



April 2006

MOP Establishment and Pressure Testing of Pipelines
TG1601.190

PAGE 1 OF 9

LIQUID PIPELINE
PRESSURE TEST
REPORT

Pressure Test Number 1

MOP of tested facility is PSIG

Company: Saddle Butte Operations Area: _____

Project: Ranger View Pipeline Gathering System AFE: 1405009

Pipeline: Ranger View Pipeline

Section: leg C 170+76 to 239+95

leg C2 0+00 to 30+13

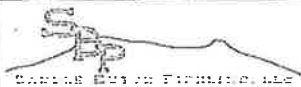
Station or Milepost From: _____ To: _____



INSTRUCTIONS

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

Location of Test Point <u>C2 30+13</u>	Elevation of Test Point <u>4612</u> Ft. (Elevation) <u>30+13</u> Ft. (Station)	High Point <u>4678</u> Ft. (Elevation) <u>C 230+00</u> Ft. (Station) Location Name	Low Point <u>4601</u> Ft. (Elevation) <u>C 226+95</u> Ft. (Station) Location Name
Target MOP: Target Test Pressure Range 1st Min: <u>2213</u> Maximum: 2nd Min:	Test Duration: <u>8</u> hr High Point Low Point	Start Point <u>4605</u> Ft. (Elevation) <u>C170+76</u> Ft. (Station) Location Name	End Point <u>4612</u> Ft. (Elevation) <u>C 230+13</u> Ft. (Station) Location Name

TEST LOG

DATE	TIME	PRESSURE	AMBIENT TEMP	BELOW GROUND TEMP	ABOVE GROUND TEMP	REMARKS
6-13-15	8:30A	500	57			
	8:45	500	57			Start building to 1000
	8:52	1001	59			
	9:08	1001	61			Build to 1500
	9:15	1501	62			
	9:30	1501	64			Build to 2000
	9:38	2002	64			
	9:53	2002	65			Build to 2211
	9:56	2215	67			
	10:00	2213	67			Begin test Sunny/Clear
	10:15	2213	69			
	10:30	2212	70			
	10:45	2212	72			
	11:00	2212	73			
	11:15	2212	75			
	11:30	2213	76			
	11:45	2213	76			
	12:00	2213	77			
	12:15	2213	79			
	12:30	2214	81			
	12:45	2214	82			
	1:00	2214	83			Still sunny and hot
	1:15	2214	83			
	1:30	2214	83			
	1:45	2214	83			
	2:00	2214	83			Becoming a little cloudy
	2:15	2215	84			
	2:30	2215	84			
	2:45	2215	84			
	3:00	2215	84			Partly Cloudy
	3:15	2215	84			
	3:30	2215	84			
	3:45	2215	84			
	4:00	2215	84			cloudy
	4:15	2215	82			
	4:30	2215	82			
	4:45	2214	80			cloudy
	5:00	2214	79			
	5:15	2213	79			Sprinkles



TEST EQUIPMENT

PRESSURE RECORDER 1:

Mfg. Precision Flow
Model _____
Serial No. 365A-3511
Range 0-2500
Notes: _____

PRESSURE RECORDER 2:

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

DEADWEIGHT TESTER OR CALIBRATED TEST GAUGE:

Mfg. Crystal Engineering
Model XP 2i 5000# DL
Serial No. 364359
Date of last Calibration June 10 2015
Calibrated by PSS
Range 0-5000 #
Notes: _____

TEMPERATURE RECORDER:

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

CALIBRATION OF TEMPERATURE RECORDER

Temperature recorder reading	Test mercury thermometer reading	Remarks
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CALIBRATION OF PRESSURE RECORDER 1

Pressure recorder reading	Deadweight tester reading	Remarks
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CALIBRATION OF PRESSURE RECORDER 2

Pressure recorder reading	Deadweight tester reading	Remarks
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NOTES



