PIPELINE SURVEY MANUAL

PG and E

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REVISION/ADDITION LOG

Pipeline Survey Manual # 6 mmc 8.26.86

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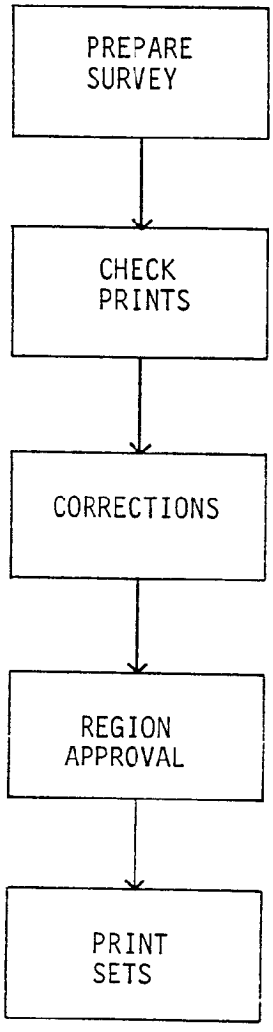
GENERAL

The intent of this manual is to provide the procedures, drafting standards, and formulas necessary to produce a pipeline survey on the new format. These guidelines can be used to convert from the existing density survey sheets, or to prepare a survey for a new line.

The main improvement of the new survey over the existing density survey is a modified format that incorporates a 1"-1000' map for easier office and field use. There are also additional data rows for more engineering reference. These features enhance the pipeline survey as a record of pipe history and class locations.

Now that local mapping departments are involved with the survey conversion program, it is important to standardize it throughout the system. This manual serves that purpose with instructions and reference sections.

SURVEY DEVELOPMENT



Division retains originals.

Division sends check prints to:
1. Local Region office.
2. [redacted]

Check prints returned to Division.

Division forwards originals to Region for approval and initials. Region retains originals.

Region issues prints to:
1. Local Divison office.
2. [redacted]

NEW SURVEYS

1. Pipeline surveys may have to be prepared for numbered transmission lines or collection systems that don't have pipeline plat sheets. Until those plats are issued by Design Drafting, local mapping departments will have to calculate their own final stations. These can be derived from job as-builts and other sources, and later reconciled with those calculated by Design Drafting.

2. If the new survey is for a distribution feeder main or a service operating over 20% SMYS, then calculate final stations as required by the survey. These kind of pipeline surveys will not have pipeline plat sheets issued by Design Drafting.

3. Inform Gas System Planning whenever pipeline surveys are going to be prepared, so that Design Drafting will not schedule the same survey for preparation.

4. New pipeline surveys affect other maps, records, and the aerial patrol program. Ensure that these and other references are brought-to-date and reissued to reflect current status.

UPDATING

1. The Pipeline Survey Manual should be kept current as changes are issued for standard practices and other references.

2. A similar practice in the Gas Mappers Manual may be followed whereby supplemental sheets are issued on pink sheets by the Region office.

3. Update the Pipeline Survey sheets as required by jobs or field conditions. The most common changes involve line reconstruction, class location changes, leak reports, and gas well status.

MAP COMPILATION

WORKSHEET PREPARATION

1. Acquire a supply of clear film formats from Gas System Planning, General Office. (See Exhibit "A"). The quantity can be estimated at four miles of line per format. Since these formats are reusable, the mapping department can keep on hand any number of formats depending on the length of surveys to be prepared.

2. Make one set of 1"-1000' right-reading clear films from the wall maps that cover the line, including any wall maps that appear to be needed for peripheral map coverage. The clear films should be made from the original 1"-500' and/or 1"-1000' wall maps to assure optimum reprographic quality in the final mylars. If wall maps are unavailable for certain lines, use 7½ minute U.S.G.S. topographic maps. These will have to be enlarged to 1"-1000' and screened 50% to minimize geographical features.

3. From the 1"-1000' clear film wall maps, make one set of white prints. Tape them together into a strip map and highlight the line for easier identification. If topographic maps are used, plot the line and main line valves as accurately as possible.

4. The next step involves plotting whole mile points along the line. Whole mile points (1.00, 2.00, 3.00, 4.00, etc.) are different mile points than those calculated for final stations. Whole mile points are theoretical values established in valve-to-valve segments along the line, and since they do not represent real fixed points, it is optional to calculate their final stations.

It is necessary to maintain some mile value integrity, because sheet limits are assigned at these points. This is accomplished by keeping the mile within 3% of 5280'. The problems of mile length are due to out-of-date valve numbers and fluctuations in pipe length caused by line relocations. These factors explain why a mile in the Pipeline Survey is not always 5280'.

Refer to 'Whole Mile Point Plotting' in the Formula Section, and establish those mile points on the strip map.

5. After whole mile points are plotted, then determine the number of miles of line to be covered per sheet. This is accomplished by referring to the existing density survey sheets, the 1"-1000' strip map, and considering several factors in sheet planning.

5. (Cont'd)

These factors are:

a. The number of jobs and their data space requirements.
b. The allowance of space for future pipe data.
c. The northerly orientation and geographical route of the line.
d. The format's map area limits.
e. The line's urban and/or rural locales.
f. The line's service area boundary line(s).

Sheet coverage is grouped in whole mile units with whole mile points serving as sheet match lines. The conjestion of pipe data usually decides sheet coverage, though all factors require attention. Four miles per sheet is customary, with five miles being the maximum, however, extreme conditions can reduce sheet coverage to one mile or less.

6. It is essential in sheet planning that map north be given priority over whether pipe data and line direction read left-to-right or right-to-left. Examination of the entire strip map will determine this aspect of sheet direction. If the line happens to run primarily north-south, orient the sheets so the north arrow points to either 'map-east' or 'map-west' to favor map lettering and road names.

Sheet order also proceeds in the direction that is described by the line's identification title from Appendix "A". These titles describe what the Pipeline Surveys cover, and how they are grouped for multiple line surveys.

7. The survey's first sheet begins at one or more of the following points:

a. The line's tap or point of departure from a station.
b. MP 0.00 or V-0.00, or some mileage value representing the lowest number.
c. The line's service area boundary, and coincident with the line's lowest mileage number.
d. The transmission tap for distribution feeder mains.

If the line's title is contrary to valve numbering, refer to the Pipeline Plat Sheet that indicates "BEG. LINE ____". This will designate the place from which the survey will proceed.

8. As sheet limits are determined, highlight those match line mile points on the existing density survey sheets and the strip map.

9. Using the map portion of a clear film format as a guide, outline in pencil and cut out the individual sheet maps from the strip map. At this paper stage, the ends of the maps are cut at sheet match lines which prevent complete map coverage. These missing map ends will be provided for during the clear film stage.

When laying out the individual maps with the clear film format, keep the pipeline segment centered below the data section and within map borders to allow for the class location boundaries.

10. Tape the individual maps onto white print copies of the clear film format, and label them by sheet number and miles covered. These paper composites become the worksheets used for survey research and preparation.

WORKSHEET COMPLETION

1. Worksheet completion involves researching information about the line's history and location, and recording that data on the worksheets. Some or all of the following sources are used:

a. Existing density survey sheets.
b. Pipeline plat sheets.
c. Operating maps and diagrams.
d. Gas well drawings.
e. As-builts.
f. Strength test pressure reports.
g. SP 460-1, SP 463-7, and SP 463-8.
h. GO 112D.
i. Gas Operations bulletins.
j. Letters of file.
k. Form As.
l. Survey mapping standards.
m. Formulas.

The existing density survey sheets and the pipeline plat sheets are the main sources of information. If discrepancies occur, the pipeline plat sheets shall serve as documentation, unless some other record resolves the difference.

2. The purpose for the worksheets is to transfer as much information as possible onto them in a manner representative of the final mylars. This method makes it easier to judge how many miles of line will ultimately be shown per sheet. The only information withheld from the worksheets is the quarter-mile-wide class location boundary and the dwelling symbols.

Perform all calculations as required by certain data sections and as enough sheets are completed, calculate mile point values for final stations. (See Formula Section). Refer to the Mapping Standards Section and post all applicable information to the map and title areas.

3. When listing information in the data rows, do not use double arrows in conjested areas, because it is difficult to add subsequent information. It is preferable to allow space for future jobs. Information should only be listed at points of change, rather than repetitively with each job. Sources of information are listed by each row in Exhibit "B".

4. Post certain final stations at pipeline angle points on the strip map for reference in plotting other final stations.

5. When all the worksheets are completed, review them for any possible changes in sheet coverage. If necessary, adjust the match lines, titling and sheet numbers.

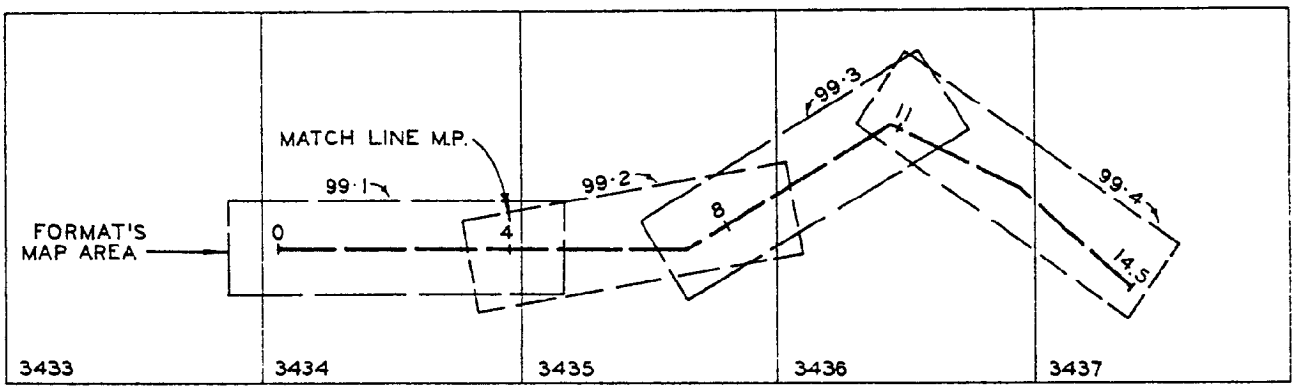
CLEAR FILM MAPS

1. Make another white print strip map from the 1"-1000' clear film wall maps. Highlight the line and plot only those whole mile points at match lines. Situate one of the clear film formats over the line section designated as 'sheet one', and using the match line points as guides, center the line section below the data area and within map borders. Make sure space is allowed at pipeline angle points to fully plot the quarter-mile-wide class location boundary.

Tape down the format and list the underlying wall map numbers as shown in the example. Repeat this process of taping down formats over successive sheets and listing wall map numbers. Formats can only be removed when it is certain that they are no longer needed to account for sheet coverage for other sheets.

Example

Transmission Line 99 is 14.50 miles, requiring four new survey sheets and encompassing five wall maps.



SHEET NO.	MATCH LINE MPs	WALL MAPS
99-1	0.00 - 4.00	3433,3434,3435*
99-2	4.00 - 8.00	3434,3435,3436**
99-3	8.00 - 11.00	3435*, 3436
99-4	11.00 - 14.50	3436**,3437

* 3435 can be used for 99-1 and 99-3.
** 3436 can be used for 99-2 and 99-4.

WALL MAPS PER LIST	CLEAR FILMS ON HAND	NO. TO ORDER
3433 - 1	1	0
3434 - 2	1	1
3435 - 2	1	1
3436 - 2	1	1
3437 - 1	1	0

CLEAR FILM MAPS (Cont'd)

2. The clear films must be ordered right-reading, and can be made either from the clear films on hand or from the original wall maps. Do not order silver films, unless the mapping department has the three-step eradicator for erasing images.

3. As the clear film copies become available, tape them together per the list. Using a blank format as a guide, cut out each sheet's strip map. Tape these individual strip maps into the clear film formats with transparent tape only on the short ends of the strip maps to allow for lengthwise rolling of the sheet for mailing. As each sheet is made, label its sheet number in a corner margin with ink for easier identification when the mylars are returned. When sheets are assembled, keep those map pieces that are used for other sheets, and label them to avoid confusion.

4. At this clear film stage, some of the survey's titling and map lettering can be done. If the mapping department has access to a Kroy 80 lettering machine, the following items can be printed on transparent tape and applied to the clear films:

a. Title block information.
b. Sheet no., operating map no., superseded dwg. no.
c. Reference maps.
d. County.
e. Region, Division, Pipe Line Operations.
f. Township & Range.
g. Town names.
h. Station names.
i. Gas producers and well names.

Some of this information can be used on successive mylars, so only remove what does not apply and replace with respective items. Use a solvent cleaner to remove adhesive residues.

5. If a Kroy 80 is not available, an alternative is to letter with Wrico guides onto sheets of adhesive-backed transparent paper. The lettering can be stripped off and applied to the clear films. If lettering can't be done during the clear film stage, then it will have to be done onto the front of the mylars.

6. Keep all clear film strip maps and worksheets until the survey mylars have been approved and issued, then discard them.

MYLAR COMPLETION

1. The mylars are printed reverse-reading for reprographic quality from the right-reading clear films. This reverse-reading also allows inkwork without interferring with the format's lines and map information. Examine the mylars for clarity and retention of narrow lines, and clean the entire surface with a solvent cleaner prior to inking.

2. The mylars are completed by transferring all the data from the worksheets. See Exhibits "I" and "J" for examples of completed surveys. The quarter-mile-wide class location boundary and dwelling symbols can be mapped at this time. Determine the class location limits and their respective final stations, mile points and dwelling counts.

3. The words GAS OPERATIONS in the signature block should be replaced with DIVISION GAS. This change could be made permanent by making the correction on the clear film formats. The Region office will use the APPROVAL section for initials.

MAPPING & SURVEY STANDARDS

SURVEY SHEETS

1. Coverage. The survey sheets shall be made on 1"-1000' mylar polyester films. The drawing number has been preassigned as 385121, which shall supersede existing density survey sheets.

2. Title. The title will vary according to the line being surveyed. See Appendix "A" for Line titles and Appendix "I" for D.F.M. titles.

3. Map Compilation. The survey is prepared in a three - step process involving a preliminary paper worksheet, an intermediate clear film map, and a final mylar composite. Use Form 62-3254 for reprographic orders.

4. Care of Material. Clean all mylars with a solvent product for better ink retention. The inks used on distribution gas plats are adequate for survey mylars. Use drafting pens for linework and lettering. Split point nib pens such as Crowquill or Gillott can be used for freehand lettering. Ink removal is done with a vinyl eraser and moisture. Q-tips and moisture can be used on clear films. Do not use electric erasing machines or Exacto knives on mylar or clear film.

5. Filing. Survey sheets can be kept in a flat file or hung in map cabinets.

PEN SIZES/WRICO & KROY 80 EQUIVALENTS

Pen Sizes	Wrico Guide	Kroy Discs*
0	VCN 90	8 pt
1	VCN 120	10 pt
1	VCN 140	12 pt
2	VCN 175	14 pt
2½	VCN 240	24 pt
00	250 Shadow	-

* All Kroy discs are Helvetica Regular ULNS and used with transparent tape.

PIPE SPECIFICATIONS

1. The following examples indicate how pipe specifications will be shown in the data section. Not all kinds or combinations of pipe are listed.

Joint Efficiency	0.80, 1.0
Girth Welds	Arc Weld, Gas
Long. Seams	ERW, DSAW
SMYS	35,000, 52,000
Grade	API 5LX X42, API 5L GR B
Wall Thickness	0.188", 0.500"
Size	2.375", 8.625"
Design Factor	.40, .72
Design Pressure	500, 850

2. Common abbreviations for longitudinal seams are:

CW = continuous weld	(3" and smaller)
SMLS = seamless	(all sizes to 24")
ERW = electric resistance weld	(4" to 18")
DSAW = double submerged arc weld	(20" and larger)

3. Consult the Region office or Gas System Planning for pipe specifications of uncommon pipe and how they should be shown on the survey.

PIPE COATINGS

1. Pipe coatings shall be listed by abbreviation only.

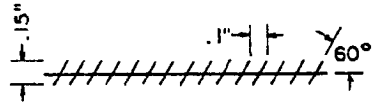
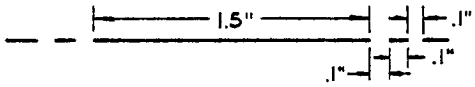
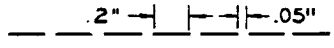
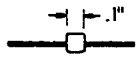
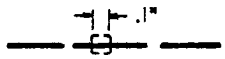
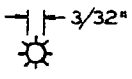
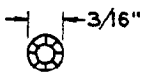
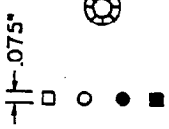
Abbreviation	Category	Types
H.A. ASPH.	Hot applied asphalt	Asphalt Asphalt enamel w/felt Felt Fiberglass Hot asphalt Paint and floatine P-2 wrap Single wrap Double wrap Triple wrap Decoto wrap* White mica coated
SOM.	Somastic	Somastic asphalt
TAPE	Cold applied tape	Polyken tape Plastic wrap Plastic triple wrap Line travel wrap Plastic double wrap Polyken coat Decoto wrap*
EX. PL.	Extruded plastic	Plastic coat Polypropylene X-Tru coat
F.B. EP.	Fusion bonded epoxy	Napguard coated Skotch kote
BARE	Bare	Uncoated
C. TAR	Coal tar	Coal tar coating Mastic
PAINT	Paint	-

* Decoto coatings:
  a. Before 1970 - all sizes - hot applied asphalt.
  b. 1970 and 1971 - 16" and up - hot applied asphalt.
  c. 1970 and after - 12" and smaller - cold applied tape.
  d. 1972 and after - all sizes - cold applied tape.

PIPE COATINGS (Cont'd)

2. Concrete and gunite coatings are used to provide negative buoyancy. They do not give corrosion protection. As they are actually weights, their presence should not be shown under "Coating" on the survey sheets. However, the presence of these weights, including "chance anchors" and coatings must be indicated on pipeline plat sheets and other records.

SYMBOLS/MAP FEATURES

Symbol	Feature	Line Weight
	Service area boundary	0
	County line	2
	Township & Range	2
	Quarter-mile-wide class boundary	0
	Transmission line, D.F.M.	3, Graphos T-08
	Reference T.L.s, D.F.M.s	1
	Stations, junctions, etc.	0
	Main line valves	0
	Casings	0
	Lines between pipeline and data section at whole mile points	0
	Lines between pipeline and data section at all other mile points	0
	Gas producer	0
	Dual gas producer	0
	Dwellings/areas	0

SYMBOLS/MAP FEATURES (Cont'd)

Example	Feature	Identification
REDWOOD REGION	Region name	140 Wrico/ 12pt Kroy
YOSEMITE DIVISION	Division name	140 Wrico/ 12pt Kroy
STANISLAUS DIVISION	Service area boundary	140 Wrico/ 12pt Kroy
MERCED COUNTY	County	140 Wrico/ 12pt Kroy
PIPE LINE OPERATIONS	Pipe Line Operations	140 Wrico/ 12pt Kroy
383075 SH. 1	Operating map	140 Wrico/ 12pt Kroy
T13S R15E MDB&M	Township & Range	140 Wrico/ 12pt Kroy
(See Title Blocks)	Line name, mile points, line size, and number	140 Wrico/ 12pt Kroy
118A-385121-21	Survey sheet number	240 Wrico/ 24pt Kroy
G-20186	Superseded density sheet drawing number	120 Wrico/ 10pt Kroy
195B - 2 OF 10	Sheet number	120 Wrico/ 10pt Kroy
COOPER FIELD	Gas field name	250 Wrico Shadow
⑦	Key to gas wells and data	120 Wrico/ 10pt Kroy
LIVINGSTON REG. STA.	Stations, junctions, etc.	90 Wrico/ 8pt Kroy
BENDER 77X-13	Gas well names	90 Wrico/ 8pt Kroy
SHL - SHELL OIL	Gas producers	90 Wrico/ 8pt Kroy
3434, 3435	Reference wall maps	90 Wrico/ 8pt Kroy

SYMBOLS/MAP FEATURES (Cont'd)

Example	Feature	Identification
	Cathodic protection station	120 Wrico/ 10pt Kroy
	Leaks	120 Wrico/ 10pt Kroy
	Electrolysis test station	120 Wrico/ 10pt Kroy

SHEET NUMBERING

1. Numbered transmission lines are identified as follows:

a. Single line surveys are the line's number followed by a numerical sequence for additional sheets.

118 - 1 of 1

118 - 1 of 3
118 - 2 of 3
118 - 3 of 3

b. Multiple line surveys are the line's number, an alphabetical suffix, and followed by a numerical sequence for additional sheets.

118A - 1 of 50	118B - 1 of 2	118C - 1 of 8
118A - 2 of 50	118B - 2 of 2	118C - 2 of 8
etc.		etc.

In this example, the main line is designated "A", with alphabetical suffixes for parallels and/or branches of descending order. These groupings should coincide with the line's titles as described in Appendix "A".

2. Collection system surveys follow the same rules as numbered transmission lines.

3. Distribution feeder mains are identified by Region name abbreviation.

a. Example: San Joaquin Valley Region

SJVR/DFM 1 - 1 of 2
SJVR/DFM 1 - 2 of 2

b. Subsequent DFMs in that Region are numbered by increasing numerical suffixes.

SJVR/DFM 2 - 1 of 6
SJVR/DFM 3 - 1 of 1
SJVR/DFM 4 - 1 of 3
etc.

4. The survey sheet number will be shown thus:

118 - 385121 - 1
118B - 385121 - 6
SJVR/DFM 1 - 385121 - 3

The total number of sheets is omitted.

SHEET NUMBERING (Cont'd)

5. If it becomes necessary to add sheets due to conjestion of pipe data or other causes, then additional sheets will be numbered thus:

118A - 5 of 10 (existing sheet)
118A - 5a of 10 (additional sheet)

118A - 385121 - 5a (survey sheet number)

6. Additional sheets for distribution feeder mains are numbered similarly:

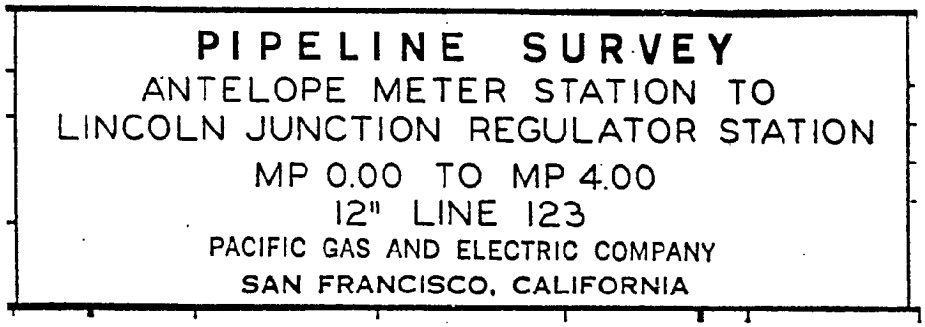
SJVR/DFM 2 - 1 of 6 (existing sheet)
SJVR/DFM 2 - 1a of 6 (additional sheet)

SJVR/DFM 2 - 385121 - 1a (survey sheet number)

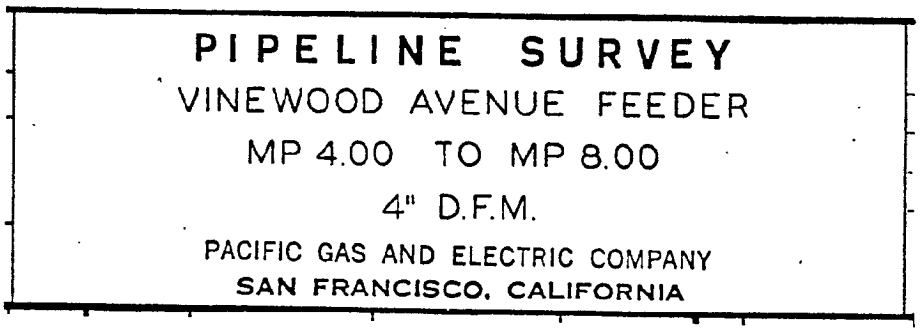
TITLE BLOCKS

1. Title blocks indicate the line's name, the number of miles covered per sheet, the line's size(s), and its identification number. Normally only one line size is shown, however, list two line sizes if they equally dominate. The miles covered for collection systems is not required, unless particular sheets have only transmission line. The gas field pressure can be listed to distinguish individual well systems.

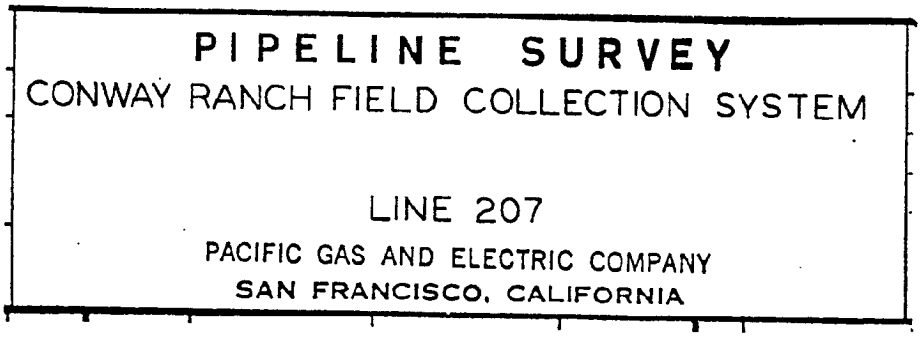
2. List the entire line's title even though only a portion of the line falls into local service area boundaries.



Transmission Line



Distribution Feeder Main



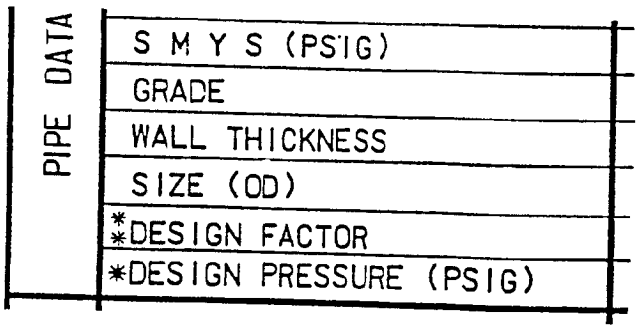
Collection System

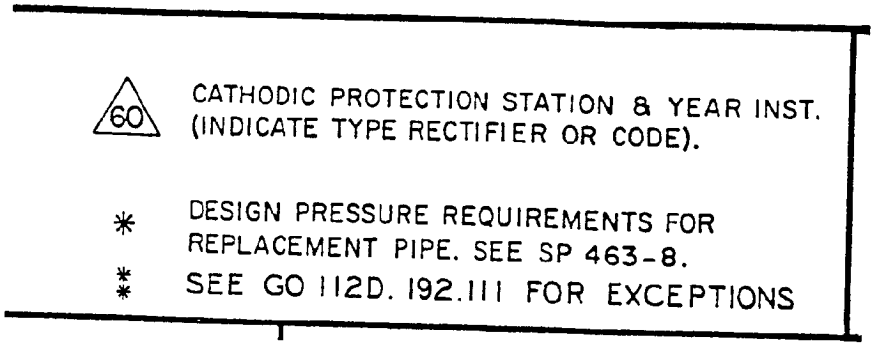
DESIGN FACTOR

1. The design factor can have numerous changes along the line which would considerably add to the number of final stations and mile points. Instead of listing and plotting them, add a note in the legend with a double asterisk for the GO 112D reference. This note could become a permanent note on the clear films, rather than lettering it on each mylar.

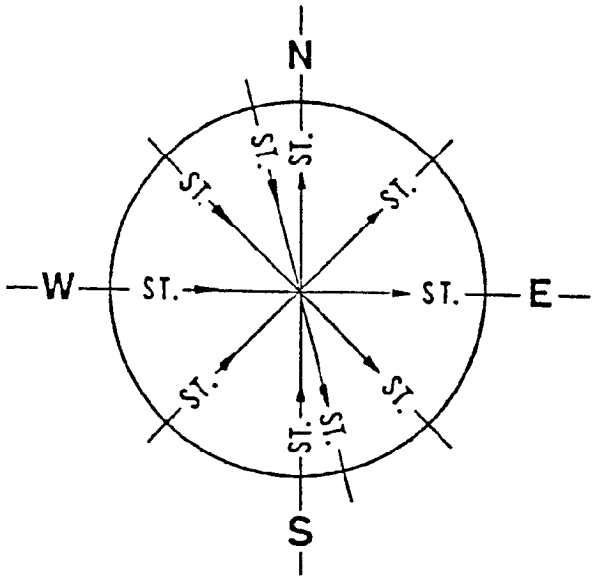
2. The design factors that will be shown on the surveys will indicate normal combinations. (See Appendix "F")

Class location	Design factor
1	.72
2	.60
3	.50
4	.40

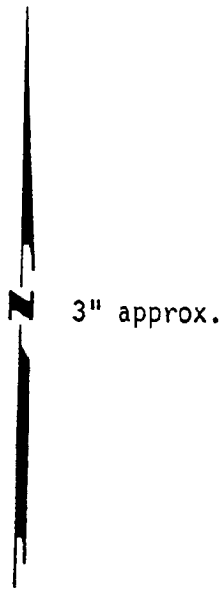




MISCELLANEOUS



Guide for Direction of Lettering

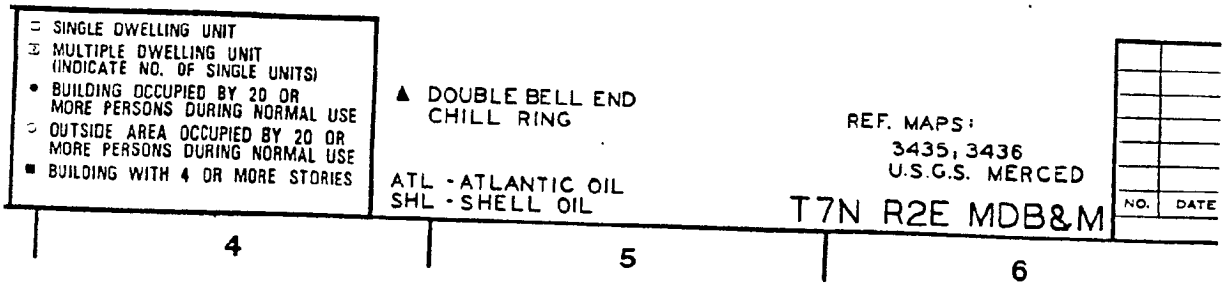


North Arrow

1. If one Township & Range covers the entire map, then list it as shown below.

2. List reference Wall Maps or U.S.G.S. maps used in respective sheet coverage above the Township & Range, or in that corner.

3. The left side of open area can be used for producer's names, well name abbreviations, notes on pipe specifications, or any other pertinent information.



NOTES

1. Include street and town names that may have been cut off during the clear film stage.

2. Erase map information on the reverse side of the mylar that conflicts with lettering, symbols, or the north arrow.

3. The north arrow is generally located in the lower right corner of the map area.

4. The survey sheet number is located in the upper left corner margin to allow for reference if sheets are hung in map cabinets.

5. Sheet 'match lines' should be 3" long and perpendicular to the line. Identify each match line with the adjoining sheet number.

6. Reference other transmission lines and D.F.M.s appearing in the map with their respective survey sheet numbers.

7. Refer to the operating map for line ownership and maintenance responsibility. List the Region and Division names in the lower right corner of the map, and indicate Pipe Line Operations if their interest warrants.

8. The county name will appear above the Region and Division names if it applies to the entire map.

9. Erase from the mylar the note "THIS SECTION OF TRANSMISSION LINE - - - SHOWN ON ADJACENT SHEETS" when cathodic protection stations occur on that sheet.

10. The pipe footages listed with each job must be corrected each time a new job is posted.

STATION PIPING

1. Station piping is defined as pipe installed within stations, metering stations, regulator stations, junctions, holder stations, tap stations, and any other facility where pipe is not installed under account 1124, or 1224 for D.F.M.s.

2. As these stations are encountered along the line, their piping has to be examined to determine if pipe length will be included in survey calculations. This determination is based upon how the final stations were developed for the Pipeline Plat Sheets, and whether or not main line valves occur in the station.

3. The following rules apply to stations and piping.

a. All stations appearing on the operating maps will be posted to the survey maps with their station names, irregardless of the status of piping.

b. Station piping criteria is never included in the survey data sections, because they fall under separate engineering standards.

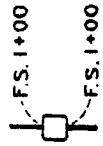
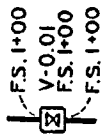
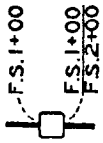
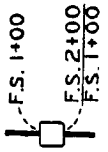
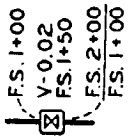
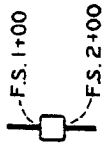
c. Main line valves installed inside stations will always be listed with their final stations. If the station is unnamed, then post a valve symbol to the map instead of a station symbol.

d. Any change in pipe data occuring at a station that is only relevant to the transmission line will be posted with its appropriate final station and mile point.

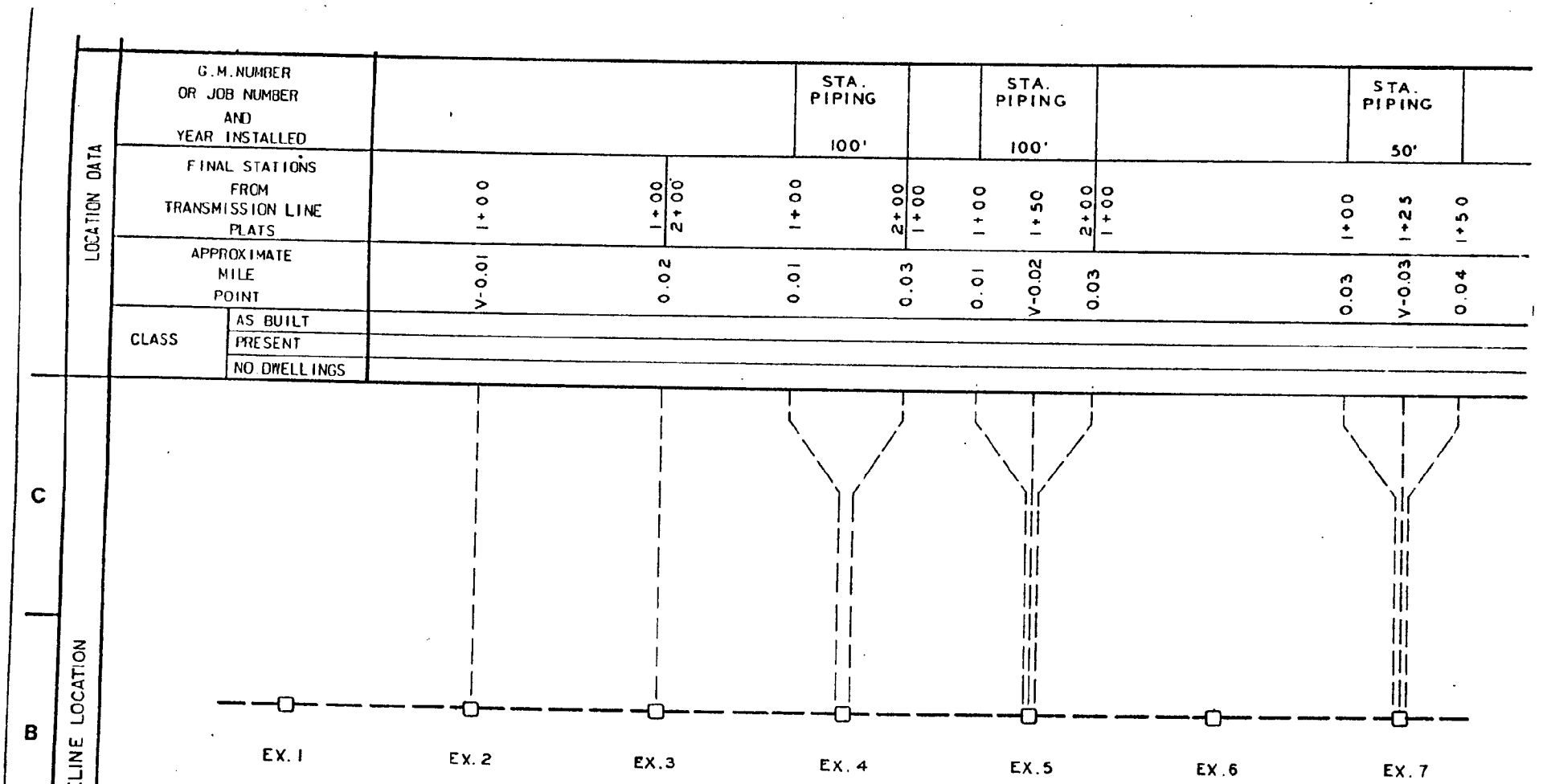
e. Exceptional cases involving large station size or complicated pipe configuration shall be handled to the best interests of the survey or requirements of calculations.

