

PACIFIC GAS AND ELECTRIC COMPANY
San Bruno Gas Transmission Line Incident
Data Response

PG&E Data Request No.:	NTSB_035-016-Amended-2		
PG&E File Name:	San Bruno GT Line Incident_DR_NTSB_035-016-Amended-2		
Request Date:	December 9, 2010	Requesting Party:	NTSB
Date Amended:	May 12, 2011	Requestor:	Operations (Gunther/Chhatre)

QUESTION 16

Who manufactured the pipe at the accident site, and the manufacturing process?

ANSWER 16 - AMENDED 2

Upon information and belief, the pipe at the accident site was most likely manufactured by Consolidated Western Steel Corporation in years 1948, 1949, and 1953. PG&E did not specifically purchase pipe from a manufacturer for the 1956 relocation project (hereafter referred to as Project # 136471 or Segment 180) but rather used pipe that it already had in supply from previous purchases of pipe. Between 1947 and 1957 PG&E purchased 320,065 feet of 30" pipe from Consolidated Western, 1,699 feet of 30" pipe from Basalt-Kaiser and 320 feet of 30" pipe from Pacific Pipe for a total of 322,084 feet. An accounting balance of the 30" pipe purchased and installed during this time frame has been completed and indicates that the pipe purchased was sufficient to supply all of PG&E needs during this time frame.

There are some specific characteristics of the pipe observed during the NTSB Metallurgical investigation that lead to the conclusion that the pipe was most likely manufactured by Consolidated Western in years 1948, 1949 and/or 1953. These characteristics were cross referenced against (1) PG&E historical records (2) inspectors notes (3) the ASME Research Report CRTD – Vol.43 entitled "History of Line Pipe Manufacturing in North America," (4) camera inspection images (5) a photograph from the NTSB metallurgical investigation of the failed section of pipe. The characteristics and analysis are set forth below as follows:

1) The Presence of A Brand and Diameter Stamp Likely Identify Some Sections of Segment 180 as Consolidated Western Pipe.

According to the ASME Research Report referenced above, Consolidated Western branded its pipe in a manner consistent with numbers engraved just north of the ruptured section of pipe. The ASME Report provides, in pertinent part:

In addition, when most CW pipe skelp was rolled on the skelp mills it was common to use an engraved roll in the last stand of the mill, resulting in a brand located 180 degrees from the weld. In both the lap weld and the CW cases, the name of brand recurred at an interval reflecting the diameter of the engraved roll.

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ASME Report, Vol. 43, History of Line Pipe Manufacturing in North America, Page 8-3

The removed pipe that was shipped to the NTSB showed evidence of metal stamping on the North end of the ruptured segment. Although not oriented 180 degrees opposite the long seam weld as stated in the report, the following picture appears to be evidence of the same type of “brand” stamp referenced above:



2) Accounting Balance of the 30” Pipe Purchased and Installed Suggests Pipe Purchased In Connection With Installation of Lines 153, 131 and 132

As set forth in response to NTSB 035-002, PG&E believes the possible sources for the pipe used on the 1956 relocation of L132 (Project # 136471) came from left over pipe from the construction of:

- 1) L153 constructed in 1949 on job 100099
- 2) L131 constructed in 1954 on job 123902
- 3) L132 in 1948 on job 98015

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Records show that the pipe used in the construction of the above referenced pipelines was manufactured by Consolidated Western Pipe in their Maywood California plant up to May 1949 and after that date in their South San Francisco plant. [The detailed explanation for this follows but first it should be noted that, per the CPUC directive of December 16, 2010, PG&E has reduced by 20% of MAOP all 30 inch diameter pipelines installed prior to 1962 that have not had a hydro test on the pipeline in the field.]

L153

PG&E retained Moody Engineering to inspect Consolidated Western's pipe manufacturing process in connection with Purchase Order Number 7R66858 which was intended for the Installation of L153. According to the inspection report a "shipment serial number was assigned to each piece, and painted on the inner surface of each end, together with the length, the O.D. and the wall thickness. The wall thickness was indicated by the number 12."

The NTSB Metallurgical group uncovered painted numbers on the inside of the pipe immediately adjacent to the ruptured segment resembling 1299?*-12. This partial number is consistent with the described serial numbers in the Moody Engineering Report. Camera inspection images of other sections in Segment 180 revealed multiple three, four and five digit numbers followed by -12-30 (1513-12-30, 12773-12-30, 12763-12-30), which is also consistent with the Moody Engineering Report.

* The digit here appears to be either a 7 or 1 but is not clearly discernable.

L131

A portion of the joint numbers on the pipe installed in 1956, match Pipe Tally Sheets for a second Consolidated Western purchase order in 1953. This pipe was purchased for the construction of L131 on job #123902 P.O # 7R 182222. The job documentation shows this pipe being transported from Bituminous Products in Richmond, CA, (a common coating contractor), to a warehouse in Emeryville. The pipe tally sheets for joint numbers and the length of the joints exactly match the joint numbers and footages observed by the camera inside the pipe on Segment 180 and job 136471. These numbers are in a different format than the previous joint numbers. They consist of a T-XXX then a pipe footage such as "T505 64.20".

L132

The 1948 installation of L132 on job 98015 resulted in excess pipe that was moved to various jobs and placed into the materials warehousing system. Pipe tally sheets for this job, which reflect the joint numbers and footages of all the joints installed on the original job, have been compared to the camera inspection images of the original 1948 pipe installation near the rupture location, (Segments 181, 182.6, 182.9). At

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least one of these joint numbers matches up to joint numbers observed inside the pipe on Segment 180 job 136471* This indicates that at least some of the pipe installed on the 1956 job was originally purchased in 1948 on job 98015.

