

Bison Oil Well Cementing Tail & Lead

Date: 7/15/2019

Invoice # 900373

AFE # 205574

Foreman: Corey Barras

Customer: Noble Energy Inc.

Well Name: SLW Ranch State BB07-660


County: Weld
State: Co lorado

Sec: FF 7
Twp: 24 5 N
Range: 64 W 63 W

Consultant: John
Rig Name & Number: H&P 517
Distance To Location: 15
Units On Location: 4033/3103-4032/3203
Time Requested: 1200
Time Arrived On Location: 1115
Time Left Location: _____

WELL DATA	Cement Data
Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft.) : <u>1,937</u> Total Depth (ft) : <u>1947</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>48</u> Landing Joint (ft) : <u>0</u> Sacks of Tail Requested : <u>100</u> HOC Tail (ft): <u>0</u> <small>One or the other, cannot have quantity in both</small> Max Rate: <u>8</u> Max Pressure: <u>1500</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>

Lead Calculated Results	Tail Calculated Results
HOC of Lead <u>1639.77 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>801.41 cuft</u>	Total Volume of Tail Cement <u>106.17 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>862.46 cuft</u>	HOC Tail <u>217.23 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement <u>168.96 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>558.06 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>119.58 bbls</u>	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure <u>585.23 PSI</u>
Displacement <u>146.02 bbls</u>	
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	Collapse PSI: <u>2020.00 psi</u>
Total Water Needed: <u>329.63 bbls</u>	Burst PSI: <u>3520.00 psi</u>



 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.



Bison Oil Well Cementing
Two Cement Surface Pipe

Customer: Noble Energy Inc.
Well Name: SLW Ranch State BB07-660

Date: 7/15/2019
INVOICE #: 900373
LOCATION: Weld
FOREMAN: Corey Barras

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DESCRIPTION OF JOB EVENTS

		Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	119.5	1115	ARRIVE ON LOCATION	ASSESS LOCATION AND HAZARDS			
Lead % Excess	10%	1400	MIRU	SPOT EQUIPMENT, PRE RIG UP MEETING			
Lead Sacks	558	1430	PRE JOB SAFETY MEETING	RIG CREW AND BISON			
		1454	PRESSURE TEST LINES				1500
		1456	bbls ahead	WATER SUPPLIED RIG W/DYE IN 2ND 10	8	30	180
Tail mixed bbls	14	1503	LEAD CEMENT	CEMENT MIXED AT 13.5 PPG	6	169	130
Tail % Excess	0%	1536	TAIL CEMENT	CEMENT MIXED AT 15.2 PPG	5	22.6	120
Tail Sacks	100	1542	SHUT DOWN				
		1544	DROP PLUG				
Total Sacks	657	1545	DISPLACEMENT	DISPLACE W/ H2O	8	70	360
Water Temp	62	1608	BUMP PLUG	Casing Test for 15 Min @ 1070 Psi (Lift 460)	3	146.2	1070
bbl Returns	30	1625	CHECK FLOATS	FLOATS HELD/ WATCH FOR FALL BACK			
		1700	RIG DOWN				
Notes:			LEAVE LOCATION				
				monitered well no top off			

[Handwritten Signature]

Work Performed

Title

X

Date

7/15/19

SLW Ranch State BB07-660

— PSI — Barrels / Minute — Barrels — Lbs / Gallon

