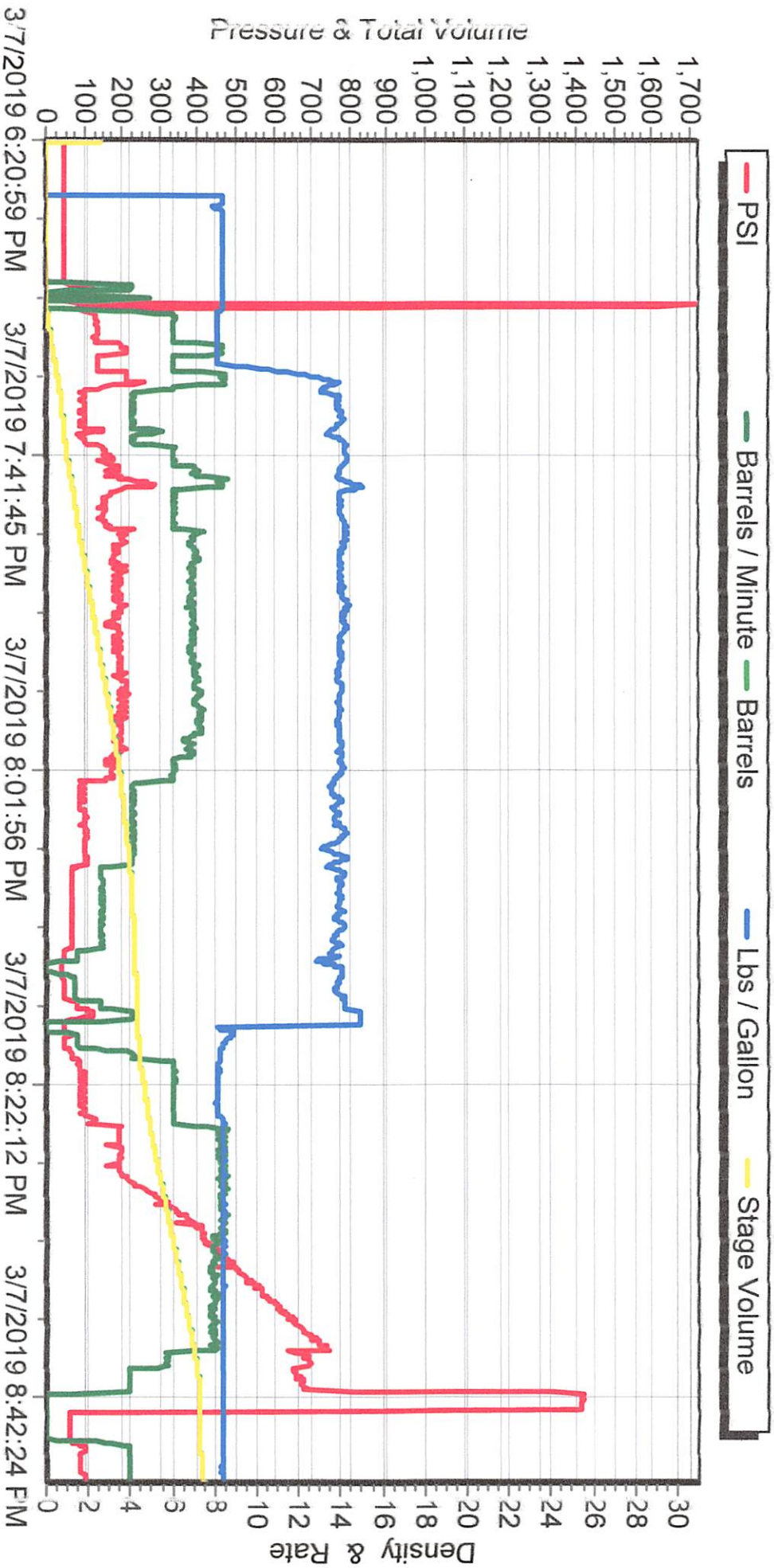


Date _____

JDB 15-5HZ





Bison Oil Well Cementing Single Cement Surface Pipe

Date: 3/7/2019

Invoice # 606447

API# 05-123-49222

Foreman: Nick Vigil

Customer: Anadarko Petroleum Corporation

Well Name: JDB 15-5HZ

County: Weld

State: Colorado

Sec: 8

Twp: 1N

Range: 05W

Consultant: Brett

Rig Name & Number: Cartel 88

Distance To Location: 34 Miles

Units On Location: 4045/4044/4030/4023

Time Requested: 16:00

Time Arrived On Location: 15:00

Time Left Location:

WELL DATA

Casing Size OD (in) : 9.625
Casing Weight (lb) : 36.00
Casing Depth (ft) : 1,922
Total Depth (ft) : 1932
Open Hole Diameter (in.) : 13.50
Conductor Length (ft) : 80
Conductor ID : 15.25
Shoe Joint Length (ft) : 44
Landing Joint (ft) : 10

Max Rate: 8
Max Pressure: 2000

Cement Data

Cement Name: BFN III
Cement Density (lb/gal) : 14.2
Cement Yield (cuft) : 1.49
Gallons Per Sack: 7.48
% Excess: 10%
Displacement Fluid lb/gal: 8.3
BBL to Pit:
Fluid Ahead (bbls): 30.0
H2O Wash Up (bbls): 10.0

Spacer Ahead Makeup
Dye in second 10 bbl

Casing ID

8.921

Casing Grade

J-55 only used

Calculated Results

cuft of Shoe 19.10 cuft
(Casing ID Squared) X (.005454) X (Shoe Joint ft)
cuft of Conductor 61.05 cuft
(Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)
cuft of Casing 990.26 cuft
(Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)
Total Slurry Volume 1070.41 cuft
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)
bbls of Slurry 190.64 bbls
(Total Slurry Volume) X (.1781)
Sacks Needed 718 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)
Mix Water 127.94 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement: 145.96 bbls

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

Pressure of cement in annulus

Hydrostatic Pressure: 1417.86 PSI

Pressure of the fluids inside casing

Displacement: 809.76 psi

Shoe Joint: 32.46 psi

Total 842.22 psi

Differential Pressure: 575.64 psi

Collapse PSI: 2020.00 psi

Burst PSI: 3520.00 psi

Total Water Needed: 313.90 bbls

X
Authorization To Proceed



BISON OILWELL CEMENTING JOB SAFETY ANALYSIS WORKSHEET










JOB/TASK: SURFACE CASING CEMENTING		CEMENTER/SUPERVISOR: Nick Vigil		PAGE 1	OF 3
WELL NAME: JDB15-542		RIG #: 88	LOCATION: cr. 31 + cr. 8	DATE: 5/17/2019	
OPERATOR: Anadarko		CONSULTANT: Brett		INVOICE #: 606447	
PPE REQUIRED: <input type="checkbox"/> Hard Hat <input type="checkbox"/> FR Coveralls <input type="checkbox"/> Goggles <input type="checkbox"/> Air Purifying Respirator <input type="checkbox"/> Safety Glasses <input type="checkbox"/> Reflective Vest <input type="checkbox"/> Faceshield <input type="checkbox"/> Supplied Air Respirator <input type="checkbox"/> Steel Toe Boots <input type="checkbox"/> Chemical Resistant Gloves <input type="checkbox"/> Personal H2S Monitor <input type="checkbox"/> Impact Gloves <input type="checkbox"/> Chemical Resistant Clothing <input type="checkbox"/> Personal Methane Monitor					
JOB STEPS		POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE		REVIEWED BY
1. Review JSA		Misunderstanding	Clarify job and associated hazards and safety concerns		NV
2. Conduct pre job safety meeting		Misunderstanding	- Hold safety meeting with all personnel on location, ensure everyone pays attention to ensure they understand their role and responsibility during the job - Review treatment report with consultant and attain signature for authorization to proceed - Identify and address short service employees (SSE) who are on location		NV
3. Move trucks in and rig up equipment		Other traffic on location, overhead lines, pinch points, heavy lifting, slips/falls	- Coordinate with well site supervisor for directions on where and when to park the equipment - All Bison crew members walk the location prior to driving in to access specific hazards - Utilize spotters when trucks are in motion - Establish buffer zone around equipment utilizing cones and caution tape - Cementer follows up to ensure connections are secure - Lift with your legs and use teamwork when rigging up - Utilize reflective vests and wands to increase visibility at night - Deploy spill berms and buckets		NV
4. Raise cement head and hoses to rig floor		Overhead work, improper hookup/load not properly secured, poor communication between ground personnel and crane/tugger operator	- Inspect slings, chains and hooks prior to lift - Ensure line of sight with crane/tugger operator is maintained throughout the lift and hand signals are understood - Ensure no personnel are under suspended equipment - Utilize a tag line to control the load		NV
5. Connect Cement head/swage/plin, chickens and hoses.		Working in a congested area, pinch points, swinging hammers, slippery rig floor	- Only Bison personnel install the cement head and hoses - Maintain line of sight and communication with crane/tugger operator - Remove non-essential personnel from rig floor, wait until other activity is done - Rig crew does not install chains until head and hoses are installed - Ensure a clear path when swinging a hammer - Ensure all fittings and hoses have proper pressure rating for the job and fall within the parameters of the Bison Oilwell Iron Inspection Program		NV
6. Pressure test lines	Test to: PSI- 1500 Maximum pressure allowed for job: PSI- 2500	Equipment failing under high pressures	- Ensure rig floor is clear and personnel are away from hoses prior to test - Establish buffer area around high pressure hoses - Lines are checked from a distance and using pressure gauges - Cementer ensures pressure gauges are functioning properly	Pressure relief valve set to: PSI- 2000 Max. pump pressure: PSI- 10000	NV
7. Pump Spacer (dye marker)/Mix and Pump Cement		Serious injury from high pressure line failure or catastrophic equipment failure. Casing hydraulicing from hole, causing injury. Burns or skin irritation from splashing cement, uncontrolled spills	- Pressure test prior to job, utilize heavy duty hose hobbles and pressure relief valve - Keep rig floor and buffer area clear while pumping - Utilize proper PPE - Have access to water to rinse affected skin - Deploy spill berms and buckets		NV

