



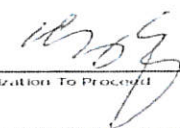
Bison Oil Well Cementing Single Cement Surface Pipe

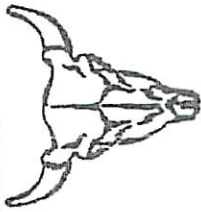
Date: 3/4/2015
Invoice #: 80153
API#:
Foreman: Lee Sharp

Customer: Noble Energy Inc.
Well Name: Reliance E23-65-1HC

County: Weld
State: Colorado
Sec:
Twp:
Range:
Consultant: Chris
Rig Name & Number: H&P 326
Distance To Location: 23.6
Units On Location: 4027-3106/ 4020-3212
Time Requested: 19:30
Time Arrived On Location: 18:25
Time Left Location:

WELL DATA	Cement Data
Casing Size OD (in) : 9.625	Cement Name: BFN II
Casing Weight (lb) : 36.00	Cement Density (lb/gal) : 14.2
Casing Depth (ft.) : 800	Cement Yield (cuft) : 1.49
Total Depth (ft) : 819	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 0%
Conductor Length (ft) : 90	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit:
Shoe Joint Length (ft) : 38	Fluid Ahead (bbls): 50.0
Landing Joint (ft) : 0	H2O Wash Up (bbls): 20.0
Max Rate: 6	Spacer Ahead Makeup 10 10D 30= 50BBL
Max Pressure: 1200	

Casing ID 8.921	Casing Grade J-55 only used
Calculated Results	Displacement 59.59 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Shoe 16.47 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Pressure of cement in annulus
cuft of Conductor 68.68 cuft (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: 596.58 PSI
cuft of Casing 351.25 cuft (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume 436.40 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 332.33 psi
bbls of Slurry 77.72 bbls (Total Slurry Volume) X (.1781)	Shoe Joint: 28.00 psi
Sacks Needed 289 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total 360.33 psi
Mix Water 51.47 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: 236.25 psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed 181.05 bbls
<div>X  Authorization To Proceed</div> <p>Customers hereby acknowledges and specifically agrees to the terms and condition on this work order, including, without limitation, the provisions on this work order.</p>	



Bison Oil Well Cementing
Single Cement Surface Pipe

INVOICE #
LOCATION
FOREMAN
Date

80153
Weld
Lee Sharp
3/5/2015

Customer
Well Name

Noble Energy Inc.
Reliance E23-65-1HC

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

	10:40 9:12 11:18	Displace 1		Displace 2		Displace 3		Displace 4		Displace 5	
		BBLs	Time	PSI	BBLs	Time	PSI	BBLs	Time	PSI	BBLs
Safety Meeting		0	11:51	0	0			0			0
MIRU		10	11:54	20	10			10			10
CIRCULATE		20	11:57	200	20			20			20
Drop Plug		30	11:59	140	30			30			30
11:51		40	12:02	260	40			40			40
		50	12:04	270	50			50			50
M & P		60	12:13	510	60			60			60
Time		70			70			70			70
11:25-11:47		80			80			80			80
		90			90			90			90
		100			100			100			100
		110			110			110			110
		120			120			120			120
% Excess		130			130			130			130
Mixed bbls	61	140			140			140			140
Total Sacks	19	150			150			150			150
bbl Returns	74										
Water Temp											

Notes:

The day

Job completed with no issue

plug landed on calculated final lift 240 psi

Land psi 500

Float checked and held at 12:15am

X

Work Performed

X WSS

X Title

X Mar 5, 2015
Date