

Winter 2020-21 Southern California Reliability Assessment

BY CALIFORNIA PUBLIC UTILITIES COMMISSION STAFF

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Table of Contents

Executive Summary.....	3
Supply Outlook.....	4
Transmission Pipelines.....	4
Gas Storage Facilities	6
Gas Balance Analysis.....	7
1-in-10 Peak Day Analysis	8
CalGEM Regulations.....	9
Appendix	10

Executive Summary

The Southern California Gas Company (SoCalGas) gas system approaches this winter better prepared than in recent years with Lines 235-2, 3000, and 4000 in service albeit at reduced capacity and its combined storage fields—Honor Rancho, Playa del Rey, La Goleta, and Aliso Canyon—94 percent full on November 1. However, SoCalGas remains unable to meet its 1-in-10 peak day design standard for most of the winter. Therefore, the possibility remains that noncore customers could be curtailed if weather conditions are sufficiently cold. Service to core customers is not at risk under current conditions.

The status of the SoCalGas transmission pipeline system largely remains unchanged from the Summer Reliability Assessment released earlier this year.¹ Both Line 235-2 and Line 4000—key transmission pipelines in SoCalGas’ Northern Zone—are still operating at reduced pressure. In addition, Line 2001 in SoCalGas’ Southern Zone had to be taken out of service in September due to safety-related conditions identified in a preliminary inline inspection report that required immediate remediation. While SoCalGas expects Line 2001 to return to service on October 26, there is some risk that subsequent inline inspection reports may uncover additional safety-related conditions that would require maintenance work on the pipeline during the winter season.

The gas balance analyses in this report use demand assumptions under an average and a cold weather scenario. In both scenarios, storage is filled before the start of the winter and withdrawals are needed to meet customer demand in December, January, and February, leaving 0 percent reserve margin in those months. However, storage becomes more drawn down by the end of the winter under the cold weather scenario. In addition, if a 1-in-10 peak day demand occurs this winter, SoCalGas would not be able to meet the 1-in-10 peak day demand during any month other than November, which would likely lead to the curtailment of noncore customers.

A complicating factor this year is the Covid-19 pandemic, which resulted in more unpredictable hourly gas demand trends when customers transitioned to spending more time at home in March 2020. More people working at home is likely to increase residential natural gas demand this winter, although it is uncertain by how much.² Higher than forecast demand due to the pandemic may result in an increased need to withdraw gas from storage; lower storage inventories may, in turn, create greater risk of curtailments to noncore customers.

Lastly, SoCalGas submitted an extension request to the California Geologic Energy Management Division (CalGEM) on March 23, 2020, for mechanical integrity testing required by recently adopted CalGEM regulations.³ CalGEM sent letters to SoCalGas on September 24 and 30, 2020, indicating that SoCalGas had demonstrated that it can safely operate its wells under an interim conditional

¹ The Summer 2020 Southern California Reliability Assessment and an archive of all prior Assessments can be found here: <https://www.cpuc.ca.gov/alisoassessments/>.

² In the November 12, 2020, webinar “New Era for Natural Gas” EBW Analytics Group analyst Andy Weissman forecasted a 4 percent increase in residential demand this winter due to the pandemic and noted that other analysts are predicting an 8 percent increase.

³ <https://www.conservation.ca.gov/calgem/Documents/GasStorage/Final-Text-of-Regulations-UGS.pdf>

testing schedule. Thus, CPUC staff do not expect any wells to be out of service this winter due to noncompliance issues. However, staff do expect that SoCalGas will conduct well maintenance throughout the winter in order to comply with the new April 1, 2021, deadline. This maintenance will lead to some reductions in withdrawal capacity compared to previous years.

