



**Bison Oil Well Cementing
Tail & Lead**

Date: 12/16/2019

Invoice # 200554

API# 05-123-48041

Foreman: Kirk Kallhoff

Customer: Noble Energy Inc.

Well Name: Guttersen Y05-771

County: Weld
State: Colorado

Sec: 29
Twp: 3N
Range: 64W

Consultant: jim

Rig Name & Number: H&P 321

Distance To Location: 21

Units On Location: 4047/4032/4026

Time Requested: 230 pm

Time Arrived On Location: 130 pm

Time Left Location:

WELL DATA

Casing Size (in) : 9.625
Casing Weight (lb) : 36
Casing Depth (ft.) : 1,898
Total Depth (ft) : 1943
Open Hole Diameter (in) : 13.50
Conductor Length (ft) : 110
Conductor ID : 15.15
Shoe Joint Length (ft) : 40
Landing Joint (ft) : 3

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

One or the other, cannot have quantity in both

Max Rate: 8
Max Pressure: 2500

Cement Data

Lead

Cement Name: BFN III
Cement Density (lb/gal) : 13.5
Cement Yield (cuft) : 1.68
Gallons Per Sack 8.90
% Excess 10%

Tail Type III

Cement Name:
Cement Density (lb/gal) : 15.2
Cement Yield (cuft) : 1.27
Gallons Per Sack: 5.80
% Excess: 0%

Fluid Ahead (bbls) 30.0
H2O Wash Up (bbls) 20.0

Spacer Ahead Makeup

30 BBL ahead with Die in 2nd 10

Casing ID

8.921

Casing Grade

J-55 only used

Lead Calculated Results

HOC of Lead 1560.67 ft
Casing Depth - HOC Tail
Volume of Lead Cement 762.74 cuft
HOC of Lead X Open Hole Ann
Volume of Conductor 82.12 cuft
(Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)
Total Volume of Lead Cement 844.87 cuft
(cuft of Lead Cement) + (Cuft of Conductor)
bbls of Lead Cement 165.52 bbls
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)
Sacks of Lead Cement 553.19 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)
bbls of Lead Mix Water 117.22 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42
Displacement 143.86 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)
Total Water Needed: 324.89 bbls

Tail Calculated Results

Tail Cement Volume In Ann 127.00 cuft
(HOC Tail) X (OH Ann)
Total Volume of Tail Cement 109.64 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 224.33 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 13.81 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

Authorization To Proceed

SERIES 2000

— PSI — Barrels / Minute — Lbs / Gallon

