



**RCP, Inc**

801 Louisiana, Ste.200  
Houston, Texas 77002  
(713)655-8080

Redacted

November 2, 2011

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

Test Contractor:	ARB -- T-93B 11/02/11
Asset Owner:	Pacific Gas and Electric Company -- 41474058
Construction Contractor:	ARB -- 0629-53-3500 T-93B
Test Section:	PG&E T-93B , L-400 , Redacted
Test Date:	November 2, 2011
Certificate Number:	RCP 61362 - T-93B, L-400, Redacted

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 ARB met the requirements of the Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 1 - Roads/Facility).

The test segment was subjected to a spike pressure test of 1615 psig for 30 minutes, without observed leakage or yielding of the pipe segment.

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 1493 psig and the MAOP per 49 CFR Part 192, Subpart J can be as high as 1357 psig. The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 975 psig.

Pressure decreased 2 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 337.88 ounces, loss, which is equivalent to a 0.04 °F change in pipe temperature and within the error attributed to the temperature measurement instrumentation utilized.

Test pressure remained steady and no leaks were observed. The volumetric loss is attributed to the error characteristic of the temperature measurement instrumentation utilized.

Sincerely,

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cc. file

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Documents\PG&E Pressure tests\T-93B\

Test 93B  
Letter



# Hydrostatic Test Certification

Company	Pacific Gas and Electric Company		Job Number	41474058
Construction Co.	ARB		Job Number	0629-53-3500 T-93B
Hydro. Test Co.	ARB		Project No.	T-93B 11/02/11
Test Section	PG&E T-93B, L-400	Redacted		
File Name	RCP 61362 - T-93B, L-			

### Hydrostatic Test Pressure

APPLICABLE CODE FOR CERTIFICATION: \_\_\_\_\_ Test Date: 2-Nov-11

### Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 1 - Roads/Facility)

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-93B, L-400, MP 293.40 -297.86  
 From: 233+60 To: 0+00

### Pipe Data

Segment	Length	Diameter	Wall Thickness	Specification	100% SMYS
1	23,225.8 ft	26,000 in.	0.500 in.	API5L-X52, DSAW, Arc Weld, Steel	2,000 psi
2	72.1 ft	26,000 in.	0.500 in.	API5L-X65, DSAW, Arc Weld, Steel	2,500 psi
3	22.0 ft	26,000 in.	0.500 in.	API5L-X65, DSAW, Arc Weld, Steel	2,500 psi
4	213.0 ft	26,000 in.	0.500 in.	API5L-X52, DSAW, Arc Weld, Steel	2,000 psi

### Initial Test Conditions

Pressure at Test Point:	1,501 psig	Date/Time:	11/2/11 1:45 PM	Pipe Temperature	
Ambient Temperature:	73.0 °F	Elevation @ Test Point:	7.0 ft	Unrestrained:	77.0 °F
Pressure @ High Point (Cal/Measure):	1,495 psig	Elevation @ High Point:	20.0 ft	Restrained:	68.0 °F
Pressure @ Low Point (Cal/Measure):	1,524 psig	Elevation @ Low Point:	(47.0) ft	Location:	233+60
				Location:	0+00
				Location:	194+00

### Final Test Conditions

Pressure at Test Point:	1,489 psig	Date/Time:	11/2/11 10:00 PM	Pipe Temperature	
Ambient Temperature:	52.0 °F	Elevation @ Test Point:	7.0 ft	Unrestrained:	74.0 °F
Pressure @ High Point (Cal/Measure):	1,493 psig	Elevation @ High Point:	20.0 ft	Restrained:	68.0 °F
Pressure @ Low Point (Cal/Measure):	1,522 psig	Elevation @ Low Point:	(47.0) ft	Location:	233+60
				Location:	0+00
				Location:	194+00
Total Fluid Injected:		Volume loss			
Total Fluid Withdrawn:					
Net Change in Volume of the Test Section ± (+ Gain, - Loss):	(337.88) oz	loss	(0.0004)%	(0.041) °F equivalent	

Test Duration: 8.25 hours

Minimum Test Pressure:	1,499 psig	Max Elevation	1,493 psig	Min Elevation	1,522 psig
Maximum Test Pressure:	1,501 psig		1,495 psig		1,524 psig
% SMYS:			59.8%		76.2%
Test Segment Observed % SMYS:	Minimum		59.8%	Maximum	76.2%

Minimum Test Pressure (Calculated/Measured): 1,493 psig

Maximum Allowable Operating Pressure: DOT Part 192 Test Factor= 1.10 1,357 psig

The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 975 psig.

Were leaks observed?	No	Explain:
Acceptable Hydrostatic Test?	Yes	<p>The test segment was subjected to a spike pressure test of 1615 psig for 30 minutes, without observed leakage or yielding of the pipe segment.</p> <p>No leaks were observed during the test period. The test section included 23,226 feet of buried and 307 feet of exposed pipe. Pressure lost 2 psi during the test. The buried pipe segment fluid temperature remained steady and the exposed pipe segment lost 3°F.</p> <p>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 337.88 ounces, loss, which is equivalent to a 0.04 °F change in pipe temperature and within the error attributed to the temperature measurement instrumentation utilized.</p> <p>Test pressure remained steady and no leaks were observed. The volumetric loss is attributed to the error characteristic of the temperature measurement instrumentation utilized.</p>

Remarks

Redacted

2-Nov-11

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Documents\PG&E Pressure tests\T-93B\

Test 93B Certification



# Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41474058
Construction Co.	ARB	Job Number	0629-53-3500 T-93B
Testing Co.	ARB	Project No.	T-93B 11/02/11
Test Section	PG&E T-93B, L-400, MF <span style="border: 1px solid black; padding: 2px;">Redacted</span>		
File Name	RCP 61362 - T-93B, L-400 <span style="border: 1px solid black; padding: 2px;">Redacted</span>		