4. The examples on the following page illustrate the various situations encountered with stations, piping, and valves.

STATION TYPES

SITUATIONS*	MAPPING EXAMPLE	INCLUDE PIPING IN CALCULATIONS
	1	NO
	2	NO
	3	NO
	4	YES
	5	YES
	6	YES
	7	YES

* The station piping shown in these examples can also occur at the beginning or end of a line.



NOTE: These examples assume that the stations are named, however, if Examples 1 and 6 are unnamed stations, then no symbol posting is required. If Example 2 is an unnamed station, then post a valve symbol instead. If Example 3 is an unnamed station, then only post the final station equation, mileage value, and leader line, without a station symbol.

COLLECTION SYSTEMS

1. Collection System surveys are compiled similar to linear transmission surveys, except for the addition of individual well lines. (See Exhibit "J")

2. Additional factors in sheet planning would include the following field conditions.

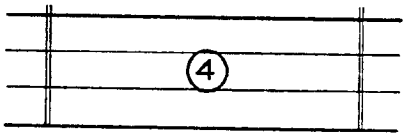
a. Gathering lines from wells only.
b. Gathering lines and connecting transmission lines.
c. Transmission lines only.

The sheets would be grouped to encompass wells in an orderly arrangement, and organized for easy reference to overlapping or adjacent sheets.

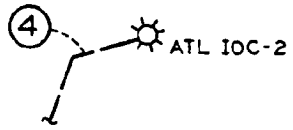
3. It may be necessary to make more than one white print strip map of the collection system or parts of it due to the complexity of the field. Plot whole mile points along main lines from tap to termination. Mile points for individual well lines are plotted from tap to bottom of riser.

4. Complete the worksheets per the requirements of mapping standards and formulas. When determining clear film coverage, carefully list the wall maps, because collection systems sometimes require overlapping sheets, and pieces of clear film maps can be used for more than one other sheet.

5. Since it is inconvenient to draw connecting lines between well lines and the data section, circled numbers of increasing value are used to key wells with respective data. The circled numbers are shown thus:



location class row



map area

6. Cross-reference sheet numbers in the map area, because some sheets may not have match lines.

7. Plot certain dwellings or areas in all sheets having common quarter-mile-wide class location zones.

8. Leave room in the data section during sheet planning for gas well expansion.

MILE POINTS & FINAL STATIONS

Mile Points

1. Mile points are values assigned to final stations that simultaneously relate to valve numbering. These mile points are only approximations because some main line valve numbers usually do not represent exact pipeline mileage distance. Mile points are also always subject to change due to the results of new job constructions affecting pipe length.

2. Mile points are calculated and assigned to the following items.

   a. Changes in pipe data.
   b. Rectifier, ETS, and leak locations.
   c. Job limits.
   d. M-numbers. (Tie-ins, service area boundaries, etc.)
   e. T-numbers. (Taps off T.L.s and D.F.M.s)
   f. Class location limits.
   g. All other points requiring final stations.

3. If an M-number or T-number is found to be incorrect after calculations, it must be changed to maintain mileage continuity between valves. Notify the Region Office so other maps and records can be changed.

4. Mile points are calculated to numerically coincide with valve numbering direction, but may or may not coincide with final stations.

5. Mileage values for main line valves are not recalculated because they are physically numbered in the field. Situations involving reversed gas flow and grossly out-of-date valve numbers due to large line relocations have caused valves to be renumbered in the field. Contact the Region Office for any instances requiring evaluation.

6. Refer to Calculating Mile Points for Final Stations in the Formula Section, and follow those examples.

7. Mile points can be calculated on GO Form 76-1482. (Exhibit "H")

Final Stations

1. Final stations represent fixed points on the pipeline that numerically account for accumulated pipe length, changes in pipe data, and individual points of information. Once assigned, final stations are not altered unless removed by line abandonment or readjusted due to changes in class location limits.

2. Final stations are always determined first, then mile points are calculated for them. The only exception is if final stations are calculated for whole mile points.

3. Final stations are obtained from the Pipeline Plat Sheets, or determined from other records, and assigned to the following items.

a. Changes in pipe data.
b. Rectifier, ETS, and leak locations.
c. Job limits.
d. M-numbers.
e. T-numbers.
f. Class location limits.
g. Any other items requiring identification.
h. Whole mile points (optional).

Whole mile points are an optional situation because any final station values calculated for them don't represent useful numbers. Also any changes in pipe length between their valves would require final station recalculation.

4. Refer to Calculating Final Stations for Mile Points in the Formula Section, and follow those examples.

5. Final stations can be recorded during worksheet preparation on GO Form 76-1482 for later calculations.

CLASS LOCATION

1. The class location is recorded along the bottom of the data section. The "AS-BUILT" row applies to original installations and remains unchanged. The "PRESENT" row reflects current class location status and is updated per changes in dwelling count or location. The "NO. OF DWELLINGS" represent field verified dwelling or area counts within a quarter-mile-wide corridor centered over the pipeline. The row entitled "% SMYS PERMIT/PRESENT LOC CLASS" in the operating data section is directly related to the "PRESENT" class location limits. (See Appendix "C")

2. The class location units and limits are described by the criteria of GO 112D and SP 460-1. (Appendices "B" & "C") The class location limits are determined by the "sliding mile", which results in class limits varying in length from several miles to a few hundred feet in all class designations.

3. It is important to distinguish the "sliding mile" concept from whole mile points. The "sliding mile" is a superimposed guage that groups dwellings into the highest possible class unit, and is completely unrelated to whole mile point locations on the line. Conversely, whole mile points are imaginary values on the line that provide mileage continuity between valves, and are unrelated to class limits. This differentiation is further apparent because dwelling counts are directly connected to class location limits and not whole mile point locations. (See Appendix "D")

4. The quarter-mile-wide corridor lines do not have to be plotted in Class 3 or 4 areas, except where individual buildings or areas defining those classes lie in Class 1 or 2 areas. Dwellings do not have to be plotted in Class 3 or 4 areas, because of high density. Instead, plot only those dwellings at the periphery that are used to establish Class 3 or 4 limits. As Class 3 or 4 areas expand, those fringe dwellings will have to be adjusted.

5. When plotting the corridor lines, describe semi-circular arcs at the line's beginning and end, and describe arcs at pipeline angle points. Refer to Appendix "E" for this specification.

6. Dwelling symbols should be plotted with proportional dividers and/or engineering scales to their closest relevant position from roads or geographical features. The symbol's geometric center is used for plotting and laying out class limits.

7. Class location limits can now be determined using the "mile density guage" as provided in Exhibit "C". Refer to Exhibits "D" & "E" for use of this transparent template.

8. Refer to Appendix "G" for class location change procedures.

FORMULAS

WHOLE MILE POINT PLOTTING (3% RULE)

1. The mile on the Pipeline Survey is kept within a 3% range of 5280' (5121.6' to 5438.4'). This percentage was established so mile lengths would not exceed .2" or 200' at the 1"-1000' scale. Mile divisions are denoted by whole mile values which are plotted within every valve-to-valve segment along the line. The 3% rule simply places a restriction on mile length variation to maintain reference value.

2. The 3% rule is based on the following relationship:

$$\frac{\text{theoretical distance (valve) - actual distance (pipe)}}{\text{theoretical distance (valve)}}$$

This results in a formula that produces a percentage difference:

$$\Delta\% = \frac{VF - PF}{VF} \times 100$$

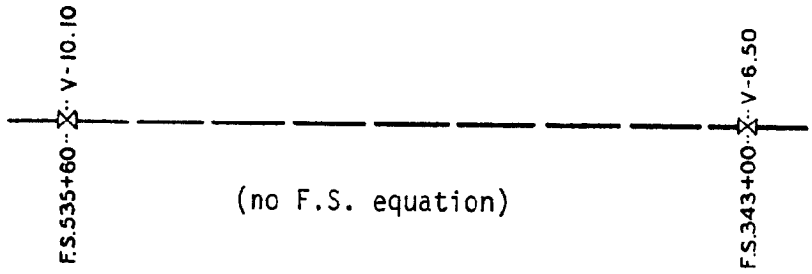
VF = valve footage calculated from valve numbers
PF = pipe footage calculated from final stations

3. The percentages will be in the range of:

$<+3\%$ to $>+3\%$ or $<-3\%$ to $>-3\%$

The results will determine the method by which all mile points will be calculated and plotted. The following examples illustrate situations where the 3% rule has and has not been exceeded.

EXAMPLE 1: △% = <3%



VF = (10.10 - 6.50)5280 = 19008'
PF = 535+60 - 343+00 = 19260'

1. If there are any F.S. equations, add or subtract those footages for a net PF.

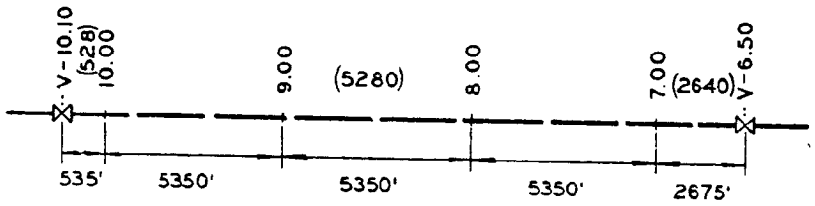
$$\triangle\% = \frac{19008 - 19260}{19008} \times 100 = -1.3\%$$

2. This line segment is less than 3%, so whole mile points will be plotted by an interpolation factor (F):

$$F = \frac{PF}{VF} = \frac{19260}{19008} = 1.0132...$$

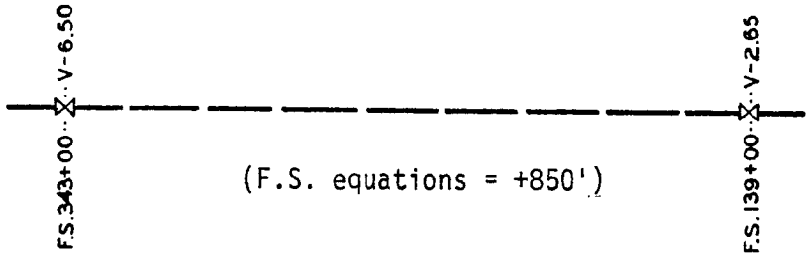
3. Map footages are obtained by: F x mileage sections in feet.

1.0132(2640) = 2675 = footage to scale from V-6.50 - 7.00
1.0132(5280) = 5350 = " " " " 7.00 - 8.00
etc.
1.0132(528) = 535 = " " " " 10.00 - V-10.10



4. When subsequent jobs alter the pipe footage in this valve segment, change the PF and calculate a new △%. If the segment remains <3%, calculate new footages and replot mile points. If the segment calculates >3%, then Example 2 will apply.

EXAMPLE 2: $\Delta\% = >3\%$



VF = (6.50 - 2.65)5280 = 20328'
PF = 343+00 - 139+00 + 850 = 21250'

$$\Delta\% = \frac{20328 - 21250}{20328} \times 100 = -4.5\%$$

1. This line segment is greater than 3%, so whole mile points will be plotted by their footage equivalents, resulting in an equation at the higher valve number (V-6.50). The table in Exhibit "F" is useful in this example.

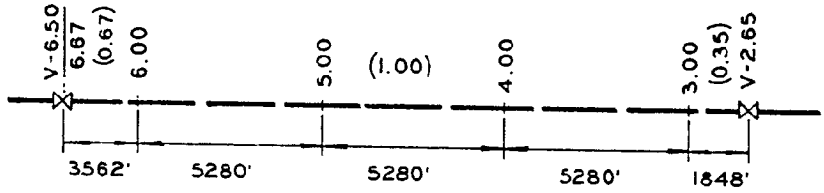
2. The mile point for the equation is calculated thus:

$$\frac{PF}{5280} = \frac{21250}{5280} = 4.02...$$

4.02 + V-2.65 = 6.67

3. Map footages are obtained by: 5280 x mileage sections in feet.

5280(0.35) = 1848 = footage to scale from V-2.65 - 3.00
5280(1.00) = 5280 = " " " " 3.00 - 4.00
etc.
5280(0.67) = 3562 = " " " " 6.00 - $\frac{6.67}{V\text{-}6.50}$



4. When subsequent jobs alter the pipe footage in this valve segment, change the PF and calculate a new $\Delta\%$. If the segment remains >3%, calculate new footages, a new mile point denominator at the valve equation, and replot mile points. If the segment calculates <3%, then Example 1 will apply.

5. An extreme situation can occur in Example 2 where overlapping and duplication of whole mile points results in adjoining valve segments. This situation would occur as a result of an extensive line relocation or straightening. Irregardless of these events, the rules of Example 2 still apply to maintain mileage continuity between valves.

CALCULATING % SMYS

1. Refer to Appendix "I" for line MAOPs.

2. The MAOP and MOP for the line are used in the same formula:

$$\%SMYS = \frac{MAOP \times OD}{2 \times SMYS \times WT \times JE} \times 100$$

$$\%SMYS = \frac{MOP \times OD}{2 \times SMYS \times WT \times JE} \times 100$$

SMYS = Specified minimum yield strength
MAOP = Maximum allowable operating pressure
MOP = Maximum operating pressure
OD = Outside diameter
WT = Wall thickness
JE = Joint efficiency

Examples:

(MAOP) $$\%SMYS = \frac{600 \times 10.750}{2 \times 42{,}000 \times 0.219 \times 1.0} = 35.1\%$$

(MOP) $$\%SMYS = \frac{550 \times 10.750}{2 \times 42{,}000 \times 0.219 \times 1.0} = 32.1\%$$

MAOP DURING WELDING

1. The MAOP during welding is listed in two rows labelled Section 2.1 and 2.2. When calculating pressures, do not round up numbers as a safety precaution. If a calculated pressure exceeds the MAOP, then list the MAOP instead.

2. Refer to Exhibit "G" for a computer list of calculated pressures for both sections, however, the following examples are provided for those pipe specification combinations not on that list.

Section 2.1 2

This section involves two formulas, from which the lower pressure applies:

$$P = \frac{2STJ}{D} \times 50\%^* \qquad \text{or,} \qquad P = \frac{2S(T - .094).72}{D}$$

P = internal pressure
S = specified minimum yield strength
T = wall thickness
D = outside diameter
J = joint efficiency

*Use 50% for longitudinal seams of DSAW or SMLS.
*Use 40% for longitudinal seams of ERW or other pipe.

Example: 26.0" OD, 0.322" WT, 60,000 SMYS, 1.0 JE, DSAW

$$P = \frac{2(60,000)0.322(1.0)}{26.0} \times .50 = 743$$

$$P = \frac{2(60,000)(0.322 - .094).72}{26.0} = 758$$

The welding pressure will be 743.

Section 2.2 7

This section involves one formula, using 20% for all types of longitudinal seams:

$$P = \frac{2STJ}{D} \times 20\%$$

Example: Same pipe specifications as Section 2.1.

$$P = \frac{2(60,000)0.322(1.0)}{26.0} \times .20 = 297$$

The welding pressure will be 297.

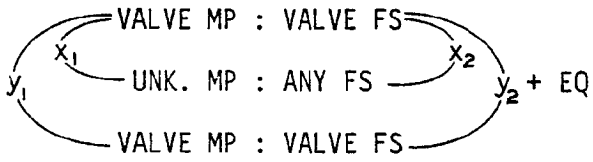
3. Both of the above examples have an assumed MAOP of greater than 743.

CALCULATING MILE POINTS FOR FINAL STATIONS

1. Mile points are calculated for final stations depending on the 3% situation in each valve segment. The following examples illustrate situations of <3% and >3%.

Example: < 3%

This percentage range establishes the following relationship:

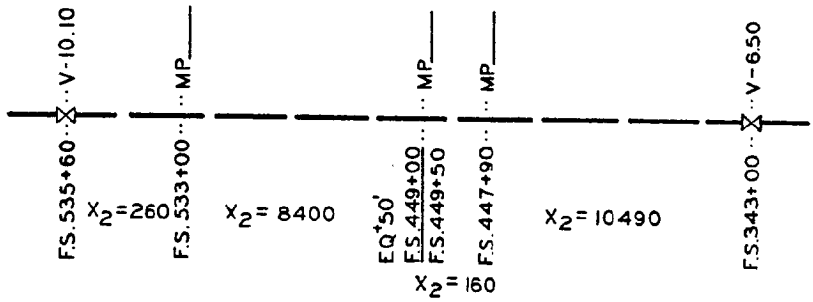


or, $\frac{x_1}{y_1} : \frac{x_2}{y_2}$

then, $x_1 = y_1 \frac{x_2}{y_2}$

Final station equations must be accounted for in the overall final station distance.

x_1 = an interpolation factor that is added to successive mile points to produce mile points at respective final stations.



x_2 = F.S. differences
y_1 = 10.10 - 6.50 = 3.60
y_2 = 535+60 - 343+00 + 50 = 19310

$$x_1 = 3.6 \frac{10490}{19310}$$
$$= 1.9556...$$
$$= 1.9556 + V\text{-}6.50$$
$$= MP\ \underline{8.45}\ \text{at FS 447+90}$$

$$x_1 = 3.6 \frac{160}{19310}$$
$$= .0298...$$
$$= .0298 + 8.45$$
$$= MP\ \underline{8.48}\ \text{at}\ \frac{\text{FS 449+50}}{\text{FS 449+00}}$$

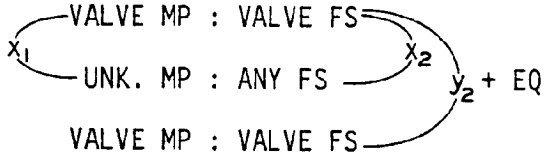
$$x_1 = 3.6 \frac{8400}{19310}$$
$$= 1.566...$$
$$= 1.566 + 8.48$$
$$= MP\ \underline{10.05}\ \text{at FS 533+00}$$

$$x_1 = 3.6 \frac{260}{19310}$$
$$= .0484...$$
$$= .0484 + 10.05$$
$$= MP\ \underline{10.10}\ \text{at FS 535+60}$$

The last mileage number (10.10) must calculate exactly as the valve's number, otherwise there has been an error.

Example: >3%

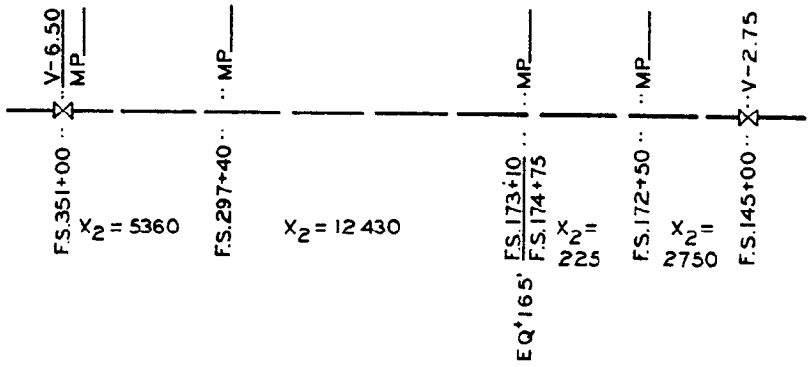
This percentage range establishes the following relationship:



or, $x_1 = \frac{x_2}{5280}$

Final station equations must be accounted for in the overall final station distance.

x_1 = the mileage equivalent of the final station difference that is added to successive mile points to produce mile points at respective final stations.



x_2 = F.S. differences
y_2 = 351+00 - 145+00 + 165 = 20765

$$x_1 = \frac{2750}{5280}$$
$$= .5208...$$
$$= .5208 + V\text{-}2.75$$
$$= MP\ \underline{3.27}\ \text{at FS } 172+50$$

$$x_1 = \frac{225}{5280}$$
$$= .0426...$$
$$= .0426 + 3.27$$
$$= MP\ \underline{3.31}\ \text{at } \frac{FS\ 174+75}{FS\ 173+10}$$

$$x_1 = \frac{12430}{5280}$$
$$= 2.3534...$$
$$= 2.3534 + 3.31$$
$$= MP\ \underline{5.67}\ \text{at FS } 297+40$$

$$x_1 = \frac{5360}{5280}$$
$$= 1.0151...$$
$$= 1.0151 + 5.67$$
$$= MP\ \underline{6.68}\ \text{at FS } 351+00$$

Mile point 6.68 becomes the equation denominator (MPD) at V-6.50, which can be checked by:

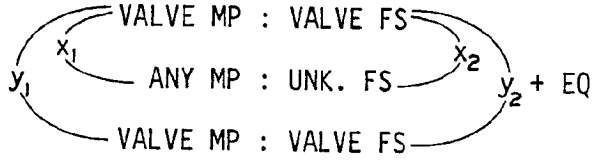
$$MPD = \frac{y_2}{5280} + V\text{-}2.75$$
$$= \frac{20765}{5280} + 2.75$$
$$= 6.68$$

CALCULATING FINAL STATIONS FOR WHOLE MILE POINTS

1. Final stations can be calculated for whole mile points, however, due to the changeability of these mile points, it is optional. The 3% rule applies similar to the examples for calculating mile points for final stations. The following examples illustrate situations of <3% and >3%.

Example: <3%

This percentage range establishes the following relationship:

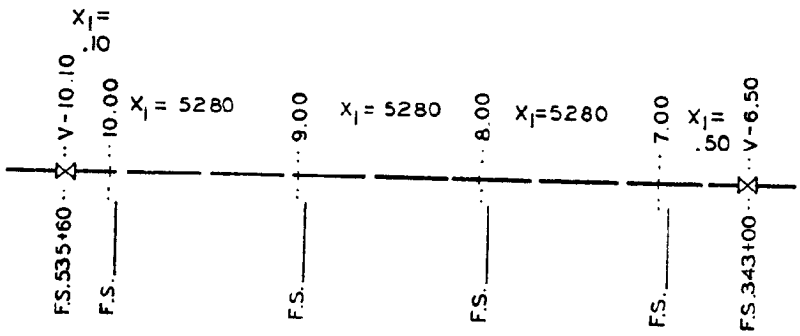


or, $\frac{x_1}{y_1} : \frac{x_2}{y_2}$

then, $x_2 = y_2 \frac{x_1}{y_1}$

Final station equations must be accounted for in the overall final station distance.

x_2= an interpolation factor that is added to successive final stations to produce final stations at respective mile points.



x_1 = MP differences
y_1 = 10.10 - 6.50 = 3.60
y_2 = 535+60 - 343+00 = 19260

$$x_2 = 19260 \frac{.50}{3.60}$$
$$= 2675$$
$$= 2675 + FS\ 343+00$$
$$= FS\ \underline{369+75}\ at\ MP\ 7.00$$

$$x_2 = 19260 \frac{1.00}{3.60}$$
$$= 5350$$
$$= 5350 + FS\ 369+75$$
$$= FS\ \underline{423+25}\ at\ MP\ 8.00$$

$$x_2 = 19260 \frac{1.00}{3.60}$$
$$= 5350$$
$$= 5350 + FS\ 423+25$$
$$= FS\ \underline{476+75}\ at\ MP\ 9.00$$

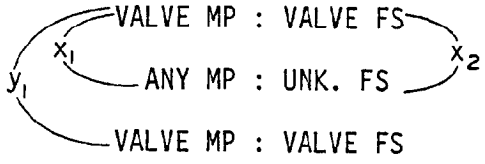
$$x_2 = 19260 \frac{1.00}{3.60}$$
$$= 5350$$
$$= 5350 + 476+75$$
$$= FS\ \underline{530+25}\ at\ MP\ 10.00$$

$$x_2 = 19260 \frac{.10}{3.60}$$
$$= 535$$
$$= 535 + FS\ 530+25$$
$$= FS\ \underline{535+60}\ at\ V-10.10$$

The last final station number (535+60) must calculate exactly as the valve's final station, otherwise there has been an error.

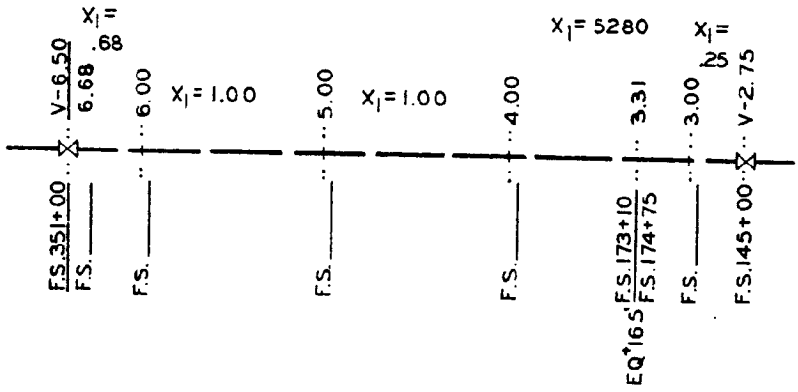
Example: >3%

This percentage range establishes the following relationship:



or, $x_2 = x_1 (5280)$

x_2= the footage equivalent of the mile point difference that is added to successive final stations to produce final stations at respective whole mile points.



x_1 = MP differences
y_1 = 6.68 - 2.75 = 3.93

x_2 = .25 (5280)
= 1320
= 1320 + FS 145+00
= FS 158+20 at MP 3.00

x_2 = 1.00 (5280)
= 5280 (FS 174+75 - FS 158+20 = 1655; 5280 - 1655 = 3625)
= 3625 + FS 173+10
= FS 209+35 at MP 4.00

x_2 = 1.00 (5280)
= 5280
= 5280 + FS 209+35
= FS 262+15 at MP 5.00

x_2 = 1.00 (5280)
= 5280
= 5280 + FS 262+15
= FS 314+95 at MP 6.00

x_2 = .68 (5280)
= 3590.4
= 3590 + FS 314+95
= FS 350+85 at MP 6.68

FS 350+85 becomes the final station denominator (FSD) at the equation. This can be checked by:

FSD = y_1 (5280) + Beg. FS - EQ
= 3.93 (5280) + 145+00 - 165
= 20750.4 + 143+35
= 350+85

APPENDICES

"A" - Numerical list of Lines and titles

"B" - GO 112D, 192.5 (Class location)

"C" - SP 460-1 Supplement

"D" - Gas Operations Bulletin No. 30 (Class location)

"E" - Letter File No. 522 (Class boundary drafting)

"F" - GO 112D, 192.111 (Design factor and casings)

"G" - SP 460-1 (Class location changes)

"H" - SP 463-7 (Pipeline Survey)

"I" - SP 463-8 (MAOPS)

NUMERICAL INDEX TO TRANSMISSION LINES

GAS OPERATIONS

August 1, 1983

Line No.	Title
10	(San Francisco to San Jose - Transfer to Distribution)
14	(San Jose to Los Gatos - Transfer to Distribution)
20	(Santa Rosa to Healdsburg - Transfer to Distribution)
21	Crockett Station to Napa "Y" Meter Station Crockett Station to Herrmann Station Herrmann Station to Vallejo Station Vallejo Station to Napa "Y" Meter Station Napa "Y" Meter Station To Willits via Adobe and Santa Rosa Compressor Station, 12"-26" Parallel Napa "Y" Meter Station to Adobe, 12"-26" Parallel Adobe to McDowell Road Tap 12"-26" Parallel McDowell Road Tap to Santa Rosa Compressor Station, 12"-26" Parallel Santa Rosa Compressor Station to Willits Napa "Y" Meter Station to Santa Rosa Compressor Station via Adobe, 16" Parallel Napa "Y" Meter Station to Adobe, 16" Parallel Adobe to Stony Point Rd. and Laguna De Santa Rosa, 16" Parallel *Stony Pt. Rd. and Laguna De Santa Rosa to Santa Rosa Compressor Station, 16" Parallel McDowell Road Tap to Petaluma Regulator Station Adobe to San Rafael Underground Holder, 12" Parallel Adobe to San Rafael Underground Holder, 16" Parallel
22	(Schellville to Glen Ellen - Transfer to Distribution)
23	(San Rafael to Sausalito - Transfer to Distribution)
24	(San Rafael to Sebastopol - Transfer to Distribution)
25	(Santa Rosa to Sebastopol - Transfer to Distribution)
26	(Vallejo Junction to Mare Island - Transfer to Distribution)
27	(Napa Meter House to Calistoga - Transfer to Distribution)
28	(Vallejo to Napa - Transfer to Distribution)
29	(Vallejo Junction to Benicia - Transfer to Distribution)

* Includes Loop North of Todd Rd. Reg. Sta. Only

Line No.	Title
30	(Sacramento to Woodland - Transfer to Distribution)
31	(Davis to Dixon - Transfer to Distribution)
32	(Thornton to Galt - Transfer to Distribution)
35	(Sacramento to Roseville - Transfer to Line 119 and Distribution)
40	(Nevada City to Grass Valley - Transfer to Distribution)
50	Marysville Service Center Regulator Station to Butte Station Marysville Service Center Regulator Station to Yuba City Underground Holder Yuba City Underground Holder to Gridley Junction Station Gridley Junction Station to Biggs Regulator Station Biggs Regulator Station to Afton Regulator Station Afton Regulator Station to Richvale "Y" Meter Station Richvale "Y" Meter Station to Butte Station Paradise Tap to Paradise (Richvale "Y" to Oroville - Transfer to Distribution) (Stirling Junction to Chico - Transfer to Distribution)
55	(Richvale "Y" to Chico - Transfer to Line 50)
Location 56	Pleasant Creek Field Underground Storage System
Location 57	McDonald Island Field Underground Storage System
Location 57A	McDonald Island Field Underground Storage System to Brentwood Terminal, 18" Parallel McDonald Island Field Underground Storage System to Palm Tract PL Station Palm Tract PL Station to Brentwood Terminal
Location 57B	McDonald Island Field Underground Storage System to Brentwood Terminal, 22" Parallel
60	(Stockton to Lodi - Transfer to Distribution)
Location 65	Los Medanos Field Underground Storage System
70	(Fresno to Sanger - Transfer to Distribution)
100	Kettleman Compressor Station to Milpitas Terminal (Kettleman Compressor Station to PL Station #7A & 7B Abandoned and Transfer to Distribution) PL Station #7A & 7B to Milpitas Terminal (Buttonwillow Field Collection System to Kettleman Compressor Station - Abandoned)

Line No.	Title
101	Milpitas Terminal to San Francisco Division Gas Load Center via Bayshore Highway Milpitas Terminal to Rengstorff Avenue Station Rengstorff Avenue Station to San Carlos Regulator Station San Carlos Regulator Station to San Francisco Division Border Meter Station San Francisco Division Border Meter Station to Martin Station Regulator Station Martin Station Regulator Station to San Francisco Division Gas Load Center
102	(Fresno Gas Plant to So. California Gas Company Transmission Line - Transfer to Distribution)
103	Hollister Meter Station to Harkins Road Meter and Mixer Station Hollister Meter Station to California Street Regulator Station California Street Regulator Station to Harkins Road Meter & Mixer Station (Salinas to Monterey - Transfer to Distribution)
104	(From Line 100 to San Jose - Transfer to Distribution)
105	Milpitas Terminal to San Pablo Station (Milpitas Terminal to Irvington Station - Abandon and Transfer to Distribution) Irvington Station to San Lorenzo Regulator Station San Lorenzo Regulator Station to East Bay Division Gas Load Center East Bay Division Gas Load Center to San Pablo Station Crockett Station to San Pablo Station East Bay Division Gas Load Center to Berkeley City Limits 24" Parallel
107	Tracy Station to Milpitas Terminal via Livermore Junction and Irvington Station Tracy Station to Livermore Junction Livermore Junction to Irvington Station Irvington Station to Milpitas Terminal

Line No.	Title
108	Vernalis Tap to Sacramento Division Gas Load Center via Stockton Division Gas Load Center Vernalis Tap to Vernalis Field Mixing Station Vernalis Field Mixing Station to McMullin Ranch Mixer Station McMullin Ranch Mixer Station to Louise Avenue Meter & Regulator Station Louise Avenue Meter & Regulator Station to Las Vinas Station Las Vinas Station to Thornton Meter Station Thornton Meter Station to Clarksburg PL Station Clarksburg PL Station to Sacramento Division Gas Load Center E. Hazelton and "B" Regulator Station to Stockton Division Gas Load Center (Freeport Field Collection System - Abandoned) (Harte Field Collection System - Transfer to Line 336) (Lodi Airport Field Collection System - Abandoned)
109	Milpitas Terminal to San Francisco Division Gas Load Center via Skyline Boulevard Milpitas Terminal to Sierra Vista Avenue Crossover Sierra Vista Avenue Crossover to Edgewood Road Crossover Edgewood Road Crossover to Ralston Avenue Crossover Ralston Avenue Crossover to Crystal Springs Crossover Crystal Springs Crossover to San Andreas Meter Station San Andreas Meter Station to Sullivan Avenue Regulator Station Sullivan Avenue Regulator Station to San Francisco Division Gas Load Center
110	(Tracy Station to Bethany - Transfer to Distribution)
111	Helm Junction Meter and Regulator Station to San Joaquin Division Gas Load Center Helm Junction Meter and Regulator Station to Raisin City Field Regulator Station Raisin City Field Regulator Station to Fresno Junction Fresno Junction to San Joaquin Division Gas Load Center Raisin City Field Collection System San Joaquin Field Collection System
112	Vernalis Field Collection System
113	(Kettleman Compressor Station to Southern Counties Gas Company 10" Line Transferred to Line 178)
114	Rio Vista Field, West Side, to Livermore Junction Rio Vista Field, West Side, to Antioch Terminal Antioch Terminal to Brentwood Terminal Brentwood Terminal to Dalton Avenue Station Dalton Avenue Station to Livermore Junction
115	Petaluma Field Collection System

Line No.	Title
116	Davis Meter and Regulator Station to Sacramento Division Gas Load Center Davis Meter and Regulator Station to Swingle Junction Regulator and Meter Station Swingle Junction Regulator and Meter Station to Sacramento Division Gas Load Center
117	(Bakersfield to Midway Gas Company Line - Transferred to Distribution)
118	San Joaquin Division Gas Load Center to Walnut Avenue - Bradbury Road, Turlock San Joaquin Division Gas Load Center to Fresno Junction Fresno Junction to Herndon Junction Herndon Junction to Livingston Regulator Station Livingston Regulator Station to Bradbury Road Regulator Station, 6" Parallel Bradbury Road Regulator Station to Walnut Avenue - Bradbury Road, Turlock, 6" Parallel Livingston Regulator Station to Bradbury Road Regulator Station, 8" Parallel Bradbury Road Regulator Station to Walnut Avenue - Bradbury Road, Turlock, 8" Parallel Herndon and Weber Avenues to Herndon Junction, 12" Parallel Herndon Junction to Athlone, 12" Parallel San Joaquin Division Gas Load Center to Fresno Underground Holder
119	Davis Meter Station to Antelope Meter Station via North Sacramento Underground Holder Davis Meter Station to Swingle Junction Regulator and Meter Station Swingle Junction Regulator and Meter Station to North Sacramento Underground Holder 6" Hudson Way, South, to Sonoma and Del Paso Boulevard Regulator Station 6" Hudson Way, North, to Roseville Road Regulator Station 6" Antelope Meter Station, South, to Roseville Road Regulator Station 12" Hudson Way, South, to North Sacramento Underground Holder 12" Hudson Way, North, to Roseville Road Regulator Station 12" Antelope Meter Station, South, to Roseville Road Regulator Station 16" North Sacramento Underground Holder, North, to Hudson Bay 16" Roseville Road Regulator Station, South, to Hudson Way (North Sacramento Underground Holder to Edison and Juliesse Station. Including 12" Tap to Elm and Traction Avenue Regulator Station - Transfer to Distribution)

Line No.	Title
120	Sutter Buttes Field Collection System Sutter Creek Field Collection System
121	Marysville Buttes Meter Station to Yuba City Underground Holder
122	(Fairfield Knolls Field to Line 220 - Transfer to Distribution, See also Line 149 & 159)
123	Antelope Meter Station to Lincoln Junction Regulator Station
124	Lincoln Junction Regulator Station to Marysville Service Center Regulator Station Lincoln Junction Regulator Station to Yuba City Underground Holder Beale Air Force Base Tap to Beale Air Force Base Regulator Station via Camp Far West Meter Station
125	Tompkins Hill Field Collection System
126	Tompkins Hill Meter and Regulator Station to Eureka Propane Air Plant Tompkins Hill Meter Station to Union Street Regulator Station, 4" Parallel Tompkins Hill Meter Station to Union Street Regulator Station, 6" Parallel Union Street Regulator Station to Eureka Propane Air Plant Elk River Road Regulator Station to Eureka Propane Air Plant
127	(Willows Field Collection System - Abandoned)
128	Ord Bend Meter Station to Willows Regulator Station
129	(Irvington Station Between Lines 107 and 105 - Transfer to Line 107)
130	Sacramento River Crossing, East and West Rio Vista Fields
131	Rio Vista Field, East Side, to Milpitas Terminal Rio Vista Field, East Side, to Antioch Terminal Antioch Terminal to Brentwood Terminal Brentwood Terminal to Irvington Station Irvington Station to Milpitas Terminal

