



**Bison Oil Well Cementing
Tail & Lead**

Date: 9/27/2018

Invoice # 300197

API# 05-123-46972

Foreman: JASON KELEHER

Customer: Noble Energy Inc.
Well Name: EMMY STATE H25-738

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: -3103,4033-3203,4041-3205
Time Requested: 230
Time Arrived On Location: 100
Time Left Location: 800

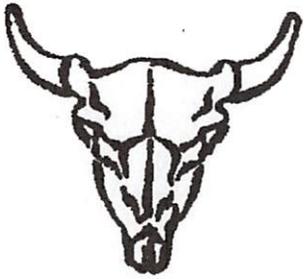
WELL DATA	Cement Data
<p>Casing Size (in) : 9.625 Casing Weight (lb) : 36 Casing Depth (ft.) : 1,934 Total Depth (ft) : 1943 Open Hole Diameter (in) : 13.50 Conductor Length (ft) : 80 Conductor ID : 15.25 Shoe Joint Length (ft) : 48 Landing Joint (ft) : 5</p> <p>Sacks of Tail Requested 100 HOC Tail (ft): 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: 8 Max Pressure: 1500</p>	<p>Lead</p> <p>Cement Name: Cement Density (lb/gal) : 13.5 Cement Yield (cuft) : 1.7 Gallons Per Sack 9.00 % Excess 15%</p> <p>Tail</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>Spacer Ahead Makeup 30 BBL WATER DYE IN 2ND 10</p>

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results	Tail Calculated Results
HOC of Lead 1716.46 ft	Tail Cement Volume In Ann 106.12 cuft (HOC Tail) X (OH Ann)
Casing Depth - HOC Tail	Total Volume of Tail Cement 127.00 Cuft (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Lead Cement 919.70 cuft HOC of Lead X Open Hole Ann	bbls of Tail Cement 22.62 bbls (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
Volume of Conductor 61.04 cuft (Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	HOC Tail 217.24 ft (Tail Cement Volume) ÷ (OH Ann)
Total Volume of Lead Cement 979.79 cuft (cuft of Lead Cement) + (Cuft of Conductor)	Sacks of Tail Cement 100.00 sk (Total Volume of Tail Cement) ÷ (Cement Yield)
bbls of Lead Cement 174.60 bbls (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	bbls of Tail Mix Water 14.02 bbls (Sacks of Tail Cement X Gallons Per Sack) ÷ 42
Sacks of Lead Cement 577.00 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Pressure of cement in annulus
bbls of Lead Mix Water 123.60 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure 500.00 PSI
Displacement 146.10 bbls (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	Collapse PSI: 2020.00 psi Burst PSI: 3520.00 psi
Total Water Needed: 190.00 bbls	



Authorization To Proceed



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

Customer Well Name: **Noble Energy Inc.
EMMY STATE H25-738**

Date: **9/27/2018**
 INVOICE #: **300197**
 LOCATION: **Weld**
 FOREMAN: **JASON KELEHER**
Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

Amount Pumped	Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls 123.6	100	ARRIVE ON LOCATION	ASSESS LOCATION AND HAZARDS			
Lead % Excess 15%	400	MIRU	SPOT EQUIPMENT, PRE RIG UP MEETING			
Lead Sacks 577	500	PRE JOB SAFETY MEETING	RIG CREW AND BISON			
	525	PRESSURE TEST LINES				1500
	527	SPACER AHEAD	WATER SUPPLIED RIG W/DYE IN 2ND 10	5.5	30	90
Tail mixed bbls 14	533	LEAD CEMENT	CEMENT MIXED AT 13.5 PPG 577 SKS	5.5	174.6	30
Tail % Excess 0%	613	TAIL CEMENT	CEMENT MIXED AT 15.2 PPG 100 SKS	3.5	22.6	20
Tail Sacks 100	629	SHUT DOWN				
	630	DROP PLUG				
Total Sacks 675	630	DISPLACEMENT	RIG DISPLACES	1	146.1	450
Water Temp 60	656	BUMP PLUG				1230
bbl Returns 34	712	CHECK FLOATS	FLOATS HELD, 1.25 BBL BACK, WATCH FALL BACK			
	730	RIG DOWN				
Notes:	800	LEAVE LOCATION				
			monitered well no top off			

X Jason Stepler
Signature

X WSS
Title

X 9/27/18
Date

EMMY STATE H25-738 SURFACE

