

**Bison Oil Well Cementing  
Tail & Lead**

Date: 3/18/2017  
 Invoice # 666093  
 API# 05-123-43875  
 Foreman: Nick Vigil

Customer: Noble Energy Inc.  
 Well Name: Wells Ranch State AA33-785

County: Weld  
 State: Colorado  
 Consultant: Charles  
 Rig Name & Number: H&P 524  
 Distance To Location: 19 Miles  
 Units On Location: 4023/4034/4032  
 Time Requested: 8:00  
 Time Arrived On Location: 7:30  
 Time Left Location:

Sec: 21  
 Twp: 6N  
 Range: 63W

**WELL DATA**

Casing Size (in) : 9.625  
 Casing Weight (lb) : 36  
 Casing Depth (ft.) : 1,927  
 Total Depth (ft) : 1936  
 Open Hole Diameter (in) : 13.50  
 Conductor Length (ft) : 80  
 Conductor ID : 15.25  
 Shoe Joint Length (ft) : 49  
 Landing Joint (ft) :

Sacks of Tail Requested 100  
 HOC Tail (ft): 0

One or the other, cannot have quantity in both

Max Rate: 8  
 Max Pressure: 2000

**Cement Data**

**Lead**

Cement Name:  
 Cement Density (lb/gal) : 13.5  
 Cement Yield (cuft) : 1.7  
 Gallons Per Sack 9.00  
 % Excess 15%

**Tail**

Cement Name:  
 Cement Density (lb/gal) : 15.2  
 Cement Yield (cuft) : 1.27  
 Gallons Per Sack: 5.89  
 % Excess: 0%

Fluid Ahead (bbls) 50.0  
 H2O Wash Up (bbls) 20.0

**Spacer Ahead Makeup**

Dye in 2nd 10 bbl

Casing ID 8.921 Casing Grade J-55 only used

**Lead Calculated Results**

HOC of Lead 1625.66 ft  
 Casing Depth - HOC Tail  
 Volume of Lead Cement 794.51 cuft  
 HOC of Lead X Open Hole Ann  
 Volume of Conductor 61.05 cuft  
 (Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)  
 Total Volume of Lead Cement 855.56 cuft  
 (cuft of Lead Cement) + (Cuft of Conductor)  
 bbls of Lead Cement 175.23 bbls  
 (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)  
 Sacks of Lead Cement 578.76 sk  
 (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)  
 bbls of Lead Mix Water 124.02 bbls  
 (Sacks Needed) X (Gallons Per Sack) ÷ 42  
 Displacement 145.56 bbls  
 (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)  
 Total Water Needed: 353.60 bbls

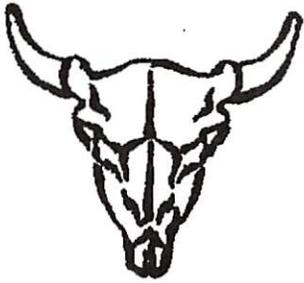
**Tail Calculated Results**

Tail Cement Volume In Ann 127.00 cuft  
 (HOC Tail) X (OH Ann)  
 Total Volume of Tail Cement 105.73 Cuft  
 (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)  
 bbls of Tail Cement 22.62 bbls  
 (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)  
 HOC Tail 216.34 ft  
 (Tail Cement Volume) ÷ (OH Ann)  
 Sacks of Tail Cement 100.00 sk  
 (Total Volume of Tail Cement) ÷ (Cement Yield)  
 bbls of Tail Mix Water 14.02 bbls  
 (Sacks of Tail Cement X Gallons Per Sack) ÷ 42  
 Pressure of cement in annulus  
 Hydrostatic Pressure 585.23 PSI  
 Collapse PSI: 2020.00 psi  
 Burst PSI: 3520.00 psi



*[Signature]*

Authorization To Proceed



**Bison Oil Well Cementing  
Two Cement Surface Pipe**

Customer: Noble Energy Inc.  
Well Name: Wells Ranch State AA33-785

Date: 3/18/2017  
INVOICE #: 666093  
LOCATION: Weld  
FOREMAN: Nick Vigil

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**DESCRIPTION OF JOB EVENTS**

| Amount Pumped   | Time/Date | Event | Description          | Rate     | BBLs  | Pressure |
|-----------------|-----------|-------|----------------------|----------|-------|----------|
| Lead mixed bbls | 175.2     | 7:30  | Arrive On Location   |          |       |          |
| Lead % Excess   | 15%       | 7:35  | Well Site Assessment |          |       |          |
| Lead Sacks      | 579       | 8:40  | Rig Up Equipment     |          |       |          |
|                 |           | 9:20  | JSA                  |          |       |          |
|                 |           | 9:46  | Test Lines           |          |       |          |
| Tail mixed bbls | 22.6      | 9:48  | Spacer Ahead         | 7.5      | 50    | 100      |
| Tail % Excess   | 0%        | 9:59  | Lead Cement          | 13.5 ppg | 175.2 | 190      |
| Tail Sacks      | 100       | 10:26 | Tail Cement          | 15.2 ppg | 22.6  | 200      |
|                 |           | 10:33 | Shut Down            |          |       |          |
| Total Sacks     | 679       | 10:34 | Drop Plug            |          |       |          |
| Water Temp      | 70        | 10:36 | Displace             |          |       |          |
| bbl Returns     | 34        | 11:03 | Bump Plug            |          |       |          |
|                 |           | 11:05 | Casing Test          |          |       |          |
| Notes:          |           | 11:20 | Check Floats         |          |       |          |
|                 |           | 11:30 | End Job              |          |       |          |
|                 |           | 12:00 | Rig Down             |          |       |          |
|                 |           | 12:30 | Crew Left Location   |          |       |          |

X Signature

X Title

X Date