Memo to File

Date: July 28, 2014
To: File 146 Destructive & Non-Destructive Inspections
From: Denis Houle
RE: Tk 663 Fill lateral between valves Y663, 653,673 at NTF

An eight (8) hour strength test and leak test was performed as per CSA Z-662-11 on the 24'' pipe lateral pipe to fill Tk 663 between closed Valves Y 663,653,673 at NTF.

Test was performed on July 25, 2014 from 18h30 to 16h45. Water was used as the medium.

Test was successful and no failures or leaks were detected.

Test was performed by Denis Houle, Maintenance Supervisor Montreal Terminal.

Instrument used to perform test.

- Dead weight pressure tester used:
  Make: Mansfield and Green, Model no. WG-50
  Serial no. 5537

- Pressure Recorder used:
  Make: Rosemount
  Serial no. 1797340

- Temperature Recorder used:
  Make: Weksler
  Serial no. R96-1959

Signature:  07-28-14

Attachments: Pressure and Temperature log
Hydro test record and certification
Pressure and temperature calibration reports
Copy of pressure and temperature chart.

HYDROSTATIC TEST RECORD AND CERTIFICATION

Test Section: Fill Line Tank 663
Date: 25-Jul-14

Company: Montreal Pipe Line Limited
System: North Tank Field
Description from: Test between valve Y663
To: Valves Y653 & Y673

New Construction: ☐
Requalification: ☒
Replacement or Relocation: ☒
Test Medium Water: ☐ **Other:** NA **Inhibitor:** NA
Design Data Code: ☐ B31.4 ☐ B31.3 ☒ CSA Z662 - 11

Pipe Design Data

Specification and Grade	Weld Joint Factor	Design Factor	OD	Wall Thick.	Corr. Allow	Loc. Factor	SMYS	Design Press.	Comments
API 5L -X42	1	0.8	24	0.375	0.0625	1	42,000	275	
API 5L -X42	1	0.8	30	0.375	0.0625	1	42,000	275	
A234 WPB	1	0.8	30&24	0.375	0.0625	1	35,000	275	All Fittings
B16.5-A105-Class 150	1	0.8	30&24	0.375	0.0625	1	36,000	275	Weld Neck Flanges -ANSI 150

Pressure Test:

Test Pressure should be as follows: Note: maximum test pressure is based on MOP Class 150 Flanges

Minimum at high point: 344 **%SMYS** 59% **Maximum at Low Point:** 450 **%SMYS** 62%

Elevations: **Low Point (Ft):** Note 1 **High Point (Ft):** Note 1 **DWT (Ft):** Note 1

Qualification:

Date of Test: 25-Jul-14 **Duration of Test (hours):** 8 hour 15 min

Testing and recording witnessed by: Dennis Houle & Jean Blanchette **Date:** 25-Jul-14

Company: Montreal Pipe Line Limited

Company Representative: Dennis Houle **Title:** Supervisor

Testing Pressure:

Maximum at low point: 450 PSIG Note: Highest Recorded during test **for %SMYS** 62%

Minimum at high point: 381 PSIG Note: Lowest recorded during test **for %SMYS** 65%

Qualified to operate at: 275 PSIG Determined by ANSI Class 150 Flanges **for %SMYS** 38%

Report checked by: **Date:** 25-Jul-14

Approved by: **Title:** OPERATIONS MANAGER

Testing Company: Montreal Pipe Line Limited

Attached Documents:

Pressure record: ☒
Temperature Record: ☒
Profile: ☐ NA - less than 2 feet
Failure Record: ☐ NA
Pressure and Temperature Log ☒
Sketch and Diagram ☒
Qualifications Calculations ☐
Test Instrument Calibration Data: ☒

Comments:

Note 1: Elevation of pipe changes by less than 2 feet from tank inlet valve Y-663 to isolation valves Y652 and Y673
24" diameter pipe used to fill Tk 663 was successfully tested with water between valve 663, 665 and 673. No visual defects or leaks were detected during the 8h 15 minute test. Weather was warm/sunny/hazy day on July 25, 2014.
Test was performed on site at NTF in MTL East by Dennis Houle

Notes:

1. OD = outside diameter, SMYS=specified minimum yield strength, SMY = Specified minimum yield, DWT = deadweight tester
2. For test Sections containing more than one type of pipe, the maximum test pressure at low point and minimum test pressure at high point resulting specified minimum yield strength need to be calculated for each type of pipe.