Date		2-Nov-11		Test Log					
Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe		Comment	Bleed	Inject
				Unrestrained	Restrained				
1	11/2/11	11:25 AM	1,102 psig	66 °F	75 °F	67 °F	Start Spike		
2	11/2/11	11:26 AM	1,112 psig	66 °F	75 °F	67 °F	Inject		3,550 oz.
3	11/2/11	11:27 AM	1,122 psig	66 °F	75 °F	67 °F	Inject		3,582 oz.
4	11/2/11	11:28 AM	1,132 psig	66 °F	75 °F	67 °F	Inject		3,454 oz.
5	11/2/11	11:29 AM	1,142 psig	66 °F	75 °F	67 °F	Inject		3,582 oz.
6	11/2/11	11:30 AM	1,152 psig	66 °F	75 °F	67 °F	Inject		3,454 oz.
7	11/2/11	11:31 AM	1,162 psig	66 °F	75 °F	67 °F	Inject		3,582 oz.
8	11/2/11	11:32 AM	1,172 psig	66 °F	75 °F	67 °F	Inject		3,422 oz.
9	11/2/11	11:33 AM	1,182 psig	67 °F	75 °F	67 °F	Inject		3,902 oz.
10	11/2/11	11:34 AM	1,192 psig	67 °F	75 °F	67 °F	Inject		3,518 oz.
11	11/2/11	11:35 AM	1,202 psig	67 °F	75 °F	67 °F	Inject		3,582 oz.
12	11/2/11	11:36 AM	1,212 psig	67 °F	75 °F	67 °F	Inject		3,454 oz.
13	11/2/11	11:37 AM	1,222 psig	67 °F	75 °F	67 °F	Inject		3,582 oz.
14	11/2/11	11:38 AM	1,232 psig	67 °F	75 °F	67 °F	Inject		3,614 oz.
15	11/2/11	11:39 AM	1,242 psig	67 °F	75 °F	67 °F	Inject		3,422 oz.
16	11/2/11	11:40 AM	1,252 psig	67 °F	75 °F	67 °F	Inject		3,646 oz.
17	11/2/11	11:41 AM	1,262 psig	67 °F	75 °F	67 °F	Inject		3,518 oz.
18	11/2/11	11:42 AM	1,272 psig	67 °F	75 °F	67 °F	Inject		3,518 oz.
19	11/2/11	11:43 AM	1,282 psig	67 °F	75 °F	67 °F	Inject		3,678 oz.
20	11/2/11	11:44 AM	1,282 psig	67 °F	75 °F	67 °F	Inject		3,358 oz.
21	11/2/11	11:45 AM	1,292 psig	67 °F	75 °F	67 °F	Inject		3,582 oz.
22	11/2/11	11:46 AM	1,302 psig	67 °F	75 °F	67 °F	Inject		3,518 oz.
23	11/2/11	11:47 AM	1,312 psig	67 °F	75 °F	67 °F	Inject		3,518 oz.
24	11/2/11	11:48 AM	1,322 psig	67 °F	75 °F	67 °F	Inject		3,582 oz.
25	11/2/11	11:49 AM	1,332 psig	67 °F	75 °F	67 °F	Inject		3,518 oz.
26	11/2/11	11:50 AM	1,342 psig	67 °F	75 °F	67 °F	Inject		3,518 oz.
27	11/2/11	11:51 AM	1,352 psig	68 °F	75 °F	67 °F	Inject		3,582 oz.
28	11/2/11	11:52 AM	1,362 psig	68 °F	76 °F	67 °F	Inject		3,582 oz.
29	11/2/11	11:53 AM	1,372 psig	68 °F	76 °F	67 °F	Inject		3,614 oz.
30	11/2/11	11:54 AM	1,382 psig	68 °F	76 °F	67 °F	Inject		3,486 oz.
31	11/2/11	11:55 AM	1,392 psig	68 °F	76 °F	67 °F	Inject		3,518 oz.
32	11/2/11	11:56 AM	1,402 psig	68 °F	76 °F	67 °F	Inject		3,518 oz.
33	11/2/11	11:57 AM	1,412 psig	68 °F	76 °F	67 °F	Inject		3,582 oz.
34	11/2/11	11:58 AM	1,422 psig	68 °F	76 °F	67 °F	Inject		3,550 oz.
35	11/2/11	11:59 AM	1,432 psig	68 °F	76 °F	67 °F	Inject		3,550 oz.
36	11/2/11	12:00 PM	1,442 psig	69 °F	76 °F	67 °F	Inject		3,550 oz.
37	11/2/11	12:01 PM	1,452 psig	69 °F	76 °F	67 °F	Inject		3,454 oz.
38	11/2/11	12:02 PM	1,462 psig	69 °F	76 °F	67 °F	Inject		3,678 oz.
39	11/2/11	12:03 PM	1,472 psig	69 °F	76 °F	67 °F	Inject		3,486 oz.
40	11/2/11	12:04 PM	1,482 psig	69 °F	76 °F	67 °F	Inject		3,518 oz.
41	11/2/11	12:05 PM	1,492 psig	69 °F	76 °F	67 °F	Inject		3,550 oz.
42	11/2/11	12:06 PM	1,502 psig	69 °F	76 °F	67 °F	Inject		3,582 oz.
43	11/2/11	12:07 PM	1,512 psig	69 °F	76 °F	67 °F	Inject		3,422 oz.
44	11/2/11	12:08 PM	1,522 psig	69 °F	76 °F	67 °F	Inject		3,678 oz.
45	11/2/11	12:09 PM	1,532 psig	69 °F	76 °F	67 °F	Inject		3,646 oz.
46	11/2/11	12:10 PM	1,542 psig	70 °F	76 °F	67 °F	Inject		3,550 oz.
47	11/2/11	12:11 PM	1,552 psig	70 °F	76 °F	67 °F	Inject		3,550 oz.



# Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41474058
Construction Co.	ARB	Job Number	0629-53-3500 T-93B
Testing Co.	ARB	Project No.	T-93B 11/02/11
Test Section	PG&E T-93B, L-400, MP	Redacted	
File Name	RCP 61362 - T-93B, L-400,	Redacted	

Date		2-Nov-11		Test Log					
Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe		Comment	Bleed	Inject
					Unrestrained	Restrained			
48	11/2/11	12:12 PM	1,562 psig	70 °F	76 °F	67 °F	Inject		3,582 oz.
49	11/2/11	12:13 PM	1,572 psig	71 °F	76 °F	67 °F	Inject		3,614 oz.
50	11/2/11	12:14 PM	1,582 psig	71 °F	76 °F	67 °F	Inject		3,614 oz.
51	11/2/11	12:15 PM	1,592 psig	71 °F	76 °F	67 °F	Inject		3,550 oz.
52	11/2/11	12:17 PM	1,602 psig	72 °F	76 °F	67 °F	Inject		3,422 oz.
53	11/2/11	12:19 PM	1,612 psig	73 °F	76 °F	67 °F	Inject		1,126 oz.
54	11/2/11	12:21 PM	1,615 psig	73 °F	76 °F	67 °F			
55	11/2/11	12:31 PM	1,614 psig	70 °F	76 °F	67 °F			
56	11/2/11	12:41 PM	1,613 psig	73 °F	76 °F	67 °F			
57	11/2/11	12:51 PM	1,613 psig	70 °F	77 °F	67 °F	End Spike		
58	11/2/11	12:55 PM	1,603 psig	73 °F	77 °F	67 °F	Bleed	3,552 oz.	
59	11/2/11	12:59 PM	1,593 psig	72 °F	77 °F	67 °F	Bleed	3,552 oz.	
60	11/2/11	1:02 PM	1,573 psig	73 °F	78 °F	67 °F	Bleed	7,104 oz.	
61	11/2/11	1:05 PM	1,553 psig	73 °F	78 °F	67 °F	Bleed	7,104 oz.	
62	11/2/11	1:08 PM	1,533 psig	73 °F	78 °F	67 °F	Bleed	7,104 oz.	
63	11/2/11	1:11 PM	1,513 psig	73 °F	78 °F	67 °F	Bleed	7,104 oz.	
64	11/2/11	1:15 PM	1,501 psig	73 °F	78 °F	67 °F	Bleed	4,262 oz.	
65	11/2/11	1:30 PM	1,501 psig	72 °F	77 °F	67 °F			
66	11/2/11	1:45 PM	1,501 psig	73 °F	77 °F	68 °F	Sun Shine	On Test	
67	11/2/11	2:00 PM	1,501 psig	72 °F	76 °F	68 °F			
68	11/2/11	2:15 PM	1,501 psig	73 °F	76 °F	68 °F			
69	11/2/11	2:30 PM	1,501 psig	71 °F	76 °F	68 °F			
70	11/2/11	2:45 PM	1,501 psig	71 °F	76 °F	68 °F	Sun Shine		
71	11/2/11	3:00 PM	1,501 psig	71 °F	76 °F	68 °F			
72	11/2/11	3:15 PM	1,501 psig	71 °F	76 °F	68 °F			
73	11/2/11	3:30 PM	1,501 psig	71 °F	76 °F	68 °F			
74	11/2/11	3:45 PM	1,501 psig	71 °F	76 °F	68 °F			
75	11/2/11	4:00 PM	1,501 psig	73 °F	76 °F	68 °F	Sun Shine		
76	11/2/11	4:15 PM	1,501 psig	72 °F	77 °F	68 °F			
77	11/2/11	4:30 PM	1,501 psig	72 °F	77 °F	68 °F			
78	11/2/11	4:45 PM	1,501 psig	71 °F	77 °F	68 °F			
79	11/2/11	5:00 PM	1,501 psig	69 °F	77 °F	68 °F	Sun Shine		
80	11/2/11	5:15 PM	1,501 psig	68 °F	77 °F	68 °F			
81	11/2/11	5:30 PM	1,501 psig	68 °F	77 °F	68 °F			
82	11/2/11	5:45 PM	1,501 psig	68 °F	76 °F	68 °F			
83	11/2/11	6:00 PM	1,501 psig	65 °F	76 °F	68 °F			
84	11/2/11	6:15 PM	1,501 psig	64 °F	76 °F	68 °F	Cool		
85	11/2/11	6:30 PM	1,501 psig	63 °F	76 °F	68 °F			
86	11/2/11	6:45 PM	1,501 psig	61 °F	75 °F	68 °F			
87	11/2/11	7:00 PM	1,501 psig	61 °F	75 °F	68 °F			
88	11/2/11	7:15 PM	1,501 psig	60 °F	75 °F	68 °F			
89	11/2/11	7:30 PM	1,501 psig	60 °F	74 °F	68 °F	Cool		
90	11/2/11	7:45 PM	1,501 psig	59 °F	74 °F	68 °F			
91	11/2/11	8:00 PM	1,500 psig	58 °F	74 °F	68 °F			
92	11/2/11	8:15 PM	1,500 psig	57 °F	74 °F	68 °F			
93	11/2/11	8:30 PM	1,500 psig	56 °F	74 °F	68 °F			
94	11/2/11	8:45 PM	1,500 psig	55 °F	74 °F	68 °F	Cool		

Redacted Documents\PG&E Pressure tests\T-93B\

Test 93B  
Dead Weight Sheet





# Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41474058
Construction Co.	ARB	Job Number	0629-53-3500 T-93B
Testing Co.	ARB	Project No.	T-93B 11/02/11
Test Section	PG&E T-93B, L-400, MP	Redacted	
File Name	RCP 61362 - T-93B, L-400,	Redacted	