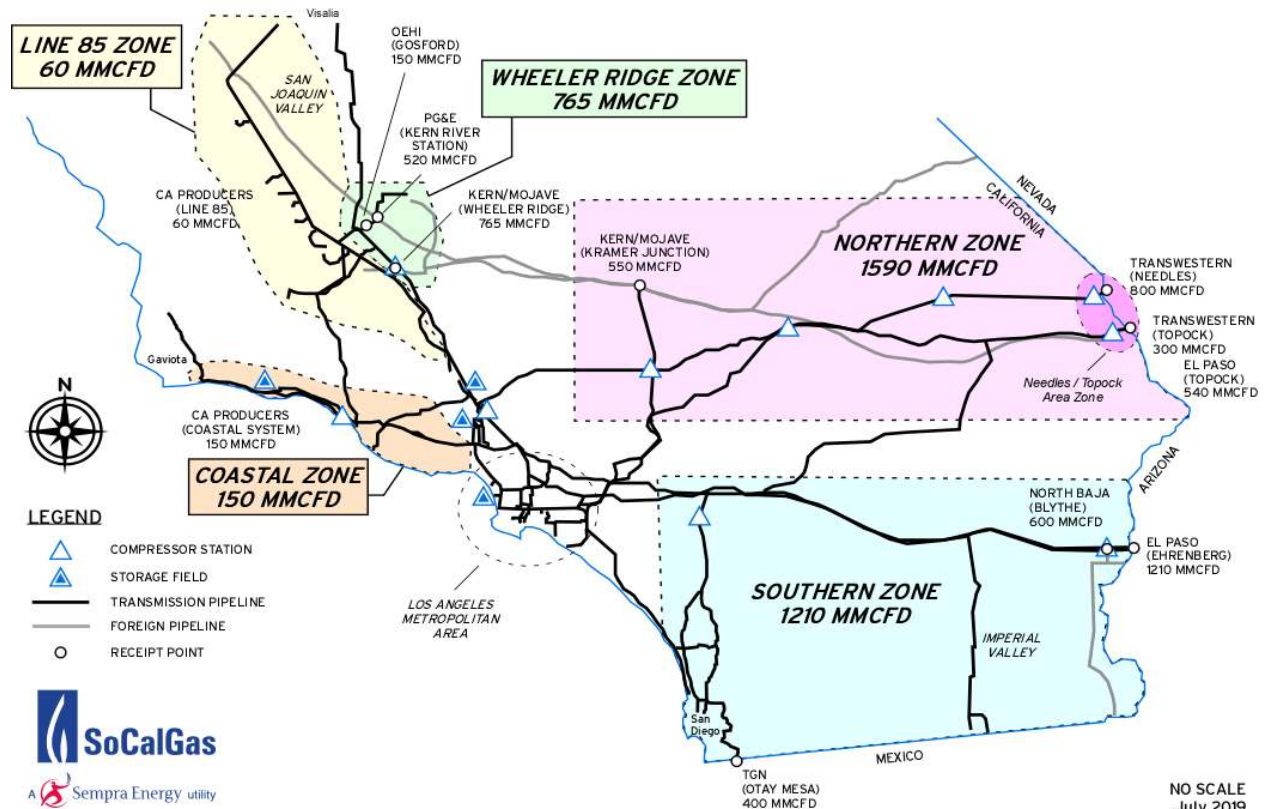
This report is authored by CPUC staff and was shared with staff at the California Energy Commission, the California Independent System Operator, and the Los Angeles Department of Water and Power (Joint Agencies) for review and comment. Should conditions significantly change, the CPUC will issue monthly supplemental reports this winter with input from the Joint Agencies to provide updates and revised gas balance analyses reflecting the new information.

Supply Outlook

Transmission Pipelines

There are three major transmission zones within the SoCalGas system—the Northern Zone, Southern Zone, and Wheeler Ridge Zone. Operational changes within a zone can impact the overall transmission capacity of the system.

Figure 1: Receipt Points and Transmission Zone Firm Capacity⁴



⁴ Zonal capacities shown do not reflect the most recent projected firm Backbone Transmission Service capacity offerings.

In the Northern Zone, Lines 235-2, 3000, and 4000 continue to operate at reduced pressure. Line 235-2—which ruptured in fall 2017 and was out of service for two years—was taken out of service again on June 1, 2020. Preliminary results from the October 2019 inline inspection had identified 31 safety-related conditions requiring immediate remedial work.⁵ Line 235-2 came back into service on August 18, 2020, operating at reduced pressure. This reduced pressure results puts current transmission capacity for the Northern Zone at 990 MMcfd. The gas balance below assumes that Northern Zone capacity remains at 990 MMcfd as there is no current indication that Northern Zone capacity will change during the winter.

