



# Bison Oil Well Cementing Tail & Lead

Date: 12/18/2017

Invoice # 900225

API# 05-123-45374

Foreman: Corey Barras

Customer: Noble Energy Inc.  
Well Name: Bison Ridge Y22-741

County: Weld  
State: Colorado  
Sec: 8  
Twp: 5N  
Range: 62W

Consultant: Matt  
Rig Name & Number: H&P 524  
Distance To Location: 38  
Units On Location: 4027/3103-4032/3203  
Time Requested: 1500  
Time Arrived On Location: 1400  
Time Left Location:

WELL DATA		Cement Data	
Casing Size (in) :	9.625	<b>Lead</b>	
Casing Weight (lb) :	36	Cement Name:	BFN III
Casing Depth (ft.) :	2,054	Cement Density (lb/gal) :	13.5
Total Depth (ft) :	2064	Cement Yield (cuft) :	1.68
Open Hole Diameter (in) :	13.50	Gallons Per Sack	8.90
Conductor Length (ft) :	80	% Excess	15%
Conductor ID :	15.25		
Shoe Joint Length (ft) :	44	<b>Tail Type III</b>	
Landing Joint (ft) :	4	Cement Name:	
		Cement Density (lb/gal) :	15.2
		Cement Yield (cuft) :	1.27
		Gallons Per Sack:	5.80
		% Excess:	0%
Sacks of Tail Requested	100	<b>Fluid Ahead (bbls)</b>	30.0
HOC Tail (ft):	0	<b>H2O Wash Up (bbls)</b>	20.0
One or the other, cannot have quantity in both			
<b>Max Rate:</b>	8	<b>Spacer Ahead Makeup</b>	
<b>Max Pressure:</b>	2500	30 BBL ahead with Die in 2nd 10	

Lead Calculated Results		Tail Calculated Results	
HOC of Lead	1749.22 ft	Tail Cement Volume In Ann	127.00 cuft
Casing Depth - HOC Tail		(HOC Tail) X (OH Ann)	
Volume of Lead Cement	854.90 cuft	Total Volume of Tail Cement	107.90 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	915.95 cuft	HOC Tail	220.78 ft
(cuft of Lead Cement) + (Cuft of Conductor)		(Tail Cement Volume) ÷ (OH Ann)	
bbls of Lead Cement	187.60 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	626.99 sk	bbls of Tail Mix Water	13.81 bbls
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)		(Sacks of Tail Cement X Gallons Per Sack) ÷ 42	
bbls of Lead Mix Water	132.86 bbls	Pressure of cement in annulus	
(Sacks Needed) X (Gallons Per Sack) ÷ 42		Hydrostatic Pressure	585.23 PSI
Displacement	155.68 bbls		
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)		Collapse PSI:	2020.00 psi
Total Water Needed:	352.35 bbls	Burst PSI:	3520.00 psi

X

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.  
Bison Ridge Y22-741

Date  
INVOICE #  
LOCATION  
FOREMAN

12/18/2017  
900225  
Weld  
Corey Barras

Treatment Report Page 2

**DESCRIPTION OF JOB EVENTS**

Amount Pumped	Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	132.86	1400	ARRIVE ON LOCATION			
Lead % Excess	15%	1430	JSA			
Lead Sacks	626	1510	JSA			
		1546	PRESSURE TEST			
		1548	SPACER AHEAD			1500
Tail mixed bbls	13.81	1550	LEAD CEMENT	5	30	50
Tail % Excess	0%	1630	TAIL CEMENT	6]	187	100
Tail Sacks	100	1636	SHUT DOWN	5	22.6	90
		1638	DROP PLUG			
Total Sacks	726	1640	DISPLACEMENT			
Water Temp	59	1708	BUMP PLUG	1	155	610
bbl Returns	42	1708	Casing Test			1024
		1730	CHECK FLOATS			1024
		1730		15min		
Notes:		1800	RIG DOWN			
Montered well for		1830	Leave Location			
30 min with no top out						
needed.						

x [Signature]  
Work Performed

x [Signature]  
Title

x 12/19/17  
Date