Date	2-Nov-11	<b>Test Log</b>
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Log No.	Test Period		Test Pressure	Temperature °F		Remarks			
	Date	Time		Ambient	Pipe		Comment	Bleed	Inject
					Unrestrained	Restrained			
95	11/2/11	9:00 PM	1,500 psig	54 °F	74 °F	68 °F			
96	11/2/11	9:15 PM	1,500 psig	54 °F	74 °F	68 °F			
97	11/2/11	9:30 PM	1,499 psig	52 °F	74 °F	68 °F			
98	11/2/11	9:45 PM	1,499 psig	52 °F	74 °F	68 °F	Cool		
99	11/2/11	10:00 PM	1,499 psig	52 °F	74 °F	68 °F	End of Test		
							<b>Spike Test</b>		182,217.6 oz.
							<b>Hydrostatic Test</b>		

Were leaks observed during the test period?	Exposed and buried pipe, no leaks observed.	High Test Pressure: 1,501 psig	Low Test Pressure: 1,499 psig
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## Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company	Job Number	41474058
Construction Co.	ARB	Job Number	0629-53-3500 T-93B
Hydro. Test Co.	ARB	Project No.	T-93B 11/02/11
Test Section	PG&E T-93B, L-400, MP	<b>WATER</b>	
File Name	RCP 61362 - T-93B, L-400, <span style="background-color: black; color: black;">Redacted</span>		

General Pipe Data

Description	Segment			
	1	2	3	4
Restrained or Unrestrained?	Restrained	Unrestrained	Unrestrained	Unrestrained
Outside Diameter	26.000 in.	26.000 in.	26.000 in.	26.000 in.
Wall Thickness	0.500 in.	0.500 in.	0.500 in.	0.500 in.
Inside Diameter	25.000 in.	25.000 in.	25.000 in.	25.000 in.
Spec./Grade	API5L-X52	API5L-X65	API5L-X65	API5L-X52
Length Unrestrained		72 ft	22 ft	213 ft
Length Restrained	23,226 ft			
Temperature -- On Test	68 °F	77 °F	77.0 °F	77.0 °F
Temperature -- End of Test	68 °F	74 °F	74.0 °F	74.0 °F
Pressure -- On Test	1,501 psig	1,501 psig	1,501 psig	1,501 psig
Pressure -- End of Test	1,499 psig	1,499 psig	1,499 psig	1,499 psig

Unrestrained Pipe

Vo	7,831.03 gal		Vtp1	7,878.66 gal		Vtp2	7,881.48 gal	
	1,002,372 oz.			1,008,469 oz.			1,008,830 oz.	
Vo Unrestrained		1,839 gal	561 gal	5,431 gal				
Fwp 1		1.004607	1.004607	1.004607				
Fpp 1		1.003127	1.003127	1.003127				
Fpt 1		1.000309	1.000309	1.000309				
Fwt 1		1.001966	1.001966	1.001966				
Fpwt 1 = Fpt/Fwt		0.998347	0.998347	0.998347				
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		1,849.73 gal	564.41 gal	5,464.52 gal				
Fwp 2		1.004600	1.004600	1.004600				
Fpp 2		1.003123	1.003123	1.003123				
Fpt 2		1.000255	1.000255	1.000255				
Fwt 2		1.001542	1.001542	1.001542				
Fpwt = Fpt/Fwt		0.998715	0.998715	0.998715				
Vtp = Vo(Fwp)(Fpp)(Fpwt)		1,850.39 gal	564.61 gal	5,466.48 gal				

Restrained Pipe

Vo	592,256.52 gal		Vtp1	595,935.60 gal		Vtp2	595,930.14 gal	
	75,808,834 oz.			76,279,757 oz.			76,279,058 oz.	
Vo Unrestrained		592,257 gal						
Fwp 1		1.004607						
Fpp 1		1.002305						
Fpt 1		1.000097						
Fwt 1		1.000803						
Fpwt 1 = Fpt/Fwt		0.999294						
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		595,936 gal						
Fwp 2		1.004600						
Fpp 2		1.002302						
Fpt 2		1.000097						
Fwt 2		1.000803						
Fpwt = Fpt/Fwt		0.999294						
Vtp = Vo(Fwp)(Fpp)(Fpwt)		595,930 gal						

Combined Pipe

Vo	600,087.55 gal		Vtp1	603,814.26 gal		Vtp2	603,811.62 gal	
	76,811,206 oz.			77,288,226 oz.			77,287,868 oz.	

Redacted Documents\PG&E Pressure tests\T-93B\



## Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company		Job Number	41474058
Construction Co.	ARB		Job Number	0629-53-3500 T-93B
Hydro. Test Co.	ARB		Project No.	T-93B 11/02/11
Test Section	PG&E T-93B, L-400, MP	Redacted	WATER	
File Name	RCP 61362 - T-93B, L-400			

