



# Bison Oil Well Cementing Tail & Lead

Date: 8/18/2017

Invoice #: 900156

API#: 05-123-44968

Foreman: Corey B.

Customer: Noble Energy Inc.

Well Name: Wells Ranch B11-667

County: Weld

State: Colorado

Sec: 8

Twp: 5N

Range: 62W

Consultant: Matt

Rig Name & Number: H&P 524

Distance To Location: 24

Units On Location: 4027/3103-4032/3203

Time Requested: 1800

Time Arrived On Location: 1700

Time Left Location:

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625</p> <p>Casing Weight (lb) : 36</p> <p>Casing Depth (ft.) : 1,935</p> <p>Total Depth (ft) : 1945</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) : 44</p> <p>Landing Joint (ft) : 4</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: 2500</p>	<p><b>Lead</b></p> <p>Cement Name: BFN III</p> <p>Cement Density (lb/gal) : 13.5</p> <p>Cement Yield (cuft) : 1.68</p> <p>Gallons Per Sack : 8.90</p> <p>% Excess : 15%</p> <p><b>Tail Type III</b></p> <p>Cement Name:</p> <p>Cement Density (lb/gal) : 15.2</p> <p>Cement Yield (cuft) : 1.27</p> <p>Gallons Per Sack: 5.80</p> <p>% Excess: 0%</p> <p>Fluid Ahead (bbls) : 30.0</p> <p>H2O Wash Up (bbls) : 20.0</p> <p><b>Spacer Ahead Makeup</b></p> <p>30 BBL ahead with Die in 2nd 10</p>

Casing ID

8.921

Casing Grade

J-55 only used

Lead Calculated Results	Tail Calculated Results
<b>HOC of Lead</b> : 1630.22 ft	<b>Tail Cement Volume In Ann</b> : 127.00 cuft
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
<b>Volume of Lead Cement</b> : 796.74 cuft	<b>Total Volume of Tail Cement</b> : 107.90 Cuft
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
<b>Volume of Conductor</b> : 61.05 cuft	<b>bbls of Tail Cement</b> : 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)
<b>Total Volume of Lead Cement</b> : 857.79 cuft	<b>HOC Tail</b> : 220.78 ft
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
<b>bbls of Lead Cement</b> : 175.69 bbls	<b>Sacks of Tail Cement</b> : 100.00 sk
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
<b>Sacks of Lead Cement</b> : 587.18 sk	<b>bbls of Tail Mix Water</b> : 13.81 bbls
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
<b>bbls of Lead Mix Water</b> : 124.43 bbls	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Hydrostatic Pressure</b> : 585.23 PSI
<b>Displacement</b> : 146.48 bbls	<b>Collapse PSI:</b> 2020.00 psi
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	<b>Burst PSI:</b> 3520.00 psi
<b>Total Water Needed:</b> 334.72 bbls	

Authorization To Proceed



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

Customer: **Noble Energy Inc.**  
Well Name: **Wells Ranch B11-667**

Date: **8/18/2017**  
INVOICE #: **900156**  
LOCATION: **Weld**  
FOREMAN: **Corey B.**

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**DESCRIPTION OF JOB EVENTS**

Amount Pumped	Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	124.43	1700	ARRIVE ON LOCATION			
Lead % Excess	15%	1900	JSA			
Lead Sacks	587	1930	JSA			
		2030	PRESSURE TEST			1500
		2037	SPACER AHEAD			
Tail mixed bbls	13.81	2045	LEAD CEMENT	5	30	50
Tail % Excess	0%	2108	TAIL CEMENT	6	175	90
Tail Sacks	100	2116	SHUT DOWN	5	22.6	80
		2120	DROP PLUG			
Total Sacks	687	2123	DISPLACEMENT			
Water Temp	62	2145	BUMP PLUG	1	146	550
bbl Returns	36					1000
						1010
		2200	CHECK FLOATS			
		2240	RIG DOWN			
Notes:			Leave Location			
Montered well for						
30 min with no top out						
needed.						

X *[Signature]* Work Performed      X WSS Title      X \_\_\_\_\_ Date