BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

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Order Instituting Rulemaking on the Commission's Own Motion to Adopt New Safety and Reliability Regulations for Natural Gas Transmission and Distribution Pipelines and Related Ratemaking Mechanisms.	)	Rulemaking 11-02-019 (Filed February 24, 2011)

REPORT OF SOUTHERN CALIFORNIA GAS COMPANY (U 904 G) AND SAN DIEGO GAS & ELECTRIC COMPANY (U 902 G) ON ACTIONS TAKEN IN RESPONSE TO THE NATIONAL TRANSPORTATION SAFETY BOARD SAFETY RECOMMENDATIONS

SHARON L. TOMKINS
DEANA M. NG

Attorneys for
SOUTHERN CALIFORNIA GAS COMPANY and
SAN DIEGO GAS & ELECTRIC COMPANY
555 West Fifth Street, Suite 1400
Los Angeles, California 90013-1011
Telephone: (213) 244-2955
Facsimile: (213) 629-9620
E-mail: STomkins@semprautilities.com

April 15, 2011

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On January 3, 2011, Executive Director Paul Clanon of the California Public Utilities Commission (Commission) notified Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E) that the National Transportation Safety Board (NTSB) had issued urgent safety recommendations to Pacific Gas and Electric Company in connection with its investigation of the natural gas pipeline rupture in San Bruno, California on September 9, 2010. Mr. Clanon directed us to report on those "steps [we] will take proactively to implement corrective actions as appropriate" for our natural gas transmission pipeline systems in light of three of the NTSB recommendations. Those recommendations, in short, require analysis and action for all pipeline segments located in Class 3 and Class 4 locations and Class 1 and Class 2 high consequence areas that have not been strength tested.[1]

[1] The specific NTSB safety recommendations are set out at pages 1 and 2 of the attached Report of Southern California Gas Company and San Diego Gas & Electric Company on Actions Taken in Response to NTSB Recommendations.

On February 1, SoCalGas and SDG&E sent a letter to Executive Director Clanon, outlining the steps we were taking in response to those NTSB recommendations, and assuring the Executive Director that we were giving the Commission's directive our highest priority. To that end, SoCalGas and SDG&E assembled a large team, under the direction of senior management, to perform a comprehensive, in-depth and exhaustive review of the records for the more than 1,600 miles of pipelines in SoCalGas' (1,416 miles) and SDG&E's (206 miles) service territories that meet the NTSB's criteria (Criteria Miles). These records span many decades and include numerous documents, such as work orders, design data sheets, hydrostatic test records and recording charts, material records, construction drawings, etc. The goal of our records review process was to conduct an intensive records search to identify gas transmission lines that had not previously been pressure tested and to develop plans for those lines to verify that they are being operated within an appropriate safety margin. The attached report provides a more detailed description of that process, our findings, and the actions we are taking or intend to take in light of those findings.

To summarize those results, we have determined that approximately 73% (1,033 miles) of SoCalGas' 1,416 Criteria Miles and 69% (142 miles) of SDG&E's Criteria Miles have documentation of hydrostatic or equivalent pressure tests (designated as Categories 1, 2 and 3 in the attached report). For the remaining 383 of SoCalGas' Criteria Miles and 64 of SDG&E's Criteria Miles (designated as Category 4), we have not yet located records sufficient to document that the pipelines have been strength tested per the NTSB recommendations. As we discuss at page nine of our report, we took a very conservative approach to the phrase "traceable, verifiable, and complete records" in the NTSB's recommendations. The maximum allowable operating pressures (MAOP) for these pipelines were established through existing regulations and are operated—as are all our pipelines—in a manner that meets or exceeds applicable rules and regulations.

SoCalGas and SDG&E have reviewed established MAOPs for all pipelines that were not included in Categories 1, 2, or 3. Nothing in our records review process revealed any significant concerns with the currently-established MAOPs for Category 4 pipelines. Accordingly, we remain confident that these pipelines are operating safely. In fact, 207 miles of the Category 4 Criteria Miles in SoCalGas' system have been assessed as part of our ongoing pipeline integrity program using in-line inspection technology (*i.e.,* smart pigs). Although not identical to a strength test, the in-line inspection process used by SoCalGas provides additional confidence in the integrity of the pipeline.

That said, SoCalGas and SDG&E recognize that natural gas utilities nationwide are entering a new era with respect to natural gas pipeline safety in light of the San Bruno pipeline rupture, and our commitment to safety must take that new era into account. Accordingly, we will take affirmative action with respect to all Category 4 miles. Those actions may include: (1) continuing examination of pipeline records; (2) performing system analyses to determine if the operating pressures can be reduced; (3) conducting strength testing, using water or other appropriate media; (4) validating the strength of the pipeline segments using non-destructive technologies such as in-line inspection, radiography or ultrasonic techniques; and (5) possible replacement of certain pipeline segments. We have also initiated additional monitoring activities with respect to these pipelines, including scheduling bi-monthly patrols and leakage surveys. More detail on these planned actions can be found in Section V of the attached report.

SoCalGas and SDG&E share a culture of safety that guides the operation of our gas transmission systems, and we remain committed to the safe operation of those systems. We are confident that our systems are safe and reliable. We are actively pursuing new ways to make our systems even safer and look forward to working with the Commission, industry experts and the customers we serve to identify opportunities to promote further advances in pipeline safety.

Dated this 15th day of April, 2011, at Los Angeles, California.

Respectfully submitted,

By: *\/s/ Richard M. Morrow*
Richard M. Morrow
Vice President – Engineering and Operations Staff
Southern California Gas Company and
San Diego Gas & Electric Company

\/s/ Sharon L. Tomkins
Sharon L. Tomkins

SHARON L. TOMKINS
DEANA M. NG

Attorneys for
SOUTHERN CALIFORNIA GAS COMPANY and
SAN DIEGO GAS & ELECTRIC COMPANY
555 West Fifth Street, Suite 1400
Los Angeles, California 90013-1011
Telephone: (213) 244-2955
Facsimile: (213) 629-9620
E-mail: STomkins@semprautilities.com

Report of
Southern California Gas Company
and
San Diego Gas & Electric Company
on
Actions Taken in Response to NTSB Safety Recommendations

April 15, 2011

Report of Southern California Gas Company and San Diego Gas & Electric Company on Actions Taken in Response to NTSB Safety Recommendations

I. Background

On January 3, 2011, the National Transportation and Safety Board (NTSB) issued several safety recommendations in connection with its investigation of the natural gas pipeline rupture and fire that occurred in San Bruno, California on September 9, 2010.[1] These NTSB safety recommendations focus on the importance of identifying pipeline segments that have not been strength tested after-construction for additional analysis and testing, and are specific to transmission pipelines in Class 3 and Class 4 locations and Class 1 and Class 2 high consequence areas (HCA). These Class 3, Class 4 and HCA pipelines are referred to as "Criteria Miles" throughout this report.