General Pipe Data							
Description	Segment						
	1	2	3	4			
Restrained or Unrestrained?	Restrained	Unrestrained	Unrestrained	Unrestrained			
Outside Diameter	26.000 in.	26.000 in.	26.000 in.	26.000 in.			
Wall Thickness	0.500 in.	0.500 in.	0.500 in.	0.500 in.			
Inside Diameter	25.000 in.	25.000 in.	25.000 in.	25.000 in.			
Spec./Grade	API5L-X52	API5L-X65	API5L-X65	API5L-X52			
Length Unstrained		72 ft	22 ft	213 ft			
Length Restrained	23,226 ft						
Temperature -- On Test	67 °F	75 °F	75 °F	75 °F			
Temperature -- End of Test	68 °F	76 °F	76 °F	76 °F			
Pressure -- On Test	1,500 psig	1,500 psig	1,500 psig	1,500 psig			
Pressure -- End of Test	1,500 psig	1,500 psig	1,500 psig	1,500 psig			
Unrestrained Pipe							
Vo	7,831.03 gal		Vtp1	7,880.52 gal		Vtp2	7,879.68 gal
	1,002,372 oz.			1,008,706 oz.			1,008,599 oz.
Vo Unrestrained		1,839 gal	561 gal	5,431 gal			
Fwp 1		1.004604	1.004604	1.004604			
Fpp 1		1.003125	1.003125	1.003125			
Fpt 1		1.000273	1.000273	1.000273			
Fwt 1		1.001688	1.001688	1.001688			
Fpwt 1 = Fpt/Fwt		0.998587	0.998587	0.998587			
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		1,850.16 gal	564.54 gal	5,465.81 gal			
Fwp 2		1.004604	1.004604	1.004604			
Fpp 2		1.003125	1.003125	1.003125			
Fpt 2		1.000291	1.000291	1.000291			
Fwt 2		1.001813	1.001813	1.001813			
Fpwt = Fpt/Fwt		0.998481	0.998481	0.998481			
Vtp = Vo(Fwp)(Fpp)(Fpwt)		1,849.97 gal	564.48 gal	5,465.23 gal			
Restrained Pipe							
Vo	592,256.52 gal		Vtp1	595,996.17 gal		Vtp2	595,932.87 gal
	75,808,834 oz.			76,287,510 oz.			76,279,407 oz.
Vo Restrained		592,257 gal					
Fwp 1		1.004604					
Fpp 1		1.002300					
Fpt 1		1.000085					
Fwt 1		1.000681					
Fpwt 1 = Fpt/Fwt		0.999404					
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		595,996 gal					
Fwp 2		1.004604					
Fpp 2		1.002304					
Fpt 2		1.000097					
Fwt 2		1.000803					
Fpwt = Fpt/Fwt		0.999294					
Vtp = Vo(Fwp)(Fpp)(Fpwt)		595,933 gal					
Combined Pipe							
Vo	600,087.55 gal		Vtp1	603,876.69 gal		Vtp2	603,812.55 gal
	76,311,206 oz.			77,296,216 oz.			77,288,006 oz.
1 °F Change		64.14 gal		8,209.95 oz.			

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Documents\PG&E Pressure tests\T-93B\

Test 93B  
Allowance



### 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	23,225.8 ft	Restrained	26.000 in.	0.5000 in.	API5L-X52	2,000 psig	Steel	Arc Weld	DSAW
2	72.1 ft	Unrestrained	26.000 in.	0.5000 in.	API5L-X65	2,500 psig	Steel	Arc Weld	DSAW
3	22.0 ft	Unrestrained	26.000 in.	0.5000 in.	API5L-X65	2,500 psig	Steel	Arc Weld	DSAW
4	213.0 ft	Unrestrained	26.000 in.	0.5000 in.	API5L-X52	2,000 psig	Steel	Arc Weld	DSAW

### Hydrostatic Test Project Owner & Participants

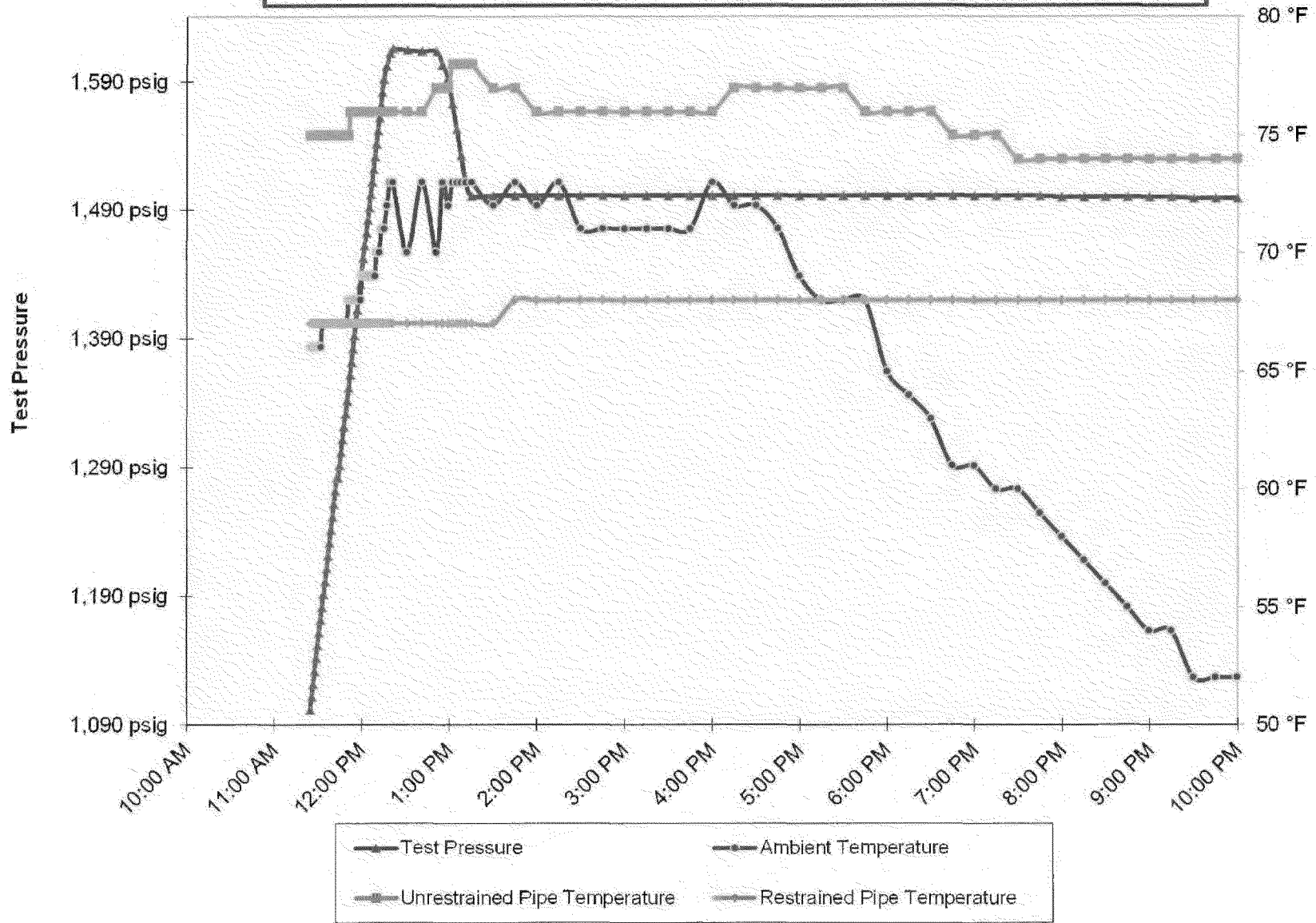
Owner Company	Pacific Gas and Electric Company	Job Number
Address	350 N. Wiget Walnut Creek, CA 94598 Attention: Redacted	41474058
Construction Company	ARB	Job Number
Address	1875 Loveridge Road Pittsburg, CA 94565 Attention: T. Barnes	0629-53-3500 T-93B
Hydrostatic Test Co.	ARB	Project No.
Address	1875 Loveridge Road Pittsburg, CA 94565 Attention: T. Barnes	T-93B 11/02/11
Test Section	PG&E T-93B, L-400, Redacted From: 233+60 To: 0+00	
File Name	RCP 61362 - T-93B, L-400, Redacted	