In the Southern Zone, SoCalGas has reduced the Ehrenberg receipt point from 1,210 to 980 MMcfd due to a longstanding pressure reduction related to its Pipeline Safety Enhancement Plan (PSEP) and the loss of a right-of-way on Line 2000. The Southern Zone still can accept 1,210 MMcfd if 230 MMcfd is delivered to Otay Mesa and there is sufficient demand within the zone. While some gas is delivered to the Otay Mesa receipt point, historically it has rarely seen deliveries of that size on a consistent basis. In addition to these long-running issues, SoCalGas removed Line 2001 from service on September 22 due to the discovery of 10 safety-related conditions in the preliminary report from a March 2020 inline inspection. Line 2001 returned to service on October 26.⁶ Since further inline inspection reports are expected in the coming weeks, there is some risk that additional maintenance will be required on Line 2001 this winter. However, for the gas balance analyses presented below, staff assume that the Line 2001 outage lasts only through October, reducing Ehrenberg deliveries to 700 MMcfd. For that month, staff assume there are no deliveries through Otay Mesa due to expected mild weather. In November through March, staff assume 980 MMcfd can be delivered through Ehrenberg. Staff assumes 30 MMcfd is delivered through Otay Mesa in November and 50 MMcfd is delivered from December through March.

The Wheeler Ridge Zone can receive up to 810 MMcfd under certain conditions but only 765 MMcfd on a firm basis. This increase to 810 MMcfd is only possible when Line 235-2 is out of service, thus removing downstream competition on the pipelines. Since Line 235-2 is assumed to be in service, the two gas balance cases below assume 765 MMcfd of capacity at Wheeler Ridge.

Lastly, SoCalGas de-rated Line 85, which delivers gas from California natural gas producers, as part of its Pipeline Safety Enhancement Plan.⁷ The de-rating reduced the pipeline’s capacity from 160 to 60 MMcfd. However, the actual impact of this change is roughly 20-30 MMcfd, substantially less than the nominal capacity loss, due to the decline in California gas production.⁸ Prior technical assessments, in any case, assumed no more than 60 MMcfd delivered from California producers

⁵ One of these 31 safety-related conditions was reported in the preliminary inline inspection report received on January 24, 2020, and was remediated in February 2020.

⁶ SoCalGas Envoy maintenance schedule posting:

https://scgenvoy.sempra.com/ebb/attachments/1602114553935_SYSIMPT.pdf

⁷ See SoCalGas Advice Letter 5493-G: <https://www.socalgas.com/regulatory/tariffs/tm2/pdf/5493.pdf>.

⁸ Staff analysis showed that California gas production has declined in recent years. Before Line 85 was de-rated, the highest observed throughput in 2016, 2017, and 2018 was 84 MMcfd, 90 MMcfd, and 83 MMcfd respectively.

owing to observed production and delivery patterns, so this change has no impact on the gas balance analyses.

Gas Storage Facilities

Aliso Canyon’s maximum allowable inventory of 34 billion cubic feet (Bcf)⁹ remains unchanged. Table 1 below compares the amount of gas in storage at the end of September in 2019 and 2020.

Table 1: Total SoCalGas Storage Inventory

Bcf	Sept. 30, 2019	Sept. 30, 2020
Non-Aliso	39.8	45.5
Aliso Canyon	33.6	33.5
Total	73.4	79.0 ¹⁰

The difference in total storage inventories shown can be attributed to different injection patterns during the two years. In the summer of 2019, there were no significant weather events that drew down storage inventory. However, under the rules in place at that time,¹¹ when injection capacity fell below 345 MMcfd—as it does when Aliso Canyon is full—all of the injection capacity was allocated to the balancing function during the prime trading cycle (Cycle 1). Once Aliso Canyon was filled on June 19, 2019, customers with firm injection rights were unable to inject gas into storage on Cycle 1 (represented by the blue line in Figure 2 below). Based on its analysis, CPUC staff conclude that this made it more difficult for customers to inject gas into storage.

New balancing rules went into effect on May 1, 2020, pursuant to the Triennial Cost Allocation Proceeding decision, (D.) 20-02-045. Under the new rules, the injection capacity allocated to core customers and the balancing function is prorated daily based on available capacity.¹² As shown by the orange line in Figure 2, under the new rules, injections by customers with firm injection rights continued even after Aliso Canyon filled on July 9, 2020, which helped compensate for storage withdrawals due to hot weather. California and the western United States, including Southern California, experienced record-setting heatwaves in summer 2020, which resulted in rolling blackouts across several regions. SoCalGas withdrew gas from its four storage fields for several days in response to the increased demand on the system. Despite these heatwaves, total storage capacity reached 94 percent full by September 30, 2020.

