



RCP, inc

801 Louisiana, Ste.200  
Houston, Texas 77002

Redacted

October 5, 2011

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

Test Contractor: Milbar Hydro-Test Inc. -- FY12-112  
Asset Owner: Pacific Gas and Electric Company -- 41497337-T87C  
Construction Contractor: Snelson -- 41474005 -T87C  
Test Section: PG&E T-87C L-300B, MP 445.49 - 446.5  
Test Date: October 5, 2011  
Certificate Number: RCP 61362 - T-87C, L-300B, MP 445.49 - 446.5

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 Hydro-Test Inc. met the requirements of the Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 2).

This hydrostatic test was completed successfully. Pressure was maintained on the test facilities in excess of 8.25 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 977 psig and the established MAOP is 782 psig.

Pressure increased 4 psi during the test. No fluid was intentionally injected or released from the test section. Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 3,009.29 ounces, loss, which is equivalent to a 0.77 °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

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T-87C version 8.30.2011

Letter

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## Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41497337-T87C
Construction Co.	Snelson	Job Number	41474005 - T87C
Testing Co.	Milbar Hydro-Test Inc.	Project No.	FY12-112
Test Section	PG&E T-87C L-300B, MP 445.49 - 446.5		
File Name	RCP 61362 - T-87C, L-300B, MP 445.49 - 446.5		

			Date	5-Oct-11	Test Log					
Log No.	Test Period		Test Pressure	Temperature °F			Remarks			
	Date	Time		Ambient	Pipe					
					Unrestrained	Restrained	Comment	Bleed	Inject	
1	10/5/11	10:36 AM	726 psig	62 °F	64 °F	72 °F				
2	10/5/11	10:37 AM	736 psig	62 °F	64 °F	72 °F	Inject		1,692 oz.	
3	10/5/11	10:38 AM	746 psig	62 °F	64 °F	72 °F	Inject		1,904 oz.	
4	10/5/11	10:39 AM	756 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
5	10/5/11	10:40 AM	766 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
6	10/5/11	10:41 AM	776 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
7	10/5/11	10:42 AM	786 psig	62 °F	64 °F	72 °F	Inject		1,904 oz.	
8	10/5/11	10:43 AM	796 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
9	10/5/11	10:44 AM	806 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
10	10/5/11	10:45 AM	816 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
11	10/5/11	10:46 AM	826 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
12	10/5/11	10:47 AM	836 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
13	10/5/11	10:48 AM	846 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
14	10/5/11	10:49 AM	856 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
15	10/5/11	10:50 AM	866 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
16	10/5/11	10:51 AM	876 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
17	10/5/11	10:52 AM	886 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
18	10/5/11	10:53 AM	896 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
19	10/5/11	10:54 AM	906 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
20	10/5/11	10:55 AM	916 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
21	10/5/11	10:56 AM	926 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
22	10/5/11	10:57 AM	936 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
23	10/5/11	10:58 AM	946 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
24	10/5/11	10:58 AM	956 psig	62 °F	64 °F	72 °F	Inject		2,115 oz.	
25	10/5/11	10:58 AM	966 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
26	10/5/11	10:58 AM	976 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
27	10/5/11	10:59 AM	986 psig	62 °F	64 °F	72 °F	Inject		1,974 oz.	
28	10/5/11	11:00 AM	996 psig	62 °F	64 °F	72 °F	Inject		2,045 oz.	
29	10/5/11	11:01 AM	999 psig	62 °F	64 °F	72 °F	Inject		494 oz.	
30	10/5/11	11:02 AM	999 psig	55 °F	60 °F	72 °F	On Test			
31	10/5/11	11:17 AM	998 psig	58 °F	59 °F	72 °F				
32	10/5/11	11:32 AM	998 psig	63 °F	62 °F	72 °F				
33	10/5/11	11:47 AM	999 psig	64 °F	62 °F	72 °F				
34	10/5/11	12:02 PM	999 psig	62 °F	61 °F	73 °F				
35	10/5/11	12:17 PM	999 psig	66 °F	64 °F	72 °F				
36	10/5/11	12:32 PM	999 psig	66 °F	65 °F	72 °F				
37	10/5/11	12:47 PM	999 psig	66 °F	66 °F	72 °F				
38	10/5/11	1:02 PM	999 psig	67 °F	67 °F	72 °F				
39	10/5/11	1:17 PM	1,000 psig	67 °F	67 °F	72 °F				
40	10/5/11	1:32 PM	1,000 psig	66 °F	66 °F	73 °F				
41	10/5/11	1:47 PM	1,000 psig	67 °F	68 °F	72 °F				
42	10/5/11	2:02 PM	1,001 psig	68 °F	68 °F	72 °F				
43	10/5/11	2:17 PM	1,001 psig	67 °F	68 °F	73 °F				
44	10/5/11	2:32 PM	1,001 psig	67 °F	67 °F	72 °F				



# Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company					Job Number	41497337-T87C		
Construction Co.	Snelson					Job Number	41474005 - T87C		
Testing Co.	Milbar Hydro-Test Inc.					Project No.	FY12-112		
Test Section	PG&E T-87C L-300B, MP 445.49 - 446.5								
File Name	RCP 61362 - T-87C, L-300B, MP 445.49 - 446.5								
Date 5-Oct-11			<b>Test Log</b>						
Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe				
				Unrestrained	Restrained	Comment	Bleed	Inject	
45	10/5/11 2:47 PM	1,001 psig	66 °F	67 °F	73 °F				
46	10/5/11 3:02 PM	1,002 psig	66 °F	66 °F	73 °F				
47	10/5/11 3:17 PM	1,002 psig	66 °F	66 °F	73 °F				
48	10/5/11 3:32 PM	1,002 psig	65 °F	66 °F	73 °F				
49	10/5/11 3:47 PM	1,002 psig	66 °F	66 °F	73 °F				
50	10/5/11 4:02 PM	1,003 psig	66 °F	66 °F	73 °F				
51	10/5/11 4:17 PM	1,003 psig	64 °F	65 °F	73 °F				
52	10/5/11 4:32 PM	1,003 psig	65 °F	66 °F	73 °F				
53	10/5/11 4:47 PM	1,003 psig	64 °F	65 °F	73 °F				
54	10/5/11 5:02 PM	1,003 psig	64 °F	65 °F	73 °F				
55	10/5/11 5:17 PM	1,003 psig	64 °F	64 °F	73 °F				
56	10/5/11 5:32 PM	1,003 psig	62 °F	63 °F	73 °F				
57	10/5/11 5:47 PM	1,003 psig	61 °F	62 °F	73 °F				
58	10/5/11 6:02 PM	1,003 psig	53 °F	59 °F	73 °F				
59	10/5/11 6:17 PM	1,003 psig	53 °F	57 °F	73 °F				
60	10/5/11 6:32 PM	1,003 psig	52 °F	57 °F	72 °F				
61	10/5/11 6:47 PM	1,003 psig	53 °F	58 °F	73 °F				
62	10/5/11 7:02 PM	1,003 psig	53 °F	59 °F	73 °F				
63	10/5/11 7:17 PM	1,003 psig	53 °F	58 °F	73 °F	End of Test			
Spike Test									
Hydrostatic Test									
Were leaks observed during the test period?			Exposed and buried pipe, no leaks observed.			High Test Pressure:	1,003 psig		
						Low Test Pressure:	998 psig		



## Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company				Job Number	41497337-T87C									
Construction Co.	Snelson				Job Number	41474005 -T87C									
Hydro. Test Co.	Milbar Hydro-Test Inc.				Project No.	FY12-112									
Test Section	PG&E T-87C L-300B, MP 445.49 - 446.5				WATER										
File Name	RCP 61362 - T-87C, L-300B, MP 445.49 - 446.5														
General Pipe Data															
Description	Segment														
	1	2	3	4											
Restrained or Unrestrained?	Unrestrained	Restrained	Unrestrained	Unrestrained											
Outside Diameter	34.000 in.	34.000 in.	34.000 in.	34.000 in.											
Wall Thickness	0.375 in.	0.344 in.	0.500 in.	0.500 in.											
Inside Diameter	33.250 in.	33.312 in.	33.000 in.	33.000 in.											
Spec./Grade	API5L-X65	API5L-X52	API5L-X65	API5L-X65											
Length Unrestrained	44 ft		39 ft	26 ft											
Length Restrained		5,358 ft		26 ft											
Temperature -- On Test	60 °F	72 °F	60.0 °F	60.0 °F											
Temperature -- End of Test	58 °F	73 °F	58.0 °F	58.0 °F											
Pressure -- On Test	999 psig	999 psig	999 psig	999 psig											
Pressure -- End of Test	1,003 psig	1,003 psig	1,003 psig	1,003 psig											
Unrestrained Pipe															
Sum:	V <sub>o</sub>	4,872.72 gal		V <sub>tp1</sub>	4,902.95 gal		V <sub>tp2</sub>	4,903.78 gal							
		623,708 oz.			627,577 oz.			627,683 oz.							
V <sub>o</sub> Unrestrained		1,985 gal		1,733 gal	1,155 gal										
Fwp 1		1.003061		1.003061	1.003061										
Fpp 1		1.003891		1.002747	1.002747										
Fpt 1		1.000000		1.000000	1.000000										
Fwt 1		1.000000		1.000000	1.000000										
F <sub>wt</sub> 1 = F <sub>pt</sub> /F <sub>wt</sub>		1.000000		1.000000	1.000000										
V <sub>tp</sub> 1 = V <sub>o</sub> (Fwp)(Fpp)(F <sub>wt</sub> )		1,998.12 gal		1,742.89 gal	1,161.93 gal										
Fwp 2		1.003074		1.003074	1.003074										
Fpp 2		1.003706		1.002758	1.002758										
Fpt 2		0.999964		0.999964	0.999964										
Fwt 2		0.999819		0.999819	0.999819										
F <sub>wt</sub> 2 = F <sub>pt</sub> /F <sub>wt</sub>		1.000145		1.000145	1.000145										
V <sub>tp</sub> = V <sub>o</sub> (Fwp)(Fpp)(F <sub>wt</sub> )		1,998.47 gal		1,743.18 gal	1,162.12 gal										
Restrained Pipe															
Sum:	V <sub>o</sub>	242,584.63 gal		V <sub>tp1</sub>	243,774.41 gal		V <sub>tp2</sub>	243,750.07 gal							
		31,050,832 oz.			31,203,125 oz.			31,200,010 oz.							
V <sub>o</sub> Unrestrained		242,585 gal													
Fwp 1		1.003061													
Fpp 1		1.002978													
Fpt 1		1.000145													
Fwt 1		1.001283													
F <sub>wt</sub> 1 = F <sub>pt</sub> /F <sub>wt</sub>		0.998863													
V <sub>tp</sub> 1 = V <sub>o</sub> (Fwp)(Fpp)(F <sub>wt</sub> )		243,774 gal													
Fwp 2		1.003074													
Fpp 2		1.002993													
Fpt 2		1.000157													
Fwt 2		1.001423													
F <sub>wt</sub> 2 = F <sub>pt</sub> /F <sub>wt</sub>		0.998736													
V <sub>tp</sub> = V <sub>o</sub> (Fwp)(Fpp)(F <sub>wt</sub> )		243,750 gal													
Combined Pipe															
Sum:	V <sub>o</sub>	247,457.35 gal		V <sub>tp1</sub>	248,677.36 gal		V <sub>tp2</sub>	248,653.85 gal							
		31,674,541 oz.			31,830,702 oz.			31,827,693 oz.							