The three safety recommendations directed specifically to Pacific Gas and Electric Company (PG&E) are as follows:

NTSB Safety Recommendation P-10-2 (Urgent):

> Aggressively and diligently search for all as-built drawings, alignment sheets, and specifications, and all design, construction, inspection, testing, maintenance, and other related records, including those records in locations controlled by or firms other than Pacific Gas and Electric Company, relating to pipeline system components, such as pipe segments, valves, fittings, and weld seams for Pacific Gas and Electric Company natural gas transmission lines in class 3 and class 4 locations and class 1 and class 2 high consequence areas <u>that have not had a maximum allowable operating pressure established through prior hydrostatic testing</u>. These records should be traceable, verifiable, and complete. (emphasis added)

NTSB Safety Recommendation P-10-3 (Urgent):

> Use the traceable, verifiable, and complete records located by implementation of Safety Recommendation P-10-2 (Urgent) to determine the valid maximum allowable operating pressure, based on the weakest section of the pipeline or component to ensure safe operation, of Pacific Gas and Electric Company natural gas transmission lines in class 3 and class 4 locations and class 1 and class 2

[1] *See generally*, NTSB Safety Recommendations P-10-001(Urgent) through P-10-007 (Urgent).

> high consequence areas that have not had a maximum allowable operating pressure established through prior hydrostatic testing.

NTSB Safety Recommendation P-10-4:

> If you are unable to comply with Safety Recommendations P-10-2 (Urgent) and P-10-3 (Urgent) to accurately determine the maximum allowable operating pressure of Pacific Gas and Electric Company natural gas transmission lines in class 3 and class 4 locations and class 1 and class 2 high consequence areas that have not had a maximum allowable operating pressure established through prior hydrostatic testing, determine the maximum allowable operating pressure with a spike test followed by a hydrostatic pressure test.

These three recommendations are described as follows by the NTSB in a Press Advisory released on January 3, 2011:

> [T]he NTSB issued three safety recommendations, two of which were classified as urgent, to PG&E asking the utility operator to do the following:
>
> 1) Conduct an intensive records search to identify all the gas transmission lines that had not previously undergone a testing regimen designed to validate a safe operating pressure (urgent recommendation);
>
> 2) Determine the maximum operating pressure based on the weakest section of pipeline or component identified in the records search referenced above (urgent recommendation); and
>
> 3) If unable to validate a safe operating pressure through the methods described above, determine a safe operating pressure by a specified testing regimen.[2]

The NTSB also issued an urgent safety recommendation to the California Public Utilities Commission (the Commission) that same day to "immediately inform California intrastate natural gas transmission operators of the circumstances leading up to and the consequences of the September 9, 2010, pipeline rupture in San Bruno, California, and the National Transportation Safety Board's urgent safety recommendations to Pacific

[2] January 3, 2011 NTSB Press Release, available at: http://www.ntsb.gov/pressrel/2011/110103.html.

Gas and Electric Company so that pipeline operators can proactively implement corrective measures as appropriate for their pipeline systems."[3]

That same day, Paul Clanon, Executive Director of the Commission, sent a letter to Southern California Gas Company, Southwest Gas Corporation and San Diego Gas & Electric Company advising them of the Safety Recommendations to PG&E, and directing each to "pay particular attention to NTSB recommendations to PG&E titled P-10-2, P-10-3, and P-10-4."[4] The letter further directed each gas pipeline operator to report to the Executive Director by February 1, 2011, "detailing the steps you will take proactively to implement corrective actions as appropriate for your natural gas transmission pipeline systems located in California."[5]

The NTSB investigation into the cause of the San Bruno pipeline rupture is ongoing and the cause of the pipeline failure has yet to be determined. The NTSB released its first *Materials Laboratory Factual Report* for the San Bruno failure on January 21, 2011.[6] In this report, the NTSB provides information that suggests the rupture initiated at the long seam of one of the pipeline segments.[7] The steps outlined by NTSB in its safety recommendations to PG&E provide a pipeline operator with a means to verify that the pipeline has the required strength for service and is safe for operation.

On February 1, 2011, Richard M. Morrow, Vice President, Engineering & Operations Staff for SoCalGas and SDG&E, sent a responsive letter to Executive Director Clanon reporting on the steps that SoCalGas and SDG&E are taking proactively to implement corrective actions, as appropriate, for their natural gas transmission pipeline systems located in California. Mr. Morrow advised Executive Director Clanon that SoCalGas and SDG&E have given the Commission's directive their "highest priority" and that they

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[3] NTSB Safety Recommendation P-10-007 (Urgent), January 3, 2011. *See also* January 3, 2011 letter from the NTSB to Paul Clanon, Executive Director of the Commission, available at http://www3.ntsb.gov/recs/letters/2010/P-10-005-007.pdf.

[4] January 3, 2011 letter from Paul Clanon, Executive Director of the Commission to Michael Allman, President and Chief Executive Officer, Southern California Gas Company, Jeffrey Shaw, Chief Executive Officer, Southwest Gas Corporation, and Jesse Knight, Jr., Chairman and Chief Executive Officer, San Diego Gas & Electric Company, available at http://www.cpuc.ca.gov/NR/rdonlyres/CE921E44-7596-4B04-B875-A0F521FF27A3/0/LettertoSoCalUtilities010311.PDF.

[5] *Id*.

[6] *Material Laboratory Factual Report*, NTSB Report No. 10-119, dated January 21, 2011.

[7] *See id*, at 10 ("In summary, the fracture features in the center section of pipe were consistent with a crack that initiated in the pup 1 longitudinal seam. . . .")

"intend to work with the [Commission] to implement the NTSB's recommendations as expeditiously as possible."[8] Mr. Morrow further explained that:

> SoCalGas and SDG&E have assembled a large team, under the direction of senior management, to perform a comprehensive, in-depth, and exhaustive review of pipeline records in order to validate the MAOPs of these transmission pipelines. . . .
>
> Should a pipeline's MAOP not be validated per pressure test or calculation for the weakest section, SoCalGas and SDG&E will develop a plan to address that pipeline and consult with CPUC staff to review that plan.[9]

In addition, SoCalGas and SDG&E stated that they would continue their pipeline safety practices "through leak surveys, pipeline patrols, corrosion control monitoring, valve maintenance, and implementation of [their] transmission integrity management program, all of which continually evaluate and assess pipeline conditions and fitness for service."[10]

II. Summary

To address the NTSB's safety recommendations as expeditiously as possible, SoCalGas and SDG&E implemented a comprehensive process of records review and analysis that categorized pipelines and pipe segments for further action. That categorization process, which placed all relevant pipelines and pipeline segments operated by SoCalGas and SDG&E into one of four categories, is described in greater detail in Section III below. Briefly:

Category 1 includes those pipelines and pipeline segments that have documentation of hydrostatic pressure testing per NTSB Safety Recommendation P-10-2 (Urgent).

Category 2 includes those pipelines and pipeline segments that have documentation of pressure testing using a medium other than water.

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[8] Letter from Richard M. Morrow, Vice President, Engineering and Operations Staff for SoCalGas and SDG&E to Paul Clanon, Executive Director of the Commission, dated February 1, 2011, available at http://www.cpuc.ca.gov/NR/rdonlyres/7AADB320-E55A-44D9-B09C-60C30A99FA59/0/Document79.pdf.
[9] *Id*.
[10] *Id*.

Category 3 includes those pipelines and pipeline segments that have a documented highest historical operating pressure that is at least 1.25 times the current MAOP. Operation of a pipeline at a pressure that is at least 1.25 times its current MAOP essentially serves as an in-service strength test using natural gas as the medium. Accordingly, Categories 1, 2 and 3 have a demonstrated safety margin and, per NTSB Safety Recommendation P-10-2 (Urgent), do not require further action.

Category 4 includes all Criteria Mile pipeline segments that were not placed in Categories 1, 2, or 3. All Category 4 pipeline segments were prioritized for further analysis and action per NTSB Safety Recommendation P-10-4.