EQUIPMENT CALCULATED MOP SUMMARY WORKSHEET

1. Test Information:

Target MOP

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

Date 6-13-15 Time 7:30 Am

Test Point Location Leg C 2 30+0

Test Medium Water Test Duration 8 hr

Specific Gravity of Test Medium _____

Min. Test Press. at test site 125% of min. MOP + elev. _____ 110%

Maximum allowable % of SMYS = 100%

2. Pipe Specifications:

Pipe (#1) O.D. 4.5 MOP _____

Manufacture Type _____ Grade _____ SMYS _____ Seam Joint Factor _____

Wall thickness .188 Design Factor (F) _____

Length (ft.): _____ Volume _____

Max allowable test pressure, psig _____

3. Pipe Specifications:

Pipe (#2) O.D. _____ MOP _____

Manufacture Type _____ Grade _____ SMYS _____ Seam Joint Factor _____

Wall thickness _____ Design Factor (F) _____

Length (ft.): _____ Volume _____

Max allowable test pressure, psig _____

4. Pipe Specifications:

Pipe (#3) O.D. _____ MOP _____

Manufacture Type _____ Grade _____ SMYS _____ Seam Joint Factor _____

Wall thickness _____ Design Factor (F) _____

Length (ft.): _____ Volume _____

Max allowable test pressure, psig _____

5. Pipe Specifications:

Pipe (#4) O.D. _____ MOP _____

Manufacture Type _____ Grade _____ SMYS _____ Seam Joint Factor _____

Wall thickness _____ Design Factor (F) _____

Length (ft.): _____ Volume _____

Max allowable test pressure, psig _____

6. Pipe Specifications:

Pipe (#5) O.D. _____ MOP _____

Manufacture Type _____ Grade _____ SMYS _____ Seam Joint Factor _____

Wall thickness _____ Design Factor (F) _____

Length (ft.): _____ Volume _____

Max allowable test pressure, psig _____

7. Pipe Specifications:

Pipe (#6) O.D. _____ MOP _____

Manufacture Type _____ Grade _____ SMYS _____ Seam Joint Factor _____

Wall thickness _____ Design Factor (F) _____

Length (ft.): _____ Volume _____

Max allowable test pressure, psig _____

8. Pipe Fittings Specifications:

Pipe Fitting O.D. _____ MOP _____

Manufacture Type _____ Grade _____ SMYS _____ Seam Joint Factor _____

Fitting Description _____ Wall thickness _____ Design Factor (F) _____

Max allowable test pressure, psig _____

9. Pipe Fittings Specifications:

Pipe Fitting O.D. _____ MOP _____

Manufacture Type _____ Grade _____ SMYS _____ Seam Joint Factor _____

Fitting Description _____ Wall thickness _____ Design Factor (F) _____

Max allowable test pressure, psig _____

10. Pipe Fittings Specifications:

Pipe Fitting O.D. _____ MOP _____

Manufacture Type _____ Grade _____ SMYS _____ Seam Joint Factor _____

Fitting Description _____ Wall thickness _____ Design Factor (F) _____

Max allowable test pressure, psig _____



FAILURE LOG

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: _____



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

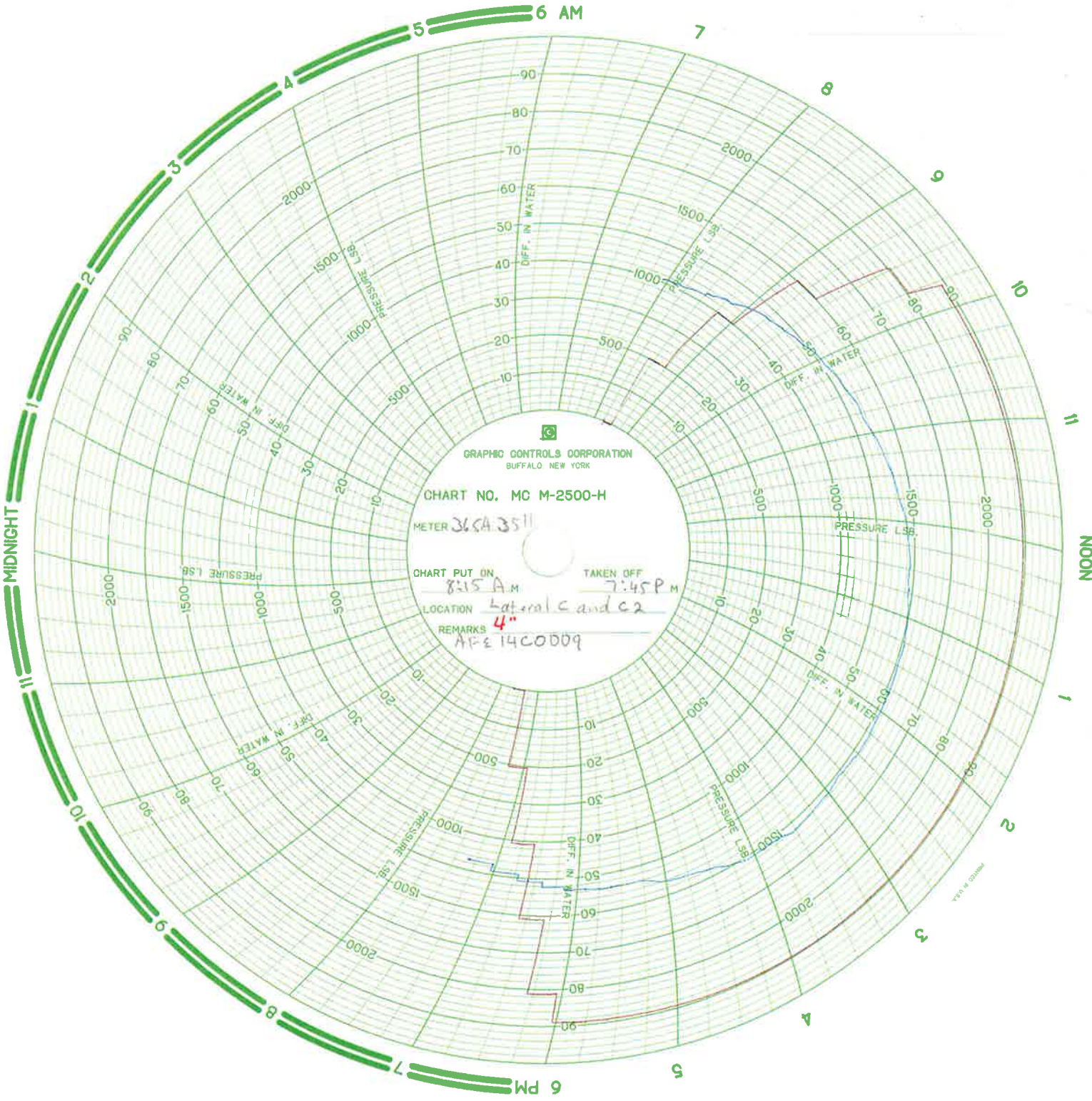
By: _____ Date: _____
(Please print) (Signature)