## Pipe Segment Volume Allowance Calculations

Company Construction Co. Hydro. Test Co.	Pacific Gas and Electric Company Snelson Milbar Hydro-Test Inc.	Job Number Job Number Project No.	41497337-T87C 41474005-T87C FY12-112			
Test Section File Name	PG&E T-87C L-300B, MP 445.49 - 446.5 RCP 61362 - T-87C, L-300B, MP 445.49 - 446.5		WATER			
General Pipe Data						
Description	Segment					
1	2	3	4			
Restrained or Unrestrained?	Unrestrained	Restrained	Unrestrained	Unrestrained		
Outside Diameter	34.000 in.	34.000 in.	34.000 in.	34.000 in.		
Wall Thickness	0.375 in.	0.344 in.	0.500 in.	0.500 in.		
Inside Diameter	33.250 in.	33.312 in.	33.000 in.	33.000 in.		
Spec./Grade	API5L-X65	API5L-X52	API5L-X65	API5L-X65		
Length Unstrained	44.00 ft		39.00 ft	26 ft		
Length Restrained		5,358 ft				
Temperature - On Test	58 °F	72 °F	58 °F	59 °F		
Temperature -- End of Test	59 °F	73 °F	59 °F	59 °F		
Pressure - On Test	1,001 psig	1,001 psig	1,001 psig	1,001 psig		
Pressure -- End of Test	1,001 psig	1,001 psig	1,001 psig	1,001 psig		
Unrestrained Pipe						
Sum:	Vo	4,872.72 gal 623,708 oz.	Vlp1	4,903.71 gal 627,675 oz.	Vlp2	4,903.37 gal 627,631 oz.
Vo Unrestrained		1.985 gal		1.733 gal		1.155 gal
Fwp 1		1.003067		1.003067		1.003067
Fpp 1		1.003698		1.002753		1.002753
Fpt 1		0.999964		0.999964		0.999964
Fwt 1		0.999819		0.999819		0.999819
Fpwt 1 = Fpt/Fwt		1.000145		1.000145		1.000145
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		1,998.44 gal		1,743.16 gal		1,162.11 gal
Fwp 2		1.003067		1.003067		1.003067
Fpp 2		1.003698		1.002753		1.002753
Fpt 2		0.999962		0.999962		0.999962
Fwt 2		0.999907		0.999907		0.999907
Fpwt 2 = Fpt/Fwt		1.000074		1.000074		1.000074
Vtp 2 = Vo(Fwp)(Fpp)(Fpwt)		1,998.30 gal		1,743.04 gal		1,162.03 gal
Restrained Pipe						
Sum:	Vo	242,584.63 gal 31,050,832 oz.	Vlp1	243,777.34 gal 31,203,499 oz.	Vlp2	243,747.15 gal 31,199,636 oz.
Vo Restrained		242,585 gal				
Fwp 1		1.003067				
Fpp 1		1.002984				
Fpt 1		1.000145				
Fwt 1		1.001283				
Fpwt 1 = Fpt/Fwt		0.998863				
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		243,777 gal				
Fwp 2		1.003067				
Fpp 2		1.002987				
Fpt 2		1.000157				
Fwt 2		1.001423				
Fpwt 2 = Fpt/Fwt		0.998736				
Vtp 2 = Vo(Fwp)(Fpp)(Fpwt)		243,747 gal				
Combined Pipe						
Sum:	Vo	247,457.35 gal 31,674,541 oz.	Vlp1	248,681.05 gal 31,831,174 oz.	Vlp2	248,650.52 gal 31,827,267 oz.
1 °F Change		30.53 gal		3,907.50 oz.		