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	11/2/11 1:45 PM	Elevation at Test Point	7 ft	Min. Required Test Press At Test Point (1)	1,468.63 psig	Max. Allowable Test Press at Test Point (4)	1,616.60 psig
Time and Date Test Ended	11/2/11 10:00 PM	Max. Elevation in Test Section	20 ft	Min. Indicated Test Pressure (2)	1,499.00 psig	Max. Indicated Test Pressure (5)	1,501.00 psig
Actual Duration of Test	8 hours 15 minutes	Min. Elevation in Test Section	(47) ft	Min. Test Pressure at Max. Elevation (3)	1,493.37 psig	Max. Test Pressure at Min. Elevation (6)	1,524.40 psig





PG&E T-93B , L-400 , Redacted

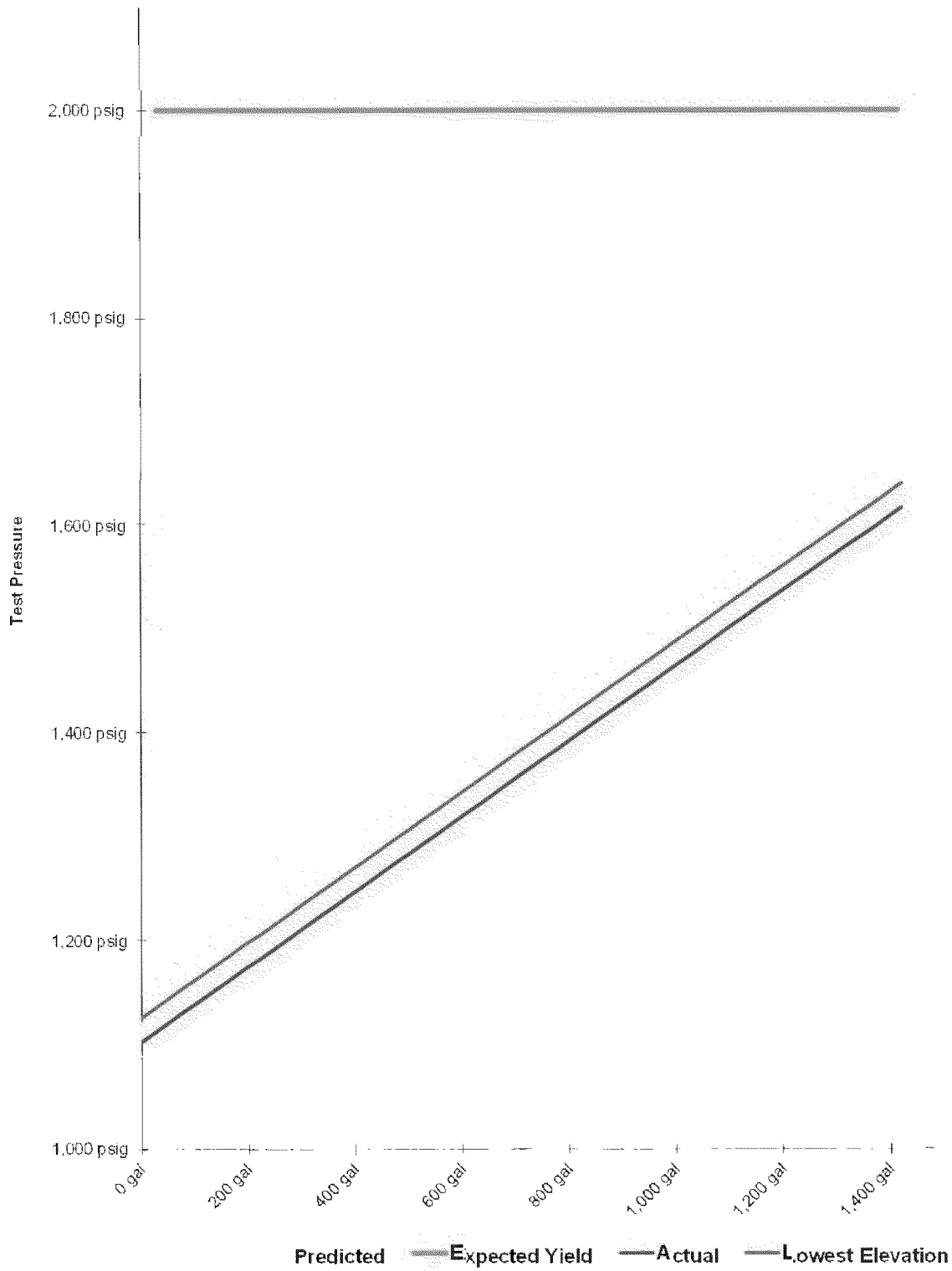


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Documents\PG&E Pressure tests\T-93B\

