

Docket: : A.13-12-012  
Exhibit Number : ORA-03-Attachments  
Commissioner : C. Peterman  
ALJ : A. Yip-Kikugawa  
Witness : N. Skinner



**OFFICE OF RATEPAYER ADVOCATES  
CALIFORNIA PUBLIC UTILITIES COMMISSION**

**Report on the Results of Operations  
for  
Pacific Gas and Electric Company  
Test Year 2015  
Gas Transmission and Storage Rate Case**

Chapter 3  
Policy and Core Gas Supply

**Supporting Attachments**

San Francisco, California  
January 13, 2015

**OFFICE OF RATEPAYER ADVOCATES  
PG&E TY2015 GT&S  
EXHIBIT ORA-03  
ATTACHMENTS A  
DATA REQUEST INDEX**

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**GTS-RateCase2015\_DR\_ORA\_029-Q01**

**PACIFIC GAS AND ELECTRIC COMPANY  
 Gas Transmission and Storage Rate Case 2015  
 Application 13-12-012  
 Data Response**

|                        |                                 |                   |                                   |
|------------------------|---------------------------------|-------------------|-----------------------------------|
| PG&E Data Request No.: | ORA_029-01                      |                   |                                   |
| PG&E File Name:        | GTS-RateCase2015_DR_ORA_029-Q01 |                   |                                   |
| Request Date:          | April 10, 2014                  | Requester DR No.: | ORA-GT&S-29                       |
| Date Sent:             | April 22, 2014                  | Requesting Party: | Office of Ratepayer Advocates     |
| PG&E Witness:          | David Elmore                    | Requester:        | Michael Tan/<br>Nathaniel Skinner |

**SUBJECT: CHAPTER 19: CORE GAS SUPPLY**

**QUESTION 1**

For Section B. 2 (page 19-8), provide the core firm storage capacity data for 2009-2013. The data should include the following:

- a) Non winter season:
  - i. Injection and withdrawal quantities;
  - ii. Incremental storage withdrawal capacity; and
  - iii. Storage capacity level
- b) Winter season:
  - i. Daily injection and withdrawal quantities;
  - ii. Daily incremental storage withdrawal capacity; and
  - iii. Daily storage level
- c) A summary table, similar to table 19-3 (page 19-8). The columns should include:
  - i. Line No.
  - ii. Description
  - iii. Units
  - iv. 2015 GT&S Proposed storage levels
  - v. And a column for each year 2009 through 2013. For these years provide historical withdrawal and injections.

**ANSWER 1**

- a) i. Non-winter injected and withdrawn quantities are provided below.

| Non-winter<br>Period | Injected<br>Quantities (Dth) | Withdrawn<br>Quantities |
|----------------------|------------------------------|-------------------------|
|----------------------|------------------------------|-------------------------|

|                |            | (Dth)   |
|----------------|------------|---------|
| Apr – Oct 2009 | 29,733,358 | 0       |
| Apr – Oct 2010 | 29,814,317 | 0       |
| Apr – Oct 2011 | 30,028,110 | 0       |
| Apr – Oct 2012 | 28,069,904 | 140,283 |
| Apr – Oct 2013 | 26,183,107 | 45,015  |

ii. Non-winter incremental storage withdrawal capacity is provided below.

| Non-winter Period | Incremental Storage Withdrawal Capacity (Dth/d) | Incremental Injected Quantities (Dth) | Incremental Withdrawn Quantities (Dth) |
|-------------------|---|---------------------------------------|--|
| Apr – Oct 2009    | 0   | 1,000,000                             | 0                                      |
| Apr – Oct 2010    | 0   | 950,000                               | 0                                      |
| Apr – Oct 2011    | 0   | 1,399,979                             | 0                                      |
| Apr – Oct 2012    | 0   | 1,100,021                             | 0                                      |
| Apr – Oct 2013    | 0   | 1,474,436                             | 0                                      |

iii. Non-winter storage capacity levels is provided below.

| Non-winter Period | Storage Capacity Level (Dth)* | Incremental Storage Contract Capacity (Dth) |
|-------------------|-------------------------------|---|
|                   |                               |   |

|                   |            |           |
|-------------------|------------|-----------|
| Apr – Oct<br>2009 | 31,146,028 | 1,000,000 |
| Apr – Oct<br>2010 | 31,021,987 | 1,000,000 |
| Apr – Oct<br>2011 | 32,294,098 | 1,500,000 |
| Apr – Oct<br>2012 | 32,636,602 | 1,500,000 |
| Apr – Oct<br>2013 | 30,271,065 | 1,500,000 |

\*PG&E Firm Storage Capacity available to Core Gas Supply

b) i, ii, and iii: please refer to attached Excel file GTS\_RateCase2015\_DR\_ORA-029Q1Atch01.

c) i, ii, iii, iv, and v: please refer to the attached file GTS\_RateCase2015\_DR\_ORA-029Q1Atch02.

**GTS-RateCase2015\_DR\_ORA\_029-Q01  
Attachment 01**

PG&E Core Gas Supply  
 2015 GT&S Rate Case  
 Data Request-ORA-029-Question-1-b)  
 Winter Daily Storage Activity for 2009-2013  
 4/18/2014

| Date       | CGT Firm Storage Withdrawal (Dth) | CGT Firm Storage Injection (Dth) | End of the Day CGT Storage Level (Dth) | Incremental Storage Withdrawal (Dth) | Incremental Storage Injection (Dth) | End of the Day Incremental Storage Level (Dth) |
|------------|-----------------------------------|----------------------------------|--|--------------------------------------|-------------------------------------|--|
| 11/1/2008  | 0                                 | 35,000                           | 31,709,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/2/2008  | 0                                 | 0                                | 31,709,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/3/2008  | -63,000                           | 0                                | 31,646,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/4/2008  | -82,000                           | 0                                | 31,564,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/5/2008  | 0                                 | 0                                | 31,564,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/6/2008  | -39,000                           | 0                                | 31,525,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/7/2008  | 0                                 | 47,000                           | 31,572,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/8/2008  | 0                                 | 47,000                           | 31,619,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/9/2008  | 0                                 | 0                                | 31,619,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/10/2008 | 0                                 | 0                                | 31,619,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/11/2008 | 0                                 | 47,000                           | 31,666,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/12/2008 | 0                                 | 0                                | 31,666,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/13/2008 | -20,000                           | 0                                | 31,646,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/14/2008 | -29,000                           | 0                                | 31,617,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/15/2008 | 0                                 | 47,000                           | 31,664,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/16/2008 | 0                                 | 30,000                           | 31,694,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/17/2008 | -15,000                           | 0                                | 31,679,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/18/2008 | -57,000                           | 0                                | 31,622,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/19/2008 | -59,000                           | 0                                | 31,563,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/20/2008 | 0                                 | 0                                | 31,563,687                             | 0                                    | 0                                   | 1,000,000                                      |
| 11/21/2008 | 0                                 | 0                                | 31,563,687                             | 0                                    | 0                                   | 1,000,000                                      |

|            |          |   |            |         |   |           |
|------------|----------|---|------------|---------|---|-----------|
| 11/22/2008 | -54,000  | 0 | 31,509,687 | 0       | 0 | 1,000,000 |
| 11/23/2008 | -73,000  | 0 | 31,436,687 | 0       | 0 | 1,000,000 |
| 11/24/2008 | -84,000  | 0 | 31,352,687 | 0       | 0 | 1,000,000 |
| 11/25/2008 | -118,000 | 0 | 31,234,687 | 0       | 0 | 1,000,000 |
| 11/26/2008 | -124,000 | 0 | 31,110,687 | 0       | 0 | 1,000,000 |
| 11/27/2008 | -64,000  | 0 | 31,046,687 | 0       | 0 | 1,000,000 |
| 11/28/2008 | -6,000   | 0 | 31,040,687 | 0       | 0 | 1,000,000 |
| 11/29/2008 | -98,000  | 0 | 30,942,687 | 0       | 0 | 1,000,000 |
| 11/30/2008 | -128,000 | 0 | 30,814,687 | 0       | 0 | 1,000,000 |
|            |          |   |            |         |   |           |
| 12/1/2008  | -294,000 | 0 | 30,520,687 | 0       | 0 | 1,000,000 |
| 12/2/2008  | -151,000 | 0 | 30,369,687 | 0       | 0 | 1,000,000 |
| 12/3/2008  | -110,000 | 0 | 30,259,687 | 0       | 0 | 1,000,000 |
| 12/4/2008  | -564,000 | 0 | 29,695,687 | 0       | 0 | 1,000,000 |
| 12/5/2008  | -565,000 | 0 | 29,130,687 | 0       | 0 | 1,000,000 |
| 12/6/2008  | -350,000 | 0 | 28,780,687 | 0       | 0 | 1,000,000 |
| 12/7/2008  | -480,000 | 0 | 28,300,687 | 0       | 0 | 1,000,000 |
| 12/8/2008  | -542,000 | 0 | 27,758,687 | 0       | 0 | 1,000,000 |
| 12/9/2008  | -412,000 | 0 | 27,346,687 | 0       | 0 | 1,000,000 |
| 12/10/2008 | -373,000 | 0 | 26,973,687 | 0       | 0 | 1,000,000 |
| 12/11/2008 | -162,000 | 0 | 26,811,687 | 0       | 0 | 1,000,000 |
| 12/12/2008 | -155,000 | 0 | 26,656,687 | 0       | 0 | 1,000,000 |
| 12/13/2008 | -322,000 | 0 | 26,334,687 | 0       | 0 | 1,000,000 |
| 12/14/2008 | -517,000 | 0 | 25,817,687 | 0       | 0 | 1,000,000 |
| 12/15/2008 | -737,000 | 0 | 25,476,516 | 0       | 0 | 1,000,000 |
| 12/16/2008 | -591,000 | 0 | 24,885,516 | -50,000 | 0 | 950,000   |
| 12/17/2008 | -650,000 | 0 | 24,235,516 | 0       | 0 | 950,000   |
| 12/18/2008 | -519,000 | 0 | 23,716,516 | 0       | 0 | 950,000   |
| 12/19/2008 | -181,000 | 0 | 23,535,516 | 0       | 0 | 950,000   |
| 12/20/2008 | -321,000 | 0 | 23,214,516 | 0       | 0 | 950,000   |
| 12/21/2008 | -246,000 | 0 | 22,968,516 | 0       | 0 | 950,000   |
| 12/22/2008 | -335,000 | 0 | 22,633,516 | 0       | 0 | 950,000   |

|            |          |   |            |   |   |         |
|------------|----------|---|------------|---|---|---------|
| 12/23/2008 | -227,000 | 0 | 22,406,516 | 0 | 0 | 950,000 |
| 12/24/2008 | -256,000 | 0 | 22,150,516 | 0 | 0 | 950,000 |
| 12/25/2008 | -407,000 | 0 | 21,743,516 | 0 | 0 | 950,000 |
| 12/26/2008 | -519,000 | 0 | 21,224,516 | 0 | 0 | 950,000 |
| 12/27/2008 | -303,000 | 0 | 20,921,516 | 0 | 0 | 950,000 |
| 12/28/2008 | -190,000 | 0 | 20,731,516 | 0 | 0 | 950,000 |
| 12/29/2008 | -356,000 | 0 | 20,375,516 | 0 | 0 | 950,000 |
| 12/30/2008 | -266,000 | 0 | 20,109,516 | 0 | 0 | 950,000 |
| 12/31/2008 | -581,000 | 0 | 19,528,516 | 0 | 0 | 950,000 |
|            |          |   |            |   |   |         |
| 1/1/2009   | -470,000 | 0 | 19,058,516 | 0 | 0 | 950,000 |
| 1/2/2009   | -635,000 | 0 | 18,423,516 | 0 | 0 | 950,000 |
| 1/3/2009   | -680,000 | 0 | 17,743,516 | 0 | 0 | 950,000 |
| 1/4/2009   | -881,000 | 0 | 16,862,516 | 0 | 0 | 950,000 |
| 1/5/2009   | -556,000 | 0 | 16,306,516 | 0 | 0 | 950,000 |
| 1/6/2009   | -391,000 | 0 | 15,915,516 | 0 | 0 | 950,000 |
| 1/7/2009   | -156,000 | 0 | 15,759,516 | 0 | 0 | 950,000 |
| 1/8/2009   | -257,000 | 0 | 15,502,516 | 0 | 0 | 950,000 |
| 1/9/2009   | -257,000 | 0 | 15,245,516 | 0 | 0 | 950,000 |
| 1/10/2009  | -84,000  | 0 | 15,161,516 | 0 | 0 | 950,000 |
| 1/11/2009  | -32,000  | 0 | 15,129,516 | 0 | 0 | 950,000 |
| 1/12/2009  | 0        | 0 | 15,129,516 | 0 | 0 | 950,000 |
| 1/13/2009  | 0        | 0 | 15,129,516 | 0 | 0 | 950,000 |
| 1/14/2009  | -183,000 | 0 | 14,946,516 | 0 | 0 | 950,000 |
| 1/15/2009  | -343,000 | 0 | 14,603,516 | 0 | 0 | 950,000 |
| 1/16/2009  | -309,000 | 0 | 14,294,516 | 0 | 0 | 950,000 |
| 1/17/2009  | -380,000 | 0 | 13,914,516 | 0 | 0 | 950,000 |
| 1/18/2009  | -368,000 | 0 | 13,546,516 | 0 | 0 | 950,000 |
| 1/19/2009  | -424,000 | 0 | 13,122,516 | 0 | 0 | 950,000 |
| 1/20/2009  | -378,000 | 0 | 12,744,516 | 0 | 0 | 950,000 |
| 1/21/2009  | -325,000 | 0 | 12,419,516 | 0 | 0 | 950,000 |
| 1/22/2009  | -445,000 | 0 | 11,974,516 | 0 | 0 | 950,000 |

|           |          |   |            |          |   |         |
|-----------|----------|---|------------|----------|---|---------|
| 1/23/2009 | -252,000 | 0 | 11,722,516 | 0        | 0 | 950,000 |
| 1/24/2009 | -245,000 | 0 | 11,477,516 | 0        | 0 | 950,000 |
| 1/25/2009 | -701,000 | 0 | 10,776,516 | 0        | 0 | 950,000 |
| 1/26/2009 | -869,000 | 0 | 9,907,516  | 0        | 0 | 950,000 |
| 1/27/2009 | -362,000 | 0 | 9,545,516  | 0        | 0 | 950,000 |
| 1/28/2009 | -303,000 | 0 | 9,242,516  | 0        | 0 | 950,000 |
| 1/29/2009 | -383,000 | 0 | 8,859,516  | 0        | 0 | 950,000 |
| 1/30/2009 | -398,000 | 0 | 8,461,516  | 0        | 0 | 950,000 |
| 1/31/2009 | -246,000 | 0 | 8,215,516  | 0        | 0 | 950,000 |
| 2/1/2009  | -270,000 | 0 | 7,945,516  | 0        | 0 | 950,000 |
| 2/2/2009  | -239,000 | 0 | 7,706,516  | 0        | 0 | 950,000 |
| 2/3/2009  | -252,000 | 0 | 7,454,516  | 0        | 0 | 950,000 |
| 2/4/2009  | -273,000 | 0 | 7,181,516  | 0        | 0 | 950,000 |
| 2/5/2009  | -242,000 | 0 | 6,939,516  | -50,000  | 0 | 900,000 |
| 2/6/2009  | -220,000 | 0 | 6,719,516  | -50,000  | 0 | 850,000 |
| 2/7/2009  | -182,000 | 0 | 6,537,516  | 0        | 0 | 850,000 |
| 2/8/2009  | -367,000 | 0 | 6,170,516  | -50,000  | 0 | 800,000 |
| 2/9/2009  | -648,000 | 0 | 5,522,516  | -100,000 | 0 | 700,000 |
| 2/10/2009 | -375,000 | 0 | 5,147,516  | -100,000 | 0 | 600,000 |
| 2/11/2009 | -315,000 | 0 | 4,832,516  | -100,000 | 0 | 500,000 |
| 2/12/2009 | -300,000 | 0 | 4,532,516  | -50,000  | 0 | 450,000 |
| 2/13/2009 | -228,000 | 0 | 4,304,516  | -50,000  | 0 | 400,000 |
| 2/14/2009 | -122,000 | 0 | 4,182,516  | -50,000  | 0 | 350,000 |
| 2/15/2009 | -27,000  | 0 | 4,155,516  | -50,000  | 0 | 300,000 |
| 2/16/2009 | -295,000 | 0 | 3,860,516  | 0        | 0 | 300,000 |
| 2/17/2009 | -326,000 | 0 | 3,534,516  | 0        | 0 | 300,000 |
| 2/18/2009 | -278,000 | 0 | 3,256,516  | 0        | 0 | 300,000 |
| 2/19/2009 | -107,000 | 0 | 3,149,516  | 0        | 0 | 300,000 |
| 2/20/2009 | 0        | 0 | 3,213,836  | 0        | 0 | 300,000 |
| 2/21/2009 | 0        | 0 | 3,213,836  | 0        | 0 | 300,000 |
| 2/22/2009 | -55,000  | 0 | 3,158,836  | 0        | 0 | 300,000 |

|           |          |        |           |         |   |         |
|-----------|----------|--------|-----------|---------|---|---------|
| 2/23/2009 | -74,000  | 0      | 3,084,836 | 0       | 0 | 300,000 |
| 2/24/2009 | -122,000 | 0      | 2,962,836 | 0       | 0 | 300,000 |
| 2/25/2009 | -20,000  | 0      | 2,942,836 | 0       | 0 | 300,000 |
| 2/26/2009 | -60,000  | 0      | 2,882,836 | 0       | 0 | 300,000 |
| 2/27/2009 | -68,000  | 0      | 2,814,836 | 0       | 0 | 300,000 |
| 2/28/2009 | -43,000  | 0      | 2,771,836 | 0       | 0 | 300,000 |
| 3/1/2009  | -24,000  | 0      | 2,747,836 | 0       | 0 | 300,000 |
| 3/2/2009  | -166,000 | 0      | 2,581,836 | 0       | 0 | 300,000 |
| 3/3/2009  | -274,000 | 0      | 2,307,836 | 0       | 0 | 300,000 |
| 3/4/2009  | -403,000 | 0      | 1,904,836 | 0       | 0 | 300,000 |
| 3/5/2009  | -175,000 | 0      | 1,729,836 | -50,000 | 0 | 250,000 |
| 3/6/2009  | -154,000 | 0      | 1,575,836 | 0       | 0 | 250,000 |
| 3/7/2009  | -115,000 | 0      | 1,460,836 | -50,000 | 0 | 200,000 |
| 3/8/2009  | -188,000 | 0      | 1,272,836 | -50,000 | 0 | 150,000 |
| 3/9/2009  | -379,000 | 0      | 893,836   | -50,000 | 0 | 100,000 |
| 3/10/2009 | 0        | 0      | 893,836   | -50,000 | 0 | 50,000  |
| 3/11/2009 | -77,000  | 0      | 816,836   | -50,000 | 0 | 0       |
| 3/12/2009 | 0        | 0      | 816,836   | 0       | 0 | 0       |
| 3/13/2009 | 0        | 0      | 816,836   | 0       | 0 | 0       |
| 3/14/2009 | 0        | 0      | 816,836   | 0       | 0 | 0       |
| 3/15/2009 | -101,000 | 0      | 715,836   | 0       | 0 | 0       |
| 3/16/2009 | -57,000  | 0      | 658,836   | 0       | 0 | 0       |
| 3/17/2009 | 0        | 34,000 | 692,836   | 0       | 0 | 0       |
| 3/18/2009 | 0        | 0      | 692,836   | 0       | 0 | 0       |
| 3/19/2009 | 0        | 0      | 692,836   | 0       | 0 | 0       |
| 3/20/2009 | 0        | 47,000 | 1,000,725 | 0       | 0 | 0       |
| 3/21/2009 | 0        | 0      | 1,000,725 | 0       | 0 | 0       |
| 3/22/2009 | -260,000 | 0      | 740,725   | 0       | 0 | 0       |
| 3/23/2009 | -213,000 | 0      | 527,725   | 0       | 0 | 0       |
| 3/24/2009 | -94,000  | 0      | 433,725   | 0       | 0 | 0       |
| 3/25/2009 | 0        | 0      | 433,725   | 0       | 0 | 0       |

|           |         |        |         |   |   |   |
|-----------|---------|--------|---------|---|---|---|
| 3/26/2009 | -23,000 | 0      | 410,725 | 0 | 0 | 0 |
| 3/27/2009 | 0       | 47,000 | 457,725 | 0 | 0 | 0 |
| 3/28/2009 | 0       | 47,000 | 504,725 | 0 | 0 | 0 |
| 3/29/2009 | 0       | 40,000 | 544,725 | 0 | 0 | 0 |
| 3/30/2009 | 0       | 0      | 544,725 | 0 | 0 | 0 |
| 3/31/2009 | 0       | 0      | 544,725 | 0 | 0 | 0 |

|            |          |        |            |   |   |           |
|------------|----------|--------|------------|---|---|-----------|
| 11/1/2009  | 0        | 0      | 31,122,862 | 0 | 0 | 1,000,000 |
| 11/2/2009  | 0        | 0      | 31,122,862 | 0 | 0 | 1,000,000 |
| 11/3/2009  | -25,000  | 0      | 31,097,862 | 0 | 0 | 1,000,000 |
| 11/4/2009  | 0        | 0      | 31,097,862 | 0 | 0 | 1,000,000 |
| 11/5/2009  | 0        | 0      | 31,097,862 | 0 | 0 | 1,000,000 |
| 11/6/2009  | 0        | 0      | 31,097,862 | 0 | 0 | 1,000,000 |
| 11/7/2009  | 10,000   | 10,000 | 31,107,862 | 0 | 0 | 1,000,000 |
| 11/8/2009  | -70,000  | 0      | 31,037,862 | 0 | 0 | 1,000,000 |
| 11/9/2009  | -80,000  | 0      | 30,957,862 | 0 | 0 | 1,000,000 |
| 11/10/2009 | 0        | 0      | 30,957,862 | 0 | 0 | 1,000,000 |
| 11/11/2009 | 0        | 0      | 30,957,862 | 0 | 0 | 1,000,000 |
| 11/12/2009 | 0        | 0      | 30,957,862 | 0 | 0 | 1,000,000 |
| 11/13/2009 | -87,000  | 0      | 30,870,862 | 0 | 0 | 1,000,000 |
| 11/14/2009 | 0        | 0      | 30,870,862 | 0 | 0 | 1,000,000 |
| 11/15/2009 | 0        | 0      | 30,870,862 | 0 | 0 | 1,000,000 |
| 11/16/2009 | -40,000  | 0      | 30,830,862 | 0 | 0 | 1,000,000 |
| 11/17/2009 | -138,000 | 0      | 30,692,862 | 0 | 0 | 1,000,000 |
| 11/18/2009 | -130,000 | 0      | 30,562,862 | 0 | 0 | 1,000,000 |
| 11/19/2009 | -212,000 | 0      | 30,350,862 | 0 | 0 | 1,000,000 |
| 11/20/2009 | -232,000 | 0      | 30,118,862 | 0 | 0 | 1,000,000 |
| 11/21/2009 | -183,000 | 0      | 29,935,862 | 0 | 0 | 1,000,000 |
| 11/22/2009 | -188,000 | 0      | 29,747,862 | 0 | 0 | 1,000,000 |
| 11/23/2009 | -192,000 | 0      | 29,555,862 | 0 | 0 | 1,000,000 |
| 11/24/2009 | -144,000 | 0      | 29,411,862 | 0 | 0 | 1,000,000 |
| 11/25/2009 | -20,000  | 0      | 29,391,862 | 0 | 0 | 1,000,000 |