In Section IV, SoCalGas and SDG&E provide their records search results as of the date of the filing of this report.[11] Those results are also summarized in Table 1 below.

Table 1

Results, as of April 15, 2011, of SoCalGas and SDG&E Records Search
to Validate Safe Operating Pressure of Pipelines in
Class 3 and Class 4 Locations and Class 1 and Class 2 High Consequence Areas

	Demonstrated Safety Margin			Safety Margin to Be Verified	
	Category 1	Category 2	Category 3	Category 4	
	Hydro Statically Tested	Strength Tested with Nitrogen or Other Medium	Permanent Reduction in Operating Pressure	Activities in Progress to Validate Safety Margin	TOTAL
	NTSB P-10-2			NTSB P-10-4	
SoCalGas	734	272	27	383	1416
SDG&E	134	8.0	0.0	64	206

As indicated in Table 1 above, as of April 15, 2011, pipelines and pipeline segments placed in Categories 1, 2, and 3 represent 73% of the Criteria Miles owned by SoCalGas and 69% of the Criteria Miles owned by SDG&E. The percentage of Criteria Miles with a documented safety margin will increase as actions are taken to verify that Category 4 pipelines and pipeline segments have documented safety margins. For example,

[11] Activities to validate the maximum allowable operating pressure for Category 4 pipelines and pipeline segments are in progress. As those validation activities are completed, the pipelines and pipeline segments currently in Category 4 will be reclassified as having a documented safety margin.

SDG&E will complete system enhancements that will allow the reduction of the MAOP of Line 1600 to a level that results in a 1.25 times safety margin, which will meet the criteria for placement in Category 3. This action will result in 30 Criteria Miles owned by SDG&E being moved from Category 4 to Category 3, increasing the percentage of SDG&E-owned Criteria Miles in Categories 1, 2, and 3 from 69% to over 83%. Temporary pressure limiting controls for Line 1600 will be put in place within two weeks of this filing and permanent system modifications will be completed by year-end.

In Section V below, SoCalGas and SDG&E describe the actions they are taking to validate the integrity of all pipeline segments presently placed in Category 4. SoCalGas and SDG&E remain confident that these pipelines are operated safely, within MAOPs established through existing regulations, and in a manner that meets or exceeds applicable rules and regulations. Nevertheless, as a precautionary measure, the frequency of patrols and leakage surveys of each segment in Category 4 are being increased to occur on a bi-monthly basis. Additional actions are being planned on a segment-by-segment basis, which may include actions such as strength testing, a permanent reduction in operating pressure, direct examination of the long seam using non-destructive testing, or replacement of the pipeline segment.

III. Approach/Process

Given the urgent need to respond to the NTSB safety recommendations on an expedited basis, and in light of the fact that SoCalGas and SDG&E operate a combined 1,622 Criteria Miles of natural gas pipeline, SoCalGas and SDG&E developed a categorization process to focus resources on identifying pipeline segments in most need of further analysis and action. To do this, SoCalGas and SDG&E scrutinized the records for each of the roughly 4,000 pipeline segments that make up the 1,622 Criteria Miles to identify all work orders that support the segmentation of the pipeline by diameter, grade, and wall thickness. Each work order was reviewed to determine if post-construction strength test records validated at least a 1.25 MAOP safety margin.

A. Categories 1 and 2

All pipelines are designed and specified to be constructed with materials that can operate at the MAOP plus a safety margin. As explained in a 2007 technical report prepared for the United States Department of Transportation Office of Pipeline Safety,

the primary purpose of a strength test is to establish that the pipeline does not contain any flaws that would pose a threat to the pipeline in operation either at or below MAOP:

> One definition of a stable pipeline defect could be a defect that never threatens the integrity of a pipeline at any time during the useful life of the pipeline. Basically, such a defect would have one essential characteristic: its failure stress level would always be higher than the maximum stress level (considering both hoop stress and longitudinal stress) experienced by the pipeline during its useful life. Therefore, it would never cause the pipeline to fail. . . . Any manufacturing defect or imperfection that survives a pre-service hydrostatic test to 1.25 times the maximum allowable pressure (MAOP) is stable immediately after the test. The reason is that by virtue of having survived the test, it is too small to fail at the MAOP that is only 80% of the test pressure.[12]

In response to NTSB Safety Recommendation P-10-2 (Urgent), SoCalGas and SDG&E used the 1.25 times MAOP threshold described above to identify pipeline segments that require additional analysis. Category 1 includes only those pipelines and pipeline segments that have documentation of a hydrostatic pressure test to at least 1.25 times the MAOP per NTSB Safety Recommendation P-10-2 (Urgent). Category 2 includes those pipelines and pipeline segments that have documentation of a post-construction strength test to at least 1.25 times the MAOP using a medium other than water. Because a pipeline strength test is based upon the pressure at which the pipeline is subjected and is not dependent upon the test media used, the media has no bearing on the outcome of the test. Accordingly, Category 2 pipelines and pipeline segments are equivalent in all relevant respects to Category 1 pipelines and pipeline segments. Nevertheless, because NTSB Safety Recommendation P-10-2 refers solely to <u>hydrostatic</u> strength testing, SoCalGas and SDG&E separately identify those pipelines that records indicate were subjected to hydrostatic strength testing (Category 1) and those pipelines for which records indicate the utilities used a different medium (such as air, inert gas, or natural gas) to perform the strength test (Category 2).

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[12] *Final Report on Evaluating the Stability of Manufacturing and Construction Defects in Natural Gas Pipelines*, April 16, 2007, *prepared for* the United States Department of Transportation Office of Pipeline Safety *by* John. F. Kiefner of Kiefner and Associates, with the Assistance of the Natural Gas Association of America, pp. 17-18.

B. Category 3

While MAOP may not be set above certain code-defined limits, the ceiling can be set at lower values by the Operator, and system capacity requirements may allow a pipeline's MAOP to be reduced further to achieve a greater margin of safety. For example, changes in customer demand and pipeline system improvements over time have allowed the Utilities to operate some pipelines at a reduced MAOP, because higher pressures are no longer needed to meet demand. For pipelines such as these, where documentation supports a previous, continuous operating pressure of at least 1.25 times greater than the current MAOP, the operating pressure safety margin has been established through an in-service natural gas strength test, and further action is not required. This in-service gas test is equivalent to strength testing the pipeline to 1.25 times its current MAOP. In addition, where location-specific operational capabilities permitted SoCalGas and SDG&E to reduce pressure to achieve this margin of safety without affecting service to customers, the pressure was reduced and the pipeline was included in Category 3. Reduction of MAOP to achieve at least a 1.25 times safety margin from the previous pressure achieved during operation effectively uses the documented and demonstrated pressure-carrying capacity as an in-service strength test and incorporates a margin of safety provided by a pressure test in the form of a reduced MAOP based on that in-service operating pressure.

Accordingly, Category 3 includes pipelines and pipeline segments for which documentation validates that the highest in-service operating pressure is at least 1.25 times the current MAOP. Although the NTSB safety recommendations refer solely to "hydrostatic strength testing," all pipelines and pipeline segments placed in Categories 1, 2, and 3 meet the stated objective of the safety recommendations because the integrity of the manufactured seam and the safety of the current MAOP have been validated through documentation of pressures achieved post-construction.[13]

[13] Effectively, the current MAOP of these pipelines incorporate a 20% MAOP reduction and safety margin from prior known operational MAOPs, a reduction identical to that ordered by the Commission, as a precautionary measure, on certain PG&E pipelines in letters dated September 13, 2010, and December 16, 2010, from Commission Executive Director Paul Clanon to PG&E Chief Executive Officer Christopher Johns.

