



BISON

Invoice

Bison Oil Well Cementing Inc.
 1547 Gaylord Street
 Denver, CO 80206
 303-296-3010

Date	Invoice #
11/17/2013	12584

Bill To
Noble Energy Inc. Attn: Accounting 1625 Broadway Ste 2000 Denver, CO 80202

Location	Well Name & No.	Terms	Job Type		
Weld CO	Crow Creek St. AC36-72-1H	Net 30	Surface Pipe		
Item	Description	Qty	U/M	Rate	Amount
Pump surface	PUMP Charge-surface pipe	1			
Discount 15%	Discount 15%				
MILEAGE	Mileage charge	360			
Discount 15%	Discount 15%				
Data Acquisition ...	Data Acquisition Charge	1			
Discount 15%	Discount 15%				
HOURS	Wait Time	2			
	Subtotal of Services				
BFN III Summer ...	BFN III Blend	337	Sack		
Discount 15%	Discount 15%				
KCL Mud Flush	(BHS 117)	4	qt		
Discount 15%	Discount 15%				
Dye - 4880	Dye (Hot Pink 4880)	16	oz		
Discount 15%	Discount 15%				
	Subtotal of Materials				

Please Remit Payment To:

Bison Oil Well Cementing, Inc.
 P.O. Box 29671
 Thornton, CO 80229

Subtotal	
Sales Tax	2.5%
Total	
Balance Due	



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 11/17/2013
 Invoice #: 12584
 API#: 05-123-37424
 Foreman: Calvin Reimers

Customer: Noble
 Well Name: Crow Creek ST AC 36-72-1HN

County: Weld
 State: Colorado
 Sec: 36
 Twp: 7N
 Range: 63W

Consultant: Martin / Cliff
 Rig Name & Number: H&P 277
 Distance To Location: 32 Miles
 Units On Location: 3106/3212
 Time Requested: 430am
 Time Arrived On Location: 345am
 Time Left Location: 1000am

WELL DATA	Cement Data
Casing Size OD (in) : 9.6250	Cement Name: BFN III
Casing Weight (lb) : 36	Cement Density (lb/gal) : 15.2
Casing Depth (ft.) : 574	Cement Yield (cuft) : 1.27
Total Depth (ft) : 608	Gallons Per Sack: 5.89
Open Hole Diameter (in.) : 13.75	% Excess: 20%
Conductor Length (ft) : 100	Displacement Fluid lb/gal: 8.3
Conductor ID : 16	BBL to Pit: 14.0
Shoe Joint Length (ft) : 42	Fluid Ahead (bbls):
Landing Joint (ft) : 28	H2O Wash Up (bbls): 20.0
Max Rate: 7	Spacer Ahead Makeup
Max Pressure: 2500	Is H2O with KCL+Dye in 2nd 10bbls

Calculated Results	Pressure of cement in annulus
cuft of Shoe 18.42 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: 43.23 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor 89.10 cuft (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: 452.94 PSI
cuft of Casing 249.07 cuft (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume 356.59 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 229.04 psi Shoe Joint: 33.50 psi Total: 262.55 psi
bbls of Slurry 76.21 bbls (Total Slurry Volume) X (.1781) X (% Excess Cement)	Differential Pressure: 190.39 psi
Sacks Needed 337 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Collapse PSI: 2020.00 psi Burst PSI: 3520.00 psi
Mix Water 47.25 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Total Water Needed: 67.25 bbls

X *Martin Hardy*
 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
Crow Creek ST AC 36-72-1HN

INVOICE #
LOCATION
FOREMAN
Date

12584
Weld
Calvin Reimers
11/17/2013

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	645am														
MIRU	610am														
	810am														
CIRCULATE															
Drop Plug	0	848am	60	0			0			0			0		
	10	851am	140	10			10			10			10		
	20	853am	210	20			20			20			20		
	30	855am	280	30			30			30			30		
	40	857am	270	40			40			40			40		
	50	859am	240	50			50			50			50		
M & P	60	Bump	790	60			60			60			60		
Time	70			70			70			70			70		
823am															
	80			80			80			80			80		
845am															
	90			90			90			90			90		
	100			100			100			100			100		
	110			110			110			110			110		
	120			120			120			120			120		
% Excess	20%			20%			20%			20%			20%		
Mixed bbls	47.25			47.25			47.25			47.25			47.25		
Total Sacks	337			337			337			337			337		
bbl Returns	14			14			14			14			14		

Notes:

The day
Float Held Used 337 sks 76.21 bbls Slurry Casing PSI Test 1020 PSI at 900am to 1050 PSI at 915am 14 bbls Slurry Back to Surface

X *M. O. O'Leary*
Work Performed

X *C. W. Sulthart*
Trie

X *11-17-13*
Date