|            |          |        |            |         |   |           |
|------------|----------|--------|------------|---------|---|-----------|
| 11/26/2009 | 46,483   | 46,483 | 29,438,345 | 0       | 0 | 1,000,000 |
| 11/27/2009 | -59,000  | 0      | 29,379,345 | 0       | 0 | 1,000,000 |
| 11/28/2009 | -176,000 | 0      | 29,203,345 | 0       | 0 | 1,000,000 |
| 11/29/2009 | -132,000 | 0      | 29,071,345 | 0       | 0 | 1,000,000 |
| 11/30/2009 | -283,000 | 0      | 28,788,345 | 0       | 0 | 1,000,000 |
|            |          |        |            |         |   |           |
| 12/1/2009  | -190,000 | 0      | 28,598,345 | 0       | 0 | 1,000,000 |
| 12/2/2009  | -399,000 | 0      | 28,199,345 | 0       | 0 | 1,000,000 |
| 12/3/2009  | -151,000 | 0      | 28,048,345 | 0       | 0 | 1,000,000 |
| 12/4/2009  | -316,000 | 0      | 27,732,345 | 0       | 0 | 1,000,000 |
| 12/5/2009  | -244,000 | 0      | 27,488,345 | 0       | 0 | 1,000,000 |
| 12/6/2009  | -553,000 | 0      | 26,935,345 | 0       | 0 | 1,000,000 |
| 12/7/2009  | -750,000 | 0      | 26,185,345 | -50,000 | 0 | 950,000   |
| 12/8/2009  | -773,000 | 0      | 25,412,345 | -50,000 | 0 | 900,000   |
| 12/9/2009  | -902,000 | 0      | 24,510,345 | -50,000 | 0 | 850,000   |
| 12/10/2009 | -487,000 | 0      | 24,023,345 | 0       | 0 | 850,000   |
| 12/11/2009 | -248,000 | 0      | 23,775,345 | 0       | 0 | 850,000   |
| 12/12/2009 | -161,000 | 0      | 23,614,345 | 0       | 0 | 850,000   |
| 12/13/2009 | -152,000 | 0      | 23,462,345 | 0       | 0 | 850,000   |
| 12/14/2009 | -70,000  | 0      | 23,103,725 | 0       | 0 | 850,000   |
| 12/15/2009 | -72,000  | 0      | 23,031,725 | 0       | 0 | 850,000   |
| 12/16/2009 | -41,000  | 0      | 22,990,725 | 0       | 0 | 850,000   |
| 12/17/2009 | -77,000  | 0      | 22,913,725 | 0       | 0 | 850,000   |
| 12/18/2009 | -160,000 | 0      | 22,753,725 | 0       | 0 | 850,000   |
| 12/19/2009 | -143,000 | 0      | 22,610,725 | 0       | 0 | 850,000   |
| 12/20/2009 | -250,000 | 0      | 22,360,725 | 0       | 0 | 850,000   |
| 12/21/2009 | -268,000 | 0      | 22,092,725 | 0       | 0 | 850,000   |
| 12/22/2009 | -497,000 | 0      | 21,595,725 | 0       | 0 | 850,000   |
| 12/23/2009 | -507,000 | 0      | 21,088,725 | 0       | 0 | 850,000   |
| 12/24/2009 | -451,000 | 0      | 20,637,725 | 0       | 0 | 850,000   |
| 12/25/2009 | -366,000 | 0      | 20,271,725 | 0       | 0 | 850,000   |
| 12/26/2009 | -233,000 | 0      | 20,038,725 | 0       | 0 | 850,000   |

|            |          |   |            |         |   |         |
|------------|----------|---|------------|---------|---|---------|
| 12/27/2009 | -264,000 | 0 | 19,774,725 | 0       | 0 | 850,000 |
| 12/28/2009 | -339,000 | 0 | 19,435,725 | 0       | 0 | 850,000 |
| 12/29/2009 | -520,000 | 0 | 18,915,725 | 0       | 0 | 850,000 |
| 12/30/2009 | -110,000 | 0 | 18,805,725 | -50,000 | 0 | 800,000 |
| 12/31/2009 | -100,000 | 0 | 18,785,050 | 0       | 0 | 800,000 |
| 1/1/2010   | -110,000 | 0 | 18,516,080 | 0       | 0 | 800,000 |
| 1/2/2010   | -145,000 | 0 | 18,371,080 | 0       | 0 | 800,000 |
| 1/3/2010   | -360,000 | 0 | 18,011,080 | 0       | 0 | 800,000 |
| 1/4/2010   | -360,000 | 0 | 17,651,080 | 0       | 0 | 800,000 |
| 1/5/2010   | -514,000 | 0 | 17,137,080 | -49,999 | 0 | 750,001 |
| 1/6/2010   | -385,000 | 0 | 16,752,080 | 0       | 0 | 750,001 |
| 1/7/2010   | -523,000 | 0 | 16,229,080 | -50,000 | 0 | 700,001 |
| 1/8/2010   | -448,000 | 0 | 15,781,080 | 0       | 0 | 700,001 |
| 1/9/2010   | -362,000 | 0 | 15,419,080 | 0       | 0 | 700,001 |
| 1/10/2010  | -398,000 | 0 | 15,021,080 | 0       | 0 | 700,001 |
| 1/11/2010  | -360,000 | 0 | 14,661,080 | 0       | 0 | 700,001 |
| 1/12/2010  | -360,000 | 0 | 14,301,080 | 0       | 0 | 700,001 |
| 1/13/2010  | -180,000 | 0 | 14,121,080 | 0       | 0 | 700,001 |
| 1/14/2010  | -180,000 | 0 | 13,210,863 | 0       | 0 | 700,001 |
| 1/15/2010  | -350,000 | 0 | 12,860,863 | 0       | 0 | 700,001 |
| 1/16/2010  | -257,000 | 0 | 12,603,863 | 0       | 0 | 700,001 |
| 1/17/2010  | -210,000 | 0 | 12,393,863 | 0       | 0 | 700,001 |
| 1/18/2010  | -243,000 | 0 | 12,150,863 | 0       | 0 | 700,001 |
| 1/19/2010  | -415,000 | 0 | 11,735,863 | 0       | 0 | 700,001 |
| 1/20/2010  | -440,000 | 0 | 11,295,863 | 0       | 0 | 700,001 |
| 1/21/2010  | -575,000 | 0 | 10,720,863 | -50,000 | 0 | 650,001 |
| 1/22/2010  | -564,000 | 0 | 10,156,863 | -50,000 | 0 | 600,001 |
| 1/23/2010  | -335,000 | 0 | 9,821,863  | -50,000 | 0 | 550,001 |
| 1/24/2010  | -310,000 | 0 | 9,511,863  | 0       | 0 | 550,001 |
| 1/25/2010  | -350,000 | 0 | 9,161,863  | 0       | 0 | 550,001 |
| 1/26/2010  | -240,000 | 0 | 8,921,863  | 0       | 0 | 550,001 |

|           |          |   |           |         |   |         |
|-----------|----------|---|-----------|---------|---|---------|
| 1/27/2010 | -465,000 | 0 | 8,456,863 | 0       | 0 | 550,001 |
| 1/28/2010 | -275,000 | 0 | 8,181,863 | 0       | 0 | 550,001 |
| 1/29/2010 | -310,000 | 0 | 7,871,863 | 0       | 0 | 550,001 |
| 1/30/2010 | -280,000 | 0 | 7,591,863 | 0       | 0 | 550,001 |
| 1/31/2010 | -240,000 | 0 | 7,351,863 | 0       | 0 | 550,001 |
| 2/1/2010  | -114,000 | 0 | 7,237,863 | 0       | 0 | 550,001 |
| 2/2/2010  | -158,000 | 0 | 7,079,863 | -49,969 | 0 | 500,032 |
| 2/3/2010  | 0        | 0 | 7,079,863 | -50,000 | 0 | 450,032 |
| 2/4/2010  | -134,500 | 0 | 6,945,363 | -12,500 | 0 | 437,532 |
| 2/5/2010  | -172,000 | 0 | 6,773,363 | 0       | 0 | 437,532 |
| 2/6/2010  | -65,000  | 0 | 6,708,363 | 0       | 0 | 437,532 |
| 2/7/2010  | -270,000 | 0 | 6,438,363 | 0       | 0 | 437,532 |
| 2/8/2010  | -278,000 | 0 | 6,160,363 | 0       | 0 | 437,532 |
| 2/9/2010  | -283,000 | 0 | 5,877,363 | -50,000 | 0 | 387,532 |
| 2/10/2010 | -340,500 | 0 | 5,536,863 | -37,501 | 0 | 350,031 |
| 2/11/2010 | -214,000 | 0 | 5,322,863 | 0       | 0 | 350,031 |
| 2/12/2010 | -204,000 | 0 | 5,118,863 | 0       | 0 | 350,031 |
| 2/13/2010 | -184,000 | 0 | 4,934,863 | 0       | 0 | 350,031 |
| 2/14/2010 | -158,000 | 0 | 4,776,863 | 0       | 0 | 350,031 |
| 2/15/2010 | -229,000 | 0 | 4,547,863 | 0       | 0 | 350,031 |
| 2/16/2010 | -172,000 | 0 | 4,375,863 | 0       | 0 | 350,031 |
| 2/17/2010 | -252,000 | 0 | 4,123,863 | 0       | 0 | 350,031 |
| 2/18/2010 | -172,000 | 0 | 3,951,863 | 0       | 0 | 350,031 |
| 2/19/2010 | -223,000 | 0 | 3,728,863 | 0       | 0 | 350,031 |
| 2/20/2010 | -119,000 | 0 | 3,609,863 | 0       | 0 | 350,031 |
| 2/21/2010 | -233,000 | 0 | 3,376,863 | 0       | 0 | 350,031 |
| 2/22/2010 | -302,000 | 0 | 3,074,863 | -50,000 | 0 | 300,031 |
| 2/23/2010 | -188,000 | 0 | 2,886,863 | 0       | 0 | 300,000 |
| 2/24/2010 | -199,000 | 0 | 2,687,863 | 0       | 0 | 300,000 |
| 2/25/2010 | -82,000  | 0 | 2,605,863 | 0       | 0 | 300,000 |
| 2/26/2010 | 0        | 0 | 2,605,863 | 0       | 0 | 300,000 |

|           |          |        |           |         |   |         |
|-----------|----------|--------|-----------|---------|---|---------|
| 2/27/2010 | -130,000 | 0      | 2,475,863 | 0       | 0 | 300,000 |
| 2/28/2010 | -135,000 | 0      | 2,340,863 | 0       | 0 | 300,000 |
| 3/1/2010  | -50,000  | 0      | 2,290,863 | 0       | 0 | 300,000 |
| 3/2/2010  | -170,000 | 0      | 2,120,863 | 0       | 0 | 300,000 |
| 3/3/2010  | -322,000 | 0      | 1,798,863 | -50,000 | 0 | 250,000 |
| 3/4/2010  | -354,000 | 0      | 1,444,863 | -50,000 | 0 | 200,000 |
| 3/5/2010  | -113,000 | 0      | 1,331,863 | 0       | 0 | 200,000 |
| 3/6/2010  | -104,000 | 0      | 1,227,863 | 0       | 0 | 200,000 |
| 3/7/2010  | 0        | 0      | 1,227,863 | 0       | 0 | 200,000 |
| 3/8/2010  | -217,000 | 0      | 1,010,863 | -50,000 | 0 | 150,000 |
| 3/9/2010  | -236,000 | 0      | 774,863   | -50,000 | 0 | 100,000 |
| 3/10/2010 | -211,000 | 0      | 563,863   | -50,000 | 0 | 50,000  |
| 3/11/2010 | 46,263   | 46,263 | 610,126   | 0       | 0 | 50,000  |
| 3/12/2010 | 46,263   | 46,263 | 656,389   | 0       | 0 | 50,000  |
| 3/13/2010 | -230,000 | 0      | 426,389   | 0       | 0 | 50,000  |
| 3/14/2010 | -55,000  | 0      | 371,389   | 0       | 0 | 50,000  |
| 3/15/2010 | 46,263   | 46,263 | 417,652   | 0       | 0 | 50,000  |
| 3/16/2010 | 46,263   | 46,263 | 463,915   | 0       | 0 | 50,000  |
| 3/17/2010 | 46,263   | 46,263 | 510,178   | 0       | 0 | 50,000  |
| 3/18/2010 | 46,263   | 46,263 | 556,441   | 0       | 0 | 50,000  |
| 3/19/2010 | 46,263   | 46,263 | 602,704   | 0       | 0 | 50,000  |
| 3/20/2010 | 0        | 0      | 602,704   | 0       | 0 | 50,000  |
| 3/21/2010 | -14,000  | 0      | 588,704   | 0       | 0 | 50,000  |
| 3/22/2010 | -93,000  | 0      | 495,704   | 0       | 0 | 50,000  |
| 3/23/2010 | 46,263   | 46,263 | 541,967   | 0       | 0 | 50,000  |
| 3/24/2010 | 0        | 0      | 541,967   | 0       | 0 | 50,000  |
| 3/25/2010 | 0        | 0      | 541,967   | 0       | 0 | 50,000  |
| 3/26/2010 | 0        | 0      | 541,967   | 0       | 0 | 50,000  |
| 3/27/2010 | 0        | 0      | 541,967   | 0       | 0 | 50,000  |
| 3/28/2010 | 0        | 0      | 541,967   | 0       | 0 | 50,000  |
| 3/29/2010 | 0        | 0      | 541,967   | 0       | 0 | 50,000  |

|            |          |        |            |         |   |           |
|------------|----------|--------|------------|---------|---|-----------|
| 3/30/2010  | 0        | 0      | 541,967    | 0       | 0 | 50,000    |
| 3/31/2010  | 0        | 0      | 541,967    | 0       | 0 | 50,000    |
| 11/1/2010  | 0        | 11,868 | 30,917,344 | 0       | 0 | 1,000,000 |
| 11/2/2010  | 0        | 46,000 | 30,963,344 | 0       | 0 | 1,000,000 |
| 11/3/2010  | 0        | 46,000 | 31,009,344 | 0       | 0 | 1,000,000 |
| 11/4/2010  | 0        | 46,000 | 31,055,344 | 0       | 0 | 1,000,000 |
| 11/5/2010  | 0        | 46,000 | 31,101,344 | 0       | 0 | 1,000,000 |
| 11/6/2010  | 0        | 46,000 | 31,147,344 | 0       | 0 | 1,000,000 |
| 11/7/2010  | 0        | 0      | 31,147,344 | 0       | 0 | 1,000,000 |
| 11/8/2010  | -268,000 | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/9/2010  | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/10/2010 | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/11/2010 | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/12/2010 | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/13/2010 | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/14/2010 | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/15/2010 | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/16/2010 | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/17/2010 | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/18/2010 | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/19/2010 | 0        | 0      | 30,879,344 | 0       | 0 | 1,000,000 |
| 11/20/2010 | -318,000 | 0      | 30,561,344 | 0       | 0 | 1,000,000 |
| 11/21/2010 | -482,000 | 0      | 30,079,344 | 0       | 0 | 1,000,000 |
| 11/22/2010 | -300,000 | 0      | 29,779,344 | 0       | 0 | 1,000,000 |
| 11/23/2010 | -576,000 | 0      | 29,203,344 | 0       | 0 | 1,000,000 |
| 11/24/2010 | -322,000 | 0      | 28,881,344 | -50,000 | 0 | 950,000   |
| 11/25/2010 | -307,000 | 0      | 28,574,344 | 0       | 0 | 950,000   |
| 11/26/2010 | -185,000 | 0      | 28,389,344 | 0       | 0 | 950,000   |
| 11/27/2010 | -169,000 | 0      | 28,220,344 | 0       | 0 | 950,000   |
| 11/28/2010 | -379,000 | 0      | 27,841,344 | -50,000 | 0 | 900,000   |
| 11/29/2010 | -407,000 | 0      | 27,434,344 | 0       | 0 | 900,000   |

|            |          |   |            |         |   |         |
|------------|----------|---|------------|---------|---|---------|
| 11/30/2010 | 0        | 0 | 27,434,344 | 0       | 0 | 900,000 |
| 12/1/2010  | -204,000 | 0 | 27,230,344 | 0       | 0 | 900,000 |
| 12/2/2010  | -84,000  | 0 | 27,146,344 | 0       | 0 | 900,000 |
| 12/3/2010  | -38,000  | 0 | 27,108,344 | 0       | 0 | 900,000 |
| 12/4/2010  | -53,000  | 0 | 27,055,344 | 0       | 0 | 900,000 |
| 12/5/2010  | 0        | 0 | 27,055,344 | 0       | 0 | 900,000 |
| 12/6/2010  | -138,000 | 0 | 26,917,344 | 0       | 0 | 900,000 |
| 12/7/2010  | -50,000  | 0 | 26,867,344 | 0       | 0 | 900,000 |
| 12/8/2010  | -271,000 | 0 | 26,596,344 | 0       | 0 | 900,000 |
| 12/9/2010  | -219,000 | 0 | 26,377,344 | 0       | 0 | 900,000 |
| 12/10/2010 | -152,000 | 0 | 26,225,344 | 0       | 0 | 900,000 |
| 12/11/2010 | -28,000  | 0 | 26,197,344 | 0       | 0 | 900,000 |
| 12/12/2010 | -114,000 | 0 | 26,083,344 | 0       | 0 | 900,000 |
| 12/13/2010 | -255,000 | 0 | 25,828,344 | 0       | 0 | 900,000 |
| 12/14/2010 | -376,000 | 0 | 25,452,344 | 0       | 0 | 900,000 |
| 12/15/2010 | -471,000 | 0 | 24,981,344 | 0       | 0 | 900,000 |
| 12/16/2010 | -453,000 | 0 | 24,528,344 | 0       | 0 | 900,000 |
| 12/17/2010 | -151,000 | 0 | 24,377,344 | 0       | 0 | 900,000 |
| 12/18/2010 | -39,000  | 0 | 24,338,344 | 0       | 0 | 900,000 |
| 12/19/2010 | -40,000  | 0 | 24,298,344 | 0       | 0 | 900,000 |
| 12/20/2010 | -280,000 | 0 | 24,031,221 | 0       | 0 | 900,000 |
| 12/21/2010 | -434,000 | 0 | 23,626,307 | 0       | 0 | 900,000 |
| 12/22/2010 | -411,000 | 0 | 23,215,526 | 0       | 0 | 900,000 |
| 12/23/2010 | -275,000 | 0 | 22,940,526 | 0       | 0 | 900,000 |
| 12/24/2010 | -398,000 | 0 | 22,542,526 | 0       | 0 | 900,000 |
| 12/25/2010 | -337,000 | 0 | 22,205,526 | 0       | 0 | 900,000 |
| 12/26/2010 | -431,000 | 0 | 21,774,526 | 0       | 0 | 900,000 |
| 12/27/2010 | -557,000 | 0 | 21,217,526 | 0       | 0 | 900,000 |
| 12/28/2010 | -414,000 | 0 | 20,803,526 | 0       | 0 | 900,000 |
| 12/29/2010 | -600,000 | 0 | 20,203,526 | 0       | 0 | 900,000 |
| 12/30/2010 | -643,000 | 0 | 19,560,526 | -50,000 | 0 | 850,000 |

|            |          |   |            |          |   |         |
|------------|----------|---|------------|----------|---|---------|
| 12/31/2010 | -505,000 | 0 | 19,055,526 | 0        | 0 | 850,000 |
| 1/1/2011   | -624,000 | 0 | 18,431,526 | 0        | 0 | 850,000 |
| 1/2/2011   | -765,000 | 0 | 17,666,526 | 0        | 0 | 850,000 |
| 1/3/2011   | -675,000 | 0 | 16,991,526 | -50,000  | 0 | 800,000 |
| 1/4/2011   | -639,000 | 0 | 16,352,526 | -50,000  | 0 | 750,000 |
| 1/5/2011   | -568,000 | 0 | 15,784,526 | 0        | 0 | 750,000 |
| 1/6/2011   | -539,000 | 0 | 15,245,526 | -50,000  | 0 | 700,000 |
| 1/7/2011   | -650,000 | 0 | 14,595,526 | -50,000  | 0 | 650,000 |
| 1/8/2011   | -568,000 | 0 | 14,027,526 | -50,000  | 0 | 600,000 |
| 1/9/2011   | -565,000 | 0 | 13,462,526 | -50,000  | 0 | 550,000 |
| 1/10/2011  | -537,000 | 0 | 12,925,526 | -100,000 | 0 | 450,000 |
| 1/11/2011  | -78,000  | 0 | 12,847,526 | 0        | 0 | 450,000 |
| 1/12/2011  | -167,000 | 0 | 12,680,526 | 0        | 0 | 450,000 |
| 1/13/2011  | -293,000 | 0 | 12,387,526 | 0        | 0 | 450,000 |
| 1/14/2011  | -263,000 | 0 | 12,124,526 | 0        | 0 | 450,000 |
| 1/15/2011  | -131,000 | 0 | 11,993,526 | 0        | 0 | 450,000 |
| 1/16/2011  | -52,000  | 0 | 11,941,526 | 0        | 0 | 450,000 |
| 1/17/2011  | -356,000 | 0 | 11,585,526 | 0        | 0 | 450,000 |
| 1/18/2011  | -307,000 | 0 | 11,278,526 | 0        | 0 | 450,000 |
| 1/19/2011  | -194,000 | 0 | 11,084,526 | 0        | 0 | 450,000 |
| 1/20/2011  | -407,000 | 0 | 10,677,526 | 0        | 0 | 450,000 |
| 1/21/2011  | -341,000 | 0 | 10,336,526 | 0        | 0 | 450,000 |
| 1/22/2011  | -145,000 | 0 | 10,191,526 | 0        | 0 | 450,000 |
| 1/23/2011  | -113,000 | 0 | 10,078,526 | 0        | 0 | 450,000 |
| 1/24/2011  | -253,000 | 0 | 9,825,526  | 0        | 0 | 450,000 |
| 1/25/2011  | -658,000 | 0 | 9,167,526  | 0        | 0 | 450,000 |
| 1/26/2011  | -428,000 | 0 | 8,739,526  | 0        | 0 | 450,000 |
| 1/27/2011  | -416,000 | 0 | 8,323,526  | 0        | 0 | 450,000 |
| 1/28/2011  | -346,000 | 0 | 7,977,526  | 0        | 0 | 450,000 |
| 1/29/2011  | -191,000 | 0 | 7,786,526  | 0        | 0 | 450,000 |
| 1/30/2011  | -303,000 | 0 | 7,483,526  | 0        | 0 | 450,000 |