Line No.	Title
132	Milpitas Terminal to San Francisco Division Gas Load Center via Skyline Boulevard Milpitas Terminal to Sierra Vista Avenue Crossover Sierra Vista Avenue Crossover to Edgewood Road Crossover Edgewood Road Crossover to Ralston Avenue Crossover Ralston Avenue Crossover to Crystal Springs Crossover Crystal Springs Crossover to San Andreas Meter Station San Andreas Meter Station to Martin Station Regulator Station Martin Station Regulator Station to San Francisco Division Gas Load Center
132A	Sierra Vista Avenue Crossover to Rengstorff Avenue Station
132B	Martin Station Regulator Station Crossover
133	Gill Ranch Field Collection System
134	Firebaugh Regulator Station to Herndon Junction Firebaugh Regulator Station to Arbios Meter Station, 3"-4" Parallel Arbios Meter Station to Gill Ranch Field Odorizer Station (V-21.57) Gill Ranch Field Odorizer Station, V-21.57 to Gill Ranch Field Odorizer Station, V-11.82 Gill Ranch Field Odorizer Station, V-11.82 to Herndon Junction Firebaugh Regulator Station to Arbios Meter Station, 6"-8" Parallel Moffat Ranch - Dixon Meter Station to Moffat Ranch Tap, T-21.83
135	Ord Bend Field Collection System (Chico Creek Field Collection System - Abandoned)
136	Ord Bend Meter Station to Butte Station Ord Bend Meter Station to V-1.65 (V-1.65 to the Sacramento River - Transfer to Distribution) (Sacramento River to Fell Regulator & Odorizer Station - Abandoned) Fell Regulator & Odorizer Station to Durham Field Meter Station Durham Field Meter Station to Butte Station
137	Eureka, 14th and Albee Streets, to Arcata Regulator Station via Ryan Slough Regulator Station Eureka, Ryan Slough Regulator Station, to Arcata Regulator Station

Line No.	Title
138	Helm Tap Station to San Joaquin Division Gas Load Center via Helm Junction and East and North Avenues, T-43.58
138A	Helm Tap Station to Helm Junction, 16" Parallel Helm Junction to Elkhorn Station Elkhorn Station to Burrel Meter Station Burrel Meter Station to Adams and Elm Meter and Regulator Station, Easton Adams and Elm Meter and Regulator Station, Easton, to East and North Avenues, Fresno East and North Avenues, Fresno, to San Joaquin Division Gas Load Center East and North Avenues, Fresno, to Chestnut and Clay Regulator Station, Fresno
138B	Helm Tap Station to Helm Junction, 20" Parallel
139	(Lodi Field Collection System - Transfer to Distribution)
140	(Lodi Field to Las Vinas Station - Transfer to Distribution)
141	Thornton Area Collection System East Thornton Field Collection System Thornton Field Collection System Walnut Grove Field Collection System NE River Islands Field Collection System
142	Bakersfield Tap to Bakersfield Regulator Station Gosford Road Meter Station to Bakersfield Regulator Station Gosford Road Meter Station to Brundage Lane & "V" Street Regulator Station Brundage Lane & "V" Street Regulator Station to Bakersfield Regulator Station
143	Millar Area Collection System Millar Field Collection System Saxon Field Collection System - See also Line 335 NE Maine Prairie Field Collection System (Dixon Field Collection System - Abandoned)
144	Millar Field to Millar Meter Station
145	Maine Prairie Field Collection System
146	Maine Prairie Field to Maine Prairie Meter Station
147	Edgewood Road Crossover to San Carlos Regulator Station
148	McMullin Ranch Mixer Station to Morgan Road Regulator Station
149	Winters Area Collection System Winters Field Collection System Fairfield Knolls Field Collection System (See Also Line 122 & 159) (Dry Slough Field Collection System - Abandoned)

Line No.	Title
150	Winters Meter Station to Davis Meter Station via Tremont Tap Winters Meter Station to Winters Field Dehydrator Station Winters Field Dehydrator Station to Tremont Tap Tremont Tap to Davis Meter Station (Dixon Field Collection System - Abandoned)
151	Afton Odorizer Station to Afton Tap (Schohr Ranch Field Collection System - Transfer to Distribution)
152	Afton Field Collection System (See also Line 167)
153	Irvington Station to East Bay Division Gas Load Center Irvington Station to Marina Boulevard Station Marina Boulevard Station to East Bay Division Gas Load Center
154	(Race Track Field to Bakersfield Power Plant - Transfer to Distribution)
155	Durham Field Collection System
156	Durham Field to Durham Field Meter Station
157	(Dunnigan Hills Field Collection System - Abandoned)
158	Dunnigan-Spreckels Regulator Station to M-4.38, North of County Road 17 Woodland Field Collection System
159	Pleasant Creek Field Compressor Station to Winters Meter Station Pleasant Creek Compressor Station to Pleasant Creek Line 159 Regulator Station Pleasant Creek Line 159 Regulator Station to Winters Meter Station (Fairfield Knolls Field Collection System - Abandoned, See also Line 122 & 149)
160	(Kettleman Middle Dome Collection System - Abandoned)
161	(Semi-Tropic Field Collection System - Abandoned - Reactivated as Line 333)
162	Tracy Station to Banta Regulator Station, 6" Parallel (See also Line 304) Tracy Station to Banta Regulator Station, 10" Parallel (Tracy Field Collection System - Abandoned, See also Line 304)
163	(Trico Field Collection System - Sold to Pacific Lighting Service and Supply Company)
164	Coalinga Nose Field to Coalinga Tap
165	Arlington Gas Lines, Inc. (For Account 1806 Rents)

Line No.	Title
166	(S.O. Plant to Kettleman Compressor Station - Abandoned)
167	Beehive Bend Field to Yuba City Underground Holder Beehive Bend Field to Wild Goose Mixer and Odorizer Station Wild Goose Mixer and Odorizer Station to Yuba City Underground Holder Wild Goose Field Meter Station to Gridley Junction Station Wild Goose Field Meter Station to Wild Goose Mixer and Odorizer Station Wild Goose Mixer and Odorizer Station to Gridley Junction Station Wild Goose Area Collection System (Angel Slough Field Collection System - Abandoned) Afton Field (South) Collection System (See also Line 152) Bounde Creek Field Collection System Compton Landing Field Collection System Princeton Field Collection System Wild Goose Field Collection System Williams Field Collection System
168	River Islands Area Collection System River Islands Field Collection System Grand Island Field Collection System
169	Beehive Bend Area Collection System Artois Field Collection System Beehive Bend Field Collection System Willows Field Collection System
170	(Buttonwillow Field Collection System - Abandoned)
171	(Buttonwillow Field to Midway Power Plant - Abandoned)
172	Beehive Bend Field, West, Meter and Odorizer Station to Sacramento Division Gas Load Center Beehive Bend Field, West, Meter and Odorizer Station to Hershey Junction Hershey Junction to Swingle Junction Regulator and Meter Station Swingle Junction Regulator and Meter Station to Sacramento Division Gas Load Center Crossroads Field Collection System Dufour Field Collection System Sugarfield Field Collection System (Sacramento Bypass Field Collection System - Abandoned)
173	Turkey Ranch Meter Station to Auburn Regulator Station, 4" Parallel Turkey Ranch Meter Station to Auburn Regulator Station, 6"-8" Parallel
174	Arbuckle Field Collection System
176	Roberts Island Field to Tracy Station Roberts Island Field Collection System

Line No.	Title
177	Fell Regulator and Odorizer Station to Ryan Slough Regulator Station, Eureka Fell Regulator and Odorizer Station to Sacramento Avenue Junction Grape Way Regulator Station to Corning North Dome Station via Sacramento Avenue Junction Corning North Dome Station to Cummings Creek PL Station Cummings Creek PL Station to Tompkins Hill Meter and Regulator Station Tompkins Hill Meter and Regulator Station to Ryan Slough Regulator Station, Eureka Grape Way Regulator Station to Butte Station Red Bluff Tap to Red Bluff and Diamond National Corp. Regulator Station (Rancho Capay Field Collection System - Transfer to Line 339)
178	(Kettleman Compressor Station to Morro Bay Power Plant - Sold to Southern Counties Gas Company)
179	(Corning Field, North, Collection System - Abandoned) Corning Field, South, Collection System
180	(Kettleman Hills, North Dome, Field Collection System to Kettleman Compressor Station - Abandoned)
181	Soap Lake Meter Station to Watsonville Station via Anzar Road Meter & Regulator Station, 10"-12" Parallel Soap Lake Meter Station to Gilroy Junction Meter Station Gilroy Junction Meter Station to V-3.17, West of Gilroy Junction Meter Station (V-3.17, West of Gilroy Junction Meter Station to V-6.19, East of Anzar Road Meter & Regulator Station - Abandoned) V-6.19, East of Anzar Road Meter & Regulator Station, to Anzar Road Meter & Regulator Station Anzar Road Meter & Regulator Station to Watsonville Station, 10"-12" Parallel Anzar Road Meter & Regulator Station to Watsonville Station, 16"-20" Parallel
182	Rio Vista Field, West Side, to Bailey Road Meter and Regulator Station Rio Vista Field, West Side, to Shell Chemical Meter Station Shell Chemical Meter Station to Suisun Junction Meter Station Kirby Hills Field Collection System Suisun Field Collection System Van Sickle Field Collection System
183	Moffat Ranch Field Meter and Regulator Station to Firebaugh Regulator Station
184	(Turk Anticline Field Collection System to Stanpac 2 - Abandoned)

Line No.	Title
185	Hollister Field Collection System
186	Chowchilla Field to Dos Palos Meter Station via South Dos Palos Chowchilla Field Collection System
187	San Ardo Field to Harkins Road Meter and Mixer Station
188	(Los Medanos Field Collection System - Sold to Shell Oil Company - Reactivated as Location (Line) 65)
189	Humboldt Bay Power Plant Tap to Humboldt Bay Power Plant
190	Kettleman Compressor Station to Coalinga Nose Field (Dudley Ridge Field Collection System - Abandoned)
191	Antioch Terminal to Martinez Meter and Regulator Station via Pittsburg Power Plant, Walnut Creek and Orinda Antioch Terminal to Antioch Town Meter Station Antioch Town Meter Station to Pittsburg Power Plant Regulator Station Pittsburg Power Plant Regulator Station to Reliez Station Road Regulator Station, Lafayette Reliez Station Road Regulator Station, Lafayette to Martinez Meter and Regulator Station via "The Junction" (Mulligan Hill Field Collection - Abandoned)
191A	The Junction, West, to Ardilla and Camino Pablo Regulator Station and Camino Sobrante Regulator Station, Orinda
191B	The Junction, East, to Reliez Valley Road, Lafayette
192	(Willow Pass Field Collection System - Sold to Shell Oil Company - Reactivated as Line 214)
193	Kirkwood Area Collection System Kirkwood Field Collection System Malton Field Collection System Rice Creek Field Collection System
194	McMullin Ranch Field Collection System
195	Rio Vista Area Collection System, East Side Bradford Island Isleton Field Collection System Rio Vista Field Collection System, East Side Sherman Island Field Collection System
196	Isleton Meter Station to Las Vinas Station East Island Field Collection System

Line No.	Title
197A	Las Vinas Station to Calaveras Cement Meter Station 10"-12" Parallel Las Vinas Station to Brandt Road PL Station Brandt Road PL Station to Calavares Cement Meter Station
197B	Las Vinas Station to Calaveras Cement Meter Station (6"-8" Parallel Las Vinas Station to V-5.50 near Acampo (V-5.50 near Acampo to Brandt Road PL Station - Transfer to Distribution) Brandt Road PL Station to V-31.24 (V-31.24 to V-2, near V-39.57 - Transfer to Distribution)
197C	Ione Tap, V-17.44 (10" - 197) near Clements, to Ione and Martell via Buena Vista Road Ione Tap V-17.44 (10" - 197) near Clements, to Martell via Buena Vista Road Buena Vista Road to Ione Regulator @ Buena Vista and Jackson Streets Buena Vista Road to American Lignite Plant
198	(Calaveras Cement Company 8" Line - Purchased and Transferred to Line 197)
199	Bunker Field Collection System
200	W. Rio Vista Master Meter to Rio Vista "Y" Mixer Station, 12" Parallel W. Rio Vista Master Meter to Rio Vista "Y" Mixer Station, 16" Parallel Rio Vista Area Collection System, West Side Rio Vista Field Collection System, West Side Liberty Island Field Collection System Lindsey Slough Field Collection System Cache Slough Field Collection System
201	Todhunters Lake Area Collection System Todhunters Lake Field Collection System Greens Lake Field Collection System (See also Line 203)
202	Camp Far West Meter Station to Grass Valley Regulator Station
203	Winchester Lake Field Collection System (Greens Lake Field Collection System - Abandoned, See also Line 201)
204	Cheney Ranch Field Collection System
206	Pleasant Creek Tap to Pleasant Creek Field Compressor Station
207	Conway Ranch Field Collection System

Line No.	Title
208	Union Island Area Collection System Union Island Field Collection System Lathrop Field Collection System (See also Line 304)
209	Johns Manville Regulator Station to 5th and Garden, Willows
210	Rio Vista "Y" Mixer Station to Napa "Y" meter Station via Creed Station and Cordelia Regulator Station, 10"-32" Parallel Rio Vista "Y" Mixer Station to Creed Station Creed Station to Cordelia Regulator Station Cordelia Regulator Station to Napa "Y" Meter Station Rio Vista "Y" Mixer Station to Napa "Y" Meter Station via Creed Station and Cordelia Regulator Station, 16"-18" Parallel Rio Vista "Y" Mixer Station to Creed Station Creed Station to Cordelia Regulator Station Cordelia Regulator Station to Napa "Y" Meter Station Cordelia Regulator Station to Herrmann Station Exxon Tap to Exxon Meter Station Denverton Creek Field Collection System
211	Mt. View Landfill Gas Processing Collection System
212	Tremont Field Collection System
213	Orland Field Collection System
214	Willow Pass Field Collection System (See also Line 192)
215	Oak Flat Road Meter Station to West Avenue Regulator Station, Turlock, via Walnut Avenue-Bradbury Road
220	Rio Vista "Y" Mixer Station to Dunnigan-Spreckels Regulator Station near Woodland Rio Vista "Y" Mixer Station to Maine Prairie Meter Station Maine Prairie Meter Station to Millar Meter Station Millar Meter Station to Davis Meter and Regulator Station Davis Meter and Regulator Station to Dunnigan-Spreckels Regulator Station near Woodland Rio Vista "Y" Mixer Station to Maine Prairie Meter Station, 16" Parallel (Davis Field Collection System - Abandoned) Merritt Field Collection System

Line No.	Title
300A	Topock Compressor Station to Milpitas Terminal Topock Compressor Station to PL Station 1A PL Station 1A to PL Station 2A PL Station 2A to PL Station 2AX PL Station 2AX to Hinkley Compressor Station Hinkley Compressor Station to PL Station 3A PL Station 3A to PL Station 4A PL Station 4A to PL Station 5A PL Station 5A to Kettleman Compressor Station Kettleman Compressor Station to PL Station 6A PL Station 6A to Hollister Meter Station Hollister Meter Station to PL Station 6AX PL Station 6AX to PL Station 7A PL Station 7A to Milpitas Terminal
300B	Topock Compressor Station to Milpitas Terminal Topock Compressor Station to PL Station 1B PL Station 1B to PL Station 2B PL Station 2B to PL Station 2BX PL Station 2BX to Hinkley Compressor Station Hinkley Compressor Station to PL Station 3B PL Station 3B to PL Station 4B PL Station 4B to PL Station 5B PL Station 5B to Kettleman Compressor Station Kettleman Compressor Station to PL Station 6B PL Station 6B to Hollister Meter Station Hollister Meter Station to PL Station 6BX PL Station 6BX to PL Station 7B PL Station 7B to Milpitas Terminal
301A	Hollister Meter Station to Moss Landing Power Plant via Dolan Road Meter Station, 20"-24" Parallel
301B	Dolan Road Meter Station to Hilltown Regulator Station via Expinosa Road Tap Station
301C	Hilltown Regulator Station to Harkins Road Meter and Mixer Station
301D	Anzar Tap Station to Anzar Road Meter and Regulator Station, 10" Parallel
301E	Reservation Road Tap to Reservation Road, Fort Ord
301F	Espinosa Road Tap Station to First Avenue Regulator Station, Fort Ord
301G	Hollister Meter Station to Moss Landing Power Plant via Dolan Road Meter Station, 24"-30" Parallel

Line No.	Title
301H	Anzar Tap Station to Anzar Road Meter and Regulator Station, 16" Parallel
302	Grimes Area Collection System Buckeye Field Collection System Butte Sink Field Collection System Butte Slough Field Collection System East Grimes Field Collection System Grimes Field Collection System Howell's Point Field Collection System Kirk Field Collection System Moon Bend Field Collection System Peace Valley Field Collection System Sutter Buttes West Field Collection System Sycamore Field Collection System West Butte Field Collection System West Grimes Field Collection System
302W	Hershey Junction to Buckeye Creek PL Station
303	Antioch Terminal to Irvington Station via Livermore Junction Antioch Terminal to Brentwood Terminal Brentwood Terminal to Livermore Junction Livermore Junction to Irvington Station
304	Lathrop Dehydrator and Odorizer Station to Tracy Station Lathrop Field Collection System (See Also Line 304) Tracy Field Collection System (See Also Line 162)
306	Kettleman Compressor Station to Morro Bay Power Plant Regulator Station Kettleman Compressor Station to Dry Creek PL Station Dry Creek PL Station to Morro Bay Power Plant Regulator Station
307	Spreckels Sugar Meter Station to Spreckels Sugar Regulator Station East of Mendota via Derrick Avenue Tap Derrick Avenue Tap (T-12.05) to Arbios Regulator Station, Mendota
308	Brentwood Field Collection System
309	(Red Bluff Field Collection System - Transferred to Distribution)
311	Trona Tap Meter Station to Westend Primary Regulator Station, 10"-12" Parallel Trona Tap Meter Station to Westend Primary Regulator Station, 12" Parallel (Ridgecrest Tap to Ridgecrest Primary Regulator Station - Transfer to Line 372)
312	Paloma Tap to Paloma Field Meter Station

Line No.	Title
313	Lucerne Valley Tap Meter Station to Kaiser Cement Company Meter and Regulator Station, Cushenbury Springs
314	Hinkley Compressor Station to Southwestern Portland Cement Company at Black Mountain and Victorville Hinkley Compressor Station to Riverside PL Station Riverside PL Station to Southwestern Portland Cement Company at Black Mountain
316	Dutch Slough Area Collection System Brentwood, East Field Collection System Dutch Slough Field Collection System Knightsen Field Collection System (River Break Field Collection System - Abandoned) Oakley Field Collection System
317	(Chickahominy Field Collection System - Abandoned)
318	Black Butte Field Collection System
319	Kern River Station to Coles Levee Regulator Station (Pacific Lighting Service Co. 34" Line 225)*
331	Santa Nella Tap to Tri-Valley Growers
333	(Semi-Tropic Field Collection System - Abandoned. See also Line 161)
334	Stone Lake Area Collection System Stone Lake Field Collection System Poppy Ridge Field Collection System
335	Putah Sink Area Collection System Putah Sink Field Collection System (Saxon Field Collection System - Abandoned. See also Line 143)
336	Harte Field Collection System (Transfer from Line 108)
337	Zamora Field Collection System
338	Kettleman City Field Collection System
339	Rancho Capay Field Collection System (Transfer from Line 177)
340	Bellevue Field Collection System
372	Ridgecrest Tap to Ridgecrest Primary Regulator Station

*50% Ownership Interest with Pacific Lighting Service Co.

Line No.	Title
400	California-Oregon Border to Antioch Terminal
	California-Oregon Border to Tionesta Compressor Station
	Tionesta Compressor Station to Indian Springs PL Station
	Indian Springs PL Station to Burney Compressor Station
	Burney Compressor Station to Shingletown PL Station
	Shingletown PL Station to Gerber Compressor Station
400A	Gerber Compressor Station to Delevan Compressor Station
400	Delevan Compressor Station to Buckeye Creek PL Station
	Buckeye Creek PL Station to Creed Station
	Creed Station to Antioch Terminal
400B	California-Oregon Border to Brentwood Terminal
	Gerber Compressor Station to Delevan Compressor Station
402	Redding-Calaveras Tap to Calaveras Cement Company via Redding
	Redding-Calaveras Tap to PL Station (V-9.96)
	PL Station (V-9.96) to Calaveras Cement Company via Redding
403	Rio Vista "Y" Mixer Station to Creed Station

NUMERICAL INDEX TO TRANSMISSION LINES

STANDARD PACIFIC GAS LINE, INC.

STANPAC

August 1, 1983

Line No.	Title
1	(Kettleman Hills, North Dome, Field Collection System to Kettleman Compressor Station - Abandoned)
2	Kettleman Compressor Station to Brentwood Terminal (Kettleman Compressor Station to Panoche Junction - Abandoned) Panoche Junction to Brentwood Terminal
3	Brentwood Terminal to San Pablo Station Brentwood Terminal to Delta Fair Junction Delta Fair Junction to Crockett Junction PL Station Crockett Junction PL Station to San Pablo Station
4	Rio Vista Field, East Side, to Antioch Terminal
5	Antioch Terminal to Delta Fair Junction
Crockett Branch	Crockett Junction PL Station to Crockett Station
Ryer Island Branch	Ryer Island Field Tap (Chevron-Shell) to Los Medanos PL Station

"Pipe" means any pipe or tubing used in the transportation of gas including pipe-type holders.

"Pipeline" means all parts of those physical facilities through which gas moves in transportation, including pipe, valves and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies.

"Pipeline facility" means new and existing pipelines, rights-of-way, and any equipment, facility, or building used in the transportation of gas or in the treatment of gas during the course of transportation.

"Secretary" means the Secretary of Transportation or any person to whom he has delegated authority in the matter concerned.

"Service line" means a distribution line that transports gas from a common source of supply to (1) a customer meter or the connection to a customer's piping, whichever is farther downstream, or (2) the connection to a customer's piping if there is no customer meter. A customer meter is the meter that measures the transfer of gas from an operator to a consumer.

"SMYS" means specified minimum yield strength is—

(1) For steel pipe manufactured in accordance with a lilsted specification, the yield strength specified as a minimum in that specification, or

(2) For steel pipe manufactured in accordance with an unknown or unlisted specification, the yield strength determined in accordance with §192.107(b).

"State" means the State of California.

"Transmission line" means a pipeline, other than a gathering line, nat—

(1) Transports gas from a gathering lilne or storage facility to a distribution center or storage facility;

(2) Operates at a hoop stress of 20 percent or more of SMYS; or

(3) Transports gas within a storage field.

"Transportation of gas" means the gathering, transmission, or distribution of gas by pipeline or the storage of gas, in or affecting interstate or foreign commerce.

"Utility" means any person, firm, or corporation engaged as a public ility in transporting natural gas, hydrocarbon gas or any mixture of ch gases for domestic, commercial, industrial, or other purposes.

92.5 Class locations

(a) Offshore is Class 1 location. The Class location onshore is deter- ined by applying the criteria set forth in this section: The class loca- n unit is an area that extends 220 yards on either side of the nterline of any continuous 1-mile length of pipeline. Except as pro- led in paragraphs (d) (2) and (f) of this section, the class location determined by the buildings in the class location unit. For the pur- ses of this section, each separate dwelling unit in a multiple dweling it building is counted as a separate building intended for human cupancy.

(b) A Class 1 location is any class location unit that has 10 or less buildings intended for human occupancy.

(c) A Class 2 location is any class location unit that has more than 10 but less than 46 buildings intended for human occupancy.

(d) A Class 3 location is—

(1) Any class location unit that has 46 or more buildings intended for human occupancy; or

(2) An area where the pipeline lies within 100 yards of any of the following:

(i) A building that is occupied by 20 or more persons during normal use.

(ii) A small, well-defined outside area that is occupied by 20 or more persons during normal use, such as a playground, recreation area, outdoor theater, or other place of public assembly.

(e) A Class 4 location is any class location unit where buildings with 4 or more stories above ground are prevalent.

(f) The boundaries of the class locations determined in accordance with paragraphs (a) through (e) of this section may be adjusted as follows:

(1) A Class 4 location ends 220 yards from the nearest building with 4 or more stories above ground.

(2) When a cluster of buildings intended for human occupancy requires a Class 3 location, the Class 3 location ends 220 yards from the nearest building in the cluster.

(3) When a cluster of buildings intended for human occupancy requires a Class 2 location, the Class 2 location ends 220 yards from the nearest building in the cluster.

§192.7 Incorporation by reference

(a) Any documents or parts thereof incorporated by reference in this part are a part of this regulation as though set out in full.

(b) The full titles for the publications incorporated by reference in this part are provided in Appendix A to this part. Numbers in parentheses indicate applicable editions. Only the latest listed edition applies except that an earlier listed edition may be followed with respect to pipe or components manufactured, designed, or installed in accordance with that earlier edition before a later edition was adopted, unless otherwise specified in Appendix A or other sections.

§192.9 Gathering lines

Each gathering line must comply with the requirements of this part applicable to transmission lines.

APPENDIX "B"

APPENDIX "C"

52-6214 (REV. 6/79)

PG&E

FOR INTRA—COMPANY USES

From Division or Department: VICE PRESIDENT - GAS OPERATIONS

File No.: 203

Re Letter of Subject: Revised Standard Practice 460-1
Class Location Determination and Maintenance

To Division or Department:

November 1, 1982

DIVISION MANAGERS:

Attached is a copy of revised Standard Practice 460-1, "Class Location Determination and Maintenance."

Major revisions to S.P. 460-1 include:

Paragraph 3(a) The definition of class locations in Paragraph 192.5 of G.O. 112-D has been incorporated in the Standard Practice.

Paragraph 3(f) Includes a more specific definition of the pipelines covered.

Paragraph 6(e) Revised reporting requirements where a class location has changed, but the pipeline is commensurate with the new class location.

Supplement

Paragraph 9(f) New paragraph which eliminates the need for an annual house count in a class one or class two area, where the pipeline is commensurate with a class three location.

Paragraph 10(c) Revised to eliminate the requirement to plot the location of buildings on "Pipeline Survey Sheets" under certain conditions.

Paragraph 10(d) Added to require plotting of small, well defined outdoor areas occuplied by 20 or more people during normal use.

Paragraph 10(j) Added to specify the limits of class locations.

SUBJECT: CLASS LOCATION DETERMINATION AND MAINTENANCE: PIPELINES OPERATING OVER 40% SMYS

PURPOSE AND POLICY

*1. To establish a class location for all pipelines having established Maximum Allowable Operating Pressures (MAOP), which produce a hoop stress in excess of 40% of Specified Minimum Yield Strength (SMYS) of the pipe material.

*2. To determine and report class location changes for all pipelines classified under Paragraph 1 on a continuing basis. Surveys will be conducted and a report filed with the California Public Utilities Commission, as required, in accordance with the current edition of General Order 112.

DEFINITIONS

3. In this Standard Practice, the following terms are used:

*a. Class Location: A geographic area classified according to the count of buildings intended for human occupancy and other characteristics that are considered when prescribing design factor, operation, maintenance, and testing of pipelines located, or to be located in the area. The class locations are determined by applying the criteria set forth in this paragraph. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. Except as provided below, the class location is determined by the number of buildings intended for human occupancy in the class location unit. For the purposes of this section, each separate dwelling unit in a multiple dwelling unit building is counted as a separate building intended for human occupancy.

**(i) Class 1 Location

A Class 1 location is any class location unit that has ten or less buildings intended for human occupancy. All areas offshore are a Class 1 location.

**(ii) Class 2 Location

A Class 2 location is any class location unit that has more than ten but less than 46 buildings intended for human occupancy.

*b. Class Location Change: A class location change occurs when the building count or the other factors described in 3a exceed the limit set for the existing class location.

c. Maximum Allowable Operating Pressure (MAOP): The maximum pressure at which a pipeline or segment of a pipeline may be operated in accordance with all of the applicable provisions of the current edition of G.O. 112.

d. Specified Minimum Yield Strength (SMYS):

(1) For steel pipe manufactured in accordance with a listed specification, the yield strength specified as a minimum in that specification; or

(2) For steel pipe manufactured in accordance with an unknown or unlisted specification, the yield strength determined in accordance with §192.107(b) of G.O. 112.

e. Design Factor: A construction specification for pipelines that limits the stress level at which it may operate. For design factors, refer to General Order 112.

*f. Pipeline: G.O. 112 defines pipeline as "all parts of those physical facilities through which gas moves in transportation, including pipe, valves, and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies." However, as used in this Standard Practice pipeline refers to numbered transmission lines, and distribution feeder mains with an MAOP which produces a hoop stress in excess of 40% of SMYS.

RECISIONS

4. Previously issued instructions, oral or written, which may be contrary to this Standard Practice.

REFERENCES

*5. G.O. 112, issued by California Public Utilities Commission. As used herein G.O. 112 shall refer to General Order 112-D and any subsequent revisions of General Order 112.

S.P. 463-7, "Pipeline and Mains History File, Establishing and Maintaining."

S.P. 463-8, "Maximum Operating Pressures of Pipelines and Mains Operating at or above 20% of SMYS."

PROCEDURAL DETAILS

CLASS LOCATION SURVEYS

CLASS LOCATION SURVEYS

*9. Except as outlined in 9(f), all pipelines with an MAOP of over 40% of SMYS shall be surveyed for possible class location changes at least annually. Areas where construction activity exists and where a class location change would require testing or replacement of facilities, should be under more frequent surveillance. The following conditions shall guide these surveys and the required action when a class location change has occurred:

*a. Pipeline constructed to a design factor of over 60% SMYS and up to 72% SMYS is permitted only in class 1 location. It shall be reported as "out of class location" if the building count and area description are found to correspond to a class 2, 3, or 4 location. The exception to this requirement is where a section of pipe with an MAOP of over 60% of its SMYS has been tested to at least 90% of its SMYS for a period of not less than eight hours. This section can be operated at up to 72% of SMYS in a class 2 location.

*b. Pipeline constructed to a design factor of over 50% SMYS and up to 60% SMYS is permitted only in a class 1 or 2 location. It shall be reported as "out of class location" if the building count and area description are found to correspond to a class 3 or 4 location. The exception to this requirement is where a section of pipe with an MAOP of over 50% and up to 60% of its SMYS has been tested to at least 90% of its SMYS for a period of not less than eight hours. This section can then be operated at up to 60% of SMYS in a class 3 location.

*c. Pipeline constructed to a design factor of over 40% SMYS and up to 50% SMYS is permitted only in a class 1, 2, or 3 location. It shall be reported as "out of class location" if the area description is found to correspond to a class 4 location. The exception to this requirement is where a section of pipe with an MAOP of over 40% and up to 50% of its SMYS has been tested to at least 90% of its SMYS for a period of not less than eight hours. This section can then be operated at up to 50% of SMYS in a class 4 location.

*d. Pipeline constructed and tested to a design factor of 40% of SMYS or less is permissible in all locations and need not be surveyed for class location changes.

* Paragraph Revised
** Paragraph Added

*e. It is important that a class location change be detected at the earliest possible time so that action can be taken where necessary to bring the pipeline into compliance. Paragraph 192.611 (e)(2) of G.O. 112 requires that action to bring the pipeline into compliance must be completed within eighteen months of the time the change occurs. Where a new building causes a class location change, the change would occur when the gas and/or electricity is connected, or when the building is occupied, whichever occurs first.

**f. When a pipeline in a Class 1 or Class 2 location has an MAOP which produces a hoop stress of 50% or less of SMYS and is patrolled, leak surveyed, and otherwise maintained in accordance with the requirements for a Class 3 location, it will not be necessary to perform the annual house count survey to determine class location because the pipeline is already qualified for the higher class location. However, the pipeline marking requirements for a Class 1 or Class 2 location must be met, and the line must be operated and maintained so as to retain any potential which may exist for a future increase in MAOP.

10. The results of each survey shall be recorded on "Pipeline Survey Sheets" and shall include the following:

a. Line numbers or designations.

b. Pipeline stations or locations.

*c. Except as noted in (1) and (2) below, the location of each established building intended for human occupancy within a quarter mile wide corridor centered on the pipeline or main (220 yards each side of the pipeline).

(1) Once a Class 3 location has been established by a cluster of 46 or more buildings intended for human occupancy, it will only be necessary to plot additional new buildings if they are adjacent to the limits of the Class 3 area where they could cause an extension of the limits.

(2) It will not be necessary to plot the location of the buildings in a Class 1 or Class 2 area for a pipeline with an MAOP which produces a stress level of 50% of SMYS or less, and which is maintained in accordance with the requirements for a Class 3 location, as outlined in paragraph 9(f).

**d. The location of small well defined outdoor areas which are occupied by twenty or more people during normal use, which are within 100 yards of the pipeline.

e. Descriptive notes that indicate the character of the built-up area.

f. Location of other permanent references, such as streets, roads, rivers, railroads, bridges, etc., that cross or are within the survey strip with respect to the built-up area and the pipeline or main.

g. Suggested class location designation.

*h. Any other information pertinent to class location determination.

*i. When determining the number of buildings intended for human occupancy in any continuous 1-mile length of pipeline, the sliding mile concept must be used. The 1-mile long segment must be positioned to obtain the maximum number of buildings in the segment. (NOTE: Dividing the pipeline into fixed 1-mile segments and counting the buildings in each segment will frequently result in a population density count which is less than that obtained using the sliding mile. Therefore, it is necessary to use the sliding mile when determining a class location.)

**j. Once a building count establishes a higher class location, the limits of the higher class location are established using the factors outlined in paragraph 3(a)(v). Therefore, the resulting higher class location may be less than one mile in length.

*11. Guidelines (supplementing those included in G.O. 112) for determining Class 1, 2, and 3 locations include the following:

a. Any structure is to be counted as a building intended for human occupancy if either a gas or an electric service is connected to it, even though the building may be uninhabited at the time of the survey. This applies to barns, homestead shacks, and other structures which have visible evidence of usage as a residence.

b. Count as one building intended for human occupancy: Each unit in a motel or hotel, each unit in an apartment house, and each space in a trailer park that is occupied or connected to gas or electric service.

c. Note presence of theaters, hotels, hospitals, and other buildings and places of public assembly, which would be occupied by 20 or more persons during normal use. If within 100 yards of pipeline, show actual dimensions from pipeline and length of building or small, well-defined outside area that is occupied by 20 or more persons during normal use.

* Paragraph Revised
** Paragraph Added

REPORTING CHANGES

*12. Where a change in class location has occurred (see Paragraph 3b) and the pipeline is not commensurate with the new class location, it shall be reported by letter to the Manager, Gas System Design, as soon as it is detected. Written reports shall include:

a. Detailed information supplied on Form #75-160, Report of New Construction Along Pipeline (Exhibit A).

*b. The physical condition of the pipeline or main to the extent that can be ascertained from available records.

*c. A summary of the operating and maintenance history of the pipeline or main.

*d. The extent of the area affected by the revised building count or development and physical barriers or other factors, which may limit the further expansion of the more densely populated area.

13. An annual summary of these letter reports on class location changes shall be submitted to the Manager of Gas System Design Department by January 15. The summary shall indicate what action was taken to comply with General Office review recommendations.

GENERAL OFFICE REVIEW

*14. The Manager, Gas System Design, shall review class location changes as they are reported and shall confirm the existing MAOP, and in conjunction with other departments, recommend the necessary action that Divisions and Pipe Line Operations Department should take to bring facilities into compliance with the existing MAOP rating or revise the MAOP (see Standard Practice 463-8).

DISPOSITION AND RETENTION OF RECORDS

15. "Pipeline Survey" sheets shall be kept current at all times by Divisions and Pipe Line Operations Department. Annually, by January 15, new or revised survey sheets, along with corresponding operating maps for orientation, shall be forwarded to the Manager of Gas System Design Department. Survey sheets shall accompany the Summary Report described in Paragraph 12 (see Paragraph 8, Standard Practice 463-7).

16. Requests for "Pipeline Survey" sheets for new or upgraded pipelines should be made to the supervisor, Maps and Records, Gas System Planning Department.

