Bison Oil Well Cementing
Single Cement Surface Pipe

Date: 1/27/2015
Invoice # 45118
API# 05-123-38142
Foreman: JASON KELEHER

Customer: Noble Energy Inc.
Well Name: RELIANCE E23-68-1HN

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: 4031-3107/ 4035-3204
Time Requested: 2230
Time Arrived On Location: 2100
Time Left Location: 130

WELL DATA

Casing Size OD (in) :	9.625
Casing Weight (lb) :	36.00
Casing Depth (ft.) :	772
Total Depth (ft) :	809
Open Hole Diameter (in.) :	13.50
Conductor Length (ft) :	100
Conductor ID :	15.25
Shoe Joint Length (ft) :	43
Landing Joint (ft) :	32
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:	45%
Displacement Fluid lb/gal:	8.3
BBL to Pit:	23.0
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	18.59	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	474.58	cuft
(Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)		
Total Slurry Volume	569.48	cuft
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)		
bbls of Slurry	101.42	bbls
(Total Slurry Volume) X (.1781)		
Sacks Needed	382	sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)		
Mix Water	68.07	bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42		

Displacement: 58.85 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

Pressure of cement in annulus
Hydrostatic Pressure: 569.50 PSI

Pressure of the fluids inside casing
Displacement: 314.41 psi
Shoe Joint: 31.59 psi
Total 346.00 psi

Differential Pressure: 223.51 psi

Collapse PSI: 2020.00 psi
Burst PSI: 3520.00 psi

Total Water Needed: 176.91 bbls

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.

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INVOICE #	45118
LOCATION	Weld
FOREMAN	JASON KELEHER
Date	1/27/2015

Customer	Noble Energy Inc.
Well Name	RELIANCE E23-68-1HN

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DESCRIPTION OF JOB EVENTS

		Displace 1			Displace 2			Displace 3			Displace 4			Displace 5		
Safety Meeting	2315	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI
MIRU	2230	0	1201	0	0			0			0			0		
CIRCULATE	2329	10	1202	50	10			10			10			10		
Drop Plug		20	1203	120	20			20			20			20		
1201		30	1208	170	30			30			30			30		
		40	1210	240	40			40			40			40		
M & P		50	1213	250	50			50			50			50		
Time	**Sacks**	60	1216	260	60			60			60			60		
2336-2358	382	70	BUMP	740	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	45%	120			120			120			120			120		
Mixed bbls	68.1	130			130			130			130			130		
Total Sacks	382	140			140			140			140			140		
bbl Returns	23	150			150			150			150			150		
Water Temp	41															

Notes:

PRESSURED TESTED TO 1500 PSI AT 2328, PUMPED 30 BBL WATER W/ DYE IN 2ND 10 AT 2329, MIXED AND PUMPED 382 SKS AT 14.2, 101.3 BBL AT 2336, SHUT DOWN AT 2358, STARTED DISPLACEMENT AT 0001, PLUG LANDED AT 260 PSI AT 0016 AND PRESSURED UP TO 740 PSI, HELD FOR 1 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 _____ Work Preformed

x WSS Title

x 1/26/15 Date