Summer 2020 Southern California Reliability Assessment

BY CALIFORNIA PUBLIC UTILITIES COMMISSION STAFF

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Table of Contents

Executive Summary

The Southern California Gas Company (SoCalGas) gas system approaches summer in better condition than at the same time last year, with more gas in storage and an additional gas transmission line in service. On March 31, 2020, SoCalGas' four storage fields—Aliso Canyon, Honor Rancho, Playa del Rey, and La Goleta—were approximately 61 percent full when taken together, and its combined non-Aliso fields approximately 67 percent full. In contrast, on March 31, 2019, total SoCalGas storage inventory was approximately 45 percent full, while the combined non-Aliso fields were approximately 36 percent full. SoCalGas was able to draw down the four fields in a more balanced way in 2020 compared to 2019 due to an additional gas transmission line in service and to the California Public Utility Commission's (CPUC) July 23, 2019 revisions to the Aliso Canyon Withdrawal Protocol (Withdrawal Protocol).[1] This change, which was made due to energy reliability challenges and price spikes in Southern California in 2018 and 2019, provided SoCalGas with more flexibility to balance the system by removing Aliso Canyon's classification as "an asset of last resort" while still maintaining limitations on its use.

The status of the SoCalGas transmission pipeline system also improved due to the return of Line 235-2, which had been out of service since October 2017.[2] As of this writing, both Line 235-2 and Line 4000—key transmission pipelines in SoCalGas' Northern Zone—are operating at reduced pressure. SoCalGas' 2019-20 Winter Technical Assessment indicated that the utility might increase the pressure on Line 4000 in February 2020.[3] However, as of this writing, the Northern Zone continues to operate at 990 million cubic feet per day (MMcfd).[4] SoCalGas released its 2020 Summer Technical Assessment on April 1, which indicates a possible increase of 250 MMcfd to Northern Zone capacity in its best-case scenario.[5]

The gas balance analyses in this Summer Reliability Assessment present three possible scenarios ranging from best-case to worst-case assumptions. In the best-case scenario, staff assumes that there is an increase in Northern Zone capacity by May 1. Under this scenario, the non-Aliso fields reach their maximum capacity by the end of July, and Aliso Canyon reaches its maximum allowable inventory by the end of August. In the base-case scenario, staff assumes that there is no additional increase in capacity in the Northern Zone. Under this scenario, all the non-Aliso fields reach their maximum capacities by the end of September, and Aliso Canyon reaches its maximum allowable inventory by the end of October, in preparation for the winter months. In the worst-case scenario, staff considers the possibility that both Lines 235-2 and 4000, which were taken out of service for

[1] Aliso Canyon Withdrawal Protocol: https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2019/UpdatedWithdrawalProtocol_2019-07-23%20-%20v2.pdf

[2] Line 235-2 ruptured on October 1, 2017 and remained out of service until October 15, 2019, when it was returned to service at reduced pressure. From October 24 to November 1, 2019, the line was taken out of service for an inline inspection, after which it returned to service at reduced pressure.

[3] SoCalGas 2019-20 Winter Technical Assessment: https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2019/SOCALGAS%20WINTER%202019-20%20TECHNICAL%20ASSESSMENT.pdf

[4] The nominal capacity of the Northern Zone is 1,590 MMcfd.

[5] SoCalGas 2020 Summer Technical Assessment: https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2020/SoCalGas%20Summer%202020%20Technical%20Assessment.pdf

safety-related remediation work in the past, are required to undergo further remediation work. Under this scenario, none of the four storage fields reach their maximum capacity or maximum allowable inventory.

In addition to the gas balance analyses, staff undertook an analysis of a peak demand summer day under the base and worst-case scenarios. Our findings show that non-Aliso withdrawals would be sufficient to meet demand under both scenarios at the daily level. Staff did not perform hydraulic modeling to examine whether hourly demand could also be met using only the non-Aliso fields. Depending on hourly demand and gas deliveries on a peak day, Condition 1 of the Withdrawal Protocol could be triggered, and Aliso Canyon might be used.

Staff's findings are generally optimistic due to a combination of relatively healthy storage inventory levels, the revised Withdrawal Protocol, the return of a critical transmission pipeline, the potential to further increase pipeline capacity, and a recent CPUC decision that provides core customers with more reliable access to storage injection capacity during the summer months. The February 28, 2020, decision, in Sempra's Triennial Cost Allocation Proceeding (TCAP)[6] increased core customers' injection allocation for the summer months and replaced the Rule 30 provision that previously gave load balancing a higher priority than core customers when injection capacity was limited. These changes should help boost core customers' ability to inject gas into storage during the summer.

