



**Bison Oil Well Cementing  
Tail & Lead**

Date: 10/9/2014  
 Invoice # 13034  
 API# 05-123-37622  
 Foreman: Calvin Reimers

Customer: Noble Energy  
 Well Name: Rohn State LD 1-64-1HN

County: Weld  
 State: Colorado  
 Sec: 9  
 Twp: 9N  
 Range: 58W

Consultant: Eric / John  
 Rig Name & Number: PD 829  
 Distance To Location: 78 Miles  
 Units On Location: 4023-3104/3105-3210  
 Time Requested: 500am  
 Time Arrived On Location: 350am  
 Time Left Location: 12:00 pm.

WELL DATA	Cement Data
Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft.) : <u>1226</u> Total Depth (ft) : <u>1252</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>45</u> Landing Joint (ft) : <u>19</u>  Sacks of Tail Requested : <u>100</u> HOC Tail (ft) : <u>0</u> <small>One or the other, cannot have quantity in both</small>  Max Rate: <u>7</u> Max Pressure: <u>2500</u>	<b>Lead</b> Cement Name: <u>BFN III</u> Cement Density (lb/gal) : <u>13.1</u> Cement Yield (cuft) : <u>1.69</u> Gallons Per Sack : <u>8.64</u> % Excess : <u>30%</u>  <b>Tail</b> Cement Name: <u>BFN III</u> Cement Density (lb/gal) : <u>15.2</u> Cement Yield (cuft) : <u>1.27</u> Gallons Per Sack : <u>5.89</u> % Excess: <u>0%</u>  Fluid Ahead (bbls) : <u>92.7</u> H2O Wash Up (bbls) : <u>20.0</u>  <b>Spacer Ahead Makeup</b> <u>40bbls H2O+Dye in 2nd 10bbls</u>

Lead Calculated Results	Tail Calculated Results
HOC of Lead : <u>887.32 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>433.66 cuft</u>	Total Volume of Tail Cement : <u>107.42 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>522.75 cuft</u>	HOC Tail : <u>219.80 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement : <u>121.30 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>403.00 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>82.90 bbls</u>	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure : <u>834.13 PSI</u>
Displacement : <u>92.71 bbls</u>	Collapse PSI: <u>2020.00 psi</u>
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	Burst PSI: <u>3520.00 psi</u>
Total Water Needed: <u>302.34 bbls</u>	

  
 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  
Rohn State LD 1-64-1HN

Date: 10/9/2014  
 INVOICE #: 13034  
 LOCATION: Weld  
 FOREMAN: Calvin Reimers  
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**DESCRIPTION OF JOB EVENTS**

	Time	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	927am															
MIRU	800am															
CIRCULATE	1004am	0	1037am	50	0			0			0			0		
Drop Plug		10	1040am	50	10			10			10			10		
	1036am	20	1042am	40	20			20			20			20		
		30	1044am	40	30			30			30			30		
		40	1046am	40	40			40			40			40		
		50	1048am	80	50			50			50			50		
M & P		60	1050am	170	60			60			60			60		
Time	Sacks	70	1052am	230	70			70			70			70		
1012am	503	80	1054am	280	80			80			80			80		
1034am		90	1057am	310	90			90			90			90		
		100	1059am	300	100			100			100			100		
		110	Bump	410	110			110			110			110		
		120			120			120			120			120		
Lead mixed bbls	82.9	130			130			130			130			130		
Lead % Excess	30%	140			140			140			140			140		
Lead Sacks	403	150			150			150			150			150		
<b>Notes:</b>																
Tail mixed bbls	14.02	1/2 bbl back on bleed off														
Tail % Excess	0%	Casing PSI Test 1100am														
Tail Sacks	100	1020psi to 1115am 1040psi														
Total Sacks	503															
Water Temp	58.3															
bbl Returns	9															

X \_\_\_\_\_  
 Work Preformed

X \_\_\_\_\_  
 Title

X \_\_\_\_\_  
 Date