Bison Oil Well Cementing
Single Cement Surface Pipe

Date:	2/2/2018
Invoice #	200237
API#	
Foreman:	Kirk Kallhoff

Customer: Anadarko Petroleum Corporation

Well Name: azul 13-11hz

County:	Weld	Consultant:	levi
State:	Colorado	Rig Name & Number:	CARTEL 88
		Distance To Location:	37
Sec:	3	Units On Location:	4028/4030/4035
Twp:	1n	Time Requested:	700 pm
Range:	68w	Time Arrived On Location:	600 pm
		Time Left Location:	12:00 am

WELL DATA

Casing Size OD (in) :	9.625
Casing Weight (lb) :	36.00
Casing Depth (ft.) :	1,860
Total Depth (ft) :	1870
Open Hole Diameter (in.) :	13.50
Conductor Length (ft) :	80
Conductor ID :	15.5
Shoe Joint Length (ft) :	40
Landing Joint (ft) :	8
Max Rate:	8
Max Pressure:	2000

Cement Data

Cement Name:	BFN III
Cement Density (lb/gal) :	14.2
Cement Yield (cuft) :	1.48
Gallons Per Sack:	7.48
% Excess:	5%
Displacement Fluid lb/gal:	8.3
BBL to Pit:	
Fluid Ahead (bbls):	30.0
H20 Wash Up (bbls):	10.0

Spacer Ahead Makeup
30 BBL WATER, DYE IN 2ND 10

Casing ID	8.921	Casing Grade	J-55 only used

Calculated Results

Displacement: 141.32 bbls

cuft of Shoe   17.36   cuft

(Casing ID Squared) X (.005454) X (Shoe Joint ft)

(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

Pressure of cement in annulus

cuft of Conductor   64.40   cuft

(Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)

Hydrostatic Pressure: 1372.12 PSI

Pressure of the fluids inside casing

cuft of Casing   913.44   cuft

(Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)

Displacement: 784.75 psi

Shoe Joint: 29.51 psi

Total Slurry Volume   995.20   cuft

(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)

Total   814.26 psi

bbls of Slurry   177.25   bbls

(Total Slurry Volume) X (.1781)

Differential Pressure: 557.86 psi

Sacks Needed   672   sk

(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

Collapse PSI: 2020.00 psi

Burst PSI: 3520.00 psi

Mix Water   119.76   bbls

(Sacks Needed) X (Gallons Per Sack) ÷ 42

Total Water Needed: 301.08 bbls

X ~~signature~~
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
Single Cement Surface Pipe

Customer	Anadarko Petroleum Corporation
Well Name	azul 13-11hz

INVOICE #	200237
LOCATION	Weld
FOREMAN	Kirk Kallhoff
Date	2/2/2018

DESCRIPTION OF JOB EVENTS

Amount Pumped		Time/Date	Event	Description	Rate	BBLs	Pressure
% Excess	5%	600 pm	ARRIVE ON LOCATION	ACCESS LOCATION			
Mixed bbls	119.6	615 pm	MIRU	SPOT EQUIPMENT			
Total Sacks	672	940 pm	JSA				
bbl Returns	12	1005 pm	PRESSURE TEST LINES	PRESSURE TEST TO 1300 PSI			1200
Water Temp	60	1007 pm	Spacer Ahead	30 BBLS H2O DYE IN 2ND 10	6	30	200
		1011 pm	CEMENT	672 SKS CEMENT 14.2 LBS 177 BBLS SLURRY	6	177	250
Notes:		1043 pm	SHUT DOWN				0
		1045 pm	DROP PLUG				
		1045 pm	START DISPLACEMENT	DISPLACE 141.3 BBLS H2O	6	141.3	350
		1110 pm	BUMP PLUG	650 PSI LIFT PSI		141.3	1220
		1111 pm	CHECK FLOATS	FLOATS HELD, .5 BBL BACK			
		1120 pm	RIG DOWN				
		1200 am	LEAVE LOCATION				

X _Kirk Kallhoff_
Authorized signature

X APC
Title

X 2-2-18
Date

SERIES 2000