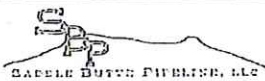


TEST SPECIFICATIONS						Date:		Select Routing:																									
Saddle Butte Rockies Midstream, LLC - Hydrostatic Pressure Test						21-Feb-2018																											
McGlothlin Well Connect						Test Number: 1		of 1																									
Project Name: Rangeview J Lateral			Project I.D. / AFE Number 17C004A			Facility Name or Number McGlothlin Well Pad																											
Installation Location (M.P. or S.S.): 0+00 to 0+80		State: CO	County/Parish: Weld		Class Location Designation	N/A	Selected Design Pressure	1480	Planned MAOP 1400																								
Project Description:																																	
Hydrostatic pressure test of the 4" well connect pipeline.																																	
Testing at 1.25*MAOP = 1850 psig minimum test pressure. 2098 psig Target Test Pressure at Chart Location																																	
Max Test Pressure for ANSI 600 Valves and Fittings is 2660 psig where they are located.																																	
Test shall be compliant with all test specifications in Exhibit D "Pipeline Construction Specifications" and all other Construction Documents.																																	
LEAK ONLY TEST <input type="checkbox"/> STRENGTH TEST <input checked="" type="checkbox"/> FABRICATION <input type="checkbox"/> NEW CONSTRUCTION <input checked="" type="checkbox"/> REPLACEMENT <input type="checkbox"/> RETEST <input type="checkbox"/> REFERENCE DRAWINGS ATTACHED <input type="checkbox"/>																																	
POST-INSTALLATION TEST <input checked="" type="checkbox"/> PRE-INSTALLATION TEST <input type="checkbox"/>																																	
Test Design Criteria					Test Section - Reference Data																												
Minimum Component Characteristics		Test Pressure Calculations																															
Pipe Information		<input type="checkbox"/> Input minimum and maximum pressure of test <input type="checkbox"/> Input minimum and maximum %SMYS of test			Test Medium: Water Test Duration: 8 Hours (min) Section Length: 80 Ft. Section Fill Volume: 66 Gal Max. Elevation Change: 8 Ft.																												
Valve/Flange ANSI Class Rating 600# Valves/Fittings		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Pressure (psig)</th> <th>% PIPE SMYS</th> </tr> </thead> <tbody> <tr> <td>Max. Test Pressure (Pipe)</td> <td>2350</td> <td>54.1%</td> </tr> <tr> <td>Max. Test Pressure (Valves and Fittings)</td> <td>2660</td> <td>61.2%</td> </tr> <tr> <td>Min.</td> <td>1850</td> <td>42.6%</td> </tr> </tbody> </table>				Pressure (psig)	% PIPE SMYS	Max. Test Pressure (Pipe)	2350	54.1%	Max. Test Pressure (Valves and Fittings)	2660	61.2%	Min.	1850	42.6%	Station Equations: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>Back</td> <td>0+00</td> <td>0+00</td> <td>0+00</td> </tr> <tr> <td>Ahead</td> <td>0+00</td> <td>0+00</td> <td>0+00</td> </tr> </tbody> </table>						1	2	3	Back	0+00	0+00	0+00	Ahead	0+00	0+00	0+00
	Pressure (psig)	% PIPE SMYS																															
Max. Test Pressure (Pipe)	2350	54.1%																															
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	1	2	3																														
Back	0+00	0+00	0+00																														
Ahead	0+00	0+00	0+00																														
Test Pressures																																	
Location	Station	Elevation (feet)	Max. psig.	% SMYS @ Max.	Min. psig.	% SMYS @ Min.	Variance psig.	Target psig.	% SMYS @Target																								
BEGIN -	0+00	4623	2,347	54.0%	1,850	42.6%	497	2,098	48.3%																								
HIGH ELEVATION	0+00	4623	2,347	54.0%	1,850	42.6%	497	2,098	48.3%																								
LOW ELEVATION	0+40	4615	2,350	54.1%	1,853	42.7%	497	2,101	48.4%																								
END	0+80	4623	2,347	54.0%	1,850	42.6%	497	2,098	48.3%																								
Chart Location (Test Point)	0+00	4623	2,347	54.0%	1,850	42.6%	497	2,098	48.3%																								
REMARKS:																																	
ASME B16.5 2.6 System Hydrostatic Testing 2003: Flanged joints and flanged fittings may be subjected to system hydrostatic tests at a pressure of 1.5 times the 38°C (100°F) rating rounded off to the next higher 1 bar (25 psi) increment. Testing at any higher pressure is the responsibility of the user, taking into account the requirements of the applicable code or regulation.																																	
Test shall be compliant with all test specifications in Exhibit D "Pipeline Construction Specifications" and all other Construction Documents.																																	
PRE-TEST SPECIFIED / REVIEWED BY:			TEST PERFORMED / ACCEPTED BY:			POST-TEST REVIEWED BY:																											
Originator (Signature)	Date:	Test Performed by (Signature):			Date:	Compliance (signature)		Date:																									
Designed Reviewed if applicable (Signature)	Date:	Company Name (for Contractor or for Employee):			Date:	Engineering or Operations (Signature)		Date:																									
Compliance (Signature)	Date:	Witnessed & Accepted by Company Representative:			Date:	Actual MAOP																											