QUALIFICATION CALCULATIONS

Test Section: Fill Line Tank 663
Date: 25-Jul-14

Company: Montreal Pipe Line Limited
System: North Tank Field
Description from: Test between valve Y663
To: Valves Y653 & Y673
New Construction: ☐
Requalification: ☒
Replacement or Relocation: ☒
Test Medium Water: ☒ 0.433 psi.ft
Other: NA
Inhibitor: NA
Design Data Code: ☐ B31.4 ☐ B31.3 ☒ CSA Z662 - 11

ELEVATION	Feet	Pressure	H	L
Location of Deadweight Tester	324.8	Read	450.0	381.0
Highest elevation in Test Section	327.5	Calc	448.8	379.8
Lowest elevation in Test Section	324.8	Calc	450.0	381.0

Calculating Minimum High Point SMYS

Pipe O.D	SMYS	Wall Thick	Corr Allow	WJF	DF	LF	Press	%SMYS
30	35000	0.375	0.0625	1	1	1	344	59%

Calculating Maximum Low Point SMYS

Pipe O.D	SMYS	Wall Thick	Corr Allow	WJF	DF	LF	Press	%SMYS
24	35000	0.375	0.0625	1	1	1	450	62%

Test Pressure Results

For Calculations Assume SMYS based on WPB fittings and Actual test pressure

Calculating Maximum at low point %SMYS

Pipe O.D	SMYS	Wall Thick	Corr Allow	WJF	DF	LF	Press	%SMYS
24	35000	0.375	0.0625	1	1	1	450	62%

Calculating Minimum at high Point %SMYS

Pipe O.D	SMYS	Wall Thick	Corr Allow	WJF	DF	LF	Press	%SMYS
30	35000	0.375	0.0625	1	1	1	381	65%

Qualified to operate at %SMYS

Pipe O.D	SMYS	Wall Thick	Corr Allow	WJF	DF	LF	Press	%SMYS
24	35000	0.375	0.0625	1	1	1	275	38%

Flange Pressure Calculation (B16.5-2003 Section 2.6 "System pressure Testing")

B16.5 Version (1996 - 2013: Maximum shell pressure test 1.5 times 100° class rating plus 25 psi

PSI	X Factor	= psi	Plus psi	Test Pressure (psi)
285	1.5	427.5	25	450

Montreal Pipe Line Ltd
Pressure and Temperature Log

Test section Description Hydro Test on lateral for fill line on TK 663. Test between valves V 663, 653, 673 at NTF.

Start of Test Period Time 08:30 Date July 25 - 2014

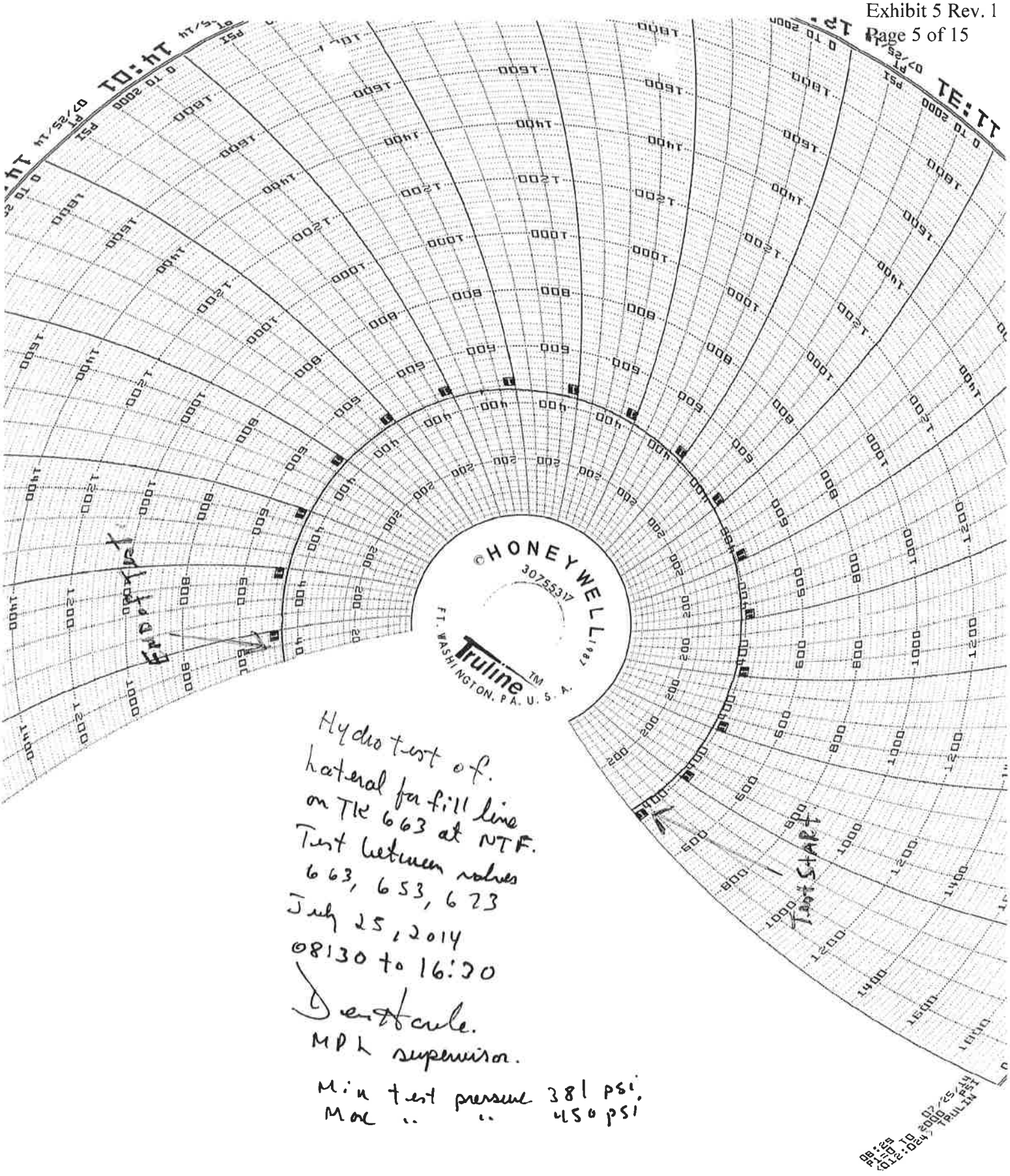
End of Test Period Time 16:45 Date July 25 - 2014.

