Bison Oil Well Cementing
Tail & Lead

Date: 12/8/2014
Invoice # 25098
API# 05-123-39701
Foreman: Calvin Reimers

Customer: Noble Energy Inc.
Well Name: Smith State LD 12-73-1BHN

County: Weld
State: Colorado
Sec: 1
Twp: 9N
Range: 58W

Consultant: Shane
Rig Name & Number: H&P 326
Distance To Location: 81 Miles
Units On Location: 4023-3104/4024-3203
Time Requested: 1200pm
Time Arrived On Location: 1100am
Time Left Location: 4:30 pm

WELL DATA

Casing Size (in)	9.625
Casing Weight (lb)	36
Casing Depth (ft)	1,212
Total Depth (ft) :	1252
Open Hole Diameter (in) :	13.50
Conductor Length (ft)	100
Conductor ID	16
Shoe Joint Length (ft)	43
Landing Joint (ft)	34
Sacks of Tail Requested	100
HOC Tail (ft):	0

One or the other, cannot have quantity in both

Max Rate:	7
Max Pressure:	2500

Cement Data

Lead

Cement Name:	BFN III
Cement Density (lb/gal) :	13.1
Cement Yield (cuft) :	1.84
Gallons Per Sack	10.06
% Excess	20%

Tail

Cement Name:	BFN III
Cement Density (lb/gal) :	15.2
Cement Yield (cuft) :	1.27
Gallons Per Sack:	5.89
% Excess:	0%
Fluid Ahead (bbls)	93.0
H20 Wash Up (bbls)	20.0

Spacer Ahead Makeup

40BBLS H2O+Dye in 2nd 10BBLS

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results

HOC of Lead Casing Depth - HOC Tail	856.81 ft
Volume of Lead Cement HOC of Lead X Open Hole Ann	418.75 cuft
Volume of Conductor (Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	89.10 cuft
Total Volume of Lead Cement (cuft of Lead Cement) + (Cuft of Conductor)	507.84 cuft
bbls of Lead Cement (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	108.80 bbls
Sacks of Lead Cement (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	332.00 sk
bbls of Lead Mix Water (Sacks Needed) X (Gallons Per Sack) ÷ 42	79.52 bbls
Displacement (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	92.96 bbls
Total Water Needed	299.46 bbls

Tail Calculated Results

Tail Cement Volume In Ann (HOC Tail) X (OH Ann)	127.00 cuft
Total Volume of Tail Cement (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)	108.24 Cuft
bbls of Tail Cement (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)	22.62 bbls
HOC Tail (Tail Cement Volume) ÷ (OH Ann)	221.48 ft
Sacks of Tail Cement (Total Volume of Tail Cement) ÷ (Cement Yield)	100.00 sk
bbls of Tail Mix Water (Sacks of Tail Cement X Gallons Per Sack) ÷ 42	14.02 bbls
Pressure of cement in annulus	
Hydrostatic Pressure	585.23 PSI
Collapse PSI:	2020.00 psi
Burst PSI:	3520.00 psi

X _____
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	Smith State LD 12-73-1BHN

Date	12/8/2014
INVOICE #	25098
LOCATION	Weld
FOREMAN	Calvin Reimers

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DESCRIPTION OF JOB EVENTS

Safety Meeting	202pm
MIRU	120pm
CIRCULATE	235pm
Drop Plug	
304pm	

M & P

Time	Sacks
242pm	432
301pm	

Lead mixed bbls	79.52
Lead % Excess	20%
Lead Sacks	332
Tail mixed bbls	14.02
Tail % Excess	0%
Tail Sacks	100
Total Sacks	432
Water Temp	46.7
bbl Returns	23

Displace 1			Displace 2			Displace 3			Displace 4			Displace 5		
BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI
0	305pm	100	0			0			0			0		
10	307pm	30	10			10			10			10		
20	309pm	70	20			20			20			20		
30	310pm	70	30			30			30			30		
40	312pm	90	40			40			40			40		
50	314pm	180	50			50			50			50		
60	316pm	220	60			60			60			60		
70	318pm	280	70			70			70			70		
80	320pm	350	80			80			80			80		
90	322pm	320	90			90			90			90		
100	324pm	320	100			100			100			100		
110	Bump	510	110			110			110			110		
120			120			120			120			120		
130			130			130			130			130		
140			140			140			140			140		
150			150			150			150			150		

Notes:

1/2 bbl Back on Bleed Off

Casing PSI Test 324pm 1020psi to 339pm 1030psi

X _____
Work Preformed

X WSS
Title

X 12/8/14
Date