



RCP, Inc

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Houston, Texas 77002
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Redacted

November 1, 2011

Pacific Gas and Electric Company
350 N. Wiget
Walnut Creek, CA 94598
Attention: Redacted

Test Contractor:	Milbar -- T-109W 10/30/11
Asset Owner:	Pacific Gas and Electric Company -- 41474082
Construction Contractor:	Snelson -- 41474802 T-109W
Test Section:	PG&E T-109W, L-148, MP 14.60 - 17.63
Test Date:	October 31, 2011
Certificate Number:	RCP 61362 - T-109W, L-148, MP 14.60 - 17.63

To whom it may concern,

This letter is to certify that the hydrostatic test performed on pipe owned by Pacific Gas and Electric Company and tested by Milbar met the requirements of the Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 3).

The test segment was subjected to a spike pressure test of 1119 psig for 30 minutes, without observed leakage or yielding of the pipe segment. The 30 minute spike test and subsequent pressure reduction with volume bleed was included and is part of the 8.42 hour test duration period.

This hydrostatic test was completed successfully. Pressure was maintained on the test facilities in excess of 8.42 continuous hours without evidence of a leak failure. Water was the test medium. At the highest elevation point in the test section, the calculated test pressure was 1035 psig and the MAOP per 49 CFR Part 192, Subpart J can be as high as 690 psig. The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 675 psig.

Pressure decreased 79 psi during the test. 1,389.70 ounces of fluid was intentionally released from the test section. Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 428.92 ounces, loss, which is equivalent to a 0.96 °F change in pipe temperature and within the error attributed to the temperature measurement instrumentation utilized.

Test pressure did not remain steady even though no leaks were observed. The volumetric loss is attributed to the error characteristic of the temperature measurement instrumentation utilized.

Sincerely,
Redacted

cc. file



Hydrostatic Test Certification

Company	Pacific Gas and Electric Company	Job Number	41474082
Construction Co.	Snelson	Job Number	41474802 T-109W
Hydro. Test Co.	Milbar	Project No.	T-109W 10/30/11
Test Section	PG&E T-109W, L-148, MP 14.60 - 17.63		
File Name	RCP 61362 - T-109W, L-148, MP 14.60 - 17.63		

Hydrostatic Test Pressure

APPLICABLE CODE FOR CERTIFICATION: _____ Test Date: 31-Oct-11

Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 3)

This is to certify that the pipeline or pipeline section(s) described below was hydrostatically pressure tested in accordance with the following procedure:

Pipeline:	PG&E T-109W, L-148, MP 14.60 - 17.63		
From:	0+00	To:	132+47

Pipe Data

Segment	Length	Diameter	Wall Thickness	Specification	100% SMYS
1	39 ft	8.625 in.	0.188 in.	API5L-X52, ERW-HF, Arc Weld, Steel	2,267 psi
2	6 ft	8.625 in.	0.322 in.	API5L-Grade B, SM, Arc Weld, Steel	2,613 psi
3	13,238 ft	8.625 in.	0.277 in.	API5L-Grade B, SM, Arc Weld, Steel	2,248 psi
4	2 ft	4.500 in.	0.237 in.	Unknown, OTH, Arc Weld, Steel	2,528 psi
5	303 ft	2.375 in.	0.154 in.	API5L-Grade B, SM, Arc Weld, Steel	4,539 psi
6	843 ft	1.315 in.	0.113 in.	API5L-Grade B, SM, Arc Weld, Steel	6,015 psi
7	18 ft	8.625 in.	0.500 in.	API5L-Grade B, SM, Arc Weld, Steel	4,058 psi
8	4 ft	8.625 in.	0.322 in.	API5L-Grade B, SM, Arc Weld, Steel	2,613 psi
9	5 ft	3.500 in.	0.216 in.	API5L-Grade B, SM, Arc Weld, Steel	4,320 psi
10	6 ft	8.625 in.	0.277 in.	API5L-Grade B, SM, Arc Weld, Steel	2,248 psi
11	5 ft	8.625 in.	0.188 in.	API5L-Grade B, SM, Arc Weld, Steel	1,526 psi

Initial Test Conditions

Pressure at Test Point:	1,119 psig	Date/Time:	10/31/11 4:01 PM	Pipe Temperature	
Ambient Temperature:	76.0 °F	Elevation @ Test Point:	77.0 ft	Unrestrained:	83.0 °F
Pressure @ High Point (Cal/Measure):	1,114 psig	Elevation @ High Point:	88.0 ft	Restrained:	71.0 °F
Pressure @ Low Point (Cal/Measure):	1,119 psig	Elevation @ Low Point:	77.0 ft	Location:	0+00
				Location:	132+47
				Location:	0+00

Final Test Conditions

Pressure at Test Point:	1,040 psig	Date/Time:	11/1/11 12:26 AM	Pipe Temperature	
Ambient Temperature:	56.0 °F	Elevation @ Test Point:	77.0 ft	Unrestrained:	64.0 °F
Pressure @ High Point (Cal/Measure):	1,035 psig	Elevation @ High Point:	88.0 ft	Restrained:	72.0 °F
Pressure @ Low Point (Cal/Measure):	1,040 psig	Elevation @ Low Point:	77.0 ft	Location:	0+00
				Location:	132+47
				Location:	0+00

Total Fluid Injected: _____

Total Fluid Withdrawn: 1389.70 fluid ounces

Volume loss

Net Change in Volume of the Test Section ± (+ Gain, - Loss):	(428.92) oz	loss	(0.0094)%	(0.963) °F equivalent
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Test Duration: 8.42 hours

Minimum Test Pressure:	1,040 psig	1,035 psig	1,040 psig	
Maximum Test Pressure:	1,119 psig	1,114 psig	1,119 psig	
% SMYS:	27.5%	25.8%	49.8%	
Test Segment Observed % SMYS:	Minimum	19.5%	Maximum	73.0%

Minimum Test Pressure (Calculated/Measured): 1,035 psig

Maximum Allowable Operating Pressure: DOT Part 192 Test Factor= 1.50 690 psig

The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 675 psig.