April 2006

MOP Establishment and Pressure Testing of Pipelines
TG1601.190

PAGE 1 OF 9

LIQUID PIPELINE
PRESSURE TEST
REPORT

Pressure Test Number

1 3-8-18

MOP of tested facility is

1400

PSIG

Company:

Saddle Butte

Operations Area:

Project:

Rogersview J

AFE:

17C004A

Pipeline:

McGlothlin Well Connect

Section:

ALL

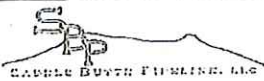
Station or Milepost

From:

0+00

To:

0+80

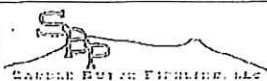


INSTRUCTIONS

PAGE 2 OF 9

In this worksheet, cells containing formulas are protected against input.
Cells with **BLUE** text labels allow or require input.

<i>General Information</i>	<ul style="list-style-type: none"> Complete this Report and attached necessary exhibits for all SBP installed pipelines or pipeline segments or those re-qualified for service. Fill in all applicable information. If information is not applicable, write NA in the corresponding space on the Report.
<i>Pipe Data</i>	<ul style="list-style-type: none"> Record the details for each pipe section tested, including lengths, line fill, pipe fittings, etc. Add together pipe section lengths and line fill for a total pipe section length and line fill.
<i>Test Water Data</i>	<ul style="list-style-type: none"> Enter water source information (i.e., from municipal supply, well, river, lake, pond) in the Test Log or notes section of the Report. Source water temperature compared to ground temperature can assist with understanding the time for the water to stabilize.
<i>Pressure Calculations</i>	<ul style="list-style-type: none"> Elevation of high and low points and the elevation of the test pressure measure sites is required for calculation of the target test pressures.
<i>Test Log</i>	<ul style="list-style-type: none"> Fill out the Test Log at the time of the test. This is the actual log of the test. From the start of filling the test section, record pressure readings from the calibrated test gauge or deadweight tester used in the test. Record the test pressure and temperatures at intervals of 30 minutes to an hour and as necessary to represent the test pressure during the test period. The below ground pipe temperature sensor should be placed away from exposed pipe and far enough from the water injection point so that water injected will not affect the readings. In the Remarks column, enter start of test, end of test, and any remarks concerning unusual events, such as liquid added or withdrawn, weather conditions, etc.
<i>Notes</i>	<ul style="list-style-type: none"> Enter all pertinent comments about the test, including such things as weather conditions, radical weather changes, equipment malfunctions, or any other noteworthy event that may affect testing.
<i>Profile</i>	<ul style="list-style-type: none"> An elevation profile is required for any test section where the elevation varies more than 100 feet. The following items should be noted on the profile: <ul style="list-style-type: none"> Location and elevation where test pressure measurements are taken High and low points Stationing or mileposts Horizontal and vertical scale of the drawing Elevation data is available in electronic format from the KPL mapping system. If electronic elevation data is not available, take profile elevations from survey information or from U.S. Geological Service 7 1/2 minute topographical maps.
<i>Failure Log</i>	<ul style="list-style-type: none"> Record each failure event that causes the line to be taken "off test". Enter the date, time, and pressure at the time of failure. List the apparent cause of the failure if the actual cause cannot be determined. Pipe seam failure or leaking flange, for example, could be entered as the cause of test failure. Describe the repair method (i.e., changed-out pipe or tightened flange).
<i>Supplementary Documentation</i>	<ul style="list-style-type: none"> Check each supplementary documentation attached as part of this test record (i.e., test charts and/or equipment certifications). Write the corresponding Exhibit Number on the attached supplementary documentation.
<i>Certification</i>	<ul style="list-style-type: none"> Signatures of the Company and Contractor representatives in charge of the test are MANDATORY.