## Hydrostatic Test Pipe Data Table

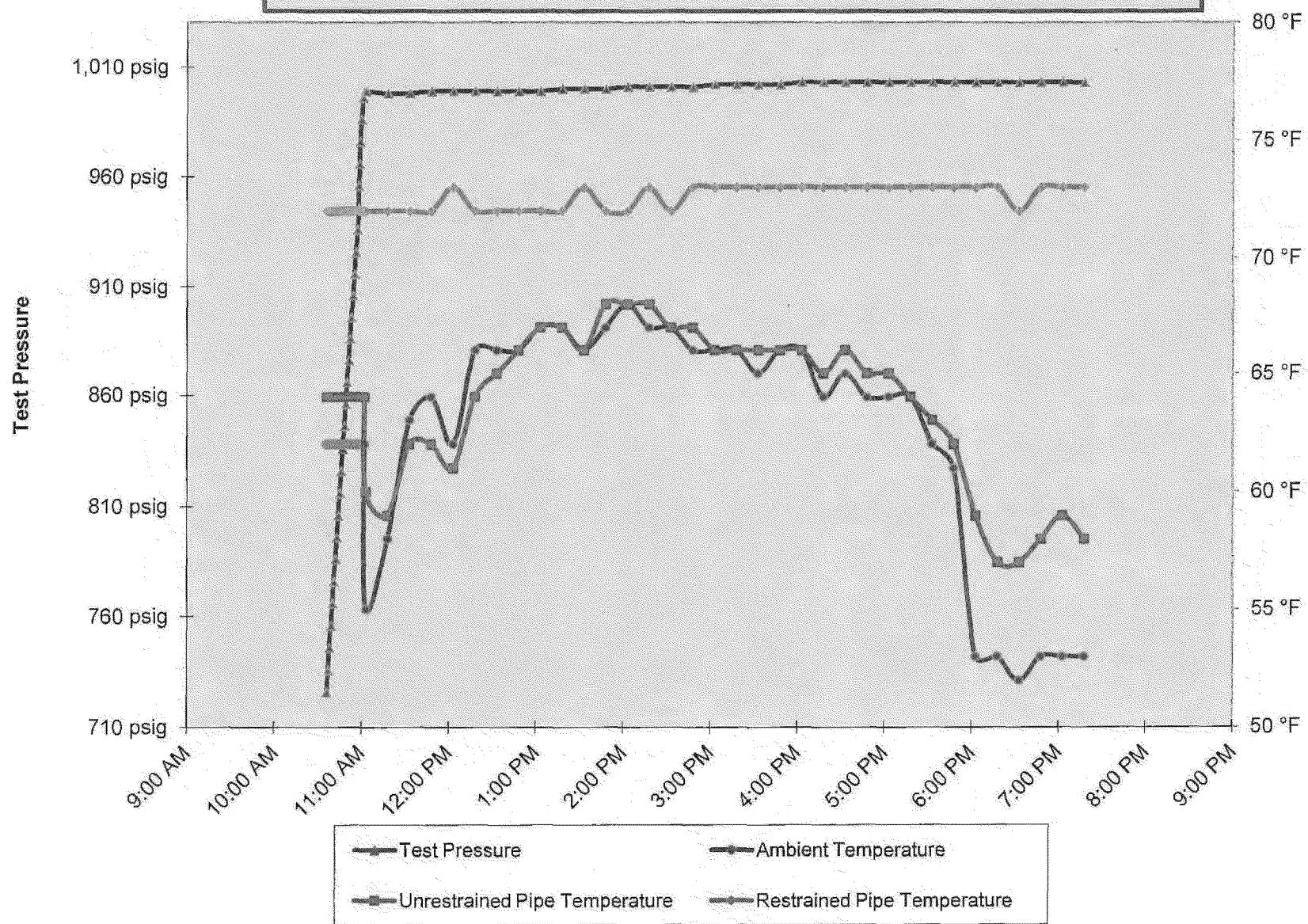
## **Hydrostatic Test Project Owner & Participants**

Hydrostatic Test Project Owner & Participants		
Owner Company	Pacific Gas and Electric Company	Job Number
Address	350 N. Wiget Walnut Creek, CA 94598	41497337-T87C
	Attention: Redacted	
Construction Company	Snelson	Job Number
Address	601 West State Street Sedro-Wooley, WA 98284	41474005 -T87C
	Attention: Redacted	
Hydrostatic Test Co.	Milbar Hydro-Test Inc.	Project No.
Address	P O Box 7701 Shreveport, La. 71137-7701	FY12-112
Test Section	PG&E T-87C L-300B, MP 445.49 - 446.5	
	From: 53+46	
	To: 0+00	
File Name	RCP 61362 - T-87C, L-300B, MP 445.49 - 446.5	

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	10/5/11 11:02 AM	Elevation at Test Point	561 ft	Min. Required Test Press At Test Point (1)	968.23 psig	Max. Allowable Test Press at Test Point (4)	1,021.03 psig
Time and Date Test Ended	10/5/11 7:17 PM	Max. Elevation in Test Section	610 ft	Min. Indicated Test Pressure (2)	998.00 psig	Max. Indicated Test Pressure (5)	1,003.00 psig
Actual Duration of Test	8 hours 15 minutes	Min. Elevation in Test Section	538 ft	Min. Test Pressure at Max. Elevation (3)	976.77 psig	Max. Test Pressure at Min. Elevation (6)	1,012.97 psig