Inspector

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

Name of Testing Contractor

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



GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK

CHART NO. MC M-2500-H

METER 36543511

CHART PUT ON 8:15 A.M. TAKEN OFF 7:45 P.M.

LOCATION Lateral C and C2

REMARKS 4" AF-E 14C0009

PRINTED IN U.S.A.

PSS COMPANIES



2070 South 4250 West - Salt Lake City, Utah 84104 - Phone (801) 363-1933 - Fax (801) 531-9548

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER: UT 61015-1

Details +/-: 0.05% ACCURACY

DATE CALIBRATED: 06-10-2015
DUE DATE: 06-10-2016
INDICATED TEMPERATURE RANGE: # 0 – 150°F
INDICATED PRESSURE RANGE: # 0 – 2,500 PSI
SERIAL NO: 365A - 3511
MANUFACTURER: PRECISION FLOW INC,

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.).
BASED ON CALIBRATED PISTON AREA: (0.3969154 cm./sq.) (0.061522 cm./sq.).

TYPE OF STANDARD USED TO CALIBRATE: AMERI-WEIGHT DEADWEIGHT TEST UNIT SPT. (50-05) SERIAL No. 1031; KESSLER TEST THERMOMETERS; SERIAL NO, 87B2276 & 403751. CALIBRATION DATE: JULY 14, 2014

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): 77°F (25°C)/ 40%.

CALIBRATED BY: TYLER HALL


SIGNATURE

Certificate of Calibration

By Double EE Service

701-572-2332
 2210 4th Ave. West
 Williston, ND 58801

Manufacturer	Model	Gauge Number	Serial Number	Calibration Date	Expiration Date
Crystal Engineering	XP2i 5000# DL	364359	364359	11/10/2014	11/10/2015

Model Uncertainty
+/- ASME 4A of reading (0.1%)



All instrument calibrations are verified for accuracy before they are shipped. The recommended calibration interval for this instrument is 12 months from the date of verification. Your particular quality assurance requirements may supersede this recommendation.

As Received Condition: In tolerance

As Left Condition: In tolerance

Reference Standards used in this calibration are traceable to the National Institute of Standards and Technology of the United States, through the following report numbers:

Manufacturer	Model	Serial Number	Report Number	Due Date	Reference Uncertainty
Ametek	DM-TQ-150-1AL/C	101860	H28072014-01A	28-Jul-15	Accuracy +/- .015% of Reading

This certificate shall not be reproduced except in full, without written approval.

Laboratory Representative

Quality Representative

Test Results

364359

As Received Test Results

5000 PSI

Reference Reading	Gauge Reading	Allowable Tolerance	Difference	Difference (% of FS)	Condition
0	0.0	1.0000	0.0	0.00%	Pass
1000	999.9	1.0000	-0.1	0.00%	Pass
2000	1999.8	2.0000	-0.2	0.00%	Pass
3000	3000.3	3.0000	0.3	0.01%	Pass
4000	4000.3	4.0000	0.3	0.01%	Pass
5000	5000.5	5.0000	0.5	0.01%	Pass
4000	4000.7	4.0000	0.7	0.01%	Pass
3000	3000.9	3.0000	0.9	0.02%	Pass
2000	2001.0	2.0000	1.0	0.02%	Pass
1000	1000.9	1.0000	0.9	0.02%	Pass
0	0.2	1.0000	0.2	0.00%	Pass

As Left Test Results

5000 PSI

Reference Reading	Gauge Reading	Allowable Tolerance	Difference	Difference (% of FS)	Condition
0	0.0	1.0000	0.0	0.00%	Pass
1000	999.9	1.0000	-0.1	0.00%	Pass
2000	1999.8	2.0000	-0.2	0.00%	Pass
3000	3000.3	3.0000	0.3	0.01%	Pass
4000	4000.3	4.0000	0.3	0.01%	Pass
5000	5000.5	5.0000	0.5	0.01%	Pass
4000	4000.7	4.0000	0.7	0.01%	Pass
3000	3000.9	3.0000	0.9	0.02%	Pass
2000	2001.0	2.0000	1.0	0.02%	Pass
1000	1000.9	1.0000	0.9	0.02%	Pass
0	0.2	1.0000	0.2	0.00%	Pass

AR Head correction:

0 PSI

AL Head correction:

0 PSI

Pressure Error Graph