* Paragraph Revised
** Paragraph Added

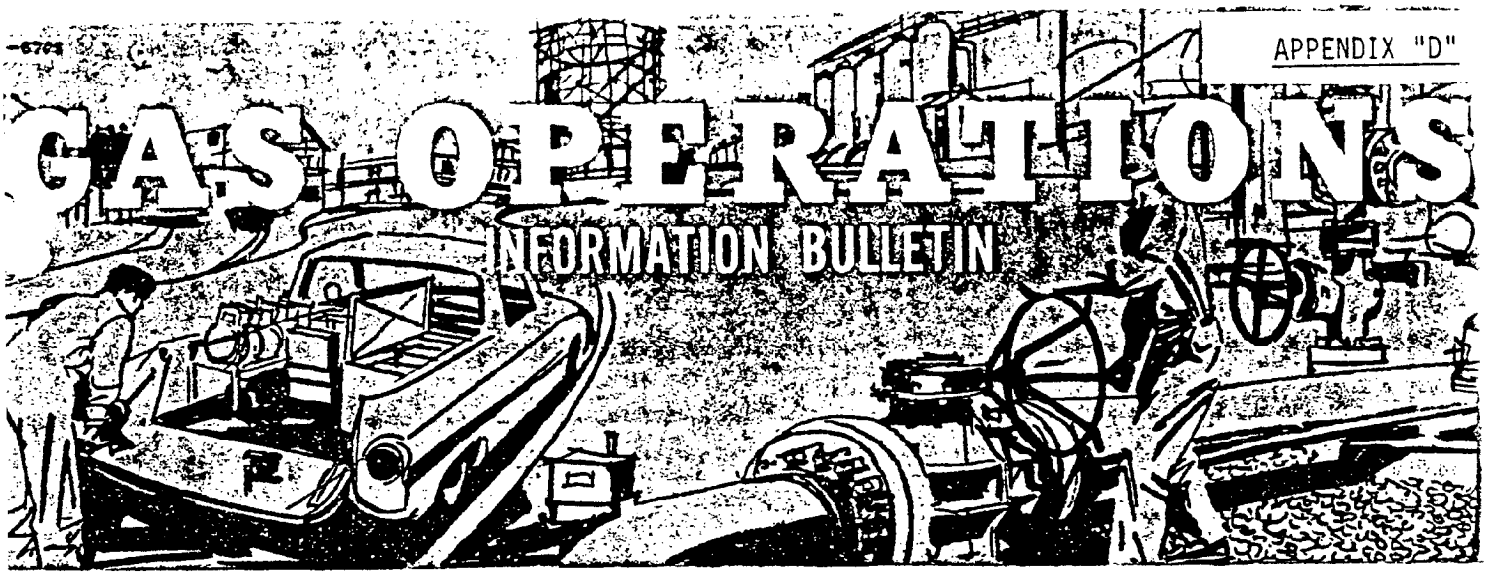
SUBJECT:
CLASS LOCATION DETERMINATION AND MAINTENANCE: PIPELINES OPERATING OVER 40% SMYS

DISTRIBUTION: Division Managers
Pipe Line Operations Department
Division Gas Superintendents
Division Administrative Analysts or Equivalent
District Managers
District Gas Superintendents or Equivalent
Director, Procedures Analysis

Additional copies of this Standard Practice and the Supplement may be obtained from Gas Operations, 77 Beale Street, San Francisco, (PGandE Extension 22-1604).

* Paragraph Revised

APPENDIX "D"



NUMBER 30 March 1, 1975

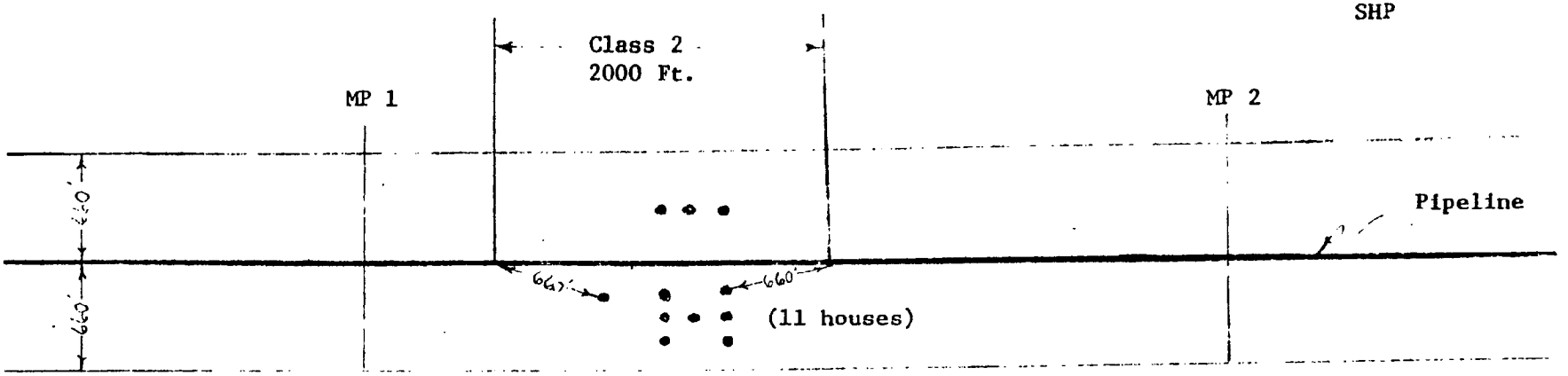
IDENTIFYING CLASS LOCATIONS

Section 192.5 of G.O. 112-C lists the criteria for determining class locations on pipelines due to population density. Recently, several errors were discovered on Pipeline Survey Sheets which indicated that the "sliding mile" concept in Section 192.5 is not being interpreted correctly. As stated in Section 192.5, the basis for determining a class location is the number of dwellings within 200 yards of the pipeline in any continuous one mile length of pipeline. For example, if there are more than ten buildings intended for human occupation within any one mile section of pipeline, then this is a Class 2 location. The mile must also be adjusted along the pipeline to incorporate the maximum number of buildings. However, the entire mile may not be Class 2. The boundaries of the class location, as stated in Section 192.5(f), end 220 yards from the end buildings in the cluster. This same rule applies to clusters of buildings causing a Class 3 or 4 location. (See attached examples). The exception to this 220 yard requirement is where there is a building or a small well-defined outside area, normally occupied by twenty or more people within 100 yards of the pipeline, which results in a Class 3 area. Here the Class 3 location covers only the area within a 100 yard radius of the building or outside area.

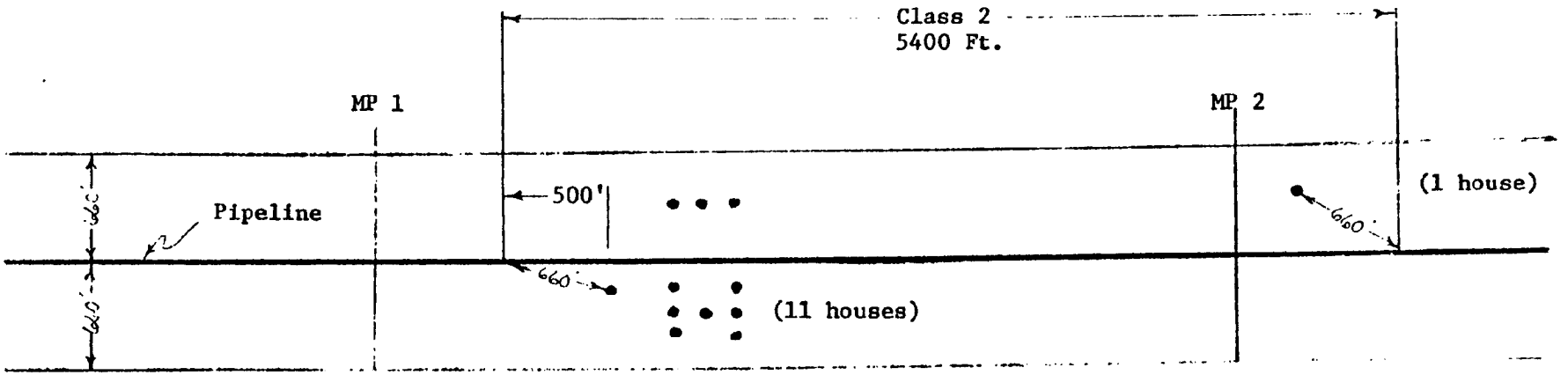
The responsibility for maintaining and correcting the pipeline survey sheets rests with the Divisions. These sheets are used throughout the Company to supply a variety of information. Some of this information is filed with the California Public Utilities Commission. Other information is used to evaluate alternatives for improving the system. Errors on these sheets can be very costly to the Company. Please review your pipeline survey sheets to make certain that all class location boundaries are correct.

S. H. Phillips
Gas System Design
General Office

* * *

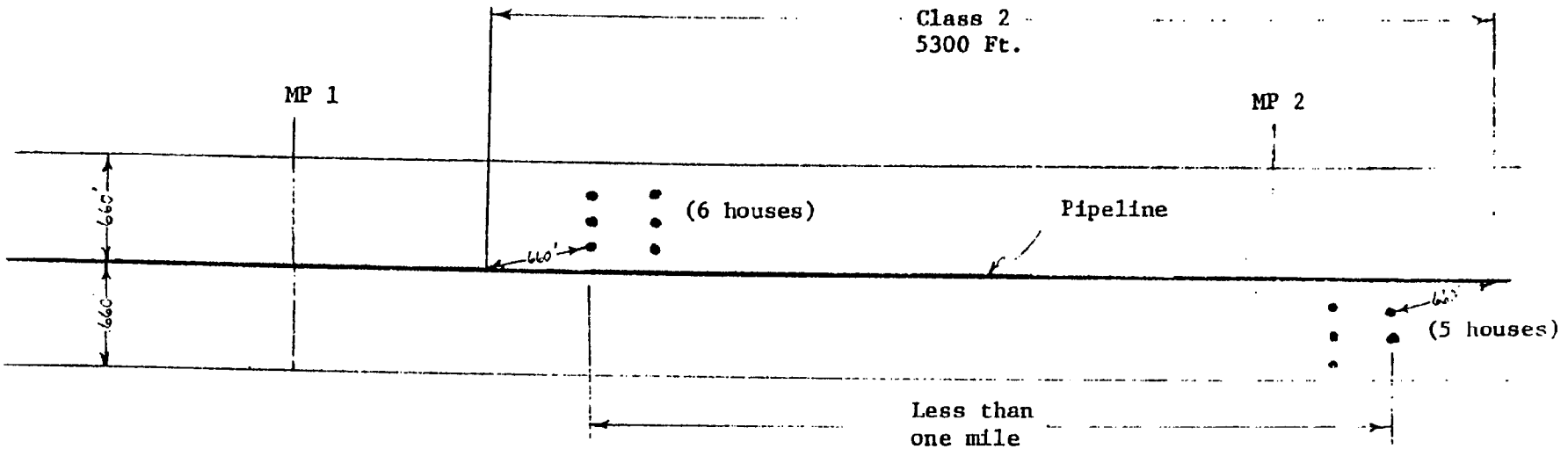


EXAMPLE 1: Eleven or more houses in a small cluster. Class 2 location extends only 660' beyond first and last house in cluster.

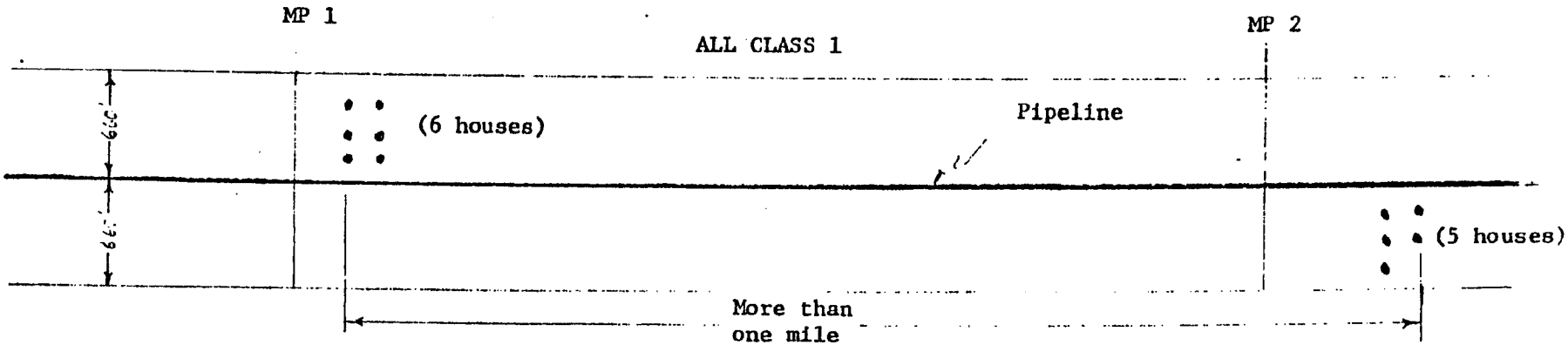


EXAMPLE 2: The addition of one house can greatly increase the length of the Class 2 location.

• - Dwelling



EXAMPLE 3: If house count were based on individual one mile increments, without use of sliding mile, this would be called a Class 1 location. This is not correct. Mile must be adjusted to give maximum number of houses in any one mile section. By adjusting position of mile there would be 11 houses in this section. It is therefore a Class 2, with limits as shown.



EXAMPLE 4: Sliding mile concept--these examples are to show that the sliding mile has no relation to the pipeline mileposts.

- Dwelling

APPENDIX "E"

+ 62-5218 (REV 6/79)

PG and E

FOR INTRA—COMPANY USES

From Division or Department: GAS SYSTEM PLANNING

FILE No.: 522

RE LETTER OF SUBJECT: Pipeline Survey

To Division or Department:

October 21, 1982

DIVISION GAS SUPERINTENDENT:

A drafting modification should be made to all existing Pipeline Survey sheets, Drawing 385121, prior to the next formal update of January 15, 1983.

The plan view shows the gas line with a lightweight line in parallel on both sides depicting the 220-yard population density boundary. When the gas line changes direction, these lines have been historically squared off, similar to the gas line.

Please modify the outer boundary line to an "arc distance" and maintain the uniform 220-yard measurement when the gas line changes direction on all existing drawings. This will eliminate the small triangular shape on the outside of an angle and will more correctly show the true area of population density and eliminate the possibility of including dwellings which could incorrectly alter the class location of the gas line.

All future drawings created by the Design Drafting Department shall include this modification.

I. C. ODOM

GBBrown(3208):al

cc: HMMcKinley
CJTateosian
[redacted]

(2) If the pipe is not tensile tested as provided in subparagraph (1) this paragraph—24,000 p.s.i.

92.109 Nominal wall thickness (t) for steel pipe

(a) If the nominal wall thickness for steel pipe is not known, it is termined by measuring the thickness of each piece of pipe at quar- r points on one end.

(b) However, if the pipe is of uniform grade, size, and thickness and ere are more than 10 lengths, only 10 percent of the individual ngths, but not less than 10 lengths, need be measured. The thickness the lengths that are not measured must be verified by applying a uge set to the minimum thickness found by the measurement. The minal wall thickness to be used in the design formula in § 192.105 is e next wall thickness found in commercial specifications that is be- w the average of all the measurements taken. However, the nominal all thickness used may not be more than 1.14 times the smallest easurement taken on pipe less than 20 inches in outside diameter, r more than 1.11 times the smallest measurement taken on pipe 20 ches or more in outside diameter.

92.111 Design factor (F) for steel pipe

When classifying locations for the purpose of determining the design ctor and the test requirements that should be applied, due considera- n shall be given to the possibility of future development of the area. at the time of planning a new pipeline this future development pears likely to be sufficient to change the location class, this shall be ken into consideration in design and testing of the proposed pipeline. addition, the following shall apply:

(a) Except as otherwise provided in paragraphs (b), (c), (d) and) of this section, the design factor to be used in the design formula § 192.105 as determined in accordance with the following table:

Class Location	*Design Factor (F)*
1	0.72
2	0.60
3	0.50
4	0.40

(b) A design factor of 0.60 or less must be used in the design formula §192.105 for steel pipe in Class 1 locations that:

(1) Crosses the right-of-way of an unimproved public road, without a casing;

(2) Crosses without a casing, or makes a parallel encroachment on, the right-of-way of either a hard-surfaced road, a highway, a public street, or a railroad;

(3) Is supported by a vehicular, pedestrian, railroad, or pipeline bridge; or

(4) Is used in a fabricated assembly (including separators, mainline

valve assemblies, cross-connections, and river crossing headers) or is used within five pipe diameters in any direction from the last fitting of a fabricated assembly, other than a transition piece or an elbow used in place of a pipe bend which is not associated with a fabricated assembly.

(c) For Class 2 locations, a design factor of 0.50, or less, must be used in the design formula in §192.105 for uncased steel pipe that crosses the right-of-way of a hard-surfaced road, a highway, a public street, or a railroad.

(d) For Class 1 and Class 2 locations, a design factor of 0.50, or less, must be used in the design formula in Sec. 192.105 for—

(1) Steel pipe in a compressor station, regulating station, or measuring station; and

(2) Steel pipe, including a pipe riser, on a platform located offshore or in inland navigable waters.

(e) Within incorporated areas of cities a design factor of 0.50 or less must be used.

§192.113 Longitudinal joint factor (E) for steel pipe

The longitudinal joint factor to be used in the design formula in §192.105 is determined in accordance with the following table:

Specification	*Pipe Class*	*Longitudinal Joint Factor (E)*
ASTM A 53	Seamless	1.00
	Electric Resistance Welded	1.00
	Furnace Butt Welded	.60
ASTM A 106	Seamless	1.00
ASTM A 134	Electric Fusion Arc Welded	.80
ASTM A 135	Electric Resistance Welded	1.00
ASTM A 139	Electric Fusion Welded	.80
ASTM A 211	Spiral Welded Steel Pipe	.80
ASTM A 333	Seamless	1.00
	Electric Resistance Welded	1.00
ASTM A 381	Double Submerged Arc Welded	1.00
ASTM A 671	Electric Fusion Welded	1.00
ASTM A 672	Electric Fusion Welded	1.00
ASTM A 691	Electric Fusion Welded	1.00
API 5 L	Seamless	1.00
	Electric Resistance Welded	1.00
	Electric Flash Welded	1.00
	Submerged Arc Welded	1.00
	Furnace Butt Welded	.60
	Furnace Lap-Welded	.80
API 5 LX	Seamless	1.00
	Electric Resistance	1.00
	Electric Flash Welded	1.00
	Submerged Arc Welded	1.00

APPENDIX "G"

62-6218 (REV. 8-70)

PG&E

FOR INTRA—COMPANY USES

DIVISION OR DEPARTMENT: VICE PRESIDENT - GAS OPERATIONS
FILE NO.: 460
RE LETTER OF
SUBJECT: Standard Practice 460-1
Location Class Changes: Pipelines

July 1, 1975

DIVISION MANAGERS:
GAS OPERATIONS MANAGERS:
MANAGER, GAS CONSTRUCTION:
MANAGER, PIPE LINE OPERATIONS:
DIVISION GAS SUPERINTENDENTS:
DISTRICT MANAGERS:
DISTRICT GAS SUPERINTENDENTS:
DIVISION ADMINISTRATIVE ANALYST OR EQUIVALENT:
DIRECTOR, PROCEDURES AND ORGANIZATION:

The attached copy of Standard Practice 460-1, including the Supplement - Procedural Details, dated June 2, 1975, replaces page 1 dated November 15, 1971, and pages 2 and 3 dated August 1, 1971, of Standard Practice 460-1, and the Supplement - Procedural Details dated August 1. 1971.

It should be noted that a new Appendix A, dated June 2, 1975, has been added to facilitate reporting of class location changes.

Additional copies of this Standard Practice may be obtained from Gas Operations by calling Extension 1604.

[redacted]

[redacted]
Attachment

62-7501 REV. 4-68

PACIFIC GAS AND ELECTRIC COMPANY
STANDARD PRACTICE

STANDARD PRACTICE NO. 460-1

EXECUTIVE OFFICE OR DIVISION GAS OPERATIONS

PAGE NO. 1 EFFECTIVE 7-1-75

ISSUING DEPARTMENT GAS SYSTEM DESIGN

REPLACING PAGE NO 1 EFFECTIVE 11-15-71

SUBJECT:

LOCATION CLASS CHANGES: PIPELINES

PURPOSE AND POLICY

*1. To establish uniform location classifications for all pipelines having established Maximum Allowable Operating Pressures (MAOP), which produce a hoop stress in excess of 40% of Specified Minimum Yield Strength (SMYS) of the pipe material.

*2. To determine and report location class changes for all pipelines classified under Paragraph 1 on a continuing basis. Surveys will be conducted and a report filed with the California Public Utilities Commission, as required, in accordance with its General Order 112.

DEFINITIONS

3. In this Standard Practice, the following terms are used:

*a. Location Class: A geographic area classified according to its approximate population density and its other characteristics that are considered when prescribing design factors, maintenance and testing of pipelines to be located in the area. For Classification of Locations (1, 2, 3, and 4), refer to General Order 112.

b. Location Class Change: A location class change exists when the density index or proximity factor described in 9 exceeds the limit set by the established design factor and its corresponding MAOP.

*c. Maximum Allowable Operating Pressure (MAOP): The maximum pressure at which a pipeline or segment of a pipeline may be operated in accordance with all of the applicable provisons of the current edition of G.O. 112.

d. Specified Minimum Yield Strength (SMYS):

(1) For steel pipe manufactured in accordance with a listed specification, the yield strength specified as a minimum in that specification; or

(2) For steel pipe manufactured in accordance with an unknown or unlisted specification, the yield strength determined in accordance with §192.107(b) of General Order 112.

*e. Design Factor: A construction specification for pipelines that fixes the stress levels. For Design Factors, refer to General Order 112.

* Paragraph Revised
** Paragraph Added

(SEE OVER)

*f. Pipeline: All parts of those physical facilities through which gas moves in transportation, including pipe, valves, and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies (G.O. 112).

**As used in this Standard Practice pipeline refers to numbered transmission lines, and distribution feeder mains operating at a hoop stress of 20% or more of SMYS.

RECISIONS

4. Previously issued instructions, oral or written, which may be contrary to this Standard Practice.

REFERENCES

5. G.O. 112, issued by California Public Utilities Commission. As used herein G.O. 112 shall refer to General Order 112-C and any subsequent revisions of General Order 112.
S.P. 463-7, "Pipeline and Mains History File, Establishing and Maintaining."
S.P. 463-8, "Maximum Operating Pressures of Pipelines and Mains Operating at or Above 20% of SMYS."

RESPONSIBILITY

*6. The Division or Pipe Line Operations Supervisor, who directs the maintenance and operation of the facilities, shall be responsible for the continuing surveillance of the facilities required by §192.613 of G.O. 112, and for the annual location class survey. Performance shall include:

a. Preparing records and maps indicating present location class.

*b Setting up procedures for continuing observation of all factors relevant to the determination of location class.

**c. Analyzing the effect that construction work within 220 yards of the pipeline would have on the location class.

**d. Making an immediate report to the Manager of Gas System Design when it appears that construction of a new building or facility has or will cause a location class change and where the pipeline does not appear to be commensurate with the new location class.

* Paragraph Revised
** Paragraph Added

**e. Where the pipeline is commensurate with the new location class, the new location class shall be indicated on the "Pipeline Survey Sheet."

7. The Manager of Gas System Design shall be responsible for:

a. Reviewing the results of location class surveys.

*b. Confirming the location class proposed by the Division or PLO for each pipeline.

*c. Recommending the action to be taken to confirm, reconfirm, or change the MAOP of each section of pipeline affected.

PROCEDURAL DETAILS

8. Procedural details for location class surveys appear in the Supplement to this Standard Practice.

APPROVED: E. F. SIBLEY
Vice President - Gas Operations

DISTRIBUTION: Division Managers
Pipe Line Operations Department
Division Gas Superintendents
Division Administrative Analysts or Equivalent
District Managers
District Gas Superintendents or Equivalent
Director, Procedures Analysis

Additional copies of this Standard Practice and the Supplement may be obtained from Gas Operations, 77 Beale Street, San Francisco (PGandE Extension 1604).

* Paragraph Revised
** Paragraph Added

62-7501 REV. 4-6 7444f

PACIFIC GAS AND ELECTRIC COMPANY
STANDARD PRACTICE

STANDARD PRACTICE NO. 463.7

EXECUTIVE OFFICE OR DIVISION GAS OPERATIONS

PAGE NO. 1 EFFECTIVE 12-15-69

ISSUING DEPARTMENT GAS DISTRIBUTION

REPLACING PAGE NO. ____ EFFECTIVE 12-1-69

SUBJECT:

PIPELINE HISTORY FILE, ESTABLISHING AND MAINTAINING

PURPOSE AND POLICY

1. To provide a current and uniform history record for pipelines (and mains) that have a Maximum Allowable Operating Pressure (MAOP) resulting in a hoop stress equal to or greater than 20% of the Specified Minimum Yield Strength (SMYS).

REFERENCES

2. Gas Standard A-34, "Design and Test Requirements for Gas Piping Systems"
S.P. 460.21-4, "Gas Leakage, Routine Inspection"
S.P. 412-1, "External Corrosion Control of Buried Gas Facilities"
S.P. 460-1, "Location Class Changes"
S.P. 460.2-1, "Patrolling, Pipelines and Mains"
S.P. 460.2-2, "Physical Inspection, Pipelines, Mains and Services"
S.P. 462-1, "Removal and Control of Liquids, Pipelines and Mains"

RESPONSIBILITY

3. The responsibility for establishing and maintaining a pipeline (and main) history file shall rest with the supervisors in the Divisions and in the Pipe Line Operations Department who direct the maintenance and operation of these facilities. Performance includes developing the initial file, gathering all pertinent new data that affect the physical elements, maintaining an up-to-date history file, and developing reports on the pipeline and main physical elements.

SUPPLEMENT

4. Procedural details for developing and maintaining a pipeline and main history file appear in the Supplement to this Standard Practice.

APPROVED: E. H. Fisher
Vice President - Gas Operations

DISTRIBUTION:
Division Managers
Division Gas Supts.
District Gas Supts.
District Managers
Division Admin. Analyst or Equal
District Gas Supts. or Equal
Director, Procedures Analysis
Pipe Line Operations Dept.

Additional copies of this Standard Practice and Supplement may be obtained from Gas Operations, 245 Market Street, San Francisco, PG&E ext. 9-1604.

PROCEDURAL DETAILS

HISTORY FILE

5. The pipeline or main history file for those facilities whose MAOP equals or exceeds 20% of SMYS shall include the various reports relative to inspection and maintenance as required by the applicable portions of those Standard Practices listed under paragraph 2, "References", of this Standard Practice.

6. The pipeline or main history file shall include:

   a. Pipeline or main number or designation (include location by mile point and terminal description).

   b. Date of original installation and dates of subsequent changes requiring work orders or GM estimates (show GM and Work Order number).

   c. Design and construction data covering the original installation and subsequent revisions requiring work orders or GM estimates.

   d. Maximum Allowable Operating Pressure (MAOP) of each section.

   e. Type of protective coating originally or subsequently installed and the existing condition of the coating.

   f. Cathodic protection installations showing locations, ratings, and installation dates.

   g. Record of pipeline or main inspections.

   h. Record of pipeline or main leakage surveys and repairs.

   i. Record of location class surveys.

   j. Record of pipeline or main sections where the hoop stress corresponding to the established MAOP exceeds that permitted for new pipelines or mains in the particular class location.

   k. Initial or most recent strength test data.

   l. Special studies and surveys made as a result of unusual operating or maintenance conditions, such as earthquakes, slides, floods, failures, leakage, internal or external corrosion or substantial changes in cathodic protection requirements.

   m. Annual summary of existing condition of pipelines and mains based upon available records as per Exhibit A.

   n. Specifications for materials and equipment, installation, testing, and fabrication shall be included or cross-referenced to this file.

(over)

REPORTING

7. Eacn Division or department shall submit to the Manager of Gas System Design a completed initial copy of the 8 letter-size form titled "Pipeline Survey" (Exhibit B) for each new pipeline or main, or existing pipeline or main newly uprated whose MAOP equals or exceeds 20% SMYS, covered by this Standard Practice. A copy of this report is also to be maintained in the Division history file.

8. Annually by January 15th, each Division or department shall submit updated "Pipeline Survey" sheets (Exhibit B). Changes in the survey sheets are to be documented in the following two ways and are to be dated and initialed by the engineer responsible for this activity.

   (1) Immediately above the "Table of Changes" in the spaces provided, print the wording "Brought to Date" and show month and year in which the last change was made.

   (2) All entries on the survey sheets designating changes during the current reporting year are to be "back-circled" so that both the vellums and the updated prints can be quickly reviewed for the latest changes. Changes shall be submitted annually prior to January 15th to the Manager of Gas System Design Department.

9. Each Division shall submit annually, before February 1, to the Manager of Gas Distribution, a completed copy of Form 75-352 (Exhibit A) "Annual Report for Pipeline and Mains Operating at or Over 20% SMYS" for each pipeline and main covered by this Standard Practice.

RECORDS

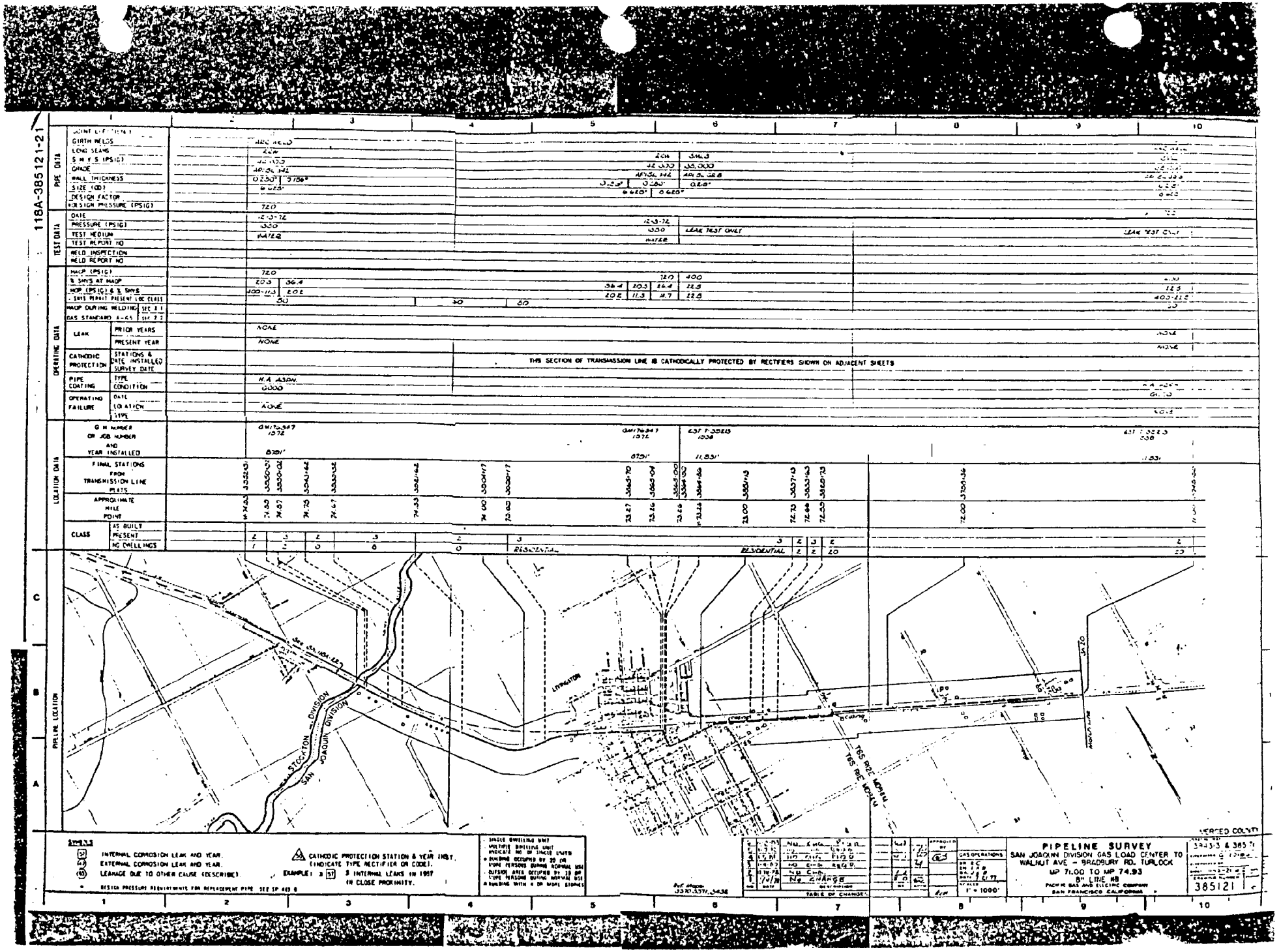
10. History records for numbered transmission lines shall be filed by line number, with all pertinent inclusions of data shown in paragraphs 5 and 6, indexed for ready reference, and cross-referenced to other permanent files, such as GM or Work Order files.

11. History recrods for gas distribution mains in this stress level category may be filed in a manner commensurate with established Division history procedure for all other distribution mains.

12. The complete pipeline and main history files shall be maintained up to date by the Division or department for the life of the operating facility.

ATTACHMENTS: Exhibit A - Form 75-352, "Annual Report for Pipeline and Mains Operating at or Over 20% SMYS"

Exhibit B - Photostatic reduction of 8 letter-size form "Pipeline Survey"



62-7501 REV 4-63

PACIFIC GAS AND ELECTRIC COMPANY
STANDARD PRACTICE

STANDARD PRACTICE NO. 463-8

EXECUTIVE OFFICE OR DIVISION GAS OPERATIONS

PAGE NO. 1 EFFECTIVE 4/15/83

ISSUING DEPARTMENT GAS SYSTEM DESIGN

REPLACING PAGE NO 1 EFFECTIVE 4/9/79

SUBJECT: MAXIMUM OPERATING PRESSURES OF PIPELINES AND MAINS OPERATING AT OR OVER 20% OF SMYS

PURPOSE AND POLICY

*1. To establish a uniform procedure for identifying, reviewing and revising Design Pressure (DP), Future Design Pressure (FDP), Maximum Allowable Operating Pressures (MAOP), and Maximum Operating Pressure (MOP) (PG&E) for all pipelines, mains and holders operating at or above 20% of specified minimum yield strength (SMYS) of the pipe material.

RECISIONS

2. All previous instructions, oral or written, that may be contrary to this Standard Practice.

RESPONSIBILITY

*3. Division Gas Superintendents and the Manager of Pipe Line Operations shall be responsible for the performance required by this Standard Practice. Performance will include reviews of design procedures for the lines and the records generated by the referenced Standard Practices any time a change in MOP, MAOP, FDP, or DP is contemplated.

*4. The Manager of Gas System Design will establish and confirm changes to MOP (PG&E), MAOP, FDP and DP.

REFERENCES

*5. Drawing 086868 "Maximum Operating Pressures of Pipelines and Mains Operating at or Over 20% of SMYS"
Current edition of California Public Utilities G.O. 112
S.P. 412-1, "External Corrosion Control of Buried Gas Facilities"
S.P. 460-1, "Location Class Changes: Pipelines and Mains"
S.P. 460.2-2, "Physical Inspection: Pipelines, Mains and Services"
S.P. 460-21-4, "Periodic Leakage Surveys of Gas Transmission and Distribution Facilities"
S.P. 463.7, "Pipeline History File, Establishing and Maintaining"

DEFINITIONS

*6. Design Pressure (DP) is the maximum pressure permitted by the design sections of the current edition of G.O. 112, applicable to the materials and locations involved. In some cases the DP has been established as the maximum pressure for the minimum wall thickness required under the current edition of G.O. 112 for Class 3 construction for line size listed (See double asterisk entries in Drawing 086868).

* Paragraph Revised

SUBJECT: MAXIMUM OPERATING PRESSURES OF PIPELINES AND MAINS OPERATING AT OR OVER 20% OF SMYS

DEFINITIONS

Future Design Pressure (FDP) is the Design Pressure to be used for future additions to existing facilities, as shown on the latest revision of Drawing 086868.

Maximum Allowable Operating Pressure (MAOP) is the maximum pressure at which a pipeline or section of a pipeline may be operated in accordance with all the applicable provisions of the current edition of G.O. 112.

Maximum Operating Pressure (MOP) (PG&E) is the maximum pressure at which a gas system may be operated as specified by the Manager of the Gas System Design Department.

Specified Minimum Yield Strength (SMYS) is the minimum yield strength in psi prescribed by the specification under which pipe is purchased from the manufacturer or as specified in Section 192.107 of the current edition of G.O. 112.

APPLICATION

7. Procedural details appear in the addenda to this Standard Practice.

RECORD

8. Pressure Recording Charts and Operating Sheets (record of hourly data) which document the MAOP and/or MOP (PG&E) of pipelines and mains operating at or above 20% of SMYS shall be kept current by the Division and/or Pipe Line Operations Department assigned with the responsibility of maintenance and operation of facility.

SUPPLEMENT

*9. The Supplement establishes the procedure for designating the MOP (PG&E), MAOP, FDP, and DP for each facility.

APPROVED BY: Howard M. McKinley
Vice President - Gas Operations

DISTRIBUTION:
Division Managers
Division Gas Superintendents
District Gas Superintendents
District Managers
Division Admin. Analyst or Equal
Director, Procedures Analysis
Pipe Line Operations
Manager, General Construction

Additional copies of this Standard Practice may be obtained from Gas Operations, 77 Beale Street, San Francisco, (PG&E Ext. 22-1604).

