



BISON

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

Invoice

Date	Invoice #
12/17/2013	12568

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

Location	Well Name & No.	Terms	Job Type		
Weld CO	Castor Federal LD15-7318	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	420			
Discount 15%	Discount 15%				
Data Acquisition ...	Data Acquisition Charge	1			
Discount 15%	Discount 15%				
	Subtotal of Services				
BFN III Winter ...	BFN III Blend	499	Sack		
Discount 15%	Discount 15%				
KCL Mud Flush	(BHS 117)	4	qt		
Discount 15%	Discount 15%				
Dye - 4880	Dye (Hot Pink 4880)	10	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 (2.9%)	
Total	
Balance	



**Bison Oil Well Cementing
Tail & Lead**

Customer: Noble Energy
Well Name: castor federal id 15-73-1hn

Date: 12-17-2013
Invoice #: 12568
API#: _____
Foreman: kirk

County: Weld
State: Colorado
Sec: 15
Twp: 9n
Range: 58w

Consultant: lance
Rig Name & Number: h&p 273
Distance To Location: _____
Units On Location: 3103-3210
Time Requested: 900 pm
Time Arrived On Location: 830 pm
Time Left Location: _____

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625 Casing Weight (lb) : 36 Casing Depth (ft) : 1,215 Total Depth (ft) : 1225 Open Hole Diameter (in) : 13.75 Conductor Length (ft) : 90 Conductor ID : 15.5 Shoe Joint Length (ft) : 40 Landing Joint (ft) : 30</p> <p>Sacks of Tail Requested : 100 HOC Tail (ft) : 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: _____ Max Pressure: _____</p>	<p>Lead</p> <p>Cement Name: _____ Cement Density (lb/gal) : 13.1 Cement Yield (cuft) : 1.69 Gallons Per Sack : 8.64 % Excess : 25%</p> <p>Tail</p> <p>Cement Name: _____ Cement Density (lb/gal) : 15.2 Cement Yield (cuft) : 1.27 Gallons Per Sack : 5.89 % Excess : 0%</p> <p>Fluid Ahead (bbls) : 93.1 H2O Wash Up (bbls) : 20.0</p> <p>Spacer Ahead Makeup</p>

Casing ID	8.921	Casing Grade	J 55 only used
Lead Calculated Results		Tail Calculated Results	
HOC of Lead	886.52 ft	Tail Cement Volume In Ann (HOC Tail) X (OH Ann)	127.00 cuft
Casing Depth - HOC Tail		Total Volume of Tail Cement (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)	109.64 Cuft
Volume of Lead Cement	466.21 cuft	bbls of Tail Cement (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)	22.62 bbls
HOC of Lead X Open Hole Ann		HOC Tail (Tail Cement Volume) ÷ (OH Ann)	208.48 ft
Volume of Conductor	72.46 cuft	Sacks of Tail Cement (Total Volume of Tail Cement) ÷ (Cement Yield)	100.00 sk
(Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)		bbls of Tail Mix Water (Sacks of Tail Cement X Gallons Per Sack) ÷ 42	14.02 bbls
Total Volume of Lead Cement (cuft of Lead Cement) + (Cuft of Conductor)	538.66 cuft	Pressure of cement in annulus	
bbls of Lead Cement (Total cuft of Lead Cement) X (.1781) X (1+Lead Excess)	119.92 bbls	Hydrostatic Pressure	826.81 PSI
Sacks of Lead Cement (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	398.42 sk	Collapse PSI:	2020.00 psi
bbls of Lead Mix Water (Sacks Needed) X (Gallons Per Sack) ÷ 42	81.96 bbls	Burst PSI:	3520.00 psi
Displacement (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	93.15 bbls		
Total Water Needed:	195.11 bbls		

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
Two Cement Surface Pipe

Date 12-17-2013
INVOICE # 12568
LOCATION Weld
FOREMAN kirk

Customer Noble Energy
Well Name castor federal id 15-73-1hn

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

	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	1134	20	0			0			0			0		
MIRU	10	1136	70	10			10			10			10		
CIRCULATE	20	1138	70	20			20			20			20		
Drop Plug	30	1140	70	30			30			30			30		
1134 pm	40	1142	100	40			40			40			40		
	50	1144	160	50			50			50			50		
M & P	60	1146	210	60			60			60			60		
Time	70	1147	300	70			70			70			70		
1057 pm	80	1149	350	80			80			80			80		
1130 pm stop	90	1153	340	90			90			90			90		
	100			100			100			100			100		
	110			110			110			110			110		
	120			120			120			120			120		
Lead mixed bbls	130			130			130			130			130		
Lead % Excess	140			140			140			140			140		
Lead Sacks	150			150			150			150			150		

Notes:

Tail mixed bbls	14	bumped plug at 1154 pm 460 psi
Tail % Excess	0%	
Tail Sacks	100	
Total Sacks	498	
bbl Returns	20	

X

X WSS

X 12-18-13

Date