shoe Joint Length (ft) : <u>45</u>	Fluid Ahead (bbls): <u>30.0</u>
Landing Joint (ft) : <u>10</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate: <u>8</u>	Spacer Ahead Makeup
Max Pressure: <u>2000</u>	Dye in second 10 bbl

Calculated Results	Pressure of cement in annulus
Displacement: <u>139.46 bbls</u> (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)	Hydrostatic Pressure: <u>1356.63 PSI</u>
cuft of Shoe <u>19.53 cuft</u> (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Pressure of the fluids inside casing
cuft of Conductor <u>61.05 cuft</u> (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Displacement: <u>773.54 psi</u>
cuft of Casing <u>859.68 cuft</u> (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Shoe Joint: <u>33.20 psi</u>
Total Slurry Volume <u>940.26 cuft</u> (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Total <u>806.74 psi</u>
bbls of Slurry <u>167.46 bbls</u> (Total Slurry Volume) X (.1781)	Differential Pressure: <u>549.89 psi</u>
Sacks Needed <u>631 sk</u> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Collapse PSI: <u>2020.00 psi</u>
Mix Water <u>112.39 bbls</u> (Sacks Needed) X (Gallons Per Sack) ÷ 42	Burst PSI: <u>3520.00 psi</u>
	Total Water Needed: <u>301.85 bbls</u>

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.

RW 37N-32HZ