Pressure test @ 380. for 8 hrs.

No.	Time	Dead Weight PSIG	Pressure Gauge	Pipe Temp.	Ambient Temp.	By	Remarks
1	08:30	380.5	381	66.7	68.1	DH	Sunny. Start Test.
2	08:45	381.5	382	66.7	68.1	DH	"
3	09:30	381.5	382	67.1	67.9	DH	Hazy.
4	10:00	382	383	67.2	68.4	DH	Hazy.
5	10:30	384	384	67.4	71.0	DH	Sunny.
6	11:00	390.5	391	67.8	72.0	DH	Sunny.
7	11:30	398	398	68.0	72.6	DH	"
8	12:00	405	405	68.3	73.7	DH	" no leaks.
9	12:30	412.5	413	68.7	74.2	DH	"
10	13:00	425	426	68.9	75.8	DH	"
11	13:30	441	441	69.3	76.7	DH	"
12	14:00	449	450	69.6	77.8	DH	"
13	14:30	449	449	69.6	77.8	DH	Hazy / cloudy. no leaks.
14	15:00	448.5	449	69.5	78.1	DH	" " "
15	15:30	448.5	449	69.6	78.1	DH	" " "
16	16:00	449	448.5	69.7	78.2	DH	" " "
17	16:30	448.5	448	70.1	77.8	DH	" " "
18	16:45	449.5	450	70.1	77.4	DH	Sunny. End of Test. all OK.
19							
20							

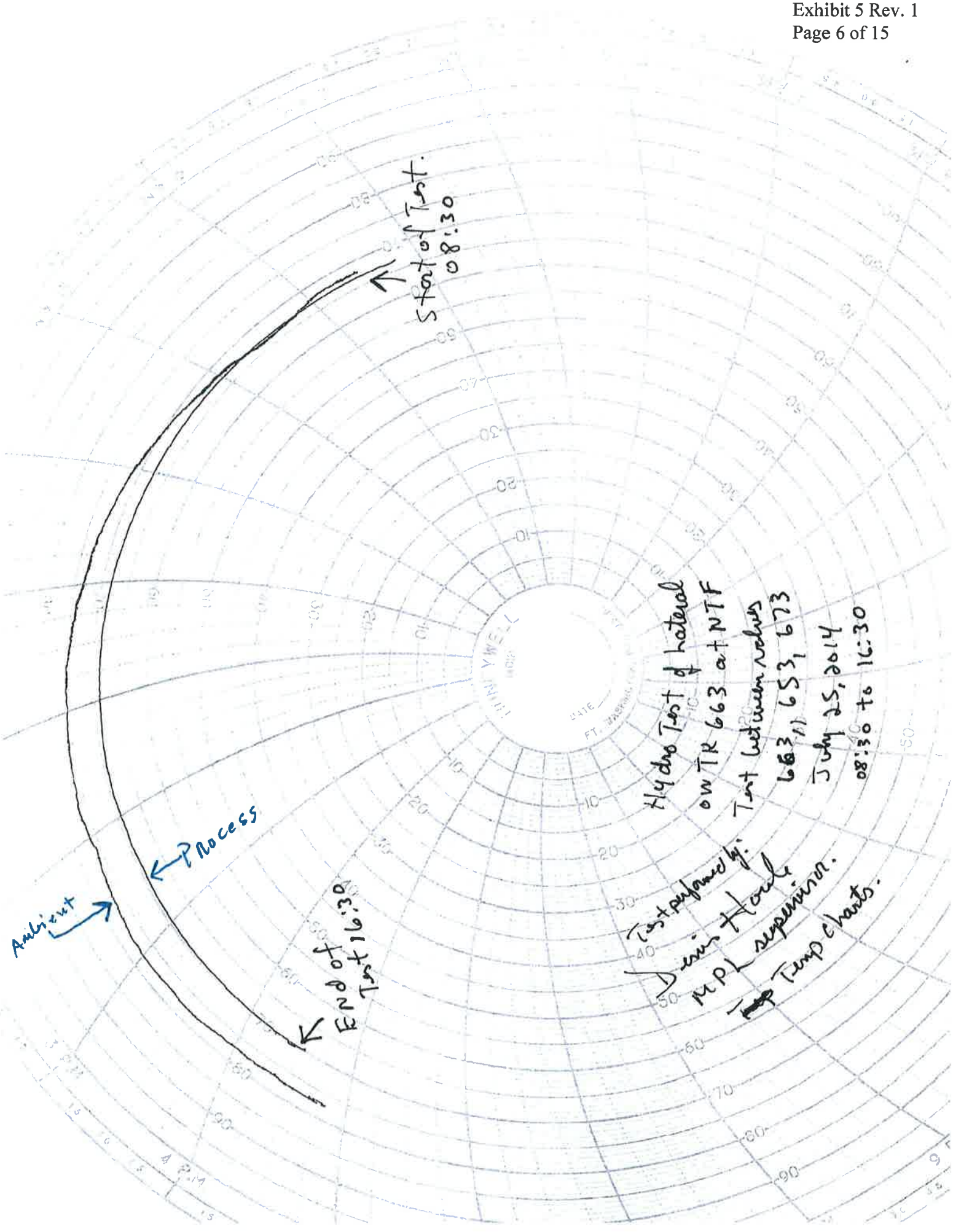
Test Performed By: Denis Houle Denis Houle 07-25-2014