|           |          |   |           |         |   |         |
|-----------|----------|---|-----------|---------|---|---------|
| 1/31/2011 | -273,000 | 0 | 7,210,526 | 0       | 0 | 450,000 |
| 2/1/2011  | -493,000 | 0 | 6,717,526 | 0       | 0 | 450,000 |
| 2/2/2011  | -440,000 | 0 | 6,277,526 | -50,000 | 0 | 400,000 |
| 2/3/2011  | -355,000 | 0 | 5,922,526 | -50,000 | 0 | 350,000 |
| 2/4/2011  | -251,000 | 0 | 5,671,526 | 0       | 0 | 350,000 |
| 2/5/2011  | -164,000 | 0 | 5,507,526 | 0       | 0 | 350,000 |
| 2/6/2011  | -120,000 | 0 | 5,387,526 | 0       | 0 | 350,000 |
| 2/7/2011  | 0        | 0 | 5,387,526 | 0       | 0 | 350,000 |
| 2/8/2011  | 0        | 0 | 5,387,526 | 0       | 0 | 350,000 |
| 2/9/2011  | 0        | 0 | 5,387,526 | 0       | 0 | 350,000 |
| 2/10/2011 | -53,000  | 0 | 5,334,526 | 0       | 0 | 350,000 |
| 2/11/2011 | -23,000  | 0 | 5,311,526 | 0       | 0 | 350,000 |
| 2/12/2011 | 0        | 0 | 5,311,526 | 0       | 0 | 350,000 |
| 2/13/2011 | 0        | 0 | 5,311,526 | 0       | 0 | 350,000 |
| 2/14/2011 | -30,000  | 0 | 5,281,526 | 0       | 0 | 350,000 |
| 2/15/2011 | -66,000  | 0 | 5,215,526 | 0       | 0 | 350,000 |
| 2/16/2011 | -391,000 | 0 | 4,824,526 | 0       | 0 | 350,000 |
| 2/17/2011 | -589,000 | 0 | 4,235,526 | 0       | 0 | 350,000 |
| 2/18/2011 | -426,000 | 0 | 3,809,526 | 0       | 0 | 350,000 |
| 2/19/2011 | -101,000 | 0 | 3,708,526 | 0       | 0 | 350,000 |
| 2/20/2011 | -143,000 | 0 | 3,565,526 | 0       | 0 | 350,000 |
| 2/21/2011 | -58,000  | 0 | 3,507,526 | 0       | 0 | 350,000 |
| 2/22/2011 | 0        | 0 | 3,507,526 | 0       | 0 | 350,000 |
| 2/23/2011 | -88,000  | 0 | 3,419,526 | 0       | 0 | 350,000 |
| 2/24/2011 | -151,000 | 0 | 3,268,526 | 0       | 0 | 350,000 |
| 2/25/2011 | -261,000 | 0 | 3,007,526 | 0       | 0 | 350,000 |
| 2/26/2011 | -461,000 | 0 | 2,546,526 | 0       | 0 | 350,000 |
| 2/27/2011 | -361,000 | 0 | 2,185,526 | 0       | 0 | 350,000 |
| 2/28/2011 | -176,000 | 0 | 2,009,526 | 0       | 0 | 350,000 |
| 3/1/2011  | -153,000 | 0 | 1,856,526 | -50,000 | 0 | 300,000 |

|           |          |        |            |         |   |           |
|-----------|----------|--------|------------|---------|---|-----------|
| 3/2/2011  | -106,000 | 0      | 1,750,526  | 0       | 0 | 300,000   |
| 3/3/2011  | -36,000  | 0      | 1,714,526  | 0       | 0 | 300,000   |
| 3/4/2011  | 0        | 0      | 1,714,526  | 0       | 0 | 300,000   |
| 3/5/2011  | 0        | 46,000 | 1,760,526  | 0       | 0 | 300,000   |
| 3/6/2011  | -48,000  | 0      | 1,712,526  | 0       | 0 | 300,000   |
| 3/7/2011  | -158,000 | 0      | 1,554,526  | 0       | 0 | 300,000   |
| 3/8/2011  | -77,000  | 0      | 1,477,526  | 0       | 0 | 300,000   |
| 3/9/2011  | -126,000 | 0      | 1,351,526  | 0       | 0 | 300,000   |
| 3/10/2011 | -125,000 | 0      | 1,226,526  | 0       | 0 | 300,000   |
| 3/11/2011 | -120,000 | 0      | 1,106,526  | -50,000 | 0 | 250,000   |
| 3/12/2011 | 0        | 0      | 1,106,526  | 0       | 0 | 250,000   |
| 3/13/2011 | 0        | 46,000 | 1,152,526  | 0       | 0 | 250,000   |
| 3/14/2011 | 0        | 0      | 1,152,526  | 0       | 0 | 250,000   |
| 3/15/2011 | 0        | 0      | 1,152,526  | 0       | 0 | 250,000   |
| 3/16/2011 | -92,000  | 0      | 1,060,526  | 0       | 0 | 250,000   |
| 3/17/2011 | -152,000 | 0      | 908,526    | 0       | 0 | 250,000   |
| 3/18/2011 | -148,000 | 0      | 760,526    | 0       | 0 | 250,000   |
| 3/19/2011 | -231,000 | 0      | 529,526    | -50,000 | 0 | 200,000   |
| 3/20/2011 | -325,000 | 0      | 204,526    | -50,000 | 0 | 150,000   |
| 3/21/2011 | 0        | 0      | 204,526    | -50,000 | 0 | 100,000   |
| 3/22/2011 | 0        | 45,988 | 250,514    | 0       | 0 | 100,000   |
| 3/23/2011 | 0        | 45,834 | 296,348    | 0       | 0 | 100,000   |
| 3/24/2011 | 0        | 46,000 | 342,348    | 0       | 0 | 100,000   |
| 3/25/2011 | 0        | 0      | 342,348    | 0       | 0 | 100,000   |
| 3/26/2011 | 0        | 46,000 | 388,348    | 0       | 0 | 100,000   |
| 3/27/2011 | 0        | 45,982 | 434,330    | 0       | 0 | 100,000   |
| 3/28/2011 | 0        | 46,000 | 480,330    | 0       | 0 | 100,000   |
| 3/29/2011 | 0        | 0      | 480,330    | 0       | 0 | 100,000   |
| 3/30/2011 | 0        | 0      | 480,330    | 0       | 0 | 100,000   |
| 3/31/2011 | 0        | 0      | 480,330    | 0       | 0 | 100,000   |
| 11/1/2011 | 0        | 0      | 32,253,027 | 0       | 0 | 1,499,979 |

|            |          |        |            |   |   |           |
|------------|----------|--------|------------|---|---|-----------|
| 11/2/2011  | 0        | 0      | 32,253,027 | 0 | 0 | 1,499,979 |
| 11/3/2011  | 0        | 0      | 32,253,027 | 0 | 0 | 1,499,979 |
| 11/4/2011  | 0        | 0      | 32,253,027 | 0 | 0 | 1,499,979 |
| 11/5/2011  | 0        | 0      | 32,253,027 | 0 | 0 | 1,499,979 |
| 11/6/2011  | -190,000 | 0      | 32,063,027 | 0 | 0 | 1,499,979 |
| 11/7/2011  | -30,000  | 0      | 32,033,027 | 0 | 0 | 1,499,979 |
| 11/8/2011  | -75,000  | 0      | 31,958,027 | 0 | 0 | 1,499,979 |
| 11/9/2011  | 0        | 0      | 31,958,027 | 0 | 0 | 1,499,979 |
| 11/10/2011 | -50,000  | 0      | 31,908,027 | 0 | 0 | 1,499,979 |
| 11/11/2011 | 0        | 0      | 31,908,027 | 0 | 0 | 1,499,979 |
| 11/12/2011 | 0        | 0      | 31,908,027 | 0 | 0 | 1,499,979 |
| 11/13/2011 | 0        | 48,489 | 31,956,516 | 0 | 0 | 1,499,979 |
| 11/14/2011 | 0        | 0      | 31,956,516 | 0 | 0 | 1,499,979 |
| 11/15/2011 | 0        | 0      | 31,956,516 | 0 | 0 | 1,499,979 |
| 11/16/2011 | 0        | 0      | 31,956,516 | 0 | 0 | 1,499,979 |
| 11/17/2011 | 0        | 0      | 31,956,516 | 0 | 0 | 1,499,979 |
| 11/18/2011 | 0        | 0      | 31,956,516 | 0 | 0 | 1,499,979 |
| 11/19/2011 | -55,000  | 0      | 31,901,516 | 0 | 0 | 1,499,979 |
| 11/20/2011 | -173,000 | 0      | 31,728,516 | 0 | 0 | 1,499,979 |
| 11/21/2011 | -158,000 | 0      | 31,570,516 | 0 | 0 | 1,499,979 |
| 11/22/2011 | -164,000 | 0      | 31,421,119 | 0 | 0 | 1,499,979 |
| 11/23/2011 | -181,000 | 0      | 31,240,119 | 0 | 0 | 1,499,979 |
| 11/24/2011 | -59,000  | 0      | 31,181,119 | 0 | 0 | 1,499,979 |
| 11/25/2011 | -97,000  | 0      | 31,084,119 | 0 | 0 | 1,499,979 |
| 11/26/2011 | 0        | 0      | 31,084,119 | 0 | 0 | 1,499,979 |
| 11/27/2011 | -115,000 | 0      | 30,969,119 | 0 | 0 | 1,499,979 |
| 11/28/2011 | -222,000 | 0      | 30,747,119 | 0 | 0 | 1,499,979 |
| 11/29/2011 | -346,000 | 0      | 30,401,119 | 0 | 0 | 1,499,979 |
| 11/30/2011 | -243,000 | 0      | 30,158,119 | 0 | 0 | 1,499,979 |
|            |          |        |            |   |   |           |
| 12/1/2011  | -143,000 | 0      | 30,015,119 | 0 | 0 | 1,499,979 |
| 12/2/2011  | 0        | 0      | 30,015,119 | 0 | 0 | 1,499,979 |

|            |          |   |            |          |   |           |
|------------|----------|---|------------|----------|---|-----------|
| 12/3/2011  | -49,000  | 0 | 29,966,119 | 0        | 0 | 1,499,979 |
| 12/4/2011  | -358,000 | 0 | 29,608,119 | 0        | 0 | 1,499,979 |
| 12/5/2011  | -498,000 | 0 | 29,110,119 | 0        | 0 | 1,499,979 |
| 12/6/2011  | -448,000 | 0 | 28,662,119 | 0        | 0 | 1,499,979 |
| 12/7/2011  | -518,000 | 0 | 28,144,119 | 0        | 0 | 1,499,979 |
| 12/8/2011  | -499,000 | 0 | 27,645,119 | 0        | 0 | 1,499,979 |
| 12/9/2011  | -345,000 | 0 | 27,300,119 | 0        | 0 | 1,499,979 |
| 12/10/2011 | -279,000 | 0 | 27,021,119 | 0        | 0 | 1,499,979 |
| 12/11/2011 | -500,000 | 0 | 26,521,119 | 0        | 0 | 1,499,979 |
| 12/12/2011 | -473,000 | 0 | 26,048,119 | -100,000 | 0 | 1,399,979 |
| 12/13/2011 | -542,000 | 0 | 25,506,119 | -100,000 | 0 | 1,299,979 |
| 12/14/2011 | -448,000 | 0 | 25,058,119 | 0        | 0 | 1,299,979 |
| 12/15/2011 | -328,000 | 0 | 24,730,119 | 0        | 0 | 1,299,979 |
| 12/16/2011 | -609,000 | 0 | 24,121,119 | -100,000 | 0 | 1,199,979 |
| 12/17/2011 | -381,000 | 0 | 23,740,119 | 0        | 0 | 1,199,979 |
| 12/18/2011 | -306,000 | 0 | 23,434,119 | -100,000 | 0 | 1,099,979 |
| 12/19/2011 | -346,000 | 0 | 23,088,119 | -100,000 | 0 | 999,979   |
| 12/20/2011 | -482,000 | 0 | 22,606,119 | 0        | 0 | 999,979   |
| 12/21/2011 | -454,000 | 0 | 22,152,119 | 0        | 0 | 999,979   |
| 12/22/2011 | -464,000 | 0 | 21,441,825 | 0        | 0 | 999,979   |
| 12/23/2011 | -509,000 | 0 | 20,932,825 | 0        | 0 | 999,979   |
| 12/24/2011 | -296,000 | 0 | 20,636,825 | 0        | 0 | 999,979   |
| 12/25/2011 | -164,000 | 0 | 20,472,825 | 0        | 0 | 999,979   |
| 12/26/2011 | -232,000 | 0 | 20,240,825 | 0        | 0 | 999,979   |
| 12/27/2011 | -160,000 | 0 | 20,080,825 | 0        | 0 | 999,979   |
| 12/28/2011 | -83,000  | 0 | 19,997,825 | 0        | 0 | 999,979   |
| 12/29/2011 | -86,000  | 0 | 19,911,825 | 0        | 0 | 999,979   |
| 12/30/2011 | -92,000  | 0 | 19,819,825 | 0        | 0 | 999,979   |
| 12/31/2011 | -191,000 | 0 | 19,628,825 | 0        | 0 | 999,979   |
| 1/1/2012   | -126,000 | 0 | 19,502,825 | 0        | 0 | 999,979   |
| 1/2/2012   | -219,000 | 0 | 19,283,825 | 0        | 0 | 999,979   |

|           |          |   |            |          |   |         |
|-----------|----------|---|------------|----------|---|---------|
| 1/3/2012  | -288,000 | 0 | 18,995,825 | 0        | 0 | 999,979 |
| 1/4/2012  | -254,000 | 0 | 18,741,825 | 0        | 0 | 999,979 |
| 1/5/2012  | -274,000 | 0 | 18,467,825 | 0        | 0 | 999,979 |
| 1/6/2012  | -338,000 | 0 | 18,129,825 | 0        | 0 | 999,979 |
| 1/7/2012  | -254,000 | 0 | 17,875,825 | 0        | 0 | 999,979 |
| 1/8/2012  | -298,000 | 0 | 17,577,825 | 0        | 0 | 999,979 |
| 1/9/2012  | -411,000 | 0 | 17,166,825 | 0        | 0 | 999,979 |
| 1/10/2012 | -308,000 | 0 | 16,858,825 | 0        | 0 | 999,979 |
| 1/11/2012 | -513,000 | 0 | 16,345,825 | 0        | 0 | 999,979 |
| 1/12/2012 | -376,000 | 0 | 15,969,825 | 0        | 0 | 999,979 |
| 1/13/2012 | -265,000 | 0 | 15,704,825 | 0        | 0 | 999,979 |
| 1/14/2012 | -266,000 | 0 | 15,438,825 | 0        | 0 | 999,979 |
| 1/15/2012 | -436,000 | 0 | 15,002,825 | 0        | 0 | 999,979 |
| 1/16/2012 | -876,000 | 0 | 14,126,825 | -100,000 | 0 | 899,979 |
| 1/17/2012 | -790,000 | 0 | 13,336,825 | -100,000 | 0 | 799,979 |
| 1/18/2012 | -437,000 | 0 | 12,899,825 | 0        | 0 | 799,979 |
| 1/19/2012 | -378,000 | 0 | 12,524,835 | 0        | 0 | 799,979 |
| 1/20/2012 | -175,000 | 0 | 12,349,835 | 0        | 0 | 799,979 |
| 1/21/2012 | -254,000 | 0 | 12,095,835 | 0        | 0 | 799,979 |
| 1/22/2012 | -465,000 | 0 | 11,630,835 | 0        | 0 | 799,979 |
| 1/23/2012 | -378,000 | 0 | 11,252,835 | 0        | 0 | 799,979 |
| 1/24/2012 | -233,000 | 0 | 11,019,835 | 0        | 0 | 799,979 |
| 1/25/2012 | -167,000 | 0 | 10,852,835 | 0        | 0 | 799,979 |
| 1/26/2012 | -32,000  | 0 | 10,820,835 | 0        | 0 | 799,979 |
| 1/27/2012 | -82,000  | 0 | 10,738,835 | 0        | 0 | 799,979 |
| 1/28/2012 | -80,000  | 0 | 10,658,835 | 0        | 0 | 799,979 |
| 1/29/2012 | -92,000  | 0 | 10,566,835 | 0        | 0 | 799,979 |
| 1/30/2012 | -125,000 | 0 | 10,441,835 | 0        | 0 | 799,979 |
| 1/31/2012 | -137,000 | 0 | 10,304,835 | 0        | 0 | 799,979 |
|           |          |   |            |          |   |         |
| 2/1/2012  | -292,000 | 0 | 10,012,835 | 0        | 0 | 799,979 |
| 2/2/2012  | -265,000 | 0 | 9,747,835  | 0        | 0 | 799,979 |

|           |          |        |           |          |   |         |
|-----------|----------|--------|-----------|----------|---|---------|
| 2/3/2012  | -251,000 | 0      | 9,496,835 | 0        | 0 | 799,979 |
| 2/4/2012  | -210,000 | 0      | 9,286,835 | 0        | 0 | 799,979 |
| 2/5/2012  | -169,000 | 0      | 9,117,835 | 0        | 0 | 799,979 |
| 2/6/2012  | -32,000  | 0      | 9,085,835 | 0        | 0 | 799,979 |
| 2/7/2012  | -183,000 | 0      | 8,902,835 | 0        | 0 | 799,979 |
| 2/8/2012  | -151,000 | 0      | 8,751,835 | 0        | 0 | 799,979 |
| 2/9/2012  | -5,000   | 0      | 8,746,835 | 0        | 0 | 799,979 |
| 2/10/2012 | 0        | 0      | 8,746,835 | 0        | 0 | 799,979 |
| 2/11/2012 | 0        | 0      | 8,746,835 | 0        | 0 | 799,979 |
| 2/12/2012 | 0        | 0      | 8,746,835 | 0        | 0 | 799,979 |
| 2/13/2012 | -195,000 | 0      | 8,551,835 | -100,000 | 0 | 699,979 |
| 2/14/2012 | -108,000 | 0      | 8,443,835 | -100,000 | 0 | 599,979 |
| 2/15/2012 | -180,000 | 0      | 8,263,835 | 0        | 0 | 599,979 |
| 2/16/2012 | -139,000 | 0      | 8,124,835 | 0        | 0 | 599,979 |
| 2/17/2012 | -67,000  | 0      | 8,057,835 | 0        | 0 | 599,979 |
| 2/18/2012 | -191,000 | 0      | 7,866,835 | 0        | 0 | 599,979 |
| 2/19/2012 | -173,000 | 0      | 7,693,835 | 0        | 0 | 599,979 |
| 2/20/2012 | -127,000 | 0      | 7,566,835 | 0        | 0 | 599,979 |
| 2/21/2012 | 0        | 0      | 7,566,835 | 0        | 0 | 599,979 |
| 2/22/2012 | 0        | 0      | 7,566,835 | 0        | 0 | 599,979 |
| 2/23/2012 | 0        | 35,000 | 7,601,835 | 0        | 0 | 599,979 |
| 2/24/2012 | 0        | 0      | 7,601,835 | 0        | 0 | 599,979 |
| 2/25/2012 | 0        | 10,000 | 7,611,835 | 0        | 0 | 599,979 |
| 2/26/2012 | -166,000 | 0      | 7,445,835 | -100,000 | 0 | 499,979 |
| 2/27/2012 | -312,000 | 0      | 7,133,835 | -100,000 | 0 | 399,979 |
| 2/28/2012 | -354,000 | 0      | 6,779,835 | 0        | 0 | 399,979 |
| 2/29/2012 | -355,000 | 0      | 6,424,835 | 0        | 0 | 399,979 |
| 3/1/2012  | -419,000 | 0      | 6,005,835 | 0        | 0 | 399,979 |
| 3/2/2012  | -288,000 | 0      | 5,717,835 | 0        | 0 | 399,979 |
| 3/3/2012  | -126,000 | 0      | 5,591,835 | 0        | 0 | 399,979 |
| 3/4/2012  | 0        | 0      | 5,591,835 | 0        | 0 | 399,979 |

|           |          |        |           |   |   |         |
|-----------|----------|--------|-----------|---|---|---------|
| 3/5/2012  | 0        | 0      | 5,591,835 | 0 | 0 | 399,979 |
| 3/6/2012  | -191,000 | 0      | 5,400,835 | 0 | 0 | 399,979 |
| 3/7/2012  | -238,000 | 0      | 5,162,835 | 0 | 0 | 399,979 |
| 3/8/2012  | -80,000  | 0      | 5,082,835 | 0 | 0 | 399,979 |
| 3/9/2012  | -61,000  | 0      | 5,021,835 | 0 | 0 | 399,979 |
| 3/10/2012 | 0        | 48,574 | 5,070,409 | 0 | 0 | 399,979 |
| 3/11/2012 | -118,000 | 0      | 4,952,409 | 0 | 0 | 399,979 |
| 3/12/2012 | -172,000 | 0      | 4,780,409 | 0 | 0 | 399,979 |
| 3/13/2012 | 0        | 0      | 4,780,409 | 0 | 0 | 399,979 |
| 3/14/2012 | 0        | 0      | 4,780,409 | 0 | 0 | 399,979 |
| 3/15/2012 | 0        | 48,000 | 4,828,409 | 0 | 0 | 399,979 |
| 3/16/2012 | 0        | 48,000 | 4,876,409 | 0 | 0 | 399,979 |
| 3/17/2012 | -235,000 | 0      | 4,641,409 | 0 | 0 | 399,979 |
| 3/18/2012 | -475,000 | 0      | 4,166,409 | 0 | 0 | 399,979 |
| 3/19/2012 | -419,000 | 0      | 3,747,409 | 0 | 0 | 399,979 |
| 3/20/2012 | 0        | 0      | 3,747,409 | 0 | 0 | 399,979 |
| 3/21/2012 | 0        | 47,966 | 3,795,375 | 0 | 0 | 399,979 |
| 3/22/2012 | 0        | 0      | 3,795,375 | 0 | 0 | 399,979 |
| 3/23/2012 | 0        | 48,000 | 3,843,375 | 0 | 0 | 399,979 |
| 3/24/2012 | -100,000 | 0      | 3,743,375 | 0 | 0 | 399,979 |
| 3/25/2012 | -133,000 | 0      | 3,610,375 | 0 | 0 | 399,979 |
| 3/26/2012 | 0        | 0      | 3,610,375 | 0 | 0 | 399,979 |
| 3/27/2012 | 0        | 48,000 | 3,658,375 | 0 | 0 | 399,979 |
| 3/28/2012 | 0        | 48,000 | 3,706,375 | 0 | 0 | 399,979 |
| 3/29/2012 | 0        | 48,000 | 3,754,375 | 0 | 0 | 399,979 |
| 3/30/2012 | 0        | 48,000 | 3,802,375 | 0 | 0 | 399,979 |
| 3/31/2012 | 0        | 0      | 3,802,375 | 0 | 0 | 399,979 |

|           |   |        |            |   |   |           |
|-----------|---|--------|------------|---|---|-----------|
| 11/1/2012 | 0 | 48,732 | 32,375,999 | 0 | 0 | 1,500,000 |
| 11/2/2012 | 0 | 48,732 | 32,424,731 | 0 | 0 | 1,500,000 |
| 11/3/2012 | 0 | 48,732 | 32,473,463 | 0 | 0 | 1,500,000 |
| 11/4/2012 | 0 | 48,732 | 32,522,195 | 0 | 0 | 1,500,000 |

|            |          |        |            |   |   |           |
|------------|----------|--------|------------|---|---|-----------|
| 11/5/2012  | 0        | 25,000 | 32,547,195 | 0 | 0 | 1,500,000 |
| 11/6/2012  | 0        | 13,000 | 32,560,195 | 0 | 0 | 1,500,000 |
| 11/7/2012  | 0        | 0      | 32,560,195 | 0 | 0 | 1,500,000 |
| 11/8/2012  | -50,000  | 0      | 32,510,195 | 0 | 0 | 1,500,000 |
| 11/9/2012  | -60,000  | 0      | 32,450,195 | 0 | 0 | 1,500,000 |
| 11/10/2012 | -124,000 | 0      | 32,326,195 | 0 | 0 | 1,500,000 |
| 11/11/2012 | -111,000 | 0      | 32,215,195 | 0 | 0 | 1,500,000 |
| 11/12/2012 | -99,000  | 0      | 32,116,195 | 0 | 0 | 1,500,000 |
| 11/13/2012 | 0        | 48,204 | 32,164,399 | 0 | 0 | 1,500,000 |
| 11/14/2012 | 0        | 0      | 32,164,399 | 0 | 0 | 1,500,000 |
| 11/15/2012 | 0        | 0      | 32,164,399 | 0 | 0 | 1,500,000 |
| 11/16/2012 | 0        | 0      | 32,164,399 | 0 | 0 | 1,500,000 |
| 11/17/2012 | 0        | 0      | 32,164,399 | 0 | 0 | 1,500,000 |
| 11/18/2012 | 0        | 0      | 32,164,399 | 0 | 0 | 1,500,000 |
| 11/19/2012 | 0        | 0      | 32,164,399 | 0 | 0 | 1,500,000 |
| 11/20/2012 | 0        | 0      | 32,164,399 | 0 | 0 | 1,500,000 |
| 11/21/2012 | 0        | 0      | 32,164,399 | 0 | 0 | 1,500,000 |
| 11/22/2012 | 0        | 0      | 32,164,399 | 0 | 0 | 1,500,000 |
| 11/23/2012 | -56,000  | 0      | 32,108,399 | 0 | 0 | 1,500,000 |
| 11/24/2012 | -90,000  | 0      | 32,018,399 | 0 | 0 | 1,500,000 |
| 11/25/2012 | 0        | 0      | 32,018,399 | 0 | 0 | 1,500,000 |
| 11/26/2012 | -360,000 | 0      | 31,658,399 | 0 | 0 | 1,500,000 |
| 11/27/2012 | -270,000 | 0      | 31,388,399 | 0 | 0 | 1,500,000 |
| 11/28/2012 | 0        | 0      | 31,327,555 | 0 | 0 | 1,500,000 |
| 11/29/2012 | 0        | 32,000 | 31,359,555 | 0 | 0 | 1,500,000 |
| 11/30/2012 | 0        | 18,000 | 31,377,555 | 0 | 0 | 1,500,000 |
|            |          |        |            |   |   |           |
| 12/1/2012  | 0        | 15,000 | 31,392,555 | 0 | 0 | 1,500,000 |
| 12/2/2012  | -40,000  | 0      | 31,352,555 | 0 | 0 | 1,500,000 |
| 12/3/2012  | -140,000 | 0      | 31,212,555 | 0 | 0 | 1,500,000 |
| 12/4/2012  | 0        | 0      | 31,212,555 | 0 | 0 | 1,500,000 |
| 12/5/2012  | 0        | 0      | 31,212,555 | 0 | 0 | 1,500,000 |