C. Category 4

SoCalGas and SDG&E have reviewed established MAOPs for all pipelines that were not included in Categories 1, 2, or 3. During the course of their records search, the Utilities reviewed many types of pre-construction documents that provide confidence that the pipelines were manufactured, designed and constructed to operate safely. Such records include design and construction specifications and drawings, material specifications, pipe mill inspections and tests to eliminate manufacturing flaws prior to arrival at the construction site and other pre-construction documentation. Post-construction records (*e.g.*, as-built drawings and records of strength tests) provide additional information to validate the integrity of a pipeline after installation.

Although NTSB Safety Recommendation P-10-3 authorizes PG&E to "[u]se traceable, verifiable and complete records located by implementation of Safety Recommendation P-10-2 (Urgent) to determine the valid maximum allowable operating pressure, based on the weakest section of the pipeline or component to ensure safe operation," SoCalGas and SDG&E did not validate the MAOP of any pipeline segments using the approach specified in Safety Recommendation P-10-3. In order to do so, SoCalGas and SDG&E believe they would need to affirmatively state that no pipeline materials other than those specified and documented in identified records were installed. That is, records must demonstrate, without fail, that no components of any portion of the pipeline segment were changed subsequent to the date of identified records, effectively requiring a perfect chain of document custody for pipelines that may have been installed over fifty years ago and that have been subject to many different document retention regulatory requirements.

This is a very difficult, if not infeasible, threshold to achieve, and such a process could not be completed within the time allotted for this report. SoCalGas and SDG&E believe it prudent to preliminarily and conservatively classify these pipelines as Category 4. Both utilities therefore focused their efforts instead toward development of an action plan for all pipeline segments in Category 4.

Many pipeline segments in Category 4 also have documentation showing that a strength test was specified. But SoCalGas and SDG&E have not yet located direct verification that the test was completed. For example, there is supporting documentation for

approximately 15 Criteria Miles of Line 2003 that references a hydrostatic test procedure, as well as change orders to the construction contractor for hydrostatic testing of the pipeline. However, because explicit strength test records, such as recording charts or test logs, do not exist, and because the actual change orders have not yet been located, this pipeline segment is classified in Category 4. While the search for documentation to verify the completion of the test continues, the evidence of test planning provides an additional degree of confidence in the safety of this pipeline and illustrates the conservative approach SoCalGas and SDG&E took in response to the NTSB recommendations.

In addition, where SoCalGas and SDG&E determined that location-specific operational conditions allow for immediate lowering of the operating pressure for Category 4 pipelines without jeopardizing reliability of service to their customers, SoCalGas and SDG&E took that action in order to increase the margin of safety on those lines. For example, SoCalGas and SDG&E have already lowered the pressure by 45 psi in the SDG&E-owned loop system consisting of 29.6 miles in 14 pipelines. SoCalGas and SDG&E are also planning to reduce pressure in Line 1600 (30.1 criteria miles) by 20% once regulation valves can be installed at the Rainbow measurement station. The MAOPs will also be reduced in four additional pipelines on the coast by 20% (3.5 Criteria Miles). These reductions in pressure will virtually eliminate all Category 4 Criteria Miles for SDG&E. For SoCalGas, the opportunities for immediate pressure reductions need to be studied in further detail to ensure reliable service to customers.

During the course of their records review, SoCalGas and SDG&E did not discover any documented inconsistencies that would call into question the standard engineering practices used through the years, nor cause concern regarding the current pressure-carrying capacity of in-service pipelines. Gas pipelines are manufactured, designed and constructed to safely operate at MAOP, and throughout their operating histories SoCalGas and SDG&E have employed industry standard engineering practices to provide appropriate margins of safety. SoCalGas and SDG&E are confident those line segments are operating safely and in compliance with current regulatory requirements. Nevertheless, in an abundance of caution, all pipeline segments with documentation that does not satisfy Categories 1, 2, or 3 requirements were identified as Category 4 and prioritized for further analysis and action. Each of these Category 4 pipeline segments

will be patrolled and leak-surveyed on a bi-monthly basis until the stability of those pipelines and pipelines segments are verified.

The action plan for each segment in Category 4 will include in-depth analyses to determine if that segment qualifies for MAOP validation per NTSB Safety Recommendation P-10-3 after the benefit of further review. In order to complete this process, in-line inspection and other field inspections may be necessary, and may include the following:

- Continuing records search
- Performing system analyses to determine if the operating pressures can be reduced to a pressure where the stability of the long seam is validated
- Analyzing and planning the use of testing to validate the long seam, including strength testing using water or other appropriate media, or nondestructive test technologies (such as radiography, ultrasonic techniques, etc.)
- Analyzing the pipe segment for possible replacement

IV. Results of Records Search

SoCalGas and SDG&E continue to review and analyze records and take action when needed to validate the MAOP for all 1,622 Criteria Miles of their natural gas pipelines. As shown in Table 1, as of the date of this report, the initial records review and screening of all transmission pipeline segments has been completed and has resulted in identification of approximately 383 Criteria Miles of transmission pipeline for SoCalGas and 64 Criteria Miles of transmission pipelines for SDG&E that require additional analysis and action to verify the stability of the long seam at the pipeline segment's MAOP.

As indicated in Table 1, the majority of the pipelines operated by SoCalGas and SDG&E are currently operated at a demonstrated margin of safety that has been documented through pressure testing records. In addition, of the 383 Criteria Miles of transmission pipelines owned by SoCalGas in Category 4, SoCalGas previously used state-of-the-art in-line inspection (ILI) tools or "smart pigs" to assess the integrity of approximately 207 Criteria Miles as part of its existing transmission integrity management program. The internal inspections of these pipelines did not identify any concerns regarding the integrity of the long seams. For all Category 4 pipelines that were previously internally

inspected, SoCalGas and SDG&E will perform additional analysis to confirm that the data indicate the long seams are sound. In addition, SoCalGas and SDG&E will determine where opportunities exist to implement additional ILI technologies to validate the integrity of the long seams for Criteria Mile pipelines in Category 4. The ILI data for all Category 4 pipeline segments are summarized in Table 2 below.

Table 2

Summary of Category 4 Pipelines
With and Without In-Line Inspection Results

	Miles
SoCalGas Category 4 ILI	207
SoCalGas Category 4 Non-ILI	176
SDG&E Category 4 ILI	0
SDG&E Category 4 Non-ILI	64

V. Action Plans for Category 4 Pipeline Segments

Category 4 is comprised of pipeline segments that have been categorized, as of April 15, 2011, for further analysis and action. These pipeline segments represent a variety of diameters and operating pressures. As shown in Attachment A, 66% of the SoCalGas Criteria Miles and 53% of the SDG&E Criteria Miles in Category 4 operate at pressures less than 500 psi. Smaller diameter, lower pressure pipelines inherently have a reduced risk of failure due to the relatively lower stresses placed on their long seams. On the other hand, as shown in Figure A-1 in Attachment A, larger, higher-stress pipelines typically benefit from the increased ability to accommodate ILI tools.[14] Action plans to verify the safety margin for Category 4 pipelines and pipelines segments are being developed by SoCalGas and SDG&E on a segment-by-segment basis to take into account these, and other, unique segment characteristics and circumstances. Each segment must be carefully analyzed prior to taking action (*e.g.*, by reducing pressure), to minimize customer impacts and to determine the optimum action to be taken (i.e., strength test, MAOP reduction, replacement, on-site evaluation, etc.).