Print Name Signature Date



Hydro test of
lateral for fill line
on TK 663 at NTF.
Test between valves
663, 653, 673
July 25, 2014
@8130 to 16:30

Min test pressure 381 psi.
Max " " 450 psi


Start of Test
08:30
End of Test 16:30
Process
Ambient
Hydro Test of lateral
on TR 663 at NTF
Test witness values
663, 653, 673
July 25, 2014
08:30 to 16:30
Test performed by:
Jevins Hoult
MPL supervisor.
Temp charts.

PRESSURE TESTING OF LIQUID PETROLEUM PIPELINES

PRESSURE RECORD

Company Montreal Pipe Line.
System fill lateral on TK 663 between values 663, 653, 673.

Description of Instrument (make/model) Rose mount.
Serial Number of Instrument 1797340
Test Section No. 24" fill lateral pipe on TK 663 @ NTF. approx 350 feet ~~miles~~
~~MP~~ V-663 to ~~MP~~ V-653, 673 Station No. NTF to Station No. NTF
Location of Chart Recorder ~~MP~~ Near values 653, 673 Station ~~No.~~ NTF
Start: Time 08:30 Date July 25 - 2014
End: Time 16:45 Date July 25 - 2014
Contractor Rep. N/A. Title N/A Date N/A
Pipeline Company Rep. Denis Houle Title Supervisor Date 07-28-14
Project ~~Engineer~~ Manager Miguel Robin. Date 07-28-14

Notes:
1. MP = mile post.
2. This pressure information should be included on the permanent record of pressure versus time. Placing this information on a stick-on label and sticking the label to the permanent record might be considered.

TEMPERATURE RECORD

Company Montreal Pipe Line.
System Fill lateral on TK 663 between values 663, 653, 673.

Description of Instrument (make/model) Weksler.
Serial Number of Instrument R-96-1959
Test Section No. 24" fill lateral pipe on TK 663 @ NTF. approx 350 feet ~~miles~~
~~MP~~ value 663 to ~~MP~~ value 653, 673 Station No. NTF. to Station No. NTF
Location of Chart Recorder MP Near values 653 and 673 Station No. NTF
Start: Time 08:30 Date July 25, 2014
End: Time 16:45 Date July 25, 2014
Contractor Rep. N/A. Title NA Date NA
Pipeline Company Rep. Denis Houle Title Supervisor. Date 07-28-14
Project ~~Engineer~~ Manager Miguel Robin. Date 07-28-14.

Notes:
1. MP = mile post.
2. This temperature information should be included on the permanent record of temperature versus time. Placing this information on a stick-on label and sticking the label to the permanent record might be considered.