As an additional check of the pipe purchases, PG&E analyzed the balance of all 30" pipe purchased between 1944 and 1960. (FootageBalance-30-22Dec10.PDF) The results of this balance indicate there was sufficient pipe in the system to construct the 1956 job 136471. It appears that Project # 136471 drew down the pipe stock resulting in additional pipe being purchased in 1957. This further supports the conclusion that the pipe for the 1956 project was pulled from the materials warehouse system and was likely a combination of pipe from job 98015, 100099 or 123902.

* The footage number inside the pipe is difficult to discern but appears to be either 29.82 or 29.87.

3) NTSB Metallurgical Photograph Suggests Manufacturing Sequence Consistent With Consolidated Western Manufacturing Process.

In the following photograph of a metallographic specimen of the broken seam weld taken during the NTSB metallurgical investigation, only the outside seam weld (OD bead) is seen to exist. There is no evidence of an internal seam weld (ID bead). Assuming that the manufacturing process called for DSAW line pipe, this suggests a manufacturing sequence where the outside seam weld was intended to be welded first, followed by the inside seam weld.

An historical review of the manufacturing process of multiple DSAW line pipe manufacturers revealed that most manufacturers of DSAW line pipe welded the ID bead first, followed by the OD bead. Consolidated Western Steel Corporation, Republic Steel (Gadsden, AL plant) and the National Tube (McKeesport, PA plant) were the only DSAW line pipe manufacturers known to have welded the OD bead first. This strongly suggests that the failed section was manufactured by Consolidated Western as PG&E has located no records of 30" pipe purchases from either Republic Steel nor National Tube during the relevant time frame.

