

**Bison Oil Well Cementing
Tail & Lead**

Date: 2/25/2018

Invoice # 666286

API# 05-123-44606

Supervisor: Nick Vigil

Customer: Noble Energy Inc.

Well Name: Centennial State G34-635

County: Weld

State: Colorado

Sec: 35

Twp: 4N

Range: 65W

Consultant: Woody

Rig Name & Number: H&P 517

Distance To Location: 18 miles

Units On Location: 4023/4032

Time Requested: 3:00

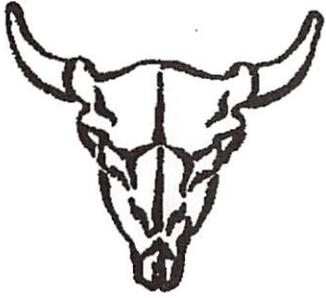
Time Arrived On Location: 2:20

Time Left Location:

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625</p> <p>Casing Weight (lb) : 36</p> <p>Casing Depth (ft.) : 1,940</p> <p>Total Depth (ft) : 1949</p> <p>Open Hole Diameter (in) : 13.50</p> <p>Conductor Length (ft) : 80</p> <p>Conductor ID : 15.25</p> <p>Shoe Joint Length (ft) : 46</p> <p>Landing Joint (ft) :</p> <p>Sacks of Tail Requested 100</p> <p>HOC Tail (ft): 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: 8</p> <p>Max Pressure: 2000</p>	<p>Lead</p> <p>Cement Name:</p> <p>Cement Density (lb/gal) : 13.5</p> <p>Cement Yield (cuft) : 1.7</p> <p>Gallons Per Sack 9.00</p> <p>% Excess 15%</p> <p>Tail</p> <p>Cement Name:</p> <p>Cement Density (lb/gal) : 15.2</p> <p>Cement Yield (cuft) : 1.27</p> <p>Gallons Per Sack: 5.89</p> <p>% Excess: 0%</p> <p>Fluid Ahead (bbls) 50.0</p> <p>H2O Wash Up (bbls) 20.0</p> <p>Spacer Ahead Makeup</p> <p>Dye in second 10 bbl</p>

Lead Calculated Results	Tail Calculated Results
HOC of Lead 1637.00 ft	Tail Cement Volume In Ann 127.00 cuft
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
Volume of Lead Cement 800.05 cuft	Total Volume of Tail Cement 107.03 Cuft
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor 61.05 cuft	bbls of Tail Cement 22.62 bbls
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
Total Volume of Lead Cement 861.10 cuft	HOC Tail 219.00 ft
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement 176.37 bbls	Sacks of Tail Cement 100.00 sk
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
Sacks of Lead Cement 582.51 sk	bbls of Tail Mix Water 14.02 bbls
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water 124.82 bbls	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure 585.23 PSI
Displacement 146.72 bbls	
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed: 355.56 bbls	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi

X Authorization To Proceed



**Bison Oil Well Cementing
Two Cement Surface Pipe**

Customer: Noble Energy Inc.
Well Name: Centennial State G34-635

Date: 2/25/2018
INVOICE #: 666286
LOCATION: Weld
FOREMAN: Nick Vigil

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

Amount Pumped	Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	176.3	2:20	Arrive On Location			
Lead % Excess	15%	2:25	Well Site Assessment			
Lead Sacks	583	3:15	Rig Up Equipment			
		3:50	JSA			
		4:15	Test Lines			
Tail mixed bbls	22.6	4:17	Spacer Ahead			
Tail % Excess	0%	4:23	Lead Cement			
Tail Sacks	100	5:05	Tail Cement			
		5:13	Shut Down			
Total Sacks	683	5:14	Drop Plug			
Water Temp	88	5:17	Displace			
bbl Returns	38	5:39	Bump Plug			
Notes:		5:40	Casing Test			
Micro motion on pump		5:55	Check Floats			
went out so we had to		6:00	End Job			
manually weigh the cement		6:05	Rig Down Equipment			
with mud scales while mixing		6:30	Crew Left Location			
cement						

X WLB
Signature

X WSS
Title

X 2/25/18
Date