Montreal Pipe Line Limited

Instrument Check

Honeywell Two Channel Portable Temperature Recorder

Model No. DR45A2-1100
Serial No: 0748Y776363200001 **Date:** September 5, 2014

Span: 0-100° F

Applied Temp. ° F	Recorder - ° F Channel 1 - Process - Purple Pen			
	Chart	Difference	Display	Difference
40.2	40.0	-0.2	40.3	0.1
60.2	60.1	-0.1	60.2	0.0
90.0	90.0	0.0	90.4	0.4

Span: 0-100° F

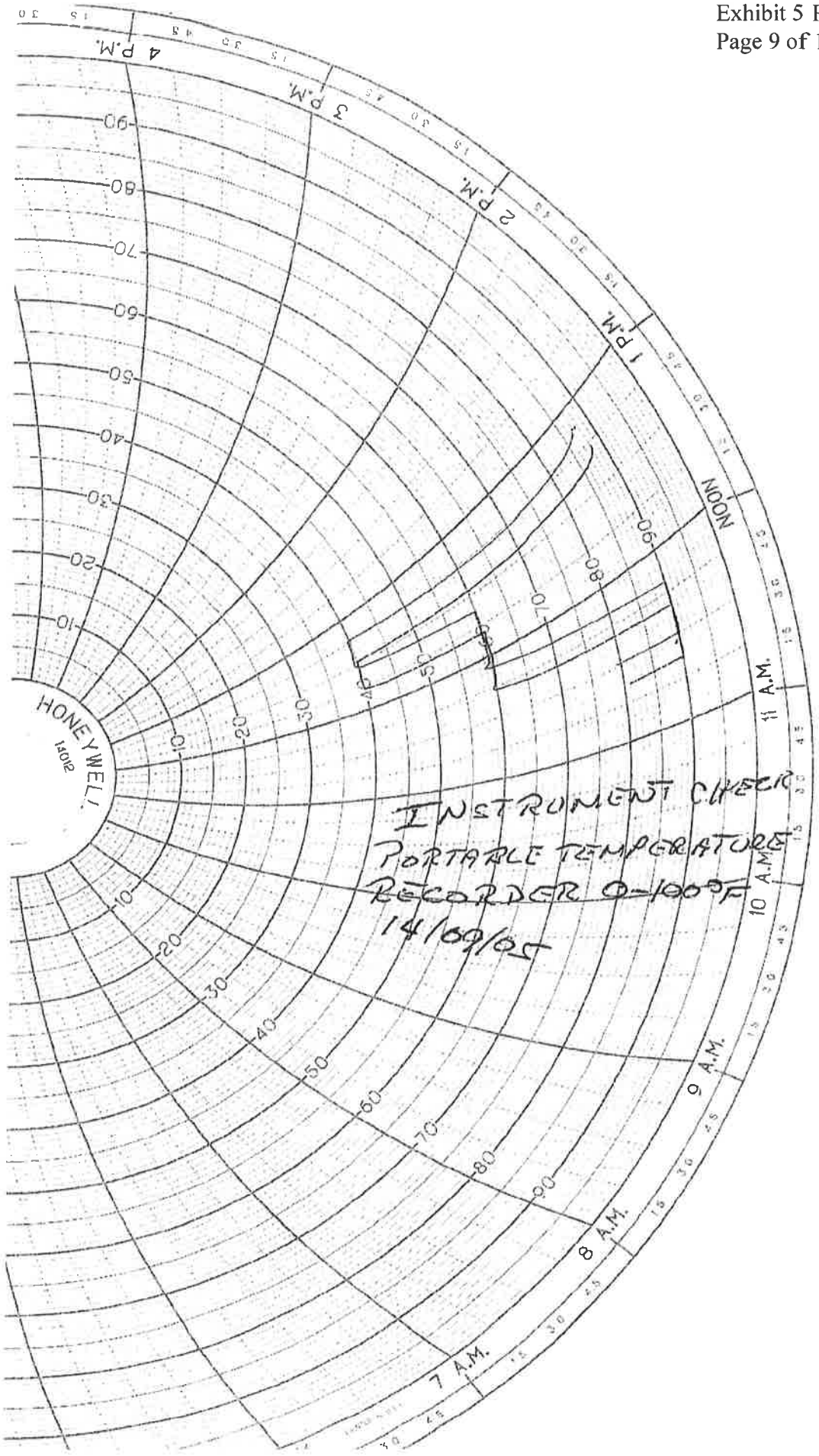
Applied Temp. ° F	Recorder - ° F Channel 2 - Ambient - Red Pen			
	Chart	Difference	Display	Difference
40.2	39.9	-0.3	40.3	0.1
60.2	60.0	-0.2	60.3	0.1
90.0	90.0	0.0	90.2	0.2

Test Instruments Used:
Hart Scientific Dry-well calibrator
Model 9105

Thermometer with probe
Model: Hart Scientific (Fluke) 1521/RTD
Serial No: A73284/800167
Recall Date: 2015-01-29

Performed By: P.M.
P. M^{c}Dougall

Comments: Instrument check


HONEYWELL
T4012
INSTRUMENT CHECK
PORTABLE TEMPERATURE
RECORDER 0-100°F
14/09/05
NOON
1 P.M.
2 P.M.
3 P.M.
4 P.M.
11 A.M.
10 A.M.
9 A.M.
8 A.M.
7 A.M.

