



**Bison Oil Well Cementing  
Tail & Lead**

Date: 9/17/2018

Invoice # 300190

API# 05-123-46969

Foreman: JASON KELEHER

Customer: Noble Energy Inc.

Well Name: EMMY STATE H25-724

County: Weld  
State: Colorado

Sec: 25  
Twp: 3N  
Range: 65W

Consultant: JON  
Rig Name & Number: H&P 517  
Distance To Location: 23  
Units On Location: -3103,4039-3214,4030-3215  
Time Requested: 930  
Time Arrived On Location: 900  
Time Left Location: 1400

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625 Casing Weight (lb) : 36 Casing Depth (ft) : 1965 Total Depth (ft) : 1975 Open Hole Diameter (in) : 13.50 Conductor Length (ft) : 80 Conductor ID : 15.25 Shoe Joint Length (ft) : 48 Landing Joint (ft) : 5</p> <p>Sacks of Tail Requested : 100 HOC Tail (ft) : 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate : 8 Max Pressure : 1500</p>	<p><b>Lead</b></p> <p>Cement Name: Cement Density (lb/gal) : 13.5 Cement Yield (cuft) : 1.7 Gallons Per Sack : 9.00 % Excess : 15%</p> <p><b>Tail</b></p> <p>Cement Name: Cement Density (lb/gal) : 15.2 Cement Yield (cuft) : 1.27 Gallons Per Sack : 5.89 % Excess : 0%</p> <p>Fluid Ahead (bbls) : 30.0 H2O Wash Up (bbls) : 20.0</p> <p><b>Spacer Ahead Makeup</b> 30 BBL WATER DYE IN 2ND 10</p>

Lead Calculated Results	Tail Calculated Results
HOC of Lead : 1746.61 ft	Tail Cement Volume In Ann (HOC Tail) X (OH Ann) : 106.68 cuft
Casing Depth - HOC Tail	Total Volume of Tail Cement (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann) : 127.00 Cuft
Volume of Lead Cement : 936.66 cuft	bbbls of Tail Cement : 22.62 bbls
HOC of Lead X Open Hole Ann	(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
Volume of Conductor : 60.64 cuft	HOC Tail : 218.39 ft
(Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	(Tail Cement Volume) ÷ (OH Ann)
Total Volume of Lead Cement (cuft of Lead Cement) + (Cuft of Conductor) : 997.60 cuft	Sacks of Tail Cement : 100.00 sk
bbbls of Lead Cement : 177.70 bbls	(Total Volume of Tail Cement) ÷ (Cement Yield)
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	bbbls of Tail Mix Water : 14.02 bbls
Sacks of Lead Cement : 581 578.00 sk	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Pressure of cement in annulus
bbbls of Lead Mix Water : 125.70 bbls	Hydrostatic Pressure : 540.00 PSI
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Collapse PSI : 2020.00 psi
Displacement : 148.60 bbls	Burst PSI : 3520.00 psi
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed : 190.00 bbls	

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.



# EMMY STATE H25-724 SURFACE