Were leaks observed?	No	Explain:
Acceptable Hydrostatic Test?	Yes	<p>The test segment was subjected to a spike pressure test of 1119 psig for 30 minutes, without observed leakage or yielding of the pipe segment. The 30 minute spike test and subsequent pressure reduction with volume bleed was included and is part of the 8.42 hour test duration period.</p> <p>No leaks were observed during the test period. The test section included 14,206 feet of buried and 63 feet of exposed pipe. Pressure lost 79 psi during the test. The buried pipe segment gained 1°F fluid temperature and the exposed pipe segment lost 19°F.</p> <p>1,389.70 ounces of fluid was intentionally released from the test section. Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 428.92 ounces, loss, which is equivalent to a 0.96 °F change in pipe temperature and within the error attributed to the temperature measurement instrumentation utilized.</p> <p>Test pressure did not remain steady even though no leaks were observed. The volumetric loss is attributed to the error characteristic of the temperature measurement instrumentation utilized.</p>

Remarks: Redacted

1-Nov-11



Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41474082
Construction Co.	Snelson	Job Number	41474802 T-109W
Testing Co.	Milbar	Project No.	T-109W 10/30/11
Test Section			
File Name	RCP 61362 - T-109W, L-148, MP 14.60 - 17.63		

Date	31-Oct-11	Test Log		
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Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe		Comment	Bleed	Inject
					Unrestrained	Restrained			
1	10/31/11	3:12 PM	764 psig	76 °F	85 °F	71 °F	Start Spike		
2	10/31/11	3:13 PM	774 psig	76 °F	85 °F	71 °F	Inject		191 oz.
3	10/31/11	3:14 PM	784 psig	76 °F	85 °F	71 °F	Inject		180 oz.
4	10/31/11	3:15 PM	794 psig	76 °F	85 °F	71 °F	Inject		180 oz.
5	10/31/11	3:16 PM	804 psig	76 °F	85 °F	71 °F	Inject		180 oz.
6	10/31/11	3:17 PM	814 psig	76 °F	85 °F	71 °F	Inject		170 oz.
7	10/31/11	3:18 PM	824 psig	76 °F	85 °F	71 °F	Inject		180 oz.
8	10/31/11	3:19 PM	834 psig	76 °F	85 °F	71 °F	Inject		191 oz.
9	10/31/11	3:20 PM	844 psig	76 °F	85 °F	71 °F	Inject		170 oz.
10	10/31/11	3:21 PM	854 psig	76 °F	85 °F	71 °F	Inject		191 oz.
11	10/31/11	3:22 PM	864 psig	76 °F	85 °F	71 °F	Inject		170 oz.
12	10/31/11	3:23 PM	874 psig	76 °F	85 °F	71 °F	Inject		191 oz.
13	10/31/11	3:24 PM	884 psig	76 °F	85 °F	71 °F	Inject		180 oz.
14	10/31/11	3:25 PM	894 psig	76 °F	85 °F	71 °F	Inject		180 oz.
15	10/31/11	3:26 PM	904 psig	76 °F	85 °F	71 °F	Inject		170 oz.
16	10/31/11	3:27 PM	914 psig	76 °F	85 °F	71 °F	Inject		191 oz.
17	10/31/11	3:28 PM	924 psig	76 °F	85 °F	71 °F	Inject		170 oz.
18	10/31/11	3:29 PM	934 psig	76 °F	85 °F	71 °F	Inject		180 oz.
19	10/31/11	3:30 PM	944 psig	76 °F	85 °F	71 °F	Inject		180 oz.
20	10/31/11	3:31 PM	954 psig	76 °F	85 °F	71 °F	Inject		191 oz.
21	10/31/11	3:32 PM	964 psig	76 °F	85 °F	71 °F	Inject		180 oz.
22	10/31/11	3:33 PM	974 psig	76 °F	85 °F	71 °F	Inject		180 oz.
23	10/31/11	3:34 PM	984 psig	76 °F	85 °F	71 °F	Inject		170 oz.
24	10/31/11	3:35 PM	994 psig	76 °F	85 °F	71 °F	Inject		180 oz.
25	10/31/11	3:37 PM	1,004 psig	76 °F	85 °F	71 °F	Inject		191 oz.
26	10/31/11	3:39 PM	1,014 psig	76 °F	85 °F	71 °F	Inject		180 oz.
27	10/31/11	3:41 PM	1,024 psig	76 °F	85 °F	71 °F	Inject		180 oz.
28	10/31/11	3:43 PM	1,034 psig	76 °F	85 °F	71 °F	Inject		170 oz.
29	10/31/11	3:45 PM	1,044 psig	76 °F	85 °F	71 °F	Inject		191 oz.
30	10/31/11	3:47 PM	1,054 psig	76 °F	85 °F	71 °F	Inject		180 oz.
31	10/31/11	3:49 PM	1,064 psig	76 °F	85 °F	71 °F	Inject		180 oz.
32	10/31/11	3:51 PM	1,074 psig	76 °F	85 °F	71 °F	Inject		180 oz.
33	10/31/11	3:53 PM	1,084 psig	76 °F	85 °F	71 °F	Inject		170 oz.
34	10/31/11	3:55 PM	1,094 psig	76 °F	85 °F	71 °F	Inject		180 oz.
35	10/31/11	3:57 PM	1,104 psig	76 °F	85 °F	71 °F	Inject		191 oz.
36	10/31/11	3:59 PM	1,114 psig	76 °F	85 °F	71 °F	Inject		180 oz.
37	10/31/11	4:00 PM	1,119 psig	76 °F	85 °F	71 °F	Inject		80 oz.
38	10/31/11	4:01 PM	1,119 psig	76 °F	83 °F	71 °F	On Test		
39	10/31/11	4:11 PM	1,119 psig	76 °F	83 °F	71 °F			
40	10/31/11	4:21 PM	1,119 psig	76 °F	82 °F	71 °F			
41	10/31/11	4:31 PM	1,119 psig	76 °F	82 °F	71 °F	End Spike		
42	10/31/11	4:34 PM	1,109 psig	76 °F	82 °F	71 °F	Bleed	180 oz.	
43	10/31/11	4:37 PM	1,099 psig	76 °F	82 °F	71 °F	Bleed	180 oz.	
44	10/31/11	4:40 PM	1,089 psig	76 °F	82 °F	71 °F	Bleed	180 oz.	
45	10/31/11	4:43 PM	1,079 psig	76 °F	82 °F	71 °F	Bleed	180 oz.	
46	10/31/11	4:46 PM	1,069 psig	76 °F	82 °F	71 °F	Bleed	180 oz.	
47	10/31/11	4:49 PM	1,059 psig	76 °F	82 °F	71 °F	Bleed	180 oz.	



Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41474082
Construction Co.	Snelson	Job Number	41474802 T-109W
Testing Co.	Milbar	Project No.	T-109W 10/30/11
Test Section			
File Name	RCP 61362 - T-109W, L-148, MP 14.60 - 17.63		

Date	31-Oct-11	Test Log
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Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe		Comment	Bleed	Inject
					Unrestrained	Restrained			
48	10/31/11	4:52 PM	1,049 psig	76 °F	82 °F	71 °F	Bleed	180 oz.	
49	10/31/11	4:55 PM	1,042 psig	76 °F	82 °F	71 °F	Bleed	126 oz.	
50	10/31/11	4:56 PM	1,042 psig	76 °F	82 °F	71 °F			
51	10/31/11	5:11 PM	1,042 psig	76 °F	82 °F	72 °F			
52	10/31/11	5:26 PM	1,042 psig	76 °F	82 °F	72 °F			
53	10/31/11	5:41 PM	1,042 psig	75 °F	81 °F	72 °F			
54	10/31/11	5:56 PM	1,042 psig	74 °F	81 °F	72 °F			
55	10/31/11	6:11 PM	1,042 psig	73 °F	80 °F	72 °F			
56	10/31/11	6:26 PM	1,042 psig	73 °F	79 °F	72 °F			
57	10/31/11	6:41 PM	1,041 psig	71 °F	78 °F	72 °F			
58	10/31/11	6:56 PM	1,041 psig	69 °F	77 °F	72 °F			
59	10/31/11	7:11 PM	1,041 psig	68 °F	77 °F	72 °F			
60	10/31/11	7:26 PM	1,041 psig	67 °F	75 °F	72 °F			
61	10/31/11	7:41 PM	1,041 psig	67 °F	74 °F	72 °F			
62	10/31/11	7:56 PM	1,041 psig	65 °F	73 °F	72 °F			
63	10/31/11	8:11 PM	1,040 psig	64 °F	73 °F	72 °F			
64	10/31/11	8:26 PM	1,040 psig	63 °F	72 °F	72 °F			
65	10/31/11	8:41 PM	1,040 psig	62 °F	71 °F	72 °F			
66	10/31/11	8:56 PM	1,040 psig	62 °F	71 °F	72 °F			
67	10/31/11	9:11 PM	1,040 psig	61 °F	71 °F	72 °F			
68	10/31/11	9:26 PM	1,040 psig	61 °F	70 °F	72 °F			
69	10/31/11	9:41 PM	1,040 psig	61 °F	69 °F	72 °F			
70	10/31/11	9:56 PM	1,040 psig	60 °F	69 °F	72 °F			
71	10/31/11	10:11 PM	1,040 psig	60 °F	69 °F	72 °F			
72	10/31/11	10:26 PM	1,040 psig	59 °F	68 °F	72 °F			
73	10/31/11	10:41 PM	1,040 psig	58 °F	67 °F	72 °F			
74	10/31/11	10:56 PM	1,040 psig	58 °F	66 °F	72 °F			
75	10/31/11	11:11 PM	1,040 psig	57 °F	66 °F	72 °F			
76	10/31/11	11:26 PM	1,040 psig	57 °F	65 °F	72 °F			
77	10/31/11	11:41 PM	1,040 psig	57 °F	65 °F	72 °F			
78	10/31/11	11:56 PM	1,040 psig	56 °F	65 °F	72 °F			
79	11/1/11	12:11 AM	1,040 psig	56 °F	65 °F	72 °F			
80	11/1/11	12:26 AM	1,040 psig	56 °F	64 °F	72 °F	End of Test		
							Spike Test		6,407.0 oz.
							Hydrostatic Test	1,389.7 oz.	

Were leaks observed during the test period?	Exposed and buried pipe, no leaks observed.	High Test Pressure: 1,119 psig	Low Test Pressure: 1,040 psig
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Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company	Job Number	41474082
Construction Co.	Snelson	Job Number	41474802 T-109W
Hydro. Test Co.	Milbar	Project No.	T-109W 10/30/11
Test Section	PG&E T-109W, L-148, MP 14.60 - 17.63	WATER	
File Name	RCP 61362 - T-109W, L-148, MP 14.60 - 17.63		

General Pipe Data

Description	Segment							
	1	2	3	4	5	6	7	8
Restrained or Unrestrained?	Unrestrained	Unrestrained	Restrained	Restrained	Restrained	Restrained	Unrestrained	Restrained
Outside Diameter	8.625 in.	8.625 in.	8.625 in.	4.500 in.	2.375 in.	1.315 in.	8.625 in.	8.625 in.
Wall Thickness	0.188 in.	0.322 in.	0.277 in.	0.237 in.	0.154 in.	0.113 in.	0.500 in.	0.322 in.
Inside Diameter	8.249 in.	7.981 in.	8.071 in.	4.026 in.	2.067 in.	1.089 in.	7.625 in.	7.981 in.
Spec./Grade	API5L-X52	API5L-Grade B	API5L-Grade B	Unknown	API5L-Grade B	API5L-Grade B	API5L-Grade B	API5L-Grade B
Length Unrestrained	39 ft	6 ft					18 ft	
Length Restrained			13,238 ft	2 ft	303 ft	643 ft		4 ft
Temperature -- On Test	83 °F	83 °F	71.0 °F	71.0 °F	71.0 °F	71.0 °F	83.0 °F	71.0 °F
Temperature -- End of Test	64 °F	64 °F	72.0 °F	72.0 °F	72.0 °F	72.0 °F	64.0 °F	72.0 °F
Pressure -- On Test	1,119 psig	1,119 psig	1,119 psig	1,119 psig	1,119 psig	1,119 psig	1,119 psig	1,119 psig
Pressure -- End of Test	1,040 psig	1,040 psig	1,040 psig	1,040 psig	1,040 psig	1,040 psig	1,040 psig	1,040 psig

Unrestrained Pipe

Vo	167.61 gal 21,453 oz.	Vtp1	168.04 gal 21,509 oz.	Vtp2	168.34 gal 21,548 oz.
Vo Unrestrained	108 gal	17 gal			43 gal
Fwp 1	1.003430	1.003430			1.003430
Fpp 1	1.002046	1.001156			1.000711
Fpt 1	1.000419	1.000419			1.000419
Fwt 1	1.002868	1.002868			1.002868
Fpwt 1 = Fpt/Fwt	0.997557	0.997557			0.997557
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	108.60 gal	16.67 gal			42.77 gal
Fwp 2	1.003187	1.003187			1.003187
Fpp 2	1.001901	1.001074			1.000661
Fpt 2	1.000073	1.000073			1.000073
Fwt 2	1.000375	1.000375			1.000375
Fpwt = Fpt/Fwt	0.999698	0.999698			0.999698
Vtp = Vo(Fwp)(Fpp)(Fpwt)	108.79 gal	16.70 gal			42.85 gal

