





# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 12/9/2019  
 Invoice #: 900455  
 AFE #: 2151794  
 Foreman: Corey Barras

Customer: Anadarko Petroleum Corporation

Well Name: Windsock 21-5HZ

County: Weld  
 State: Colorado

Sec: 21  
 Twp: 1N  
 Range: 68W

Consultant: Dave  
 Rig Name & Number: CARTEL 88  
 Distance To Location: 42  
 Units On Location: 4028/3103-4024/3214-4044/3205  
 Time Requested: 500  
 Time Arrived On Location: 400  
 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.) : 1,883	Cement Yield (cuft) : 1.48
Total Depth (ft) : 1893	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:
Shoe Joint Length (ft) : 42	Fluid Ahead (bbls): 30.0
Landing Joint (ft) : 8	H2O Wash Up (bbls): 20.0
Max Rate: 8	Spacer Ahead Makeup
Max Pressure: 2000	30 BBL WATER, DYE IN 2ND 10

Casing ID 8.921 Casing Grade J-55 only used

Calculated Results	Pressure of cement in annulus
<b>Displacement:</b> 142.94 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)	<b>Hydrostatic Pressure:</b> 1389.09 PSI
<b>cuft of Shoe</b> 18.23 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	<b>Pressure of the fluids inside casing</b>
<b>cuft of Conductor</b> 61.05 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	<b>Displacement:</b> 793.80 psi
<b>cuft of Casing</b> 969.30 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length )	<b>Shoe Joint:</b> 30.98 psi
<b>Total Slurry Volume</b> 1048.58 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	<b>Total</b> 824.79 psi
<b>bbls of Slurry</b> 186.75 bbls (Total Slurry Volume) X (.1781)	<b>Differential Pressure:</b> 564.30 psi
<b>Sacks Needed</b> 708 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	<b>Collapse PSI:</b> 2020.00 psi
<b>Mix Water</b> 126.18 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Burst PSI:</b> 3520.00 psi
	<b>Total Water Needed:</b> 319.12 bbls

X *Yan K. [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.

# Windsock 21-5HZ