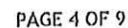
PRESSURE CALCULATIONS

PAGE 3 OF 9

Location of Test Point <u>0+00</u>	Elevation of Test Point 4623 Ft. (Elevation) 0+00 Ft. (Station)	High Point 4623 Ft. (Elevation) 0+00 Ft. (Station) Location Name	Low Point 4615 Ft. (Elevation) 0+40 Ft. (Station) Location Name
Target MOP: <u>1400</u>	Test Duration: <u>8</u> hr	Start Point 4623 Ft. (Elevation) 0+00 Ft. (Station) Location Name	End Point 4623 Ft. (Elevation) 0+80 Ft. (Station) Location Name
Target Test Pressure Range 1st Min: <u>2109</u> Maximum: <u>2350</u> 2nd Min:	High Point Low Point		

TEST LOG

DATE	TIME	PRESSURE	AMBIENT TEMP	BELOW GROUND TEMP	ABOVE GROUND TEMP	REMARKS
3-8-18	6:15 AM	0	23	25	32	DARK
	6:30	0	23	25	34	Build to 500 PSI
	6:30	504	23	25	34	
	6:45	508	24	25	35	Build to 1000
	6:45	1002	24	25	35	Cloudy
	7:00	1005	25	25	36	Build to 1500
	7:00	1500	25	25	36	
	7:15	1504	26	25	36	Build to 2000
	7:15	2002	26	25	36	
	7:30	2005	27	25	36	Build to 2098 +
	7:30	2104	27	25	36	
*	7:45	2109	29	25	37	* BEGIN TEST *
	8:00	2113	28	25	38	Mostly Cloudy, exposed pipe
	8:15	2119	29	25	39	is covered and heated
	8:30	2130	29	25	40	Check for leaks, check 1" valves
	8:45	2142	31	25	41	
	9:00	2156	33	25	42	Mostly Sunny
	9:15	2172	35	25	44	Turn some heat off
	9:30	2176	37	25	47	
	9:45	2180	39	25	49	
	10:00	2181	42	25	51	
	10:15	2190	42	25	54	
	10:30	2209	43	25	56	
	10:45	2222	45	25	58	Bleed to 2120
	11:00	2131	48	25	58	
	11:15	2141	50	25	57	Check for leaks, check 1" valves
	11:30	2150	52	25	56	
	11:45	2161	54	25	55	SUNNY, WILLY
	12:00	2179	56	25	56	
	12:15	2193	58	25	56	Check for leaks, check 1" valves
	12:30	2207	59	25	57	
	12:45	2219	61	25	58	Bleed to 2120
	1:00	2120	61	25	58	
	1:15	2140	62	25	58	
	1:30	2151	62	25	58	
	1:45	2159	63	25	58	
	2:00	2163	63	25	58	
	2:15	2167	63	26	58	
	2:30	2176	63			





TEST EQUIPMENT

PAGE 5 OF 9

PRESSURE RECORDER 1:

Mfg. Barton
Model _____
Serial No. 202A-121213
Range 0-3000 PSI
0-150° F
Notes: Cal on 2-20-18

PRESSURE RECORDER 2:

Mfg. _____
Model _____
Serial No. _____
Range _____
Notes: _____

DEADWEIGHT TESTER OR CALIBRATED TEST GAUGE:

Mfg. Crystal Engineering
Model XP2
Serial No. 352036
Date of last Calibration 2-23-18
Calibrated by APX
Range 0-5000 PSI
Notes: _____

TEMPERATURE RECORDER:

Mfg. Barton
Model _____
Serial No. 265-3312
Range 0-150° F
Notes: Cal on 2-13-18

CALIBRATION OF TEMPERATURE RECORDER

Temperature recorder reading	Test mercury thermometer reading	Remarks

CALIBRATION OF PRESSURE RECORDER 1

Pressure recorder reading	Deadweight tester reading	Remarks

CALIBRATION OF PRESSURE RECORDER 2

Pressure recorder reading	Deadweight tester reading	Remarks

NOTES



EQUIPMENT CALCULATED MOP SUMMARY WORKSHEET

PAGE 6 OF 9

1. Test Information:

Target MOP

1400

Enter the desired MOP,
If less than pipe
internal design
pressure.

Date 3-8-18

Time 6:00 AM

Test Point Location

McClouthin/Wacker/Bergview/Jannet

Test Medium

Water

Test Duration 8 hr

Specific Gravity of Test Medium

2.048

110%

Min. Test Press. at test site 125% of min. MOP + elev.

Maximum allowable % of SMYS = 100%

2. Pipe Specifications:

Manufacture Type

Grade X52

Pipe (#1) O.D.

4.5

SMYS

62,000

MOP 1400

Wall thickness

1.88

Seam Joint Factor

Design Factor (F)

Length (ft.):

80

Volume

66 Gal

Max allowable test pressure, psig

3. Pipe Specifications:

Manufacture Type

Grade

Pipe (#2) O.D.