Restrained Pipe

Vo	35,310.34 gal 4,519,723 oz.	Vtp1	35,431.14 gal 4,535,186 oz.	Vtp2	35,416.63 gal 4,533,329 oz.
Vo Unrestrained		35,183 gal	1 gal	53 gal	31 gal
Fwp 1		1.003430	1.003430	1.003430	1.003430
Fpp 1		1.001029	1.000616	1.000495	1.000367
Fpt 1		1.000133	1.000133	1.000133	1.000133
Fwt 1		1.001170	1.001170	1.001170	1.001170
Fpwt 1 = Fpt/Fwt		0.998965	0.998965	0.998965	0.998965
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		35,304 gal	1 gal	53 gal	31 gal
Fwp 2		1.003187	1.003187	1.003187	1.003187
Fpp 2		1.000962	1.000579	1.000467	1.000347
Fpt 2		1.000145	1.000145	1.000145	1.000145
Fwt 2		1.001283	1.001283	1.001283	1.001283
Fpwt = Fpt/Fwt		0.998863	0.998863	0.998863	0.998863
Vtp = Vo(Fwp)(Fpp)(Fpwt)		35,289 gal	1 gal	53 gal	31 gal

Combined Pipe

Vo	35,477.94 gal 4,541,177 oz.	Vtp1	35,599.18 gal 4,556,695 oz.	Vtp2	35,584.97 gal 4,554,877 oz.
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Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company
Construction Co.	Snelson
Hydro. Test Co.	Milbar
Test Section	PG&E T-109W, L-148, MP 14.60 - 17.63
File Name	RCP 61362 - T-109W, L-148, MP 14.60 - 17.63

General Pipe Data

Description	9	10	11			
Restrained or Unrestrained?	Restrained	Restrained	Restrained			
Outside Diameter	3.500 in.	8.625 in.	8.625 in.			
Wall Thickness	0.216 in.	0.277 in.	0.188 in.			
Inside Diameter	3.068 in.	8.071 in.	8.249 in.			
Spec./Grade	API5L-Grade B	API5L-Grade B	API5L-Grade B			
Length Unrestrained						
Length Restrained	5 ft	6 ft	5 ft			
Temperature -- On Test	71.0 °F	71.0 °F	71.0 °F			
Temperature -- End of Test	72.0 °F	72.0 °F	72.0 °F			
Pressure -- On Test	1,119 psig	1,119 psig	1,119 psig			
Pressure -- End of Test	1,040 psig	1,040 psig	1,040 psig			

Unrestrained Pipe

Vo	9	10	11			
Vo Unrestrained						
Fwp 1						
Fpp 1						
Fpt 1						
Fwt 1						
Fpwt 1 = Fpt/Fwt						
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)						
Fwp 2						
Fpp 2						
Fpt 2						
Fwt 2						
Fpwt 2 = Fpt/Fwt						
Vtp 2 = Vo(Fwp)(Fpp)(Fpwt)						

Restrained Pipe

Vo	9	10	11			
Vo Unrestrained	2 gal	16 gal	14 gal			
Fwp 1	1.003430	1.003430	1.003430			
Fpp 1	1.000522	1.001029	1.001529			
Fpt 1	1.000133	1.000133	1.000133			
Fwt 1	1.001170	1.001170	1.001170			
Fpwt 1 = Fpt/Fwt	0.998965	0.998965	0.998965			
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	2 gal	16 gal	14 gal			
Fwp 2	1.003187	1.003187	1.003187			
Fpp 2	1.000491	1.000962	1.001427			
Fpt 2	1.000145	1.000145	1.000145			
Fwt 2	1.001283	1.001283	1.001283			
Fpwt 2 = Fpt/Fwt	0.998863	0.998863	0.998863			
Vtp 2 = Vo(Fwp)(Fpp)(Fpwt)	2 gal	16 gal	14 gal			

Combined Pipe

Vo	9	10	11			
Vo						



Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company	Job Number	41474082
Construction Co.	Snelson	Job Number	41474802 T-109W
Hydro. Test Co.	Milbar	Project No.	T-109W 10/30/11
Test Section	PG&E T-109W, L-148, MP 14.60 - 17.63	WATER	
File Name	RCP 61362 - T-109W, L-148, MP 14.60 - 17.63		

Description	Segment							
	1	2	3	4	5	6	7	8
Restrained or Unrestrained?	Unrestrained	Unrestrained	Restrained	Restrained	Restrained	Restrained	Unrestrained	Restrained
Outside Diameter	8.625 in.	8.625 in.	8.625 in.	4.500 in.	2.375 in.	1.315 in.	8.625 in.	8.625 in.
Wall Thickness	0.188 in.	0.322 in.	0.277 in.	0.237 in.	0.154 in.	0.113 in.	0.500 in.	0.322 in.
Inside Diameter	8.249 in.	7.981 in.	8.071 in.	4.026 in.	2.067 in.	1.089 in.	7.625 in.	7.981 in.
Spec./Grade	API5L-X52	API5L-Grade B	API5L-Grade B	Unknown	API5L-Grade B	API5L-Grade B	API5L-Grade B	API5L-Grade B
Length Unstrained	39 ft	6 ft					18 ft	
Length Restrained			13,238 ft	2 ft	303 ft	643 ft		4 ft
Temperature -- On Test	73 °F	73 °F	71 °F	71 °F	71 °F	71 °F	73 °F	71 °F
Temperature -- End of Test	74 °F	74 °F	72 °F	72 °F	72 °F	72 °F	74 °F	72 °F
Pressure -- On Test	1,079 psig	1,079 psig	1,079 psig	1,079 psig	1,079 psig	1,079 psig	1,079 psig	1,079 psig
Pressure -- End of Test	1,079 psig	1,079 psig	1,079 psig	1,079 psig	1,079 psig	1,079 psig	1,079 psig	1,079 psig

