



# Bison Oil Well Cementing Tail & Lead

Customer: Noble Energy Inc.  
Well Name: mccaffrey state ld 12-75-1bhn

Date: 11/22/2014  
Invoice #: 35072  
API# \_\_\_\_\_  
Foreman: kirk kallhoff

County: Weld Consultant: seth  
State: Colorado Rig Name & Number: h&p 343  
Distance To Location: \_\_\_\_\_  
Units On Location: 4030-3103/4032-3211  
Time Requested: 230 pm  
Time Arrived On Location: 1130 am  
Time Left Location: 6:00 pm  
Sec: 9  
Twp: 9n  
Range: 58w

WELL DATA	Cement Data
<p>Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft) : <u>1,200</u> Total Depth (ft) : <u>1244</u> Open Hole Diameter (in) : <u>13.50</u> Conductor Length (ft) : <u>100</u> Conductor ID : <u>16</u> Shoe Joint Length (ft) : <u>40</u> Landing Joint (ft) : <u>35</u></p> <p>Sacks of Tail Requested : <u>100</u> HOC Tail (ft) : <u>0</u> <small>One or the other, cannot have quantity in both</small></p> <p>Max Rate: _____ Max Pressure: _____</p>	<p><b>Lead</b></p> <p>Cement Name: _____ Cement Density (lb/gal) : <u>13.1</u> Cement Yield (cuft) : <u>1.69</u> Gallons Per Sack : <u>8.64</u> % Excess : <u>25%</u></p> <p><b>Tail</b></p> <p>Cement Name: _____ Cement Density (lb/gal) : <u>15.2</u> Cement Yield (cuft) : <u>1.27</u> Gallons Per Sack : <u>5.89</u> % Excess: _____</p> <p>Fluid Ahead (bbls) : <u>92.4</u> H2O Wash Up (bbls) : <u>20.0</u></p> <p><b>Spacer Ahead Makeup</b></p>

Lead Calculated Results	Tail Calculated Results
HOC of Lead : <u>840.67 ft</u>	Tail Cement Volume In Ann : <u>127.00 cuft</u>
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
Volume of Lead Cement : <u>410.86 cuft</u>	Total Volume of Tail Cement : <u>109.64 Cuft</u>
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor : <u>89.10 cuft</u>	bbls of Tail Cement : <u>22.62 bbls</u>
(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 : <u>499.96 cuft</u>	HOC Tail : <u>224.33 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement : <u>111.30 bbls</u>	Sacks of Tail Cement : <u>100.00 sk</u>
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
Sacks of Lead Cement : <u>369.79 sk</u>	bbls of Tail Mix Water : <u>14.02 bbls</u>
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water : <u>76.07 bbls</u>	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure : <u>585.23 PSI</u>
Displacement : <u>92.37 bbls</u>	
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed: <u>294.84 bbls</u>	
	Collapse PSI: <u>2020.00 psi</u>
	Burst PSI: <u>3520.00 psi</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.





# Bison Oil Well Cementing Two Cement Surface Pipe

Customer  
Well Name

Noble Energy Inc.  
mccaffrey state ld 12-75-1bhn

Date  
11/22/2014  
INVOICE #  
35072  
LOCATION  
Weld  
FOREMAN  
kirk kallhoff

Treatment Report Page 2

## DESCRIPTION OF JOB EVENTS

	Displace 1			Displace 2			Displace 3			Displace 4			Displace 5		
	BBLs	Time	PSI	BBLs	Time	PSI	BBLs	Time	PSI	BBLs	Time	PSI	BBLs	Time	PSI
Safety Meeting	340 pm														
MIRU	300 pm														
CIRCULATE	413 pm														
Drop Plug															
454 pm															
M & P															
Time	Sacks														
420 pm	469														
450 pm stop															
Lead mixed bbls	76														
Lead % Excess	25%														
Lead Sacks	369														

### Notes:

Tail mixed bbls	14														
Tail % Excess	0%														
Tail Sacks	100														
Total Sacks	469														
Water Temp															
bbl Returns	26														

X *[Signature]* Title X *WSS* Date X 11-22-14

Work Performed