



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 21/31/13
 Invoice #: 12546
 API#: 445564
 Foreman: MONTE

Customer: encana
 Well Name: liberty 2d-21h

County: weld
 State: colorado
 Sec: 21
 Twp: 3n
 Range: 68w

Consultant: bill
 Rig Name & Number: ensign135
 Distance To Location: 21.6
 Units On Location: 1005-3211
 Time Requested: 1:30pm
 Time Arrived On Location: 12:50am
 Time Left Location:

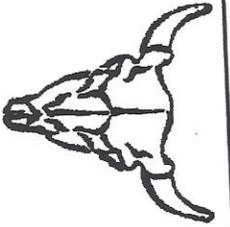
WELL DATA	
Casing Size OD (in) :	9.6250
Casing Weight (lb) :	40
Casing Depth (ft.) :	913
Total Depth (ft) :	919
Open Hole Diameter (in.) :	12.25
Conductor Length (ft) :	93
Conductor ID :	15.5
Shoe Joint Length (ft) :	46
Landing Joint (ft) :	17
Max Rate:	
Max Pressure:	

Cement Data	
Cement Name:	BFN III
Cement Density (lb/gal) :	15.2
Cement Yield (cuft) :	1.27
Gallons Per Sack:	5.89
% Excess:	40%
Displacement Fluid lb/gal:	8.3
BBL to Pit:	
Fluid Ahead (bbls):	
H2O Wash Up (bbls):	20.0
Spacer Ahead Makeup	
10 freselh 10 dye 10 fresh	

Calculated Results		Casing Grade		J-55 only used	
Casing ID	8.835	Displacement:	67.00	bbls	
cuft of Shoe 19.58 cuft		(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)			
(Casing ID Squared) X (.005454) X (Shoe Joint ft)		Pressure of cement in annulus			
cuft of Conductor 74.87 cuft		Hydrostatic Pressure: 720.90 PSI			
(Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)		Pressure of the fluids inside casing			
cuft of Casing 256.81 cuft		Displacement: 373.83 psi			
(Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)		Shoe Joint: 36.32 psi			
Total Slurry Volume 351.26 cuft		Total 410.16 psi			
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)		Differential Pressure: 310.75 psi			
bbls of Slurry 87.58 bbls		Collapse PSI: 2570.00 psi			
(Total Slurry Volume) X (.1781) X (% Excess Cement)		Burst PSI: 3950.00 psi			
Sacks Needed 387 sk		Total Water Needed: 74.30 bbls			
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)					
Mix Water 54.30 bbls					
(Sacks Needed) X (Gallons Per Sack) ÷ 42					

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

encana
 liberty 2d-21h

INVOICE #
 LOCATION
 FOREMAN
 Date

12546
 weld
 MONTE
 21/31/13

Treatment Report Page 2

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															
MIRU	0	5:12	0:00	0			0			0			0		
CIRCULATE	10	5:15	0:00	10			10			10			10		
Drop Plug	20	5:20	0:00	20			20			20			20		
	30	5:25	0:00	30			30			30			30		
	40	5:28	0:00	40			40			40			40		
	50	5:34	0:00	50			50			50			50		
M & P	60			60			60			60			60		
	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		
	120			120			120			120			120		
% Excess	120			120			130			130			130		
Mixed bbls	130			130			140			140			140		
Total Sacks	140			140			150			150			150		
bbl Returns	150			150			150			150			150		
	23														

Notes: safety meeting, miru, pressure test per company man, circulate 30 bbls ahead with dye in 2nd 10. mix and pump 387 sks at 40% excess, drop plug and displace 67 bbls

drop plug and displace 67 bbls h2o,

23 bbls back to pit, 40 % excess

X _____ X _____
 Work Performed Title Date