Unrestrained Pipe					
Vo	167.61 gal		Vtp1	168.22 gal	
	21,453 oz.			21,532 oz.	
Vo Unrestrained		17 gal		43 gal	
Fwp 1	1.003307	1.003307			1.003307
Fpp 1	1.001973	1.001114			1.000686
Fpt 1	1.000237	1.000237			1.000237
Fwt 1	1.001423	1.001423			1.001423
Fpwt 1 = Fpt/Fwt	0.998815	0.998815			0.998815
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	108.72 gal	16.69 gal			42.82 gal
Fwp 2	1.003307	1.003307			1.003307
Fpp 2	1.001973	1.001114			1.000686
Fpt 2	1.000255	1.000255			1.000255
Fwt 2	1.001542	1.001542			1.001542
Fpwt 2 = Fpt/Fwt	0.998715	0.998715			0.998715
Vtp 2 = Vo(Fwp)(Fpp)(Fpwt)	108.71 gal	16.68 gal			42.81 gal

Restrained Pipe					
Vo	35,310.34 gal		Vtp1	35,425.55 gal	
	4,519,723 oz.			4,534,470 oz.	
Vo Restrained		35,183 gal		1 gal	
Fwp 1	1.003307	1.003307	1.003307	1.003307	1.003307
Fpp 1	1.000993	1.000596	1.000479	1.000355	1.000851
Fpt 1	1.000133	1.000133	1.000133	1.000133	1.000133
Fwt 1	1.001170	1.001170	1.001170	1.001170	1.001170
Fpwt 1 = Fpt/Fwt	0.998965	0.998965	0.998965	0.998965	0.998965
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	35,298 gal	1 gal	53 gal	31 gal	10 gal
Fwp 2	1.003307	1.003307	1.003307	1.003307	1.003307
Fpp 2	1.000997	1.000599	1.000483	1.000359	1.000854
Fpt 2	1.000145	1.000145	1.000145	1.000145	1.000145
Fwt 2	1.001283	1.001283	1.001283	1.001283	1.001283
Fpwt 2 = Fpt/Fwt	0.998863	0.998863	0.998863	0.998863	0.998863
Vtp 2 = Vo(Fwp)(Fpp)(Fpwt)	35,295 gal	1 gal	53 gal	31 gal	10 gal

Combined Pipe					
Vo	35,477.94 gal		Vtp1	35,593.77 gal	
	4,541,177 oz.			4,556,003 oz.	
1 °F Change		3.48 gal	445.46 oz.		



Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company						
Construction Co.	Snelson						
Hydro. Test Co.	Milbar						
Test Section	PG&E T-109W, L-148, MP 14.60 - 17.63						
File Name	RCP 61362 - T-109W, L-148, MP 14.60 - 17.63						
General Pipe Data							
Description	9	10	11				
Restrained or Unrestrained?	Restrained	Restrained	Restrained				
Outside Diameter	3.500 in.	8.625 in.	8.625 in.				
Wall Thickness	0.216 in.	0.277 in.	0.188 in.				
Inside Diameter	3.068 in.	8.071 in.	8.249 in.				
Spec./Grade	API5L-Grade B	API5L-Grade B	API5L-Grade B				
Length Unstrained							
Length Restrained	5 ft	6 ft	5 ft				
Temperature -- On Test	71 °F	71 °F	71 °F				
Temperature -- End of Test	72 °F	72 °F	72 °F				
Pressure -- On Test	1,079 psig	1,079 psig	1,079 psig				
Pressure -- End of Test	1,079 psig	1,079 psig	1,079 psig				
Unrestrained Pipe							
Vo							
Vo Unrestrained							
Fwp 1							
Fpp 1							
Fpt 1							
Fwt 1							
Fpwt 1 = Fpt/Fwt							
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)							
Fwp 2							
Fpp 2							
Fpt 2							
Fwt 2							
Fpwt = Fpt/Fwt							
Vtp = Vo(Fwp)(Fpp)(Fpwt)							
Restrained Pipe							
Vo							
Vo Restrained							
Fwp 1	2 gal	16 gal	14 gal				
Fpp 1	1.003307	1.003307	1.003307				
Fpt 1	1.000504	1.000993	1.001476				
Fwt 1	1.000133	1.000133	1.000133				
Fpwt 1 = Fpt/Fwt	1.001170	1.001170	1.001170				
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	0.998965	0.998965	0.998965				
Fwp 2	2 gal	16 gal	14 gal				
Fpp 2	1.003307	1.003307	1.003307				
Fpt 2	1.000508	1.000997	1.001479				
Fwt 2	1.000145	1.000145	1.000145				
Fpwt = Fpt/Fwt	1.001283	1.001283	1.001283				
Vtp = Vo(Fwp)(Fpp)(Fpwt)	0.998863	0.998863	0.998863				
Combined Pipe							
Vo							
1 °F Change							



Hydrostatic Test Pipe Data Table

Pipe Type	Length	Restrained / Unrestrained	Outside Diameter	Wall Thickness	Specification & Grade	Pipe Yield Pressure	Material	Joint Type	Seam Type
1	39 ft	Unrestrained	8.625 in.	0.1880 in.	API5L-X52	2,267 psig	Steel	Arc Weld	ERW-HF
2	6 ft	Unrestrained	8.625 in.	0.3220 in.	API5L-Grade B	2,613 psig	Steel	Arc Weld	SM
3	13,238 ft	Restrained	8.625 in.	0.2770 in.	API5L-Grade B	2,248 psig	Steel	Arc Weld	SM
4	2 ft	Restrained	4.500 in.	0.2370 in.	Unknown	2,528 psig	Steel	Arc Weld	OTH
5	303 ft	Restrained	2.375 in.	0.1540 in.	API5L-Grade B	4,539 psig	Steel	Arc Weld	SM
6	643 ft	Restrained	1.315 in.	0.1130 in.	API5L-Grade B	6,015 psig	Steel	Arc Weld	SM
7	18 ft	Unrestrained	8.625 in.	0.5000 in.	API5L-Grade B	4,058 psig	Steel	Arc Weld	SM
8	4 ft	Restrained	8.625 in.	0.3220 in.	API5L-Grade B	2,613 psig	Steel	Arc Weld	SM
9	5 ft	Restrained	3.500 in.	0.2160 in.	API5L-Grade B	4,320 psig	Steel	Arc Weld	SM
10	6 ft	Restrained	8.625 in.	0.2770 in.	API5L-Grade B	2,248 psig	Steel	Arc Weld	SM
11	5 ft	Restrained	8.625 in.	0.1880 in.	API5L-Grade B	1,526 psig	Steel	Arc Weld	SM