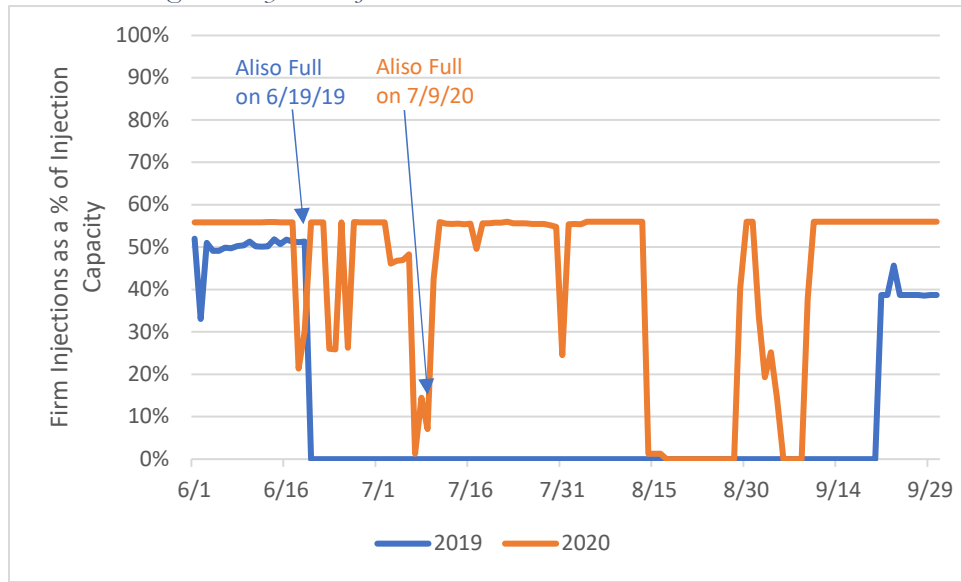
⁹ SB 380 added Section 715 to the California Public Utilities Code, which requires the CPUC to determine “the range of working gas necessary [in Aliso Canyon] to ensure safety and reliability for the region and just and reasonable rates in California. On July 2, 2018, the CPUC directed SoCalGas to maintain up to 34 Bcf of inventory due to “unprecedented level of outages on the SoCalGas system,” among other reasons. An archive of the CPUC’s 715 Reports can be found here: <http://www.cpuc.ca.gov/General.aspx?id=6442457392>. The CPUC has issued a Proposed Decision in I.17-02-002 to maintain the interim Aliso Canyon storage capacity between zero to 34 Bcf. Phase 2 of I.17-02-002, which will conclude in 2021, will provide additional relevant analysis and include reconsideration of the maximum allowable inventory at Aliso Canyon.

¹⁰ SoCalGas reported a similar inventory as of November 1.

¹¹ SoCalGas Rule 41: <https://www.socalgas.com/regulatory/tariffs/tm2/pdf/41.pdf>

¹²The most recent TCAP decision, D.20-02-045, was approved on February 28, 2020: <http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=328289863>

Figure 2: Cycle 1 Injection Patterns in Summer 2019 and 2020



Data Source: Envoy

Gas Balance Analysis

Gas demand figures for the winter are taken from the forecasts in the *2020 California Gas Report*, which were updated after the outbreak of the Covid-19 pandemic.¹³ Despite these updates, the pandemic could shift demand in unexpected ways and lead to more unpredictable demand. Staff prepared gas balances in order to provide an assessment independent of SoCalGas' own assessment.¹⁴ A gas balance is not a projection of future occurrences. Rather, it is a tool that demonstrates what may happen if the demand, supply, and storage assumptions shown come to fruition. A gas balance identifies the daily difference, or margin, between capacity (or supply) and demand to determine in general whether capacity is enough to meet demand. It also simulates the impact to month-end storage inventory levels from average daily storage injections and withdrawals. A gas balance does not simulate operations hydraulically to determine constraints or assess hourly operations.

It is important to recognize that the demand forecasts are for average daily consumption for each month under average and 1-in-35 cold weather/dry hydro weather scenarios.¹⁵ There will be days in the winter that will have higher or lower demand than the averages shown.

¹³ The *2020 California Gas Report* and its supporting workpapers can be found at:

<https://www.socalgas.com/regulatory/cgr.shtml>.

¹⁴ The Gas Balance framework in use for the purposes of this report was initially developed by Aspen Environmental for the California Energy Commission. This analysis tool has been used in several prior assessments, including those by the Joint Agencies as well as CPUC.