Balance of 30" pipe footage pre-1956

Job Number	Line	Privileged and Confidential - Description	Manufacturer	Date Ordered	Footage Ordered	Footage Manufactured	Footage Installed	Footage Transferred In	Footage Transferred Out	Un-accounted 30" pipe	Net New Pipe	Footage Salvaged	Footage Abandoned in place	Net Old Pipe True Up	Available Pool	Start Date	Operation Date	Date Complete	Comments
73429	132	Milpitas to Sierra Vista				0	434				-434			0	450	Feb-44	Dec-44	Dec-44	59,400 24" to Sierra Vista. 30" casing used on this job, no pipe records for 30". Assuming pool starts with 1800 ft available to make up for pre-1948 jobs that only had casing.
85737	132	Install Sierra Vista North & L147, PO 7R 52365	Consolidated	8-Aug-47		493	244		251		-2			0	448	May-47	Nov-47	Nov-48	Installed just before 98015. Odd sizes of roughly 30" pipe and un-expanded pipe were ordered (PO 7R 52365). For 29" unexpanded pipe, 94 ft installed, 221 ft transferred to 82999
82999	131	Antloch to Marsh Crk				0	187	221			34				482	Jun-47	Nov-47	Dec-48	85737 sent 221 ft of 29" pipe to this job, only 187 used leaving 34 ft un-expanded pipe missing.
98015	132	Original install 132 north, 3/8 wall 7R61963, 5/16 wall 7R65888	Consolidated	Mar-48	100683	100683	93688	0	7455	0	-460	0	0	0	22	Aug-48	Dec-48	Dec-48	Some small discrepancies in the footage manufactured 320 ft additional purchased (PO 7R 69294) from Pacific Pipe July 21, 1948 and Dec 2, 1948, JV 2368ft to Division using same job#, 360 ft for experimental wrapping. Some pipe serial numbers as high as 8176 in 25 Oct 1948.
101779		50th Ave Holder Storage				0	0	2866	0	2866				0	2888			Jan-49	Late 1948 and early 1949 transfers to sub store at 50th Ave.
		19th Ave Oakland				0	145	280	0	0	135			0	3023	Oct-48	Dec-48	Jan-49	30" pipe for casing, only 145 ft as designed
100989		Install semi-high Oakland				0	62	62	0	0	0	0	0	0	3023	Oct-48	Jan-49	Jan-49	Installed semi-high pressure, called for 36" casing, appears they used 30" for 24" carrier.
102047	131	2 miles west of Livermore				0	196	216	20	0	0	0	0	0	3023			Jan-49	L131 Irvington to Livermore section, used as casing pipe
		50th Ave Holder Pipe Storage				0		932		0	932			0	3955			Jul-50	
100099	153	Original installation 153 PO 7R-68858, all pipe on PO delivered between 11 Mar 49 and 22 Apr 49	Consolidated	Mar-49	101800	101801	99601	3821	4917	0	1104	0	47	-47	5012	Oct-48	20-Dec-49	Aug-50	6 pieces welded dipped steel pipe from Montague Pipe and Steel Co. (PO 7R-84407) same as California Steel, 1800 ft 30 inch 5/16" pipe from California Steel Products Company (PO 7R-84407), 1800 ft hauled from Maywood CA (Probably Consolidated Western Pipe). 24" came from Kaiser (PO 7R-91409), 3614 ft of primed "experimental" pipe coming in from 98015 22 to 27 Oct 1948 to Irvington.
104985		San Rafael Gas Holder PO 4R 81740 between July 5 to Jul 14, 1949	Consolidated	25-May-49	81900	81892	37774		45531	0	-1413	0	18	-18	3581	28-Apr-49	9-Dec-49	31-Dec-50	High pressure gas holder no longer exists, 40,239 feet shipped between 10 Oct 1949 and 16 Nov 1949. PO 7R 88417 for elliptical caps only. Moody Engineering inspection PO 7R 87997
104987		Fresno Gas Holder, both holders on 4R 81740				0	44100	44100		0	0	0	0	0	3581			Feb-51	as of 22 Dec requesting job....
106232		Lake Almanor Hydro job				0	454	454		0	0	0	0	0	3581	Aug-49	Dec-50	Feb-51	Pre work for Almanor Dam. Assume pipe went for none gas carrying purpose.
101793	105	Oakland Sta B compressor suction				0	325			0	-325			0	3256	16-Nov-48	13-Nov-51	13-Nov-51	Facility no longer exists
WO19111	101	Installed phone cable				0	0			0	0			0	3256	3-Nov-49	8-Feb-52	8-Feb-52	Not applicable
101688	300	Original 300A job	Consolidated		0	0	3184	3548	365	1431	1430	0	0	0	4686	Apr-49	Dec-50	Jun-52	order footage not clear, changes from 30 to 34, same footage from San Rafael Gas Holder as shipped to El Paso.
105415	153	Original north Oakland				0	1464	1040			-424			0	4262	Jul-49	Dec-49	Nov-52	Installed 24" carrier 50th Ave to Station B, 30" used for casing
166051	300B	MP 344.528 x-tie				0	3	0	0	0	-3	0	0	0	4259	Apr-52	Dec-52	Jan-53	Only 3 ft of pipe
118401	153	overhead creek crossing			112	0	112		0	0	-112	108	0	0	4147	Oct-52	Nov-52	Apr-53	Salvaged appeared to go to stores
124622	132	Morningside Ave			211	0	211		0	0	-211	212	0	0	3936	Jul-53	7-Aug-53	May-53	Salvaged pipe, No requisitions
121383		Guadalupe Crk, San Jose				0	194	34	0	0	-160	183	0	55	3831	Nov-52	Apr-53	Jun-53	Job installed total 200' of 30", pipe was reused as carrier pipe, 1929 20 inch pipe was "salvaged". 30" pipe # 18, 47, 48 all at 31.25 ft, #19, 20, 49 at 31.12 ft
