Bison Oil Well Cementing
Tail & Lead

Date: 3/24/2018
Invoice # 606453
API# 05-123-48562

Customer: Noble Energy Inc.
Well Name: Vogler State D21-750
Supervisor: Nick Vigil

Consultant: John
County: Weld
State: Colorado
Rig Name & Number: H&P 517
Distance To Location: 22 miles
Units On Location: 4045/4032
Sec: 19
Twp: 6N
Range: 63W
Time Requested: 1:00
Time Arrived On Location: 12:00
Time Left Location:

WELL DATA

Casing Size (in) :	9.625
Casing Weight (lb) :	36
Casing Depth (ft.) :	1,929
Total Depth (ft) :	1940
Open Hole Diameter (in) :	13.50
Conductor Length (ft) :	80
Conductor ID :	15.25
Shoe Joint Length (ft) :	49
Landing Joint (ft) :	
Sacks of Tail Requested	100
HOC Tail (ft):	0

One or the other, cannot have quantity in both

Max Rate:	8
Max Pressure:	2000

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

Dye in second10 bbl

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results

HOC of Lead	1632.66 ft
Casing Depth - HOC Tail	
Volume of Lead Cement	797.93 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	858.98 cuft
(cuft of Lead Cement) + (Cuft of Conductor)	
bbls of Lead Cement	175.93 bbls
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	
Sacks of Lead Cement	581.07 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	
bbls of Lead Mix Water	124.52 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42	
Displacement	145.32 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed:	333.86 bbls

Tail Calculated Results

Tail Cement Volume In Ann	127.00 cuft
(HOC Tail) X (OH Ann)	
Total Volume of Tail Cement	105.73 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	216.34 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

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	Vogler State D21-750

Date	3/24/2018
INVOICE #	606453
LOCATION	Weld
FOREMAN	Nick Vigil

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DESCRIPTION OF JOB EVENTS

Amount Pumped		Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	176.3	0:00	Arrive On Location	Rig was rigging up to running casing.			
Lead % Excess	15%	0:05	Well Site Assessment	Hazard hunt, rig up safety meeting			
Lead Sacks	581	5:30	Rig Up Equipment				
		6:15	JSA	Held safety meeting with all personell involved in job.			
		6:55	Test Lines	Pressure tested lines to 1500 psi.			
Tail mixed bbls	22.6	6:58	Spacer Ahead	Fresh water with dye in second 10 bbls.	8	30	180
Tail % Excess	0%	7:01	Lead Cement	13.5 ppg	5.5	175.9	120
Tail Sacks	100	7:36	Tail Cement	15.2 ppg	5.5	22.6	170
		7:43	Shut Down				
Total Sacks	681	7:44	Drop Plug	Plug was pre loaded.			
Water Temp	75	7:45	Displace	Rig displaced with OBM (1595 Strokes)	8	70	350
bbl Returns	40	8:13	Bump Plug	Bumped plug 540 psi over final lift (1100 psi)	1	145.8	560
Notes:		8:14	Casing Test	Pressured up casing to 1000 psi and held for 15 min.			
		8:30	Check Floats	Floats held (flowed back 2 bbls)			
		8:40	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

Vogler State D21-750