Bison Oil Well Cementing
Tail & Lead

Date: 12/8/2018
Invoice # 900330
API# 05-123-47705
Foreman: Corey Barras

Customer: Noble Energy Inc.
Well Name: Dorothy State LG16-748

County: Weld
State: Colorado
Sec: 16
Twp: 2n
Range: 64w

Consultant: Dave
Rig Name & Number: H&P 321
Distance To Location: 54
Units On Location: 047/3106-
Time Requested: 600 am
Time Arrived On Location: 540am
Time Left Location:

WELL DATA

Casing Size (in) :	9.625
Casing Weight (lb) :	36
Casing Depth (ft.) :	1,945
Total Depth (ft) :	1955
Open Hole Diameter (in) :	13.50
Conductor Length (ft) :	80
Conductor ID :	15.25
Shoe Joint Length (ft) :	41
Landing Joint (ft) :	5
Sacks of Tail Requested	100
HOC Tail (ft):	0

One or the other, cannot have quantity in both

Max Rate: 8
Max Pressure: 1500

Cement Data

Lead

Cement Name:	
Cement Density (lb/gal) :	13.5
Cement Yield (cuft) :	1.7
Gallons Per Sack	9.00
% Excess	15%

Tail

Cement Name:	
Cement Density (lb/gal) :	15.2
Cement Yield (cuft) :	1.27
Gallons Per Sack:	5.89
% Excess:	0%
Fluid Ahead (bbls)	30.0
H20 Wash Up (bbls)	20.0

Spacer Ahead Makeup
30BBL WATER DYE IN 2ND 10

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results

HOC of Lead	1636.56 ft
Casing Depth - HOC Tail	
Volume of Lead Cement	799.83 cuft
HOC of Lead X Open Hole Ann	
Volume of Conductor	61.05 cuft
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	
Total Volume of Lead Cement	860.88 cuft
(cuft of Lead Cement) + (Cuft of Conductor)	
bbls of Lead Cement	176.32 bbls
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	
Sacks of Lead Cement	582.36 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	
bbls of Lead Mix Water	124.79 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42	
Displacement	147.57 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed:	336.38 bbls

Tail Calculated Results

Tail Cement Volume In Ann	127.00 cuft
(HOC Tail) X (OH Ann)	
Total Volume of Tail Cement	109.20 Cuft
(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)	
bbls of Tail Cement	22.62 bbls
(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)	
HOC Tail	223.44 ft
(Tail Cement Volume) ÷ (OH Ann)	
Sacks of Tail Cement	100.00 sk
(Total Volume of Tail Cement) ÷ (Cement Yield)	
bbls of Tail Mix Water	14.02 bbls
(Sacks of Tail Cement X Gallons Per Sack) ÷ 42	
Pressure of cement in annulus	
Hydrostatic Pressure	585.23 PSI
Collapse PSI:	2020.00 psi
Burst PSI:	3520.00 psi

DAVE NIELSEN

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	Dorothy State LG16-748

Date	12/8/2018
INVOICE #	900330
LOCATION	Weld
FOREMAN	Corey Barras

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Lead mixed bbls	124.7
Lead % Excess	15%
Lead Sacks	582
Tail mixed bbls	14
Tail % Excess	0%
Tail Sacks	100
Total Sacks	682
Water Temp	62
bbl Returns	40

DESCRIPTION OF JOB EVENTS

Time/Date	Event	Description	Rate	BBLs	Pressure
540 am	ARRIVE ON LOCATION	ASSESS LOCATION AND HAZARDS			
110 pm	MIRU	SPOT EQUIPMENT, PRE RIG UP MEETING			
145 pm	PRE JOB SAFETY MEETING	RIG CREW AND BISON			
227 pm	PRESSURE TEST LINES				1500
228 pm	bbls ahead	WATER SUPPLIED RIG W/DYE IN 2ND 10	5	30	120
232 pm	LEAD CEMENT	CEMENT MIXED AT 13.5 PPG 585 SKS	6	176	160
310 pm	TAIL CEMENT	CEMENT MIXED AT 15.2 PPG 100 SKS	5	22.6	140
320 pm	SHUT DOWN				
323 pm	DROP PLUG				
325 pm	DISPLACEMENT	RIG DISPLACES	2	147.5	560
355 pm	BUMP PLUG				
415 pm	CHECK FLOATS	FLOATS HELD/ WATCH FOR FALL BACK			1140
630 pm	RIG DOWN				
715 pm	LEAVE LOCATION				
		monitered well no top off			

Notes:

X _____ Work Preformed

COMAN Title

12-8-18 Date