Hydrostatic Test Project Owner & Participants

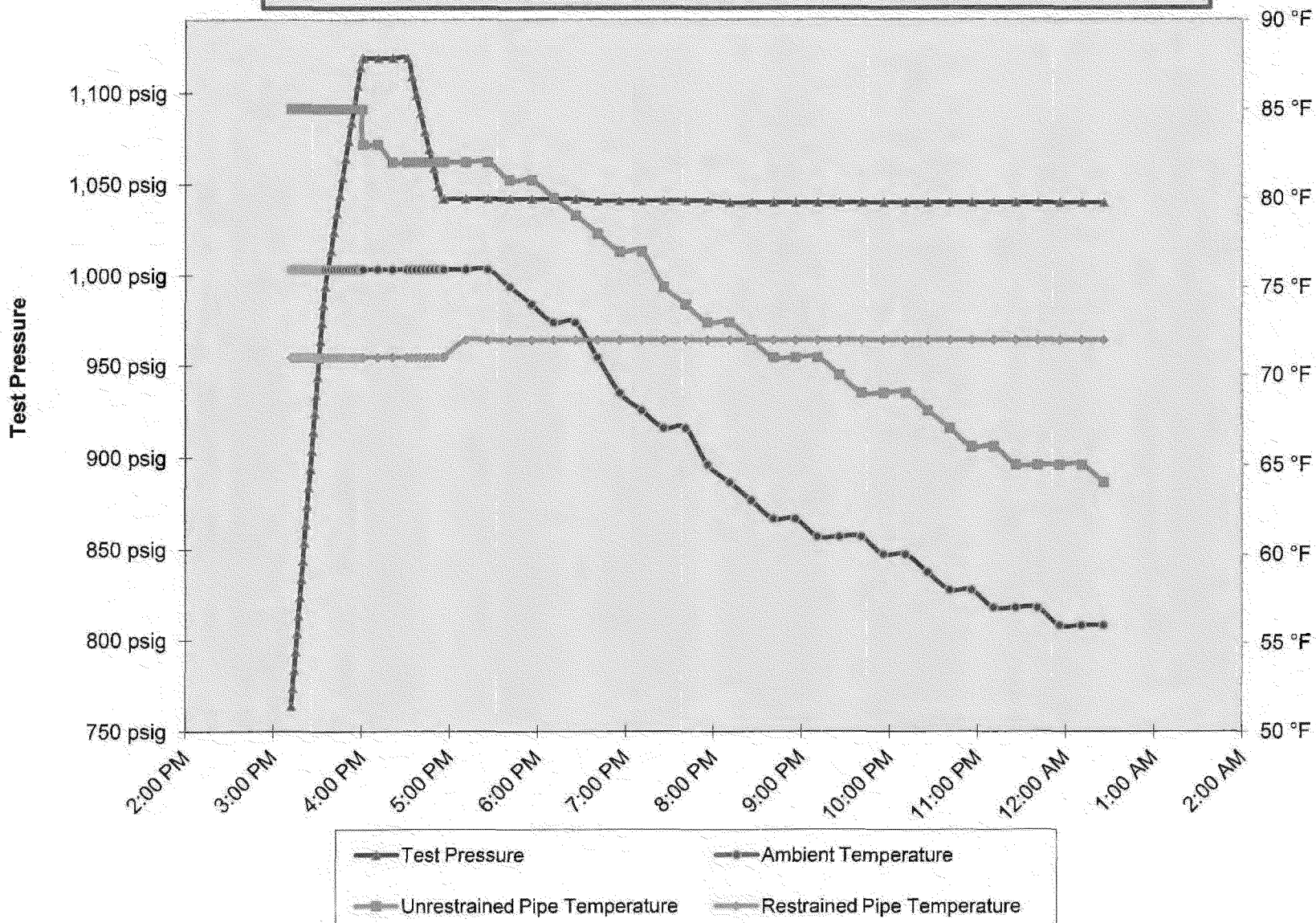
Owner Company	Pacific Gas and Electric Company	Job Number
Address	350 N. Wiget Walnut Creek, CA 94598 Attention: Redacted	41474082
Construction Company	Snelson	Job Number
Address	601 West State Street. Sedro-Woooley, WA Attention: Redacted	41474802 T-109W
Hydrostatic Test Co.	Milbar	Project No.
Address	P.O. Box 7701 Shreveport, LA 71137	T-109W 10/30/11
Test Section	PG&E T-109W, L-148, MP 14.60 - 17.63 From: 0+00 To: 132+47	
File Name	RCP 61362 - T-109W, L-148, MP 14.60 - 17.63	

Part II - Test Data (TO BE PREPARED BY PERSON SUPERVISING TEST AT TIME OF TEST)

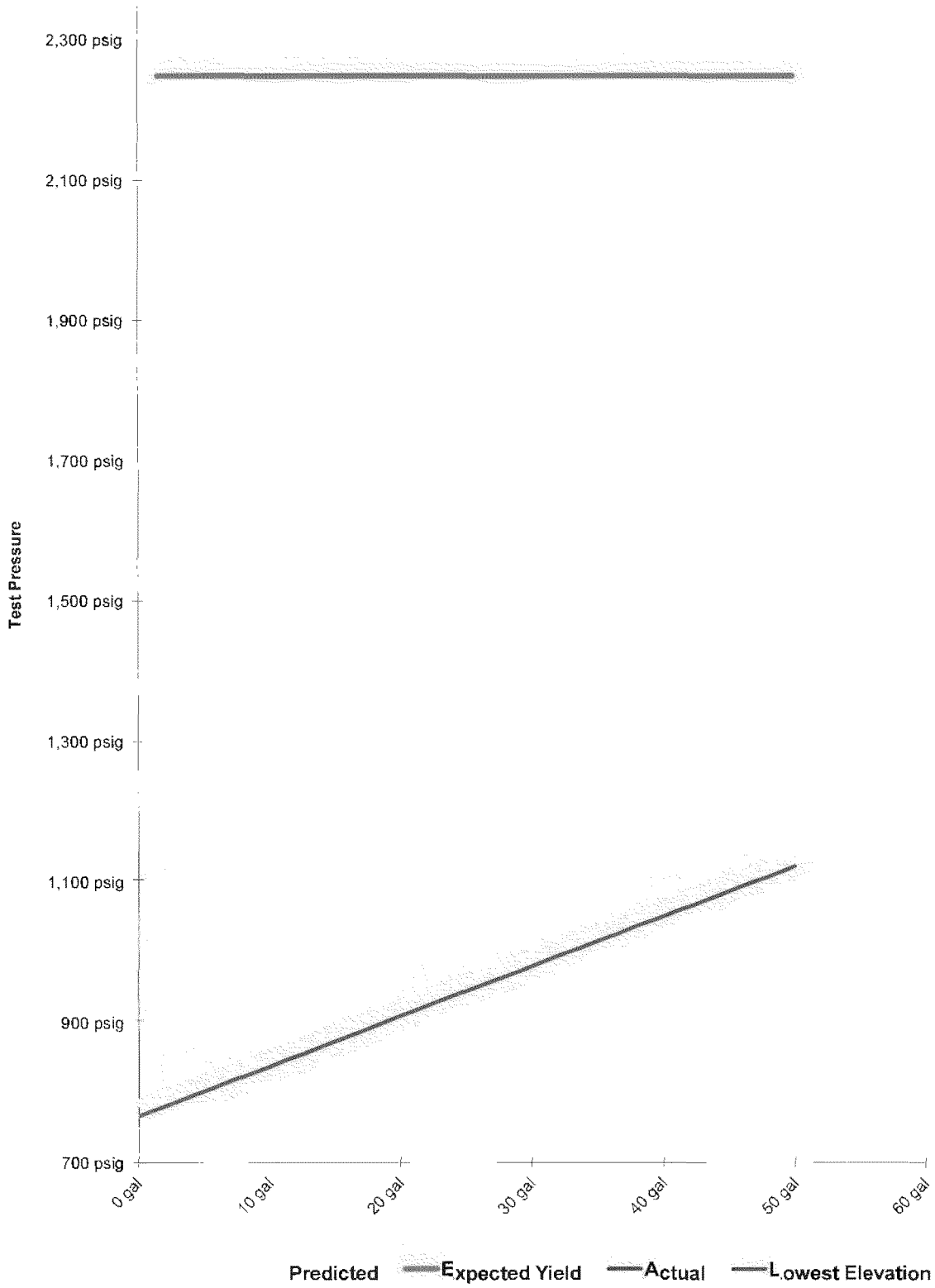
Note: Minimum test pressure and duration are not to be changed without written approval.