[14] As illustrated in Figure A-1, SoCalGas has used ILI tools to inspect 90% of their pipeline segments that operate at pressures above 500 psi.

Although the development of a final action plan for each Category 4 pipeline segment must be completed on a segment-by-segment basis to take into account the unique circumstances involved, in general, segments greater than one mile in length will likely be scheduled for strength testing, MAOP reduction, or replacement. Segments less than one hundred feet will likely be excavated and have the integrity of their long seams validated using non-destructive tests. In Table 3 below, SoCalGas and SDG&E provide their preliminary action plan, with milestones, for all Category 4 pipeline segments.

One component of the utilities' preliminary action plan for Category 4 pipelines is the use of ILI to inspect to detect flaws using a transverse field inspection (TFI) tool. TFI is specifically oriented to improve sensitivity to anomalies, such as long seam flaws, and other conditions that are indicative of deviations from normal practice. Under certain circumstances, TFI is preferable to pressure testing because it provides: 1) anomaly sizing and location information, 2) avoids the service disruptions necessary for pressure testing, and 3) enables the monitoring of smaller anomalies that would go undetected using pressure test.[15] SoCalGas' and SDG&E's plan will include preliminary analysis of Category 4 pipelines to determine the feasibility of inspection using TFI and select a list of candidates to demonstrate this method of validation.

[15] *See* Baker, Michael Jr., in association with Kiefner and Associates, Inc., and CorrMet Engineering Services, PC, Low *Frequency ERW and Lap Welded Longitudinal Seam Evaluation*, TTO Number 5, Integrity Management Program Delivery Order DTRS56-02-D-70036 (2003), pp. 15-16, 31. *See also* Keifer, John F. Maxey, Willard A., *The Benefits and Limitations of Hydrostatic Testing* (2000), p. 9.

Table 3 **PRELIMINARY ACTION PLAN FOR CATEGORY 4**		
Action Type	Actions Taken	Date
Universal	Bi-Monthly Pipeline Patrols and Leakage Surveys	Ongoing
	Complete Scheduling of Bi-Monthly Leakage Surveys and Pipeline Patrols	May 2, 2011
	Complete First Round of Bi-Monthly Leakage Surveys and Pipeline Patrols	June 17, 2011
Segment-Specific	Execute Action (*e.g.* pressure reduction, strength test, etc.)	In Progress
	Complete Records Search & Segment-Specific Preliminary Action Plan	July 29, 2011
	Finalize Segment-Specific Action Plan and Schedule	Oct. 14, 2011
Non-Destructive In-Line Inspection Validation	Identify Pipeline(s) to Address in 2011 Using ILI Technology	May 2, 2011
	Schedule ILI Vendor & Prepare Pipeline(s) for ILI	July 15, 2011
	Complete ILI	July 29, 2011
	Receive ILI Results & Complete Data Analysis	Oct. 21, 2011
	Complete Pipeline Excavation & Data Validation (pending permit approvals)	Dec. 31, 2011
Reporting	Submit Progress Report to CPUC	June 24, 2011
	Brief CPUC Re Segment-Specific Preliminary Action Plan & Schedule	Aug. 1, 2011
	Submit Final Action Plan & Schedule to CPUC	Oct. 21, 2011
	2011 Year-End Status Report to CPUC	Jan. 31, 2012

As part of the ongoing review of the pipeline segments in Category 4, SoCalGas and SDG&E will perform the following activities to validate the safety of these segments:

- Universal Action (applied to all pipeline segments in Category 4)
  - Continued records search
  - Increase frequency of pipeline patrols to bi-monthly
  - Increase frequency of pipeline leakage survey to bi-monthly
  - Determine which long seam validation action to use on each section

- Specific Action (analysis to be completed and appropriate action(s) applied on a pipeline segment- by-segment basis)
  - Perform system analysis to determine if the MAOP can be reduced to achieve the safety margin required and identify the location and number of pressure regulating stations required (typically will apply to longer pipeline segments)
  - Determine if it is feasible to expose the entire length of the Category 4 segment and validate the integrity of the long seam through the use of

ultrasonic and/or radiographic testing (typically will apply to shorter pipeline segments)

- Perform the following activities, if the pipeline segment has been in-line inspected:
  - Conduct additional analysis using ILI data to verify condition of long seam of the pipe and identify if the pipe in Category 4 segments has characteristics that are atypical for the location (*e.g.*, several short pups welded directly together)
  - Determine if an ILI tool with sufficient long seam flaw detection sensitivity is available to validate the long seam (requires technical review)
- Determine approach and impact of performing a strength test using one of the following two methods:
  - Hydrostatic test
  - Nitrogen strength test
- Determine feasibility of removing Category 4 pipe from service through:
  - Abandonment and replacement with new pipe (typically for longer segments)
  - A repair method such as a full encirclement sleeve or canopy that removes pressure from the Category 4 segment (only for a short segment)

In Attachment B, SoCalGas and SDG&E identify each line with at least one segment greater than one mile in length, the sum total of all Category 4 pipeline segments for that line, the line's location, and whether or not it has been internally inspected

VI. Conclusion

SoCalGas and SDG&E have a culture of safety that guides everyday operations at every level of their integrated natural gas system. The results of the records review process by SoCalGas and SDG&E confirm what their safety record already reflects: the SoCalGas and SDG&E natural gas systems are operated and maintained safely. SoCalGas and SDG&E recognize that the tragic events in San Bruno have appropriately raised the bar for natural gas pipeline safety, and further validation of system integrity is required. SoCalGas and SDG&E are closely monitoring the NTSB's investigation into the pipeline rupture in San Bruno and have responded quickly to NTSB's urgent safety recommendations. SoCalGas and SDG&E are implementing additional actions to verify and enhance the safety of their systems and to provide extra assurance to the public they serve and their regulators that SoCalGas and SDG&E natural gas infrastructure is operated safely and reliably.

Attachment A

Category 4 Diameter and Pressure Information

Table A-1

SDG&E Category 4 Diameter and Pressure Information

SDGE Category 4 Criteria Miles by Diameter and Pressure Range				
	Pressure Range			
Diameter (in)	**300-399 psig**	**400-499 psig**	**Over 499 psig**	**Cat 4 Miles**
8	-	0.02	-	0.02
10	-	8.98	-	8.98
12	-	4.42	-	4.42
16	0.34	12.06	30.10	42.50
20	-	7.85	-	7.85
30	-	-	0.37	0.37
Total	**0.34**	**33.34**	**30.47**	**64.15**

Table A-2

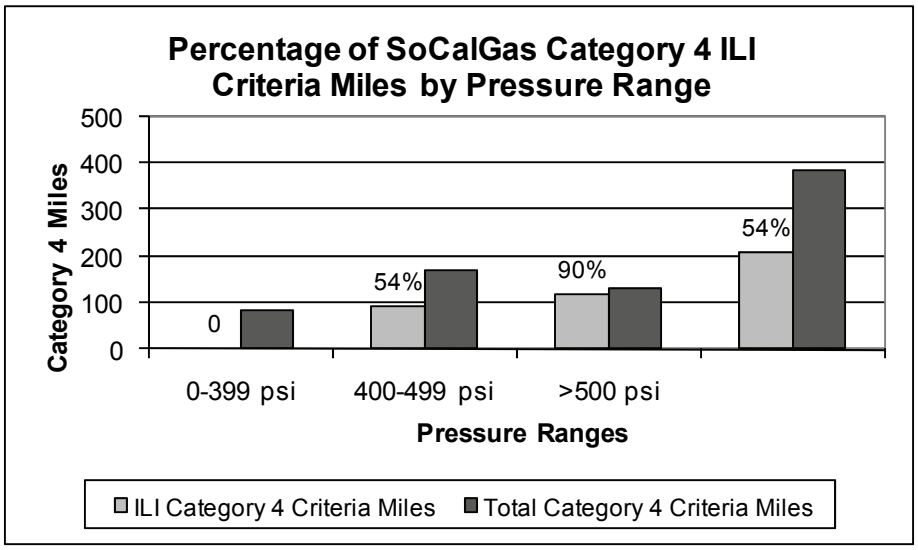
SoCalGas Category 4 Diameter and Pressure Information