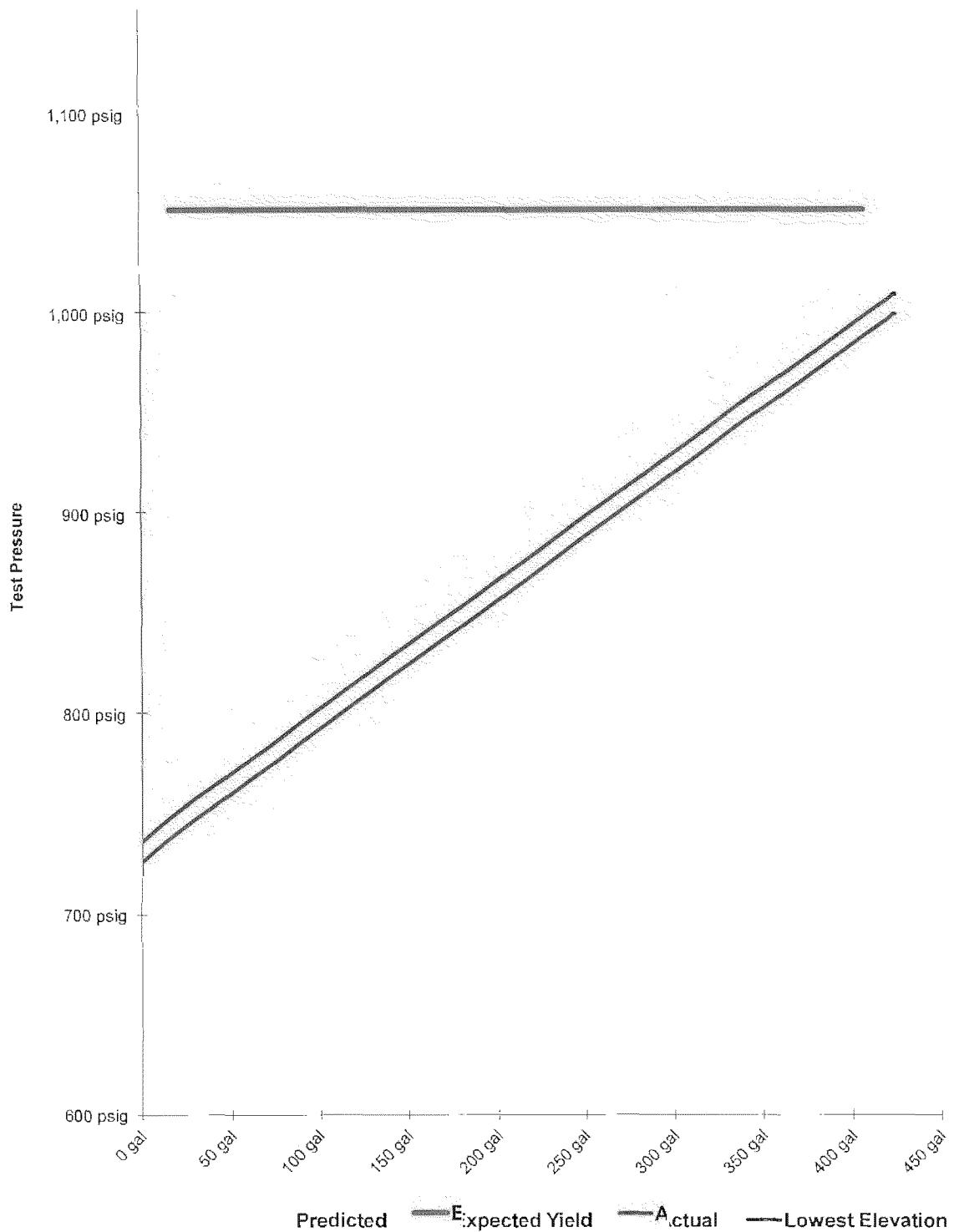
RCP

PG&E T-87C L-300B, MP 445.49 - 446.5



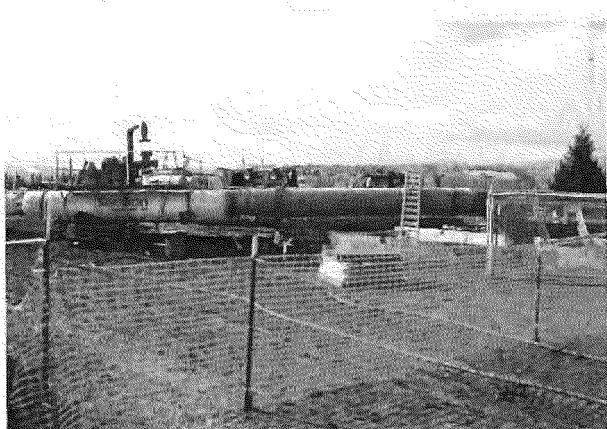
C:\1\PG&E FILES\TESTS\KTest T-87C Redac  
T-87C version 8.30.2011  
PlotT