124756	132	Hillside Blvd			212	0	212		0	0	-212	226	0	65	3684	Jul-53	Aug-53	Aug-53	Constructed with 124622, discrepancy between material transfers and job as-builts. May be only 65 ft salvaged.
WO43678	132	Assist 30" tie-in Hillside				0	0			0	0		0	0	3684	Jul-53	Aug-53	Aug-53	Work order to capture charges of tie-in assist on L132, Labor only job
		Substore 1, Hollis St Emeryville				0	0	1075			1075			0	4759			Jan-54	
116051		Kettleman City-300B looping				0	400	374		0	-26	0	0	0	4733			Jun-54	Installing 86 miles 34 inch, 30 inch installed on crossover near Kettleman compressor station
128826	132	Sneath and Junipero Serra			405	0	355	0	50	0	-405	0	360	0	4328	30-Jun-54	20-Aug-54	20-Aug-54	
119640	300	Milpitas Bypass	Kaiser	15-Aug-53	1699	1699	1705	0	390	0	-396	0	0	0	3932	Aug-53	Jan-54	Sep-54	footage installed approximate. Basalt-Kaiser 7R183613
129813	153	Creek crossing near Lewelling			162	0	162	0	0	0	-162	157	0	0	3770	Aug-54	Oct-54	Oct-54	Salvaged appeared to go to stores
MS 1933331	153	Potrero Gas Plant				0	44	44	0	0	0	0	0	0	3770			Jan-55	
		Gas Materials				0	166		0	0	166		0	0	3936			Jan-55	
		Material Warehouse				0	157		0	0	157		0	0	4093			Jan-55	
14513		18th and Shotwell				0	6		0	0	6		0	0	4099			Jan-55	
		Decoto Pipe yard				0	375		0	0	375		0	0	4474			Mar-55	
123902	131	Original L131 PO 7R-182222, delivered to Bituminous, 15Feb54	Consolidated	Oct-53	34043	34043	34000	813	1437	0	-581	0	41	0	3893	Aug-54	Oct-54	Jul-55	More pipe transferred off than ordered on the job, salvaged pipe transferred to job. Tally sheets with T-xxx number and pipe footages matching camera Stencils.
132303	153	Creek crossing			70	0	70		0	0	-138	68	0	0	3755	Jul-55	26-Jul-55	Aug-55	Mostly 64 ft joints.
		50th Ave Holder Storage				0	74		0	0	74	0	0	0	3829			Apr-56	Salvaged appeared to go to stores
136471	132	Glenview bad			1851	0	1851	0	0	0	-1851	1400	450	272	2250	Jun-56	31-Jul-56	Sep-56	Problem segment
136774		Relocate 20" Palo Alto				0	158	158	0	0	0	0	0	0	2250	Aug-56	Nov-56	Nov-56	30" pipe used for casing across freeway
130004	300	300A Looping Diana Ave				0	487	487	0	0	0	0	0	0	2250	Nov-54	Jan-55	Nov-56	Salvaged pipe, 1970 this pipe was replaced.
134616	300	Looping 300B Diana Ave				0	62	62		0	0		0	0	2250	Jun-56	Dec-56	Mar-57	Salvaged pipe, Diana Ave 300B portion, Pipe replaced in 1970.
		Warehouse post 1956				0	163	0	0	0	-163	141	13	0	2087	8-Apr-57	30-Jun-57	Aug-57	Elbows purchased on 7R 20021, pipe requisition 6379816
137292	153	Lower for storm drain				0	5506		0	4963	-543	0	5506	0	1544	Sep-56	May-57	Sep-57	1959 memo says 4963 ft of 30" un-accounted for...
135313	105N	Replace San Leandro 105N			11593	0			0									Sep-57	725 ft 30" casing installed and included in install numbers, some split casing at .344 wall, else .312 wall
137729	153	Freeway Interchanges	Consolidated	9-Apr-57	1473	1473	1699	60			-166	483	649	0	1378	Nov-56	Sep-57	Oct-57	
137729	131	Freeway Interchanges				0	771	390	30		-411	304	177	0	967	Nov-56	Sep-57	Oct-57	
		Crk Crossing near West Ave				0	180	0	0	0	-180	185		141	928	30-Jun-58	24-Jul-58	Jul-58	Pipe req 153 ft, Elbows purchased on 7R 40492 (Gilmore Steel and Supply), transferred to 143658, elbows from 141116
139542	153	137				0	51	0	0	0	-51	46		46	923	13-Nov-58	22-Nov-58	Nov-58	Elbows purchased on 7R 40492 and transferred from 135313, 139542
143658	153	Blacow Rd, Crk Crossing				0	1670		0	0	-1670	0	0	0	-747	12-Feb-59	17-Jul-59	Aug-59	1670 ft installed, verified DSAW by camera.
143347	101	Adobe Crk				0	13		0	0	-13	0	0	0	-760	Aug-59	Sep-59	Sep-59	Installed 24" MLV associated for District Reg
144893	132	MLV install				0	59	0	0	0	-59	42	42	-777	Sep-59	Oct-59	Oct-59	X-42. 375 wall from requisition, elbows transferred from GM 143347	
145804	153	Crk Crossing near Mowry				0	57		0	0	-57	59		59	-775	Mar-60	Apr-60	Apr-60	1949 pipe was sent for reconditioning
409015	132	Replace at Hillside				0	100		0	0	-100		0	0	-875	Mar-61	Mar-61	Mar-61	Pipe is within Power Plant fence line
148721	306	Morro Bay PP	Kaiser			0	11426	0	0	0	-11426			0	-12301	Feb-61	Apr-61	May-61	Job approved July 1960
148978	105A	Berkeley Oakland				0			0	0				0				May-61	
151181	132	Relocate at Skyline & Glenview				0	615				-615	496	58	496	-12420	30-Jul-61	30-Aug-61	30-Aug-61	Glenview and San Bruno Ave.
151236	132	Relocated Ponderosa				0	581				-581	565		547	-12454	3-Aug-61	Sep-61	Sep-61	Elbows from 148978 on 7R-68114 Republic Supply, pipe shipped from Union City maybe Decoto pipe yard.