SoCalGas Category 4 Criteria Miles by Diameter and Pressure Range						
	Pressure Range					
Diameter (in)	**100-199 psig**	**200-299 psig**	**300-399 psig**	**400-499 psig**	**Over 499 psig**	**Cat 4 Miles**
2	-	0.73	-	0.03	0.02	0.78
3	-	-	-	0.01	0.41	0.42
4	-	0.12	0.15	0.13	0.02	0.43
6	-	10.69	0.73	18.91	0.10	30.43
8	1.92	8.42	5.29	12.69	2.87	31.18
10	0.23	3.69	0.01	14.23	1.27	19.43
12	3.97	8.94	3.50	8.28	1.05	25.74
14	-	-	-	-	0.23	0.23
16	3.70	11.20	0.50	19.30	17.40	52.11
18	-	-	-	9.85	15.44	25.29
20	1.58	11.44	-	7.93	1.70	22.65
22	-	2.16	-	-	5.78	7.94
24	0.21	2.65	0.24	11.44	0.05	14.60
26	-	2.61	-	-	0.07	2.69
30	-	0.32	-	65.58	71.99	137.89
34	-	-	-	0.01	10.49	10.51
36	-	-	-	-	0.59	0.59
Total	**11.60**	**62.97**	**10.42**	**168.39**	**129.49**	**382.88**

Table A-3

SoCalGas ILI Criteria Miles by Diameter by Pressure Range						
	Pressure Range					
Diameter (in)	100-199 psig	200-299 psig	300-399 psig	400-499 psig	Over 499 psig	Cat 4 Miles
8	-	-	-	-	0.33	0.33
16	-	-	-	7.04	15.10	22.14
18	-	-	-	9.85	11.14	21.00
20	-	-	-	5.40	1.45	6.84
22	-	-	-	-	5.78	5.78
24	-	-	-	3.50	-	3.50
30	-	-	-	64.70	71.99	136.69
34	-	-	-	-	10.49	10.49
36	-	-	-	-	0.59	0.59
Total	**0.00**	**0.00**	**0.00**	**90.49**	**116.87**	**207.36**

Figure A-1



Attachment B

Category 4 Pipeline Information

SDG&E Category 4 Pipeline Information

Table B-1

SDG&E Category 4 Pipeline Segments
That Have Not Been In-Line-Inspected

Location	Miles	Line Number
Fallbrook to San Diego	30.08	1600
El Cajon	1.98	49-15
Escondido	0.01	1601
Fallbrook to San Diego	0.37	3010
La Jolla	1.44	49-27
La Mesa	5.94	49-17
National City	3.91	49-22
San Diego	7.51	49-18
San Diego	2.67	49-28
San Diego	2.40	49-26
San Diego	1.57	49-25
San Diego	1.34	49-19
San Diego	0.34	49-11
San Diego	0.32	49-14
San Diego	0.25	49-32
San Diego	0.04	49-20
San Diego, Lemon Grove, La Mesa	0.72	49-16
Santee	3.26	49-13
Total:	64.15	

SoCalGas Category 4 Pipeline Information

Table B-2

SoCalGas Category 4 Pipeline Segments
That Have Been In-Line Inspected

Location	ILI%	Miles	Line Number
Adelanto to Valencia	100%	11.60	335
Adelanto to Quigley	100%	5.96	235 West
Anaheim	100%	0.00	1014
Banning to Rosemead	100%	20.34	2001 West
Blythe	100%	0.01	5000 (1)
Blythe to Santa Fe Springs	100%	58.51	2000
Brea to Placentia	100%	3.46	1013
Blythe to Desert Center	100%	2.03	2001 East
Costa Mesa to Dana Point	100%	7.04	35-20
Fontana	100%	0.59	4000
Glendale	100%	0.04	3002
Goleta	100%	0.33	80
Goleta	100%	0.08	247
Lakewood to Long Beach	100%	4.06	1020
Needles	100%	0.62	235 East
Needles	100%	1.07	3000 East
Pico Rivera to West Los Angeles	100%	26.22	2003
Rosemead to Pico Rivera	100%	0.03	2002
San Fernando Valley to West Los Angeles	100%	6.25	407
Santa Ana	100%	0.04	1018
Ventura to Goleta	100%	15.02	1004
Ventura to Goleta	100%	4.10	1005
Ventura to San Fernando Valley	83%	25.27	404
Ventura to San Fernando Valley	100%	8.48	406
Wheeler Ridge to Valencia	100%	9.27	225
Wilmington	100%	1.15	1024
	Total: Category 4 Miles	211.57	
	Total ILI Miles	207.36	

Table B-3

SoCalGas Category 4 Pipeline Segments Greater than 50 Feet That Have Not Been In-Line-Inspected

Location	Miles	Line Number
Anaheim	0.091	35-6416
Atascadero	1.876	44-1008
Bakersfield	2.162	44-635
Bakersfield	0.288	38-200
Beaumont	0.041	6906LT1
Blythe	0.015	5000-0.16-XO3
Blythe	0.012	2000-0.18-BO
Brawley	0.014	41-80
Camarillo	0.577	36-8-06
Carson	2.139	30-18
Carson	2.057	37-18F
Carson	0.076	30-6543
Carson	0.010	30-6292
Chino	4.783	41-25-A
Chino	0.259	41-30-A
Chino	0.121	41-25
Chino, Ontario	3.891	41-30
Colton	0.346	41-04-I
Commerce	1.561	30-02
Commerce	1.009	30-09-A
Compton	0.033	30-6209
Compton	0.017	30-6799
Costa Mesa	3.427	35-10
Covina	7.348	31-09
Dana Point	0.072	1025
Delano	4.050	38-351
El Centro	0.827	41-84
El Centro	0.225	41-84-A
El Centro	0.010	41-101
El Centro	11.373	41-6000-2
El Monte	0.996	44-137
El Segundo	0.019	1172BP2
El Segundo	0.015	1172 ID 2313 2
El Segundo	0.012	1172BP3
El Segundo	0.010	1172 ID542-P 1
Encino	0.027	3005
Encino, Sherman Oaks	0.609	33-121
Garden	3.561	37-18
Garden Grove	0.336	35-22
Glendale	0.322	8045
Goleta	0.061	GNG-004 (NG-004-12")
Goleta	0.041	5009
Goleta	0.039	GNG003 (NG-003-8")