**Spike Pressure Test**  
**Stress Strain Curve -- PG&E T-87C L-300B, MP 445.49 - 446.5**

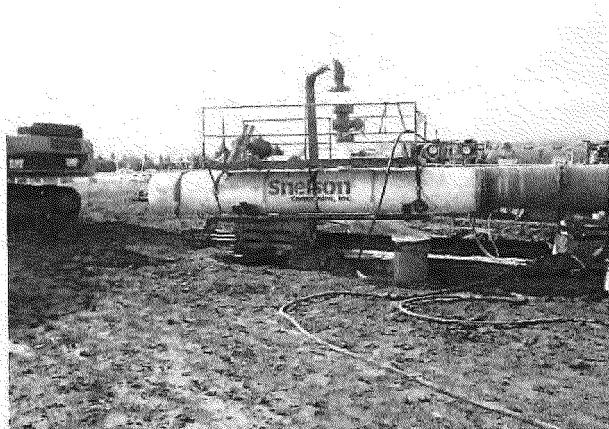




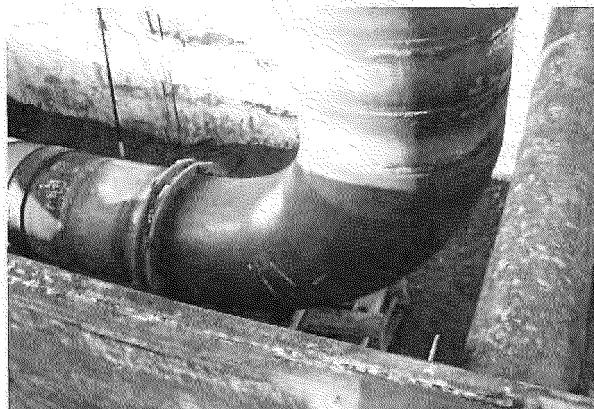
Actual Pressure Volume Plot Data			Predicted Pressure Volume Plot Data	Slope		Spike Pressure Test Stress Strain Curve -- PG&E T-87C L-300B, MP 445.49 - 446.5	
Pressure	Strokes	Gallons	Gallons	Actual	Predicted		
726 psig	0	0.00 gal		0	0.000	Pump gal per stroke	0.551 gal/stroke
736 psig	24	13.22 gal	14.90 gal	1.322	1.490	Pump Piston Diameter	3.000 in
746 psig	51	28.09 gal	29.81 gal	1.487	1.490	Pump Piston Stroke	6.00 in
756 psig	80	44.06 gal	44.71 gal	1.597	1.491	Pump Cylinders	3 ea
766 psig	108	59.49 gal	59.62 gal	1.542	1.491	Volume check gal per stroke	0.000 gal/stroke
776 psig	137	75.46 gal	74.53 gal	1.597	1.491	Volume Released (gallons)	0.00 gal
786 psig	164	90.33 gal	89.44 gal	1.487	1.491	Pressure Reduced (psi)	10 psi
796 psig	193	106.30 gal	104.34 gal	1.597	1.491	Maximum2	450 gal
806 psig	221	121.73 gal	119.25 gal	1.542	1.491	Minimum2	0 gal
816 psig	249	137.15 gal	134.17 gal	1.542	1.491	Maximum1	1,153 psig
826 psig	278	153.12 gal	149.08 gal	1.597	1.491	Minimum1	600 psig
836 psig	306	168.54 gal	163.99 gal	1.542	1.491	Gallons/Stroke Used	0.551 gal/stroke
846 psig	335	184.52 gal	178.90 gal	1.597	1.491	Predicted Gallons/Stroke	0.527 gal/stroke
856 psig	363	199.94 gal	193.82 gal	1.542	1.491	Pressure Increment	10 psi
866 psig	392	215.91 gal	208.73 gal	1.597	1.492	Max Pressure	999 psig
876 psig	420	231.34 gal	223.65 gal	1.542	1.492	Buried Pipe Temperature	64 °F
886 psig	448	246.76 gal	238.57 gal	1.542	1.492	Exposed Pipe Temperature	71 °F
896 psig	477	262.73 gal	253.49 gal	1.597	1.492	ASME B31.8 Appendix N-5	
906 psig	506	278.70 gal	268.41 gal	1.597	1.492		
916 psig	534	294.13 gal	283.33 gal	1.542	1.492		
926 psig	563	310.10 gal	298.25 gal	1.597	1.492		
936 psig	591	325.52 gal	313.17 gal	1.542	1.492		
946 psig	619	340.94 gal	328.09 gal	1.542	1.492	Average Actual Elastic Slope	1.547
956 psig	649	357.47 gal	343.01 gal	1.652	1.492	Average Predicted Elastic Slope	1.492
966 psig	678	373.44 gal	357.94 gal	1.597	1.492	Code Prescribed Minimum Yield Slope (less 10%) B31.8 N-5 (c)(2)	2.939
976 psig	706	388.86 gal	372.87 gal	1.542	1.493	Established Minimum Yield Pressure B31.8 N-5 (c)(2)	999 psig
986 psig	734	404.29 gal	387.79 gal	1.542	1.493	Maximum Allowed Volume (After Slope Deviation) B31.8 N-5 (c)(2)	418 gal
996 psig	763	420.26 gal	402.72 gal	1.597	1.493	Volume (After Slope Deviation) B31.8 N-5 (c)(2)	0 gal
999 psig	770	424.12 gal	407.20 gal	1.285	1.493	Redacted	
999 psig	772	425.22 gal	407.20 gal	#DIV/0!	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000	5-Oct-11	
999 psig		425.22 gal	407.20 gal	0.000	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000	Date	
999 psig		425.22 gal	407.20 gal	0.000	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000		
999 psig		425.22 gal	407.20 gal	0.000	0.000		