Explanation-Help

Details about the spreadsheet.

The first tab labeled "30 inch balance" is the balance of 30 inch pipe from 1947 through 1961.

The second tab labeled "Details Seg180" lists all of the known documents concerning pipe segment 180 job 136471. (you might want to delete this tab, or we need to make sure we have sent all the referenced documents to the NTSB.)

How the footage balance was created:

We started with the existing known jobs on L-132 prior to 1956. Then researched all of the records related to all of these jobs. In this process we identified other related jobs. These additional jobs were added to the spreadsheet and have a gray background.

During the Dec 13th week we have added the jobs after 1956, up to 1961. The review of these jobs is not completed.

The spreadsheet is currently sorted by the "Date Completed" column, this puts it in chronological order of how pipe was consumed.

The "date ordered" column is approximately the date the pipe was ordered.

The "footage ordered" is from the original job design or initial material requests and is for information only. It does not impact the over-all balance of pipe.

The "footage manufactured" is the actual manufactured and delivered footage of new pipe coming into the system. The "footage installed", "transferred in" and "transferred out" are tracking the footage into and out of a job.

When the spreadsheet shows the small red triangles in the upper right corner of the cell you can roll over the cell and get additional information. Usually this will give you the details of the transfers of pipe into or out of the job.

The "un-accounted 30" pipe" column is for special situations, see the rollover comment.

The "net new pipe" yellow background column is a formula based on the prior 5 columns. It reflects the footage of pipe added or subtracted from the system for the "footage salvaged" and "footage abandoned in place" are columns to track these items. Use the rollover comments to see the details.

The "new old pipe true up" column is manually entered based on the salvaged or abandoned pipe. It reflects the total adjustment to the pool of pipe available in the system.

The "Available Pool" is the most important column. It adds together the other two yellow background columns to come up with a total "pool" of available 30" pipe in the system. It starts out with 450 ft in the pool just to make up for the first job listed, which was built in 1944. When this column approaches zero there is very little available pipe in the system. For example you can see the pool decreasing around the time of the 1956 job and then more pipe was purchased in 1957.

Even later in 1959 you can see the "available pool" goes negative. This shows that they must have purchased additional pipe in 1959, but we have not found the

The Glenview 1956 job is shown with an orange background.

A few other notes. The transfers in and out are only counted if we have clear evidence the material was transferred directly between the jobs. Most transfers are sending the material to a storage location or warehouse, so these footages end up in the "available pool" in the spreadsheet.

We might be under counting on salvaged pipe. On most relocation jobs, the job calls for "salvaging" the pipe because it is in the way of the construction project and must be moved. However, just because it says "salvaged" we did not consider it to be pipe sent back into the system for re-use. We only counted pipe as "salvaged for re-use" if we have evidence of "re-conditioning" charges or shipment to be re-wrapped or similar additional information.

