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Date



Bison Oil Well Cementing Tail & Lead

Customer: Crestone Peak Resources
Well Name: Ruegge 3C-4H-N165

Date: 4/24/2018
Invoice # 900285
API# 05-123-46569
Foreman: Corey Barras

County: Weld
State: Colorado
Sec: 4
Twp: 1N
Range: 65W

Consultant: Matt Rosales
Rig Name & Number: Ensign 122
Distance To Location: 36 Miles
Units On Location: 4027-3103/4041-3205/4039-3214
Time Requested: 630
Time Arrived On Location: 500
Time Left Location: 1530

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625 Casing Weight (lb) : 40 Casing Depth (ft.) : 2,484 Total Depth (ft) : 2500 Open Hole Diameter (in) : 13.50 Conductor Length (ft) : 80 Conductor ID : 15.6 Shoe Joint Length (ft) : 77 Landing Joint (ft) : 10</p> <p>Sacks of Tail Requested 190 HOC Tail (ft): 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: Max Pressure:</p>	<p>Lead Cement Name: Cement Density (lb/gal) : 13.5 Cement Yield (cuft) : 1.68 Gallons Per Sack 8.90 % Excess 30%</p> <p>Tail 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) 60.0 H2O Wash Up (bbls) 20.0</p> <p>Spacer Ahead Makeup 60 BBL with Die in 2nd 10</p>

Casing ID 8.835	Casing Grade J-55 only used
Lead Calculated Results	Tail Calculated Results
HOC of Lead 1967.34 ft	Tail Cement Volume In Ann 241.30 cuft
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
Volume of Lead Cement 961.50 cuft	Total Volume of Tail Cement 208.52 Cuft
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor 65.76 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 1027.26 cuft	HOC Tail 426.66 ft
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement 237.84 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 794.90 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 168.44 bbls	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure 585.23 PSI
Displacement 183.21 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: 458.30 bbls	

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Authorization To Proceed