Test 93B  
PlotT

**Spike Pressure Test**  
**Stress Strain Curve -- PG&E T-93B , L-400 ,** Redacted



Actual Pressure Volume Plot Data			Predicted Pressure Volume Plot Data	Slope		Spike Pressure Test Stress Strain Curve -- PG&E T-93B, L-400, <span style="border: 1px solid black; padding: 2px;">Redacted</span>	
Pressure	Strokes	Gallons	Gallons	Actual	Predicted	<span style="border: 1px solid black; padding: 2px;">Redacted</span>	
1,102 psig	0	0.00 gal		0	0.000	39250	0.054 gal/stroke
1,112 psig	555	27.74 gal	27.63 gal	2.774	2.763	Pump Piston Diameter	1.225 in
1,122 psig	1115	55.72 gal	55.26 gal	2.799	2.763	Pump Piston Stroke	3.50 in
1,132 psig	1655	82.71 gal	82.89 gal	2.699	2.763	Pump Cylinders	3 ea
1,142 psig	2215	110.69 gal	110.52 gal	2.799	2.763	Volume check gal per stroke	0.050 gal/stroke
1,152 psig	2755	137.68 gal	138.16 gal	2.699	2.763	Volume Released (gallons)	27.75 gal
1,162 psig	3315	165.67 gal	165.79 gal	2.799	2.764	Pressure Reduced (psi)	10 psi
1,172 psig	3850	192.40 gal	193.43 gal	2.674	2.764	Maximum2	1,500 gal
1,182 psig	4460	222.89 gal	221.07 gal	3.048	2.764	Minimum2	0 gal
1,192 psig	5010	250.37 gal	248.71 gal	2.749	2.764	Maximum1	2,100 psig
1,202 psig	5570	278.36 gal	276.35 gal	2.799	2.764	Minimum1	1,000 psig
1,212 psig	6110	305.34 gal	304.00 gal	2.699	2.764	Gallons/Stroke Used	0.050 gal/stroke
1,222 psig	6670	333.33 gal	331.64 gal	2.799	2.765	Predicted Gallons/Stroke	0.050 gal/stroke
1,232 psig	7235	361.57 gal	359.29 gal	2.824	2.765	Pressure Increment	10 psi
1,242 psig	7770	388.30 gal	386.94 gal	2.674	2.765	Max Pressure	1,615 psig
1,252 psig	8340	416.79 gal	414.59 gal	2.849	2.765	Buried Pipe Temperature	67 °F
1,262 psig	8890	444.27 gal	442.25 gal	2.749	2.765	Exposed Pipe Temperature	75 °F
1,272 psig	9440	471.76 gal	469.90 gal	2.749	2.765	<b>ASME B31.8 Appendix N-5</b>  Average Actual Elastic Slope 2.777 Average Predicted Elastic Slope 2.767 Code Prescribed Minimum Yield Slope (less 10%) B31.8 N-5 (c)(2) 5.277 Established Minimum Yield Pressure B31.8 N-5 (c)(2) 1,615 psig Maximum Allowed Volume (After Slope Deviation) B31.8 N-5 (c)(2) 418 gal Volume (After Slope Deviation) B31.8 N-5 (c)(2) 0 gal  <div style="border: 1px solid black; width: 150px; height: 50px; margin: 10px auto; display: flex; align-items: center; justify-content: center;"> <span style="font-size: 1.2em;">Redacted</span> </div> <div style="text-align: right; margin-top: 10px;"> <span style="font-size: 1.2em;">11/02/11</span>                      Date                 </div>	
1,282 psig	10015	500.50 gal	497.56 gal	2.874	2.766		
1,292 psig	10540	526.73 gal	525.21 gal	2.624	2.766		
1,302 psig	11100	554.72 gal	552.87 gal	2.799	2.766		
1,312 psig	11650	582.20 gal	580.54 gal	2.749	2.766		
1,322 psig	12200	609.69 gal	608.20 gal	2.749	2.766		
1,332 psig	12760	637.68 gal	635.86 gal	2.799	2.766		
1,342 psig	13310	665.16 gal	663.53 gal	2.749	2.767		
1,352 psig	13860	692.65 gal	691.20 gal	2.749	2.767		
1,362 psig	14420	720.63 gal	718.87 gal	2.799	2.767		
1,372 psig	14980	748.62 gal	746.54 gal	2.799	2.767		
1,382 psig	15545	776.85 gal	774.21 gal	2.824	2.767		
1,392 psig	16090	804.09 gal	801.89 gal	2.724	2.768		
1,402 psig	16640	831.58 gal	829.57 gal	2.749	2.768		
1,412 psig	17190	859.06 gal	857.24 gal	2.749	2.768		
1,422 psig	17750	887.05 gal	884.92 gal	2.799	2.768		
1,432 psig	18305	914.78 gal	912.61 gal	2.774	2.768		
1,442 psig	18860	942.52 gal	940.29 gal	2.774	2.768		
1,452 psig	19415	970.26 gal	967.98 gal	2.774	2.769		
1,462 psig	19955	997.24 gal	995.66 gal	2.699	2.769		
1,472 psig	20530	1,025.98 gal	1,023.35 gal	2.874	2.769		
1,482 psig	21075	1,053.21 gal	1,051.04 gal	2.724	2.769		
1,492 psig	21625	1,080.70 gal	1,078.73 gal	2.749	2.769		
1,502 psig	22180	1,108.44 gal	1,106.43 gal	2.774	2.769		
1,512 psig	22740	1,136.42 gal	1,134.12 gal	2.799	2.770		
1,522 psig	23275	1,163.16 gal	1,161.82 gal	2.674	2.770		
1,532 psig	23850	1,191.89 gal	1,189.52 gal	2.874	2.770		
1,542 psig	24420	1,220.38 gal	1,217.22 gal	2.849	2.770		
1,552 psig	24975	1,248.11 gal	1,244.92 gal	2.774	2.770		
1,562 psig	25530	1,275.85 gal	1,272.63 gal	2.774	2.770		
1,572 psig	26090	1,303.84 gal	1,300.33 gal	2.799	2.771		
1,582 psig	26655	1,332.07 gal	1,328.04 gal	2.824	2.771		
1,592 psig	27220	1,360.31 gal	1,355.75 gal	2.824	2.771		
1,602 psig	27775	1,388.04 gal	1,383.46 gal	2.774	2.771		
1,612 psig	28310	1,414.78 gal	1,411.17 gal	2.674	2.771		
1,615 psig	28486	1,423.58 gal	1,419.49 gal	2.932	2.771		
1,615 psig		1,423.58 gal	1,419.49 gal	0.000	0.000		
1,615 psig		1,423.58 gal	1,419.49 gal	0.000	0.000		