Location	Miles	Line Number
Goleta	0.034	GNG247
Goleta	0.030	GNG002 (NG-002-10")
Goleta	0.027	GNG005 (NG-005-12”)
Goleta	0.021	GNG247.02-A (NG-247.02-12")
Goleta	0.021	GNG002-C1 (NG-002-8")
Goleta	0.020	GNG003-A (NG-003-10")
Goleta	0.016	GNG002-A (NG-002-12")
Goleta	0.016	GNG001.06 (NG-001.03-12")
Goleta	0.015	GNG002-B (NG-002-12")
Goleta	0.014	GNG-001-A (NG-001-16")
Goleta	0.012	GNG003-B (NG-003-10")
Goleta	0.011	GNG-001.01 (NG-001-16")
Goleta	0.010	GNG-001-A3 (NG-001-12")
Goleta	0.010	GNG-001-A4 (NG-001-10")
Hanford	7.344	38-516
Hanford	0.501	38-508
Hanford	0.014	38-508-D
Hanford	0.250	38-523
Hawthorne	0.012	37-18-J
Hermosa Beach	0.020	37-6180
Inglewood	2.673	37-07
Irvine	1.324	35-20-A
Irvine	0.285	35-20-A1
Kingsburg	3.487	38-528
La Habra	0.036	42-66-1
La Habra	0.026	42-66-2
Laguna Niguel	0.113	35-6405
Lamont	4.327	38-959
Lemoore	2.238	38-512
Lemoore	1.147	38-501
Lemoore	0.055	44-687
Lompoc	1.862	36-1032
Long Beach	0.837	1023
Long Beach	0.090	775
Long Beach	0.019	2007 ID629-T1
Long Beach	0.012	1023LT3
Long Beach	0.012	1023LT2
Los Angeles	2.766	43-121
Los Angeles	0.699	45-1106
Los Angeles	0.387	33-120
Los Angeles	0.186	43-1106
Los Angeles	0.023	30-02U
Los Angeles	0.022	1230-A
Los Angeles	0.020	30-6200
Los Angeles	0.013	765-8.24-BO
Los Angeles	0.010	765ST1
Los Angeles to Culver City	1.571	317
Montebello	0.118	5011

Location	Miles	Line Number
Moreno Valley	0.011	41-19
Morro Bay	3.841	36-9-06
Morro Bay	0.823	36-1008-A West
New Cuyama	0.541	8107
Newhall	4.692	45-163
Newhall	0.011	408XO1
Newhall, Los Angeles	1.772	45-120
Newport Beach	0.010	35-20-N
Orange	0.145	35-40
Orange	0.015	1019ST1
Oxnard	0.200	36-1006
Oxnard	0.164	36-8-01-C
Palmdale	0.035	32-90
Palmdale	0.010	44-654
Pasadena	8.590	32-21
Paso Robles	1.919	36-9-21
Placentia to Santa Ana	7.942	1015
Playa Del Rey	0.603	PGR7WEST
Playa Del Rey	0.250	PGR21
Playa Del Rey	0.219	PGR8
Playa Del Rey	0.130	PGR20
Playa Del Rey	0.093	PC13
Playa Del Rey	0.087	PGR1
Playa Del Rey	0.083	PGR3-F
Playa Del Rey	0.077	PGR20-F
Playa Del Rey	0.058	PGR4-C2
Playa Del Rey	0.045	PGR21-C2
Playa Del Rey	0.042	PC2
Playa Del Rey	0.032	PC291
Playa Del Rey	0.031	PC291-A
Playa Del Rey	0.031	PGR6-F2
Playa Del Rey	0.020	PC23
Playa Del Rey	0.020	PGR20-A1
Playa Del Rey	0.016	PGR21-D1
Playa Del Rey	0.015	PC290
Playa Del Rey	0.011	PGR21-C1
Porterville	3.226	38-552
Porterville	0.116	38-556
Redondo Beach	2.852	37-18K
Redondo Beach	0.017	1171 ID567-P 15
Redondo Beach	0.012	1171 ID567-P 1
Riverdale	0.174	38-514
San Bernardino	2.760	41-05
San Bernardino	0.406	41-05-A
San Jacinto	1.686	41-17
San Jacinto	0.033	41-17F
San Luis Obispo	2.641	36-9-06-A
San Luis Obispo	9.878	36-9-09 North

Location	Miles	Line Number
Santa Barbara	0.071	36-1002
Santa Maria	2.143	36-6588
Santa Maria	1.503	36-9-06 F
Santa Monica	4.522	37-04
Santa Paula	0.120	36-1001
Seal Beach	0.154	42-46-F
Seal Beach	0.010	42-57
Shafter	0.011	293 ID1517-N
Tipton	2.361	38-539
Tipton	0.952	44-720
Valencia	0.010	HGW348-2
Valencia	0.010	HGW348-3
Valencia	0.010	HGW349-1
Valencia	0.010	HGW349-2
Valencia	0.050	HGI16
Valencia	0.050	HGW17
Valencia	0.243	119 North
Ventura	1.832	1011
Ventura	1.408	1003
Ventura	0.880	53
Ventura	0.012	169
Ventura	5.444	36-8-01
Ventura	0.502	36-37
Westminster	0.691	42-46
Whittier	1.042	30-32
Wilmington	1.577	43-34
Wilmington	0.814	37-49
Wilmington	0.208	37-51
Total:	170.5	

Table B-4

SoCalGas Category 4 Pipeline Segments Less-Than-or-Equal-To 50 Feet That Have Not Been In-Line-Inspected

Location	Feet	Line Number
Alhambra	8	3000-261.73-BO
Alhambra	24	3000-261.73-BR
Atascadero	15	36-9-21BR1
Beaumont	33	6906LT2
Bell	16	30-09
Blythe	33	6100
Blythe	49	2000-0.18-XO1
Blythe	50	2000-0.18-XO2
Brawley	24	41-6001-2
Brea	28	1013ST1
Brentwood	8	1205 ID436-T 1
Brentwood	27	1205 ID436-T 3
Burbank	33	3004
Calipatria	30	41-141
Vernon	3	1234
Colton	7	41-04-ST1
Compton	17	30-6799BR1
Corona	3	41-117
East Blythe	50	41-6045
East Hemet	17	41-17-A2
El Centro	7	41-83
El Segundo	4	1172BP2ST1
El Segundo	4	1172BP2ST2
El Segundo	5	1172 ID 2313 1
El Segundo	15	1172BP2ST3
El Segundo	32	1172BP2ST4
El Segundo	50	1172 ID 2313 3
Encino	7	3005-A1
Encino	17	3005-A
Encino	17	3005-B
Fontana	2	41-35-1-KST2
Goleta	1	GNG005-B (NG-005-8")
Goleta	1	GNG005-C (NG-005-8")
Goleta	3	GNG001.12 (NG-001.12-8")
Goleta	3	GNG001.14 (NG-001.14-8")
Goleta	3	GNG001.16 (NG-001.16-8")
Goleta	3	GNG003.03-B1
Goleta	3	GNG257-A5
Goleta	4	GNG001-E (NG-001.06-12")
Goleta	4	GNG003.01-A1
Goleta	4	GNG003.01-B1
Goleta	4	GNG003.01-B2
Goleta	4	GNG003.02-B1