|            |          |   |            |          |   |           |
|------------|----------|---|------------|----------|---|-----------|
| 12/6/2012  | 0        | 0 | 31,212,555 | 0        | 0 | 1,500,000 |
| 12/7/2012  | -100,000 | 0 | 31,112,555 | 0        | 0 | 1,500,000 |
| 12/8/2012  | -130,000 | 0 | 30,982,555 | 0        | 0 | 1,500,000 |
| 12/9/2012  | -245,000 | 0 | 30,737,555 | 0        | 0 | 1,500,000 |
| 12/10/2012 | -345,000 | 0 | 30,392,555 | 0        | 0 | 1,500,000 |
| 12/11/2012 | -115,000 | 0 | 30,277,555 | 0        | 0 | 1,500,000 |
| 12/12/2012 | -345,000 | 0 | 29,932,555 | 0        | 0 | 1,500,000 |
| 12/13/2012 | -525,000 | 0 | 29,407,555 | 0        | 0 | 1,500,000 |
| 12/14/2012 | -590,000 | 0 | 28,817,555 | 0        | 0 | 1,500,000 |
| 12/15/2012 | -540,000 | 0 | 28,277,555 | 0        | 0 | 1,500,000 |
| 12/16/2012 | -415,000 | 0 | 27,862,555 | 0        | 0 | 1,500,000 |
| 12/17/2012 | -395,000 | 0 | 27,467,555 | 0        | 0 | 1,500,000 |
| 12/18/2012 | -555,000 | 0 | 26,912,555 | 0        | 0 | 1,500,000 |
| 12/19/2012 | -774,000 | 0 | 26,138,555 | 0        | 0 | 1,500,000 |
| 12/20/2012 | -580,000 | 0 | 25,558,555 | 0        | 0 | 1,500,000 |
| 12/21/2012 | -303,000 | 0 | 25,255,555 | 0        | 0 | 1,500,000 |
| 12/22/2012 | -166,000 | 0 | 25,089,555 | 0        | 0 | 1,500,000 |
| 12/23/2012 | -59,000  | 0 | 25,030,555 | 0        | 0 | 1,500,000 |
| 12/24/2012 | -225,000 | 0 | 24,805,555 | 0        | 0 | 1,500,000 |
| 12/25/2012 | -414,000 | 0 | 24,391,555 | 0        | 0 | 1,500,000 |
| 12/26/2012 | -538,000 | 0 | 23,595,916 | 0        | 0 | 1,500,000 |
| 12/27/2012 | -427,000 | 0 | 23,168,916 | -100,000 | 0 | 1,400,000 |
| 12/28/2012 | -435,000 | 0 | 22,733,916 | 0        | 0 | 1,400,000 |
| 12/29/2012 | -359,000 | 0 | 22,374,916 | -100,000 | 0 | 1,300,000 |
| 12/30/2012 | -413,000 | 0 | 21,961,916 | -100,000 | 0 | 1,200,000 |
| 12/31/2012 | -435,000 | 0 | 21,526,916 | -100,000 | 0 | 1,100,000 |
|            |          |   |            |          |   |           |
| 1/1/2013   | -467,000 | 0 | 21,059,916 | -100,000 | 0 | 1,000,000 |
| 1/2/2013   | -517,000 | 0 | 20,542,916 | -100,000 | 0 | 900,000   |
| 1/3/2013   | -410,000 | 0 | 20,132,916 | -100,000 | 0 | 800,000   |
| 1/4/2013   | -300,000 | 0 | 19,832,916 | -100,000 | 0 | 700,000   |
| 1/5/2013   | -395,000 | 0 | 19,437,916 | 0        | 0 | 700,000   |

|           |          |   |            |          |   |         |
|-----------|----------|---|------------|----------|---|---------|
| 1/6/2013  | -460,000 | 0 | 18,977,916 | 0        | 0 | 700,000 |
| 1/7/2013  | -470,000 | 0 | 18,507,916 | 0        | 0 | 700,000 |
| 1/8/2013  | -285,000 | 0 | 18,222,916 | 0        | 0 | 700,000 |
| 1/9/2013  | -304,000 | 0 | 17,918,916 | 0        | 0 | 700,000 |
| 1/10/2013 | -471,000 | 0 | 17,447,916 | 0        | 0 | 700,000 |
| 1/11/2013 | -311,000 | 0 | 17,136,916 | -100,000 | 0 | 600,000 |
| 1/12/2013 | -390,000 | 0 | 16,746,916 | -100,000 | 0 | 500,000 |
| 1/13/2013 | -320,000 | 0 | 16,426,916 | -100,000 | 0 | 400,000 |
| 1/14/2013 | -542,000 | 0 | 15,884,916 | -100,000 | 0 | 300,000 |
| 1/15/2013 | -542,000 | 0 | 15,342,916 | -100,000 | 0 | 200,000 |
| 1/16/2013 | -350,000 | 0 | 14,992,916 | 0        | 0 | 200,000 |
| 1/17/2013 | -486,000 | 0 | 14,506,916 | 0        | 0 | 200,000 |
| 1/18/2013 | -444,000 | 0 | 14,062,916 | 0        | 0 | 200,000 |
| 1/19/2013 | -381,000 | 0 | 13,681,916 | 0        | 0 | 200,000 |
| 1/20/2013 | -405,000 | 0 | 13,276,916 | 0        | 0 | 200,000 |
| 1/21/2013 | -430,000 | 0 | 12,846,916 | 0        | 0 | 200,000 |
| 1/22/2013 | -269,000 | 0 | 12,577,916 | 0        | 0 | 200,000 |
| 1/23/2013 | -157,000 | 0 | 12,420,916 | 0        | 0 | 200,000 |
| 1/24/2013 | -344,000 | 0 | 12,076,916 | 0        | 0 | 200,000 |
| 1/25/2013 | -103,000 | 0 | 11,973,916 | 0        | 0 | 200,000 |
| 1/26/2013 | -112,000 | 0 | 11,861,916 | 0        | 0 | 200,000 |
| 1/27/2013 | -368,000 | 0 | 11,493,916 | 0        | 0 | 200,000 |
| 1/28/2013 | -437,000 | 0 | 11,056,916 | 0        | 0 | 200,000 |
| 1/29/2013 | -417,000 | 0 | 10,639,916 | 0        | 0 | 200,000 |
| 1/30/2013 | -271,000 | 0 | 10,368,916 | 0        | 0 | 200,000 |
| 1/31/2013 | -171,000 | 0 | 10,197,916 | 0        | 0 | 200,000 |
|           |          |   |            |          |   |         |
| 2/1/2013  | -212,000 | 0 | 9,985,916  | 0        | 0 | 200,000 |
| 2/2/2013  | -143,000 | 0 | 9,842,916  | 0        | 0 | 200,000 |
| 2/3/2013  | -205,000 | 0 | 9,637,916  | 0        | 0 | 200,000 |
| 2/4/2013  | -259,000 | 0 | 9,378,916  | 0        | 0 | 200,000 |
| 2/5/2013  | -242,000 | 0 | 9,136,916  | 0        | 0 | 200,000 |

|           |          |        |           |          |   |         |
|-----------|----------|--------|-----------|----------|---|---------|
| 2/6/2013  | -260,000 | 0      | 8,876,916 | 0        | 0 | 200,000 |
| 2/7/2013  | -377,000 | 0      | 8,499,916 | 0        | 0 | 200,000 |
| 2/8/2013  | -361,000 | 0      | 8,138,916 | 0        | 0 | 200,000 |
| 2/9/2013  | -201,000 | 0      | 7,937,916 | -100,000 | 0 | 100,000 |
| 2/10/2013 | -337,000 | 0      | 7,600,916 | 0        | 0 | 100,000 |
| 2/11/2013 | -202,000 | 0      | 7,398,916 | -100,000 | 0 | 0       |
| 2/12/2013 | -245,000 | 0      | 7,153,916 | 0        | 0 | 0       |
| 2/13/2013 | -240,000 | 0      | 6,913,916 | 0        | 0 | 0       |
| 2/14/2013 | -97,000  | 0      | 6,816,916 | 0        | 0 | 0       |
| 2/15/2013 | 0        | 0      | 6,816,916 | 0        | 0 | 0       |
| 2/16/2013 | 0        | 0      | 6,816,916 | 0        | 0 | 0       |
| 2/17/2013 | 0        | 0      | 6,816,916 | 0        | 0 | 0       |
| 2/18/2013 | -296,000 | 0      | 6,520,916 | 0        | 0 | 0       |
| 2/19/2013 | -657,000 | 0      | 5,863,916 | 0        | 0 | 0       |
| 2/20/2013 | -411,000 | 0      | 5,452,916 | 0        | 0 | 0       |
| 2/21/2013 | -312,000 | 0      | 5,140,916 | 0        | 0 | 0       |
| 2/22/2013 | -68,000  | 0      | 5,072,916 | 0        | 0 | 0       |
| 2/23/2013 | 0        | 0      | 5,072,916 | 0        | 0 | 0       |
| 2/24/2013 | 0        | 0      | 5,072,916 | 0        | 0 | 0       |
| 2/25/2013 | -146,000 | 0      | 4,926,916 | 0        | 0 | 0       |
| 2/26/2013 | -139,000 | 0      | 4,787,916 | 0        | 0 | 0       |
| 2/27/2013 | -50,000  | 0      | 4,737,916 | 0        | 0 | 0       |
| 2/28/2013 | 0        | 0      | 4,737,916 | 0        | 0 | 0       |
|           |          |        |           |          |   |         |
| 3/1/2013  | 0        | 0      | 4,737,916 | 0        | 0 | 0       |
| 3/2/2013  | 0        | 45,985 | 4,783,901 | 0        | 0 | 0       |
| 3/3/2013  | 0        | 48,732 | 4,832,633 | 0        | 0 | 0       |
| 3/4/2013  | -66,000  | 0      | 4,766,633 | 0        | 0 | 0       |
| 3/5/2013  | 0        | 0      | 4,766,633 | 0        | 0 | 0       |
| 3/6/2013  | -361,000 | 0      | 4,405,633 | 0        | 0 | 0       |
| 3/7/2013  | -357,000 | 0      | 4,048,633 | 0        | 0 | 0       |
| 3/8/2013  | -270,000 | 0      | 3,778,633 | 0        | 0 | 0       |

|           |         |        |           |   |   |   |
|-----------|---------|--------|-----------|---|---|---|
| 3/9/2013  | -90,000 | 0      | 3,688,633 | 0 | 0 | 0 |
| 3/10/2013 | -47,000 | 0      | 3,641,633 | 0 | 0 | 0 |
| 3/11/2013 | 0       | 0      | 3,641,633 | 0 | 0 | 0 |
| 3/12/2013 | 0       | 0      | 3,641,633 | 0 | 0 | 0 |
| 3/13/2013 | 0       | 39,999 | 3,681,632 | 0 | 0 | 0 |
| 3/14/2013 | 0       | 0      | 3,681,632 | 0 | 0 | 0 |
| 3/15/2013 | 0       | 0      | 3,681,632 | 0 | 0 | 0 |
| 3/16/2013 | 0       | 0      | 3,681,632 | 0 | 0 | 0 |
| 3/17/2013 | 0       | 0      | 3,681,632 | 0 | 0 | 0 |
| 3/18/2013 | 0       | 48,732 | 3,730,364 | 0 | 0 | 0 |
| 3/19/2013 | -80,000 | 0      | 3,650,364 | 0 | 0 | 0 |
| 3/20/2013 | 0       | 0      | 3,650,364 | 0 | 0 | 0 |
| 3/21/2013 | 0       | 0      | 3,650,364 | 0 | 0 | 0 |
| 3/22/2013 | 0       | 0      | 3,650,364 | 0 | 0 | 0 |
| 3/23/2013 | 0       | 0      | 3,650,364 | 0 | 0 | 0 |
| 3/24/2013 | 0       | 0      | 3,650,364 | 0 | 0 | 0 |
| 3/25/2013 | -36,000 | 0      | 3,614,364 | 0 | 0 | 0 |
| 3/26/2013 | -11,000 | 0      | 3,603,364 | 0 | 0 | 0 |
| 3/27/2013 | -25,000 | 0      | 3,578,364 | 0 | 0 | 0 |
| 3/28/2013 | -47,000 | 0      | 3,531,364 | 0 | 0 | 0 |
| 3/29/2013 | 0       | 48,731 | 3,580,095 | 0 | 0 | 0 |
| 3/30/2013 | 0       | 0      | 3,580,095 | 0 | 0 | 0 |
| 3/31/2013 | 0       | 0      | 3,580,095 | 0 | 0 | 0 |

|           |   |        |            |   |       |           |
|-----------|---|--------|------------|---|-------|-----------|
| 11/1/2013 | 0 | 45,015 | 29,939,888 | 0 | 7,010 | 1,481,446 |
| 11/2/2013 | 0 | 45,015 | 29,984,903 | 0 | 7,010 | 1,488,456 |
| 11/3/2013 | 0 | 0      | 29,984,903 | 0 | 7,010 | 1,495,466 |
| 11/4/2013 | 0 | 0      | 29,984,903 | 0 | 4,017 | 1,499,483 |
| 11/5/2013 | 0 | 45,015 | 30,029,918 | 0 | 0     | 1,499,483 |
| 11/6/2013 | 0 | 45,015 | 30,074,933 | 0 | 0     | 1,499,483 |
| 11/7/2013 | 0 | 45,015 | 30,119,948 | 0 | 517   | 1,500,000 |
| 11/8/2013 | 0 | 0      | 30,119,948 | 0 | 0     | 1,500,000 |

|            |          |   |            |          |   |           |
|------------|----------|---|------------|----------|---|-----------|
| 11/9/2013  | 0        | 0 | 30,119,948 | 0        | 0 | 1,500,000 |
| 11/10/2013 | 0        | 0 | 30,119,948 | 0        | 0 | 1,500,000 |
| 11/11/2013 | 0        | 0 | 30,119,948 | 0        | 0 | 1,500,000 |
| 11/12/2013 | 0        | 0 | 30,119,948 | 0        | 0 | 1,500,000 |
| 11/13/2013 | 0        | 0 | 30,119,948 | 0        | 0 | 1,500,000 |
| 11/14/2013 | 0        | 0 | 30,119,948 | 0        | 0 | 1,500,000 |
| 11/15/2013 | -81,000  | 0 | 30,038,948 | 0        | 0 | 1,500,000 |
| 11/16/2013 | -61,000  | 0 | 29,977,948 | 0        | 0 | 1,500,000 |
| 11/17/2013 | -123,000 | 0 | 29,854,948 | 0        | 0 | 1,500,000 |
| 11/18/2013 | -76,000  | 0 | 29,778,948 | 0        | 0 | 1,500,000 |
| 11/19/2013 | -84,000  | 0 | 29,694,948 | 0        | 0 | 1,500,000 |
| 11/20/2013 | 0        | 0 | 29,694,948 | 0        | 0 | 1,500,000 |
| 11/21/2013 | -119,000 | 0 | 29,575,948 | 0        | 0 | 1,500,000 |
| 11/22/2013 | -180,000 | 0 | 29,395,948 | 0        | 0 | 1,500,000 |
| 11/23/2013 | -183,000 | 0 | 29,212,948 | 0        | 0 | 1,500,000 |
| 11/24/2013 | -237,000 | 0 | 28,975,948 | 0        | 0 | 1,500,000 |
| 11/25/2013 | -313,000 | 0 | 28,662,948 | 0        | 0 | 1,500,000 |
| 11/26/2013 | -220,000 | 0 | 28,442,948 | 0        | 0 | 1,500,000 |
| 11/27/2013 | -90,000  | 0 | 28,352,948 | 0        | 0 | 1,500,000 |
| 11/28/2013 | -43,000  | 0 | 28,309,948 | 0        | 0 | 1,500,000 |
| 11/29/2013 | -54,000  | 0 | 28,255,948 | 0        | 0 | 1,500,000 |
| 11/30/2013 | -50,000  | 0 | 28,205,948 | 0        | 0 | 1,500,000 |
|            |          |   |            |          |   |           |
| 12/1/2013  | -56,000  | 0 | 28,149,948 | 0        | 0 | 1,500,000 |
| 12/2/2013  | -134,000 | 0 | 28,015,948 | 0        | 0 | 1,500,000 |
| 12/3/2013  | -223,000 | 0 | 27,792,948 | 0        | 0 | 1,500,000 |
| 12/4/2013  | -429,000 | 0 | 27,363,948 | 0        | 0 | 1,500,000 |
| 12/5/2013  | -985,000 | 0 | 26,078,948 | -100,000 | 0 | 1,400,000 |
| 12/6/2013  | -708,000 | 0 | 25,370,948 | -100,000 | 0 | 1,300,000 |
| 12/7/2013  | -545,000 | 0 | 24,825,948 | -100,000 | 0 | 1,200,000 |
| 12/8/2013  | -776,000 | 0 | 24,049,948 | -100,000 | 0 | 1,100,000 |
| 12/9/2013  | -952,000 | 0 | 23,097,948 | -100,000 | 0 | 1,000,000 |

|            |          |   |            |          |   |         |
|------------|----------|---|------------|----------|---|---------|
| 12/10/2013 | -781,000 | 0 | 22,316,948 | -100,000 | 0 | 900,000 |
| 12/11/2013 | -537,000 | 0 | 21,779,948 | 0        | 0 | 900,000 |
| 12/12/2013 | -300,000 | 0 | 21,479,948 | 0        | 0 | 900,000 |
| 12/13/2013 | -140,000 | 0 | 21,339,948 | 0        | 0 | 900,000 |
| 12/14/2013 | -212,000 | 0 | 21,127,948 | 0        | 0 | 900,000 |
| 12/15/2013 | -110,000 | 0 | 21,017,948 | 0        | 0 | 900,000 |
| 12/16/2013 | -132,000 | 0 | 20,885,948 | 0        | 0 | 900,000 |
| 12/17/2013 | 0        | 0 | 20,885,948 | 0        | 0 | 900,000 |
| 12/18/2013 | 0        | 0 | 20,885,948 | 0        | 0 | 900,000 |
| 12/19/2013 | -154,000 | 0 | 20,731,948 | 0        | 0 | 900,000 |
| 12/20/2013 | -76,000  | 0 | 20,655,948 | 0        | 0 | 900,000 |
| 12/21/2013 | -201,000 | 0 | 20,454,948 | 0        | 0 | 900,000 |
| 12/22/2013 | -207,000 | 0 | 20,247,948 | 0        | 0 | 900,000 |
| 12/23/2013 | -218,000 | 0 | 20,029,948 | 0        | 0 | 900,000 |
| 12/24/2013 | -176,000 | 0 | 19,853,948 | 0        | 0 | 900,000 |
| 12/25/2013 | -246,000 | 0 | 19,607,948 | 0        | 0 | 900,000 |
| 12/26/2013 | -285,000 | 0 | 19,322,948 | 0        | 0 | 900,000 |
| 12/27/2013 | -308,000 | 0 | 19,014,948 | 0        | 0 | 900,000 |
| 12/28/2013 | -354,000 | 0 | 18,660,948 | 0        | 0 | 900,000 |
| 12/29/2013 | -394,000 | 0 | 18,266,948 | 0        | 0 | 900,000 |
| 12/30/2013 | -404,000 | 0 | 17,862,948 | 0        | 0 | 900,000 |
| 12/31/2013 | -297,000 | 0 | 17,565,948 | 0        | 0 | 900,000 |
|            |          |   |            |          |   |         |
| 1/1/2014   | -355,000 | 0 | 17,210,948 | 0        | 0 | 900,000 |
| 1/2/2014   | -354,000 | 0 | 16,856,948 | 0        | 0 | 900,000 |
| 1/3/2014   | -236,000 | 0 | 16,620,948 | 0        | 0 | 900,000 |
| 1/4/2014   | -309,900 | 0 | 16,310,999 | 0        | 0 | 900,000 |
| 1/5/2014   | -353,700 | 0 | 15,957,259 | 0        | 0 | 900,000 |
| 1/6/2014   | -375,000 | 0 | 15,582,259 | 0        | 0 | 900,000 |
| 1/7/2014   | -378,000 | 0 | 15,204,259 | 0        | 0 | 900,000 |
| 1/8/2014   | -445,000 | 0 | 14,759,259 | 0        | 0 | 900,000 |
| 1/9/2014   | -336,000 | 0 | 14,423,259 | 0        | 0 | 900,000 |

|           |          |   |            |      |   |         |
|-----------|----------|---|------------|------|---|---------|
| 1/10/2014 | -303,000 | 0 | 14,120,259 | 0    | 0 | 900,000 |
| 1/11/2014 | -305,000 | 0 | 13,815,259 | 0    | 0 | 900,000 |
| 1/12/2014 | -439,000 | 0 | 13,376,259 | 0    | 0 | 900,000 |
| 1/13/2014 | -409,000 | 0 | 12,967,259 | 0    | 0 | 900,000 |
| 1/14/2014 | -396,000 | 0 | 12,571,259 | 0    | 0 | 900,000 |
| 1/15/2014 | -325,000 | 0 | 12,246,259 | 0    | 0 | 900,000 |
| 1/16/2014 | -348,000 | 0 | 11,898,259 | 0    | 0 | 900,000 |
| 1/17/2014 | -313,600 | 0 | 11,584,689 | 0    | 0 | 900,000 |
| 1/18/2014 | -261,000 | 0 | 11,323,689 | 0    | 0 | 900,000 |
| 1/19/2014 | -283,000 | 0 | 11,040,689 | 0    | 0 | 900,000 |
| 1/20/2014 | -329,000 | 0 | 10,711,689 | 0    | 0 | 900,000 |
| 1/21/2014 | -395,000 | 0 | 10,316,689 | 0    | 0 | 900,000 |
| 1/22/2014 | -476,000 | 0 | 9,840,689  | 0    | 0 | 900,000 |
| 1/23/2014 | -461,000 | 0 | 9,379,689  | 0    | 0 | 900,000 |
| 1/24/2014 | -342,000 | 0 | 9,037,689  | 0    | 0 | 900,000 |
| 1/25/2014 | -367,000 | 0 | 8,670,689  | 0    | 0 | 900,000 |
| 1/26/2014 | -188,000 | 0 | 8,482,689  | 0    | 0 | 900,000 |
| 1/27/2014 | -339,000 | 0 | 8,143,689  | 0    | 0 | 900,000 |
| 1/28/2014 | -407,000 | 0 | 7,736,689  | -100 | 0 | 800,000 |
| 1/29/2014 | -340,000 | 0 | 7,396,689  | -100 | 0 | 700,000 |
| 1/30/2014 | -40,000  | 0 | 7,356,689  | -100 | 0 | 600,000 |
| 1/31/2014 | -100,000 | 0 | 7,256,689  | -100 | 0 | 500,000 |
|           |          |   |            |      |   |         |
| 2/1/2014  | -279,000 | 0 | 6,977,689  | -100 | 0 | 400,000 |
| 2/2/2014  | -390,000 | 0 | 6,587,689  | -100 | 0 | 300,000 |
| 2/3/2014  | -483,000 | 0 | 6,104,689  | -100 | 0 | 200,000 |
| 2/4/2014  | -220,000 | 0 | 5,884,689  | 0    | 0 | 200,000 |
| 2/5/2014  | -150,000 | 0 | 5,734,689  | 0    | 0 | 200,000 |
| 2/6/2014  | -210,000 | 0 | 5,524,689  | -100 | 0 | 100,000 |
| 2/7/2014  | -267,000 | 0 | 5,257,689  | 0    | 0 | 100,000 |
| 2/8/2014  | -145,000 | 0 | 5,112,689  | 0    | 0 | 100,000 |
| 2/9/2014  | 0        | 0 | 5,112,689  | 0    | 0 | 100,000 |

