



**Bison Oil Well Cementing  
Tail & Lead**

Date: 2/6/2021  
 Invoice # 200672  
 AFE # \_\_\_\_\_  
 Foreman: Terry Richey

Customer: Noble Energy Inc.  
 Well Name: REVELLE A34-788

County: Weld Consultant: Charles  
 State: Colorado Rig Name & Number: H&P 517  
 Distance To Location: 10  
 Units On Location: 4028/3103-4020/3203 4025/3214  
 Time Requested: 500 am  
 Time Arrived On Location: 400 am  
 Time Left Location: \_\_\_\_\_

Sec: 34  
 Twp: 6N  
 Range: 64W

WELL DATA	Cement Data
Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft.) : <u>1,892</u> Total Depth (ft) : <u>1937</u> Open Hole Diameter (in) : <u>13.50</u> Conductor Length (ft) : <u>110</u> Conductor ID : <u>15.5</u> Shoe Joint Length (ft) : <u>40</u> Landing Joint (ft) : <u>2</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>700</u>	<b>Lead</b> Cement Name: _____ Cement Density (lb/gal) : <u>13.5</u> Cement Yield (cuft) : <u>1.68</u> Gallons Per Sack <u>8.90</u> % Excess <u>10%</u>  <b>Tail</b> 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: _____  <b>Fluid Ahead (bbls)</b> <u>30.0</u> <b>H2O Wash Up (bbls)</b> <u>20.0</u>  <b>Spacer Ahead Makeup</b> <u>30BBL WATER DYE IN 2ND 10</u>

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results	Tail Calculated Results
<b>HOC of Lead</b> <u>1555.67 ft</u>	<b>Tail Cement Volume In Ann</b> <u>127.00 cuft</u>
<b>Casing Depth - HOC Tail</b>	<b>(HOC Tail) X (OH Ann)</b>
<b>Volume of Lead Cement</b> <u>760.30 cuft</u>	<b>Total Volume of Tail Cement</b> <u>109.64 Cuft</u>
<b>HOC of Lead X Open Hole Ann</b>	<b>(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)</b>
<b>Volume of Conductor</b> <u>88.56 cuft</u>	<b>bbls of Tail Cement</b> <u>22.62 bbls</u>
<b>(Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)</b>	<b>(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)</b>
<b>Total Volume of Lead Cement</b> <u>848.86 cuft</u>	<b>HOC Tail</b> <u>224.33 ft</u>
<b>(cuft of Lead Cement) + (Cuft of Conductor)</b>	<b>(Tail Cement Volume) ÷ (OH Ann)</b>
<b>bbls of Lead Cement</b> <u>166.30 bbls</u>	<b>Sacks of Tail Cement</b> <u>100.00 sk</u>
<b>(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)</b>	<b>(Total Volume of Tail Cement) ÷ (Cement Yield)</b>
<b>Sacks of Lead Cement</b> <u>555.80 sk</u>	<b>bbls of Tail Mix Water</b> <u>14.02 bbls</u>
<b>(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)</b>	<b>(Sacks of Tail Cement X Gallons Per Sack) ÷ 42</b>
<b>bbls of Lead Mix Water</b> <u>117.78 bbls</u>	<b>Pressure of cement in annulus</b>
<b>(Sacks Needed) X (Gallons Per Sack) ÷ 42</b>	<b>Hydrostatic Pressure</b> <u>585.23 PSI</u>
<b>Displacement</b> <u>143.16 bbls</u>	<b>Collapse PSI:</b> <u>2020.00 psi</u>
<b>(Casing ID Squared) X (.0009714) X (Casing Depth) - (Shoe Length)</b>	<b>Burst PSI:</b> <u>3520.00 psi</u>
<b>Total Water Needed:</b> <u>324.96 bbls</u>	

Centralizers: 18

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.



# SERIES 2000

— PSI      — Barrels / Minute — Barrels      — Lbs / Gallon      — Stage Volume