SMYS

MOP

Seam Joint Factor

Design Factor (F)

Wall thickness

Length (ft.):

Volume

Max allowable test pressure, psig

4. Pipe Specifications:

Manufacture Type

Grade

Pipe (#3) O.D.

SMYS

MOP

Seam Joint Factor

Design Factor (F)

Wall thickness

Length (ft.):

Volume

Max allowable test pressure, psig

5. Pipe Specifications:

Manufacture Type

Grade

Pipe (#4) O.D.

SMYS

MOP

Seam Joint Factor

Design Factor (F)

Wall thickness

Length (ft.):

Volume

Max allowable test pressure, psig

6. Pipe Specifications:

Manufacture Type

Grade

Pipe (#5) O.D.

SMYS

MOP

Seam Joint Factor

Design Factor (F)

Wall thickness

Length (ft.):

Volume

Max allowable test pressure, psig

7. Pipe Specifications:

Manufacture Type

Grade

Pipe (#6) O.D.

SMYS

MOP

Seam Joint Factor

Design Factor (F)

Wall thickness

Length (ft.):

Volume

Max allowable test pressure, psig

8. Pipe Fittings Specifications:

Manufacture Type

Grade

Pipe Fitting O.D.

SMYS

MOP

Seam Joint Factor

Design Factor (F)

Fitting Description

Wall thickness

Max allowable test pressure, psig

9. Pipe Fittings Specifications:

Manufacture Type

Grade

Pipe Fitting O.D.

SMYS

MOP

Seam Joint Factor

Design Factor (F)

Fitting Description

Wall thickness

Max allowable test pressure, psig

10. Pipe Fittings Specifications:

Manufacture Type

Grade

Pipe Fitting O.D.

SMYS

MOP

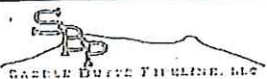
Seam Joint Factor

Design Factor (F)

Fitting Description

Wall thickness

Max allowable test pressure, psig



EQUIPMENT CALCULATED MOP SUMMARY WORKSHEET
(continued)

PAGE 7 OF 9

11. Manufactured:		Weldolet, etc. O.D.	Working Pressure
Manufacture Type	Grade		
Fitting Description			
		Max allowable test pressure, psig	
12. Manufactured:		Pipe Flanges O.D.	Working Pressure
Manufacture Type	Class		
	Temperature Derating Factor (T)		
		Max allowable test pressure, psig	
13. Manufactured:		Pipe Flanges O.D.	Working Pressure
Manufacture Type	Class		
	Temperature Derating Factor (T)		
		Max allowable test pressure, psig	
14. Manufactured:		Block Valve Size	Working Pressure
Manufacture Type	Class		
	Temperature Derating Factor (T)		
		Max allowable test pressure, psig	
15. Calculated MOPs (psi):			
Test Pressure Range @Test Site, psig		125% to psig	110% to psig
Note: Add 0 psi to min. test range			
Maximum test pressure at test site, psig			
CALCULATED TARGET MOP OF PIPELINE SECTION		PSIG	



FAILURE LOG

PAGE 8 OF 9

FAILURE:

Date: _____ Time: _____ am / pm Failure Pressure: _____

Apparent Cause: _____

REPAIR:

Describe Repair Method: _____

FAILURE:

Date: _____ Time: _____ am / pm Failure Pressure: _____

Apparent Cause: _____

REPAIR:

Describe Repair Method: _____

FAILURE:

Date: _____ Time: _____ am / pm Failure Pressure: _____

Apparent Cause: _____

REPAIR:

Describe Repair Method: _____

FAILURE:

Date: _____ Time: _____ am / pm Failure Pressure: _____

Apparent Cause: _____

REPAIR:

Describe Repair Method: _____

FAILURE:

Date: _____ Time: _____ am / pm Failure Pressure: _____

Apparent Cause: _____

REPAIR:

Describe Repair Method: _____



SUPPLEMENTARY DOCUMENTATION

PAGE 9 OF 9

The following marked exhibits are attached as a part of this Test Report:

- EXHIBIT NO. 1 ☐ Sketch of Tested Piping (including how section is isolated), with material list
- EXHIBIT NO. 2 ☐ Profile of pipeline section and/or segment
- EXHIBIT NO. 3 ☐ Pressure Chart, with pressure test number, date, test section name, Inspector name and signature
- EXHIBIT NO. 4 ☐ Temperature Chart, with pressure test number, date, test section name, Inspector name and signature
- EXHIBIT NO. 5 ☐ Pressure Recorder Certification Papers
- EXHIBIT NO. 6 ☐ Temperature Recorder Certification Papers
- EXHIBIT NO. 7 ☐ Deadweight or Calibrated Test Gauge Certification Papers
- EXHIBIT NO. 8 ☐ Field test data log, if hand written
- EXHIBIT NO. 9 ☐ Pressure Test Procedure, if applicable, with MOP Area Representative and Engineer signature approval

CERTIFICATION

I certify this pipeline or pipeline section has been tested and successfully met the terms of SBP MOP Establishment and Pressure Testing of Pipelines Technical Guideline and, where applicable, the contract document between SBP and its prime contractor.