|           |          |        |           |     |   |         |
|-----------|----------|--------|-----------|-----|---|---------|
| 2/10/2014 | -77,000  | 0      | 5,335,689 | 0   | 0 | 100,000 |
| 2/11/2014 | -244,000 | 0      | 5,091,689 | 0   | 0 | 100,000 |
| 2/12/2014 | -53,000  | 0      | 5,038,689 | 0   | 0 | 100,000 |
| 2/13/2014 | -231,111 | 0      | 4,807,578 | 0   | 0 | 100,000 |
| 2/14/2014 | -24,000  | 0      | 4,783,578 | 0   | 0 | 100,000 |
| 2/15/2014 | 0        | 0      | 4,783,578 | 0   | 0 | 100,000 |
| 2/16/2014 | -194,000 | 0      | 4,589,578 | 0   | 0 | 100,000 |
| 2/17/2014 | -237,000 | 0      | 4,352,578 | 0   | 0 | 100,000 |
| 2/18/2014 | -171,000 | 0      | 4,181,578 | 0   | 0 | 100,000 |
| 2/19/2014 | -269,000 | 0      | 3,912,578 | 0   | 0 | 100,000 |
| 2/20/2014 | -41,000  | 0      | 3,871,578 | 0   | 0 | 100,000 |
| 2/21/2014 | -256,000 | 0      | 3,615,578 | -25 | 0 | 75,000  |
| 2/22/2014 | -42,000  | 0      | 3,573,578 | -25 | 0 | 50,000  |
| 2/23/2014 | -99,000  | 0      | 3,474,578 | -25 | 0 | 25,000  |
| 2/24/2014 | -60,000  | 0      | 3,414,578 | -25 | 0 | 0       |
| 2/25/2014 | -134,000 | 0      | 3,280,578 | 0   | 0 | 0       |
| 2/26/2014 | -49,000  | 0      | 3,231,578 | 0   | 0 | 0       |
| 2/27/2014 | -176,000 | 0      | 3,055,578 | 0   | 0 | 0       |
| 2/28/2014 | -102,000 | 0      | 2,953,578 | 0   | 0 | 0       |
| 3/1/2014  | -253,000 | 0      | 2,700,578 | 0   | 0 | 0       |
| 3/2/2014  | -294,000 | 0      | 2,406,578 | 0   | 0 | 0       |
| 3/3/2014  | -277,000 | 0      | 2,129,578 | 0   | 0 | 0       |
| 3/4/2014  | -160,000 | 0      | 1,969,578 | 0   | 0 | 0       |
| 3/5/2014  | -20,000  | 0      | 1,949,578 | 0   | 0 | 0       |
| 3/6/2014  | -177,000 | 0      | 1,772,578 | 0   | 0 | 0       |
| 3/7/2014  | 0        | 45,000 | 1,817,593 | 0   | 0 | 0       |
| 3/8/2014  | 0        | 45,000 | 1,862,608 | 0   | 0 | 0       |
| 3/9/2014  | 0        | 45,000 | 1,907,623 | 0   | 0 | 0       |
| 3/10/2014 | 0        | 0      | 1,907,623 | 0   | 0 | 0       |
| 3/11/2014 | 0        | 45,000 | 1,952,638 | 0   | 0 | 0       |
| 3/12/2014 | -116,000 | 0      | 1,836,638 | 0   | 0 | 0       |

|           |          |        |           |   |   |   |
|-----------|----------|--------|-----------|---|---|---|
| 3/13/2014 | 0        | 45,000 | 1,881,653 | 0 | 0 | 0 |
| 3/14/2014 | 0        | 0      | 1,881,653 | 0 | 0 | 0 |
| 3/15/2014 | 0        | 0      | 1,881,653 | 0 | 0 | 0 |
| 3/16/2014 | 0        | 0      | 1,881,653 | 0 | 0 | 0 |
| 3/17/2014 | -131,000 | 0      | 1,750,653 | 0 | 0 | 0 |
| 3/18/2014 | 0        | 0      | 1,750,653 | 0 | 0 | 0 |
| 3/19/2014 | 0        | 0      | 1,750,653 | 0 | 0 | 0 |
| 3/20/2014 | 0        | 0      | 1,750,653 | 0 | 0 | 0 |
| 3/21/2014 | -93,000  | 0      | 1,657,653 | 0 | 0 | 0 |
| 3/22/2014 | 0        | 0      | 1,657,653 | 0 | 0 | 0 |
| 3/23/2014 | 0        | 0      | 1,657,653 | 0 | 0 | 0 |
| 3/24/2014 | -56,000  | 0      | 1,601,653 | 0 | 0 | 0 |
| 3/25/2014 | -117,000 | 0      | 1,484,653 | 0 | 0 | 0 |
| 3/26/2014 | -41,000  | 0      | 1,443,653 | 0 | 0 | 0 |
| 3/27/2014 | -100,000 | 0      | 1,343,653 | 0 | 0 | 0 |
| 3/28/2014 | 0        | 0      | 1,343,653 | 0 | 0 | 0 |
| 3/29/2014 | 0        | 0      | 1,343,653 | 0 | 0 | 0 |
| 3/30/2014 | -100,000 | 0      | 1,243,653 | 0 | 0 | 0 |
| 3/31/2014 | 0        | 0      | 1,243,653 | 0 | 0 | 0 |

**GTS-RateCase2015\_DR\_ORA\_029-Q01  
Attachment 02**

A summary table, similar to table 19-3 (page 19-8) including years 2009-2013:

| Line No. | Description                          | Units  | 2015 GT&S Proposed Core Storage Levels | 2009/2010 and 2010/2011 |                      |           | 2011/2012               |                      |           | 2012/2013 and 2013/2014 |                      |           |
|----------|--------------------------------------|--------|--|-------------------------|----------------------|-----------|-------------------------|----------------------|-----------|-------------------------|----------------------|-----------|
|          |                                      |        |  | Firm                    | Withdrawal Agreement | Total     | Firm                    | Withdrawal Agreement | Total     | Firm                    | Withdrawal Agreement | Total     |
| 1        | Inventory                            | MDth   | 33,478                                 | 33,478                  | n.a.                 | no change | 33,478                  | n.a.                 | no change | 33,478                  | n.a.                 | no change |
| 2        | <u>Injection</u><br>April to October | MDth   | 33,478<br>Formula Based                | 33,478<br>Formula Based | n.a.                 | no change | 33,478<br>Formula Based | n.a.                 | no change | 33,478<br>Formula Based | n.a.                 | no change |
| 3        |                                      |        |  |                         |                      |           |                         |                      |           |                         |                      |           |
| 4        |                                      |        |  |                         |                      |           |                         |                      |           |                         |                      |           |
| 5        | <u>Withdrawal*</u>                   |        | Formula Based                          | Formula Based           |                      |           | Formula Based           |                      |           | Formula Based           |                      |           |
| 6        | November                             | MDth/d | 1,243                                  | 1,243                   |                      | 1,243     | 1,243                   |                      | 1,243     | 1,243                   |                      | 1,243     |
| 7        | Dec 1 to Jan 15                      | MDth/d | 1,282                                  | 1,160                   | 150                  | 1,310     | 1,160                   | 150                  | 1,310     | 1,160                   | 150                  | 1,310     |
| 8        | Jan 16 to Jan 31                     | MDth/d | 1,159                                  | 1,059                   | 100                  | 1,159     | 1,059                   | 100                  | 1,159     | 1,059                   | 100                  | 1,159     |
| 9        | Feb 1 to Feb 14                      | MDth/d | 1,032                                  | 982                     | -50                  | 932       | 982                     | -100                 | 882       | 982                     | -50                  | 932       |
| 10       | Feb 15 to Feb 29                     | MDth/d | 798                                    | 898                     | -100                 | 798       | 898                     | -100                 | 798       | 898                     | -100                 | 798       |
| 11       | March                                | MDth/d | 478                                    | 728                     | -250                 | 478       | 728                     | -100                 | 628       | 728                     | -250                 | 478       |
| 12       | April to October                     | MDth/d | 50                                     | 50                      |                      | 50        | 50                      |                      | 50        | 50                      |                      | 50        |

\*Withdrawal maximum quantities are based on the following formula (based on a normal profile of storage withdrawals as set for CPIM benchmark calculations) and modified with additional peak withdrawal capability as described in Chapter 19 testimony:

|  |
|--|
| CGT storage withdrawal equation found in G-CFS affective April 1, 2004 is:   |
| $\text{Withdrawal Quantity} = \frac{(\text{CI} * 283) + (\text{AI} * 970)}{33,478}$  |
| Where AI is the Annual Inventory and CI is the Current Inventory in PG&E's Core Procurement's G-CFS storage account. Withdrawal Rights will be in decatherms per day (Dth/d) when AI and CI are expressed in decatherms (Dth). |

**GTS-RateCase2015\_DR\_ORA\_041-Q02**

|                        |                                 |                   |                               |
|------------------------|---------------------------------|-------------------|-------------------------------|
| PG&E Data Request No.: | ORA_041-02                      |                   |                               |
| PG&E File Name:        | GTS-RateCase2015_DR_ORA_041-Q02 |                   |                               |
| Request Date:          | May 19, 2014                    | Requester DR No.: | ORA-GT&S-41                   |
| Date Sent:             | June 3, 2014                    | Requesting Party: | Office of Ratepayer Advocates |
| PG&E Witness:          | Jim Howe                        | Requester:        | Nathaniel Skinner             |

**SUBJECT: CHAPTER 13 – REPORTING AND COMMUNICATION**

The following questions all relate to Chapter 13 of PG&E’s testimony.

**QUESTION 2**

PG&E discusses on page 13-5 a desire for Commission-staff led workshops to review reporting requirements. What procedural process does PG&E believe would be appropriate to host these workshops, and when changes are found to be needed, serve as the vehicle to address changes to reporting requirements?

**ANSWER 2**

Procedurally, PG&E recommends workshops led by Commission staff to discuss Commission staff information needs and to identify jointly how to revise current reporting to meet those needs. During these workshops, parties would also identify and define specific metrics, reporting frequency and format. PG&E would envision periodic meetings/workshops with the Commission so that new information and changes to reporting would be determined, understood, and implemented. If specific reporting requirements are established by Commission decision or by statute, there may be restrictions on the process for making changes to the reporting requirements.

**GTS-RateCase2015\_DR\_ORA\_048-Q04**

and by reference:

**GTS-RateCase2015\_DR\_IndicatedProducers\_002-Q168**

**GTS-RateCase2015\_DR\_IndicatedProducers\_002\_Q168Atch03**

|                        |                                 |                   |                                   |
|------------------------|---------------------------------|-------------------|-----------------------------------|
| PG&E Data Request No.: | ORA_048-04                      |                   |                                   |
| PG&E File Name:        | GTS-RateCase2015_DR_ORA_048-Q04 |                   |                                   |
| Request Date:          | May 22, 2014                    | Requester DR No.: | ORA-GT&S-48                       |
| Date Sent:             | June 18, 2014                   | Requesting Party: | Office of Ratepayer Advocates     |
| PG&E Witness:          | David F. Elmore                 | Requester:        | Michael Tan/<br>Nathaniel Skinner |

**SUBJECT: CHAPTER 19: CORE GAS SUPPLY**

**QUESTION 4**

In its testimony at page 19-7, PG&E “estimated that the proposed intrastate capacity reductions will result in an annual savings of \$11.7 million dollars.” Please provide the detail and calculation of the savings.

**ANSWER 4**

Please see Attachment GTS-RateCase2015\_DR\_IndicatedProducers\_002-Q168Atch03.

|                        |   |                   |   |
|------------------------|---|-------------------|---|
| PG&E Data Request No.: | IndicatedProducers_002-168                      |                   |   |
| PG&E File Name:        | GTS-RateCase2015_DR_IndicatedProducers_002-Q168 |                   |   |
| Request Date:          | March 14, 2014                                  | Requester DR No.: | 002   |
| Date Sent:             | March 28, 2014                                  | Requesting Party: | Indicated Producers                               |
| PG&E Witness:          | Jeff Bennett (a-f)<br>David Elmore (g-h)        | Requester:        | Evelyn Kahl/<br>John McIntyre/<br>Kenneth Sosnick |

**CHAPTER 17A – BACKBONE LOAD FACTOR**

**QUESTION 168**

In Chapter 17A Section C, PG&E mentions adjustments for its Core Redwood and Core Baja sub-paths. Please provide the following for the Core Redwood and Core Baja sub-paths:

- a. Historical physical capacities of each sub-path from 2003 to 2013, broken down month-by-month.
- b. Forecasted physical capacities of each sub-path for 2015 to 2017, broken down month-by-month.
- c. Historical core contract level for each sub-path from 2003 to 2013, broken down month-by-month.
- d. Forecasted core contract level for each sub-path for 2015 to 2017, broken down month-by-month.
- e. Historical noncore contract level for each sub-path from 2003 to 2013, broken down month-by-month.
- f. Forecasted noncore contract level for each sub-path for 2015 to 2017, broken down month-by-month.
- g. What is PG&E’s reasoning for relinquishing physical capacities or core contract levels on the Core Baja sub-path?
- h. Please provide in electronic format all documents, models, methodologies, or any other related source describing or illustrating the explanation provided in (g).

**ANSWER 168**

- a. For historical and forecasted physical capacities of each sub-path, see the first tab of attachment GTS-RateCase2015\_DR\_IndicatedProducers\_002-Q168Atch01.

- b. See response to part (a).
- c. For historical and forecasted core contract levels for each sub-path, see the first tab of attachment GTS-RateCase2015\_DR\_IndicatedProducers\_002-Q168Atch01. Note that the Core physical backbone capacities are identical to (and determined by) the Core firm contract levels. Core customers may also take as-available service, which is available to both the Core and Noncore classes and is undifferentiated by class.
- d. See response to part (c).
- e. For historical and forecasted noncore contract levels for each sub-path, see the second tab of attachment GTS-RateCase2015\_DR\_IndicatedProducers\_002-Q168Atch01.
- f. See response to part (e).
- g. The reasoning behind the reduction in Core's Baja Path subscription is described in 2015 Gas Transmission and Storage (GT&S) Rate Case, Chapter 19, Core Gas Supply, Section B.1 of PG&E's Prepared Testimony. In summary, the change is intended to be consistent with the new Interstate Pipeline Capacity Range proposed by PG&E in application (A.)13-06-011, as well as to reduce overall core costs.
- h. Refer to the 2015 Gas Transmission and Storage (GT&S) Rate Case, Chapter 19, Core Gas Supply Tables 19-1 and 19-2, as well as the following two spreadsheets:
  - Derivation of capacity recommendation from forecasted load (see GTS-RateCase2015\_DR\_IndicatedProducers\_002-Q168Atch02); and
  - Calculation of Baja Redwood savings from intrastate capacity reduction (see GTS\_Ratecase2015\_DR\_IndicatedProducers-002-Q168Atch03).

In preparing the response to this data request, PG&E discovered some slight errors in Table 19-2 of the testimony. A corrected version of Table 19-2 appears in the Recommendations worksheet of GTS-RateCase2015\_DR\_IndicatedProducers\_002-Q168Atch02, and PG&E will update Table 19-2 at a future date.

Ex ORA-03 – Ch3 Policy and Core Gas Supply – Supporting Attachments

| Core Gas Supply  |           |           |           |           |           |           |           |           |           |           |           |           |              |              |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|--------------|
| 2015 GT&S Rate Case Intrastate Capacity Savings  |           |           |           |           |           |           |           |           |           |           |           |           |              |              |
| 11/11/2013: Nov. 2013 GT&S Forecast  |           |           |           |           |           |           |           |           |           |           |           |           |              |              |
|  | Jan       | Feb       | Mar       | Apr       | May       | Jun       | Jul       | Aug       | Sep       | Oct       | Nov       | Dec       | Annual Total |              |
|  | 31        | 28        | 31        | 30        | 31        | 30        | 31        | 31        | 30        | 31        | 30        | 31        |              |              |
| <b>Current Contracts (Dth/d)</b>   |           |           |           |           |           |           |           |           |           |           |           |           |              |              |
| Annual Redwood   | 608,766   | 608,766   | 608,766   | 608,766   | 608,766   | 608,766   | 608,766   | 608,766   | 608,766   | 608,766   | 608,766   | 608,766   | 608,766      |              |
| Annual Baja  | 348,000   | 348,000   | 348,000   | 348,000   | 348,000   | 348,000   | 348,000   | 348,000   | 348,000   | 348,000   | 348,000   | 348,000   | 348,000      |              |
| Seasonal Baja  | 321,000   | 321,000   |           |           |           |           |           |           |           |           |           |           | 321,000      |              |
| <b>Proposed Contracts for 2015 (Dth/d)</b>   |           |           |           |           |           |           |           |           |           |           |           |           |              |              |
| Annual Redwood   | 605,088   | 605,088   | 605,088   | 605,088   | 605,088   | 605,088   | 605,088   | 605,088   | 605,088   | 605,088   | 605,088   | 605,088   | 605,088      |              |
| Annual Baja  | 182,000   | 182,000   | 182,000   | 182,000   | 182,000   | 182,000   | 182,000   | 182,000   | 182,000   | 182,000   | 182,000   | 182,000   | 182,000      |              |
| Seasonal Baja  | 157,000   | 157,000   | 157,000   |           |           |           |           |           |           |           |           |           | 157,000      |              |
| <b>April 2013 Revised Rate (\$)</b>  |           |           |           |           |           |           |           |           |           |           |           |           |              |              |
| Redwood - Core Annual  | 4.4923    | 4.4923    | 4.4923    | 4.4923    | 4.4923    | 4.4923    | 4.4923    | 4.4923    | 4.4923    | 4.4923    | 4.4923    | 4.4923    | 4.4923       |              |
| Baja - Core Annual   | 5.2276    | 5.2276    | 5.2276    | 5.2276    | 5.2276    | 5.2276    | 5.2276    | 5.2276    | 5.2276    | 5.2276    | 5.2276    | 5.2276    | 5.2276       |              |
| Baja - Core Seasonal   | 6.2731    | 6.2731    | 6.2731    | 6.2731    | 6.2731    | 6.2731    | 6.2731    | 6.2731    | 6.2731    | 6.2731    | 6.2731    | 6.2731    | 6.2731       |              |
| <b>Total Cost (\$)</b>   |           |           |           |           |           |           |           |           |           |           |           |           |              |              |
| Current  | 6,567,629 | 6,567,629 | 4,553,964 | 4,553,964 | 4,553,964 | 4,553,964 | 4,553,964 | 4,553,964 | 4,553,964 | 4,553,964 | 4,553,964 | 4,553,964 | 6,567,629    | \$60,688,567 |
| GT&S Rate Case - 2015  | 4,654,537 | 4,654,537 | 4,654,537 | 3,669,660 | 3,669,660 | 3,669,660 | 3,669,660 | 3,669,660 | 3,669,660 | 3,669,660 | 3,669,660 | 4,654,537 | 4,654,537    | \$48,960,304 |
| Total Savings  |           |           |           |           |           |           |           |           |           |           |           |           |              | \$11,728,263 |
| <b>Savings by Path (\$)</b>  |           |           |           |           |           |           |           |           |           |           |           |           |              |              |
| Redwood Savings  | 16,523    | 16,523    | 16,523    | 16,523    | 16,523    | 16,523    | 16,523    | 16,523    | 16,523    | 16,523    | 16,523    | 16,523    | 16,523       | \$ 198,272   |
| Baja Savings   | 1,896,570 | 1,896,570 | (117,095) | 867,782   | 867,782   | 867,782   | 867,782   | 867,782   | 867,782   | 867,782   | 867,782   | (117,095) | 1,896,570    | \$11,529,991 |
| Total Savings  |           |           |           |           |           |           |           |           |           |           |           |           |              | \$11,728,263 |
| Note: All Cost/Savings calculations utilize April 2013 rates (savings derived from contract quantity changes only) |           |           |           |           |           |           |           |           |           |           |           |           |              |              |

**GTS-RateCase2015\_DR\_ORA\_048-Q05**

|                        |                                 |                   |                                   |
|------------------------|---------------------------------|-------------------|-----------------------------------|
| PG&E Data Request No.: | ORA_048-05                      |                   |                                   |
| PG&E File Name:        | GTS-RateCase2015_DR_ORA_048-Q05 |                   |                                   |
| Request Date:          | May 22, 2014                    | Requester DR No.: | ORA-GT&S-48                       |
| Date Sent:             | June 18, 2014                   | Requesting Party: | Office of Ratepayer Advocates     |
| PG&E Witness:          | Melvin Christopher              | Requester:        | Michael Tan/<br>Nathaniel Skinner |

**SUBJECT: CHAPTER 19: CORE GAS SUPPLY**

**QUESTION 5**

In its testimony at page 19-12, PG&E stated the reallocation of capacity withdrawal rights would result in an additional cost of \$2.4 million. Please explain and show details of the cost.

**ANSWER 5**

PG&E allocates storage capacity based on the principle that all firm capacity is to be made available to its customers, given the required service profile for the season.

To apply this principle when allocating winter withdrawal capacity to each of the three firm storage services (core, balancing, and market storage), PG&E performs an analysis to identify the calendar date when physical withdrawal capacity can accommodate the largest possible quantity of withdrawal rights for storage services across the entire winter. This calendar date is referred to here as the “point of constrained firm withdrawal capacity.”

There are two factors that constrain firm physical withdrawal capacity: (1) PG&E’s traditional storage assets and (2) the total working gas inventory that is controlled by PG&E, either through ownership or through its California Public Utilities Commission (CPUC) approved tariffs. PG&E can offer firm withdrawal only to the extent of these two physical volumes it controls.

The withdrawal rights profile is the sum of all withdrawal rights for Core, Balancing and Market Storage service. The withdrawal rights profile for Core and Balancing services are each based on reliability requirements. The Market Storage withdrawal profile was adopted in Gas Accord II, Decision 03-12-061. This profile is referred to as a 30-day product, meaning that the product must offer sufficient rights to withdraw the full inventory over a 30-day period.

Both the shape and quantity of the Core and Balancing profiles are fixed. For the Market Storage profile, only the shape is fixed. The quantity is the residual after Core and Balancing quantities have been determined. It is this allocation procedure that

assures that Core and Balancing firm withdrawal rights will fit within the constraints of the physical withdrawal capacity.

In previous rate cases, Core’s winter firm withdrawal service was constrained on March 31, the last day of the withdrawal season. Core Gas Supply’s proposal to increase its firm service rights during the December 1- January 15 period results in a temporal shift of the constrained withdrawal point to January 15.