PROCEDURAL DETAILS

10. Piping systems shown on Drawing 086868 are not to be operated in excess of the MOP (PG&E). This limitation has been determined by the lowest of the following:

    a) The test pressure or the rated working pressure of the pipe, valves, and fittings in the line.

    b) The MAOP of the line as established in accordance with the provisions of the current edition of G.O. 112.

    c) The MAOP of another pipeline system connected to the first system where there is no pressure control complete with over pressure protection between the two systems.

    d) Operating conditions that limit pressure.

*11. The MOP (PG&E) may equal, but shall never exceed the MAOP or the DP. In some cases where the MAOP is less than the FDP, it is anticipated that the MAOP may be increased at some future time, in accordance with Subpart K (Uprating) of the current edition of G.O. 112. For this reason, all new additions to an existing system shall have a design pressure at least equal to the future design pressure listed in Drawing 086868. Some sections of an existing system may not qualify for the established design pressure and would require reconstruction, testing, or replacement prior to increasing the MAOP. See Paragraph 6.

12. New or replacement sections of line should be tested and qualified for the ultimate MAOP of the system, even though the MOP (PG&E) of the system is limited by the MAOP of other facilities connected to it.

13. Any changes contemplated in the MOP (PG&E) or the MAOP of a line operating at or over 20% of SMYS shall be submitted by the Division Gas Superintendent or the Manager of Pipe Line Operations, in letter form, to the Manager of Gas System Design, for review and approval. A copy should be sent to the Manager of Gas System Planning.

*14. The MOP (PG&E), MAOP, FDP and DP of all newly installed pipelines and mains operating at or above 20% of SMYS, along with those in Drawing 086868 shall be confirmed annually by letter on or before February 1, by the Division Gas Superintendents and the Manager of Pipe Line Operations to the Manager of Gas System Design Department, for each facility within the scope of this Standard Practice.

*15. The Manager of Gas System Design Department will issue and distribute an updated copy of Drawing 086868 annually.

*Paragraph Revised
**Paragraph Added

PURPOSE

This drawing lists the operating limitations and design requirements for all pipelines, mains and holders operating at or above 20% of the specified minimum yield strength (SMYS) of the pipe.

See S.P. 463-8 for detailed requirements for establishing and maintaining the MAOP of gas facilities.

DEFINITIONS

Maximum Allowable Operating Pressure (MAOP) is the maximum pressure at which a pipeline or section of a pipeline may be operated in accordance with all the applicable provisions of the current edition of G.O. 112.

Maximum Operating Pressure (MOP) (PG&E) is the maximum pressure at which a gas system may be operated as specified by the Manager of the Gas System Design Department.

Design Pressure (DP) is the maximum pressure permitted by the design sections of the current edition of G.O. 112, applicable to the materials and locations involved. In some cases, the DP has been established as the maximum pressure for the minimum wall thickness required under the current edition of G.O. 112 for construction in Class 3 location for line size listed (see double asterisk entries).

Future Design Pressure (FDP) is the Design Pressure (DP) to be used for future additions to existing facilities.

CHANGES IN THE MAOP REQUIRE CPUC NOTIFICATION

General Order 112 (Subpart C) requires the Company to notify the CPUC 30 days prior to the uprating of any system operating, or to be operated, at 20 percent SMYS or greater.

The CPUC must be advised within 30 days after the lowering of the MAOP of a line operating at 20 percent or more of SMYS.

Any changes contemplated in the MOP (PG&E) or the MAOP of a line operating at or over 20% of SMYS shall be submitted by the Division Gas Superintendent or the Manager of Pipe Line Operations, in letter form, to the Manager of Gas System Design, for review and approval.

APPROVED BY									
		3	[illegible]	Updated		KAH		[illegible]	
		2	4/26/82	Updated		KAFL		PAL	CJT
		1	4/1/81	Updated		DES		PAL	CJT
	CJT	REV.	DATE	DESCRIPTION	GM	DWN.	CHKD.	SUPV.	APVD.

GM		B/M	
SUPV.	PIPELINE - DATA SHEET MAOP OF LINES OPERATING AT OR OVER 20% SMYS TYPICAL	DWG. LIST	
DSGN.		SUPSDS	
DWN.		SUPSD BY	
CHKD.		SHEET NO. 1 of 26 SHEETS	
O.K.			REV.
DATE 4/9/79 / SCALE	PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA	086868	3
62-1804 Rev 7-75		MICROFILM	

MAOP INDEX

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
2	39.81	129.10	Panoche Station to Vernalis Tap	22", 26", 36"	500	500	500	890
2	129.10	142.50	Vernalis Tap to Tracy Station	26"	500	500	890(1)	890
2	142.50	158.00	Tracy Station to Brentwood Terminal	26"	605	605	890(2)	890
3	158.00	164.35	Brentwood Terminal to Empire Mine Rd.	22", 26"	315	360	456	600
3	167.29	168.00	Delta Fair Junction to MP 168.0	20", 26"	600	600	600	600
3	0.00	2.12	Crockett Branch	20", 22"	250	250	250	600
21	0.00	1.07	Crockett Station to MP 1.07	24", 26"	400	405	650	675
21	1.07	1.52	MP 1.07 to Herrmann Station	24"	400	675	675	675
21	1.52	1.59	Herrmann Station to MP 1.59	12", 16"	250	258	575	585
21	1.59	2.71	MP 1.59 to Vallejo Station	12"	375	375	585	585
21	2.71	12.05	Vallejo Station to Napa "Y"	12"	250	375	585	585
21	12.05	35.05	Napa "Y" to MP 35.05	12", 24", 26"	450	450	675	675
21	35.05	51.41	MP 35.05 to Monroe Reg. Station	12"	450	500	675	675
21	51.41	53.12	Monroe Reg. Station to Santa Rosa Compressor Station	12"	450	494	675	675
21	53.12	137.38	Santa Rosa Compressor Station to Willits	8", 12"	820	820	890	890
21	0.00	18.64	Napa "Y" to Adobe	16"	450	500	675	675
21	18.64	32.0	Adobe to Laguna de Santa Rosa	16"	450	500	675	675
21	35.90	37.04	Stony Point Rd., Hearn to Sebastopol Rds.	16"	450	675	675	675
21	34.84	35.86	McDowell Road Tap to Petaluma Reg. Sta.	12"	450	500	593	675
21	0.00	21.11	Adobe to San Rafael Underground Holder	16", 20"	450	500	500	500
21	0.00	21.11	Adobe to San Rafael Underground Holder	12", 16"	450	500	500	500
*50	0.00	2.87	Marysville Service Center Reg. Station to Yuba City Underground Holder	8"	400	400	720	720
*50	2.87	21.62	Yuba City Underground Holder to Biggs Reg. Station	8"	250	250	720	720

General Notes:

a. *Indicates that line or sections are under 20% SMYS, but are listed for the purpose of continuity.
b. Transmission line numbers or distribution main location descriptions which are underlined indicate changes by this revision of Standard Practice 463.8.
c. Numbered notes, when shown on the bottom of a sheet, annotate the status of an item listed above.
   (1) At MP 132.42, a 145' section crossing the California Aqueduct has a design pressure of 605 psig.
   (2) At MP 149, a 950' pipeline section at the California Aqueduct crossing has a design pressure of 605 psig.

REV. 9
DRAWING NUMBER 086868
P G & E CO.
SHEET OF SHEETS
LINES OPERATING AT OR OVER 20% SMYS
MICROFILM

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
*50	21.62	26.94	Biggs Regulator Station to Richvale "Y"	6", 8"	250	250	720	720
*50	26.94	44.87	Richvale "Y" to Butte Station	6", 8",	400	400	686	720
				12", 10"	400	720	720	720
50	0.00	7.81	MP 0.00 to Paradise	8"	400	720	720	720
56			Pleasant Creek Field Underground Storage System	4"	1300	1300	1300	1440
56			Pleasant Creek Field Underground Storage System	4", 8"	1300	1440	1440	1440
57			McDonald Island Field Underground Storage System	4" - 12"	2160	2160	2160	2160
57A	0.00	7.47	McDonald Island Compressor Station to Palm Tract PLS	14", 16", 18"	1025	1025	1025	1025
57A	7.47	16.64	Palm Tract PLS to Brentwood Terminal	18"	867	867	867	867
57B	0.00	16.46	Brentwood Terminal to McDonald Island Field Underground Storage System	22"	2160	2160	2160	2160
65			SP 3 (T176.70) to Los Medanos Compressor Station	12", 20" 22"	600	720	720	720
65			Los Medanos Field Storage System	4", 22"	1800	1800	1800	1800
100	134.5	150.13	MP 134.5 to Milpitas Terminal	20"	400	400	546	400
101	0.00	9.80	Milpitas Terminal to Rengstorff Avenue Station	24", 34", 36"	375	400	400	400
*101	9.78	33.68	Rengstorff Ave Sta Via Bayshore to Lomita Park Reg Sta	20", 24" 30"	375	400	400	400
*101	33.68	44.56	Lomita Park Reg Sta Via Bayshore Blvd to San Francisco Division Gas Load Center	34", 36" 24"	145	275	275	275
*103	0.00	23.55	Hollister Meter Station Reg Station to California Street Reg Station	12"	350	350	500	500
*103	23.55	26.63	California Street Regulator Station to Harkins Road Meter and Mixer Station	12"	313	313	500	500
105N	6.88	23.03	Irvington Station to San Lorenzo Regulator Station	20", 24" 26", 34"	250	250	500	500
*105N	23.03	36.48	San Lorenzo Regulator Station to East Bay Gas Load Center	16", 20" 24", 26", 30", 34"	150	198	275	275

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
*105A	36.64	37.33	2nd and Market to 5th and Kirkham	20", 24"	150	198	275	275
*105A	38.17	52.01	Poplar n/o 18th to San Pablo Station	20", 22" 24", 30"	150	198	275	275
*105C	0.00	2.03	2nd and Market to 32nd and Peralta	20", 22" 24"	150	198	275	275
105N	0.00	0.18	Baine Avenue Crossover to Line 153	20"	250	250	590	500
*105N	0.00	1.29	West Winton Avenue Crossover to Line 153	22", 24"	250	250	500	500
105B	0.00	11.85	Crockett Station to San Pablo Station	24"	400	400	400	400
107	0.00	13.11	Tracy Station to Livermore Junction	22"	500	500	500	720
107	13.11	31.22	Livermore Junction to Irvington Station	22"	477	477	500	720
107S	31.22	33.20	Irvington Station to MP 33.20	22", 24"	477	477	500	720
107S	33.20	38.12	MP 33.20 to Milpitas Station	36"	477	720	720	720
108	0.00	4.59	Line 2 to Vernalis Field Mixing Station	16"	500	500	720	890
108	4.59	8.79	Vernalis Field Mixing Station to McMullin Ranch Mixer Station	16"	408	408	720	720
108	8.79	14.0	McMullin Ranch Mixer Station to MP 14.0	16"	408	408	720	720
108	14.0	22.31	MP 14.0 to MP 22.31	24"	408	720	720	720
108	22.31	36.01	MP 22.31 to MP 36.01	24"	412	720	720	720
108	36.01	43.5	MP 36.01 to Las Vinas Station	16"	412	412	720	720
108	43.5	62.20	Las Vinas Station to Clarksburg PLS	16"	490	490	500	720
108	62.20	75.10	Clarksburg PLS to Sacramento Division Gas Load Center	16", 20" 24"	412	412	500	720
*108	27.10	1.71	E. Hazleton & "B" Streets Reg Station to Stockton Division Gas Load Center	12"	188(2)	188	275	400
109	0.00	43.47	Milpitas Terminal to Sullivan Avenue Reg Station	22", 24", 30", 34"	375	375	400	400
*109	43.47	52.71	Sullivan Avenue Regulator Sta to San Francisco Division Gas Load Center	26"	150	150	275	275
111	0.00	21.65	Helm Junction to Fresno Junction	12", 16"	650	650	800	720
111	21.65	28.05	Fresno Junction to San Joaquin Division Gas Load Center	8"	400	400	720	720
111			Raisin City Field Collection System	4"	650	800	800	800

(2) This Section of L-108 has a 175 psig MOP when operated in conjunction with the Pacific Paperboard Feeder.

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
111			San Joaquin Field Collection System	3", 4"	650	800	960	960
112			Strangeman Well 1-1 to L-108 MP 1.98	4"	500	594	720	720
112			Vernalis Field Collection System	3" - 8"	594	594	800	890
114	0.00	9.01	Rio Vista Field West Side to Antioch Terminal	12", 16"	510	510	800	800
114	7.33	8.31	San Joaquin River Crossing--Block Valve 7.46 on Stanpac Line 4 to Block Valve 8.31 on Line 114	12"	720	800	800	800
114	9.01	16.59	Antioch Terminal to Brentwood Terminal	22", 24"	510(3) 595(4)	595	595	720
114	16.59	28.97	Brentwood Terminal to Dalton Avenue Station	22"	595	595	595	720
114	28.97	33.85	Dalton Avenue Station to Livermore Junction	36"	595	595	595	720
115			Petaluma Gas Field	2"	450	675	675	675
*116	0.00	3.86	Davis Meter and Reg Station to Swingle Junction Meter and Reg Station	8"	500	500	500	500
*116	3.86	6.18	Swingle Junction Meter and Reg Station to MP-6.18	16"	500	800	800	720
116	6.18	9.60	MP-6.18 to Block Valve 9.60	16"	500	800	800	720
116	9.60	12.89	MP-9.60 to Sacramento Division Gas Load Center	8", 24", 16"	500	500	500	720
*118	0.00	6.09	San Joaquin Division Gas Load Center to Fresno Junction	8"	400	400	500	500
118	0.00	0.66	San Joaquin Division Gas Load Center to Fresno Underground Holder	12"	690	690	720	720
*118	5.86	12.57	Fresno Junction to MP 12.57	12"	400	400	720	720
*118	12.57	73.26	MP 12.57 to Livingston Reg Station	8"	400	400	500	500
118	0.00	39.81	Herndon Junction to Pioneer Road	12"	400	400	720	720
118	73.26	74.89	Livingston Reg Station to Collier Road	6", 8"	400	720	720	720
118	74.89	83.74	Collier Road to Bradbury Road Reg station	6", 8"	400	400	400	720
118	78.08	83.74	MP 78.08 to Bradbury Road Reg Station	8"	400	720	720	720
118	83.74	84.69	Bradbury Road Reg Station to MP 84.69 (L-215 Tap) Parallel	6", 8"	500	890	890	890

(3) This section of Line 114 has a 510 psig MOP when Block Valve 8.31 is open.
(4) This section of Line 114 has a 438 psig MOP when Valve #5 at Antioch is open.

REV. 9
DRAWING NUMBER 086868
P G & E CO.
SHEET OF SHEETS
LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
119	0.00	3.85	Davis Meter Station to Swingle Junction Reg and Meter Station	12"	792	792	800	800
119	3.85	4.85	Swingle Junction Reg & Meter Station to MP 4.85	12", 16"	500	720	720	720
119	4.85	11.14	MP 4.85 to MP 11.14	12", 20"	500	520	720	720
119	11.14	11.35	MP 11.14 to MP 11.35	10"	500	520	720	720
119	11.35	16.46	MP 11.35 to N. Sacramento Underground Holder	12"	500	520	720	720
119	0.00	10.17	N. Sacramento Underground Holder to Antelope Meter Station	12", 16"	500	500	500	600
119	0.00	6.69	N. Sacramento Underground Holder to Roseville Rd Reg Station	16"	500	500	500	600
119	0.00	7.85	Roseville Rd Reg Station to Antelope Meter Station	6", 16"	500	500	500	600
119	0.00	5.25	Sonoma Avenue Reg and Del Pasa Blvd to Roseville Rd Reg Station	6"	180	500	500	500
120			Sutter Creek Field Collection System	4", 6"	485(5)	492	720	720
120			Sutter Buttes Field Collection System	4", 6"	485	485	720	720
121	0.00	11.54	Marysville Buttes Meter Station to Yuba City Underground Holder	6"	485	485	720	720(6)
123	0.00	13.57	Antelope Meter Station to Lincoln Junction Reg Station	12"	500	500	670	670
124	0.00	23.46	Lincoln Junction Reg Station to Marysville Service Center Reg Station	8"	400	400	720	720
124	0.00	26.03	Lincoln Junction Reg Station to Yuba City Underground Holder	16"	600	600	720	720
124	0.00	3.76	Beale Air Force Base Tap (T 13.31) to Beale Air Force Base Reg Station	6"	400	400	720	720
125			Edwards Vicenus to Tompkins Hill Meter and Reg Station	4"	350	448	720	720
125			Tompkins Hill Field Collection System	2", 3", 4", 6"	448	448	720	720

(5) This section of Line 120 is directly tied to Sutter Buttes Field Collection System which has a MOP of 485 psig.
(6) The future design pressure was reduced to 720 psig to be consistent with the design pressure.

REV. 9
DRAWING NUMBER 086868
P G & E CO.
SHEET OF SHEETS
LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
126	0.00	10.57	Tompkins Hill Meter & Reg Station to Union Street Reg Station	4"	350	425	720	425
126	0.00	10.89	Tompkins Hill Meter Station to Union Street Reg Station	6"	350	425	720	425
126	0.00	3.62	Elk River Road Reg Station to T 12.38, Line 126	10"	167	167	713	600
*126	0.00	0.36	MP 0.00 to Eureka Manifold Propane Air Plant	10"	167	167	713	600
126	10.89	12.61	Union Street Reg Station to Line 137	6"	167	167	713	275
128	0.00	8.35	Ord Bend Meter Station to Willows Town Reg	3", 4"	479	720	720	720
130A	0.00	0.50	HP Rio Vista Sacramento River Crossing	10"	800	800	800	800
130B	0.00	0.50	LP Rio Vista Sacramento River Crossing	10"	510	510	800	720
131	0.00	0.71	Rio Vista Field East Side	12"	510	685	800	720
131	0.00	9.19	Rio Vista Field East Side to Antioch Terminal	10", 12"	720(8) 510(9)	720	720	720
131	9.19	10.47	Antioch Terminal to MP 10.47	24"	438	438	600	720
131	10.47	16.87	MP 10.47 to Brentwood Terminal	24"	438	495	600	720
131	16.87	50.57	Brentwood Terminal to Irvington Station	24"	500	525	600	650
131	50.57	57.45	Irvington Station to Milpitas Terminal	30"	590	595	650	650
132	0.00	35.84	Milpitas Terminal to MP 35.84	12", 16", 24", 30", 34", 36"	375	400	400	400
132	35.84	46.59	MP 35.84 to Martin Station Reg Station	30", 36"	390	390	400	400
132	46.59	51.50	Martin Station Reg Station to San Francisco Division Gas Load Center	24"	145	145	275	275
132A	0.00	1.50	Sierra Vista Avenue Crossover to Rengstorff Avenue Station	16", 24"	375	400	400	400
132B	0.00	0.35	Martin Station Reg Station to Geneva Avenue	20"	109	110	275	275
133			Gill Ranch Field Collection System	4", 6"	500	500	720	720
134	0.00	21.57	Herndon Junction to MP 21.57	6", 8"	500	500	720	720

(8) The MOP is 720 psig when this section of L-131 is operated in conjunction with the HP Rio Vista Collection System.

(9) The MOP is 510 psig when this section of L-131 is operated in conjunction with the LP Rio Vista Collection System.

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
134	21.57	27.04	MP 21.57 to Arbios Reg Station	6"	500	500	720	720
134	27.04	30.50	Arbios Reg Station to MP 30.50	6", 8"	500	500	720	720
134		34.13	Arbios Reg Station to Firebaugh Regulator Station	3", 4"	500	500	720	720
134			Dixion Dryer DFM	4"	500	500	720	720
136	0.00	1.65	Ord Bend Meter Station to MP 1.65	6"	479	565	720	720
136	5.14	12.89	Fell Reg & Odorizer Station to Butte Station	6"	550	550	720	720
				8"	550	720	720	720
*137	0.00	11.83	14th and Albee Street, Eureka, to Arcata Reg Station	4", 6"	167	167	275	275
137	3.58	7.37	Ryan Slough Reg Station to Arcata Reg Station	8"	350	350	720	600
138A	0.00	14.94	Helm Tap Station to Helm Junction	16"	800(10)	862	862	862
138B	0.00	14.71	Helm Tap Station to Helm Junction	20"	700	700	800	890
138	14.71	20.50	Helm Junction to Elkhorn Station	18"	800(10)	865	865	890
138	20.50	22.04	Elkhorn Station to Burrel Meter Station	18"	650	650	865	720
138	22.04	38.59	Burrel Meter Station to Adams & Elm Meter and Regulator Station	16"	650	650	720	720
138	38.59	49.42	Adams & Elm Meter & Reg Station to San Joaquin Division Gas Load Center	10", 12", 16"	650	650	720	720
138	43.58	50.02	T 43.58 to Chestnut & Clay Reg Station	16"	650	650	720	720
138	45.10	46.64	MP 45.10 to Peach Avenue	10"	650	720	720	720
141E			E Thornton Field Collection System	4", 6"	538	538	800	800
141W			W Thornton Field Collection System	3" - 10"	538	768	800	800
*141			N.E. River Island & Walnut Grove Field Collection System	6", 8"	538	768	800	800
142N	0.00	14.05	Bakersfield Tap to Bakersfield Reg Station	12", 16" 20", 24"	475	475	720	720
142S	0.00	9.00	Gosford Road Meter Station to Brundage Lane & "V" St Regulator	6", 10"	600	600	720	720
*142S	9.00	11.47	Brundage Lane & "V" St Regulator to Bakersfield Reg Station	8", 12"	300	300	720	720
*143			Millar Field Collection System	3", 4"	792	800	800	800
144	0.00	3.50	Millar Field to Millar Meter Station	10", 12"	792	796	800	800

(10) This section of L-138/L-138A has a 700 psig MOP when operating in conjunction with 20" L-138B.

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
145			Maine Prairie Field Collection System	3", 4", 6"	510	796	800	800
146	0.00	6.00	Maine Prairie Field to Maine Prairie Meter Station	8"	510	796	800	800
147	0.00	3.39	Edgewood Road Crossover to San Carlos Regulator Station	20", 24"	400	400	400	400
148	0.00	17.63	McMullin Ranch Mixer Station to Morgan Road Regulator Station	8"	408	408	720	720
149			Winters Field Collection System	4", 6"	720	750	800	800
150	0.00	18.09	Winters Meter Station to Davis Meter Station	6"	720	750	800	800
151	0.53	14.05	MP 0.53 to Afton Reg Station	6"	250	250	720	720
153	0.00	18.00	Irvington Station to Marina Blvd Station	30", 32", 34"	420	420	500	500
*153	18.00	27.89	Marina Blvd Station to East Bay Div Gas Load Center	24", 30"	246	246	275	275
153			Tap to 50th Avenue Holder	16", 20"	246	246	275	275
153			Tap to East Bay Div Gas Load Center	20"	246	246	275	275
153			Alvarado Crossover & Reg Station to Line 105	16"	246	250	500	500
*153			Fairway Avenue Crossover Station to Line 105	20", 30"	150	198	542	500
155			Durham Field Collection System	4"	680	680	800	800
156	0.00	5.72	Durham Field to Durham Field Meter Station	6"	680	680	800	800
158	4.80	11.06	V-4.80 to L-172 (MP 11.06)	6"	800	800	800	800
158	11.06	13.65	MP 11.06 to Dunnigan Spreckels Reg Station	6"	500	564	800	800
158			Woodland Field Collection System	3", 4"	800	800	800	800
159	0.00	0.65	Pleasant Creek Field Compressor Station to V-0.65	4"	975	975	1000	975
159	0.65	3.91	V-0.65 to Pleasant Creek Line 159 Regulator Station	4"	975	975	1000	975
159	3.91	4.70	Pleasant Creek Line 159 Regulator Station to Winters Meter Station	4", 8"	720	750	800	975
159			Winters Field Collection System	4"	720	750	800	975
*162	0.00	7.73	Tracy Station to Banta Regulator Station	6", 8"	365	365	720	720
162	0.00	6.61	Tracy Station to Holly Road	10"	365	720	720	720

REV. 9
DRAWING NUMBER 086868
MICROFILM
P G & E CO.
SHEET OF SHEETS
LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
164			Coalinga Nose Field Collection System	8", 10"	390	498	865	890
167	0.00	34.50	Beehive Bend Field to Yuba City Underground Holder	12", 16"	800	800	800	800
167	0.00	4.60	Wild Goose Field Meter Station to Wild Goose Mixer & Odorizer Sta	10"	800	800	800	800
167	4.60	6.54	Wild Goose Mixer & Odorizer Station to Gridley Junction Station	8"	800	800	800	800
167			Wild Goose Field Collection System	4"	800	800	800	800
167	4.12	7.60	Princeton Field Collection System	3"	800	800	800	800
167			Compton Landing Field Collection System	3", 4", 6"	800	800	800	800
167			Bounde Creek Field Collection System	2" - 6"	800	800	800	800
168			River Island Field Collection System	2" - 8"	800 720(11)	800	800	800
169			Beehive Bend, Willows, Llano Seco & Perkins Lake Field Collection System	3" - 20"	800	800	800	800
172	0.00	69.81	Beehive Bend Field, West, Meter & Odorizer Station to Swingle Junction Reg & Meter Station	18", 20"	800	800	800	800
172			Sugarfield Field Collection System	2" - 4"	800	800	800	800
			Dufour Field Collection System	3", 4"	800	800	800	800
172	69.81	79.12	Swingle Junction Reg & Meter Station to Sacramento Div Gas Load Center	12", 16"	500	520	720	720
172	0.00	0.60	Crosstie Between Line 172 and Line 167	10"	800	800	800	800
172	75.45	9.68	Crosstie Between Line 172 and Line 119	12"	500	520	720	720
*173	0.00	17.56	Turkey Ranch Meter Station to Auburn Reg Station	4", 6", 8"	500	500	670	670
*174			Arbuckle Field Collection System	2" - 10"	800	800	800	800
176			Roberts Island Field Collection System	2" - 8"	500	555	800	890
176	0.00	18.85	Roberts Island Field to Tracy Station	6", 8"	500	555	800	720
177	0.00	0.87	Sacramento Avenue Junction to Grape Way Regulator Station	10"	819	819	960	960
177	0.86	7.13	Grape Way Reg Station to Butte Station	6", 10"	469	469	600	720

(11) The MOP of Line 168 shall be 720 psig when operated in conjunction with Line 131.

REV. 9
DRAWING NUMBER 086868
P G & E CO.
SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
177	0.00	4.75	Fell Regulator & Odorizer to Sacramento Avenue Junction	16"	819	819	960	960
177	4.75	29.09	Sacramento Avenue Junction to Corning N. Dome Station	10"	819	819	960	960
177	0.00	2.19	Tap 27.60 to Tap 29.87 Parallel Section Near Corning N. Dome	6", 8"	819	819	960	960
177	29.09	37.84	Corning N. Dome Station to Gerber Compressor Station	12"	819	819	960	960
177	37.84	163.04	Gerber Compressor Station to Cummings Creek PL Station	12"	819	819	960	960
177	163.04	178.18	Cummings Creek PL Station to Tompkins Hill Meter & Regulator Station	12"	430	430	720	720
177	178.18	192.29	Tompkins Hill Meter & Regulator Station to Ryan Slough Regulator Station	12"	350	425	600	600
177	37.8	149.18	Crosstie Between Lines 177 and Line 400	12"	819	819	960	960
177	43.87	1.24	Red Bluff Tap to Red Bluff and Diamond National Corp.	6"	819	819	960	960
179			Corning Field, South, Collection System	6"	819	819	960	960
181A	0.00	1.56	Soap Lake Meter Station to Gentry Foods Regulator Station	6", 10" 12", 16"	300	300	400	400
181A	6.19	20.15	V-6.19 to Watsonville	10", 12"	300	303	400	400
181B	0.00	10.85	Anzar Road Meter and Regulator to Watsonville Station	10", 16", 20"	400	400	400	400
*182	0.00	12.86	Serpa "Y" to V-12.86, Suisun Junction	8" - 10"	510	510	800	800
182	12.86	18.23	V-12.86 to Shell Chemical Meter Station	12"	435	435	800	800
*182	18.23	18.87	Shell Chemical Meter Station to Bailey Road Meter and Regulator Sta.	12"	435	435	600	800
182			Kirby Hills Field Collection System	3" - 8"	510	510	800	800
182			Suisun Field Collection System	2" - 6"	510	510	800	800
183	0.00	6.35	Moffat Ranch Field Meter & Reg Station to Firebaugh Regulator Station	3"	175	320	800	800
185	0.00	0.014	Hollister Gas Field Tie to Main 301A	4"	396	396	600	500
186	0.00	26.1	Red Top Regulator to Dos Palos Meter Station	3", 4", 6"	500	625	720	720
186	26.1	29.4	Chowchilla Field to Red Top Regulator Station	2", 3", 4"	500	960	960	960

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
*187	0.00	22.58	San Ardo Field to Jolon Road Regulator Station	6"	313	313	720	720
*187	22.58	65.70	Jolon Road Regulator Station to Harkins Road Meter & Mixer Station	8"	313	313	720	720
189	0.00	1.72	Humboldt Bay PP Tap to Humboldt Bay PP	10"	350	425	720	600
190	0.00	16.08	Kettleman Compressor Station to Coalinga Nose Dehydrator Station	12", 16"	2160	2160	2160	2160
190	16.08	16.22	Coalinga Nose Dehydrator Station to Coalinga Nose Field	16"	2160	2160	2160	2160
191	0.00	3.86	Antioch Terminal to Antioch Town Meter Station	30", 34"	600	600	600	600
191			Antioch Town Meter Station Cross Tie	16"	600	600	600	600
191	3.87	9.93	MP 3.87 to SP 3-Line 191 Meter Sta Via Pittsburg Power Plant	20", 24"	338	390	600	600
191	9.93	25.30	SP 3-Line 191 Meter Sta to Reliez Station Road Regulator Station	16", 20", 24"	338	338	600	600
*191	25.30	29.36	Reliez Station Road Regulator Station to The Junction	8", 10", 12"	268	283	400	400
*191	29.36	32.76	The Junction to MP 32.76	10"	268	270	400	400
*191	32.76	35.83	MP 32.76 to Martinez Meter and Regulator Station	10"	268	268	400	400
*191A			The Junction to Ardilla and Camino Pablo Regulator Station	3", 6", 8"	268	283	400	400
*191B	0.00	1.53	The Junction to Reliez Valley Road, Lafayette	8"	268	283	400	400
193			Rice Creek Field Collection System	2" - 8"	819	960	960	960
193			Malton Field Collection System	4", 6", 8"	819	960	960	960
193			Kirkwood & Rice Creek Field, North, Collection System	6"	819	819	960	960
194			McMullin Ranch Field Collection System	2" - 10"	440	440	800	800
195			Rio Vista Field, East Side Collection System (HP)	2" - 16"	800(12)	800	800	800

(12) The MOP of this section of line is 720 psig when it is operated in conjunction with L-131.

REV. 9

DRAWING NUMBER 086868

PG&E CO. SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
*195			Rio Vista Field, East Side Collection System (LP)	2" - 16"	510	510	800	800
196			King Island Gas Field Collection System	4", 6"	800	800	800	800
196	0.00	13.45	Isleton Meter Station to Las Vinas Sta.	8", 12", 16"	800(13)	800	800	800
197A	0.00	21.41	Las Vinas Station to Brandt Rd PLS	10"	275	388	720	720
197A	21.41	31.23	Brandt Rd PLS to MP 31.23	10", 12"	275	720	720	720
197A	31.23	39.57	MP 31.23 to MP 39.57	12"	275	320	720	720
197A	39.57	41.78	MP 39.57 to Calaveras Cement Meter Station	8"	275	320	720	720
197B	0.00	5.50	Las Vinas Station to V-5.50	6"	275	388	720	720
197C	17.44	23.02	Ione Tap to MP 23.02	10"	275	720	720	720
199			Bunker Field Collection System	3" - 8"	792	796	800	800
200			Rio Vista Field, West Side, Collection System (HP)	2" - 16"	800(13)	800	800	800
*200			Rio Vista Field, West Side, Collection System (LP)	2" - 16"	510	510	800	800
200	0.00	6.51	Rio Vista Field, West Side, Collection System (LP), Rio Vista "Y" Mixer Sta. to Serpa Junction Compressor Sta.	12"	510	800	800	800
200			Rio Vista field, West Side, Collection System (30 psig)	3" - 10"	400	510	800	800
200			Liberty Island Field Collection System	4"	800 720(13)	800	800	800
200			Lindsey Slough Field Collection System	3" - 10"	868(13)	868	960	960
201			Todhunters Lake Field Collection System	2" - 12"	792	960	960	960
201			Greens Lake Field Collection System	2"	792	960	960	960
202	0.00	23.72	Camp Far West Meter Station to Grass Valley Reg Station	6", 8"	400	720	720	720
203			Winchester Lake Field Collection System	3", 4"	800	800	800	960
206			Pleasant Creek Tap to Pleasant Creek Field Compressor Station	12"	975	1440	1440	1440
207			Conway Ranch Field Collection System	4", 6", 8"	800	1000	1000	960

(13) The MOP of this section of line is 720 psig when it is operated in conjunction with L-131.
(14) Line 197B between M.P. 21.47 and M.P. 31.24 has been abandoned.