Location	Feet	Line Number
Goleta	4	GNG003.02-B2
Goleta	4	GNG003.03-A1
Goleta	4	GNG004.01 (NG-004.01-6")
Goleta	4	GNG004.02 (NG-004.02-6")
Goleta	4	GNG004.03 (NG-004.03-6")
Goleta	4	GNG004.04 (NG-004.04-6")
Goleta	4	GNG004.05 (NG-004.05-6")
Goleta	5	GNG005-D-12" (NG-004.06-12")
Goleta	5	GNG002.01-B1
Goleta	5	GNG002.01-B2
Goleta	5	GNG002.02-B1
Goleta	5	GNG002.02-B2
Goleta	5	GNG002-C
Goleta	5	GNG002-D (NG-002-LATERAL")
Goleta	5	GNG004-B (NG-004-8")
Goleta	5	GNG257-A2 (NG-257-12")
Goleta	5	GNG257-B (NG-257)
Goleta	7	GNG002.01-B
Goleta	7	GNG002.02-B
Goleta	7	GNG002-03-B
Goleta	8	GNG005.01 (NG-005.01-6")
Goleta	8	GNG005.02 (NG-005.02-6")
Goleta	8	GNG005.03 (NG-005.03-6")
Goleta	8	GNG005.04 (NG-005.04-6")
Goleta	8	GNG005.05 (NG-005.05-6")
Goleta	8	GNG001.05-A (NG-001.04-12")
Goleta	8	GNG003.01-B
Goleta	8	GNG003.02-B
Goleta	8	GNG003.03-B
Goleta	8	GNG247.03-A
Goleta	9	GNG001.07 (NG-001.07-12")
Goleta	9	GNG-001-A2 (NG-001-16")
Goleta	10	36-7-04
Goleta	10	GNG002.01-A
Goleta	10	GNG002.02-A
Goleta	10	GNG002.03-A
Goleta	10	GNG003.01-A
Goleta	10	GNG003.02-A
Goleta	10	GNG003.03-A
Goleta	12	GNG001.02
Goleta	12	GNG002-A1 (NG-002-12")
Goleta	13	GNG247.07 (NG247.07-16")
Goleta	20	GNG247.02 (NG-247.02-12")
Goleta	22	1005 ID805-T
Goleta	22	GNG003-B1
Goleta	23	G247-A
Goleta	25	GNG002.01 (NG-002.01-8")
Goleta	25	GNG002.02 (NG-002.02-8")

Location	Feet	Line Number
Goleta	25	GNG002.03 (NG-002.03-8")
Goleta	25	GNG247.06 (NG-247.06-16")
Goleta	25	NG-003-10"
Goleta	27	GNG003.11 (NG-003.11-8")
Goleta	28	GNG002.04 (NG-002.04-6")
Goleta	28	GNG002.05 (NG-002.05-6")
Goleta	28	GNG002.06 (NG-002.06-6")
Goleta	28	GNG002.07 (NG-002.07-6")
Goleta	28	GNG002.08 (NG-002.08-6")
Goleta	28	GNG002.09 (NG-002.09-6")
Goleta	28	GNG002.10 (NG-002.10-8")
Goleta	30	GNG257-A3 (NG-257)
Goleta	31	GNG003.05 (NG-003.05-4")
Goleta	31	GNG003.07 (NG-003.07-4")
Goleta	31	GNG003.09 (NG-003.09-4")
Goleta	32	GNG257-A1 (NG-257-10")
Goleta	36	GNG005-A (NG-005-12”)
Goleta	37	GNG003.04 (NG-003.04-4")
Goleta	37	GNG003.06 (NG-003.06-4")
Goleta	37	GNG003.08 (NG-003.08-4")
Goleta	37	GNG003.10 (NG-003.10-6")
Goleta	39	GNG-001-A1 (NG-001-16")
Goleta	40	GNG003.01 (NG-003.01-6")
Goleta	40	GNG003.02 (NG-003.02-6")
Goleta	40	GNG003.03 (NG-003.03-6")
Goleta	40	GNG005-E (NG-005.01-12")
Goleta	42	GNG001.05 (NG-001.04-12")
Goleta	43	GNG001.11 (NG-001.11-10")
Goleta	43	GNG001.13 (NG-001.13-10")
Goleta	43	GNG001.15 (NG-001.15-10")
Goleta	45	GNG247.04 (NG-247.04-12")
Goleta	47	GNG001.03 (NG-001.05-16")
Goleta	48	GNG247.03 (NG-247.03-10")
Goleta	50	GNG001.04 (NG-003-12")
Home Gardens	11	41-116-BP1
Home Gardens	16	41-116
Honor Rancho	4	HGW348-1
Honor Rancho	37	HPV300A
Laguna Niguel	27	35-6405-BR1
Long Beach	15	2007 ID629-T2
Los Angeles	1	32-6523
Los Angeles	1	765ST3
Los Angeles	1	765 ID562-T 7
Los Angeles	4	765ST4
Los Angeles	4	765ST5
Los Angeles	5	1230-B
Los Angeles	6	765-8.24-BR
Los Angeles	6	1170 ID502-T 1

Location	Feet	Line Number
Los Angeles	9	765BR2
Los Angeles	11	765ST2
Los Angeles	25	765BR4
Los Angeles	35	775BO1
Los Angeles	39	37-15
Moreno Valley	13	41-181
Newhall	9	45-120X01
Newhall	46	3008BR1
North Palm Springs	47	41-55
Orange	20	1019BP1
Pacoima	11	44-725BP1
Pedley	3	41-128
Placentia	14	1015ST1
Playa Del Rey	1	PC23-A
Playa Del Rey	5	PC1-A
Playa Del Rey	6	PC290-A
Playa Del Rey	8	PGR20-A
Playa Del Rey	9	PGR21-D
Playa Del Rey	12	PC27
Playa Del Rey	13	PC28
Playa Del Rey	15	PGR21-C
Playa Del Rey	18	PC26-A
Playa Del Rey	18	PC26-B
Playa Del Rey	30	PC292
Playa Del Rey	31	PF357
Playa Del Rey	32	PC1
Playa Del Rey	32	PF302
Playa Del Rey	32	PF410
Playa Del Rey	37	PF358
Playa Del Rey	38	PF303
Playa Del Rey	38	PF411
Playa Del Rey	39	PGR21-B1
Playa Del Rey	40	PC26
Playa Del Rey	40	PGR21-D1A
Playa Del Rey	41	PGR361
Playa Del Rey	42	PGR14-A
Playa Del Rey	42	PGR414
Playa Del Rey	43	PGR306
Playa Del Rey	47	PF305
Playa Del Rey	47	PF360
Playa Del Rey	49	PF413
Rancho Cucamonga	2	41-90
Redondo Beach	17	1171 ID567-P 13
Riverside	6	41-201
Riverside	38	41-199
Riverside	44	41-198
Rosemead to Pico Rivera	10	2002 ID465-T 3
Rosemead to Pico Rivera	34	2002 ID465-T 2

Location	Feet	Line Number
Rosemead to Pico Rivera	38	2002ST1
Rosemead to Pico Rivera	42	2002ST2
San Jacinto	3	41-17-FST1
Santa Ana	6	1017-A
Santa Ana	14	1017BR2
Santa Ana	17	1025BR1
Santa Ana	23	1017BR1
Santa Ana	24	1017BR4
Santa Ana	24	1017BR5
Santa Ana	24	1017BR6
Santa Ana	26	1017BP1
Santa Ana	26	1017BP2
Santa Ana	26	1017BP3
Santa Ana	26	1017BR7
Santa Ana	44	1017-ABO1
Santa Fe Springs, Norwalk, Cerritos	48	42-12
Sylmar	10	32-8043BR1
Tustin	4	35-6520
Van Nuys	23	3001-0.00-XO1
Van Nuys	23	3001-0.00-XO2
Ventura	17	1003LT2
Total Feet:	**4163**	
Total Miles:	**0.79**	