Time and Date Test Pressure Reached	10/31/11 4:01 PM	Elevation at Test Point	77 ft	Min. Required Test Press At Test Point (1)	1,017.77 psig	Max. Allowable Test Press at Test Point (4)	1,125.00 psig
Time and Date Test Ended	11/1/11 12:26 AM	Max. Elevation in Test Section	88 ft	Min. Indicated Test Pressure (2)	1,040.00 psig	Max. Indicated Test Pressure (5)	1,119.00 psig
Actual Duration of Test	8 hours 25 minutes	Min. Elevation in Test Section	77 ft	Min. Test Pressure at Max. Elevation (3)	1,035.23 psig	Max. Test Pressure at Min. Elevation (6)	1,119.00 psig

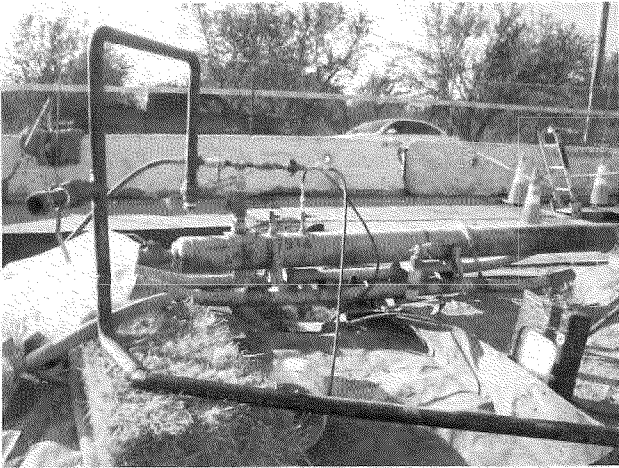
PG&E T-109W, L-148, MP 14.60 - 17.63



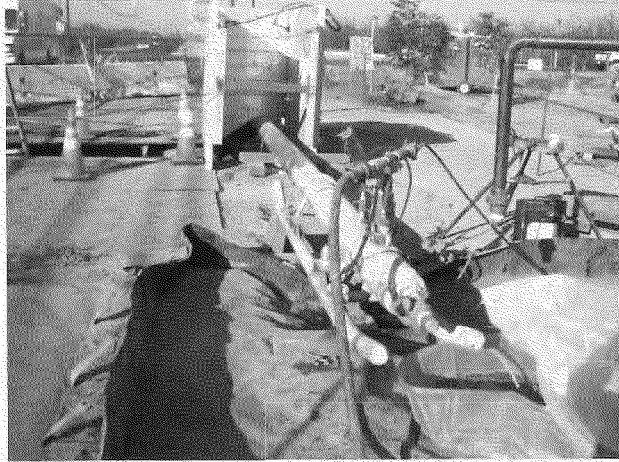
**Spike Pressure Test
Stress Strain Curve -- PG&E T-109W, L-148, MP 14.60 - 17.63**