The details of the additional costs allocated to Core are shown in the tables below. Table 1 below is the estimate that was developed at the time testimony was prepared. Prior to PG&E’s 2015 Gas Transmission and Storage (GT&S) Rate Case filing on December 19, 2013, PG&E’s Gas Transmission & Storage organization could not share certain information with PG&E’s Core Gas Supply Department (CGS), such as the change in storage capacities and the proposal to change withdrawal rights for Load Balancing, due to Gas Rule 26. Table 2 is an update of CGS’s estimate by Gas Transmission and Storage, based on PG&E’s filed Application.

**Table 1: Cost Comparison of Reallocation of Withdrawal Rights and Adjusted Withdrawal Rights Profile; Estimate Prior to PG&E’s Filing its Application.**

| <b>Scenarios:<br/>Reallocation<br/>and Adjusted<br/>Withdrawal<br/>Rights Profile</b> | <b>Core’s<br/>Storage<br/>Units<br/>(Mdth)</b> | <b>Total<br/>Storage<br/>Units<br/>(Mdth)</b> | <b>Core’s Percent<br/>of Total<br/>Storage Units</b> | <b>Storage<br/>Revenue<br/>Requirement;<br/>Traditional Facilities<br/>(\$ millions)</b> | <b>Core’s<br/>Allocated<br/>Costs<br/>(\$ millions)</b> |
|---|--|---|--|--|---|
| January 15 <sup>th</sup>  | 250,515  | 416,001                                       | 60.2%  | \$ 90.00   | \$ 54.20  |
| March 31 <sup>st</sup>  | 253,153  | 435,357                                       | 58.1%  | \$ 90.00   | \$ 52.33  |
| Net change from reallocation and adjusted withdrawal rights profile                   |  |   |  |  | \$ 1.86   |
| Savings from adjusted withdrawal rights profile (See Table 19-4 in PG&E’s Testimony)  |  |   |  |  | \$ 0.55   |
| Increase due to reallocation of withdrawal rights only.                               |  |   |  |  | \$ 2.41   |

**Table 2: Cost Comparison of Reallocation of Withdrawal Rights and Adjusted Withdrawal Rights Profile based on PG&E's Application Filed December 19, 2013**

| <b>Scenarios:<br/>Reallocation<br/>and Adjusted<br/>Withdrawal<br/>Rights Profile</b> | <b>Core's<br/>Storage<br/>Units<br/>(Mdth)</b> | <b>Total<br/>Storage<br/>Units<br/>(Mdth)</b> | <b>Core's Percent<br/>of Total<br/>Storage Units</b> | <b>Storage<br/>Revenue<br/>Requirement;<br/>Traditional Facilities<br/>(\$ millions)</b> | <b>Core's<br/>Allocated<br/>Costs<br/>(\$ millions)</b> |
|---|--|---|--|--|---|
| January 15 <sup>th</sup>  | 250,515  | 392,324                                       | 63.8%  | \$ 110.56  | \$ 70.50  |
| March 31 <sup>st</sup>  | 253,153  | 411,660                                       | 61.4%  | \$ 110.56  | \$ 67.89  |
| Net change from reallocation and adjusted withdrawal rights profile                   |  |   |  |  | \$ 2.61   |
| Savings from adjusted withdrawal rights profile                                       |  |   |  |  | \$ 0.27   |
| Increase due to reallocation of withdrawal rights only.                               |  |   |  |  | \$ 2.88   |

**Decision 12-12-030**  
**Mandating Pipeline Safety Implementation Plan, Disallowing Costs,**  
**Allocating Risk of Inefficient Construction Management to Shareholders,**  
**And Requiring Ongoing Improvement in Safety Engineering**

**Discussion (pp. 60-61):**

We do not agree that the change from an industry practice to regulatory mandate somehow excuses PG&E's failure to retain the pressure test records. As noted above, the record supports the finding that PG&E stated that from 1956 on, PG&E's practice was to pressure gas system test pipeline prior to placing it in service and that the costs of such testing was passed on to ratepayers. As required by industry practice and prudent natural gas transmission system operations, PG&E should have created and maintained records of those pressure tests. The absence of the records for the 1956 to 1961 pipeline now brings these pipeline segments into the Implementation Plan for re-testing or replacement. Having paid for such testing once, the ratepayers should not be required to pay for re-testing due to PG&E's failures in document management.

For pipeline determined to be in need of replacement, ratepayers should similarly be relieved of the obligation to pay for retesting, but not for complete replacement. That is, absent PG&E's poor document management, ratepayers would not have been required to pay for retesting the 1956 to 1961 pipeline. Certain pipeline segments, for reasons unrelated to PG&E's poor document management, require replacement, rather than just re-testing.<sup>1</sup> PG&E shareholders should be held to their obligation for re-testing costs, but not extended to replacement costs. Shareholders should not be excused from their duty to pay the costs of re-testing, and ratepayers should not receive a new pipeline at no cost. Thus, shareholders will be allocated the costs of retesting pipeline installed in 1956 to 1961; and where such pipeline is scheduled for replacement, the estimated cost of pressure testing will be recorded as an equitable adjustment to reduce the replacement costs included in revenue requirement and recovered from ratepayers. In this way, PG&E's shareholders meet their obligation caused by management's protracted failure to retain the missing records while ratepayers fund the remaining pipeline replacement costs. We order similar treatment for pipeline installed after 1961, lacking pressure test records, and scheduled for replacement, rather than pressure testing, in Phase 1.

In conclusion, we hold that for pipeline segments installed after 1955 or for which PG&E does not know the installation date, and where PG&E cannot produce pressure testing

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<sup>1</sup> As discussed in more detail below, some pipeline segments have features, such as now-suspect welds, that when combined with age of the pipeline and operating pressure, support replacement rather than pressure testing based on sound safety engineering.

documentation, the cost of pressure testing these segments now is not a just and reasonable cost of providing public utility service and we deny PG&E's request to include these costs in revenue requirement for recovery from ratepayers. Where such segments, and any segments installed after 1955 similarly lacking pressure test records, require replacement, rather than pressure testing, we grant PG&E's request to include in revenue requirement for recovery from ratepayers replacement costs but only to the extent the replacement costs exceed the estimated cost of pressure testing the segment.

**Findings of Fact (pages 117-118):**

16. Adopted in 1955, the American Standard Association Code for Pressure Pipeline (ASA B31.8) required pre-service pressure testing for natural gas pipelines.

17. PG&E admits that it voluntarily complied with American Standard Association Code for Pressure Pipeline (ASA B31.8), beginning in 1955.

18. Since no later than January 1, 1956, PG&E complied with or stated that it complied with industry standards to pressure test pipeline prior to placing it in service. PG&E is unable to produce the records for certain pressure tests that would have been performed in accord with industry standards from January 1, 1956, or for pipeline of unknown installation date. The lack of pressure test records for pipeline placed into service after January 1, 1956, or with an unknown installation date, reflect an error in PG&E's operation of its natural gas system. No evidence was presented that PG&E excluded the costs of pressure testing pipeline from its regulated revenue requirement from January 1, 1956.

**Conclusions of Law (page 122):**

15. It is reasonable for shareholders to absorb the costs of pressure testing pipeline placed into service after January 1, 1956, or for which PG&E has no known installation date, and for which PG&E is unable to produce pressure test records.

16. It is reasonable to impose an equitable adjustment to the replacement cost of pipeline installed from January 1, 1956, to July 1, 1961, for which pressure test records are not available, but which require replacement rather than pressure testing. Such an equitable adjustment shall be equal to the forecasted cost of pressure testing the pipeline and shall reduce the cost of the pipeline replacement included in rate base and revenue requirement.

**Decision 61269**  
**Investigation into the Need of a General Order Governing Design, Construction,  
Testing, Maintenance and Operation of Gas Transmission Pipeline Systems**

Body (page 4):

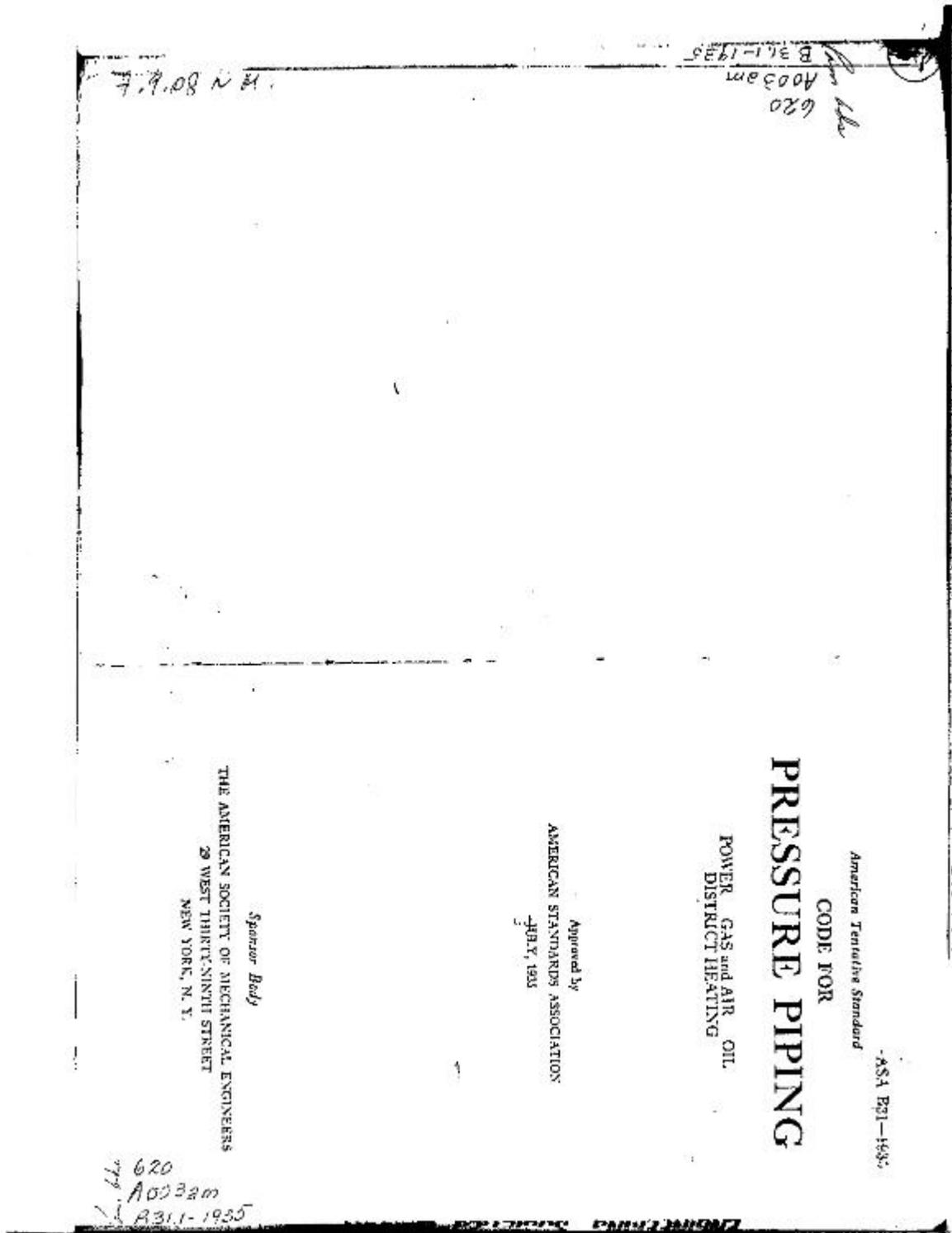
C. 6352 GH

Position of the Respondents

Respondents Pacific Gas and Electric Company, Southwest Gas Corporation, San Diego Gas & Electric Company and the Pacific Lighting group assert that no general order on this subject is necessary. They claim that there is no evidence to show that public health or safety has suffered from the lack of a general order; that the safety record of California gas utilities has been excellent; that there have been no major pipeline failures in the State resulting in either loss of life or major interruption of service; that there is nothing to indicate this good record will not continue; and that the gas utilities in California voluntarily follow the American Standards Association (ASA) code for gas transmission and distribution piping systems.<sup>4/</sup>

It was the further position of Pacific Gas and Electric Company, San Diego Gas & Electric Company and the Pacific Lighting group that if the Commission should determine that a general order governing gas pipeline systems is necessary, the interests of the Commission, the public and the utilities would be best served by the adoption of the ASA Code as proposed by the Pacific Lighting group or in some other manner including both transmission and distribution lines.

**American Standards Association B31-1935  
Code for Pressure Piping  
Power Gas and Air Oil District Heating**



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Table 10 Allowable "S" Values for Pipe in Gas and Air Piping Systems<sup>1</sup>

| Material  | Specification                   | Value of S in Lb per Sq In. |
|---|---------------------------------|-----------------------------|
| Steel pipe, seamless, Grade A                   | A.S.T.M. A 106 or A.P.I. 5L     | 16,000                      |
| Steel pipe, seamless, Grade B—medium carbon     | A.S.T.M. A 106 or A.S.T.M. A 53 | 20,700                      |
| Steel pipe, seamless, Grade C                   | A.S.T.M. A 106 or A.P.I. 5L     | 32,000                      |
| Steel pipe, seamless, low carbon                | A.S.T.M. A 53 or A.S.T.M. A 120 | 15,000                      |
| Steel pipe, seamless, Grade B                   | A.S.T.M. A 133                  | 13,500                      |
| Steel pipe, electric-fusion-welded, Grade A     | A.S.T.M. A 135                  | 15,000                      |
| Steel pipe, electric-fusion-welded, Grade B     | A.S.T.M. A 135                  | 16,500                      |
| Steel pipe, electric-fusion-welded, Grade C     | A.S.T.M. A 135                  | 12,800                      |
| Steel pipe, electric-fusion-welded, Grade A     | A.S.T.M. A 139                  | 16,000                      |
| Steel pipe, electric-fusion-welded, Grade B     | A.S.T.M. A 139                  | 17                          |
| Steel pipe, electric-fusion-welded, Grade C     | A.S.T.M. A 139                  | 375                         |
| Steel pipe, electric-resistance-welded, Grade A | A.S.T.M. A 133                  | 13,600                      |
| Steel pipe, electric-resistance-welded, Grade B | A.S.T.M. A 133                  | 17,000                      |
| Steel pipe, electric-resistance-welded, Grade C | A.S.T.M. A 133                  | 12,000                      |
| Steel pipe, forge-welded, Grade A               | A.S.T.M. A 136                  | 12,000                      |
| Steel pipe, forge-welded, Grade B               | A.S.T.M. A 136                  | 11,500                      |
| Steel pipe, forge-welded, Grade C               | A.S.T.M. A 136                  | 11,500                      |
| Steel or wrought iron pipe, riveted joint       | A.S.T.M. A 138                  | 20,000                      |
| Steel pipe, lock bar joint                      | A.S.T.M. A 137                  | 75 X E                      |
| Wrought iron pipe, lap-welded                   | A.S.T.M. A 72                   | 10,700                      |
| Wrought iron pipe, lap-welded                   | A.P.I. 5L                       | 11,200                      |
| Wrought iron pipe, butt-welded                  | A.S.T.M. A 72                   | 8,000                       |
| Wrought iron pipe, butt-welded                  | A.P.I. 5L                       | 8,400                       |
| Wrought iron pipe, butt-welded                  | A.S.T.M. B 43                   | 7,600                       |

GAS AND AIR PIPING 55

Table 10 Allowable "S" Values for Pipe in Gas and Air Piping Systems (Continued)

| Material  | Specification                                 | Value of S in Lb per Sq In. |
|---|---|-----------------------------|
| Copper pipe or tubing   | A.S.T.M. B 42, A.S.T.M. B 75 or A.S.T.M. B 88 | 7,000                       |
| Cast iron pipe, centrifugally cast or cast horizontally in green sand | A.S.T.M. WWP-P-421                            | 6,000                       |
| Cast iron pipe, pig cast  | A.S.T.M. WWP-P-421                            | 4,900                       |

<sup>1</sup>To the maximum pipe wall thickness calculated from any of the above "S" values, the manufacturing tolerance, demand for the pipe considered must be added to obtain the nominal wall thickness. (See A5.4, Standard B16.) The values of S for cast iron pipe thickness above are the ultimate tensile strengths, as developed by test specimens cut from the wall of the pipe, divided by 1.75.

<sup>2</sup>E = Ultimate tensile strength of the material.

determined by the method given in Par. 221(c), the factor F shall be 1.4 for all pipe.

222 Hydrostatic Tests. Div. 1, BEFORE ERECTION: (a) Valves and fittings shall be capable of withstanding a hydrostatic shell test, made before erection, equal to one and one-half times the maximum working gas or air pressure except that steel valves and fittings shall be capable of withstanding the test pressure as given in Table 11. Pipe shall be capable of meeting the hydrostatic test requirements contained in the respective material specifications, given in Table 9, under which it is purchased.

(b) AFTER ERECTION. (Welded Pipe Lines) (1) All piping systems containing welded joints shall be capable of withstanding a hydrostatic test of one and one-half times the

<sup>1</sup> The term "tensile efficiency" stated in the first sentence of Par. 211(d) designates the ratio (not exceeding 1.0) of the yield strength, as determined on a representative sample including stress, to the yield strength as determined on a representative sample not including a stress. The term "ultimate efficiency of mechanical components" shall be defined as the ratio of the yield strength to the ultimate tensile strength. The term "maximum working gas or air pressure" shall be interpreted in this Section as the maximum gas or air pressure or shall be a given piping system may be used in accordance with the requirements of this section of the Code.

normal service pressure. This test to be applied where practicable.

(2) If a hydrostatic test is made, it shall be in accordance with Section 3, Par. 524 (c) of this Code.

Table 11 Hydrostatic Tests for Steel Fittings and Valves

| Pressure Service, Pressure Range<br>Lb per Sq In. | Test Pressure<br>Lb per Sq In. |
|---|--------------------------------|
| 150   | 150                            |
| 300   | 750                            |
| 400   | 1000                           |
| 600   | 1500                           |
| 900   | 2000                           |
| 1500  | 3500                           |

**223 Hydrostatic Tests, Div. 2, BEFORE Erection.** (a) Valves and fittings in piping systems within the scope of Division 2 shall be capable of withstanding a hydrostatic test pressure of not less than one and one-half times the maximum working pressure for which the valves and fittings are rated.

(b) All steel or wrought iron pipe manufactured after the adoption of this Code for use in piping systems within the scope of Division 2 shall be subjected to end safety withstand an internal hydrostatic mill test without showing failure, leakage, distress, or distortion other than elastic distortion, at a pressure  $P$  in lb per sq in. gauge, not less than provided in the appropriate specifications enumerated in Table 9 and not greater than that calculated from Formula 4,<sup>1</sup>

$$P = \frac{2SY}{FD} \dots\dots\dots [4]$$

where  $Y$  = yield point or yield strength for respective material and method of manufacture as determined by one of the methods provided in Par. 221 at the option of the user; and

$F$  = nominal or specified pipe wall thickness in inches,  $F$  = a factor not less than 1.4 determined according to Par. 221 (d), and

$D$  = specified outside diameter of pipe in inches.

<sup>1</sup> When pipe is tested for which the hydrostatic mill test pressure is not stated in any of the specifications enumerated in Table 9, the minimum internal hydrostatic mill test pressure shall be 50 per cent of the maximum internal mill test pressure as determined according to Formula 4.

(c) All cast iron pipe for use in piping systems within the scope of Division 2 shall be subjected to end safety withstand an internal hydrostatic mill test without showing failure, leakage, or distress at a pressure of at least 300 lb per sq in. in excess of the service pressure for which the pipe line is designed and in no case less than that designated in the A.W.W.A. and Federal Specifications referred to in this section of the Code for the various classes and weights of pipe.

**224 Working Pressure on Piping Systems in Div. 2.** (A) The maximum allowable working pressure for all piping systems within the scope of Division 2 constructed with pipe which has been mill tested subsequent to the official adoption of this Code in accordance with Par. 223(b) shall be 80 per cent of the mill test pressure.

(b) The maximum allowable working pressure  $P$  in lb per sq in. gauge, for all piping systems within the scope of Division 2 constructed with pipe which has not been mill tested in accordance with Par. 223(b) shall be determined by Formula 5.

$$P = \frac{2SY}{FD} \dots\dots\dots [5]$$

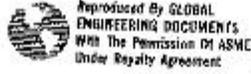
where  $Y$  = yield point or yield strength for respective material and method of manufacture as determined by one of the methods provided in Par. 221 at the option of the user;

$F$  = nominal or specified pipe wall thickness in inches,  $F$  = a factor not less than 1.4 and shall be determined according to Par. 221 (d), and

$D$  = specified outside diameter of pipe in inches.

(c) The maximum allowable working pressure for cast iron pipe cast under Division 2 shall be based on the provisions governing cast iron pipe for Division 1 except that the value of  $S$  for cast iron pipe may be increased in the ratio 5/4 over the values given in Par. 220.

**American Standards Association B31.1.8-1955  
Gas Transmission and Distribution Piping Systems**



**SUPERSEDED**

A M E R I C A N   S T A N D A R D

*SUPERSEDED BY ASME CODE*

# Gas Transmission and Distribution Piping Systems

ASA B31.1.8-1955  
UDC 621.64.002.1/2

SECTION 8 of  
American Standard Code for Pressure Piping  
(ASA B31.1-1955)

*SUPERSEDED BY ASME CODE E 31.8-1955*

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AMERICAN STANDARD CODE FOR PRESSURE PIPING

to, but the reverse of that described in 841.285(a) feasible, a slug of inert gas should be introduced to prevent the formation of an explosive mixture at the interface between gas and air. Nitrogen or carbon dioxide can be used for this purpose.

(c) If a pipeline or main containing gas is to be removed, the operation may be carried out in accordance with 841.282 or the line may be first disconnected from all sources of gas and then thoroughly purged with air, water or with inert gas before any further cutting or welding is done.

(d) If a gas pipeline or main or auxiliary equipment is to be filled with air after having been in service and there is a reasonable possibility that the inside surfaces of the facility are wetted with a volatile inflammable liquid, or if such liquids might have accumulated in low places, purging procedures designed to meet this situation shall be used. Steaming of the facility until all combustible liquids have been evaporated and swept out is recommended. Filling of the facility with an inert gas and keeping it full of such gas during the progress of any work that might ignite an explosive mixture in the facility is an alternative recommendation. The possibility of striking static sparks within the facility must not be overlooked as a possible source of ignition.

841.286 Whenever the accidental ignition in the open air of a gas-air mixture might be likely to cause personal injury or property damage, precautions shall be taken as, for example

- (a) Prohibit smoking and open flames in the area, and
- (b) Install a metallic bond around the location of cuts in gas pipes to be made by other means than cutting torches, and
- (c) Take precautions to prevent static electricity sparks, and
- (d) Provide a fire extinguisher of a class approved by the National Fire Protection Association, or the National Board of Fire Underwriters.

841.3 Testing After Construction

841.31 General Provisions. All pipelines,

mains and services shall be tested after construction, except as follows:

Tie-ins. Because it is sometimes necessary to divide a pipeline or main into test sections and install test heads, connecting piping, and other necessary appurtenances for testing, it is not required that the tie-in sections of pipe be tested.

841.4 Test Requirements

841.41 Test Required to Prove Strength of Pipelines and Mains to Operate at Hoop Stresses of 30% or More of the Specified Minimum Yield Strength of the Pipe

841.411 All pipelines and mains to be operated at a hoop stress of 30% or more of the specified minimum yield strength of the pipe shall be given a field test to prove strength after construction and before being placed in operation.

841.412 (a) Pipelines and mains located in Location Class 1 shall be tested either with air or gas to 1.1 times the maximum operating pressure or hydrostatically to at least 1.1 times the maximum operating pressure. See 841.5.