Actual Pressure Volume Plot Data			Predicted Pressure Volume Plot Data	Slope		Spike Pressure Test Stress Strain Curve -- PG&E T-93B , L-400 , <span style="border: 1px solid black;">Redacted</span> <span style="border: 1px solid black;">Reda</span>
Pressure	Strokes	Gallons	Gallons	Actual	Predicted	
1,615 psig		1,423.58 gal	1,419.49 gal	0.000	0.000	
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Actual Pressure Volume Plot Data			Predicted Pressure Volume Plot Data	Slope		Spike Pressure Test Stress Strain Curve -- PG&E T-93B , L-400 , <span style="border: 1px solid black; padding: 2px;">Redacted</span>
Pressure	Strokes	Gallons	Gallons	Actual	Predicted	
1,615 psig		1,423.58 gal	1,419.49 gal	0.000	0.000	<span style="border: 1px solid black; padding: 2px;">Reda</span>
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1,615 psig		1,423.58 gal	1,419.49 gal	0.000	0.000	





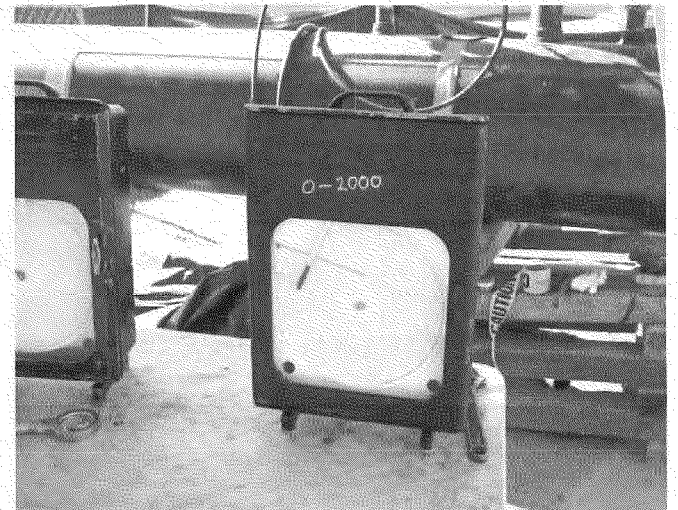
Test Location B Test Header



Pressure Pump



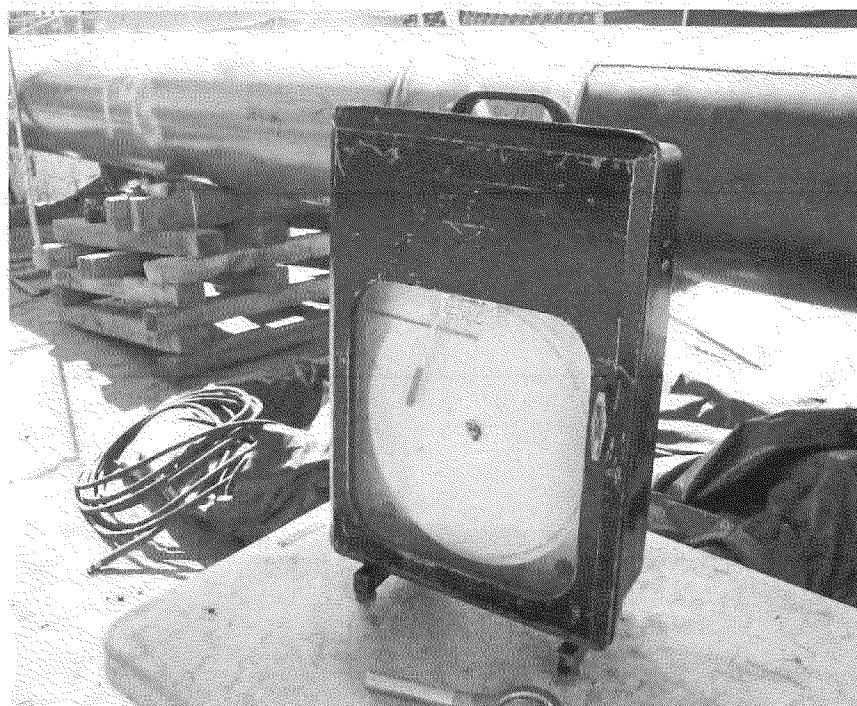
Deadweight Testing Equipment



Pressure Recorder and Chart



**Restrained Temp Recorder and Chart**



**Unrestrained Temp Chart and Recorder**