



# BISON

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

## Invoice

Date	Invoice #
1/14/2014	12640

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

Location	Well Name & No.	Terms	Job Type		
Weld CO	Wells Ranch AA21-67-1HN	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	3			
	Subtotal of Services				
BFN III Winter ...	BFN III Blend-Lead	449	Sack		
Discount 15%	Discount 15%				
KCL Mud Flush	(BHS 117)	7	qt		
Discount 15%	Discount 15%				
Dye - 4880	Dye (Hot Pink 4880)	10	oz		
Discount 15%	Discount 15%				
Sugar	Sugar	100	lb		
	Subtotal of Materials				

Please Remit Payment To:

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

Subtotal

Sales Tax

Total

Balance



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 1/14/2014  
Invoice #: 12640  
API#:   
Foreman: Kirk

Customer: noble  
Well Name: wells ranch aa 21-67-1hn

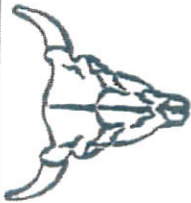
County: weld  
State: Colorado  
Sec: 21  
Twp: 6n  
Range: 63w

Consultant: roger  
Rig Name & Number: h&p 277  
Distance To Location:   
Units On Location: 3103-3210  
Time Requested: 1230 am  
Time Arrived On Location: 1100 pm  
Time Left Location:

WELL DATA		Cement Data	
Casing Size OD (in) :	9.6250	Cement Name:	BPN III
Casing Weight (lb) :	36	Cement Density (lb/gal) :	15.2
Casing Depth (ft.) :	932	Cement Yield (cuft) :	1.27
Total Depth (ft) :	970	Gallons Per Sack:	5.89
Open Hole Diameter (in.) :	13.75	% Excess:	30%
Conductor Length (ft) :	100	Displacement Fluid lb/gal:	8.3
Conductor ID :	15.5	BBL to Pit:	
Shoe Joint Length (ft) :	41	Fluid Ahead (bbls):	
Landing Joint (ft) :	28	H2O Wash Up (bbls):	20.0
Max Rate:		Spacer Ahead Makeup	
Max Pressure:			

Calculated Results		Pressure of cement in annulus	
Casing ID	8.921	Casing Grade	I-55 only used
<b>cuft of Shoe</b>	17.80 cuft	<b>Displacement:</b>	71.05 bbls
(Casing ID Squared) X (.005454) X (Shoe Joint ft)		(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)	
<b>cuft of Conductor</b>	80.51 cuft	<b>Hydrostatic Pressure:</b>	735.91 PSI
(Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)		<b>Pressure of the fluids inside casing</b>	
<b>cuft of Casing</b>	437.54 cuft	<b>Displacement:</b>	384.18 psi
(Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)		<b>Shoe Joint:</b>	32.37 psi
<b>Total Slurry Volume</b>	535.84 cuft	<b>Total</b>	416.56 psi
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)		<b>Differential Pressure:</b>	319.35 psi
<b>bbls of Slurry</b>	124.06 bbls	<b>Collapse PSI:</b>	7020.00 psi
(Total Slurry Volume) X (.1781) X (% Excess Cement)		<b>Burst PSI:</b>	3520.00 psi
<b>Sacks Needed</b>	548 sk	<b>Total Water Needed</b>	96.92 bbls
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)			
<b>Mix Water</b>	76.92 bbls		
(Sacks Needed) X (Gallons Per Sack) ÷ 42			
 X _____ Mike Anderson Authorization To Proceed			
Customers hereby acknowledges and specifically agrees to the terms and conditions on this work order, including, without limitation, the provisions on this work order.			





Bison Oil Well Cementing  
Single Cement Surface Pipe

INVOICE #  
LOCATION  
FOREMAN  
Date

12640

weld

Kirk

1/14/2014

Customer  
Well Name

noble

wells ranch aa 21-67-1hn

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

	340am 200am 515pm	Displace 1			Displace 2			Displace 3			Displace 4			Displace 5		
		BBS	Time	PSI	BBS	Time	PSI	BBS	Time	PSI	BBS	Time	PSI	BBS	Time	PSI
Safety Meeting		0	550	10	0			0			0			0		
MIRU		10	553	70	10			10			10			10		
CIRCULATE		20	555	70	20			20			20			20		
Drop Plug		30	557	170	30			30			30			30		
550 am		40	559	220	40			40			40			40		
		50	601	300	50			50			50			50		
M & P		60	603	350	60			60			60			60		
Time	Sacks	70			70			70			70			70		
526 am	449	80			80			80			80			80		
547 am stop		90			90			90			90			90		
		100			100			100			100			100		
		110			110			110			110			110		
% Excess	6%	120			120			120			120			120		
Mixed bbls	63	130			130			130			130			130		
Total Sacks	449	140			140			140			140			140		
bbl Returns		150			150			150			150			150		

Notes:

rig had to finish displacement of 10 bbls due to packing nut coming off  
was able to put packing nut back on

101.5 bbls slurry

X *Rosen*

Work Prepared

X *WSS*

Title

X

Date

1-14-14