



**Bison Oil Well Cementing
Single Cement Surface Pipe**

Date: 3/22/2015
 Invoice #: 80115
 API#: 05-123-40924
 Foreman: JASON KELEHER

Customer: Noble Energy Inc.

Well Name: AGGIE STATE AA17-643

County: Weld
 State: Colorado
 Sec: 17
 Twp: 6N
 Range: 63W

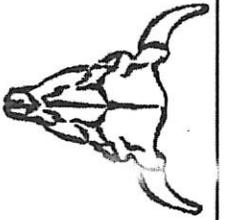
Consultant: JIM
 Rig Name & Number: H&P 343
 Distance To Location: 27
 Units On Location: 4031-3107/ 4034-3211
 Time Requested: 2130
 Time Arrived On Location: 2100
 Time Left Location: 230

WELL DATA	Cement Data
Casing Size OD (in) : 9.625	Cement Name: BFN III
Casing Weight (lb) : 36.00	Cement Density (lb/gal) : 14.2
Casing Depth (ft) : 892	Cement Yield (cuft) : 1.49
Total Depth (ft) : 925	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 0%
Conductor Length (ft) : 100	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit: 17.0
Shoe Joint Length (ft) : 42	Fluid Ahead (bbls): 50.0
Landing Joint (ft) : 29	H2O Wash Up (bbls): 20.0
Max Rate: 6	Spacer Ahead Makeup
Max Pressure: 1000	50 BBL WATER W/ DYE IN 2ND 10

Calculated Results	Pressure of cement in annulus
Displacement: 67.96 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)	Hydrostatic Pressure: 657.90 PSI
cuft of Shoe 18.11 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Pressure of the fluids inside casing
cuft of Conductor 76.31 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Displacement: 366.55 psi
cuft of Casing 386.99 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Shoe Joint: 30.78 psi
Total Slurry Volume 481.41 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Total 397.32 psi
bbls of Slurry 85.74 bbls (Total Slurry Volume) X (.1781)	Differential Pressure: 260.57 psi
Sacks Needed 323 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Collapse PSI: 2020.00 psi
Mix Water 57.54 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Burst PSI: 3520.00 psi
	Total Water Needed: 195.50 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.



**Bison Oil Well Cementing
Single Cement Surface Pipe**

Customer
Well Name

Noble Energy Inc.
AGGIE STATE AA17-643

INVOICE #
LOCATION
FOREMAN
Date

80115
Weld
JASON KELEHER
3/22/2015

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DESCRIPTION OF JOB EVENTS

Safety Meeting	2350	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
MIRU	2315															
CIRCULATE	1223	0	1258	0			0			0			0			
Drop Plug		10	100	70			10			10			10			
		20	102	50			20			20			20			
		30	107	120			30			30			30			
		40	109	210			40			40			40			
M & P		50	112	250			50			50			50			
Time	Sacks	60	114	280			60			60			60			
0035-0056	401	70	117	290			70			70			70			
		80	BUIMP	730			80			80			80			
		90					90			90			90			
		100					100			100			100			
		110					110			110			110			
% Excess	24%	120					120			120			120			
Mixed bbls	71.4	130					130			130			130			
Total Sacks	401	140					140			140			140			
bbl Returns	17	150					150			150			150			
Water Temp	57															

Notes:

PRESSURED TESTED TO 1500 PSI AT 0021, PUMPED 50 BBL WATER W/ DYE IN 2ND 10 AT 0023, MIXED AND PUMPED 401 SKS AT 14.2, 106.4 BBL AT 0035, SHUT DOWN AT 0056, STARTED DISPLACEMENT AT 0058, PLUG LANDED AT 290 PSI AT 0117 AND PRESSURED UP TO 730 PSI, HELD FOR 1 MINUTE AND PRESSURED UP TO 1030 PSI TO PERFORM CASING TEST, HELD FOR 15 MINUTES AND THEN RELEASED AND CHECKED FLOATS, FLOATS HELD, GOT .5 BBL BACK

X  _____ X
 Work Performed _____ Title _____ Date _____