Some "salvaged" pipe is shown transferred with units of "lbs" not feet. This indicates the pipe is being scrapped and not reused. Also "wrought iron" pipe usually means it is going to scrap. Also material code x-1664, appears to indicate the pipe is going to be re-conditioned.

Details Seg180

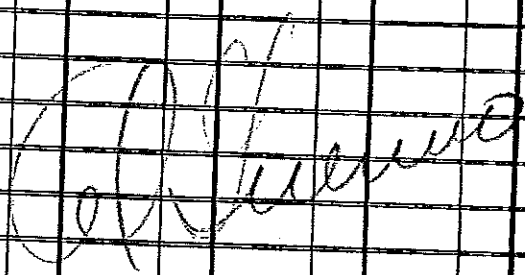
Date	Pipe	Mat Code	Footage	Source Document	References	References	Notes - Started 14 Jun 1956, in operation 31 Jul 1956.	Grp	Comments
12-Jun-56	30" Bare	01-1485	81	GC Procurement Order 21315	WO 4017G		note says "ship with MPO 25970". Deliver to Crestmoor subdivision		
15-Jun-56	30" DW .375 wall	01-1373	1186	GC Procurement Order 26166	WO 4017G		Must be on job by 6-14-56		
5-Jul-56	30" DW	01-1373	8	Credit Req xxx	WO 4017G				
16-Jul-56	30" bare pipe		9	Credit Req 2840100	WO 4017G		W.I. scrap from 9 ft of pipe		
23-Jul-56	30" DW gas transmission	01-1373	315	Credit Req 2840142	WO 4017G				
Sep-56	30" .375 X-42 DW	01-1373	198	Journal Voucher 174143	130004	MPO 25970	4017G was original work order, 999154 could not be traced., transferred a series of charges apparently to 130004		
Sep-56	30" .375 X-42 DW	01-1485	281	Journal Voucher 174143	130004	MPO 15425	Charges include removal and re-coating of wrap for 220 ft		
5-Sep-56	30" .375 wall (9 pcs)	x-1664	272	Credit Req 2737360	136471		Clean and recondition, Transfer to Divn dated 12/56.		
24-Sep-56	30" pipe	52-1003	13	Credit Req 2862165			(GM 98015 - 1949) junk?Crestmoor Park salvage pipe.		
28-Sep-56	30" OD DW .375 wall		550	GC Procurement Order 29866	136471	130004	For 34" loop lines, unload remove old coating, hold for shipping instructions, order for material on 7R 18301		
Oct-56	30" DW		64	Supply Dept statement	136471		64 ft - second line Iron heavy wrought.		Probably salvaged for scrap.
3-Oct-56	30" bare	01-1373	64	Credit Req 2858307	136471		Installed 1949 GM 98015		
4-Oct-56	30" OD DW .375 wall		550	PO 7R18302	136471	130004	Order for material on 7R 18301, Order No 29866		
11-Oct-56	30" .375 wall		487	Shipping Notice 04864	from 136471	to 130004	To Bitumous, Richmond for recoating then to job in Morgan Hill. Pipe salvaged, originally installed on 98015 in 1949.		
11-Oct-56	30" .375 wall		61	Shipping Notice 04865	from 136471	to 134616	To Bitumous, Richmond for recoating then to job in Morgan Hill. Pipe salvaged, originally installed on 98015 in 1949.		
19-Mar-57	30" OD DW .375 wall	01-9991	90	Shipping Notice 09680	from 136471	to 136471	Originally installed on GM 98015 (1949)		
19-Mar-57	30" OD DW .375 wall	01-9991	90		from 136471	to 136471	Originally installed on GM 98015 (1949)		
25-Mar-57	30" trans		415	Credit Req 3116195	136471		Salvaged adj see Req 2737360, INST 98015 (9-23-49) abandoned.		