MOP Area Representative

By: _____ Date: _____
(Please print) (Signature)

Engineer

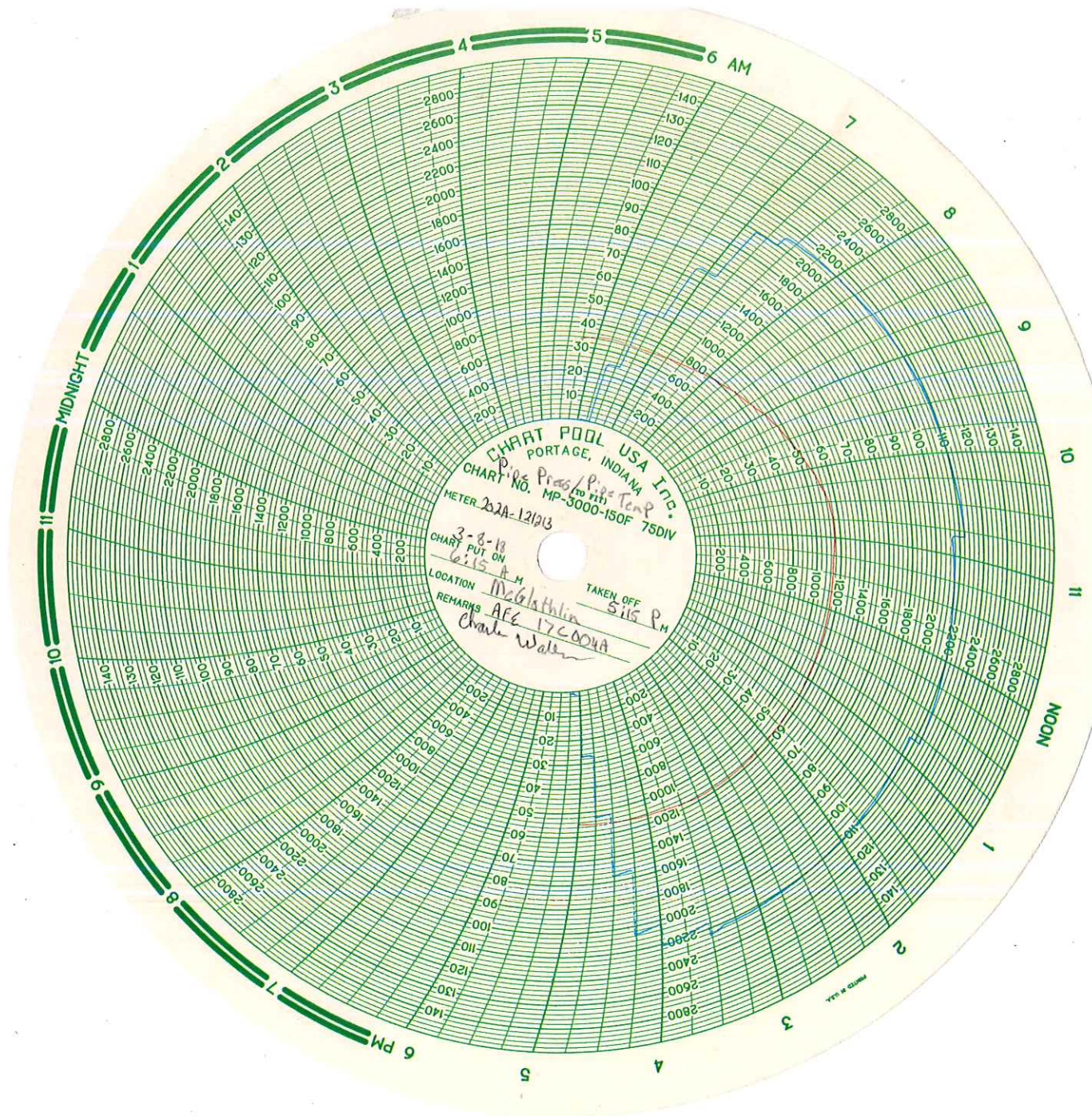
By: _____ Date: _____
(Please print) (Signature)

