Bison Oil Well Cementing
Single Cement Surface Pipe

Date: 2/10/2015
Invoice # 45125
API# 05-123-38143
Foreman: JASON KELEHER

Customer: Noble Energy Inc.
Well Name: RELIANCE E23-69-HN

County: Weld
State: Colorado
Sec: 23
Twp: 6N
Range: 65W

Consultant: GARY
Rig Name & Number: H&P 326
Distance To Location: 19
Units On Location: 4027-3106/ 4022-3213
Time Requested: 900
Time Arrived On Location: 830
Time Left Location: 1500

WELL DATA

Casing Size OD (in) :	9.625
Casing Weight (lb) :	36.00
Casing Depth (ft.) :	753
Total Depth (ft) :	792
Open Hole Diameter (in.) :	13.50
Conductor Length (ft) :	100
Conductor ID :	15.25
Shoe Joint Length (ft) :	44
Landing Joint (ft) :	30
Max Rate:	6
Max Pressure:	1000

Cement Data

Cement Name:	BFN III
Cement Density (lb/gal) :	14.2
Cement Yield (cuft) :	1.49
Gallons Per Sack:	7.48
% Excess:	0%
Displacement Fluid lb/gal:	8.3
BBL to Pit:	17.0
Fluid Ahead (bbls):	30.0
H20 Wash Up (bbls):	20.0

Spacer Ahead Makeup
30 BBL WATER W/ DYE IN 2ND 10

Casing ID 8.921 Casing Grade J-55 only used

Calculated Results

cuft of Shoe	19.25	cuft
(Casing ID Squared) X (.005454) X (Shoe Joint ft)		
cuft of Conductor	76.31	cuft
(Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)		
cuft of Casing	319.06	cuft
(Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)		
Total Slurry Volume	414.62	cuft
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)		
bbls of Slurry	73.84	bbls
(Total Slurry Volume) X (.1781)		
Sacks Needed	278	sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)		
Mix Water	49.56	bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42		

Displacement: 57.09 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

Pressure of cement in annulus
Hydrostatic Pressure: 555.36 PSI

Pressure of the fluids inside casing
Displacement: 305.48 psi
Shoe Joint: 32.72 psi
Total 338.20 psi

Differential Pressure: 217.16 psi

Collapse PSI: 2020.00 psi
Burst PSI: 3520.00 psi

Total Water Needed: 156.65 bbls

X Tracy Stapleton
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
Single Cement Surface Pipe

INVOICE #	45125
LOCATION	Weld
FOREMAN	JASON KELEHER
Date	2/10/2015

Customer	Noble Energy Inc.
Well Name	RELIANCE E23-69-HN

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

		Displace 1			Displace 2			Displace 3			Displace 4			Displace 5		
Safety Meeting	1150	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI
MIRU	1120	0	1315	0	0			0			0			0		
CIRCULATE	1241	10	1317	40	10			10			10			10		
Drop Plug		20	1320	70	20			20			20			20		
1315		30	1324	100	30			30			30			30		
		40	1329	170	40			40			40			40		
M & P		50	1333	210	50			50			50			50		
Time	**Sacks**	60	1336	220	60			60			60			60		
1253-1313	342	70	BUMP	480	70			70			70			70		
		80			80			80			80			80		
		90			90			90			90			90		
		100			100			100			100			100		
		110			110			110			110			110		
% Excess	23%	120			120			120			120			120		
Mixed bbls	60.9	130			130			130			130			130		
Total Sacks	342	140			140			140			140			140		
bbl Returns	17	150			150			150			150			150		
Water Temp	51															

Notes:

PRESSURED TESTED TO 1500 PSI AT 1238, PUMPED 40 BBL WATER W/ DYE IN 2ND 10 AT 1241, MIXED AND PUMPED 342 SKS AT 14.2, 90.7 BBL AT 1253, SHUT DOWN AT 1313, STARTED DISPLACEMENT AT 1315, PLUG LANDED AT 220 PSI AT 1336 AND PRESSURED UP TO 480 PSI, HELD FOR 2 MINUTE AND PRESSURED UP TO 1020 PSI TO PERFORM CASING TEST, HELD FOR 15 MINUTES AND THEN RELEASED AND CHECKED FLOATS, FLOATS HELD, GOT .5 BBL BACK

x Gary Stapleton
Work Preformed

x WSS
Title

x 2/10/2015
Date