REV. 9
DRAWING NUMBER 086868
P G & E CO.
SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
208			Union Island Field to Lathrop Dehydrator Station	12"	825	1000	1000	1000
209			Johns Manville Reg Station to 5th & Garden, Willows	4"	479	720	720	720
210			Denverton Field Collection System	3", 4", 6"	650	650	720	720
210	0.00	1.40	Rio Vista "Y" to Creed Station	16"	800	800	800	800
210	1.40	25.98	Creed Station to Napa "Y" Meter Station	16", 18"	650	650	720	720
210	1.40	19.47	Creed Station to Cordelia Reg Station	32", 34"	650	675	675	675
210	19.47	25.62	Cordelia Regulator Station to Napa "Y" Meter Station	10", 12"	650	650	675	675
210	0.00	1.36	Rio Vista "Y" to Creed Station	10"	650	650	800	800
210	19.47	32.11	Cordelia Reg Sta. to Herrmann Station	24"	650	675	675	675
210	0.00	3.7	Exxon Tap to Exxon Meter Station	18"	650	720	720	675
212			Tremont Field Collection System	4", 6"	792	800	800	800
214	0.00	0.41	Arcoma-Shriners No. 16-3 Gas Well	3", 4"	315	600	600	600
215	0.00	20.05	Oak Flat Road Meter Sta to West Ave. Reg Station	12"	500	890	890	890
220	0.00	2.41	Rio Vista "Y" to Maine Prairie Meter & Reg Station	16"	792	800	800	800
220	0.00	2.41	Rio Vista "Y" to Maine Prairie Meter & Reg Station	10"	510	796	800	800
220	2.41	22.01	Maine Prairie Meter & Reg Station to Davis Meter and Reg Station	8", 10", 12"	792	796	800	800
220	22.01	34.46	Davis Meter & Regulator Station to Dunnigan-Spreckels Regulator Station	6", 8"	500	500	500	800
220			Dixon Gas Field	4"	792	796	800	800
300	0.00	0.47	Panoche Station to Line 2	24"	500	840	890	890
300A	0.00	0.64	Colorado River to Topock Compressor Station	30", 34"	660	700	700	700
300A	0.64	40.87	Topock Compressor Station to PLS 1A	34"	867	867	890	890
300A	40.87	103.72	PLS 1A to PLS 2A	34"	815	815	815	815
300A	103.72	130.37	PLS 2A to PLS 2AX	34"	688	688	688	688
300A	130.37	159.33	PLS 2AX to Hinkley Compressor Station	26", 34"	573	573	573	573
300A	159.33	203.02	Hinkley Compressor Station to PLS 3A	34"	861	861	890	890

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
300A	203.02	256.21	PLS 3A to PLS 4A	34"	803	817	817	817
300A	256.21	299.01	PLS 4A to PLS 5A	34"	757	757	757	757
300A	299.01	353.85	PLS 5A to Kettleman Compressor Station	34"	669	688	688	688
300A	353.85	436.74	Kettleman Compressor Station to PLS 6A	34"	840	840	890	890
300A	436.74	461.07	PLS 6A to PLS 6AX	34"	715	715	715	715
300A	461.07	490.65	PLS 6AX to PLS 7A	34"	631	631	715	715
300A	490.65	502.34	PLS 7A to Milpitas Terminal	34"	558	558	676	676
300B	0.00	0.45	Colorado River to Topock Compressor Sta.	34"	660	660	735	735
300B	0.45	40.49	Topock Compressor Station to PLS 1B	34"	867	867	894	894
300B	40.49	103.51	PLS 1B to PLS 2B	34"	815	821	821	821
300B	103.51	130.40	PLS 2B to PLS 2BX	34"	688	688	688	688
300B	130.40	161.02	PLS 2BX to Hinkley Compressor Station	34"	573	573	573	573
300B	161.02	203.07	Hinkley Compressor Station to PLS 3B	34"	861	861	897	897
300B	203.07	256.64	PLS 3B to PLS 4B	34"	803	816	816	816
300B	256.64	299.00	PLS 4B to PLS 5B	34"	757	757	757	757
300B	299.00	354.02	PLS 5B to Kettleman Compressor Station	34"	669	688	688	688
300B	354.02	436.85	Kettleman Compressor Station to PLS 6B	34"	840	840	890	890
300B	436.85	461.08	PLS 6B to PLS 6BX	34"	715	715	715	715
300B	461.08	490.92	PLS 6BX to PLS 7B	34"	631	631	715	715
300B	490.92	502.64	PLS 7B to Milpitas Terminal	34"	600	600	669	669
301G	0.00	24.68	Hollister Meter Station to Moss Landing Power Plant	24", 30"	500	500	500	500
301A	0.00	24.84	Hollister Meter Station to Moss Landing Power Plant	20"	396	396	500	500
301B	0.00	14.02	Dolan Road Meter Station to Hilltown Regulator Station	12"	408	408	500	500
*301C	14.02	17.20	Hilltown Regulator Station to Harkins Road Meter and Mixer Station	8", 12"	313	313	500	500
*301F	0.00	7.94	Espinosa Road Tap Station to First Avenue Reg Station, Fort Ord Reg Station	16"	408	412	412	412
*301E	0.00	0.89	Crosstie-Monterey #2 to Main 301B	12"	408	408	500	500
*301E	0.89	1.02	Crosstie-Monterey #2 to Main 301B	12"	313	313	400	400
301D	0.00	1.72	Anzar Tap Station to Anzar Road Meter & Regulator Station	10"	500	500	500	500
301H	0.00	1.72	Anzar Tap Station to Anzar Road Meter & Regulator Station	16"	500	500	500	500

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
302			Grimes Area Collection	2" - 20"	975	975	1000	975
302W	0.00	5.76	Hershey Junction to Buckeye Creek PLS	20"	975	975	1000	975
303	0.00	7.95	Antioch Terminal to Brentwood Terminal	36"	720	720	720	720
303	7.95	11.97	Brentwood Terminal to Vasco Road	36"	720(17)	793	864	864
303	11.97	20.43	Vasco Road to Dalton Avenue Station	36"	720(17)	864	864	864
303	20.43	25.54	Dalton Avenue Sta to Livermore Junction	36"	720(17)	864	864	864
303	25.54	36.56	Livermore Junction to Sheridan Rd PL Sta	36"	720	731	877	877
303	36.56	42.86	Sheridan Road PL Station to Irvington Sta	36"	590	590	600	877
304	0.00	11.29	Lathrop Dehydrator & Odorizer Station to Tracy Station	12"	825	825	825	825
304			Lathrop Field Collection System	3" - 12"	825	825	825	890
306	0.00	43.3	Kettleman Compressor Station to Dry Creek PL Station	20"	840	840	840	840
306	43.3	70.02	Dry Creek PL Station to Morro Bay Power Plant Reg Station	20"	650	650	840	840
307	0.00	16.36	Spreckels Sugar Meter Station to Spreckels Sugar Regulator Station	8"	500	500	915	890
307	0.00	2.01	Spreckels Sugar Meter Station	10"	500	890	890	890
307	12.05	16.92	Derrick Avenue Tap to Arbios Reg Station	8"	500	890	915	890
308	0.00	0.140	Collection Line 308 to Ginochio 2	3"	438	495	720	720
308	0.00	0.118	Collection Line 308 to Ginochio 1	3"	438	495	720	720
308	0.00	0.093	Collection Line 308 to Producers Tank Battery	4"	438	495	720	720
310	0.00	38.25	Tres Pinos Creek Station to BAF Cogeneration Facility	10", 12"	840	890	890	890
311	0.00	54.44	Trona Tap Meter Station to Westend Primary Regulator Station	10", 12"	700	700	960	890
311	31.97	38.49	Parallel Section to MP 38.49	12"	700	810	960	890
312	0.00	8.00	Paloma to Paloma Field Meter Station	8"	757	757	820	820
313	0.00	34.4	Lucerne Valley Tap Meter Station to Big Bear Meter Station	8", 10"	573	573	720	573
314	0.00	24.19	Hinkley Compressor Station to PLS	12"	861	861	890	890
*314	24.19	29.12	PLS to Valve 8 at MP 29.12	10"	550	550	720	720
*314	29.12	43.18	Valve 8 at MP 29.12 to Black Mountain Meter & Reg. Station	8", 10"	550	550	720	720

(17) Division regulation, cross-tied to Line 114 and Line 303, can operate at pressures up to 600 psig. If it becomes necessary to feed regulation from Line 303, then the Line 303 MOP becomes 600 psig.

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
*314			Tap to Riverside Cement	8"	550	550	720	720
*314			Tap to Airbase Road Meter Station	8"	550	550	720	720
*316			Dutch Slough Area Collection System	2" - 12"	800	800	800	800
318			Black Butte Field Collection System	3", 4", 6"	911	911	960	960
319	0.00	9.00	"Gosford Intertie" Kern River Station PGandE to Coles Levee Reg Station P.L.S. Co.	34"	757	1440	1440	1440
331			Santa Nella Tap to Tri Valley Growers	4", 6"	500	890	890	890
335			Putah Sink Field	3", 4"	800	800	800	800
336			Harte Field Collection System	3"	412	800	800	800
337			Zamora Gas Field	3", 4"	800	800	800	800
*338			Kettleman City Field Collection System	2"	669	669	688	688
339	0.00	0.87	Rancho Capay Field Collection System	4"	819	819	960	960
341	0.00	0.01	Tulare Lake Field Collection System	6"	688	688	720	720
342	0.00	2.18	Mtn. View Gas Field @ T-257.75B, L-300	3"	757	757	960	960
372	0.00	3.7	Ridgecrest Tap to Ridgecrest Primary Regulator Station	6"	700	700	960	960
374(1)	0.00	0.01	Semi-Tropic Gas Field @ T-309.62B, L-300	2"	890	89	890	890
375	0.00	6.60	L-142 Tap to V-6.60 (So. Calif. Gas L-7039 Tap)	16"	475	833	780	780
375	6.60	17.41	V-6.60 to PSE, Mt. Poso Cogen. Plant	8", 12", 16"	771	771	780	780
376	0.00	1.67	Arco Cork Lease	6", 8", 10"	780	780	780	780
377	0.00	0.64	So. Calif. Gas Co. L-7039 to Dexzel Cogen. Plant	6"	771	780	780	780
400	0.00	24.60	California-Oregon Border to Tionesta Compressor Station	36"	911	911	911	911
400	24.60	48.64	Tionesta Compressor Station to Indian Springs PL Station	36"	911	911	911	911
400	48.64	82.33	Indian Springs PL Station to Burney Compressor Station	36"	911	911	911	911
400	82.33	104.20	Burney Compressor Station to MP 104.20	36"	911	911	911	911
400	104.20	115.26	MP 104.20 to Shingletown PL Station	36"	911	915	942	942

(1) Line 374 was abandoned during 1990.

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Trans. Line No.	MP	to MP	Description	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design Press. (psig)
400	115.26	149.18	Shingletown PL Station to Gerber Compressor Station	26", 36"	911	911	911	911
400	149.18	180.77	Gerber Compressor Station to V-180.77	24", 36"	911	911	911	911
400A	180.77	197.83	V-180.77 to Delevan Compressor Station	36"	911	911	911	911
400B	180.76	197.72	MP 180.76 to Delevan Compressor Station	36"	911	911	911	911
400	197.72	233.87	Delevan Compressor Station to Buckeye Creek PL Station	36"	1040	1040	1040	1040
400	233.87	297.87	Buckeye Creek PL Station to Antioch Terminal	26", 36"	975	975	975	975
402	0.00	9.96	Redding-Calaveras Tap to PL Station	12"	500	600	720	720
402	9.96	38.10	PL Station to Calaveras Cement Co.	8", 10", 12"	500	600	720	720
403	0.00	1.38	Rio Vista "Y" to Creed Station	16"	650(19)	800	855	800
404	0.00	1.64	Tamarack Rd. to Burney Forest Products	4"	911	911	911	911

(19) The MOP of L-403 is 650 when operated in conjunction with L-210.

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Location	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design (psig)
EAST BAY REGION					
BAY DIVISION					
Port Costa Feeder	4", 6"	315	338	600	600
Standard Oil Feeder	22"	400	400	400	400
Union Oil Tap	12"	400	400	400	400
CENTRAL DIVISION					
50th Avenue Holder Feeder Off Line 105	16", 20"	150	198	275	275
DIABLO DIVISION					
Foster-Wheeler Feeder	8", 12"	315	338	600	600
Tosco Oil Company Feeder	12"	315	338	600	600
Nichols Road Tap	4"	338	338	600	600
Pittsburg Town Feeder	12"	338	338	600	600
Concord Feeder to Alpha Beta Regulator	8"	338	600	600	600
Concord Feeder	6", 8", 10", 12"	170	170	600	600
Antioch Feeder	6"	338	600	600	600
Danville Feeder	6", 8", 10"	338	365	600	600
Discovery Bay Feeder - From Line 57A to Secondary Stage Regulator (Bixler Road)	3", 4"	867	867	867	867
Discovery Bay Feeder - From Bixler Road Regulator to Pt. of Timber Regulator	4", 6" 8"	400	400	400	400
Viera Avenue Feeder	8"	338	338	600	600

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Location	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design (psig)
EAST BAY REGION (Cont'd)					
MISSION DIVISION					
Pacific States Steel Feeder	8", 12"	411	420	500	500
Caltran Sta. 2.35 to 6.35	12"	411	411	500	500
San Ramon Valley Feeder	12"	500	656	656	650
Santa Rita Feeder	6", 12", 16"	500	656	656	650
Warm Springs Feeder	4"	590	650	650	650
GOLDEN GATE REGION					
SKYLINE DIVISION					
Peninsula Main (1)	16"	60	60	60	60
SAN FRANCISCO DIVISION					
Peninsula Main (1)	16", 20"	60	60	60	60
Hunters Point Power Plant Feeder	20"	145	145	275	275
PENINSULA DIVISION					
Half Moon Bay Feeder Line	8", 10", 12"	375	400	400	400
Sanchez Feeder	6" , 8"	400	400	400	400
Harbor Blvd. Feeder	8"	400	400	400	400
Stanford Cogen. Feeder	10"	400	400	400	400
Hayward Ave. Feeder	10", 24"	400	400	400	400

(1) The Peninsula Main has been downrated to distribution pressure and is now operating below 20% SMYS. It will be removed from the next revision of this drawing.

REV. 9

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P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Location	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design (psig)
MISSION TRAIL REGION					
COAST DIVISION					
Santa Cruz to Davenport	10", 12"	300	303	557	400
Watsonville to Santa Cruz	8", 10", 12", 16", 20"	300	303	577	400
Watsonville to Rob Roy Junction	10", 16"	400	400	577	400
Airport Boulevard Feeder	6"	400	400	400	400
COAST VALLEYS DIVISION					
*Monterey #1 - Harkins Road Meter & Mixer Station to Fig-Frank Streets Regulator Station	8", 12"	313	313	400	400
*Monterey #2 - Fort Ord to Fig-Frank Streets Regulator Station	8", 10", 12", 16"	313	313	400	400
*DFM-3 Harkins Road Meter and Mixer Station to MP 2.45	8", 10"	313	313	500	500
*DFM-3 MP 2.45 to MP 3.50	8"	313	313	500	500
*DFM-3 MP 3.50 to California Street Regulator Station	8"	313	313	500	500
*DFM-4 Monterey V-18.65 to Carmel V-2.13 (Aquajito Road Regulator Station)	8", 10"	313	313	400	400
*DFM-5 Hunter Road to Pajaro Street (MP 0.00 to MP 1.09)	8"	313	313	500	500
DFM-6 Espinosa Road Main from 301-B, V-3.40	6"	408	500	500	500
*DFM-7 Union Carbide Main from 187, MP 17.42	3"	313	313	720	720
DFM-8 Paradise Road to Meridian Road Main	4", 6"	500	500	500	500
SAN JOSE DIVISION					
Milpitas Terminal to PLS #7, King Road, 20" Feeder	16", 20", 24", 30"	200	200	275	400

REV. 9
DRAWING NUMBER 086868
P G & E CO.
SHEET OF SHEETS
LINES OPERATING AT OR OVER 20% SMYS

Location	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design (psig)
REDWOOD REGION					
SANTA ROSA DIVISION					
Cotati Feeder	8"	450	500	675	675
6" Sonoma Tap Line	6"	450	500	675	675
VALLEJO-NAPA DIVISION					
26" Line 21 (V-16.16) to Pine Street Meter Station, V-3.04	8"	450	500	675	675
26" Line 21 (V-16.16) to Kilburn Regulator Station	10"	450	500	675	675
Kilburn Regulator Station to T-14.01, No. of Yountville	8", 10"	450	500	675	675
T-14.01 to Inglewood Lane M.P. 18.96	10"	150	500	675	675
Tap to Kaiser Steel East of Napa River	4"	450	500	675	675
SACRAMENTO VALLEY REGION					
COLGATE DIVISION					
Yuba City Underground Holder to Market Street Regulator Pit	6", 8"	250	250	400	400
Tap to Schohr Ranch	6"	250	250	720	720
DFM-1 Tap to Strain Ranch Dryer	4"	800	800	800	800
Feather River Boulevard	4"	600	600	720	720
Naas Foods Feeder, Williams	4"	800	800	800	800
Nicolaus Road, Lincoln	4"	100	600	600	600
District 10 DFM, Marysville	8"	400	400	720	720
Tap From L-50 to Biggs Reg Station	4"	250	720	720	720
DE SABLA DIVISION					
DFM-1 Butte College Tap	3", 4"	400	720	720	720
Orland Tap from L-177 to Second Stage regulator	6"	490	490	720	720
Paradise Primary Reg To Secondary Reg	8"	400	720	720	720
Hamilton City Tap to Verschagin	4", 6"	720	720	720	720
Holly Sugar Tap	4", 6"	575	720	720	720

REV. 9
DRAWING NUMBER 086868
P G & E CO.
SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

Location	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design (psig)
SACRAMENTO VALLEY REGION					
DRUM DIVISION					
Diamond Oaks Feeder	6"	500	500	500	600
SACRAMENTO DIVISION					
160 L-108 to Campbell Soup Co.	16"	412	412	500	656
160 L-108 to Galt Primary Regulator	4"	490	490	500	720
*DFM-1 Sacramento Division Gas Load Center to North Sacramento Holder	8", 12"	260	260	275	275
16" L-108 Tap to Sacramento Boulevard Regulator	10", 12", 16"	412	412	500	656
L-108 to Florin Road Primary	6", 10"	412	412	500	656
DFM-2 Union Carbide Tap to Union Carbide Corp.	8", 10"	412	412	500	656
L-108 to Florin Road and Woodline Avenue	6"	412	412	500	656
Sutterville Road to 43rd and Riverside	6", 8"	412	412	500	656
L-108 to Elk Grove Primary	4"	412	412	500	656
119-Elm and Traction Avenue Regulator Station to T-0.93	12"	180	500	500	600
16" DFM Madison & Kenneth to Pershing & Madison	16"	225	500	500	500
SHASTA DIVISION					
Simpson Paper Mill Feeder	6"	500	600	720	720
Enterprise Town Feeder	4", 6"	500	600	720	720
Calaveras Cement Company Feeder	8"	500	600	720	720
Red Bluff District Tap (22)	2"	911	911	911	911
Burney Tap	2"	911	911	960	911
Sierra Pacific Lumber (Burney) Tap	2"	911	911	960	911
Redding Feeder	6"	500	600	720	720
Clear Creek Road Feeder	4"	500	720	720	720
Louisiana Pacific Lumber Mill S/O Red Bluff	2"	911	911	960	911
McArthur-Fall River Feeder	2"	525	911	911	911
Gerber Feeder	2"	450	911	911	911

(22) Formerly Line 309.

LINES OPERATING AT OR OVER 20% SMYS

P G & E CO. | SHEET OF SHEETS

DRAWING NUMBER 086868 | REV. 9

GTR0007454

Material Redacted

Location	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design (psig)
SACRAMENTO VALLEY REGION (Cont'd)					
VACA VALLEY DIVISION - VACAVILLE SERVICE TERRITORY					
American Home Foods Feeder	2", 4"	720	720	720	720
Vacaville Feeder	6"	400	400	400	400
Vacaville - Eldridge to Nut Tree Road	6"	400	400	720	720
Vacaville - Travis to Vacaville Junction	3", 4", 6"	400	400	400	400
Vacaville - SNRR to Elmira Road	3", 6"	400	400	400	720
Vacaville - Hawkins Road, Nut Tree Road to Lewis Road	8"	400	400	400	400
Vacaville - Hawkins Road, Nut Tree Road to Lewis Road	6"	975	975	975	975
Anheuser Busch Feeder	2", 4"	650	650	720	720
Fairfield Feeder - Scandia Road - Vaca Tap	10"	675	675	675	675
Fairfield Feeder - Scandia Road - Vaca Tap	12"	650	650	740	740
Robben Road Feeder - Tremont Tap to Dixon Meter Station	6"	720	750	800	800
Illinois Street 10" Feeder	6", 10"	650	675	740	720
VACA VALLEY DIVISION - WOODLAND SERVICE TERRITORY					
Gibson Feeder Main	6"	500	500	500	800
Fairfield - Knolls Feeder	4"	500	500	500	800
Hunts Feeder Main	6"	500	500	500	800
SAN JOAQUIN VALLEY REGION					
FRESNO DIVISION					
DFM-1 San Joaquin to Tranquility	3"	650	800	900	900
DFM-5 Ashland Avenue Tap to River Rock Products	4", 6"	400	593	720	720
DFM-6 SIM CAL Chemical Co. Feeder	6"	650	650	800	720
DFM-7 Adams & Elm Meter & Reg Sta. to So. Cal. Gas Co.	8"	263	263	400	400

P G & E CO. DRAWING NUMBER 086868 REV. 9

LINES OPERATING AT OR OVER 20% SMYS

Location	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design (psig)
SAN JOAQUIN VALLEY REGION (Cont'd)					
FRESNO DIVISION (Cont'd)					
DFM-16 Coalinga Feeder - Amador Avenue Sta. to Oil City Road Sta.	10"	498	890	890	890
DFM-16 Coalinga Feeder - Oil City Road Sta, to Coalinga	4", 6" 8", 10"	498	720	720	720
Clovis Feeder Main	6", 12"	650	650	720	720
Peach and Central Feeder	6", 8"	650	720	720	720
Kerman Primary Feeder	4"	500	500	720	720
KERN DIVISION					
DFM-8 L-300A/B to US Borax & Chem. Co. Primary Reg. Sta.	4", 6", 8"	861	897	897	897
DFM-8 US Borax & Chem. Co. Primary Reg Sta to US Borax & Chem. Co. Secondary Reg. Station	4", 6", 8"	490	490	720	720
STANISLAUS DIVISION					
Ripon-Modesto Feeder, Stanislaus River to Modesto	8", 12"	408	408	720	720
Dale Road to North Avenue Feeder	4", 6", 8", 12"	408	408	720	720
Riverbank Feeder	8", 10"	408	408	720	720
Carpenter Road Feeder (Modesto)	4", 12"	408	720	720	720
Pauline Avenue Feeder	4", 6"	408	408	720	720
Turlock Irrigation District Peaking Power Plant	6"	500	890	890	890
Claus Road Feeder	6", 8"	408	720	720	720
STOCKTON DIVISION					
Valley Tomato Feeder	8"	412	500	720	720
Eight Mile Road Feeder	4", 8"	412	412	720	720
Turner Road Feeder A	8"	300	720	720	720
Turner Road Eeeder B	4", 6"	300	300	720	720

REV. 9
DRAWING NUMBER 086868
PG&E CO. SHEET OF SHEETS
LINES OPERATING AT OR OVER 20% SMYS

Location	Nominal Pipe Diameter (Inches)	MOP (psig)	Min MAOP for any Segment (psig)	Min DP for any Segment (psig)	Future Design (psig)
SAN JOAQUIN VALLEY REGION (Cont'd)					
STOCKTON DIVISION (Cont'd)					
McArthur Road Feeder	8"	295	720	720	720
Louise Avenue Feeder	8"	408	408	720	720
Ripon-Modesto Feeder, L108 to Stanislaus River	8", 12"	408	408	720	720
	12", 16"	408	720	720	720
East Stockton Feeder (Miner Avenue)	8"	412	412	720	720
French Camp Feeder	6"	412	412	720	720
Pinchot Feeder (Ragu Foods)	8"	412	412	720	720
Yosemite Avenue Feeder (Airport to Pacific)	8"	408	408	720	720
YOSEMITE DIVISION					
DFM-4 Cressey Way Tap to Rogers Bros Packing	4", 6"	400	400	720	720
DFM-10 Red Top Cogeneration Facility Service Line	4"	500	625	720	720
DFM-29 L-118 Tap to Madera Women's Prison	4"	400	400	720	720
DFM-30 L-307 Tap to Mendota Biomass Cogeneration Plant	4"	500	890	890	890
DFM-32 L-134 Tap to Kerman Primary Reg. Station	4"	500	720	720	720
Yosemite Avenue Feeder	6"	400	400	720	720
Snelling Highway Feeder	6", 8"	400	400	400	720
Vinewood Avenue Feeder	4"	400	720	720	720
Winton Avenue Feeder	6"	400	720	720	720
Mendota Biomass Feeder	4"	890	890	890	890

REV. 0

DRAWING NUMBER 078760

P G & E CO.

LINES OPERATING AT OR OVER 20% SMYS

Location	Nominal Pipe Length (Feet)	Nominal Diameter (Inches)	MOP (psig)	MAOP (psig)	Design Press. (psig)	Future Design Press. (psig)
MISSION TRAIL REGION						
COAST DIVISION						
Santa Cruz	7,221	30"	618	618	618	660
	4,838	34"	618	618	618	660
REDWOOD REGION						
MARIN DIVISION						
San Rafael	37,392	30"	650	650	690	690
SACRAMENTO VALLEY REGION						
COLGATE DIVISION						
Yuba City	24,784	34"	525	525	550	550
SACRAMENTO DIVISION						
Sacramento	78,452	34"	500	500	500	500
	3,984	36"	500	500	500	500
	10,956	42"	500	500	500	500
SAN JOAQUIN VALLEY REGION						
FRESNO DIVISION						
Fresno	43,722	30"	690	690	690	690

REV. 9

DRAWING NUMBER 086868

P G & E CO.

SHEET OF SHEETS

LINES OPERATING AT OR OVER 20% SMYS

EXHIBITS

"A" - Clear film format

"B" - Data section sources

"C" - Sliding mile template

"D" - Template instructions

"E" - Class location examples

"F" - Mileage/footage conversion table

"G" - Welding pressure tables

"H" - Form 76-1482 (Computations)

"I" - Pipeline Survey (Transmission)

"J" - Pipeline Survey (Collection System)

		1	2	3	4	5	6	7	8	9	10
PIPE DATA	JOINT EFFICIENCY										
	GIRTH WELDS										
	LONG. SEAMS										
	S M Y S (PSIG)										
	GRADE										
	WALL THICKNESS										
	SIZE (OD)										
	DESIGN FACTOR										
	*DESIGN PRESSURE (PSIG)										
TEST DATA	DATE										
	PRESSURE (PSIG)/DURATION										
	TEST MEDIUM										
	TEST REPORT NO.										
	WELD INSPECTION										
	WELD REPORT NO.										
OPERATING DATA	MAOP (PSIG)										
	% SMYS AT MAOP										
	MOP (PSIG) & % SMYS										
	% SMYS PERMIT/PRESENT LOC CLASS										
	MAOP DURING WELDING SEC. 2.8	2									
	GAS STANDARD A-65 SEC. 2.8	3									
	LEAK: PRIOR YEARS										
	LEAK: PRESENT YEAR										
	CATHODIC PROTECTION: STATIONS & DATE INSTALLED					THIS SECTION OF TRANSMISSION LINE IS CATHODICALLY PROTECTED BY RECTIFIERS SHOWN ON ADJACENT SHEETS					
	CATHODIC PROTECTION: SURVEY DATE										
	PIPE COATING: TYPE										
	PIPE COATING: CONDITION										
	OPERATING FAILURE: DATE										
	OPERATING FAILURE: LOCATION										
	OPERATING FAILURE: TYPE										
LOCATION DATA	G.M. NUMBER OR JOB NUMBER AND YEAR INSTALLED										
	FINAL STATIONS FROM TRANSMISSION LINE PLATS										
	APPROXIMATE MILE POINT										
	CLASS: AS BUILT										
	CLASS: PRESENT										
	NO. DWELLINGS										

PIPELINE LOCATION

Order from:

Steve Niemann
Gas System Planning, Rm 2987
77 Beale, SF

SYMBOLS:

- 57 INTERNAL CORROSION LEAK AND YEAR.
- 49 EXTERNAL CORROSION LEAK AND YEAR.
- 65 LEAKAGE DUE TO OTHER CAUSE (DESCRIBE).
- EX: 3 57 3 INTERNAL LEAKS IN 1957 IN CLOSE PROXIMITY
- 60 CATHODIC PROTECTION STATION & YEAR INST. (INDICATE TYPE RECTIFIER OR CODE).
- * DESIGN PRESSURE REQUIREMENTS FOR REPLACEMENT PIPE SEE SP 463-8.

- □ SINGLE DWELLING UNIT
- ⊡ MULTIPLE DWELLING UNIT (INDICATE NO. OF SINGLE UNITS)
- • BUILDING OCCUPIED BY 20 OR MORE PERSONS DURING NORMAL USE
- ○ OUTSIDE AREA OCCUPIED BY 20 OR MORE PERSONS DURING NORMAL USE
- ■ BUILDING WITH 4 OR MORE STORIES

TABLE OF CHANGES

NO.	DATE	DESCRIPTION	BY	APPR

APPROVED BY

GAS OPERATIONS

DES.
CH.
CHK.
DATE

SCALE: 1" = 1000'

PIPELINE SURVEY

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

OPERATING MAP

SUPERSEDES

SUPERSEDED BY

SHEET SHEETS

DRAWING NUMBER 385121 CHANGE

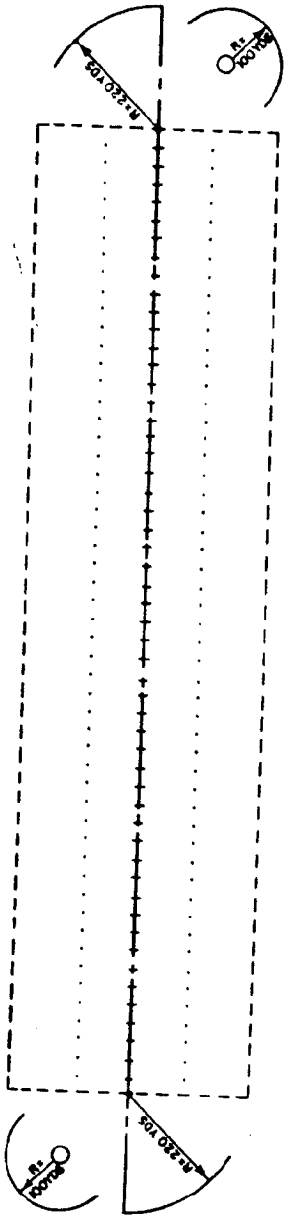
PIPE DATA	JOINT EFFICIENCY		...Density survey; GO 112D, 192.113
	GIRTH WELDS		...Density survey
	LONG. SEAMS		...Density survey, pipeline plat, strength test repor
	S M Y S (PSIG)		" " "
	GRADE		" " "
	WALL THICKNESS		" " "
	SIZE (OD)		" " "
	DESIGN FACTOR		...GO 112D, 192.111
	*DESIGN PRESSURE (PSIG)		...SP 463-8
TEST DATA	DATE		...Strength test pressure report
	PRESSURE (PSIG)/DURATION		"
	TEST MEDIUM		"
	TEST REPORT NO.		"
	WELD INSPECTION		...Weld test reports in job copies
	WELD REPORT NO.		"
OPERATING DATA	MAOP (PSIG)		...Density survey, SP 463-8
	% SMYS AT MAOP		...See Formula Section
	MOP (PSIG) & % SMYS		"
	% SMYS PERMIT/PRESENT LOC CLASS		...GO 112D, 192.111
	MAOP DURING WELDING	SEC.2.#2	
	GAS STANDARD A-65	SEC.2.#3	...See Formula Section
	LEAK	PRIOR YEARS	...Density survey, Form As
		PRESENT YEAR	" "
	CATHODIC PROTECTION	STATIONS & DATE INSTALLED	...Density survey, plat sheets, C.P. files
		SURVEY DATE	" " "
	PIPE COATING	TYPE	...Density survey, pipeline sheets, survey standard
		CONDITION	" " "
	OPERATING FAILURE	DATE	...Density survey, annual report for lines over 20%
		LOCATION	" "
		TYPE	" "
LOCATION DATA	G.M.NUMBER OR JOB NUMBER AND YEAR INSTALLED		...Density survey, pipeline plats, job records
	FINAL STATIONS FROM TRANSMISSION LINE PLATS		...Pipeline plats
	APPROXIMATE MILE POINT		...See Formula Section, operating maps
	CLASS	AS BUILT	...GO 112D, 192.5
		PRESENT	"
		NO. DWELLINGS	"

...Density survey, C.P. files, Form As

SYMBOLS:

- 57 INTERNAL CORROSION LEAK AND YEAR.
- 49 EXTERNAL CORROSION LEAK AND YEAR.
- 65 LEAKAGE DUE TO OTHER CAUSE (DESCRIBE).
- EX: 3 57 3 INTERNAL LEAKS IN 1957 IN CLOSE PROXIMITY.
- 60 CATHODIC PROTECTION STATION & YEAR INST. (INDICATE TYPE RECTIFIER OR CODE).
- * DESIGN PRESSURE REQUIREMENTS FOR REPLACEMENT PIPE. SEE SP 463-8.

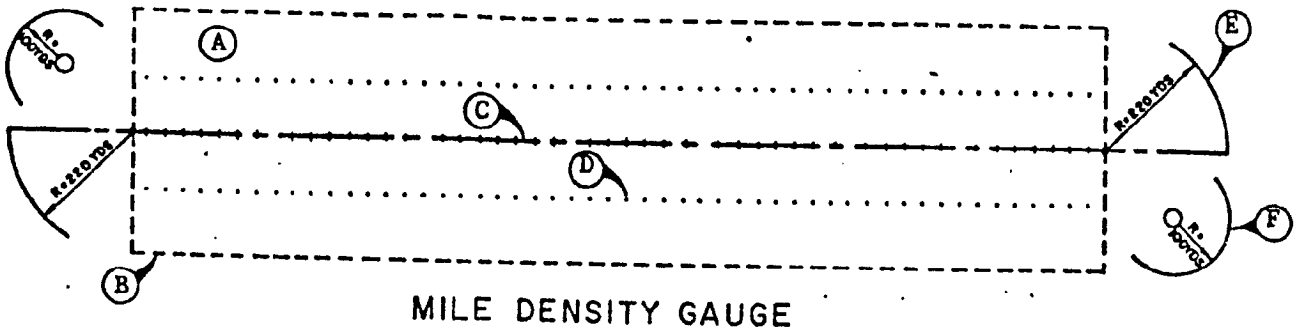
EXHIBIT "C"



MILE DENSITY GAUGE
1" = 1000'

EXHIBIT D

DESCRIPTION OF "MILE DENSITY GAUGE" TEMPLATE



MILE DENSITY GAUGE

1"= 1000'

(A) The template's transparency allows it to be overlayed on the survey sheet, permitting easy accounting of dwellings within any mile length.

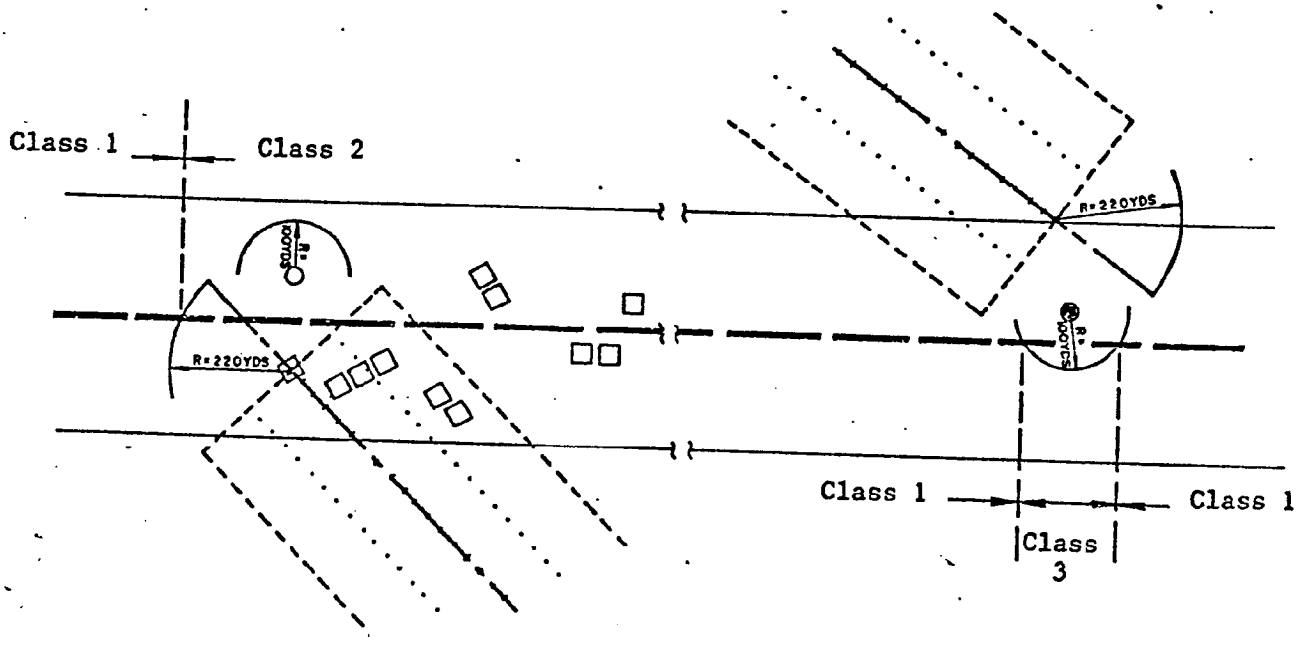
(B) The dashed line rectangle outlines a one mile long by one-quarter mile wide area, and is designed only for the new pipeline survey formats. (Dwg. 385121)

(C) The centerline is positioned over the pipeline to maintain the quarter-mile corridor. The tick marks are used as pivot points for angles in the pipeline.

(D) The parallel dotted line is scaled at 100 yds from the pipeline as a limit for any building or area of 20 or more persons, which would qualify by themselves as Class 3.

(E) The 220 yd radius is used to mark the Class 1, 2, 3, or 4 limit, as determined by the dwelling count. (See Example (E) below)

(F) The 100 yd radius is used to mark the Class 3 limit for buildings or areas of 20 or more persons that fall within 100 yds of the pipeline. (See Example (F) below)



EXAMPLE (E) :

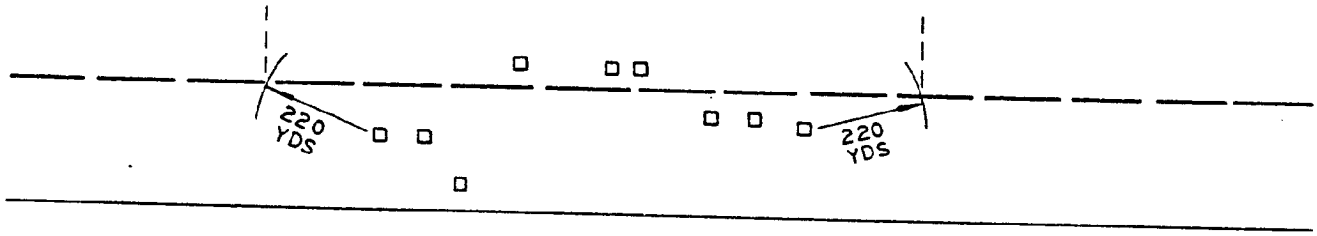
Place template over center of symbol; wherever arc crosses pipeline, it marks Class limit.