Order	Assessment No	Pipe Piece	W	her	Pipe Feature	Long Seam	LS Position	GPS #	GIS Segment	Year	Privileged and Confidential - Stencil Number	Stencil Footage	Description	Pipe No	Good No	Manuf. Length	Shipping Length	Load Out Date	Date Received	Date Unloaded	PO	Manufacturer	Checked By	
1	1	74			Pipe	DSAW	1:00		178.6	1995	24x.312 40.1	40.10												
2	1	81			Pipe	DSAW	10:00		179.3	1961	API 30-99-08 X52 Test 980 PSI .0460 (39')	39.00												
3	3	54			Pipe	DSAW	12:30		179.6	1961	Bk -API x52-E-Test 39ft WT .4060	39.00												
4	3	45			Pipe	DSAW	1:00		180	1956	None , T-413 62-42	62.42	Probably in the batch from BAPCO, but T number doesn't match. Check film.											
5	3	43			Pipe	DSAW	11:00		180	1956	None , 64' 2" 2	64.13												
6	3	42			Pipe	DSAW	11:00		180	1956	T-24-642	64.20	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville.	T24		64.2	64.2		15-Oct-54		7R-182222	Consolidated		
7	3	41			Pipe	DSAW	12:00		180	1956	None , 64' 3	64.25												
8	3	37			Pipe	DSAW	1:00		180	1956	5 60'-6" , None	60.50												
9	3	34			Pipe	DSAW	12:00		180	1956	5 , None													
10	3	32			Pipe	DSAW	2:00		180	1956	12763.12-30 31.2 , None	31.20												
11	3	31			Pipe	DSAW	2:00		180	1956	3120 12773-12-30 6, 12793-12-30 31-20	31.20												
12	3	28			Pipe	Unknown			180	1956	None , 31	31.00												
13	3	26			Pipe	DSAW	11:00		180	1956	T505 64.20 , None	64.20	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville.	T505		64.2	64.2		15-Oct-54		7R-182222	Consolidated		
14	3	25			Pipe	DSAW	12:00		180	1956	None , 9													
15	3	24			Pipe	DSAW	10:00		180	1956	T14 64.27 , None	64.27	cut piece, potentially T49 or T7, need to check film											
16	3	23			Pipe	DSAW	11:00		180	1956	None , T-14 64.27	64.27	cut piece, potentially T49 or T7, need to check film											
17	3	21			Pipe	DSAW	10:00		180	1956	T-10 64.1 , None	64.11	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville.	T10		64.11	64.11		15-Oct-54		7R-182222	Consolidated		
18	3	20			Pipe	DSAW	12:00		180	1956	None , 522	31.13	Warren Transportation from Bechtel, no footage on pipe to verify against.	1799	522	31.13	31.13	8-Nov-48	10-Nov-48	12-Nov-48	7R-61963		J. Walpole	
19	3	18			Pipe	DSAW	10:00		180	1956	T471 64.10 , None	64.10	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville.	T471		64.1	64.1		15-Oct-54		7R-182222	Consolidated		
20	3	17			Pipe	DSAW	11:00		180	1956	None , 13													
21	3	14			Pipe	DSAW	11:00		180	1956	T41-4 6420 , None	64.20	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville. Or could be T44.	T144		64.2	64.2		15-Oct-54		7R-182222	Consolidated		
22	3	13			Pipe	DSAW	3:00		180	1956	2748 , None	27.48	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville. Footage matches assigned TC number for matching	TC		27.48	27.48		15-Oct-54		7R-182222	Consolidated		
23	3	12			Pipe	DSAW	12:30		180	1956	None , 3927	39.27	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville. Footage matches assigned TA number for matching	TA		39.27	39.27		15-Oct-54		7R-182222	Consolidated		
24	3	6			Pipe	DSAW	10:30		180	1956	None , 1513-12-30 2982	29.82	Warren Transportation #181, some double joints. Shipper No 4338, matches on shipping length only, bad read of 7 vs 2 as last digit.	1186	1513	29.87	29.82	27-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole	
25	x	missing			Pipe	DSAW			180	1956	12997-12-30 or 12991													
30	4	8			Pipe	DSAW	11:30		180	1956	4670	46.70												
31	4	10			Pipe	DSAW	11:00		180	1956	04' 2" / (3)	4.12												
32	4	11			Pipe	DSAW	1:00		180	1956	T-460 / 64-13	64.13	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville.	T460		64.14	64.14		15-Oct-54		7R-182222	Consolidated		
33	4	12			Pipe	DSAW	9:30		180	1956	24.80 / 50'2" / (3), 24.80	24.80	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville. Footage matches assigned TG	TG		24.8	24.8		15-Oct-54		7R-182222	Consolidated		
34	4	14			Pipe	DSAW	12:30		180	1956	6400 / T-124	64.00	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville.	T124		64	64		15-Oct-54		7R-182222	Consolidated		
35	4	15			Pipe	DSAW	1:00		180	1956	# 64 / (2) / (16)													
36	4	16			Pipe	DSAW	8:30		180	1956	T-477 / 64'24"	64.24	Pipe Tally sheet 123902 (L131) from BAPCO Richmond to PG&E Emeryville.	T477		64.24	64.24		15-Oct-54		7R-182222	Consolidated		
37	4	20			Pipe	DSAW	11:30	24	181	1948	13130-12													
38	4	22			Pipe	DSAW	7:00		181	1948	295-12-36 / 3126	31.26	Warren Transportation #15 ?????? Probably not a real match...	295	3095	31.25	31.25	8-Sep-48	11-Sep-48	11-Sep-48	7R-61963		J. Walpole	
39	4	24			Pipe	DSAW	11:30		181	1948	494-30 / 31.2 , 494-12 / 31.21	31.21	Warren Transportation Load #185	1214	494	31.21	31.21	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole	
40	4	25			Pipe	DSAW	1:00		181	1948	498-1230 / 31.19 , 498-12-31 / 31.19	31.19	Warren Transportation Load #185	1212	498	31.19	31.19	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole	
41	4	26			Pipe	DSAW	11:00		181	1948	691-12-30 / 30.67 / (4) , 691-12-30 / 30.67 / (s-3)	30.67	Warren Transportation Load #185	1211	691	30.67	30.67	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole	
42	4	27			Pipe	DSAW	1:30		181	1948	469-12-30 / 31.22	31.22												
43	4	28			Pipe	DSAW	11:30		181	1948	1366-12-30 / 31.7 , 1366-12-30 / 31.24	31.24	Warren Transportation Load #227	1297	1366	31.24	31.24	3-Oct-48	4-Oct-48	4-Oct-48	7R-61963	Consolidated	J. Walpole	
44	4	29			Pipe	DSAW	1:00		181	1948	219-12-3 / 31.19 , 219-12-30 / 31-19	31.19	Warren Transportation Load #197	1298	219	31.19	31.19	3-Oct-48	4-Oct-48	4-Oct-48	7R-61963	Consolidated	J. Walpole	
45	4	30			Pipe	DSAW	11:00		181	1948	29-12-30 / 31.23, 292-12-30 / 31.23	31.23	Warren Transportation Load #184	1202	292	31.23	31.24	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole	

