



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 12/18/2014

Invoice # 25108

API# 05-123-39636

Foreman: Calvin Reimers

Customer: Noble Energy Inc.

Well Name: Wells Ranch AE 19-631

County: Weld

State: Colorado

Sec: 20

Twp: 6N

Range: 62W

Consultant: Derick

Rig Name & Number: H&P 330

Distance To Location: 33 Miles

Units On Location: 4023-3104/4034-3211

Time Requested: 1230pm

Time Arrived On Location: 1115am

Time Left Location: 345pm

WELL DATA

Casing Size OD (in) : 9.625
Casing Weight (lb) : 36.00
Casing Depth (ft) : 686
Total Depth (ft) : 725
Open Hole Diameter (in.) : 13.50
Conductor Length (ft) : 100
Conductor ID : 16
Shoe Joint Length (ft) : 39
Landing Joint (ft) : 33

Max Rate: 7
Max Pressure: 2500

Cement Data

Cement Name: BFN III
Cement Density (lb/gal) : 14.2
Cement Yield (cuft) : 1.49
Gallons Per Sack: 7.48
% Excess: 20%
Displacement Fluid lb/gal: 8.3
BBL to Pit: 11.0
Fluid Ahead (bbls): 50.0
H2O Wash Up (bbls): 20.0

Spacer Ahead Makeup
50bbls H2O+Dye in 2nd 10bbls

Casing ID

8.921

Casing Grade

J-55 only used

Calculated Results

cuft of Shoe 16.86 cuft
(Casing ID Squared) X (.005454) X (Shoe Joint Length)
cuft of Conductor 89.10 cuft
(Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)
cuft of Casing 343.60 cuft
(Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)
Total Slurry Volume 449.56 cuft
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)
bbls of Slurry 80.07 bbls
(Total Slurry Volume) X (.1781)
Sacks Needed 302 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)
Mix Water 53.73 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement: 52.57 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

Pressure of cement in annulus

Hydrostatic Pressure: 505.97 PSI

Pressure of the fluids inside casing

Displacement: 278.99 psi

Shoe Joint: 28.65 psi

Total 307.64 psi

Differential Pressure: 198.33 psi

Collapse PSI: 2020.00 psi

Burst PSI: 3520.00 psi

Total Water Needed: 176.31 bbls

[Signature]
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.
Wells Ranch AE 19-631

INVOICE #
LOCATION
FOREMAN
Date

25108
Weld
Calvin Reimers
12/18/2014

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DESCRIPTION OF JOB EVENTS

		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
Safety Meeting	122pm															
MIRU	1250pm															
CIRCULATE	208pm	0	233pm	90	0			0			0			0		
Drop Plug		10	236pm	80	10			10			10			10		
232pm		20	237pm	140	20			20			20			20		
		30	239pm	210	30			30			30			30		
		40	241pm	260	40			40			40			40		
M & P		50	243pm	230	50			50			50			50		
Time	Sacks	60	245pm	210	60			60			60			60		
217pm	302	70	Bump	410	70			70			70			70		
229pm		80			80			80			80			80		
		90			90			90			90			90		
		100			100			100			100			100		
		110			110			110			110			110		
% Excess	20%	120			120			120			120			120		
Mixed bbls	53.73	130			130			130			130			130		
Total Sacks	302	140			140			140			140			140		
bbl Returns	11	150			150			150			150			150		
Water Temp	71.3															

Notes:

The day

1/2 bbl back on bleed off

Casing PSI Test 246pm 1030psi to 301pm 1040psi

xx [Signature]
Work Performed

X
Title

X
Date