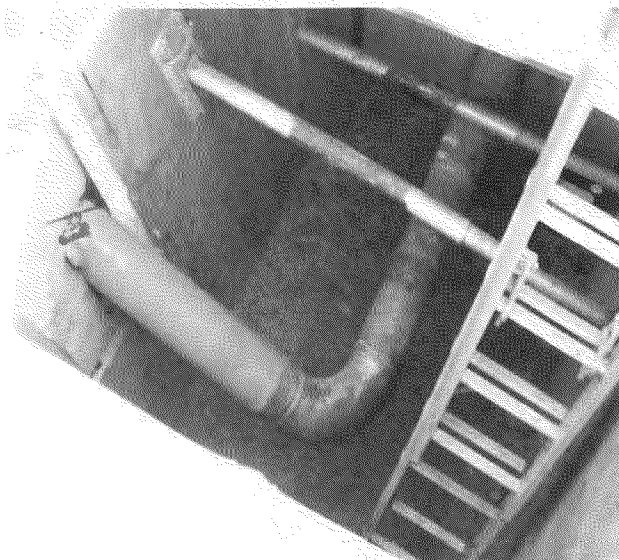
Actual Pressure Volume Plot Data			Predicted Pressure Volume Plot Data	Slope		Spike Pressure Test Stress Strain Curve -- PG&E T-109W, L-148, MP 14.60 - 17.63	
Pressure	Strokes	Gallons	Gallons	Actual	Predicted		
764 psig	0	0.00 gal		0	0.000	39250	0.092 gal/stroke
774 psig	19	1.49 gal	1.40 gal	0.149	0.140	Pump Piston Diameter:	1.500 in
784 psig	37	2.90 gal	2.81 gal	0.141	0.140	Pump Piston Stroke	6.00 in
794 psig	55	4.31 gal	4.21 gal	0.141	0.140	Pump Cylinders	2 ea
804 psig	73	5.72 gal	5.62 gal	0.141	0.140	Volume check gal per stroke	0.078 gal/stroke
814 psig	90	7.05 gal	7.02 gal	0.133	0.140	Volume Released (gallons)	1.41 gal
824 psig	108	8.46 gal	8.43 gal	0.141	0.140	Pressure Reduced (psi)	10 psi
834 psig	127	9.95 gal	9.83 gal	0.149	0.140	Maximum2	60 gal
844 psig	144	11.28 gal	11.23 gal	0.133	0.140	Minimum2	0 gal
854 psig	163	12.77 gal	12.64 gal	0.149	0.140	Maximum1	2,349 psig
864 psig	180	14.10 gal	14.04 gal	0.133	0.140	Minimum1	700 psig
874 psig	199	15.59 gal	15.45 gal	0.149	0.140	Gallons/Stroke Used	0.078 gal/stroke
884 psig	217	17.00 gal	16.85 gal	0.141	0.140	Predicted Gallons/Stroke	0.078 gal/stroke
894 psig	235	18.41 gal	18.26 gal	0.141	0.141	Pressure Increment	10 psi
904 psig	252	19.74 gal	19.66 gal	0.133	0.141	Max Pressure	1,119 psig
914 psig	271	21.23 gal	21.07 gal	0.149	0.141	Buried Pipe Temperature	65 °F
924 psig	288	22.56 gal	22.47 gal	0.133	0.141	Exposed Pipe Temperature	83 °F
934 psig	306	23.97 gal	23.88 gal	0.141	0.141	ASME B31.8 Appendix N-5	
944 psig	324	25.38 gal	25.28 gal	0.141	0.141	Average Actual Elastic Slope	0.141
954 psig	343	26.87 gal	26.69 gal	0.149	0.141	Average Predicted Elastic Slope	0.141
964 psig	361	28.28 gal	28.10 gal	0.141	0.141	Code Prescribed Minimum Yield Slope (less 10%) B31.8 N-5 (c)(2)	0.267
974 psig	379	29.69 gal	29.50 gal	0.141	0.141	Established Minimum Yield Pressure B31.8 N-5 (c)(2)	1,119 psig
984 psig	396	31.02 gal	30.91 gal	0.133	0.141	Maximum Allowed Volume (After Slope Deviation) B31.8 N-5 (c)(2)	418 gal
994 psig	414	32.43 gal	32.31 gal	0.141	0.141	Volume (After Slope Deviation) B31.8 N-5 (c)(2)	0 gal
1,004 psig	433	33.92 gal	33.72 gal	0.149	0.141	<div style="border: 1px solid black; width: 150px; height: 150px; margin: 0 auto;"></div> Redacted 10/31/2011 Date	
1,014 psig	451	35.33 gal	35.13 gal	0.141	0.141		
1,024 psig	469	36.74 gal	36.53 gal	0.141	0.141		
1,034 psig	486	38.07 gal	37.94 gal	0.133	0.141		
1,044 psig	505	39.56 gal	39.34 gal	0.149	0.141		
1,054 psig	523	40.97 gal	40.75 gal	0.141	0.141		
1,064 psig	541	42.38 gal	42.16 gal	0.141	0.141		
1,074 psig	559	43.79 gal	43.56 gal	0.141	0.141		
1,084 psig	576	45.12 gal	44.97 gal	0.133	0.141		
1,094 psig	594	46.53 gal	46.38 gal	0.141	0.141		
1,104 psig	613	48.02 gal	47.78 gal	0.149	0.141		
1,114 psig	631	49.43 gal	49.19 gal	0.141	0.141		
1,119 psig	639	50.06 gal	49.89 gal	0.125	0.141		
1,119 psig		50.06 gal	49.89 gal	0.000	0.000		
1,119 psig		50.06 gal	49.89 gal	0.000	0.000		
1,119 psig		50.06 gal	49.89 gal	0.000	0.000		
1,119 psig		50.06 gal	49.89 gal	0.000	0.000		
1,119 psig		50.06 gal	49.89 gal	0.000	0.000		
1,119 psig		50.06 gal	49.89 gal	0.000	0.000		



T-109 West Test Header



Pipe Associated With Test Header



Connection to Main Line



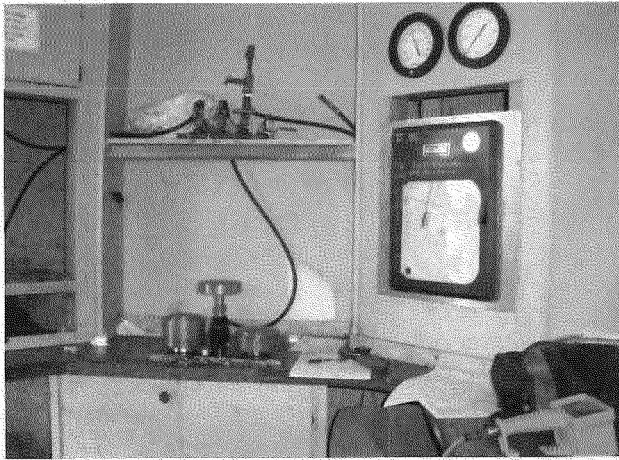
Restrained Temp Recorder Test Head



Pressure Chart Recorder



Unrestrained Temp Chart Recorder



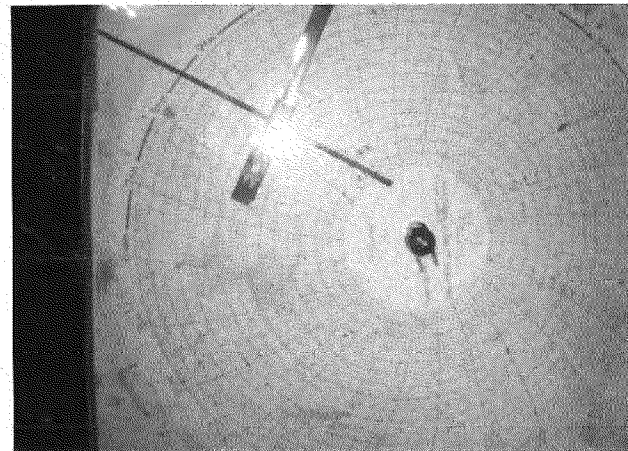
Deadweight Test Equipment



Pump Truck



Test End



Backup Restrained Temp Recorder