¹⁵ A 1-in-35 cold weather/dry hydro year is different from a 1-in-35 extreme peak day. Under the 1-in-35 extreme peak day design standard set by the CPUC, all noncore can be curtailed. See D.02-11-073 and D.06-09-039 for the establishment of reliability standards.

The first gas balance scenario presented in the appendix below, Scenario A, assumes weather is normal and that Line 2001 is out of service in October; all other lines are assumed to be in service from November through March. Storage inventory fills before the start of the winter season. Scenario A meets demand in all months and maintains an 18 percent reserve margin in March but does not maintain a 15 percent reserve margin during the other months. Storage withdrawals are needed to meet customer demand on average weather days in December, January, and February.¹⁶ Month-end inventories, however, are high enough to allow greater withdrawals than assumed, thus preserving a reserve margin not shown in the balance.

The second gas balance scenario presented in the appendix below, Scenario B, evaluates gas demand under a 1-in-35 cold weather/dry hydro weather forecast. The pipeline supply and storage assumptions are the same as Scenario A. Scenario B meets demand in all months but does not maintain a 15 percent reserve margin for any of the winter months. Storage withdrawals are needed to meet average customer demand in December, January, and February.¹⁷ Some months could allow higher withdrawals than shown, implying a non-zero reserve margin, but not nearly so much as in Scenario A.

1-in-10 Peak Day Analysis

In addition to the gas balances, which show the impact of average daily demand for normal and cold winter scenarios, staff performed a 1-in-10 peak day analysis for each month of the winter. Table 2 examines a peak day under Scenario A, which depicts a normal weather winter. The demand figures in Column (a) were provided to the CPUC through a data request and represent a peak day in each month. Column (b) in Table 2 shows the pipeline capacity assumed in Scenario A. In Column (c) a declining combined withdrawal capacity from all four fields is used in the storage fields based on the month-end inventory for each month, including staff estimates for the maintenance-related reductions, which are discussed in the next section. The shortfalls displayed in column (e) represent the curtailments that would be required if a peak day occurs. Even in a normal winter, the SoCalGas system could not support 1-in-10 peak demand in any month other than November without resorting to curtailments. Moreover, the volume of gas demand on the system tends to rapidly increase as users turn on their gas-fired furnaces for home heating in the morning and evening. Staff remains concerned about the risk of meeting demand in peak hours in this case. The analyses in Table 2 does not model or capture these hourly peaks.

¹⁶ Withdrawals from Aliso Canyon may occur if any of the four conditions of the Withdrawal Protocol are triggered: https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2019/UpdatedWithdrawalProtocol_2019-07-23%20-%20v2.pdf

¹⁷ See footnote 14.

Table 2: Ability to Meet 1-in-10 Analysis

	(a) 1-in-10 Peak Day Demand	(b) Total Pipeline Capacity	(c) Estimated Total System Withdrawal Capacity ¹⁸	(d) Total System Capacity (d=b+c)	(e) Surplus/ Shortfall (e=d-a)
November	4,178	2,825	1,472	4,297	119
December	4,983	2,845	1,285	4,130	(853)
January	4,943	2,845	1,116	3,961	(982)
February	4,563	2,845	1,120	3,965	(598)
March	4,153	2,845	1,120	3,965	(188)

CalGEM Regulations

In the aftermath of the October 2015 Aliso Canyon gas leak, CalGEM¹⁹ developed more stringent regulations for California’s natural gas storage fields that went into effect October 1, 2018. These regulations, among other things, require that all gas storage wells be converted to tubing-only flow within seven years and that storage providers conduct mechanical integrity and pressure testing on each well every 24 months unless a different testing schedule is proposed by the storage provider in its Risk Management Plan and approved by CalGEM. The first 24 month-period ended on October 1, 2020.

While SoCalGas has submitted a Risk Management Plan, it has not yet been approved. SoCalGas has converted all its wells to tubing-only flow and completed the initial round of testing. It has not completed the second round of testing that was required to be finished by October 1, 2020. SoCalGas submitted a temporary stay of enforcement request to CalGEM on March 23, 2020, citing concerns related to the Covid-19 pandemic and its impact on SoCalGas’ efforts to complete the reassessments in a timely manner. CalGEM concluded that SoCalGas demonstrated that each of its wells can be safely operated during an interim conditional testing schedule. Thus, staff do not anticipate that any wells will be unavailable due to noncompliance with CalGEM regulations. However, staff do expect that SoCalGas will conduct well maintenance throughout the winter in order to comply with the new April 1, 2021 deadline. This ongoing maintenance will lead to some reductions in injection and withdrawal capacity compared to previous years.