Montreal Pipe Line Limited

Instrument Loop Check

Honeywell Portable Pressure Recorder

Model No. DR45AT-1100
Serial No: 0722Y7744440500001

and Rosemount Pressure Transmitter **Date:** September 5, 2014
Model No: 3051165A1AB
Serial No: 1797340

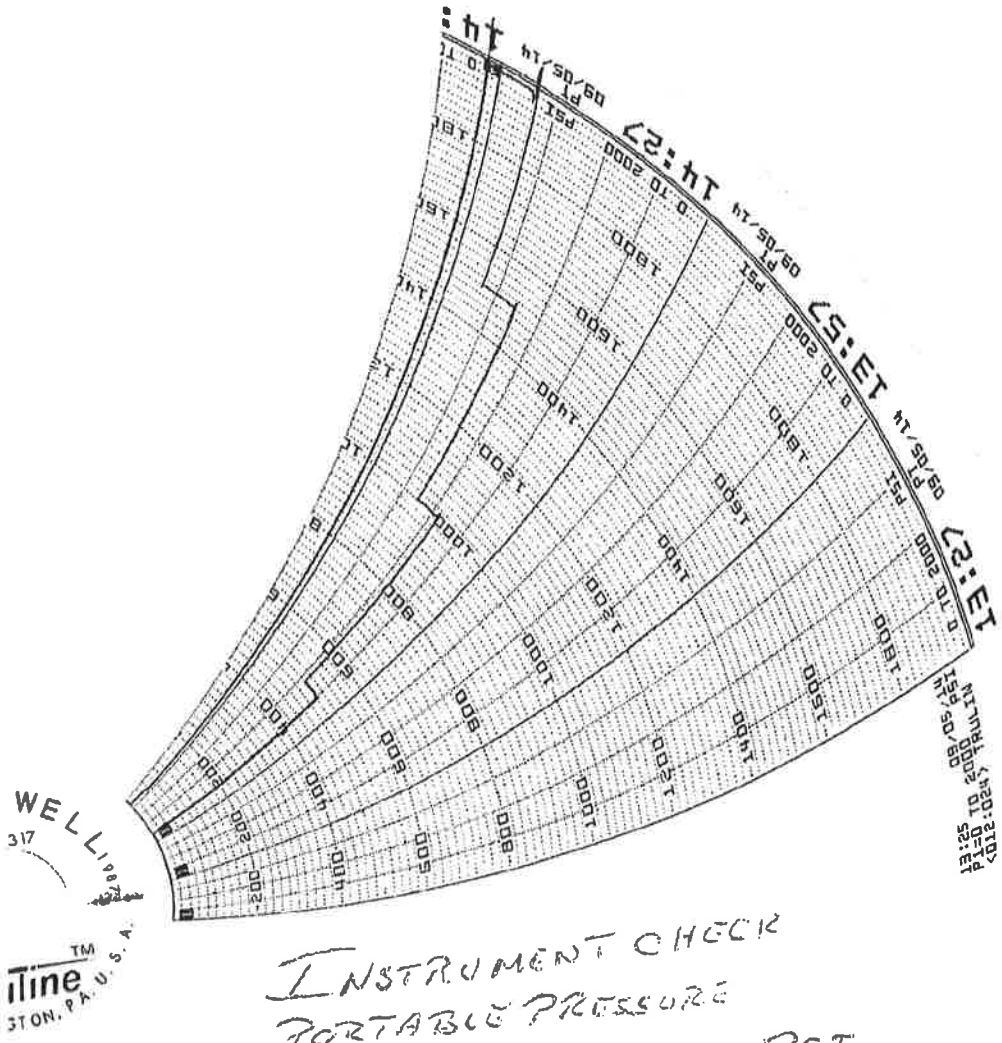
Span: 0-2000 PSI

Applied Pressure PSI	Recorder - PSI			
	Chart	Difference	Display	Difference
0	0	0	0	0
500	500	0	500	0
1000	1000	0	1000	0
1500	1501	1	1500	0
1980	1982	2	1980	0

Test Instrument Used:
Ametek Jofra Advanced Pressure Calibrator (APC)
Model: APC03KGINDG
Serial No: 9632072
Recall Date: 2015-04-09

Performed By: P. McDougall

Comments: Instrument Check



INSTRUMENT CHECK
PORTABLE PRESSURE
RECORDER 0-2,000PSI
14/09/05

Montreal Pipe Line Limited

Instrument Loop Check

Honeywell Portable Pressure Recorder

Model No. DR45AT-1100
Serial No: 0722Y7744440500001

and Rosemount Pressure Transmitter **Date:** April 14, 2014
Model No: 3051165A1AB
Serial No: 1797340

