



**Bison Oil Well Cementing
Tail & Lead**

Date: 9/8/2019
 Invoice # 900406
 API# 05-123-48628
 Foreman: Corey Barras

Customer: Noble Energy Inc.
 Well Name: Guttersen D25-753

County: Weld Consultant: Gary
 State: Colorado Rig Name & Number: H&P 321
 Distance To Location: 27
 Units On Location: 4028/3203-4032/3203
 Time Requested: 2030
 Time Arrived On Location: 1900
 Range: 64w Time Left Location: _____

WELL DATA	Cement Data
Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft.) : <u>1,918</u> Total Depth (ft) : <u>1928</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>44</u> Landing Joint (ft) : <u>30</u> Sacks of Tail Requested <u>100</u> HOC Tail (ft): <u>0</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>
One or the other, cannot have quantity in both Max Rate: <u>8</u> Max Pressure: <u>1500</u>	

Lead Calculated Results	Tail Calculated Results
HOC of Lead <u>1587.22 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>775.72 cuft</u>	Total Volume of Tail Cement <u>107.90 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>836.77 cuft</u>	HOC Tail <u>220.78 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement <u>163.93 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>541.44 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>116.02 bbls</u>	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure <u>585.23 PSI</u>
Displacement <u>144.86 bbls</u>	
(Casing ID Squared) X (.0009714) X (Casing Depth) - (Shoe Length)	Collapse PSI: <u>2020.00 psi</u>
Total Water Needed: <u>324.91 bbls</u>	Burst PSI: <u>3520.00 psi</u>

X
 Authorization To Proceed



Bison Oil Well Cementing
Two Cement Surface Pipe

Customer
Well Name

Noble Energy Inc.
Guttersen D25-753

Date
INVOICE #
LOCATION
FOREMAN

9/8/2019
900406
Weld
Corey Barras

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DESCRIPTION OF JOB EVENTS

		Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	116.02	1900	ARRIVE ON LOCATION	ASSESS LOCATION AND HAZARDS			
Lead % Excess	10%	2130	MIRU	SPOT EQUIPMENT, PRE RIG UP MEETING			
Lead Sacks	541	2210	PRE JOB SAFETY MEETING	RIG CREW AND BISON			
		2228	PRESSURE TEST LINES				1500
		2229	bbls ahead	WATER SUPPLIED RIG W/DYE IN 2ND 10	6	30	90
Tail mixed bbls	14	2236	LEAD CEMENT	CEMENT MIXED AT 13.5 PPG	7	163.9	130
Tail % Excess	0%	2305	TAIL CEMENT	CEMENT MIXED AT 15.2 PPG	5	22.6	90
Tail Sacks	100	2311	SHUT DOWN				
		2312	DROP PLUG				
Total Sacks	641	2314	DISPLACEMENT	Displace W/Water (Lift 620PSI)	8	70	380
Water Temp	62	2343	BUMP PLUG	15 Min Casing Test @ 1000 PSI	2	144.8	1060
bbl Returns	19	1200	CHECK FLOATS	FLOATS HELD/ WATCH FOR FALL BACK			
		1210	RIG DOWN				
Notes:		1240	LEAVE LOCATION				
				monitered well no top off			

[Signature]

X

Work Performed

[Signature]

X

Title

[Signature]

Date

Guttersen D25-753

