



**Bison Oil Well Cementing
Single Cement Surface Pipe**

INVOICE #
LOCATION
FOREMAN
Date

606447
Weld
Nick Vigil
3/7/2019

Customer Manadarko Petroleum Corporation
Well Name JDB 15-5HZ

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

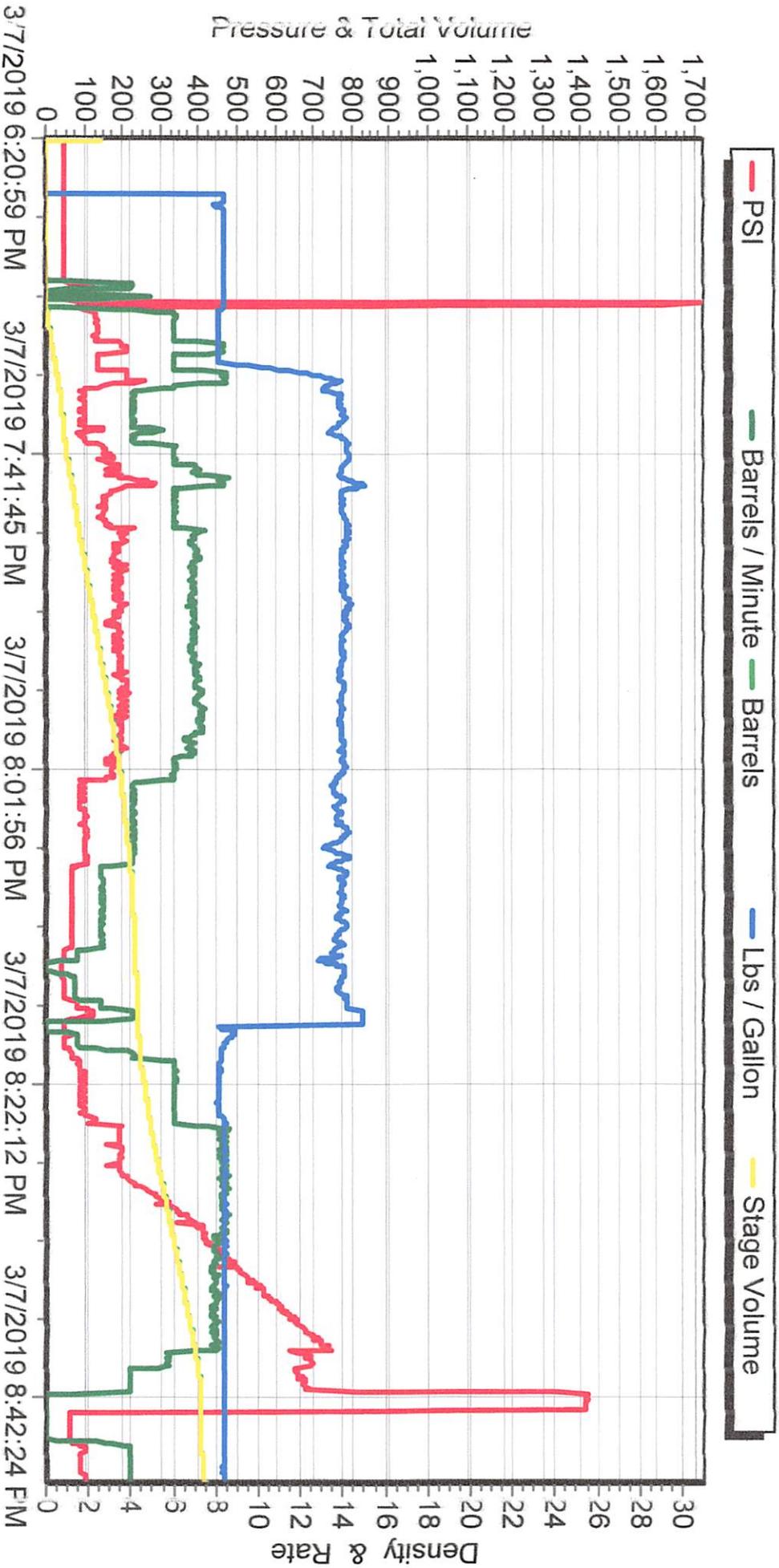
Amount Pumped	Time/Date	Event	Description	Rate	BBLs	Pressure
% Excess 10%	15:00	Arrive On Location	Rig was running casing.			
Mixed bbls 190.6	15:05	Well Site Assessment	Hazard hunt, Rig up safety meeting			
Total Sacks 718	18:00	Rig Up Equipment				
bbl Returned 5	19:15	JSA	Held Safety meeting with all personnel involved in job.			
Water Temp 45	19:34	Pressure Test Lines	Pressure tested lines to 1700 psi.			
	19:35	Spacer Ahead	Fresh water with dye in second 10 bbl.	8	30	210
Notes:	19:38	Pump Cement	14.2 ppg Cement	7	190.6	200
	20:20	Shut Down				
	20:21	Drop Plug	Plug was pre loaded			
	20:21	Pump Displacement	Fresh water	8	70	380
	20:45	Bump Plug	Bumped plug 750 psi over final lift (1400psi)	3.8	145.9	650
	20:46	Check Floats	Floats held (flowed back .5 bbl)			
	20:47	End Job				
	20:50	Rig Down Equipment				
	21:15	Leave Location				

X David [Signature]
Work Performed

X Co-man
Title

X 3-7-19
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	Cement Data
Casing Size OD (in) : 9.625	Cement Name: BFN III
Casing Weight (lb) : 36.00	Cement Density (lb/gal) : 14.2
Casing Depth (ft) : 1,922	Cement Yield (cuft) : 1.49
Total Depth (ft) : 1932	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 10%
Conductor Length (ft) : 80	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit:
Shoe Joint Length (ft) : 44	Fluid Ahead (bbls): 30.0
Landing Joint (ft) : 10	H2O Wash Up (bbls): 10.0
Max Rate: 8	Spacer Ahead Makeup
Max Pressure: 2000	Dye in second 10 bbl

Calculated Results	Pressure of cement in annulus
cuft of Shoe 19.10 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: 145.96 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor 61.05 cuft (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: 1417.86 PSI
cuft of Casing 990.26 cuft (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume 1070.41 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 809.76 psi
bbls of Slurry 190.64 bbls (Total Slurry Volume) X (.1781)	Shoe Joint: 32.46 psi
Sacks Needed 718 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total 842.22 psi
Mix Water 127.94 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	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 #: 60647	
PPE REQUIRED: <input type="checkbox"/> Hard Hat <input type="checkbox"/> FR Coveralls ADDITIONAL PPE (based on job specific hazards) <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 <i>Bison Oilwell Iron Inspection Program</i>	NV		
6. Pressure test lines	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	NV
	Test to: PSI- 1500 Maximum pressure allowed for job: PSI- 2500			Max. pump pressure: PSI- 10000	
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	-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.	-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.	-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	-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	-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

BISON OILWELL CEMENTING JOB SAFETY ANALYSIS WORKSHEET

	Signature and Company
	 Bison
	 Bison
	 Bison
	 Bison
	 ABC
	 Bison
	 Cabel
	 Cabel
	 Cabel