



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 12/18/2018
 Invoice # 200374
 API# _____
 Foreman: KirkKallhoff

Customer: Anadarko Petroleum Corporation

Well Name: reese 21-3hz

County: Weld
 State: Colorado
 Sec: 30
 Twp: 2N
 Range: 65w

Consultant: bryan
 Rig Name & Number: Cartel 88
 Distance To Location: 28
 Units On Location: 4047/4030/4023
 Time Requested: 230 pm
 Time Arrived On Location: 1230 pm
 Time Left Location: 5:30 pm

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>1,861</u>	Cement Yield (cuft) : <u>1.48</u>
Total Depth (ft) : <u>1871</u>	Gallons Per Sack: <u>7.40</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>10%</u>
Conductor Length (ft) : <u>80</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.25</u>	BBL to Pit:
Shoe Joint Length (ft) : <u>41</u>	Fluid Ahead (bbls): <u>30.0</u>
Landing Joint (ft) : <u>8</u>	H2O Wash Up (bbls): <u>10.0</u>
Max Rate: <u>8</u>	Spacer Ahead Makeup
Max Pressure: <u>2000</u>	<u>30 bbl with Die in 2nd 10</u>

Calculated Results	Displacement: <u>141.32 bbls</u>
cuft of Shoe <u>17.80</u> 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 <u>61.05</u> cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Pressure of cement in annulus
cuft of Casing <u>957.47</u> cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Hydrostatic Pressure: <u>1372.86 PSI</u>
Total Slurry Volume <u>1036.32</u> cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Pressure of the fluids inside casing
bbls of Slurry <u>184.57</u> bbls (Total Slurry Volume) X (.1781)	Displacement: <u>784.75 psi</u>
Sacks Needed <u>700</u> sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Shoe Joint: <u>30.25 PSI</u>
Mix Water <u>123.37</u> bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Total <u>815.00 psi</u>
	Differential Pressure: <u>557.86 psi</u>
	Collapse PSI: <u>2020.00 psi</u>
	Burst PSI: <u>3520.00 psi</u>
	Total Water Needed: <u>304.69 bbls</u>

X [Signature]
 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.

SERIES 2000