EXAMPLE (F) :

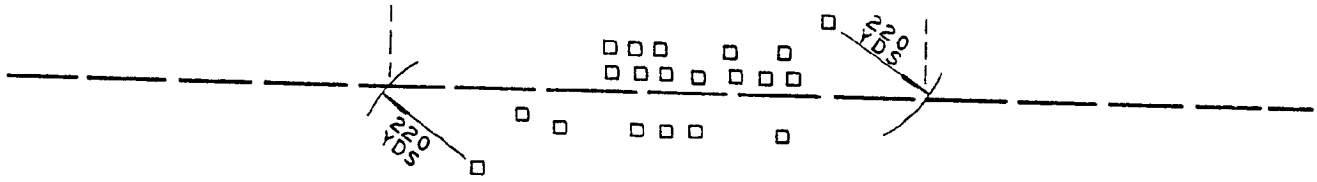
Position circle on template over dwelling symbol; wherever arc crosses pipeline at two points, it marks Class 3 length.

LOCATION CLASS LIMITS

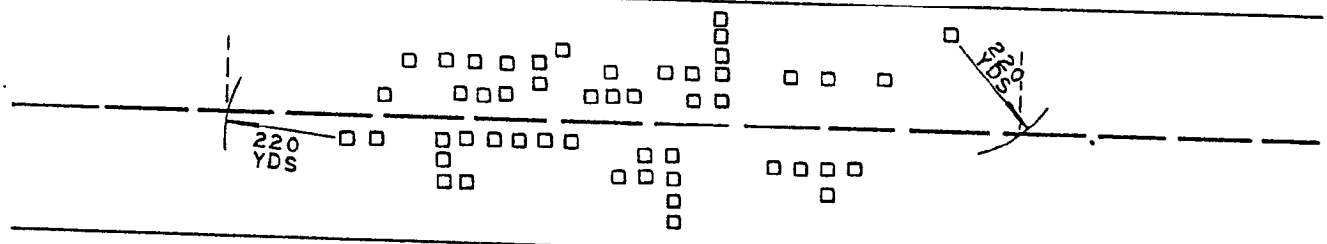
CLASS 1



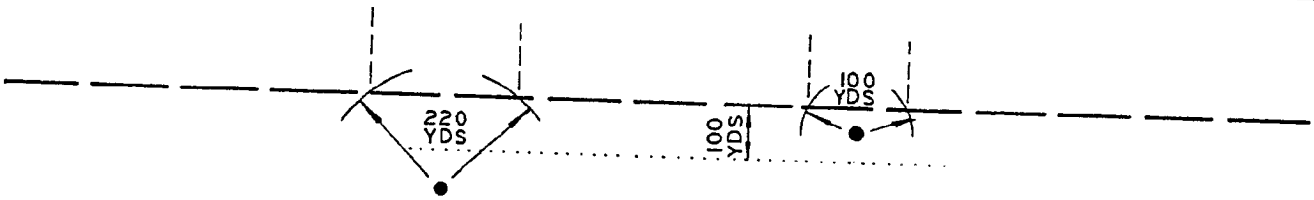
CLASS 2



CLASS 3



CLASS 3



CLASS 4

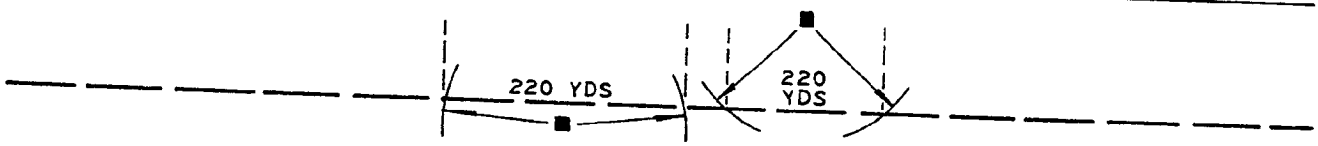


EXHIBIT "F"

Mileage/footage conversion table

	26.4		1346.4
.01 =	52.8	.26 =	1372.8
	79.2		1399.2
.02 =	105.6	.27 =	1425.6
	132.0		1452.0
.03 =	158.4	.28 =	1478.4
	184.8		1504.8
.04 =	211.2	.29 =	1531.2
	237.6		1557.6
.05 =	264.0	.30 =	1584.0
	290.4		1610.4
.06 =	316.8	.31 =	1636.8
	343.2		1663.2
.07 =	369.6	.32 =	1689.6
	396.0		1716.0
.08 =	422.4	.33 =	1742.4
	448.8		1768.8
.09 =	475.2	.34 =	1795.2
	501.6		1821.6
.10 =	528.0	.35 =	1848.0
	554.4		1874.4
.11 =	580.8	.36 =	1900.8
	607.2		1927.2
.12 =	633.6	.37 =	1953.6
	660.0		1980.0
.13 =	686.4	.38 =	2006.4
	712.8		2032.8
.14 =	739.2	.39 =	2059.2
	765.6		2085.6
.15 =	792.0	.40 =	2112.0
	818.4		2138.4
.16 =	844.8	.41 =	2164.8
	871.2		2191.2
.17 =	897.6	.42 =	2217.6
	924.0		2244.0
.18 =	950.4	.43 =	2270.4
	976.8		2296.8
.19 =	1003.2	.44 =	2323.2
	1029.6		2349.6
.20 =	1056.0	.45 =	2376.0
	1082.4		2402.4
.21 =	1108.8	.46 =	2428.8
	1135.2		2455.2
.22 =	1161.6	.47 =	2481.6
	1188.0		2508.0
.23 =	1214.4	.48 =	2534.4
	1240.8		2560.8
.24 =	1267.2	.49 =	2587.2
	1293.6		2613.6
.25 =	1320.0	.50 =	2640.0

	2666.4		3986.4
.51 =	2692.8	.76 =	4012.8
	2719.2		4039.2
.52 =	2745.6	.77 =	4065.6
	2772.0		4092.0
.53 =	2798.4	.78 =	4118.4
	2824.8		4144.8
.54 =	2851.2	.79 =	4171.2
	2877.6		4197.6
.55 =	2904.0	.80 =	4224.0
	2930.4		4250.4
.56 =	2956.8	.81 =	4276.8
	2983.2		4303.2
.57 =	3009.6	.82 =	4329.6
	3036.0		4356.0
.58 =	3062.4	.83 =	4382.4
	3088.8		4408.8
.59 =	3115.2	.84 =	4435.2
	3141.6		4461.6
.60 =	3168.0	.85 =	4488.0
	3194.4		4514.4
.61 =	3220.8	.86 =	4540.8
	3247.2		4567.2
.62 =	3273.6	.87 =	4593.6
	3300.0		4620.0
.63 =	3326.4	.88 =	4646.4
	3352.8		4672.8
.64 =	3379.2	.89 =	4699.2
	3405.6		4725.6
.65 =	3432.0	.90 =	4752.0
	3458.4		4778.4
.66 =	3484.8	.91 =	4804.8
	3511.2		4831.2
.67 =	3537.6	.92 =	4857.6
	3564.0		4884.0
.68 =	3590.4	.93 =	4910.4
	3616.8		4936.8
.69 =	3643.2	.94 =	4963.2
	3669.6		4989.6
.70 =	3696.0	.95 =	5016.0
	3722.4		5042.4
.71 =	3748.8	.96 =	5068.8
	3775.2		5095.2
.72 =	3801.6	.97 =	5121.6
	3828.0		5148.0
.73 =	3854.4	.98 =	5174.4
	3880.8		5200.8
.74 =	3907.2	.99 =	5227.2
	3933.6		5253.6
.75 =	3960.0	1.00 =	5280.0

WELDING PRESSURE TABLES

1. The tables are divided into two parts:

   a. One section for DSAW/SMLS pipe with 50% and 20% pressures.
   b. One section for ERW/other pipe with 40% and 20% pressures.

2. Both tables indicate the lower welding pressure for Section 2.1 as required by calculation comparison. (See Formula Section)

3. Do not round up pressure values, however, rounding up is necessary for wall thickness and some joint efficiency factors.

4. The "+" or "-" notation preceeding the numerical 'suffix' specifies which direction the decimal will be moved.

5. The following examples show how to read pipe specifications and pressures for Sections 2.1 and 2.2. Ignore the "E".

Diameter:	1.27500E+01 = 12.750"
Wall thickness:	2.80999E-01 = 0.281"
SMYS:	4.20000E+04 = 42,000
Joint Efficiency:	1.00000E+00 = 1.0
Joint Efficiency:	7.99999E-01 = 0.80
Section 2.1:	6.58822E+02 = 658
Section 2.2:	2.07058E+02 = 207

6. The tables are dichotomous keys whereby pressures are located by the following order:

   First select the required percentage table,

   Then select the pipe diameter,

   Then match its wall thickness,

   Then match its SMYS,

   Then match its joint efficiency,

   Then respective welding pressures will read on that line to the right of the joint efficiency.

SEAMLES DBLE SUB ARC "MAOP DURING WELDING"

DIAMETER	WALL THICK	SMYS	JT FACTOR	50% SEC 2.1	20% SEC 2.2
2.37500E+00	1.53999E-01	3.50000E+04	1.00000E+00	1.27326E+03	9.07789E+02
2.37500E+00	1.87999E-01	3.50000E+04	1.00000E+00	1.99477E+03	1.10820E+03
3.50000E+00	1.47999E-01	3.50000E+04	1.00000E+00	7.77599E+02	5.91999E+02
3.50000E+00	1.55999E-01	3.50000E+04	1.00000E+00	8.92799E+02	6.23999E+02
3.50000E+00	1.87999E-01	3.50000E+04	1.00000E+00	1.35359E+03	7.51999E+02
3.50000E+00	2.15999E-01	3.50000E+04	1.00000E+00	1.75679E+03	8.63999E+02
3.50000E+00	2.25999E-01	3.00000E+04	1.00000E+00	1.62925E+03	7.74856E+02
4.50000E+00	1.40999E-01	3.50000E+04	1.00000E+00	5.26399E+02	4.38666E+02
4.50000E+00	1.47999E-01	3.50000E+04	1.00000E+00	6.04799E+02	4.60443E+02
4.50000E+00	1.55999E-01	3.50000E+04	1.00000E+00	6.94399E+02	4.65333E+02
4.50000E+00	1.87999E-01	3.50000E+04	1.00000E+00	1.05279E+03	5.84888E+02
4.50000E+00	2.15999E-01	3.50000E+04	1.00000E+00	1.36639E+03	6.71999E+02
4.50000E+00	2.36999E-01	3.50000E+04	1.00000E+00	1.60159E+03	7.37333E+02
4.50000E+00	2.36999E-01	2.40000E+04	1.00000E+00	1.09823E+03	5.05599E+02
4.50000E+00	2.36999E-01	3.00000E+04	1.00000E+00	1.37279E+03	6.31999E+02
4.50000E+00	2.80999E-01	3.50000E+04	1.00000E+00	2.09439E+03	8.74221E+02
4.50000E+00	3.36999E-01	3.50000E+04	1.00000E+00	2.62111E+03	1.04844E+03
6.62500E+00	1.55999E-01	4.20000E+04	1.00000E+00	5.66000E+02	3.95592E+02
6.62500E+00	1.87999E-01	3.00000E+04	1.00000E+00	6.12950E+02	3.40528E+02
6.62500E+00	1.87999E-01	3.50000E+04	1.00000E+00	7.15108E+02	3.97282E+02
6.62500E+00	1.87999E-01	4.20000E+04	1.00000E+00	8.58130E+02	4.76739E+02
6.62500E+00	2.02999E-01	3.00000E+04	1.00000E+00	7.10761E+02	3.67697E+02
6.62500E+00	2.15999E-01	3.50000E+04	1.00000E+00	9.28120E+02	4.56452E+02
6.62500E+00	2.18999E-01	3.50000E+04	1.00000E+00	9.50942E+02	4.62792E+02
6.62500E+00	2.18999E-01	4.20000E+04	1.00000E+00	1.14113E+03	5.55350E+02
6.62500E+00	2.19999E-01	3.50000E+04	1.00000E+00	9.58550E+02	4.64905E+02
6.62500E+00	2.50000E-01	3.00000E+04	1.00000E+00	1.01723E+03	4.52830E+02
6.62500E+00	2.50000E-01	3.50000E+04	1.00000E+00	1.18677E+03	5.28301E+02
6.62500E+00	2.79999E-01	3.00000E+04	1.00000E+00	1.21285E+03	5.07169E+02
DIA.	WT	SMYS	JT	2.1	2.2

• SMLS & DSAW •

DIA.	WT	SMYS	JT	50%	20%
6.62500E	2.79999E-01	3.50000E+04	1.00000E+00	1.41500E+03	5.51697E+02
6.62500E+00	2.79999E-01	4.20000E+04	1.00000E+00	1.69800E+03	7.10037E+02
6.62500E+00	3.11999E-01	3.50000E+04	1.00000E+00	1.64830E+03	6.59320E+02
6.62500E+00	3.75000E-01	3.50000E+04	1.00000E+00	1.98113E+03	7.92452E+02
6.62500E+00	4.31999E-01	3.50000E+04	1.00000E+00	2.28226E+03	9.12905E+02
8.62500E+00	1.87999E-01	3.00000E+04	1.00000E+00	4.70816E+02	2.61564E+02
8.62500E+00	1.87999E-01	3.50000E+04	1.00000E+00	5.49286E+02	3.05159E+02
8.62500E+00	1.87999E-01	4.20000E+04	1.00000E+00	6.59143E+02	3.66191E+02
8.62500E+00	2.02999E-01	3.50000E+04	1.00000E+00	6.36930E+02	3.29507E+02
8.62500E+00	2.18999E-01	3.00000E+04	1.00000E+00	6.26086E+02	3.04695E+02
8.62500E+00	2.18999E-01	3.50000E+04	1.00000E+00	7.30434E+02	3.55478E+02
8.62500E+00	2.18999E-01	4.20000E+04	1.00000E+00	8.76521E+02	4.26573E+02
8.62500E+00	2.19999E-01	3.50000E+04	1.00000E+00	7.36277E+02	3.57101E+02
8.62500E+00	2.50000E-01	3.50000E+04	1.00000E+00	9.11582E+02	4.05796E+02
8.62500E+00	2.50000E-01	4.20000E+04	1.00000E+00	1.09389E+03	4.86956E+02
8.62500E+00	2.76999E-01	3.50000E+04	1.00000E+00	1.06935E+03	4.49623E+02
8.62500E+00	2.80999E-01	3.50000E+04	1.00000E+00	1.09272E+03	4.56115E+02
8.62500E+00	2.99999E-01	3.50000E+04	1.00000E+00	1.20375E+03	4.86956E+02
8.62500E+00	3.11999E-01	3.50000E+04	1.00000E+00	1.26608E+03	5.06434E+02
8.62500E+00	3.12500E-01	3.50000E+04	1.00000E+00	1.26811E+03	5.07245E+02
8.62500E+00	3.21999E-01	3.00000E+04	1.00000E+00	1.11999E+03	4.47999E+02
8.62500E+00	3.21999E-01	3.50000E+04	1.00000E+00	1.30666E+03	5.22666E+02
8.62500E+00	3.75000E-01	3.50000E+04	1.00000E+00	1.52173E+03	6.08695E+02
8.62500E+00	3.87999E-01	4.20000E+04	1.00000E+00	1.88939E+03	7.55755E+02
8.62500E+00	5.00000E-01	3.50000E+04	1.00000E+00	2.02898E+03	8.11593E+02
8.62500E+00	5.00000E-01	4.20000E+04	1.00000E+00	2.43478E+03	9.73912E+02
1.07500E+01	2.18999E-01	3.50000E+04	1.00000E+00	5.86046E+02	2.85208E+02
1.07500E+01	2.18999E-01	4.20000E+04	1.00000E+00	7.03255E+02	3.42250E+02
1.07500E+01	2.18999E-01	5.20000E+04	1.00000E+00	8.70697E+02	4.23739E+02
1.07500E+01	2.19999E-01	3.00000E+04	1.00000E+00	5.06343E+02	2.45581E+02
				2.1	2.2

2-7MLS & DSAW

DIA.	WT	SMYS	JT	50%	20%
1.07500E	2.50000E-01	3.50000E+04	1.00000E+00	7.31385E+02	3 .81E+02
1.07500E+01	2.50000E-01	4.20000E+04	1.00000E+00	8.77663E+02	3.90697E+02
1.07500E+01	2.50000E-01	5.20000E+04	1.00000E+00	1.08663E+03	4.83720E+02
1.07500E+01	2.58999E-01	3.50000E+04	1.00000E+00	7.73580E+02	3.37302E+02
1.07500E+01	2.99999E-01	3.50000E+04	1.00000E+00	9.65803E+02	3.90697E+02
1.07500E+01	3.06999E-01	3.30000E+04	1.00000E+00	9.41550E+02	3.76967E+02
1.07500E+01	3.11999E-01	3.50000E+04	1.00000E+00	1.01581E+03	4.06325E+02
1.07500E+01	3.43999E-01	3.50000E+04	1.00000E+00	1.11999E+03	4.47999E+02
1.07500E+01	3.64999E-01	3.50000E+04	1.00000E+00	1.18837E+03	4.75348E+02
1.07500E+01	3.94999E-01	3.50000E+04	1.00000E+00	1.28604E+03	5.14418E+02
1.07500E+01	4.37999E-01	3.50000E+04	1.00000E+00	1.42604E+03	5.70418E+02
1.07500E+01	5.00000E-01	3.50000E+04	1.00000E+00	1.62790E+03	6.51162E+02
1.07500E+01	5.00000E-01	4.20000E+04	1.00000E+00	1.95348E+03	7.81394E+02
1.07500E+01	5.93999E-01	4.20000E+04	1.00000E+00	2.32074E+03	9.28297E+02
1.27500E+01	2.02999E-01	3.50000E+04	1.00000E+00	4.30869E+02	2.22901E+02
1.27500E+01	2.18999E-01	3.50000E+04	1.00000E+00	4.94117E+02	2.40470E+02
1.27500E+01	2.18999E-01	4.20000E+04	1.00000E+00	5.92940E+02	2.88564E+02
1.27500E+01	2.18999E-01	5.20000E+04	1.00000E+00	7.34117E+02	3.57270E+02
1.27500E+01	2.50000E-01	3.00000E+04	1.00000E+00	5.20564E+02	2.35294E+02
1.27500E+01	2.50000E-01	3.50000E+04	1.00000E+00	6.16658E+02	2.74509E+02
1.27500E+01	2.50000E-01	4.20000E+04	1.00000E+00	7.39990E+02	3.29411E+02
1.27500E+01	2.50000E-01	5.20000E+04	1.00000E+00	9.16178E+02	4.07842E+02
1.27500E+01	2.58999E-01	3.50000E+04	1.00000E+00	6.52234E+02	2.84391E+02
1.27500E+01	2.80999E-01	3.50000E+04	1.00000E+00	7.39199E+02	3.08548E+02
1.27500E+01	2.80999E-01	4.20000E+04	1.00000E+00	8.87039E+02	3.70258E+02
1.27500E+01	2.80999E-01	4.60000E+04	1.00000E+00	9.71519E+02	4.05521E+02
1.27500E+01	3.06999E-01	3.50000E+04	1.00000E+00	8.41976E+02	3.37097E+02
1.27500E+01	3.11999E-01	3.00000E+04	1.00000E+00	7.34117E+02	2.93646E+02
1.27500E+01	3.11999E-01	3.50000E+04	1.00000E+00	8.56470E+02	3.42587E+02
1.27500E+01	3.12500E-01	3.50000E+04	1.00000E+00	8.57843E+02	3.43136E+02
				2.1	2.2

SMLS & DSAW

DIA	WT	SMYS	JT	50%	20%
1.2750[illegible]	3.29999E-01	3.50000E+04	1.00000E+00	9.05881E+02	[illegible]352E+02
1.27500E+01	3.64999E-01	3.50000E+04	1.00000E+00	1.00196E+03	4.00783E+02
1.27500E+01	3.75000E-01	3.50000E+04	1.00000E+00	1.02941E+03	4.11764E+02
1.27500E+01	4.05999E-01	3.50000E+04	1.00000E+00	1.11450E+03	4.45803E+02
1.27500E+01	4.35999E-01	3.50000E+04	1.00000E+00	1.19686E+03	4.78744E+02
1.27500E+01	4.37999E-01	3.50000E+04	1.00000E+00	1.20235E+03	4.80940E+02
1.27500E+01	5.00000E-01	3.50000E+04	1.00000E+00	1.37254E+03	5.49019E+02
1.27500E+01	5.00000E-01	4.20000E+04	1.00000E+00	1.64705E+03	6.58822E+02
1.27500E+01	5.00000E-01	4.60000E+04	1.00000E+00	1.80392E+03	7.21568E+02
1.27500E+01	5.61999E-01	3.50000E+04	1.00000E+00	1.54274E+03	6.17097E+02
1.27500E+01	8.42999E-01	3.50000E+04	1.00000E+00	2.31411E+03	9.25646E+02
1.40000E+01	3.75000E-01	3.50000E+04	1.00000E+00	9.37500E+02	3.74999E+02
1.60000E+01	2.18999E-01	5.20000E+04	1.00000E+00	5.84999E+02	2.84699E+02
1.60000E+01	2.50000E-01	3.50000E+04	1.00000E+00	4.91399E+02	2.18749E+02
1.60000E+01	2.50000E-01	4.20000E+04	1.00000E+00	5.89679E+02	2.62499E+02
1.60000E+01	2.50000E-01	4.20000E+04	1.00000E+00	5.89679E+02	2.62499E+02
1.60000E+01	2.50000E-01	4.50000E+04	1.00000E+00	6.31799E+02	2.81249E+02
1.60000E+01	2.50000E-01	5.20000E+04	1.00000E+00	7.30079E+02	3.24999E+02
1.60000E+01	2.80999E-01	3.50000E+04	1.00000E+00	5.89049E+02	2.45874E+02
1.60000E+01	2.80999E-01	4.20000E+04	1.00000E+00	7.06859E+02	2.95049E+02
1.60000E+01	2.80999E-01	4.20000E+04	1.00000E+00	7.06859E+02	2.95049E+02
1.60000E+01	3.11999E-01	4.20000E+04	1.00000E+00	8.18999E+02	3.27599E+02
1.60000E+01	3.11999E-01	5.20000E+04	1.00000E+00	1.01399E+03	4.05599E+02
1.60000E+01	3.12500E-01	3.50000E+04	1.00000E+00	6.83593E+02	2.73437E+02
1.60000E+01	3.12500E-01	4.20000E+04	1.00000E+00	8.20312E+02	3.28124E+02
1.60000E+01	3.12500E-01	4.20000E+04	1.00000E+00	8.20312E+02	3.28124E+02
1.60000E+01	3.12500E-01	5.20000E+04	1.00000E+00	1.01562E+03	4.06249E+02
1.60000E+01	3.12500E-01	5.20000E+04	1.00000E+00	1.01562E+03	4.06249E+02
1.60000E+01	3.21999E-01	3.50000E+04	1.00000E+00	7.04374E+02	2.81749E+02
1.60000E+01	3.75000E-01	3.50000E+04	1.00000E+00	8.20312E+02	3.28124E+02
				2.1	2.2

- SMLS & DSAW -

DIA.	WT	SMYS	JT	50% 2.1	20% 2.2
1.60000	3.75000E-01	3.50000E+04	1.00000E+00	8.20312E+02	.124E+02
1.60000E+01	3.75000E-01	4.20000E+04	1.00000E+00	9.84375E+02	3.93749E+02
1.60000E+01	4.00999E-01	3.50000E+04	1.00000E+00	8.77187E+02	3.50874E+02
1.60000E+01	5.00000E-01	3.50000E+04	1.00000E+00	1.09375E+03	4.37499E+02
1.60000E+01	5.19999E-01	3.00000E+04	1.00000E+00	9.74999E+02	3.89999E+02
1.60000E+01	5.19999E-01	3.50000E+04	1.00000E+00	1.13749E+03	4.54999E+02
1.60000E+01	6.05999E-01	5.70000E+04	1.00000E+00	2.15887E+03	8.63549E+02
1.60000E+01	6.79999E-01	5.20000E+04	1.00000E+00	2.20999E+03	8.83999E+02
1.80000E+01	2.50000E-01	5.20000E+04	1.00000E+00	6.48959E+02	2.88888E+02
1.80000E+01	3.12500E-01	4.20000E+04	1.00000E+00	7.29166E+02	2.91666E+02
1.80000E+01	3.75000E-01	5.20000E+04	1.00000E+00	1.08333E+03	4.33333E+02
2.00000E+01	2.50000E-01	3.50000E+04	1.00000E+00	3.93119E+02	1.74999E+02
2.00000E+01	2.50000E-01	4.20000E+04	1.00000E+00	4.71743E+02	2.09999E+02
2.00000E+01	2.50000E-01	4.20000E+04	1.00000E+00	4.71743E+02	2.09999E+02
2.00000E+01	2.50000E-01	5.20000E+04	1.00000E+00	5.84063E+02	2.59999E+02
2.00000E+01	2.80999E-01	3.50000E+04	1.00000E+00	4.71239E+02	1.96699E+02
2.00000E+01	2.80999E-01	4.20000E+04	1.00000E+00	5.65487E+02	2.36039E+02
2.00000E+01	2.80999E-01	5.20000E+04	1.00000E+00	7.00127E+02	2.92239E+02
2.00000E+01	2.81250E-01	3.50000E+04	1.00000E+00	4.71869E+02	1.96874E+02
2.00000E+01	3.11999E-01	3.50000E+04	1.00000E+00	5.45999E+02	2.18399E+02
2.00000E+01	3.11999E-01	4.20000E+04	1.00000E+00	6.55199E+02	2.62079E+02
2.00000E+01	3.11999E-01	4.20000E+04	1.00000E+00	6.55199E+02	2.62079E+02
2.00000E+01	3.11999E-01	4.60000E+04	1.00000E+00	7.17599E+02	2.87039E+02
2.00000E+01	3.11999E-01	5.20000E+04	1.00000E+00	8.11199E+02	3.24479E+02
2.00000E+01	3.12500E-01	3.50000E+04	1.00000E+00	5.46875E+02	2.18749E+02
2.00000E+01	3.12500E-01	4.20000E+04	1.00000E+00	6.56250E+02	2.62499E+02
2.00000E+01	3.12500E-01	5.20000E+04	1.00000E+00	8.12500E+02	3.24999E+02
2.00000E+01	3.12999E-01	4.20000E+04	1.00000E+00	6.57299E+02	2.62919E+02
2.00000E+01	3.43999E-01	4.20000E+04	1.00000E+00	7.22399E+02	2.88959E+02
2.00000E+01	3.43999E-01	5.20000E+04	1.00000E+00	8.94399E+02	3.57759E+02

• SMLS & DSAW •

DIA	WT	SMYS	JT	50%	20%
2.00000	3.75000E-01	3.50000E+04	1.00000E+00	6.56250E+02	[illegible]99E+02
2.00000E+01	3.75000E-01	4.20000E+04	1.00000E+00	7.87500E+02	3.14999E+02
2.00000E+01	3.75000E-01	5.20000E+04	1.00000E+00	9.75000E+02	3.89999E+02
2.00000E+01	5.00000E-01	3.50000E+04	1.00000E+00	8.75000E+02	3.49999E+02
2.00000E+01	5.00000E-01	4.20000E+04	1.00000E+00	1.05000E+03	4.19999E+02
2.00000E+01	5.00000E-01	3.50000E+04	1.00000E+00	8.75000E+02	3.49999E+02
2.00000E+01	5.00000E-01	5.20000E+04	1.00000E+00	1.30000E+03	5.19999E+02
2.00000E+01	7.19999E-01	6.00000E+04	1.00000E+00	2.15999E+03	8.63999E+02
2.20000E+01	2.50000E-01	3.50000E+04	1.00000E+00	3.57381E+02	1.59090E+02
2.20000E+01	2.80999E-01	3.50000E+04	1.00000E+00	4.28399E+02	1.78818E+02
2.20000E+01	2.80999E-01	4.20000E+04	1.00000E+00	5.14079E+02	2.14581E+02
2.20000E+01	2.85999E-01	5.20000E+04	1.00000E+00	6.53497E+02	2.70399E+02
2.20000E+01	3.11999E-01	3.50000E+04	1.00000E+00	4.96363E+02	1.98545E+02
2.20000E+01	3.11999E-01	4.20000E+04	1.00000E+00	5.95635E+02	2.38254E+02
2.20000E+01	3.12500E-01	3.50000E+04	1.00000E+00	4.97158E+02	1.98863E+02
2.20000E+01	3.12500E-01	5.20000E+04	1.00000E+00	7.38636E+02	2.95454E+02
2.20000E+01	3.43999E-01	4.20000E+04	1.00000E+00	6.56727E+02	2.62690E+02
2.20000E+01	3.75000E-01	3.50000E+04	1.00000E+00	5.96590E+02	2.38636E+02
2.20000E+01	3.75000E-01	4.20000E+04	1.00000E+00	7.15908E+02	2.86363E+02
2.20000E+01	6.59999E-01	6.00000E+04	1.00000E+00	1.79999E+03	7.19999E+02
2.20000E+01	7.91999E-01	6.00000E+04	1.00000E+00	2.15999E+03	8.63999E+02
2.40000E+01	2.50000E-01	4.20000E+04	1.00000E+00	3.93119E+02	1.74999E+02
2.40000E+01	2.50000E-01	5.20000E+04	1.00000E+00	4.86719E+02	2.16666E+02
2.40000E+01	2.70999E-01	6.00000E+04	1.00000E+00	6.37199E+02	2.70999E+02
2.40000E+01	2.79999E-01	4.00000E+04	1.00000E+00	4.46399E+02	1.86666E+02
2.40000E+01	2.80999E-01	3.50000E+04	1.00000E+00	3.92699E+02	1.63916E+02
2.40000E+01	2.80999E-01	4.00000E+04	1.00000E+00	4.48799E+02	1.87333E+02
2.40000E+01	2.80999E-01	4.20000E+04	1.00000E+00	4.71239E+02	1.96699E+02
2.40000E+01	2.80999E-01	4.50000E+04	1.00000E+00	5.04899E+02	2.10749E+02
2.40000E+01	2.80999E-01	5.20000E+04	1.00000E+00	5.83439E+02	2.43533E+02

2.1 2.2 lp

- SMLS & DSAW -

DIA	WT	SMYS	JT	50% 2.1	20% 2.2
2.40000	2.80999E-01	6.00000E+04	1.00000E+00	6.73199E+02	[illegible]999E+02
2.40000E+01	2.97999E-01	6.00000E+04	1.00000E+00	7.34399E+02	2.97999E+02
2.40000E+01	3.11999E-01	3.00000E+04	1.00000E+00	3.89999E+02	1.55999E+02
2.40000E+01	3.11999E-01	3.50000E+04	1.00000E+00	4.54999E+02	1.81999E+02
2.40000E+01	3.11999E-01	4.20000E+04	1.00000E+00	5.45999E+02	2.18399E+02
2.40000E+01	3.11999E-01	4.50000E+04	1.00000E+00	5.84999E+02	2.33999E+02
2.40000E+01	3.11999E-01	5.20000E+04	1.00000E+00	6.75999E+02	2.70399E+02
2.40000E+01	3.12500E-01	3.50000E+04	1.00000E+00	4.55729E+02	1.82291E+02
2.40000E+01	3.12500E-01	4.20000E+04	1.00000E+00	5.46875E+02	2.18749E+02
2.40000E+01	3.12500E-01	5.20000E+04	1.00000E+00	6.77083E+02	2.70833E+02
2.40000E+01	3.43999E-01	4.20000E+04	1.00000E+00	6.01999E+02	2.40799E+02
2.40000E+01	3.49999E-01	5.20000E+04	1.00000E+00	7.58333E+02	3.03333E+02
2.40000E+01	3.75000E-01	3.50000E+04	1.00000E+00	5.46875E+02	2.18749E+02
2.40000E+01	3.75000E-01	4.20000E+04	1.00000E+00	6.56250E+02	2.62499E+02
2.40000E+01	3.75000E-01	5.20000E+04	1.00000E+00	8.12500E+02	3.24999E+02
2.40000E+01	4.05999E-01	4.20000E+04	1.00000E+00	7.10499E+02	2.84199E+02
2.40000E+01	5.00000E-01	4.20000E+04	1.00000E+00	8.75000E+02	3.49999E+02
2.40000E+01	5.00000E-01	5.20000E+04	1.00000E+00	1.08333E+03	4.33333E+02
2.60000E+01	2.50000E-01	5.20000E+04	1.00000E+00	4.49279E+02	1.99999E+02
2.60000E+01	2.80999E-01	5.20000E+04	1.00000E+00	5.38559E+02	2.24799E+02
2.60000E+01	2.94999E-01	6.00000E+04	1.00000E+00	6.67938E+02	2.72307E+02
2.60000E+01	2.96999E-01	6.00000E+04	1.00000E+00	6.74584E+02	2.74153E+02
2.60000E+01	3.11999E-01	4.20000E+04	1.00000E+00	5.03999E+02	2.01599E+02
2.60000E+01	3.21999E-01	6.00000E+04	1.00000E+00	7.43076E+02	2.97230E+02
2.60000E+01	3.43999E-01	6.00000E+04	1.00000E+00	7.93845E+02	3.17538E+02
2.60000E+01	3.75000E-01	5.20000E+04	1.00000E+00	7.50000E+02	2.99999E+02
2.60000E+01	4.05999E-01	4.20000E+04	1.00000E+00	6.55845E+02	2.62338E+02
2.60000E+01	4.06999E-01	4.20000E+04	1.00000E+00	6.57461E+02	2.62984E+02
2.60000E+01	5.00000E-01	4.20000E+04	1.00000E+00	8.07692E+02	3.23076E+02
3.00000E+01	2.89999E-01	5.20000E+04	1.00000E+00	4.89215E+02	2.01066E+02

• SMLS & DSAW •

DIA	WT	SMYS	JT	50% 2.1	20% 2.2 A
3.00000E+	2.90999E-01	5.20000E+04	1.00000E+00	4.91711E+02	2.. E+02
3.00000E+01	2.97999E-01	6.00000E+04	1.00000E+00	5.87519E+02	2.38399E+02
3.00000E+01	3.11999E-01	4.20000E+04	1.00000E+00	4.36799E+02	1.74719E+02
3.00000E+01	3.11999E-01	4.60000E+04	1.00000E+00	4.78399E+02	1.91359E+02
3.00000E+01	3.11999E-01	5.20000E+04	1.00000E+00	5.40799E+02	2.16319E+02
3.00000E+01	3.12500E-01	4.20000E+04	1.00000E+00	4.37500E+02	1.74999E+02
3.00000E+01	3.12500E-01	4.40000E+04	1.00000E+00	4.58333E+02	1.83333E+02
3.00000E+01	3.12500E-01	5.20000E+04	1.00000E+00	5.41666E+02	2.16666E+02
3.00000E+01	3.32999E-01	6.00000E+04	1.00000E+00	6.65999E+02	2.66399E+02
3.00000E+01	3.49999E-01	5.20000E+04	1.00000E+00	6.06666E+02	2.42666E+02
3.00000E+01	3.59999E-01	5.20000E+04	1.00000E+00	6.23999E+02	2.49599E+02
3.00000E+01	3.75000E-01	4.20000E+04	1.00000E+00	5.25000E+02	2.09999E+02
3.00000E+01	3.75000E-01	4.40000E+04	1.00000E+00	5.50000E+02	2.19999E+02
3.00000E+01	3.75000E-01	5.20000E+04	1.00000E+00	6.50000E+02	2.59999E+02
3.00000E+01	5.00000E-01	5.20000E+04	1.00000E+00	8.66666E+02	3.46666E+02
3.00000E+01	5.00000E-01	6.00000E+04	1.00000E+00	1.00000E+03	3.99999E+02
3.20000E+01	3.59999E-01	6.00000E+04	1.00000E+00	6.74999E+02	2.69999E+02
3.40000E+01	3.11999E-01	5.20000E+04	1.00000E+00	4.77176E+02	1.90870E+02
3.40000E+01	3.43999E-01	5.20000E+04	1.00000E+00	5.26117E+02	2.10446E+02
3.40000E+01	3.49999E-01	5.20000E+04	1.00000E+00	5.35293E+02	2.14117E+02
3.40000E+01	4.21999E-01	5.20000E+04	1.00000E+00	6.45411E+02	2.58164E+02
3.40000E+01	4.37500E-01	4.80000E+04	1.00000E+00	6.17646E+02	2.47058E+02
3.40000E+01	4.37999E-01	5.20000E+04	1.00000E+00	6.69882E+02	2.67952E+02
3.40000E+01	5.00000E-01	4.20000E+04	1.00000E+00	6.17646E+02	2.47058E+02
3.40000E+01	5.00000E-01	4.60000E+04	1.00000E+00	6.76470E+02	2.70587E+02
3.60000E+01	3.11999E-01	5.20000E+04	1.00000E+00	4.50666E+02	1.80266E+02
3.60000E+01	3.49999E-01	5.20000E+04	1.00000E+00	5.05555E+02	2.02222E+02
3.60000E+01	3.59999E-01	5.20000E+04	1.00000E+00	5.19999E+02	2.07999E+02
3.60000E+01	3.59999E-01	5.20000E+04	1.00000E+00	5.19999E+02	2.07999E+02
3.60000E+01	3.59999E-01	6.00000E+04	1.00000E+00	5.99999E+02	2.39999E+02