(b) Pipelines or mains located in Location Class 2 shall be tested either with air to 1.25 times the maximum operating pressure or hydrostatically to at least 1.25 times the maximum operating pressure. See 841.5.

(c) Pipelines and mains in Location Classes 3 and 4 shall be tested hydrostatically to a pressure not less than 1.4 times the maximum operating pressure.

(d) The test requirements given in 841.412 (a), (b) and (c) above are summarized in Table 841.412 (d).

841.413 Requirements of 841.412 (c) for hydrostatic testing of mains and pipelines in Location Classes 3 and 4 do not apply if at the time the pipeline or main is first

SECTION 3 GAS TRANSMISSION AND DISTRIBUTION

Table 841.412(d)

Test Requirements for Pipelines and Mains to Operate at Hoop Stresses of 80% or More of the Specified Minimum Yield Strength of the Pipe

| 1<br>Location Class | 2<br>Permissible Test Fluid | 3<br>Prescribed Test Pressure |             | 4<br>Minimum Allowable Operating Pressure, the lesser of |
|---------------------|-----------------------------|-------------------------------|-------------|--|
|                     |                             | Minimum                       | Maximum     |  |
| 1                   | Water                       | 1.1 x m.o.p.                  | None        | { t.p. }<br>{ 1.1 }<br>{ or }<br>{ d.p. }                |
|                     | Air                         | 1.1 x m.o.p.                  | 1.1 x d.p.  |  |
|                     | Gas                         | 1.1 x m.o.p.                  | 1.1 x d.p.  |  |
| 2                   | Water                       | 1.25 x m.o.p.                 | None        | { t.p. }<br>{ 1.25 }<br>{ or }<br>{ d.p. }               |
|                     | Air                         | 1.25 x m.o.p.                 | 1.25 x d.p. |  |
| 3                   | Water                       | 1.40 x m.o.p.                 | None        | t.p.<br>1.40<br>or<br>d.p.                               |
| 4                   | Water                       | 1.40 x m.o.p.                 | None        | t.p.<br>1.40<br>or<br>d.p.                               |

m.o.p. = maximum operating pressure (not necessarily the maximum allowable operating pressure)

d.p. = design pressure

t.p. = test pressure

Note (1) This table brings out the relationships between test pressures and maximum allowable operating pressures subsequent to the test. If an operating company decides that the maximum operating pressure will be less than the design pressure a corresponding reduction in prescribed test pressure may be made as indicated in Column 3. However, if this reduced test pressure is used the maximum operating pressure cannot later be raised to the design pressure without retesting the line to the test pressure prescribed in Column 4. See 805.14, 845.22 and 845.23.

ready for test, one or both of the following conditions exist:

(a) The ground temperature at pipe

depth is 32° F, or less, or might fall to that temperature before the hydrostatic test could be completed, or

AMERICAN STANDARD CODE FOR PRESSURE PIPING

(b) Water of satisfactory quality is not available in sufficient quantity.

(c) In such cases an air test to 1.1 times the maximum operating pressure shall be made and the limitations on operating pressure imposed by 841.412(d) above do not apply.

841.414 Other provisions of this code notwithstanding, pipelines and mains crossing highways and railroads may be tested in each case in the same manner and to the same pressure as the pipeline on each side of the crossing.

841.415 Other provisions of this code notwithstanding, fabricated assemblies, including mainline valve assemblies, cross connections, river crossing headers, etc., installed in pipelines in Class 1 locations and designed in accordance with Type B construction, as required in 841.142, may be tested as required for Class 1 locations.

841.416 Notwithstanding the limitations on air testing imposed in 841.412 (c), air testing may be used in Location Classes 3 and 4, provided that all of the following conditions apply:

(a) The maximum hoop stress during test is less than 50% of the specified minimum yield strength in Class 3 locations, and less than 40% of the specified minimum yield strength in Class 4 locations.

(b) The maximum pressure at which the pipeline or main is to be operated does not exceed 80% of the maximum field test pressure used.

(c) The pipe involved is new pipe having a longitudinal joint factor  $F$  in Table 841.12 of 1.00.

841.417 Records. The operating company shall maintain in its file for the useful life of each pipeline and main, records showing the type of fluid used for test and the test pressure.

841.42 Tests Required to Prove Strength for Pipelines and Mains to Operate at Less than 20% of the Specified Minimum Yield Strength of the Pipe, but in Excess of 100 psi.

Steel piping that is to operate at stress less than 20% of the specified minimum yield strength but in excess of 100 psi in location classes 2, 3 and 4 shall be tested to at least 1.5 times the maximum operating pressure. The test medium used may be water, air or gas; provided, however, that no medium shall be used to a higher hoop stress during test than the maximums set in Table 841.43.

Table 841.431

Maximum Hoop Stress Permissible During Test

| Location class | Percent of Specified Minimum Yield Strength |         |         |         |
|----------------|---|---------|---------|---------|
|                | 1   | 2       | 3       | 4       |
| Test medium    |   |         |         |         |
| Water          | No max.                                     | No max. | No max. | No max. |
| Air            | 75.2  | 75      | 50      | 40      |
| Gas            | 75.2  | 30      | 25      | 20      |

841.43 Leak Tests for Pipelines or Mains to Operate at 100 psi or More

841.431 Each pipeline and main shall be tested after construction and before being placed in operation to demonstrate that it does not leak. If the test indicates that a leak exists, the leak or leaks shall be located and eliminated, unless it can be determined that no undue hazard to public safety exists.

841.432 The test procedure used shall be capable of disclosing all leaks in the section being tested and shall be selected after giving due consideration to the volumetric content of the section and to its location.

841.433 In all cases where a line is to be stressed in a strength-proof to less than 20% or more of the specified minimum yield strength of the pipe, and gas or air



SECTION 8 GAS TRANSMISSION AND DISTRIBUTION

the test medium, a leak test shall be made at a pressure in the range from 100 psi to that required to produce a hoop stress of 20% of the minimum specified yield, or the line shall be walked while the hoop stress is held at approximately 20% of the specified minimum yield.

**841.44 Leak Tests for Pipelines and Mains to Operate at Less Than 100 psi**

841.441 At the time of or prior to placing in operation distribution mains and related equipment to operate at less than 100 psi, they shall be tested to determine that they are gas-tight.

841.442 Gas may be used as the test medium at the maximum pressure available in the distribution system at the time of the test. In this case the soap bubble test may be used to locate leaks if all joints are accessible during the test.

841.443 Testing at available distribution system pressures as provided for above in 841.442 may not be adequate if substantial protective coatings are used that would seal a split pipe seam. If such coatings are used, the leak test pressure shall be 100 psi.

841.5 **Safety During Tests** All testing of pipelines and mains after construction shall be done with due regard for the safety of employees and the public during the test. When air or gas is used, suitable steps shall be taken to keep persons not working on the testing operations out of the testing area during the period in which the hoop stress is first raised from 50% of the specified minimum yield to the maximum test stress, and until the pressure is reduced to the maximum operating pressure.

**842 CAST IRON**

**842.1 Cast Iron Pipe Design**

842.11 **Basis Equation to Determine Required Wall Thickness.** Cast iron pipe shall be designed in accordance with

the methods set forth in the ASA A21.1 "American Recommended Practice Manual for the Computation of Strength and Thickness of Cast Iron Pipe."

**842.12 Maximum Allowable Values of Sand**

**R.** The values of S, bursting tensile strength, and R, modulus of rupture, to be used in the equations given in ASA A21.1 are:

| Specification | Type of Pipe                     | S<br>Bursting<br>Tensile Strength | R<br>Modulus of<br>Rupture |
|---------------|----------------------------------|-----------------------------------|----------------------------|
| ASA A21.3     | PII Cast                         | 11,500 psi                        | 11,000 psi                 |
| ASA A21.7     | Centrifugal<br>(Metal Mold)      | 18,300 psi                        | 40,000 psi                 |
| ASA A21.9     | Centrifugal<br>(Sand-lined Mold) | 18,300 psi                        | 40,000 psi                 |

842.13 **Allowable Thicknesses for Cast Iron Pipe.** The least cast iron pipe thicknesses permitted are the lightest standard classes for each nominal pipe size as shown in ASA Specifications A21.3, A21.7 and A21.9.

**842.14 Standard Thickness for Cast Iron**

**Pipe.** The wall thickness, diameter, and maximum working pressure permitted under ASA A21.1 for the type and sizes of cast iron pipe most commonly used for gas piping are shown in Tables 842.141 and 842.142. For pipe sizes, pressure, thicknesses, or laying conditions not shown in these tables, reference should be made to ASA A21.1 for the method of calculation.

- Table 842.141  
(See Table on page 53).
- Table 842.142  
(See Table on page 54).

**842.15 Cast Iron Pipe Joints**

(a) **Caulked Bell and Spigot Joints**  
Dimensions for caulked bell and spigot joints shall conform to the American Standards Association Specifications A21.3, A21.7, A21.9 and A21.10. This type of joint shall not be used for pressures in excess of 25 psig, unless reinforced with mechanical clamps.

(b) **Mechanical Joints** Mechanical joints shall utilize gaskets made of a resili-

**PACIFIC GAS AND ELECTRIC COMPANY  
Gas Pipeline Safety OIR  
Rulemaking 11-02-019  
Data Response**

|                        |                                     |                   |                                 |
|------------------------|-------------------------------------|-------------------|---------------------------------|
| PG&E Data Request No.: | DRA_045-07                          |                   |                                 |
| PG&E File Name:        | GasPipelineSafetyOIR_DR_DRA_045-Q07 |                   |                                 |
| Request Date:          | December 16, 2011                   | Requester DR No.: | 045 (TCR-18)                    |
| Date Sent:             | January 6, 2012                     | Requesting Party: | Division of Ratepayer Advocates |
| PG&E Witness:          | Sumeet Singh                        | Requester:        | Tom Roberts                     |

**QUESTION 7**

PG&E filed a report on MAOP validation dated March 15, 2011 in R.11-02-019. At page 13, the report shows that of the pipelines analyzed and installed before 7/1/1961, at least 31% were pressure tested.

- a. What was the justification for performing these tests?
- b. Is there any further breakdown of when pressure tests were performed as a function of installation date?
- c. When did PG&E first pressure test newly constructed or repaired lines?
- d. Provide PG&E requirement documents describing the requirements for performing these tests.
- e. Provide PG&E procedures describing how these tests were performed.
- f. Were these tests funded by PG&E ratepayers or PG&E shareholders?
- g. Provide documents which state that PG&E shareholders paid to have these tests performed, or that PG&E would not request funding from ratepayers, if applicable.

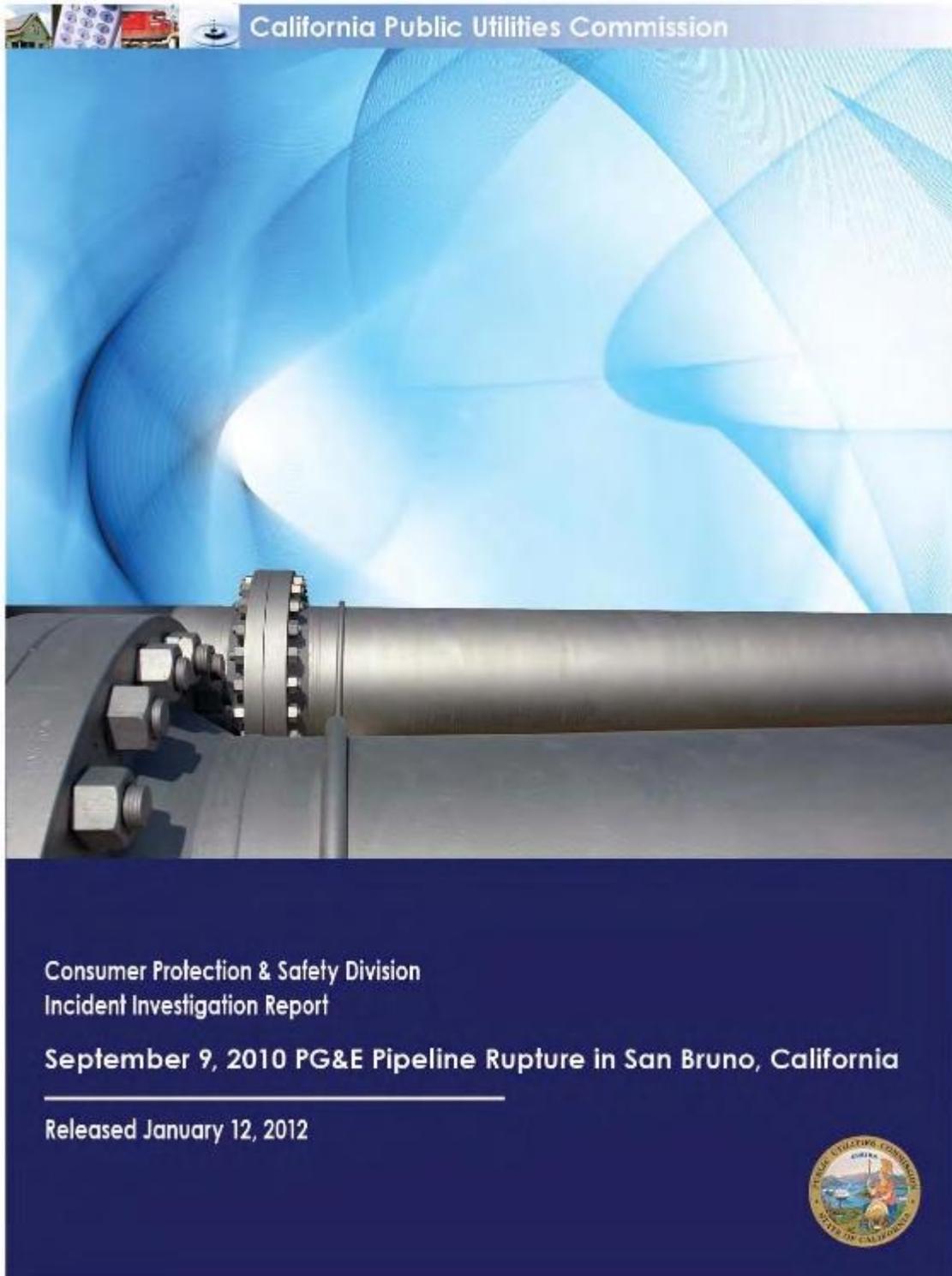
**ANSWER 7**

- a. Pressure tests were, and are, a means to confirm or test the strength of pipeline segments. PG&E believes that after adoption of American Society of Mechanical Engineers (ASME) standard ASA B31.1.8-1955, PG&E's practice was to follow ASA B31.1.8-1955, including pre-service testing.
- b. Additional breakdown of pressure tests as a function of installation date is available for the approximately 723 miles of pipeline segments installed before July 1, 1961 that were part of the 1,805 miles of Class 3 and Class 4 and Class 1 and Class 2 HCA segments that were the subject of PG&E's March 15, 2011 report on Records and MAOP Validation.

- c. The earliest date identified on a pressure test report for newly constructed or repaired pipelines is 1954; however, there were no state or federal regulatory requirements to perform pressure tests prior to 7/1/1961.
- d. Pressure tests were performed in accordance with ASA B31.1.8 – 1955 and no additional PG&E standards have been located for this era.
- e. Please see response to part (d) above.
- f. The testing was part of the pipe installation costs and, therefore, would have been funded by ratepayers.
- g. Please see response to part (f) above.

**Investigation 12-01-007**  
**On the Commission's Own Motion into the Operations and Practices of**  
**Pacific Gas and Electric Company to Determine Violations of Public**  
**Utilities Code Section 451, General Order 112, and Other Applicable**  
**Standards, Laws, Rules, and Regulations in Connection with the San Bruno**  
**Explosion and Fire on September 9, 2010**

**Consumer Protection and Safety Division**  
**Incident Investigation Report**  
**September 9, 2010 PG&E Pipeline Rupture in San Bruno, California**  
**Released January 12, 2012**



Recommendations, and ordered PG&E to complete compliance with the recommendations by February 1, 2011. The Commission ratified the Executive Director's order on January 13, 2011, in Resolution L-410, and extended PG&E's date for the compliance report filing to March 15, 2011.

On February 24, 2011, the Commission instituted an investigation into whether PG&E violated applicable rules or requirements pertaining to safety recordkeeping for its gas service and facilities, including the PG&E San Bruno gas pipeline, Line 132.

Also on February 24, 2011, the Commission initiated a rulemaking proceeding to consider a "new model of natural gas pipeline safety regulation applicable to all California pipelines."

On November 10, 2011, the Commission instituted a new proceeding to determine whether PG&E's natural gas transmission pipeline system was safely operated in areas of greater population density or other areas identified as High Consequence Areas (HCAs), stemming from PG&E's compliance reports issued in response to Resolution L-403.

#### **D. Summary of Findings**

CPSD's investigation concludes that the San Bruno incident was caused by a combination of multiple contributing factors:

1. PG&E's failure to follow accepted industry practices when it constructed Segment 180 in 1956;
2. PG&E's failure to comply with the integrity management requirements;
3. PG&E's inadequate record keeping practices;
4. Deficiencies in PG&E's SCADA system and inadequate procedures related to the work at the Milpitas Terminal and PG&E's failure to comply with its own procedures;
5. PG&E's deficient emergency response actions after the incident; and
6. PG&E's corporate culture emphasizing profits over safety.

The investigation found the following code violations:

1. PG&E did not follow the accepted industry standards specified in ASA B31.1.8-1955 when it installed Segment 180 in 1956 and therefore violated the Public Utilities Code, Section 451.

2. PG&E violated Code of Federal Regulations (CFR) 49, Part 192, Subpart O, for its failure to comply with the integrity management requirements.
3. PG&E failed to keep adequate records for Segment 180 and failed to comply with the industry standards specified in ASA B31.1.8-1955 and therefore violated the Public Utilities Code, Section 451.
4. PG&E violated 49 CFR Parts 192.605(c) and 192.13(c) for its failure to establish adequate procedures for recognizing abnormal operating conditions at the Milpitas Terminal and for not following its own procedures.
5. PG&E failed to timely test employees at the Milpitas Terminal for alcohol and therefore violated Part 199.225.
6. PG&E violated the Public Utilities Code, Section 451 for allowing deficiencies to exist in its SCADA system which interfered with its ability to detect and respond to the emergency.
7. PG&E violated Parts 192.605 and 192.615 and Public Utilities Code Section 451 for inadequately responding to a major incident and jeopardizing public safety.

## II. Applicable Laws and Regulations

The California State Constitution, Article XII and California Public Utilities Code Section 222, give the California Public Utilities Commission (Commission) authority over natural gas operators in California. Pursuant to 49 United States Code (U.S.C.) §60101 *et seq.* the federal government regulates the safety of transportation of natural gas through pipelines. Many provisions of the California Public Utilities Code have relevance to this investigation. In particular, Section 701 empowers the Commission to do “all things...necessary and convenient” in the exercise of its powers and jurisdiction. Section 768 authorizes the Commission to promote and safeguard the health and safety of the public by establishing uniform standards for construction and maintenance of utility equipment and plant. Section 451, which has been in effect since 1909 when California began regulating utilities, requires all public utilities to provide and maintain “adequate, efficient, just, and reasonable” service and facilities as are necessary for the “safety, health, comfort, and convenience” of its customers and the public.<sup>2</sup> A violation of the Public Utilities Code or a Commission decision or order is subject to fines of \$500 to \$20,000 for each violation, for each ongoing day, pursuant to Sections 2107 and 2108. As of January 2012, SB 879 has increased the penalties up to \$50,000 for each violation.

In order to enforce the federal regulations, state regulatory agencies such as the Commission may become certified by the Office of Pipeline Safety (an office of the U.S. Department of Transportation) under 49 U.S.C. §60105, so long as the state adopts the minimum federal standards (but the states may adopt more stringent standards where appropriate). The Commission has been certified and applies the federal pipeline safety regulations contained in 49 CFR Part 192, *et seq.* The Commission approved General Order (GO) 112-C in 1971 which adopted the federal pipeline safety rules in 49 C.F.R. Part 192. The Natural Gas Pipeline Safety Act of 1968 created 49 U.S.C. §60101, and prompted a federal rulemaking that promulgated 49 C.F.R. Part 192, adopted in 1971.

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<sup>2</sup> The California Court of Appeals has upheld the Commission’s authority to find Section 451 violations that are separate and distinct from any other rule or regulation. *PacBell Wireless v. PUC* (2006) 140

Pursuant to its constitutional and statutory mandate, the Commission created the first version of GO 112 in 1960 (effective July 1 1961) governing natural gas pipeline safety. GO 112 adopted the standards put forth by the American Society of Mechanical Engineers (ASME) that were followed by the industry at that time (ASME B31.1.8, in effect in 1955). General Order 112 has been updated several times – the current version is GO 112-E, last revised in 2008. General Order 112-E was substantially altered in order to automatically incorporate all revisions to the Federal Pipeline Safety Regulations, 49 CFR Parts 190, 191, 192, 193, and 199.

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Cal.App. 4<sup>th</sup> 718. Section 451 was in effect in 1956, when Segment 180 of Line 132 was built.

**National Transportation Safety Board  
Pipeline Accident Report (NTSB/PAR-11/01)  
Adopted August 30, 2011**

**Pacific Gas and Electric Company  
Natural Gas Transmission Pipeline Rupture and Fire  
San Bruno, California  
September 9, 2010**

Pacific Gas and Electric Company  
Natural Gas Transmission Pipeline Rupture and Fire  
San Bruno, California  
September 9, 2010



**Accident Report**

NTSB/PAR-11/01  
PB2011-916501



**National  
Transportation  
Safety Board**

PG&E's pipeline integrity management program, which should have ensured the safety of the system, was deficient and ineffective because it—

- Was based on incomplete and inaccurate pipeline information.
- Did not consider the design and materials contribution to the risk of a pipeline failure.
- Failed to consider the presence of previously identified welded seam cracks as part of its risk assessment.
- Resulted in the selection of an examination method that could not detect welded seam defects.
- Led to internal assessments of the program that were superficial and resulted in no improvements.

Several deficiencies revealed by the National Transportation Safety Board investigation, such as PG&E's poor quality control during the pipe installation and inadequate emergency response, were factors in the 2008 explosion of a PG&E gas pipeline in Rancho Cordova, California. (See *Explosion, Release, and Ignition of Natural Gas, Rancho Cordova, California, December 24, 2008*, Pipeline Accident Brief NTSB/PAB-10/01 [Washington, DC: National Transportation Safety Board, 2010].) This 2008 accident involved the inappropriate installation of a pipe that was not intended for operational use and did not meet applicable pipe specifications. PG&E's response to that event was inadequate; PG&E initially dispatched an unqualified person to the emergency, causing an unnecessary delay in dispatching a properly trained and equipped technician. Some of these deficiencies were also factors in the 1981 PG&E gas pipeline leak in San Francisco, which involved inaccurate record-keeping, the dispatch of first responders who were not trained or equipped to close valves, and unacceptable delays in shutting down the pipeline. (See *Pacific Gas & Electric Company Natural Gas Pipeline Puncture, San Francisco, California, August 25, 1981*, Pipeline Accident Report NTSB/PAR-82/01 [Washington, DC: National Transportation Safety Board, 1982].) The National Transportation Safety Board concluded that PG&E's multiple, recurring deficiencies are evidence of a systemic problem.

The investigation also determined that the California Public Utilities Commission, the pipeline safety regulator within the state of California, failed to detect the inadequacies in PG&E's integrity management program and that the Pipeline and Hazardous Materials Safety Administration integrity management inspection protocols need improvement. Because the Pipeline and Hazardous Materials Safety Administration has not incorporated the use of effective and meaningful metrics as part of its guidance for performance-based management pipeline safety programs, its oversight of state public utility commissions regulating gas transmission and hazardous liquid pipelines could be improved. Without effective and meaningful metrics in performance-based pipeline safety management programs, neither PG&E nor the California Public Utilities Commission was able to effectively evaluate or assess PG&E's pipeline system.

