

**Bison Oil Well Cementing
Tail & Lead**

Date: 3/4/2020
 Invoice # 900485
 AFE # 206790
 Foreman: Corey Barras

Customer: Noble Energy Inc.
 Well Name: Vogler State D33-728

County: Weld Consultant: James
 State: Colorado Rig Name & Number: H&P 517
 Distance To Location: 21
 Units On Location: 4028/3103-4020/3203
 Time Requested: 200
 Time Arrived On Location: 130
 Time Left Location: _____
 Sec: 21
 Twp: 3N
 Range: 64W

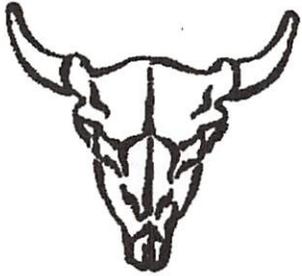
WELL DATA	Cement Data
Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft.) : <u>1,956</u> Total Depth (ft) : <u>1966</u> Open Hole Diameter (in) : <u>13.50</u> Conductor Length (ft) : <u>80</u> Conductor ID : <u>15.25</u> Shoe Joint Length (ft) : <u>42</u> Landing Joint (ft) : <u>30</u> Sacks of Tail Requested <u>100</u> HOC Tail (ft): <u>0</u> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> One or the other, cannot have quantity in both </div> Max Rate: <u>8</u> Max Pressure: <u>1500</u>	Lead Cement Name: Cement Density (lb/gal) : <u>13.5</u> Cement Yield (cuft) : <u>1.7</u> Gallons Per Sack <u>9.00</u> % Excess <u>10%</u> Tail 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: <u>0%</u> Fluid Ahead (bbls) <u>30.0</u> H2O Wash Up (bbls) <u>20.0</u> Spacer Ahead Makeup <u>30BBL WATER DYE IN 2ND 10</u>

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results	Tail Calculated Results
HOC of Lead <u>1623.44 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>793.42 cuft</u>	Total Volume of Tail Cement <u>108.77 Cuft</u>
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor <u>61.05 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>854.48 cuft</u>	HOC Tail <u>222.56 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement <u>167.40 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>552.90 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>118.48 bbls</u>	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure <u>585.23 PSI</u>
Displacement <u>147.95 bbls</u>	
(Casing ID Squared) X (.0009714) X (Casing Depth) - (Shoe Length)	Collapse PSI: <u>2020.00 psi</u>
Total Water Needed: <u>330.45 bbls</u>	Burst PSI: <u>3520.00 psi</u>

X James Barras
 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: Noble Energy Inc.
Well Name: Vogler State D33-728

Date: 3/4/2020
INVOICE #: 900485
LOCATION: Weld
FOREMAN: Corey Barras

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DESCRIPTION OF JOB EVENTS

		Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	118.4	130	ARRIVE ON LOCATION	ASSESS LOCATION AND HAZARDS			
Lead % Excess	10%	415	MIRU	SPOT EQUIPMENT, PRE RIG UP MEETING			
Lead Sacks	553	445	PRE JOB SAFETY MEETING	RIG CREW AND BISON			
		522	Test Lines				1500
		523	bbls ahead	WATER SUPPLIED RIG W/DYE IN 2ND 10	6	30	90
Tail mixed bbls	14	531	LEAD CEMENT	CEMENT MIXED AT 13.5 PPG	6	167.4	110
Tail % Excess	0%	602	TAIL CEMENT	CEMENT MIXED AT 15.2 PPG	4	22.6	80
Tail Sacks	100	610	SHUT DOWN				
		611	DROP PLUG				
Total Sacks	652	612	DISPLACEMENT	Rig DISPLACE	7	70	390
Water Temp	68	640	BUMP PLUG	Casing Test for 15 Min @ 1030 Psi (Lift 610)	3	148	1030
bbl Returns	28	655	CHECK FLOATS	FLOATS HELD/ WATCH FOR FALL BACK			
		700	RIG DOWN				
Notes:		730	LEAVE LOCATION				
				monitered well no top off			

Work Performed

WSS

Title

WSS

Date

3-4-20

Vogler State D33-728