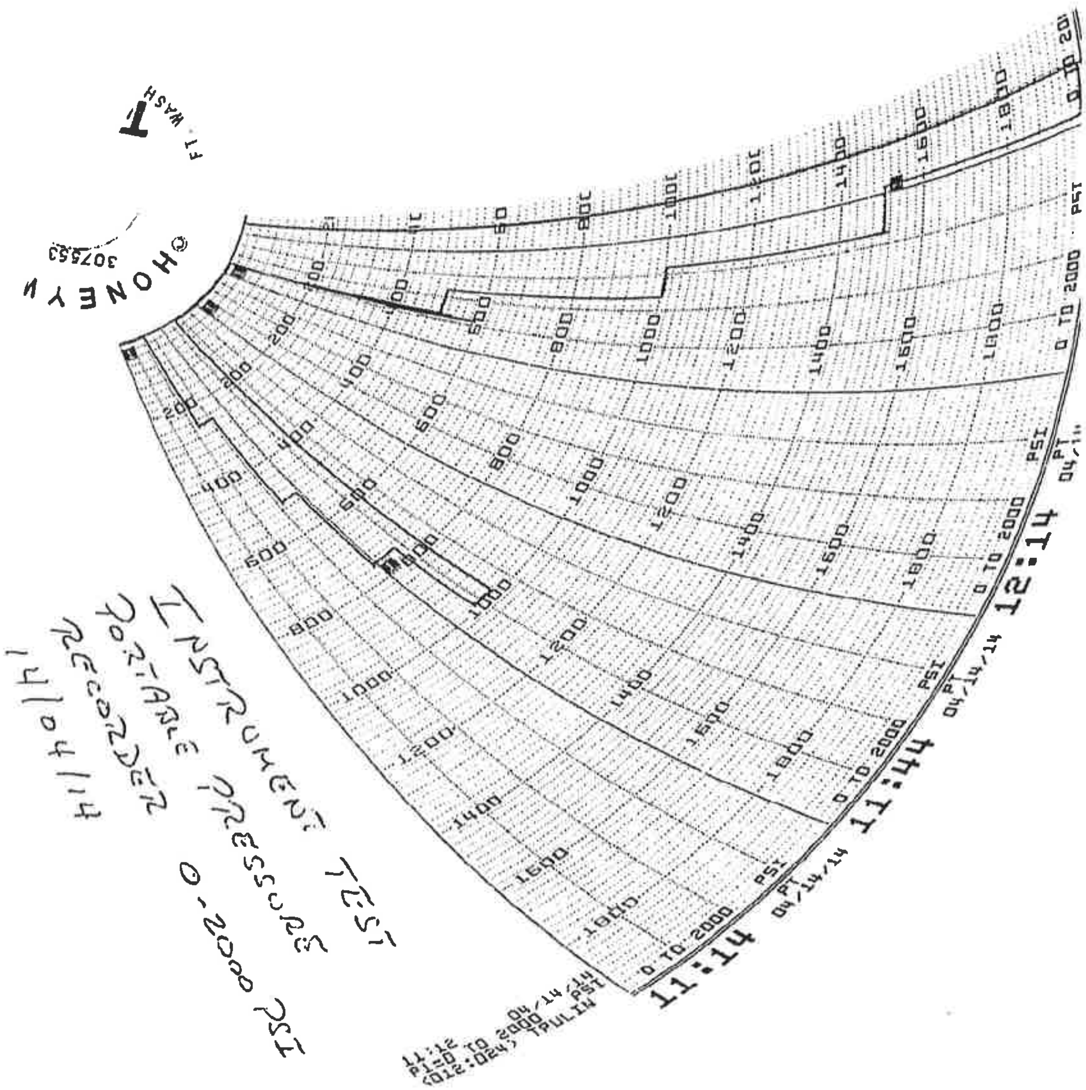
Span: 0-2000 PSI

Applied Pressure PSI	Recorder - PSI			
	Chart	Difference	Display	Difference
0	0	0	2	2
500	500	0	502	2
1000	1000	0	1002	2
1500	1500	0	1502	2
1980	1980	0	1983	3

Test Instrument Used:
Ametek Jofra Advanced Pressure Calibrator (APC)
Model: APC03KGINDG
Serial No: 9632072
Recall Date: 2015-04-09

Performed By: P. M°Dougall

Comments: Instrument Check


INSTRUMENT TEST
PORTABLE PRESSURE
RECORDER 0-2000 PSI
11:14
11:44
12:14

Montreal Pipe Line Limited

Instrument Check

Honeywell Two Channel Portable Temperature Recorder

Model No. DR45A2-1100
Serial No: 0748Y776363200001 **Date:** April 14, 2014

Span: 0-100° F

Applied Temp. ° F	Recorder - ° F Channel 1 - Process - Purple Pen			
	Chart	Difference	Display	Difference
33.1	33.0	-0.1	33.2	0.1
62.0	62.0	0.0	62.2	0.2
90.8	91.0	0.2	91.1	0.3