**Table 6.** Survey postcard responses to public awareness brochures.

| Question   | Yes | No | Blank          |
|--|-----|----|----------------|
| Do you or someone you know work or live near a pipeline?                       | 7   | 9  | 4              |
| Have you seen any information about pipeline safety within the last two years? | 3   | 14 | 3              |
| If you noticed what appears to be a pipeline leak, would you call 911?         | 17  | 0  | 3              |
| Have you or anyone you know ever discovered a buried pipeline while digging?   | 17  | 0  | 3              |
| Have you ever heard of the "One-Call" system before reading this brochure?     | 2   | 14 | 3 <sup>a</sup> |

<sup>a</sup> In Paradigm's report, only 19 responses to this question were documented.

In 2007, PG&E participated in an API survey to evaluate the effectiveness of its public awareness program via the Public Awareness Program Effectiveness Research Survey (PAPERS). The survey, which evaluated 18 operators, including PG&E, measured retention and comprehension of awareness messages by the audiences defined in API Recommended Practice 1162. The survey found that the affected public<sup>96</sup> was PG&E's least informed audience, with 89 percent of the 155 respondents reporting that they did not recall receiving information from PG&E and 34 percent reporting that they considered themselves somewhat or very well informed. The 50 emergency responders that responded to the survey reported the highest awareness level; 85 percent of these indicated that they were somewhat or very well informed about pipelines. However, the survey also found the emergency official audience indicating a need for more information about potential pipeline hazards and appropriate training and response.

#### 1.9.4 PG&E Risk Management/Integrity Management Program

In October 2001, PG&E developed a risk management program presented in a series of risk management procedures (RMP). The current version of RMP-01, which has been revised several times, states that the risk management program was designed to provide a process for complying with the requirements for risk calculation and an integrity management program.<sup>97</sup>

##### 1.9.4.1 Geographic Information System

PG&E states in RMP-01 that it will develop and maintain an inventory of all pipeline design attributes, operating conditions, environment (structure, faults, etc.), threats to structural integrity, leak experience, and inspection findings. This inventory is maintained in the PG&E GIS database. GIS data are used to calculate risk for each pipeline segment. (According to PG&E, a pipeline segment is a length of pipe that differs from adjacent pipe in some way, such as its material properties, age, manufacture, pressure test history, coating type or age, or leak

<sup>96</sup> In the 2007 PAPERS, the affected public surveyed did not include PG&E distribution line customers, only the residents along its transmission line right-of-way.

<sup>97</sup> For more information about the required elements of pipeline integrity management programs, see section 1.10.2, "Federal Oversight by PHMSA."

survey history.) PG&E then selects a target threshold, segments above that threshold are reviewed for significant risk drivers, and some segments are selected for investigation and mitigation.

Although the Federal integrity management regulations do not explicitly list all of the information that must be maintained for each segment, they state (at 49 CFR 192.917(b)) that to identify and evaluate the potential threats to a covered pipeline segment, an operator must gather and integrate existing data on the entire pipeline that could be relevant to the covered segment, including, at a minimum, the information specified in ASME B31.8S, 2004 edition, and “consider on both the covered segment and similar noncovered segments, past incident history, corrosion control records, continuing surveillance records, patrolling records, maintenance history, internal inspection records and all other conditions specific to each pipeline.” In addition, ASME B31.8S, 2004 edition, which is incorporated by reference into Part 192, notes that “[c]omprehensive pipeline and facility knowledge is an essential component of a performance-based integrity management program” and states, if an operator “lacks sufficient data or where data quality is below requirements, the operator shall follow the prescriptive-based processes [outlined in appendix A to ASME B31.8S, 2004 edition].” It further states that when all of the specified data elements<sup>98</sup> for the prescriptive-based process are not available for each threat to perform the risk assessment, “it shall be assumed that the particular threat applies to the pipeline segment being evaluated.” ASME B31.8S, 2004 edition, also states that data applied in a risk assessment process should be verified and checked for accuracy and for missing or questionable data, and that the operator should choose values that conservatively reflect the values of other similar segments on the pipeline or in the operator’s system.

The PG&E GIS was implemented in the 1990s and was populated with data from preexisting pipeline survey sheets. If information was missing, assumed values were entered, preceded by a negative sign to indicate they were assumed values. According to PG&E, the GIS was fully populated in 1998. If discrepancies between GIS data and actual conditions are discovered by field personnel, PG&E procedures require field engineers to report them to the PG&E mapping department, which validates the information by checking the original job package paperwork for that segment of pipeline. If the mapping department concludes that a change is warranted, it is made.

NTSB investigators reviewed PG&E GIS data and pipeline survey sheets for Line 132 to determine how often assumed or unknown values were entered. They found that—

- The pipe wall thickness was an assumed value for 21.5 miles (41.75 percent) of Line 132.
- The manufacturer of the pipe was unknown (“NA”) for 40.6 miles (78.81 percent) of Line 132.

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<sup>98</sup> The required data for each segment include pipe material, year of installation, manufacturing process (or age of manufacture as an alternative), seam type, joint factor, and operating pressure history.

- The pipeline depth of ground cover was also unknown for 42.7 miles (82.79 percent) of Line 132.
- Three values were used for the SMYS of grade B pipe: 35,000 psi (consistent with the value given in ASME B31.1.8, 1955 edition), 40,000 psi, and 45,000 psi.
- Two segments with unknown SMYS were assigned values of 33,000 psi and 52,000 psi, whereas 49 CFR 192.107 requires operators to use a value of 24,000 psi when SMYS is unknown.
- Six consecutive segments, totaling 3,649 feet, specified an erroneous minimum depth of cover of 40 feet.
- Several segments, including Segment 180, specified 30-inch-diameter seamless pipe, although there was no API-qualified domestic manufacturer of such pipe when the line was constructed.
- The GIS did not reflect the presence of the six pups in Segment 180.

#### 1.9.4.2 Risk Management Procedures

PG&E defines risk as the product of the likelihood of failure (LOF) and the consequence of failure (COF), each of which is determined by PG&E steering committees. Failure is defined as a breach of the structural integrity of the pipe. LOF is derived from combining the risks of the following threats, which, according to RMP-01, are weighted in proportion to PG&E and industry failure experience: 25 percent for external corrosion, 45 percent for third-party damage, 20 percent for ground movement, and 10 percent for design and material characteristics. For the integrity management program only, COF is a function of the potential impact radius. PG&E developed individual RMPs (as discussed below) for each of the perceived threats to the system:

- RMP-02 contains an algorithm to calculate the risk of external corrosion, detailing possible threats to the pipeline caused by items such as soil resistivity, coating age, coating design, and d.c./a.c. interference. It considers the results of pressure tests (if any were conducted), visual inspections of the coating, casing surveys, corrosion leak rate, and external corrosion direct assessment (ECDA<sup>99</sup>) data, if available, to develop a ranking of coated piping.
- RMP-03 contains the algorithm for third-party threats. It accounts for the likelihood of excavation frequency, class location, ground cover protection, damage prevention, pipe diameter, and wall thickness, among other factors, to rank the vulnerability of the pipeline.
- RMP-04 contains the algorithm for ground movement and natural forces threat, such as seismic activity.
- RMP-05 contains the algorithm for design/material threats and also addresses construction threats. It includes weighted factors for pipe seam design, girth weld

<sup>99</sup> ECDA is a method of surveying a pipeline by first selecting likely areas of potential corrosion for assessment and then excavating and physically examining these areas.

condition, material flaws or unique joints (such as pre-1950 miter bends), pipe age, MOP versus pipe strength, leak history, and test pressure. Points are assigned for various risk factors so that higher scores indicate a higher threat. The maximum score that a segment can receive is 135. Pre-1970 pipes are assigned 30 points for pipe seam design and 10 points for pipe age. Pipe segments that have not been pressure tested are assigned 30 points; conversely, pipes that have undergone pressure testing receive a 30 or 40 point deduction, depending on the recency of the test. (The scores assigned to Segment 180 are discussed in section 1.9.4.3, “Threats Identified for Line 132.”)

- RMP-06 contains the PG&E gas transmission integrity management program and is discussed below.
- RMP-08 contains the procedure for identification, location, and documentation of HCAs. PG&E uses the potential impact circle method, described in 49 CFR 192.903, to determine HCAs. Pipe diameter and MAOP are used to calculate the potential impact circle, which designates an HCA according to whether the area within the potential impact circle contains 20 or more buildings intended for human occupancy. If it does, the area is classified as an HCA, regardless of class designation. PG&E records specify Line 132 from MP 8.39–40.08, which includes the location of the rupture, as a class 3 location.
- RMP-09 includes requirements for performing ECDA, which consists of preassessment, including data collection; indirect inspections; prioritizing excavation locations and examinations; and postassessment, including data analysis. RMP-09 requires the collection of data that could be used for validating assumed values or determining unknown values in the GIS and calls for updating pipeline records with data collected during the preassessment process.
- RMP-10 contains requirements for performing internal corrosion direct assessment, which consists of preassessments, including data collection and identifying sites; prioritizing excavation locations and examinations; and postassessment, including data and analysis. Dry gas internal corrosion is not included in the PG&E equation for calculating LOF because PG&E automatically classifies the few pipelines it has with the threat of internal corrosion as high risk.
- RMP-11 contains procedures and requirements for performing in-line inspections. It includes steps for performing a preassessment, including data collection and work necessary to allow the line to accommodate in-line inspection tools; in-line inspection, including internal cleaning and inspection tool running; direct examination of identified anomalies; and postassessment, including data analysis and mitigation planning.
- RMP-12 contains the PG&E pipeline public awareness plan. (See section 1.9.3, “Public Awareness,” in this report.)
- RMP-13 contains requirements for performing stress corrosion cracking direct assessment. The procedures include preassessment, including data collection; indirect inspections; prioritizing excavation locations and examinations; and postassessment,

including data analysis. Stress corrosion cracking is not included in LOF calculations because PG&E classifies the few pipelines it has with this threat as high risk.

#### 1.9.4.2.1 Integrity Management Plan

The PG&E gas transmission integrity management program is set forth in RMP-06. It was developed to meet the requirements of 49 CFR Part 192 Subpart O, which became effective in 2004. RMP-06 identifies 22 potential threats to HCAs, which fall into 4 categories: time dependent, stable, time independent, and unknown. Manufacturing- and welding/fabrication-related defects are listed as stable defects (that is, they are not expected to grow in service). However, under 49 CFR 192.917(e)(3), such defects would not be considered stable in the event of certain increases in operating pressure.<sup>100</sup> RMP-06 section 3.5, “Threat Analysis,” states that a manufacturing threat is assumed to exist in pipe segments installed before 1970. Under the heading “Insufficient Data or Poor Quality Data,” RMP-06 states that the integrity management program “avoids the use of data assumptions to identify applicable threats.”

RMP-06 section 4, “Baseline Assessment Plan,” addresses the initial evaluation of the condition of the pipeline, which is used as a baseline for further inspections. This section specifies that all HCAs will be assessed in accordance with the schedule set forth in the baseline assessment plan and that HCAs with the highest potential for risk are given priority. Consistent with 49 CFR 192.921, it specifies that at least 50 percent of the HCAs identified in the plan will be assessed by December 17, 2007, and the remainder by December 17, 2012. RMP-06 section 4.5 notes that the methods chosen to assess a particular segment of pipe are based on the threats identified in the risk assessment procedure, and more than one assessment method may be required to adequately cover the potential risks of an HCA. PG&E’s baseline assessment plan includes 1,021 miles of HCA pipeline and about 500 miles of non-HCA pipeline. PG&E determined that 813 HCA miles would be assessed using direct assessment methodologies<sup>101</sup> (ECDA, internal corrosion, and stress corrosion cracking); 208 HCA miles would be assessed using in-line inspection tools or “pigs”;<sup>102</sup> and 500 non-HCA miles would be assessed using in-line inspection tools. As of June 30, 2010, 749.35 HCA miles had been inspected; Line 132 had not yet been inspected.

Concerning in-line inspection, RMP-06 section 5.4 states that “it is the company’s desire to inspect pipelines utilizing in-line inspection whenever it is physically and economically feasible.” Factors that PG&E considers in determining feasibility include whether the pipeline at issue is at least 10 miles long and predominately located in HCAs, whether less than 0.5 mile of

<sup>100</sup> For more information on how PG&E addressed this issue, see section 1.7.5.3, “Periodic Pressure Increases to MAOP.”

<sup>101</sup> According to the PG&E director of integrity management and technical support, PG&E has performed 500 digs since the start of the integrity management program.

<sup>102</sup> A “pig” can be any of a variety of mechanical devices inserted into a pipeline to either clean or inspect the line to identify possible defects. Pigs that gather information as they travel through the line are referred to as “smart pigs.” A variety of physical obstacles can prevent a pig from successfully traveling through a pipeline, thus rendering that pipeline “unpiggable.” For more information about smart pigs, see section 1.13.1.2, “In-line Inspection.”

replacement is required to make the pipeline piggable, whether the pipeline at issue has adequate flow rates to enable successful in-line inspection, and whether the pipeline operates at more than 30 percent SMYS.

Regarding pressure testing, RMP-06 section 5.5 states that PG&E—

does not plan to use pressure testing to assess the integrity of its pipelines, unless it is a post installation test or up-rate for a new HCA. However, during the course of assessing data for ECDA or in-line inspection, it may become apparent that pressure testing is the only feasible option.

RMP-06 section 10, “Performance Plan,” sets forth the program measurements that PG&E uses to evaluate the long-term effectiveness of its integrity management program. These measures, which are reported semiannually to PHMSA, include number of total system miles, number of total miles of pipelines inspected, number of HCA miles in the integrity management program, number of HCA miles inspected via integrity management assessments, number of immediate repairs<sup>103</sup> completed in HCAs, number of scheduled repairs completed in HCAs, number of leaks<sup>104</sup> in HCAs classified by cause, number of failures<sup>105</sup> in HCAs classified by cause, and number of incidents<sup>106</sup> in HCAs classified by cause. The combined number of leaks, failures, and incidents that PG&E reported for the years 2004–2010 is shown in table 7.

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<sup>103</sup> Immediate repair conditions, as defined in 49 CFR 192.933 (d)(1), include (i) an anomaly resulting in a calculated predicted failure pressure of 1.1 times the MAOP; (ii) a dent that has any indication of metal loss, cracking, or a stress riser; or (iii) any indication or anomaly that, in the judgment of the person designated by the operator to evaluate the assessment results, requires immediate action. Until the repair is completed, the operator is required to temporarily reduce the in pressure to no more than 80 percent of the operating pressure at the time the condition was discovered.

<sup>104</sup> PHMSA defines a “leak” as an unintentional release of gas from a pipeline that is not an “incident,” including an unintentional release of gas that does not result in an injury, death, or \$50,000 or more in property damage.

<sup>105</sup> PHMSA defines “failure” as a general term used to imply that a part in service has become completely inoperable, is still operable but incapable of satisfactorily performing its intended function, or has deteriorated seriously to the point that it has become unreliable or unsafe for continued use. However, according to the definition, a “failure” does not involve a release of gas.

<sup>106</sup> PHMSA defines “incident” as a release of gas from a pipeline causing death or personal injury necessitating inpatient hospitalization; as estimated property damage, including the cost of gas lost, for the operator or others or both, that is \$50,000 or more; or as an event that is significant in the judgment of the operator, even though it does not meet the criteria above.

**Table 7.** PG&E's reportable events by cause for 2004–2010.

| Cause                     | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | All |
|---------------------------|------|------|------|------|------|------|------|-----|
| External corrosion        | 0    | 10   | 1    | 3    | 5    | 3    | 1    | 23  |
| Internal corrosion        | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0   |
| Stress corrosion cracking | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0   |
| Manufacturing             | 0    | 0    | 1    | 0    | 1    | 0    | 0    | 2   |
| Construction              | 1    | 0    | 0    | 1    | 1    | 3    | 3    | 9   |
| Equipment                 | 0    | 7    | 1    | 1    | 1    | 4    | 3    | 17  |
| Third party               | 0    | 4    | 0    | 3    | 1    | 2    | 1    | 11  |
| Incorrect operations      | 0    | 1    | 0    | 0    | 0    | 3    | 1    | 5   |
| Weather/outside force     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0   |
| Total                     | 1    | 22   | 3    | 8    | 8    | 15   | 9    | 67  |

In addition to leaks, incidents, and failures, as defined by PHMSA, the CPUC also required pipeline operators such as PG&E to report “incidents which have either attracted public attention or have been given significant news media coverage, that are suspected to involve natural gas, which occur in the vicinity of the operator’s facilities; regardless of whether or not the operator’s facilities are involved.”

RMP-06 section 13, “Quality Assurance,” indicates that PG&E will conduct periodic self assessments of its integrity management program to determine its effectiveness and specifies that internal or external audits will be performed every other year to ensure compliance with PG&E and regulatory requirements. Internal audits were conducted in 2007 and 2009. External audits were completed by the CPUC (with PHMSA) in 2005 and by the CPUC in 2010. (For more information on these audits and the PG&E response, see section 1.10.1, “State Oversight by CPUC.”)

#### 1.9.4.3 Threats Identified for Line 132

Line 132 has about 322 pipeline segments. In 2009 and 2010 (prior to the accident), Segment 180 received the assessment scores shown in table 8. (For comparison, the scores for the Line 132 segment with the highest total risk in 2009 and 2010 are also provided.<sup>107</sup>)

<sup>107</sup> The highest ranking segments in 2009 and 2010 were Segments 106.7 and 189, respectively.

**Table 8.** Line 132 risk values.

| Line 132 Risk Values              |             |                   |
|-----------------------------------|-------------|-------------------|
| <b>Segment 180</b>                | <b>2009</b> | <b>2010</b>       |
| External corrosion (25 percent)   | 4.18        | 4.18              |
| Third party (45 percent)          | 20.9        | 20.9              |
| Ground movement (20 percent)      | 0.0         | 0.0               |
| Design and materials (10 percent) | 55.0        | 73.0 <sup>a</sup> |
| Total risk (Unweighted)           | 927.63      | 1036.0            |
| Rank                              | 69.0        | 80.0              |
| <b>Highest Ranking Segment</b>    |             |                   |
| External corrosion (25 percent)   | 5.78        | 7.58              |
| Third party (45 percent)          | 25.6        | 38.9              |
| Ground movement (20 percent)      | 61.5        | 22.5              |
| Design and materials (10 percent) | 68.0        | 81.0              |
| Total risk (Unweighted)           | 1878.8      | 2149.0            |
| Rank                              | 1.0         | 1.0               |

<sup>a</sup> The increased score in the "design and materials" category resulted from the discovery of miter bends in Segment 180.

PG&E conducted ECDA to assess the corrosion and coating on numerous sections of Line 132 in 2005 and 2009. PG&E indicated that eight digs were conducted as a result of the 2009 survey of Line 132.

Prior to the accident, no in-line inspections had been performed on Line 132 or the other two lines in the peninsula system (Lines 101 and 109). PG&E indicated that bends, valves, and variations in pipe diameter made in-line inspection impracticable on these lines. As part of its 2009 rate case, PG&E requested permission to replace sections and/or fittings on the segments that currently prevent Lines 101, 109, and 132 from accepting smart pigs. The cost to make Line 132 piggable is estimated to be \$13 million; and, according to a PG&E supervising engineer for gas transmission and distribution, PG&E plans to perform in-line inspection on Line 132 by 2014. He further stated that preparing an older line for an in-line inspection process requires 3–4 years to engineer upgrades, replace components such as valves and fittings, and clean the pipeline.

**Report of the Independent Review Panel  
San Bruno Explosion  
Prepared for  
California Public Utilities Commission  
Revised Copy  
June 24, 2011**

# **Report of the Independent Review Panel San Bruno Explosion**



**Prepared For  
California Public Utilities Commission**

**Revised Copy  
June 24, 2011**

**institutions must confront and change elements of their respective cultures to assure the citizens of California that public safety is the foremost priority.**

## **1.6 PG&E's Pipeline Integrity Management Program Has Numerous Shortcomings**

The mindset of a prudent operator is to identify and cure defects through scrupulous attention to every activity in the integrity cycle. The following are the Panel's findings regarding gaps in PG&E's performance.

- **Worker Safety versus System Safety** - Management's focus in recent times appears to have been on the occupational safety of its employees and lacking an equivalent focus on the public safety aspects of its system. In extensive discussions with top management and in our evaluation of the company's goals, pipeline system safety was not substantively tracked, benchmarked, or otherwise a center of focus for the management. There was no evidence of any intent to compromise public safety, but there is the lack of management focus on how system integrity would be managed and assured that has significant consequences, as discussed below.<sup>4</sup>
- **Data Management** – It was extensively reported PG&E's first submission of incident data to the NTSB included information that incorrectly characterized fundamental aspects of Line 132. Based on discussions with PG&E staff, experienced piping engineers were well aware the San Bruno segment was double-submerged arc welded (DSAW), rather than seamless. However, it is not clear whether the process by which data was collected and examined for threat identification and the risk ranking of piping segments (which should include examination of construction and operating records by those experienced piping engineers) has been consistently undertaken.

PG&E provided erroneous data because of a lack of: (1) robust data and document information management systems to archive historical data, and (2) processes to capture emerging information about the underground gas transmission system. There is a lack of coordination between field resources and engineering management regarding which data are to be collected and where and how records are to be preserved.

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<sup>4</sup> That a company could emphasize personal safety and seemingly neglect system safety is not unique. This seemingly contradictory problem was reported by the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling regarding BP in January 2011. Namely, "BP has caused a number of disastrous or potentially disastrous workplace incidents that suggest its approach to managing safety has been on individual worker occupational safety but not on process safety. These incidents and subsequent analyses indicate that the company does not have consistent and reliable risk-management processes—and thus has been unable to meet its professed commitment to safety." (See page 218 of the Report to the President, at [www.oilspillcommission.gov](http://www.oilspillcommission.gov).)

While we understand the entire pipeline industry has had challenges in digitizing and systematizing all the engineering design, construction and operating data, we find PG&E's efforts inchoate. **The lack of an overarching effort to centralize diffuse sources of data hinders the collection, quality assurance and analysis of data to characterize threats to pipelines as well as to assess the risk posed by the threats on the likelihood of a pipeline's failure and consequences.**

- **Threat Identification** – Given the questions raised about the completeness and correctness of the input data for integrity management, it appears PG&E's program is not identifying all threats, as required by regulation; is not identifying the segments of highest risk and remediating significant anomalies; and hence is not taking programmatic actions to prevent or mitigate threats. As described below, the company is now undertaking additional testing efforts, which the Panel fully supports.

However, the Panel has observed some troubling issues with the company's implementation of its threat identification methodology. For example, while the company identifies individual threats and the assessment of those individual threats includes a weighted accumulation of the risk from those individual threats, the interaction or multiplicative effect of those threats appears not to be given adequate consideration.

Another example, PG&E originally identified the San Bruno segment on Line 132 as seamless pipe (which was not possible given the vintage and diameter of the pipe). As noted below, there should have been a step whereby knowledgeable piping engineers could find and correct this misidentification during the annual internal review process for the integrity management program. But even if the misidentification had been caught, in PG&E's methodology the risk ranking for that segment would not have changed because of the way it ranks risks.

As a practical matter, the portion of Line 132 that failed was installed across a ravine using very short segments ("pups") to deal with fitting up the welds across the terrain. This configuration is highly relevant for considering the riskiness of the segment. Three other threats should have been noted and evaluated: (1) the potential for one or more of the short pup segments (which were likely selected from pre-1950 vintage shop-welded inventory) to lack the quality of the more recently fabricated full-length, factory welded, and tested segments; (2) the potential for soil movement of the ravine fill from subsidence, seismic motion or other effects; and (3) the potential for third-party activity since the segment was in the city streets. Even without precise knowledge of the defective double submerged arc weld, such a combination of threats should have raised concerns about threat interaction and multiplicative increases in risk.