Order	Assessment No	Pipe Piece	W	her	Pipe Feature	Long Seam	LS Position	GPS #	GIS Segment	Year	Privileged and Confidential - Stencil Number	Stencil Footage	Description	Pipe No	Good No	Manuf. Length	Shipping Length	Load Out Date	Date Received	Date Unloaded	PO	Manufacturer	Checked By
46	4	31			Pipe	DSAW	1:00		181	1948	1111-12-30 / 31.26 , 1111-12-30 / 31.24	31.26	Warren Transportation Load #197	1299	1111	31.26	31.26	3-Oct-48	4-Oct-48	4-Oct-48	7R-61963	Consolidated	J. Walpole
47	4	32			Pipe	DSAW	11:00		181	1948	2-4, 504-12-30 / 31-19	31.19	Warren Transportation Load #182	1192	504	31.19	31.19	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole
48	4	33			Pipe	DSAW	1:30		181	1948	699-12-30 / 30.72, 699-12-30 / 30.72	30.72											
49	4	34			Pipe	DSAW	11:30		181	1948	497-1230 / 31.17	31.17	Warren Transportation Load #182	1194	497	31.17	31.17	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole
50	4	35			Pipe	DSAW	11:00		181	1948	497-12-30 / 31.17	31.17	Warren Transportation Load #182	1194	497	31.17	31.17	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole
51	4	36			Pipe	DSAW	1:00		181	1948	3116-12-30 / 31.28 , 3116-12-30 / 31.28	31.28	Warren Transportation Load #182	1195	3116	31.28	31.28	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole
52	4	37			Pipe	DSAW	11:00		181	1948	706-12-30 / 31.18, 706-12-30 / 31.18	31.18											
53	4	38			Pipe	DSAW	1:00		181	1948	3112-12-30 / 31.37 , 3112-12-30 / 31.27	31.27	Warren Transportation Load #182	1199	3112	31.27	31.27	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole
54	4	39			Pipe	DSAW	12:00		181	1948	697-12-30 / 31.18, 697-12-30 / 31.18	31.18	Warren Transportation Load #182	1198	697	31.18	31.18	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963	Consolidated	J. Walpole
55	4	40			Pipe	DSAW	1:00		181	1948	3016-12-30 / 31.24 , 3016-12-30 / 31.24	31.24											
56	4	41			Pipe	DSAW	11:30		181	1948	276-12-30 / 30.26 / S-4	30.26	Warren Transportation #184, probably poor read of length in pipe, and really should match footage.	1204	276	31.26	31.24	30-Sep-48	1-Oct-48	1-Oct-48	7R-61963		
57	5	9			Pipe	DSAW	9:30		182.3	1954	358-12-30 31.22,	31.22											
58	5	6			Pipe	DSAW	10:00		182.3	1954	14132-12-30 31.13, 14132-12-30 31.13	31.13											
59	5	5			Pipe	DSAW	11:00		182.3	1954	#9 ?-12-30 , "14121"												
60	5	4			Pipe	DSAW	1:00		182.3	1954	3521?												
61	5	25			Pipe	DSAW	2:30		181.8	1948	1189-12-30 31-25,	31.25											
62	5	22			Pipe	DSAW	1:00		181.8	1948	278-12-30 31.13, 274-12-3 31.13 S3	31.13											
63	5	21			Pipe	DSAW	11:00		181.8	1948	290-12-30 31.21, 290-12-30 30.21	30.21											
64	5	20			Pipe	DSAW	2:00		181.8	1948	291-12-30 31.19, ?	31.19											
65	5	19			Pipe	DSAW	12:00		181.8	1948	S-3 3121, 57	31.21											
66	5	18			Pipe	DSAW	11:30		181.8	1948	31.30, 71-12-30 S3	31.30											
67	5	17			Pipe	DSAW	6:00		181.8	1948	28601 31.2	31.20											
68	5	15			Elbow	SMLS			181.8	1948	GM 123902 7R-149882-B		L131 Milpitas to Irvington job, approved Mar 1953, could not have been installed in 1948										
69	5	30			Pipe	DSAW	10:30		181.5	1995	ITI 9396 PSI 587 C255												
70	6	1			Pipe	DSAW	1:30		182.3	1954	None , 150-12-30 31.19	31.19											
71	6	2			Pipe	DSAW	11:00		182.3	1954	543-12-30 30.42, 543-12-30 30.42	30.42	Warren Transportation #186, not matching on length	1222	543	30.35	30.35	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963		J. Walpole
72	6	3			Pipe	DSAW	11:00		182.3	1954	3 , 325-12-30												
73	6	4		89	Elbow	SMLS		40	182.3	1954	None , GM123902 7R-194882-B		L131 Milpitas to Irvington job, approved Mar 1953, Pipe PO										
74	6	6			Pipe	DSAW	12:00		182.3	1954	None, 630-12-30 31.19	31.19	Warren Transportation #189	1246	630	31.19	31.19	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
75	6	7			Pipe	DSAW	1:00		182.6	1948	None, 630-12-30 31.19	31.19	Warren Transportation #189	1246	630	31.19	31.19	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
76	6	8			Pipe	DSAW	11:00		182.6	1948	670-12-30 03.01, 670-12-30 30.01	30.01	Warren Transportation #189	1247	670	30.01	31.22	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
77	6	9			Pipe	DSAW	1:00		182.6	1948	S4? 38-12-30 31.20, 638-12-30 31.20	31.20	Warren Transportation #189	1248	638	31.2	31.12	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
78	6	10			Pipe	DSAW	11:00		182.6	1948	612-12-30 31.14 , 672-12-30 31.14	31.14	Warren Transportation #189 Shipper No 4218, believe 612 is actually 672	1249	672	31.14	31.12	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
79	6	11			Pipe	DSAW	2:00		182.6	1948	(12) , 666-12-30 31.19	31.19	Warren Transportation #189	1250	666	31.19	31.19	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
80	6	12			Pipe	DSAW	11:00		182.6	1948	823-12-30 31-54 , 623-12-30 31.14	31.14											
81	6	13			Pipe	DSAW	1:00		182.6	1948	619-12-30 31.21 , 619-12-30 31.21	31.21	Warren Transportation #189 Shipper No 4218	1252	619	31.21	31.23	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
82	6	15			Pipe	DSAW	11:00		182.6	1948	46-12-30 31.22 , 646-12-30 31.22	31.22											
83	6	16			Pipe	DSAW	10:00		182.6	1948	IS-3 , 648-12-30 , 31.17	31.17	Warren Transportation #190 Shipper No 4217	1255	648	31.17	31.17	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
84	6	17			Pipe	DSAW	11:00		182.6	1948	683-12-30 31.16 , 683-12-30 31.16	31.16	Warren Transportation #190 Shipper No 4217	1256	683	31.16	31.21	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
85	6	19			Pipe	DSAW	11:00	41	182.6	1948	668-12-30 31.17, None	31.17	Warren Transportation #190 Shipper No 4217	1258	668	31.17	31.17	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
86	6	20			Pipe	DSAW	12:00		182.9	1954	None , 329-12-? 31.?	31.00											
87	6	21			Pipe	DSAW	11:00		182.9	1954	None, 12 31.17	31.17											
88	6	22			Pipe	DSAW	2:00		182.9	1954	None, 671-12-30 31.25	31.25	Warren Transportation #190 Shipper No 4217	1259	671	31.25	31.25	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
89	6	23			Pipe	DSAW	10:00		182.9	1954	None, 633-12-30 31.21	31.21	Warren Transportation #190 Shipper No 4217	1261	633	31.21	31.21	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
90	6	24			Pipe	DSAW	12:00		182.9	1954	None, 633-12-30 31.21	31.21	Warren Transportation #190 Shipper No 4217	1261	633	31.21	31.21	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
91	6	25			Pipe	DSAW	10:00		182.9	1954	653-12-30 31.22 , None	31.22	Warren Transportation #190 Shipper No 4217	1262	653	31.22	31.22	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
92	6	26			Pipe	DSAW	10:00		182.9	1954	1083-12-30 30.07 , 1312-30 ?07	30.07	Warren Transportation Load #193, cut piece, same number again.	1286	1083	30.07	30.07	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
93	6	27			Pipe	DSAW	10:30		182.9	1954	77-12-30 ?23, None												
94	6	28			Pipe	DSAW	11:00		182.9	1954	207-12-30 31.15 , None	31.15											
95	6	29			Pipe	DSAW	10:00		182.9	1954	216-12-30 31.25 , 6-12-30 ?25	31.25											
96	6	31			Pipe	DSAW	12:00		182.9	1954	None , 1041-12-30 31.22	31.22	Warren Transportation Load #192	1281	1041	31.22	31.22	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
97	6	32			Pipe	DSAW	1:00		182.9	1954	None, 1094-12-30 36.28	31.28	Warren Transportation Load #191, cut piece same number again, length read wrong in pipe.	1272	1094	31.28	31.28	1-Oct-48	2-Oct-48	2-Oct-48	7R-61963	Consolidated	J. Walpole
98	6	34			Pipe	DSAW	11:00		182.9	1954	71-12-30 30.22 1-S2 , 210-12-30	30.22											
99	6	35			Pipe	DSAW	12:00		182.9	1954	None , ?17												
100	6	36			Pipe	DSAW	10:00		182.9	1954	1095-12-30 31.26 , 15-12-30 ?26	31.26	Warren Transportation Load #191	1270	1095	31.26	31.26	1-Oct-48	2-Oct-48	2-Oct-48	7R-61		

PIPE TALLY SHEET

From PHSE Emeryville Job No. _____
 To from Bages Richmond Date 10-15-54
 Via Bigge Driver _____ P. O. No. _____
 No. Pieces 5
 Wrap _____ Size 30"

No.	Feet		In.		Feet		In.		Feet		In.	
	Feet	In.	Feet	In.	Feet	In.	Feet	In.	Feet	In.	Feet	In.
1	710		64	11								
2	7471		64	10								
3	749		64	27								
4	77		64	22								
5	744		64	20								
6			320.90									
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REFER TO SW TOWERS 196												

PIPE TALLY SHEET

From RD&C Emerquillo Job No. _____
 To from Bayan Richman Date 10-15-54
 Via Biggs Driver _____ P. O. No. _____
 No. Pieces 6
 Wrap _____ Size 30"

	Feet		In.		Feet		In.		Feet		In.		Feet		In.	
	Feet	In.	Feet	In.	Feet	In.	Feet	In.	Feet	In.	Feet	In.	Feet	In.	Feet	In.
1	25	63														
2	27	48														
3	39	35														
4	40	10														
5	23	95														
6	24	80														
7	781		31													
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Refer to S/N IWATA 196