



**Bison Oil Well Cementing
Tail & Lead**

Date: 3/22/2018

Invoice # 606452

API# 05-123-48564

Supervisor: Nick Vigil

Customer: Noble Energy Inc.

Well Name: Vogler State D21-731

Consultant: John

County: Weld
State: Colorado

Rig Name & Number: H&P 517
Distance To Location: 22 miles

Sec: 19
Twp: 6N
Range: 63W

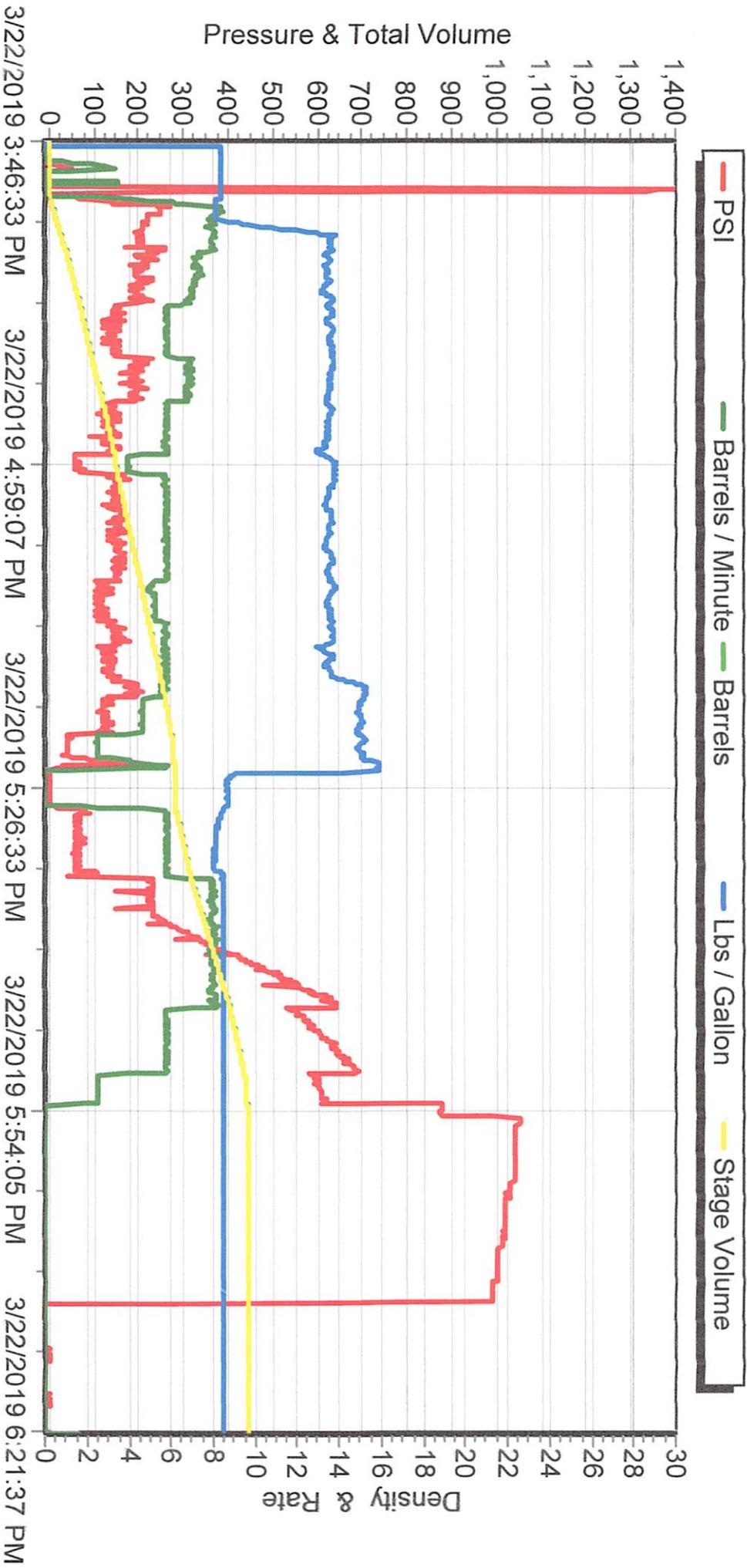
Units On Location: 4023/4032
Time Requested: 13:00
Time Arrived On Location: 12:40
Time Left Location:

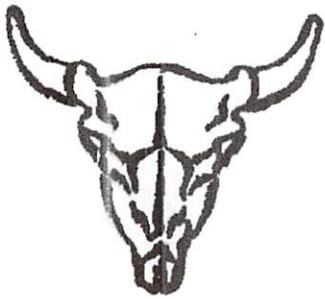
WELL DATA	Cement Data
<p>Casing Size (in) : 9.625 Casing Weight (lb) : 36 Casing Depth (ft.) : 1,933 Total Depth (ft) : 1973 Open Hole Diameter (in) : 13.50 Conductor Length (ft) : 80 Conductor ID : 15.25 Shoe Joint Length (ft) : 49 Landing Joint (ft) :</p> <p>Sacks of Tail Requested 100 HOC Tail (ft): 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: 8 Max Pressure: 2000</p>	<p>Lead Cement Name: Cement Density (lb/gal) : 13.5 Cement Yield (cuft) : 1.7 Gallons Per Sack 9.00 % Excess 15%</p> <p>Tail 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 Dye in second 10 bbl</p>

Lead Calculated Results	Tail Calculated Results
HOC of Lead 1636.66 ft Casing Depth - HOC Tail	Tail Cement Volume In Ann 127.00 cuft (HOC Tail) X (OH Ann)
Volume of Lead Cement 799.88 cuft HOC of Lead X Open Hole Ann	Total Volume of Tail Cement 105.73 Cuft (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor 61.05 cuft (Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	bbls of Tail Cement 22.62 bbls (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
Total Volume of Lead Cement 860.94 cuft (cuft of Lead Cement) + (Cuft of Conductor)	HOC Tail 216.34 ft (Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement 176.33 bbls (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	Sacks of Tail Cement 100.00 sk (Total Volume of Tail Cement) ÷ (Cement Yield)
Sacks of Lead Cement 582.40 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	bbls of Tail Mix Water 14.02 bbls (Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water 124.80 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Pressure of cement in annulus
Displacement 145.63 bbls (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	Hydrostatic Pressure 585.23 PSI
Total Water Needed: 334.46 bbls	Collapse PSI: 2020.00 psi Burst PSI: 3520.00 psi

X
Authorization To Proceed

Vogler D21-731





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

Customer: Noble Energy Inc.
Well Name: Vogler State D21-731

Date: 3/22/2018
INVOICE #: 606452
LOCATION: Weld
FOREMAN: Nick Vigil

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

Amount Pumped	Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	176.3	12:40	Arrive On Location			
Lead % Excess	15%	12:45	Well Site Assessment			
Lead Sacks	582	15:30	Rig Up Equipment			
		16:30	JSA	Held safety meeting with all personell involved in job.		
		16:37	Test Lines	Pressure tested lines to 1500 psi.		
Tail mixed bbls	22.6	16:40	Spacer Ahead			
Tail % Excess	0%	16:44	Lead Cement	13.5 ppg	176.3	160
Tail Sacks	100	17:21	Tail Cement	15.2 ppg	22.6	120
		17:28	Shut Down			
Total Sacks	682	17:29	Drop Plug	Plug was pre loaded.		
Water Temp	75	17:31	Displace	Fresh Water		
bbl Returns	48	17:56	Bump Plug	Bumped plug 430 psi over final lift (1050 psi)		
Notes:		17:57	Casing Test	Pressured up casing to 1000 psi and held for 15 min.		
		18:13	Check Floats	Floats held (flowed back .5 bbl)		
		18:15	End Job	Monitored well for top out.		
		18:16	Rig Down Equipment	Rig down safety meeting.		
		18:30	Crew Left Location			

X 
Signature

X _____
Title

X _____
Date