Span: 0-100° F

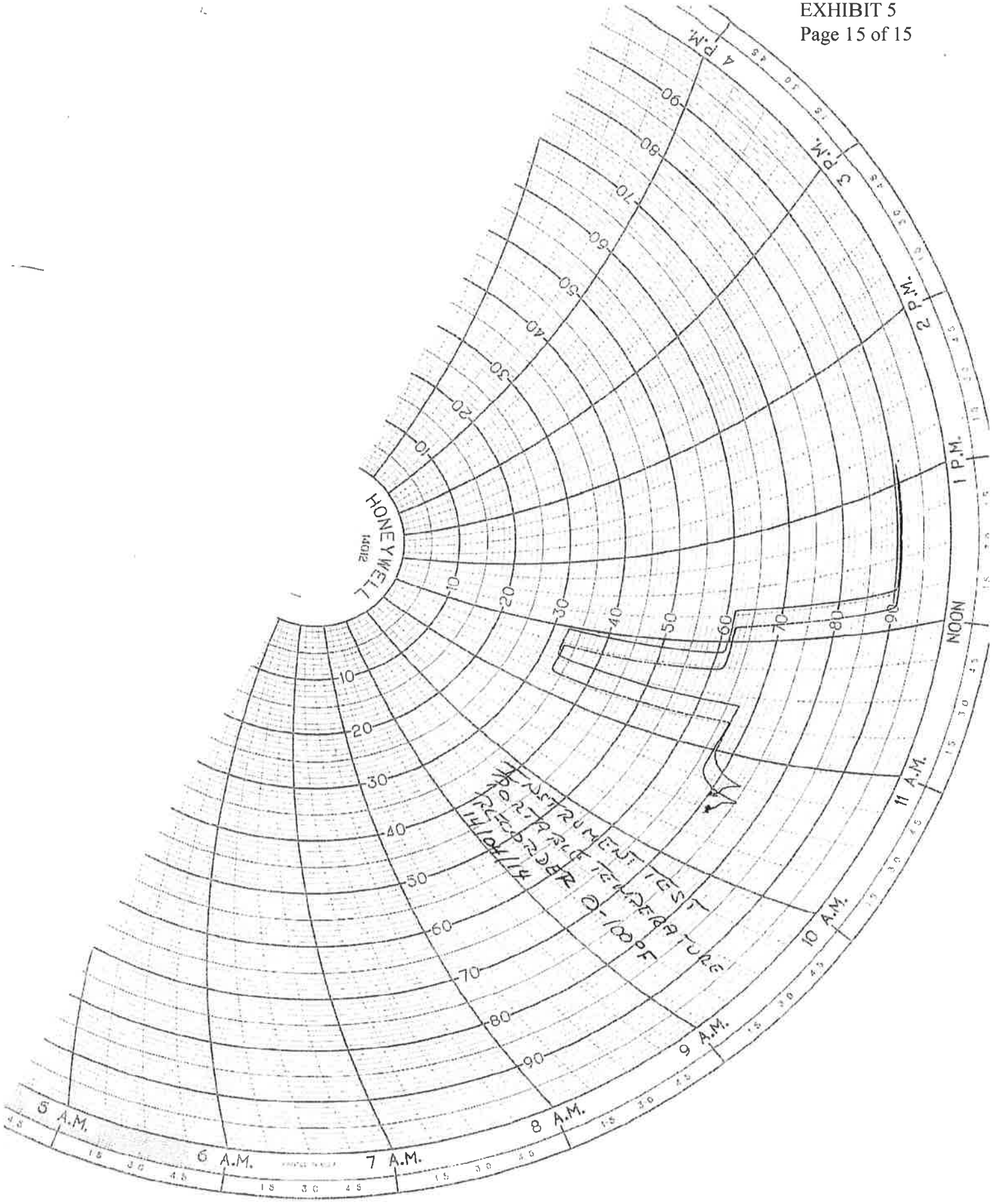
Applied Temp. ° F	Recorder - ° F Channel 2 - Ambient - Red Pen			
	Chart	Difference	Display	Difference
33.1	33.0	-0.1	33.2	0.1
62.0	62.0	0.0	62.0	0.0
90.8	91.0	0.2	90.8	0.0

Test Instruments Used:
Hart Scientific Dry-well calibrator
Model 9105

Thermometer with probe
Model: Hart Scientific (Fluke) 1521/RTD
Serial No: A73284/789477
Recall Date: 2015-01-29

Performed By: P.M.
P. McDougall

Comments: Instrument check


HONEYWELL
4 P.M.
3 P.M.
2 P.M.
1 P.M.
NOON
11 A.M.
10 A.M.
9 A.M.
8 A.M.
7 A.M.
6 A.M.
5 A.M.
10
20
30
40
50
60
70
80
90
INSTRUMENT TEST
PORTABLE TEMPERATURE
RECORDER 0-100°F
1H10411