BISON OILWELL CEMENTING JOB SAFETY ANALYSIS WORKSHEET

8. Drop plug		Slips, trips, falls. Miscommunication between pump operator and cementer, pressure against a closed stop	<ul style="list-style-type: none"> -Utilize 3 points of contact while descending/climbing ladder and stairs -Have visual contact between cementer and pump operator before pump is engaged 	NV
9. Displacement		Unexpected pressure associated with resuming of pumping, casing hydraulic failure from hole, serious injury from high pressure line failure or catastrophic equipment failure.	<ul style="list-style-type: none"> -Ensure rig floor remains clear and non-essential personnel stay clear from buffer area -Pump operator monitors pump pressure constantly -Utilize proper PPE 	NV
10. Bump plug-Test float and release pressure		Pressure jumps before expected (calculated) displacement. Pressure jumps rapidly and higher than expected.	<ul style="list-style-type: none"> -Pump operator slows rate to 2 BPM when 5 bbls from calculated displacement and down to 1 bpm within 2 bbls of calculated displacement -Pump operator monitors pressure constantly -Pressure relief valve installed on pump 	NV
11. Pressure test casing (If required)	Test to: PSI-NA FOR: MIN- NA	Serious injury from high pressure line or catastrophic equipment failure	-Ensure rig floor remains clear and non-essential personnel stay clear from the buffer area	NV
12. Wash up / rig down		Splashing cement slurry, heavy lifting, pinch points, unsecured hoses	<ul style="list-style-type: none"> -Utilize stakes or portable tank manifold to secure hoses -Use proper lifting technique (2 man lift, lift with legs, plan your route) 	NV
13. Depart location		Other traffic and personnel and location, overhead lines	<ul style="list-style-type: none"> -All Bison crew member walk the planned exit route to access possible obstacles and hazards -Utilize spotters while backing 	NV
14. General Precautions/Stop Work - If you see a leaking connection, notify the cementer. Do not attempt to hammer up a leaking connection as there may be pressure on the lines. -Any person on location, regardless of their position or experience level has the authority and responsibility to stop the job if they witness an unsafe act or condition.				NV
15. OTHER HAZARDS SPECIFIC TO LOCATION OR ENVIRONMENT NOT ADDRESSED ABOVE:				NV
DESIGNATED EMERGENCY MUSTER AREA:		Entrance to location.		
		NEAREST EMERGENCY MEDICAL FACILITY (OTHER THAN 911): Brighton		



BISON OILWELL CEMENTING JOB SAFETY ANALYSIS WORKSHEET

Signature and Company	
 Nick Van	Bison
	Bison
	Bison
	Bison
 David Smith	ABC
	Mesa
	Cabel
	
	Cabel