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

Casing Size OD (in) :	9.625
Casing Weight (lb) :	36.00
Casing Depth (ft.) :	605
Total Depth (ft) :	639
Open Hole Diameter (in.) :	13.75
Conductor Length (ft) :	100
Conductor ID :	15.25
Shoe Joint Length (ft) :	45
Landing Joint (ft) :	24
Max Rate:	7
Max Pressure:	2500

Cement Data

Cement Name:	BFN III
Cement Density (lb/gal) :	15.2
Cement Yield (cuft) :	1.27
Gallons Per Sack:	5.89
% Excess:	15%
Displacement Fluid lb/gal:	8.3
BBL to Pit:	7.5
Fluid Ahead (bbls):	45.0
H20 Wash Up (bbls):	20.0

Spacer Ahead Makeup

45 BBL H2O+KCL+DYE IN 2ND 10

Casing ID 8.921 Casing Grade J-55 only used

Calculated Results

cuft of Shoe 19.51 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 305.55 cuft
(Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)

Total Slurry Volume 401.38 cuft
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)

bbls of Slurry 71.4 ~~82.21~~ bbls
(Total Slurry Volume) X (.1781) X (% Excess Cement)

Sacks Needed 316 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

Mix Water 44.32 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement: 45.17 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

Pressure of cement in annulus

Hydrostatic Pressure: 477.90 PSI

Pressure of the fluids inside casing

Displacement: 241.58 psi
Shoe Joint: 35.50 psi
Total 277.08 psi

Differential Pressure: 200.81 psi

Collapse PSI: 2020.00 psi
Burst PSI: 3520.00 psi

Total Water Needed: 154.49 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 #	12078
LOCATION	Weld County
FOREMAN	JASON
Date	6/29/2014

Customer	NOBLE
Well Name	RAINBOW LC28-76-1BHNA

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DESCRIPTION OF JOB EVENTS

		Displace 1			Displace 2			Displace 3			Displace 4			Displace 5		
Safety Meeting	2000	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI
MIRU	1930	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~~ 0%	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 Performed

X MEI WSS Title

X 6-29-14 Date