



**Bison Oil Well Cementing
Tail & Lead**

Date: 5//2018

Invoice # 900289

API# 05-123-46558

Foreman: Corey Barras

Customer: Crestone Peak Resources

Well Name: Ruegge 3H-4H-N165

Consultant: Jerry Thorstad

County: Weld

Rig Name & Number: Ensign 122

State: Colorado

Distance To Location: 36 Miles

Sec: 4

Units On Location: 4027-3103/4041-3205/4039-3214

Twp: 1N

Time Requested: 700

Range: 65W

Time Arrived On Location: 630

Time Left Location: 1130

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625</p> <p>Casing Weight (lb) : 40</p> <p>Casing Depth (ft.) : 2,440</p> <p>Total Depth (ft) : 2458</p> <p>Open Hole Diameter (in) : 13.50</p> <p>Conductor Length (ft) : 98</p> <p>Conductor ID : 15.6</p> <p>Shoe Joint Length (ft) : 74</p> <p>Landing Joint (ft) : 10</p> <p>Sacks of Tail Requested 190</p> <p>HOC Tail (ft): 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate:</p> <p>Max Pressure:</p>	<p>Lead</p> <p>Cement Name:</p> <p>Cement Density (lb/gal) : 13.5</p> <p>Cement Yield (cuft) : 1.68</p> <p>Gallons Per Sack 8.90</p> <p>% Excess 15%</p> <p>Tail</p> <p>Cement Name:</p> <p>Cement Density (lb/gal) : 15.2</p> <p>Cement Yield (cuft) : 1.27</p> <p>Gallons Per Sack: 5.89</p> <p>% Excess: 0%</p> <p>Fluid Ahead (bbls) 60.0</p> <p>H2O Wash Up (bbls) 20.0</p> <p>Spacer Ahead Makeup</p> <p>60 BBL with Die in 2nd 10</p>

Lead Calculated Results	Tail Calculated Results
HOC of Lead 1902.73 ft	Tail Cement Volume In Ann 241.30 cuft
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
Volume of Lead Cement 929.92 cuft	Total Volume of Tail Cement 209.80 Cuft
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor 80.56 cuft	bbls of Tail Cement 42.98 bbls
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
Total Volume of Lead Cement 1010.48 cuft	HOC Tail 429.27 ft
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement 206.96 bbls	Sacks of Tail Cement 190.00 sk
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
Sacks of Lead Cement 691.70 sk	bbls of Tail Mix Water 26.65 bbls
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water 146.57 bbls	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure 585.23 PSI
Displacement 180.10 bbls	Collapse PSI: 2570.00 psi
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	Burst PSI: 3950.00 psi
Total Water Needed: 433.32 bbls	



Authorization To Proceed