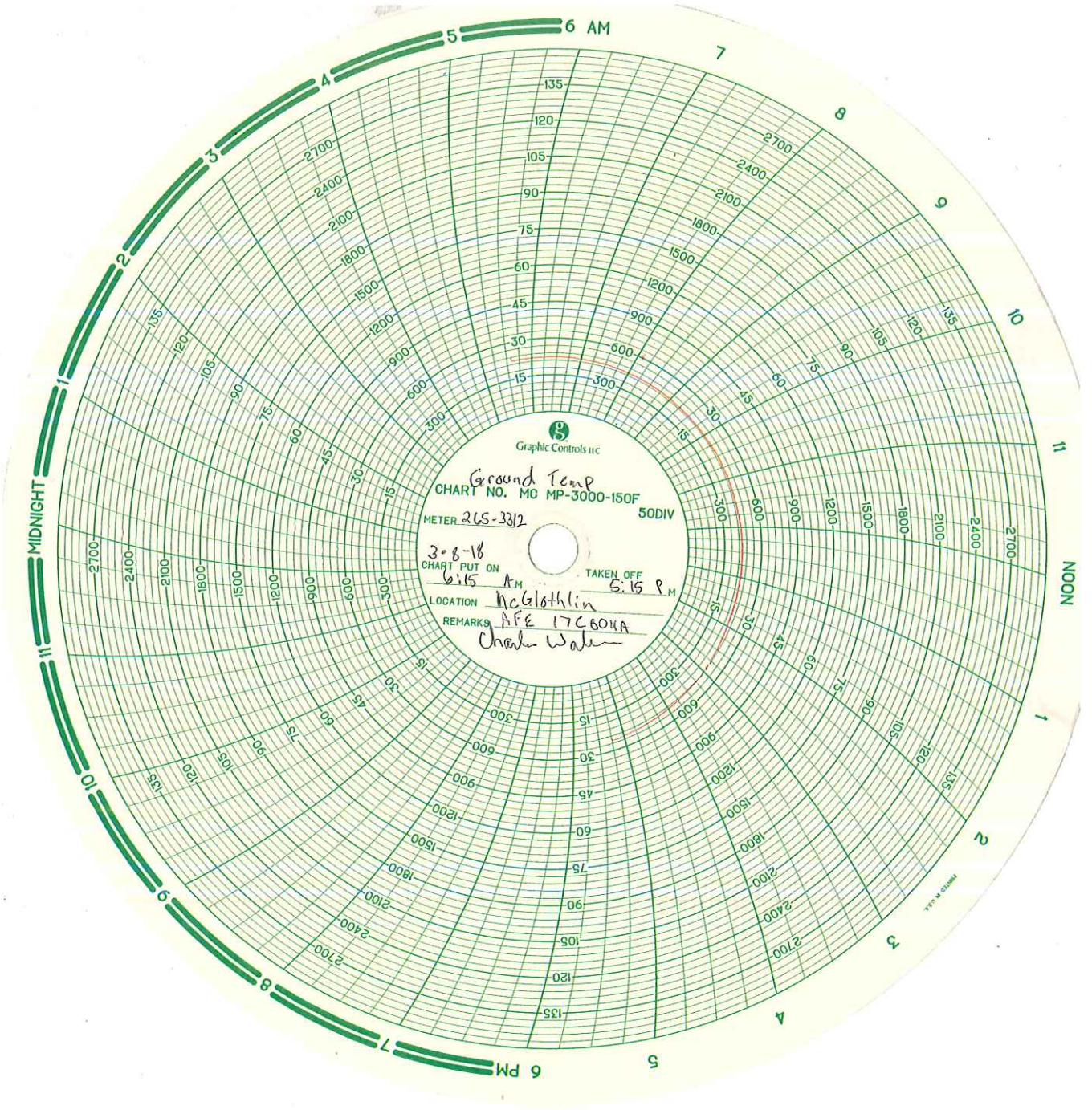
Inspector

By: Charles Wallace Charles Waller Date: 3-8-18
(Please print) (Signature)

Name of Testing Contractor

North Winds of Wyoming
By: Dorwayne Keys Dorwayne Keys Date: 3-8-18
(Please print) (Signature)





PSS-COMPANIES



9700 E. 104TH AVE, UNIT F- HENDERSON, CO 80640 - Phone (303)857-7986 - Fax (303)389-4945

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER: CO

Details +/-: 1.0% ACCURACY

DATE CALIBRATED: 02/20/2018

DUE DATE: 02/20/2019

INDICATED TEMPERATURE RANGE: # 0 – 150°F

INDICATED PRESSURE RANGE: #0 – 3000 PSI

SERIAL NO: 202A-121213

MANUFACTURER: BARTON/ 12" RECORDER

TYPE OF INSTRUMENT CALIBRATED: TEMPERATURE / PRESSURE RECORDER

INSTRUMENT FINDINGS/STATUS: UNIT IS IN TOLERANCE/ INSTRUMENT MEETS OR EXCEEDS SPECIFICATIONS.