• SMLS & DSAW •

				50%	20%
3.60000E-	4.05999E-01	5.20000E+04	1.00000E+00	5.86444E+02	2.[illegible]77E+02
3.60000E+01	4.21999E-01	5.20000E+04	1.00000E+00	6.09555E+02	2.43822E+02
3.60000E+01	4.31999E-01	6.00000E+04	1.00000E+00	7.19999E+02	2.87999E+02
3.60000E+01	4.37999E-01	5.20000E+04	1.00000E+00	6.32666E+02	2.53066E+02

ALL OTHER PIPE and ERW

DIAMETER	WALL THICK	SMYS	JT FACTOR	40% SEC 2.1	20% SEC 2.2
2.37500E+00	1.53999E-01	3.50000E+04	1.00000E+00	1.27326E+03	9.07789E+02
3.50000E+00	1.40999E-01	4.20000E+04	1.00000E+00	8.12159E+02	6.76799E+02
3.50000E+00	1.55999E-01	3.50000E+04	1.00000E+00	8.92799E+02	6.23999E+02
3.50000E+00	1.87999E-01	4.20000E+04	1.00000E+00	1.62431E+03	9.02399E+02
3.50000E+00	1.87999E-01	3.50000E+04	1.00000E+00	1.35359E+03	7.51999E+02
3.50000E+00	2.15999E-01	3.50000E+04	1.00000E+00	1.72799E+03	8.63999E+02
3.50000E+00	2.15999E-01	2.80000E+04	5.99999E-01	8.29438E+02	4.14719E+02
3.50000E+00	2.18999E-01	2.40000E+04	1.00000E+00	1.20137E+03	6.00685E+02
3.50000E+00	2.25999E-01	3.00000E+04	1.00000E+00	1.54971E+03	7.74856E+02
4.50000E+00	1.40999E-01	3.50000E+04	1.00000E+00	5.26399E+02	4.38666E+02
4.50000E+00	1.40999E-01	4.20000E+04	1.00000E+00	6.31679E+02	5.26399E+02
4.50000E+00	1.47999E-01	3.50000E+04	1.00000E+00	6.04799E+02	4.60443E+02
4.50000E+00	1.53999E-01	4.20000E+04	1.00000E+00	8.06399E+02	5.74933E+02
4.50000E+00	1.55999E-01	3.50000E+04	1.00000E+00	6.94399E+02	4.85333E+02
4.50000E+00	1.55999E-01	4.20000E+04	1.00000E+00	8.33279E+02	5.82399E+02
4.50000E+00	1.87999E-01	3.50000E+04	1.00000E+00	1.05279E+03	5.84888E+02
4.50000E+00	1.87999E-01	4.20000E+04	1.00000E+00	1.26335E+03	7.01866E+02
4.50000E+00	2.15999E-01	2.80000E+04	5.99999E-01	6.45119E+02	3.22559E+02
4.50000E+00	2.36999E-01	3.50000E+04	1.00000E+00	1.47466E+03	7.37333E+02
4.50000E+00	2.36999E-01	2.80000E+04	5.99999E-01	7.07839E+02	3.53919E+02
4.50000E+00	2.50000E-01	2.80000E+04	5.99999E-01	7.46666E+02	3.73333E+02
6.62500E+00	1.40999E-01	4.20000E+04	1.00000E+00	4.29065E+02	3.57554E+02
6.62500E+00	1.47999E-01	3.50000E+04	1.00000E+00	4.10807E+02	3.12754E+02

DIA. WT SMYS JT 2.1 2.2

Other pipe and ERW

DIA.	WT	SMYS	JT	40% 2.1	20% 2.2
6.62500E	1.55999E-01	4.20000E+04	1.00000E+00	5.66000E+02	3. 2E+02
6.62500E+00	1.71999E-01	4.20000E+04	1.00000E+00	7.12065E+02	4.36165E+02
6.62500E+00	1.87999E-01	2.80000E+04	7.99999E-01	5.00521E+02	2.54260E+02
6.62500E+00	1.87999E-01	3.00000E+04	7.99999E-01	5.44844E+02	2.72422E+02
6.62500E+00	1.87999E-01	3.50000E+04	7.99999E-01	6.35652E+02	3.17826E+02
6.62500E+00	1.87999E-01	3.50000E+04	1.00000E+00	7.15108E+02	3.97282E+02
6.62500E+00	1.87999E-01	4.20000E+04	1.00000E+00	8.58130E+02	4.76739E+02
6.62500E+00	2.18999E-01	4.20000E+04	1.00000E+00	1.11070E+03	5.55350E+02
6.62500E+00	2.50000E-01	4.20000E+04	1.00000E+00	1.26792E+03	6.33961E+02
6.62500E+00	2.50000E-01	5.20000E+04	1.00000E+00	1.56981E+03	7.84905E+02
6.62500E+00	2.79999E-01	3.50000E+04	7.99999E-01	9.46716E+02	4.73358E+02
6.62500E+00	2.79999E-01	4.20000E+04	1.00000E+00	1.42007E+03	7.10037E+02
6.62500E+00	5.61999E-01	4.20000E+04	1.00000E+00	2.85029E+03	1.42514E+03
8.62500E+00	1.71999E-01	4.20000E+04	1.00000E+00	5.46949E+02	3.35025E+02
8.62500E+00	1.87999E-01	3.00000E+04	1.00000E+00	4.70816E+02	2.61564E+02
8.62500E+00	1.87999E-01	3.50000E+04	1.00000E+00	5.49286E+02	3.05159E+02
8.62500E+00	1.87999E-01	4.20000E+04	1.00000E+00	6.59143E+02	3.66191E+02
8.62500E+00	1.87999E-01	4.60000E+04	1.00000E+00	7.21919E+02	4.01066E+02
8.62500E+00	2.02999E-01	3.50000E+04	1.00000E+00	6.36938E+02	3.29507E+02
8.62500E+00	2.02999E-01	3.50000E+04	1.00000E+00	6.36938E+02	3.29507E+02
8.62500E+00	2.02999E-01	4.20000E+04	1.00000E+00	7.64326E+02	3.95408E+02
8.62500E+00	2.18999E-01	3.00000E+04	7.99999E-01	4.87512E+02	2.43756E+02
8.62500E+00	2.18999E-01	4.20000E+04	1.00000E+00	8.53146E+02	4.26573E+02
8.62500E+00	2.18999E-01	2.40000E+04	7.99999E-01	3.90010E+02	1.95005E+02
8.62500E+00	2.36999E-01	4.20000E+04	1.00000E+00	9.23268E+02	4.61634E+02
8.62500E+00	2.50000E-01	3.30000E+04	7.99999E-01	6.12173E+02	3.06006E+02
8.62500E+00	2.50000E-01	4.20000E+04	1.00000E+00	9.73912E+02	4.86956E+02
8.62500E+00	2.79999E-01	4.20000E+04	1.00000E+00	1.09078E+03	5.45390E+02
8.62500E+00	3.12500E-01	4.20000E+04	1.00000E+00	1.21739E+03	6.08695E+02
8.62500E+00	3.21999E-01	2.40000E+04	7.99999E-01	5.73439E+02	2.86719E+02

Other pipe and ERW

DIA.	WT	SMYS	JT	40% 2.1	20% 2.2
8.62500	3.21999E-01	2.80000E+04	7.99999E-01	6.69012E+02	6E+02
8.62500E+00	3.21999E-01	4.20000E+04	1.00000E+00	1.25439E+03	6.27199E+02
8.62500E+00	5.00000E-01	4.20000E+04	1.00000E+00	1.94782E+03	9.73912E+02
1.07500E+01	1.87999E-01	4.20000E+04	1.00000E+00	5.28847E+02	2.93804E+02
1.07500E+01	1.87999E-01	5.20000E+04	1.00000E+00	6.54764E+02	3.63757E+02
1.07500E+01	1.94999E-01	3.15000E+04	7.99999E-01	3.65692E+02	1.82846E+02
1.07500E+01	2.18999E-01	3.50000E+04	1.00000E+00	5.70418E+02	2.85208E+02
1.07500E+01	2.18999E-01	4.20000E+04	1.00000E+00	6.84501E+02	3.42250E+02
1.07500E+01	2.50000E-01	3.50000E+04	1.00000E+00	6.51162E+02	3.25581E+02
1.07500E+01	2.50000E-01	4.20000E+04	1.00000E+00	7.81394E+02	3.90697E+02
1.07500E+01	2.78999E-01	3.50000E+04	1.00000E+00	7.26697E+02	3.63348E+02
1.07500E+01	2.78999E-01	4.20000E+04	1.00000E+00	8.72036E+02	4.36018E+02
1.07500E+01	2.89999E-01	3.50000E+04	1.00000E+00	7.55348E+02	3.77674E+02
1.07500E+01	3.06999E-01	4.20000E+04	1.00000E+00	9.59552E+02	4.79776E+02
1.07500E+01	3.11999E-01	4.20000E+04	1.00000E+00	9.75180E+02	4.87590E+02
1.07500E+01	3.12500E-01	4.20000E+04	1.00000E+00	9.76743E+02	4.88371E+02
1.27500E+01	2.02999E-01	5.20000E+04	1.00000E+00	6.40149E+02	3.31167E+02
1.27500E+01	2.02999E-01	4.20000E+04	1.00000E+00	5.17044E+02	2.67482E+02
1.27500E+01	2.02999E-01	4.20000E+04	1.00000E+00	5.17044E+02	2.67482E+02
1.27500E+01	2.18999E-01	3.50000E+04	7.99999E-01	3.84752E+02	1.92376E+02
1.27500E+01	2.18999E-01	4.20000E+04	1.00000E+00	5.77128E+02	2.88564E+02
1.27500E+01	2.18999E-01	5.20000E+04	1.00000E+00	7.14540E+02	3.57270E+02
1.27500E+01	2.50000E-01	3.50000E+04	1.00000E+00	5.49019E+02	2.74509E+02
1.27500E+01	2.50000E-01	3.30000E+04	7.99999E-01	4.14117E+02	2.07058E+02
1.27500E+01	2.50000E-01	4.20000E+04	1.00000E+00	6.58822E+02	3.29411E+02
1.27500E+01	2.50000E-01	3.30000E+04	7.99999E-01	4.14117E+02	2.07058E+02
1.27500E+01	2.50000E-01	4.60000E+04	1.00000E+00	7.21568E+02	3.60783E+02
1.27500E+01	2.50000E-01	5.20000E+04	1.00000E+00	8.15685E+02	4.07842E+02
1.27500E+01	2.80999E-01	3.50000E+04	1.00000E+00	6.17097E+02	3.08548E+02
1.27500E+01	2.80999E-01	4.20000E+04	1.00000E+00	7.40517E+02	3.70258E+02

Other pipe and ERW

DIA.	WT	SMYS	JT	40% 2.1	20% 2.2
1.27500L	2.00999E-01	4.60000E+04	1.00000E+00	8.11042E+02	E+02
1.27500E+01	3.11999E-01	4.20000E+04	1.00000E+00	8.22211E+02	4.11105E+02
1.27500E+01	3.12500E-01	4.20000E+04	1.00000E+00	8.23529E+02	4.11764E+02
1.27500E+01	3.32999E-01	4.20000E+04	1.00000E+00	8.77552E+02	4.38775E+02
1.27500E+01	3.75000E-01	4.20000E+04	1.00000E+00	9.88234E+02	4.94117E+02
1.27500E+01	4.05999E-01	3.50000E+04	1.00000E+00	8.91607E+02	4.45803E+02
1.27500E+01	4.05999E-01	4.20000E+04	1.00000E+00	1.06992E+03	5.34964E+02
1.27500E+01	5.00000E-01	4.20000E+04	1.00000E+00	1.31764E+03	6.58822E+02
1.27500E+01	5.00000E-01	4.60000E+04	1.00000E+00	1.44313E+03	7.21568E+02
1.60000E+01	2.18999E-01	4.20000E+04	1.00000E+00	4.59899E+02	2.29949E+02
1.60000E+01	2.50000E-01	3.00000E+04	7.99999E-01	2.99999E+02	1.49999E+02
1.60000E+01	2.50000E-01	3.30000E+04	7.99999E-01	3.29999E+02	1.64999E+02
1.60000E+01	2.50000E-01	3.50000E+04	7.99999E-01	3.49999E+02	1.74999E+02
1.60000E+01	2.50000E-01	3.30000E+04	7.99999E-01	3.29999E+02	1.64999E+02
1.60000E+01	2.50000E-01	3.50000E+04	1.00000E+00	4.37499E+02	2.18749E+02
1.60000E+01	2.50000E-01	4.20000E+04	1.00000E+00	5.24999E+02	2.62499E+02
1.60000E+01	2.50000E-01	4.60000E+04	1.00000E+00	5.74999E+02	2.87499E+02
1.60000E+01	2.50000E-01	5.20000E+04	1.00000E+00	6.49999E+02	3.24999E+02
1.60000E+01	2.80999E-01	3.30000E+04	7.99999E-01	3.70919E+02	1.85459E+02
1.60000E+01	2.80999E-01	4.20000E+04	1.00000E+00	5.90099E+02	2.95049E+02
1.60000E+01	2.80999E-01	4.20000E+04	1.00000E+00	5.90099E+02	2.95049E+02
1.60000E+01	2.80999E-01	4.60000E+04	1.00000E+00	6.46299E+02	3.23149E+02
1.60000E+01	2.80999E-01	5.20000E+04	1.00000E+00	7.30599E+02	3.65299E+02
1.60000E+01	3.11999E-01	4.20000E+04	1.00000E+00	6.55199E+02	3.27599E+02
1.60000E+01	3.11999E-01	3.50000E+04	1.00000E+00	5.45999E+02	2.72999E+02
1.60000E+01	3.11999E-01	5.20000E+04	1.00000E+00	8.11199E+02	4.05599E+02
1.60000E+01	3.12500E-01	2.40000E+04	7.99999E-01	2.99999E+02	1.49999E+02
1.60000E+01	3.12500E-01	3.50000E+04	1.00000E+00	5.46874E+02	2.73437E+02
1.60000E+01	3.12500E-01	4.20000E+04	1.00000E+00	6.56249E+02	3.28124E+02
1.60000E+01	3.75000E-01	3.50000E+04	1.00000E+00	6.56249E+02	3.28124E+02

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Other pipe and ERW

DIA.	WT	SMYS	JT	40% 2.1	20% 2.2
1.60000	3.75000E-01	4.20000E+04	1.00000E+00	7.87499E+02	9E+02
1.60000E+01	5.00000E-01	4.20000E+04	1.00000E+00	1.04999E+03	5.24999E+02
1.80000E+01	2.50000E-01	5.20000E+04	1.00000E+00	5.77777E+02	2.88888E+02
1.80000E+01	2.80999E-01	4.20000E+04	1.00000E+00	5.24533E+02	2.62266E+02
1.80000E+01	3.12500E-01	6.00000E+04	1.00000E+00	8.33333E+02	4.16666E+02
2.00000E+01	2.50000E-01	3.30000E+04	7.99999E-01	2.63999E+02	1.31999E+02
2.00000E+01	2.50000E-01	3.50000E+04	7.99999E-01	2.79999E+02	1.39999E+02
2.00000E+01	2.50000E-01	3.50000E+04	1.00000E+00	3.49999E+02	1.74999E+02
2.00000E+01	2.50000E-01	4.20000E+04	1.00000E+00	4.19999E+02	2.09999E+02
2.00000E+01	2.80999E-01	3.30000E+04	7.99999E-01	2.96735E+02	1.48367E+02
2.00000E+01	2.80999E-01	3.50000E+04	7.99999E-01	3.14719E+02	1.57359E+02
2.00000E+01	2.80999E-01	4.20000E+04	1.00000E+00	4.72079E+02	2.36039E+02
2.00000E+01	2.80999E-01	4.20000E+04	1.00000E+00	4.72079E+02	2.36039E+02
2.00000E+01	2.80999E-01	6.00000E+04	1.00000E+00	6.74399E+02	3.37199E+02
2.00000E+01	3.11999E-01	4.20000E+04	1.00000E+00	5.24159E+02	2.62079E+02
2.00000E+01	3.12500E-01	3.30000E+04	7.99999E-01	3.29999E+02	1.64999E+02
2.00000E+01	3.12500E-01	3.50000E+04	1.00000E+00	4.37499E+02	2.18749E+02
2.00000E+01	3.12500E-01	4.20000E+04	1.00000E+00	5.24999E+02	2.62499E+02
2.00000E+01	3.12999E-01	3.20000E+04	7.99999E-01	3.20511E+02	1.60255E+02
2.00000E+01	3.75000E-01	4.20000E+04	1.00000E+00	6.29999E+02	3.14999E+02
2.00000E+01	5.00000E-01	4.20000E+04	1.00000E+00	8.39999E+02	4.19999E+02
2.20000E+01	2.80999E-01	4.20000E+04	1.00000E+00	4.29163E+02	2.14581E+02
2.20000E+01	3.11999E-01	3.30000E+04	7.99999E-01	2.99519E+02	1.49759E+02
2.20000E+01	3.11999E-01	4.20000E+04	1.00000E+00	4.76508E+02	2.38254E+02
2.20000E+01	3.12500E-01	3.30000E+04	7.99999E-01	2.99999E+02	1.49999E+02
2.20000E+01	3.12500E-01	3.50000E+04	7.99999E-01	3.18181E+02	1.59090E+02
2.20000E+01	3.75000E-01	3.50000E+04	1.00000E+00	4.77272E+02	2.38636E+02
2.20000E+01	3.75000E-01	4.20000E+04	1.00000E+00	5.72727E+02	2.86363E+02
2.40000E+01	2.50000E-01	4.20000E+04	1.00000E+00	3.49999E+02	1.74999E+02
2.40000E+01	2.70999E-01	6.00000E+04	1.00000E+00	5.41999E+02	2.70999E+02

Other pipe and ERW

				40%	20%
2.40000	2.80999E-01	3.30000E+04	7.99999E-01	2.47279E+02	1.39E+02
2.40000E+01	2.80999E-01	3.90000E+04	7.99999E-01	2.92239E+02	1.46119E+02
2.40000E+01	2.80999E-01	3.50000E+04	1.00000E+00	3.27833E+02	1.63916E+02
2.40000E+01	2.80999E-01	4.00000E+04	1.00000E+00	3.74666E+02	1.87333E+02
2.40000E+01	2.80999E-01	4.20000E+04	1.00000E+00	3.93399E+02	1.96699E+02
2.40000E+01	2.80999E-01	5.20000E+04	1.00000E+00	4.87066E+02	2.43533E+02
2.40000E+01	3.11999E-01	3.30000E+04	7.99999E-01	2.74559E+02	1.37279E+02
2.40000E+01	3.11999E-01	4.20000E+04	1.00000E+00	4.36799E+02	2.18399E+02
2.40000E+01	3.11999E-01	5.20000E+04	1.00000E+00	5.40799E+02	2.70399E+02
2.40000E+01	3.12500E-01	3.50000E+04	1.00000E+00	3.64583E+02	1.82291E+02
2.40000E+01	3.12500E-01	4.20000E+04	1.00000E+00	4.37499E+02	2.18749E+02
2.40000E+01	3.43999E-01	4.20000E+04	1.00000E+00	4.81599E+02	2.40799E+02
2.40000E+01	3.75000E-01	4.20000E+04	1.00000E+00	5.24999E+02	2.62499E+02
2.40000E+01	3.75000E-01	5.20000E+04	1.00000E+00	6.49999E+02	3.24999E+02
2.60000E+01	2.80999E-01	3.30000E+04	7.99999E-01	2.28258E+02	1.14129E+02
2.60000E+01	3.11999E-01	3.30000E+04	7.99999E-01	2.53439E+02	1.26719E+02
2.60000E+01	3.11999E-01	4.20000E+04	1.00000E+00	4.03199E+02	2.01599E+02
2.60000E+01	3.11999E-01	5.20000E+04	1.00000E+00	4.99199E+02	2.49599E+02
2.60000E+01	3.21999E-01	6.00000E+04	1.00000E+00	5.94461E+02	2.97230E+02
2.60000E+01	3.75000E-01	4.20000E+04	1.00000E+00	4.84615E+02	2.42307E+02
3.00000E+01	3.11999E-01	5.20000E+04	1.00000E+00	4.32639E+02	2.16319E+02
3.00000E+01	3.75000E-01	4.20000E+04	1.00000E+00	4.19999E+02	2.09999E+02
3.00000E+01	3.75000E-01	5.20000E+04	1.00000E+00	5.19999E+02	2.59999E+02
3.40000E+01	3.43999E-01	5.20000E+04	1.00000E+00	4.20893E+02	2.10446E+02
3.40000E+01	3.75000E-01	4.60000E+04	1.00000E+00	4.05802E+02	2.02941E+02
DIA.	WT	SMYS	JT	2.1	2.2

IBM1811I 'ONCODE'=0070 'ENDFILE' CONDITION RAISED ('ONFILE'= SYSIN)
AT OFFSET +0003E8 IN PROCEDURE WITH ENTRY A65MAOP

DWG. NO. _____ Sheet ___ of ___ Sheets

PIPELINE SURVEY COMPUTATIONS

LINE NO. _____ DIVISION _____ COUNTY _____

Made By _____ Checked By _____ Date _____

76-1482(3-82)

MILE POINT	FINAL STATION	GM/WO NO., PIPE SPECS., ETC.	PLAT SHEET DWG. NO.

1 385121-8

EXHIBIT "I"

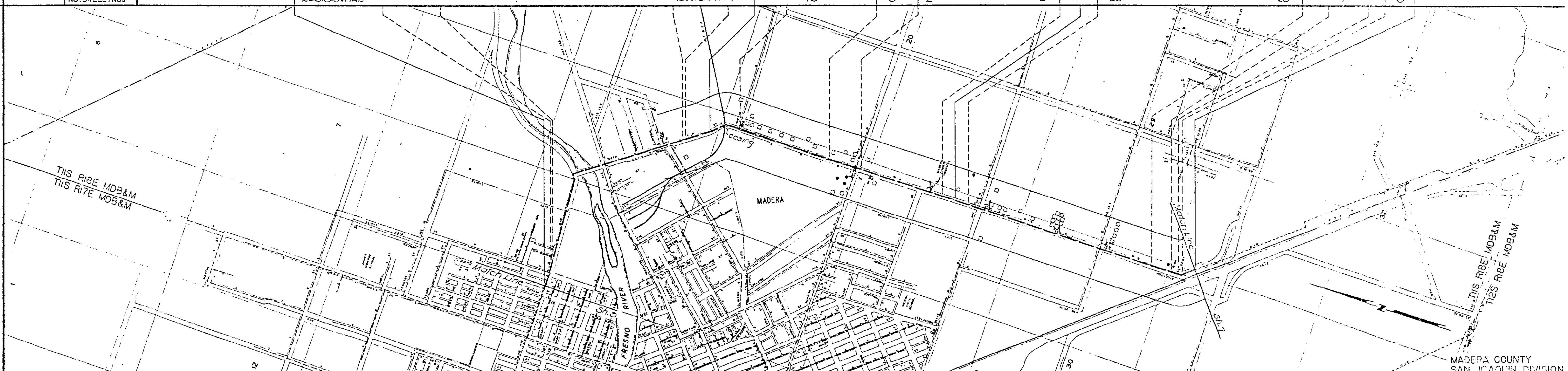
PIPE DATA / TEST DATA / OPERATING DATA (by pipe segment)

Item	MP 25.00–24.90	MP 24.90–24.89	MP 24.89–24.11	MP 24.11–24.10	MP 24.10–22.00
JOINT EFFICIENCY	1.0				1.0
GIRTH WELDS	ARC WELD				ARC WELD
LONG. SEAMS	SMLS				SMLS
S M Y S (PSIG)	35,000	42,000	35,000		35,000
GRADE	▲API 5L GR B	API 5L X42	▲API 5L GR B / ▲API 5L GR B	API 5L GR B	▲API 5L GR B / ▲API 5L GR B
WALL THICKNESS	0.250"	0.25"	0.250" / 0.250"	0.322"	0.250" / 0.250"
SIZE (OD)	8.626"				8.625"
DESIGN FACTOR					
*DESIGN PRESSURE (PSIG)	720				720
DATE (TEST)		1974		1973	
PRESSURE (PSIG)	LEAK TEST ONLY	1600	LEAK TEST ONLY	1100	LEAK TEST ONLY / LEAK TEST ONLY
TEST MEDIUM		WATER		WATER	
TEST REPORT NO.					
WELD INSPECTION					
WELD REPORT NO.					
MAOP (PSIG)	400				400
% SMYS AT MAOP	19.7	18.8	19.7 / 19.7	15.3	19.7 / 19.7
MOP (PSIG) & % SMYS	400-19.7	18.8	19.7 / 19.7	15.3	19.7 / 400-19.7
% SMYS PERMIT/PRESENT LOC CLASS	50				50
MAOP DURING WELDING SEC. 2.1					
GAS STANDARD A-65 SEC. 2.2					
LEAK – PRIOR YEARS	NONE				NONE
LEAK – PRESENT YEAR	NONE				NONE
CATHODIC PROTECTION – STATIONS & DATE INSTALLED					3/5 AMP 10/20 VOLT 71 CPS#110; 3/5 AMP 10/20 VOLT 71 CPS#108
CATHODIC PROTECTION – SURVEY DATE					
PIPE COATING – TYPE	H.A. ASPH.				H.A. ASPH.
PIPE COATING – CONDITION	GOOD				GOOD
OPERATING FAILURE – DATE					
OPERATING FAILURE – LOCATION	NONE				NONE
OPERATING FAILURE – TYPE					
G.M. NUMBER OR JOB NUMBER AND YEAR INSTALLED	GM41263 1931 537'	GM483612 1974 58'	GM41263 1931 4171'	WO3-4255A 1973 66'	GM41263 1931 11,254' / GM41263 1931 11,254'

LOCATION DATA

APPROXIMATE MILE POINT	FINAL STATIONS FROM TRANSMISSION LINE PLATS	CLASS – AS BUILT	CLASS – PRESENT	CLASS – NO. DWELLINGS
25.00	1319+32		3	RESIDENTIAL
24.90	1313+95 / 1313+99			
24.89	1313+41			
24.11	1271+70 / 1271+30			
24.10	1271+24		3	RESIDENTIAL
24.00	1265+87			
23.87	1258+90		2	10
23.45	1238+90		3	3
23.36	1232+20		2	2
			2	2
23.05	1214+86		3	2
23.00	1212+16			
22.95	1209+36		2	20
			2	20
22.18	1168+12			
22.10	1163+82		3	
V-22.07	1162+42			
22.06	1161+42		2	0
22.00	1158+70			

PIPELINE LOCATION



SYMBOLS:

- [57] INTERNAL CORROSION LEAK AND YEAR.
- (49) EXTERNAL CORROSION LEAK AND YEAR.
- (65) LEAKAGE DUE TO OTHER CAUSE (DESCRIBE).
- △50 CATHODIC PROTECTION STATION & YEAR INST. (INDICATE TYPE RECTIFIER OR CODE).
- EXAMPLE: 3 [57] 3 INTERNAL LEAKS IN 1957 IN CLOSE PROXIMITY.
- * DESIGN PRESSURE REQUIREMENTS FOR REPLACEMENT PIPE. SEE SP 463-8

- □ SINGLE DWELLING UNIT
- ⊡ MULTIPLE DWELLING UNIT (INDICATE NO. OF SINGLE UNITS)
- ● BUILDING OCCUPIED BY 20 OR MORE PERSONS DURING NORMAL USE
- ○ OUTSIDE AREA OCCUPIED BY 20 OR MORE PERSONS DURING NORMAL USE
- ■ BUILDING WITH 4 OR MORE STORIES

▲ DBL. BELL END CHILL RING

Ref. Maps: 3706, 3707, 3771

TABLE OF CHANGES

NO.	DATE	DESCRIPTION	BY	APPR
6	1-10-83	No Chg. Rec'd	WJ	

APPROVED BY: GB; [signature]

GAS OPERATIONS — DR. E.C. — CH. E.A.G. — OK. J.L.B. — DATE 7-21-77 — SCALES 1" = 1000'

PIPELINE SURVEY
SAN JOAQUIN DIVISION GAS LOAD CENTER TO WALNUT AVE – BRADBURY RD, TURLOCK
MP 22.00 TO MP 25.06
8" LINE 118
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

OPERATING MAP 384312 — SUPERSEDES C-20186 — SHEET 118-8 of 21 SHTS — DRAWING NUMBER 385121 — CHANGE 6

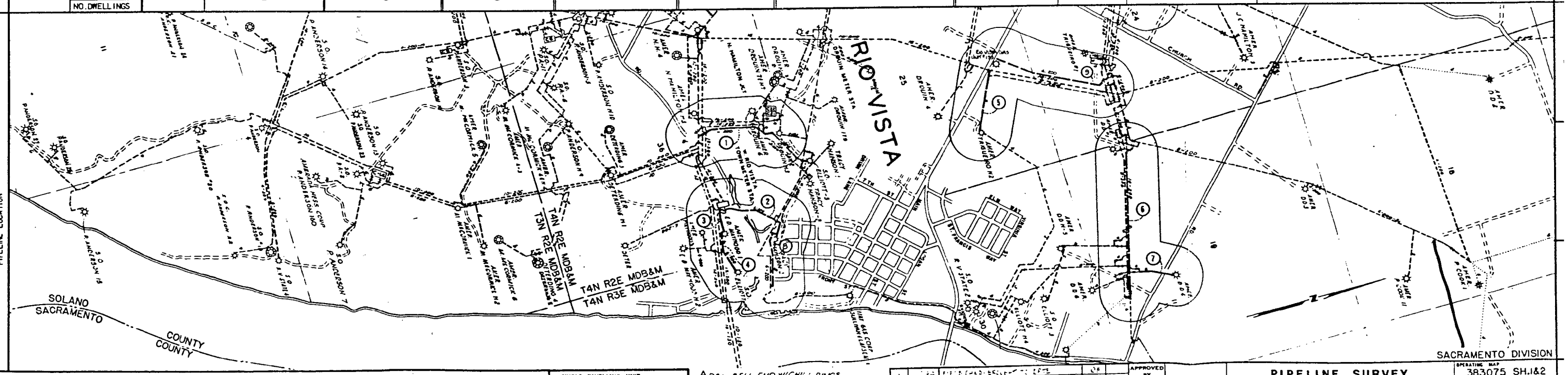
25-72

Material Redacted

GTR0007482

2008-2 5121-2

	1	2	3	4	5	6	7	8	9	10
PIPE DATA	JOINT EFFICIENCY	1.0					1.0	1.0		
	GIRTH WELDS	ARC WELD	SEE BELOW	ARC WELD			ARC WELD	ARC WELD		ARC WELD
	LONG. SEAMS	SMLS		SMLS / ERW	SMLS		SMLS	ERW		ERW
	S.M.Y.S. (PSIG)	35,000		35,000 / 42,000	35,000		35,000	42,000		35,000
	GRADE	API 5L GRB		API 5L GRB / API 5L X42	API 5L GRB		API 5L GRB	API 5L X42		API 5L GR B
	WALL THICKNESS	0.280"	0.219"	0.188"	0.35"	0.219"	0.219"	.219"		.156
	SIZE (OD)	6.625"			6.625"	10.750"	6.625"	8.625"		4.5
	DESIGN FACTOR									
	*DESIGN PRESSURE (PSIG)	800					800	720		800
TEST DATA	DATE							5-12-75		7-1-82
	PRESSURE (PSIG)	UNKNOWN					UNKNOWN	1140		1360
	TEST MEDIUM							WATER		WATER
	TEST REPORT NO.									
	WELD INSPECTION									
	WELD REPORT NO.									
OPERATING DATA	MAOP (PSIG)	510					510	720		800
	% SMYS AT MAOP	22.0	22.0	25.7	21.4	25.7	22.0	33.8		33.0
	MOP (PSIG) & % SMYS	510-22.0	22.0	25.7	21.4	25.7	22.0	510-33.0		510-81%
	% SMYS PERMIT/PRESENT LOC CLASS									
	MAOP DURING WELDING SEC. 2.1									
	GAS STANDARD A-65 SEC. 2.2									
	LEAK PRIOR YEARS	NONE					NONE			
	LEAK PRESENT YEAR	NONE					NONE			
	CATHODIC PROTECTION STATIONS & DATE INSTALLED	THIS SECTION OF TRANSMISSION LINE IS CATHODICALLY PROTECTED BY RECTIFIERS SHOWN ON ADJACENT SHEETS								
	CATHODIC PROTECTION SURVEY DATE									
	PIPE COATING TYPE	H.A. ASPH.					H.A. ASPH.	PL		PL
	PIPE COATING CONDITION									
	OPERATING FAILURE DATE									
	OPERATING FAILURE LOCATION	NONE					NONE	NONE		
	OPERATING FAILURE TYPE									
LOCATION DATA	G.M. NUMBER OR JOB NUMBER AND YEAR INSTALLED	GM 74600 1944 — 1697'	GM 60772 1950 — 1786'	GM 55556 1938 — 1100' / GM 56551 1938 — 641'	GM 166841 1967 — 65'	GM 75834 1946 — 782'	GM 74473 1945 — 1334'	GM 74501 1944 — 3010'	GM 74501 1944 — 360'	GM 182056 1974 — 1,601'	GM 4234308 1982 — 2683'
	FINAL STATIONS FROM TRANSMISSION LINE PLATS	16+97 / 0+00 Beg of Riser	0+00 / 6+44 / 17+86	10+51 / 12+71 / 13+12 Beg of Riser	0+00 / 0+65	0+00 / 4+66 / 8+48 Beg of Riser	0+00 / 13+34 Beg of Riser	30+30 / 0+20	0+00 / 3+60 Beg of Riser	16+01 Beg of Riser 0+00	26+87 Beg of Riser
	APPROXIMATE MILE POINT	0.00 / 0.32	0.00 / 0.34	0.00 / 0.03 / 0.15	0.00 / 0.01	0.00 / 0.16	0.00 / 0.26	0.00 / 0.22 / 0.57	0.00 / 0.15		
	CLASS AS BUILT	1 / 1	2 / 2 / 3 / 3	2 / 2	2 / 2	3 / 3	1 / 3 / 3	3	3 / 3	3 / 3 / 3	1 / 1
	CLASS PRESENT	1 / (1) / 1	2 / 2 / (2) / 3	2 / (3) / 2	2 / (4) / 2	3 / (5) / 3	1 / (6) / 3 / 3	3 / (7) / 3	3 / (8) / 3	1 / (9) / 1	
	CLASS NO. DWELLINGS										



SYMBOLS:
- (57) INTERNAL CORROSION LEAK AND YEAR.
- (49) EXTERNAL CORROSION LEAK AND YEAR.
- (65) LEAKAGE DUE TO OTHER CAUSE (DESCRIBE)
- • DESIGN PRESSURE REQUIREMENTS FOR REPLACEMENT PIPE SEE SP 463-8
- (56) CATHODIC PROTECTION STATION & YEAR INST. (INDICATE TYPE RECTIFIER OR CODE).
- EXAMPLE: 3 (57) 3 INTERNAL LEAKS IN 1957 IN CLOSE PROXIMITY.

- □ SINGLE DWELLING UNIT
- ⊡ MULTIPLE DWELLING UNIT (INDICATE NO. OF SINGLE UNITS)
- • BUILDING OCCUPIED BY 20 OR MORE PERSONS DURING NORMAL USE
- ○ OUTSIDE AREA OCCUPIED BY 20 OR MORE PERSONS DURING NORMAL USE
- ■ BUILDING WITH 4 OR MORE STORIES

△ DSL BELL END W/CHILL RINGS

▲ Some Final Stations are not known, so footages have been scaled from plot shts.

Ref. Mod: 500513

TABLE OF CHANGES

NO.	DATE	DESCRIPTION	BY	APPR
		FIELD CHECKED - AS BUILT		
		FIELD CHECKED - AS BUILT	CE	
1	11-1-82	FIELD CHECKED - AS BUILT	CE	
		FIELD CHECKED - AS BUILT	CE	
		FIELD CHECKED - AS BUILT	CE	

APPROVED BY

GAS OPERATIONS

DR. R.C.
CH. C.A.D.
DR. J. B.
DATE 3-22-83

SCALES 1" = 1000'

PIPELINE SURVEY
RIO VISTA FIELD COLLECTION SYSTEM
WEST SIDE, 510# SYSTEM
LINE 200
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

OPERATING MAP 383075 SH.1&2
SUPERSEDES
SUPERSEDED BY
SHEET 2008-2 OF 4
DRAWING NUMBER 385121
CHANGE 1

GTR0007483

Material Redacted