¹⁸ Including withdrawals from Aliso Canyon. Confidential withdrawal curves provided by SoCalGas via data request.

¹⁹ Formerly known as the Department of Oil, Gas and Geothermal Resources or DOGGR.

Appendix

SoCalGas Monthly Gas Balance						
<i>Scenario A</i>						
SoCalGas Monthly Gas Balance NORMAL WEATHER						
California Gas Report 2020 Demand (MMcfd)	Oct	Nov	Dec	Jan	Feb	March
Core	701	1,030	1,459	1,383	1,362	1,098
Noncore including EG	1,194	1,138	1,202	1,066	1,071	937
Wholesale & International	346	394	483	415	432	337
Co. Use and LUAF	29	33	40	37	37	30
Subtotal Demand	2,270	2,595	3,184	2,901	2,902	2,402
Storage Injection (Non-Aliso Fields)	165	0	0	0	0	0
Storage Injection (Aliso)	0	0	0	0	0	0
Storage Injection Total	165	0	0	0	0	0
System Total Throughput	2,435	2,595	3,184	2,901	2,902	2,402
Supply (MMcfd)						
California Line 85 Zone	60	60	60	60	60	60
Wheeler Ridge Zone	765	765	765	765	765	765
Blythe (Ehrenberg) into Southern Zone	700	980	980	980	980	980
Otay Mesa into Southern Zone	0	30	50	50	50	50
Kramer Junction into Northern Zone	550	550	550	550	550	550
North Needles into Northern Zone	200	200	200	200	200	200
Topock into Northern Zone	240	240	240	240	240	240
Sub Total Pipeline Receipts	2,515	2,825	2,845	2,845	2,845	2,845
Storage Withdrawal (Non-Aliso Fields)	0	0	239	56	57	0
Storage Withdrawal (Aliso)	0	0	100	0	0	0
Total Supply	2,515	2,825	3,184	2,901	2,902	2,845
DELIVERABILITY BALANCE (MMcfd)	80	230	0	0	0	443
Reserve Margin	3%	9%	0%	0%	0%	18%
Non-Aliso Month-End Storage Inventory (Bcf)	45.5	50	50	43	42	40
Aliso Month-End Storage Inventory (Bcf)	33.5	34	34	31	31	31
Total Storage Inventory	79.0	84	84	74	72	70

SoCalGas Monthly Gas Balance						
<i>Scenario B</i>						
SoCalGas Monthly Gas Balance COLD WEATHER						
California Gas Report 2020 Demand (MMcfd)	Oct	Nov	Dec	Jan	Feb	March
Core	721	1,111	1,625	1,536	1,511	1,195
Noncore including EG	1,194	1,139	1,205	1,087	1,098	954
Wholesale & International	349	409	513	454	462	361
Co. Use and LUAF	29	34	43	39	39	32
Subtotal Demand	2,293	2,693	3,386	3,116	3,110	2,542
Storage Injection (Non-Aliso Fields)	165	0	0	0	0	0
Storage Injection (Aliso)	0	0	0	0	0	0
Storage Injection Total	165	0	0	0	0	0
System Total Throughput	2,458	2,693	3,386	3,116	3,110	2,542
Supply (MMcfd)						
California Line 85 Zone	60	60	60	60	60	60
Wheeler Ridge Zone	765	765	765	765	765	765
Blythe (Ehrenberg) into Southern Zone	700	980	980	980	980	980
Otay Mesa into Southern Zone	0	30	50	50	50	50
Kramer Junction into Northern Zone	550	550	550	550	550	550
North Needles into Northern Zone	200	200	200	200	200	200
Topock into Northern Zone	240	240	240	240	240	240
Sub Total Pipeline Receipts	2,515	2,825	2,845	2,845	2,845	2,845
Storage Withdrawal (Non-Aliso Fields)	0	0	250	171	165	0
Storage Withdrawal (Aliso)	0	0	291	100	100	0
Total Supply	2,515	2,825	3,386	3,116	3,110	2,845
DELIVERABILITY BALANCE (MMcfd)	57	132	0	0	0	303
Reserve Margin	2%	5%	0%	0%	0%	12%
Non-Aliso Month-End Storage Inventory (Bcf)	45.5	50	50	43	38	33
Aliso Month-End Storage Inventory (Bcf)	33.5	34	34	25	22	19
Total Storage Inventory	79.0	84	84	68	59	51