BASED ON INTERNATIONAL STANDARDS OF GRAVITY: (980.665 cm./sq.).

TYPE OF STANDARD USED TO CALIBRATE: REFINERY DEADWEIGHT TEST UNIT SPT. (35225-3) SERIAL No. 5268: KESSLER TEST THERMOMETERS; SERIAL NO. CALIBRATION

ALL STANDARD DIRECTLY TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGIES TEST NO: (N.I.S.T.) 2.6/172490 & 6.6/139577.

CALCULATED USING MASS VALUES, AREA, AO, AND STATED GRAVITY.
ROOM TEMPERATURE/HUMIDITY (AT TIME OF TEST): 66°F / 25%.

CALIBRATED BY: NICK BEDFORD


SIGNATURE



7200 E. Dry Creek Rd, STE C-102, Centennial, CO 80112
Ph. 303-804-0667 Cal.Lab@Apex-Instruments.com

Calibration Certificate

Certificate Number: 184319

Customer:

Pipeline Supply & Service
Henderson, CO

Manufacturer: Crystal Engineering
Model Number: XP2i 5000 psi
Serial Number: 352036
Description: Digital Test Gauge
Procedure: CRY_P_XP2i
Calibrated To: Manufacturer's Specifications
Technician: Austin Molyneux

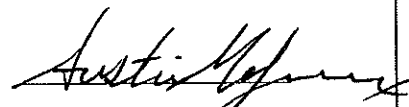
Calibration Date: 2/23/2018
Due Date: 2/23/2019
As Found: In Tolerance
As Left: As Found
Temperature: 72 F
Humidity: 20 %

Tolerance Specs:

0 - 20%: +/- (0.02% of FS)
20% - 100%: +/- (0.1% of Rdg)

Technician Notes:

As Left Userspan: 1.00017

Approved Signatory: 

Apex Instruments certifies that the instrument listed above meets the specifications of the manufacturer at the completion of its calibration. Standards used are traceable to the National Institute of Standards and Technology (NIST), or have been derived from accepted values, natural physical constants, or through the use of the ratio method of self-calibration techniques.

Methods used are in accordance with the procedure listed above. This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

This certificate does not guarantee the continued performance of the instrument listed above. Any modifications or services performed hereafter may void this certificate.

This certificate is not to be reproduced other than in full, except with prior written approval from Apex Instruments Inc.

Standards Used

Description	Model Number	Serial Number	Calibration Date	Due Date	ID
Electronic Deadweight Tester	RPM4-E-DWT A100M/A10M	1709	11/13/2017	11/13/2018	APX00024



APX00674

Ground Temp

PSS-COMPANIES



9700 E. 104TH AVE, UNIT F- HENDERSON, CO 80640 - Phone (303)857-7986 - Fax (303)389-4945

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER: CO

Details +/-: 1.0% ACCURACY

DATE CALIBRATED: 02/13/2018

DUE DATE: 02/13/2019

INDICATED TEMPERATURE RANGE: # 0 – 150°F

INDICATED PRESSURE RANGE: #0 – 3000 PSI

SERIAL NO: 265-3312

MANUFACTURER: BARTON/ 12" RECORDER

TYPE OF INSTRUMENT CALIBRATED: TEMPERATURE / PRESSURE RECORDER

INSTRUMENT FINDINGS/STATUS: UNIT IS IN TOLERANCE/ INSTRUMENT MEETS OR EXCEEDS SPECIFICATIONS.

BASED ON INTERNATIONAL STANDARDS OF GRAVITY: (980.665 cm./sq.).

TYPE OF STANDARD USED TO CALIBRATE: REFINERY DEADWEIGHT TEST UNIT SPT. (35225-3) SERIAL No. 5268: KESSLER TEST THERMOMETERS; SERIAL NO. CALIBRATION

ALL STANDARD DIRECTLY TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGIES TEST NO: (N.I.S.T.) 2.6/172490 & 6.6/139577.