Test T-87C Test Head Connects



Test T-87C Test Head



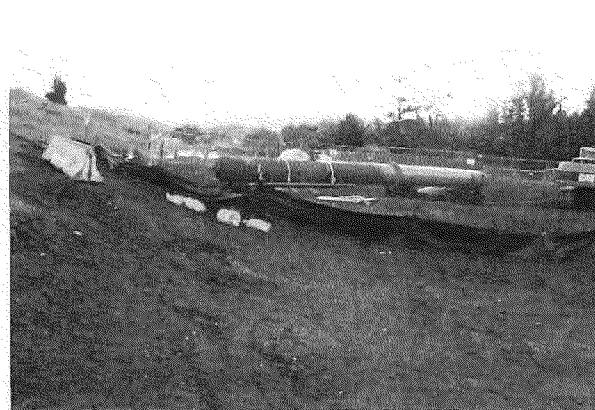
Test T-87C Test Head Tie In



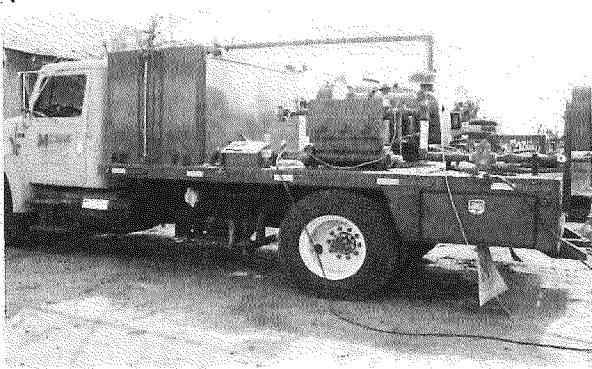
Test T-87C Restrained Temp. Rec.



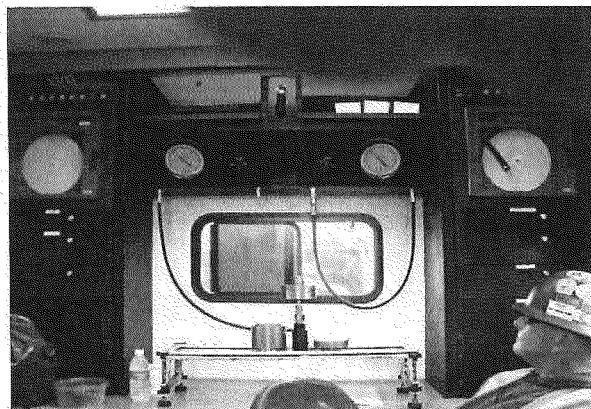
Test T-87C Chart Pressure Recorder



Test T-87C Test End



Test T-87C Pump Truck



Test T-87C Deadweight