



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 6/29/2014
 Invoice # 12078
 API# 05-123-38854
 Foreman: JASON

Customer: NOBLE

Well Name: RAINBOW LC28-76-1BHNA

County: Weld County
 State: Colorado
 Sec: 28
 Twp: 9N
 Range: 59W

Consultant: DAVE
 Rig Name & Number: H&P 273
 Distance To Location: 68
 Units On Location: 4031-3106, 4027-3204
 Time Requested: 1700
 Time Arrived On Location: 1800
 Time Left Location: 2200

WELL DATA	Cement Data
Casing Size OD (in.) : <u>9.625</u>	Cement Name: <u>BFN III</u>
Casing Weight (lb) : <u>36.00</u>	Cement Density (lb/gal) : <u>15.2</u>
Casing Depth (ft.) : <u>605</u>	Cement Yield (cuft) : <u>1.27</u>
Total Depth (ft) : <u>639</u>	Gallons Per Sack: <u>5.89</u>
Open Hole Diameter (in.) : <u>13.75</u>	% Excess: <u>15%</u>
Conductor Length (ft) : <u>100</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.25</u>	BBL to Pit: <u>7.5</u>
Shoe Joint Length (ft) : <u>45</u>	Fluid Ahead (bbls): <u>45.0</u>
Landing Joint (ft) : <u>24</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate: <u>7</u>	Spacer Ahead Makeup
Max Pressure: <u>2500</u>	<u>45 BBL H2O+KCL+DYE IN 2ND 10</u>

Calculated Results	Pressure of cement in annulus
Casing ID: <u>8.921</u> Casing Grade: <u>J-55 only used</u> cuft of Shoe <u>19.51</u> cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: <u>45.17</u> bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor <u>76.31</u> cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: <u>477.90</u> PSI
cuft of Casing <u>305.55</u> cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume <u>401.38</u> cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: <u>241.58</u> psi
bbls of Slurry <u>71.4</u> bbls (Total Slurry Volume) X (.1781) X (% Excess Cement)	Shoe Joint: <u>35.50</u> psi
Sacks Needed <u>316</u> sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total <u>277.08</u> psi
Mix Water <u>44.32</u> bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: <u>200.81</u> psi
	Collapse PSI: <u>2020.00</u> psi
	Burst PSI: <u>3520.00</u> psi
	Total Water Needed: <u>154.49</u> bbls

X
 AUTHORIZED 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
RAINBOW LC28-76-1BHNA

INVOICE #
LOCATION
FOREMAN
Date

12078
Weld County
JASON
6/29/2014

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

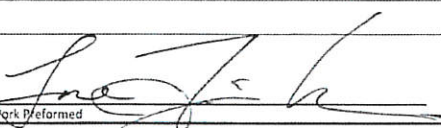
	2000	Displace 1			Displace 2			Displace 3			Displace 4			Displace 5		
	1930	BBLs	Time	PSI	BBLs	Time	PSI	BBLs	Time	PSI	BBLs	Time	PSI	BBLs	Time	PSI
Safety Meeting																
MIRU		0	2053	0	0			0			0			0		
CIRCULATE		10	2055	80	10			10			10			10		
Drop Plug		20	2057	100	20			20			20			20		
2052		30	2100	280	30			30			30			30		
		40	2102	290	40			40			40			40		
M & P		50	2104	240	50			50			50			50		
Time	Sacks	60	BUMP	760	60			60			60			60		
2030-2049	316	70			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	15.4%	120			120			120			120			120		
Mixed bbls	44.3	130			130			130			130			130		
Total Sacks	316	140			140			140			140			140		
bbl Returns	7.5	150			150			150			150			150		
Water Temp	75															

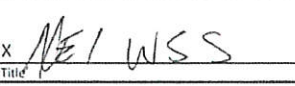
Notes:

The day

PRESSURE TEST TO 1000 PSI, PUMPED 45 BBL WATER WITH DYE IN THE 2ND 10, MIXED AND PUMPED 316 SKS AT 15.2, 71.4 BBL, DISPLACED 45.3 BBLs

PRESSURING UP TO 760 PSI, RELEASED PRESSURE AND GOT .5 BBL BACK

x 
Work Deformed

x 
Title

x 6-29-14
Date