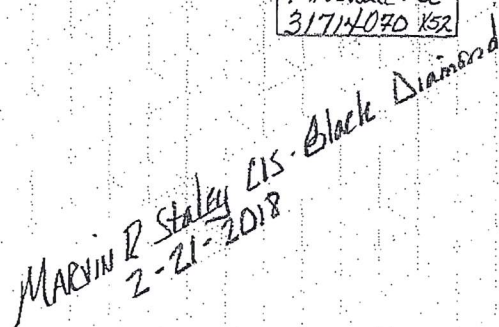
CALCULATED USING MASS VALUES, AREA, AO, AND STATED GRAVITY.

ROOM TEMPERATURE/HUMIDITY (AT TIME OF TEST): 66°F / 25%.

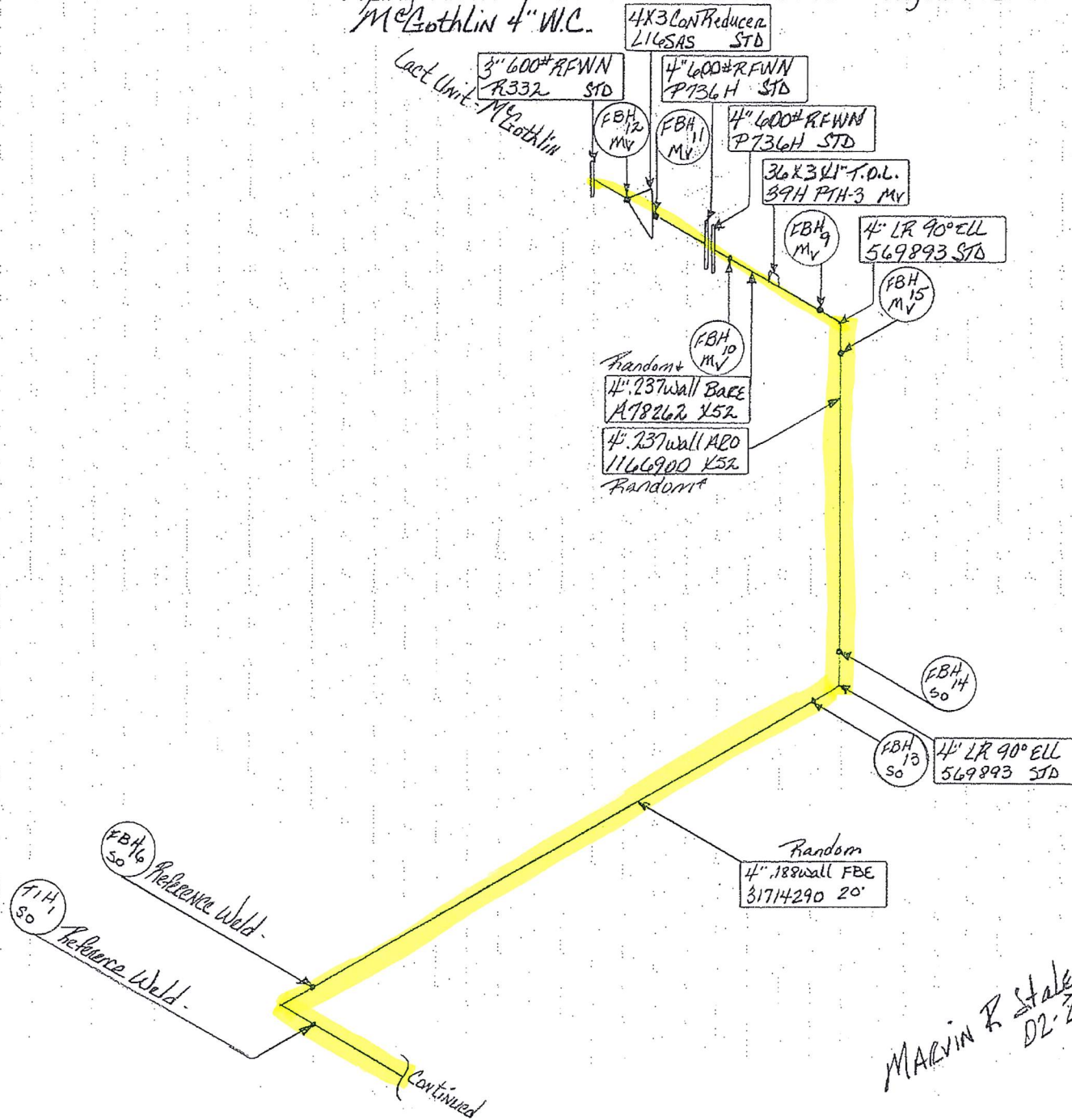
CALIBRATED BY: NICK BEDFORD


SIGNATURE

Page 1 of 2



4" Piping from 4" Receiver to Lack Unit Page 2 of 2
McGothlin 4" W.C.



North

MARVIN R Staley CIS- Black Diamond
02-20-2018