It is important to note that early indications show that the COVID-19 pandemic has resulted in more unpredictable hourly gas demand trends. This increase is likely attributable to customers transitioning to spending more time in their homes. Looking forward, gas demand projections may not be as accurate and maintenance schedules may change as a result of the COVID-19 pandemic. Furthermore, potential demand forecasting errors may result in an increased need to withdraw gas from storage.

This report is authored by CPUC staff and was shared with staff at the California Energy Commission, 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 summer with input from the Joint Agencies to provide updates and revised gas balance analyses reflecting any new information.

Winter Lookback 2019-20

Staff analyzed the events of winter 2019-20 (the winter) to provide a brief overview of SoCalGas system conditions and customer demand leading up to the summer season.[7] As shown in this section, while this past winter and winter 2018-19 had varying periods of warm and cold weather, the defining differences between the two years were the lack of a sustained cold weather event, non-Aliso storage inventory levels, and gas prices.

[6] D.20-02-045: http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=328289863

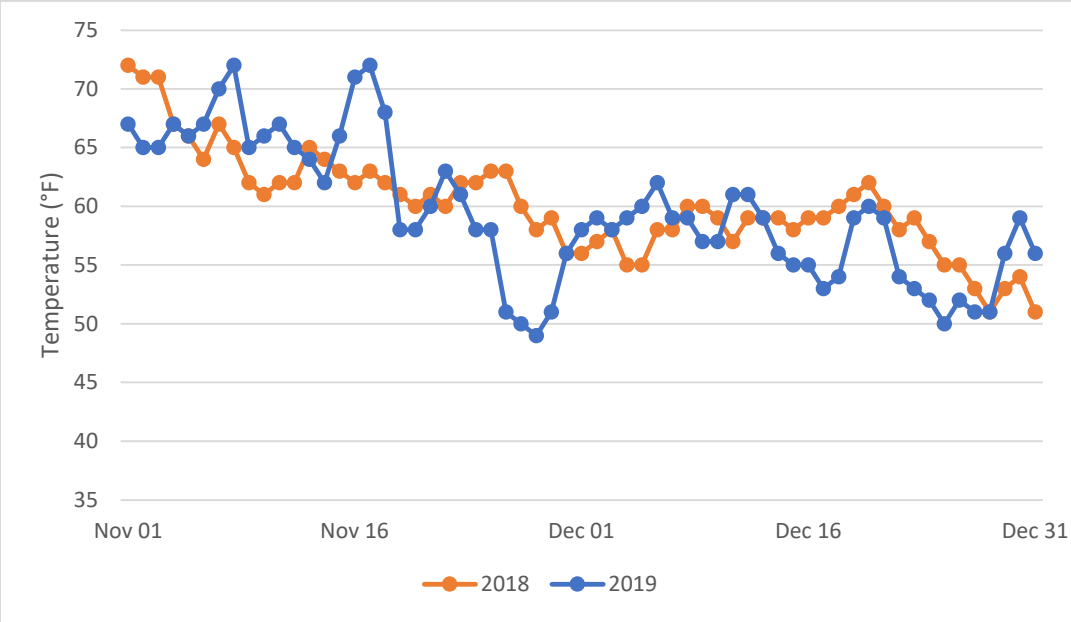
[7] CPUC staff will provide a more comprehensive review of the winter in the forthcoming Winter 2019-20 SoCalGas Conditions and Operations Report.

Figures 1 and 2 plot composite weighted average temperature.[8] Figure 3 plots storage inventory in the Honor Rancho, Playa del Rey, and La Goleta gas storage fields (non-Aliso fields), as well as the total underground storage inventory, including Aliso Canyon. Figure 4 compares SoCal Citygate gas prices from this past winter to the prior winter 2018-19 season. Figure 5 plots total gas delivery (sendout) each winter season.

The graphs below contrast four elements of winters 2018-19 and 2019-20: weather, storage levels, prices, and unexpected events: the February-March sustained cold snap in 2019 and the COVID-19 pandemic in 2020.

First, winter 2019-20 started off colder than winter 2018-19, became warmer throughout February, then ended colder than winter 2018-19 in March. The composite weighted average temperature in the SoCalGas territory from November to December 2019 was colder than November to December 2018 (which was notably warm) 63 percent of the time.[9] As seen in Figure 1, during the Thanksgiving weekend of November 27-30, a cold front moved in and brought the composite weighted average temperature down to 49°F on November 28. Weather conditions in December 2019 were cool, with a mean composite weighted average temperature of 57°F. January to February 2020 was warmer than the same 2019 time period almost 70 percent of the time. However, as seen in Figure 2, a cold front moved into SoCalGas' territory on March 12. The cooler temperatures persisted through the remainder of March.

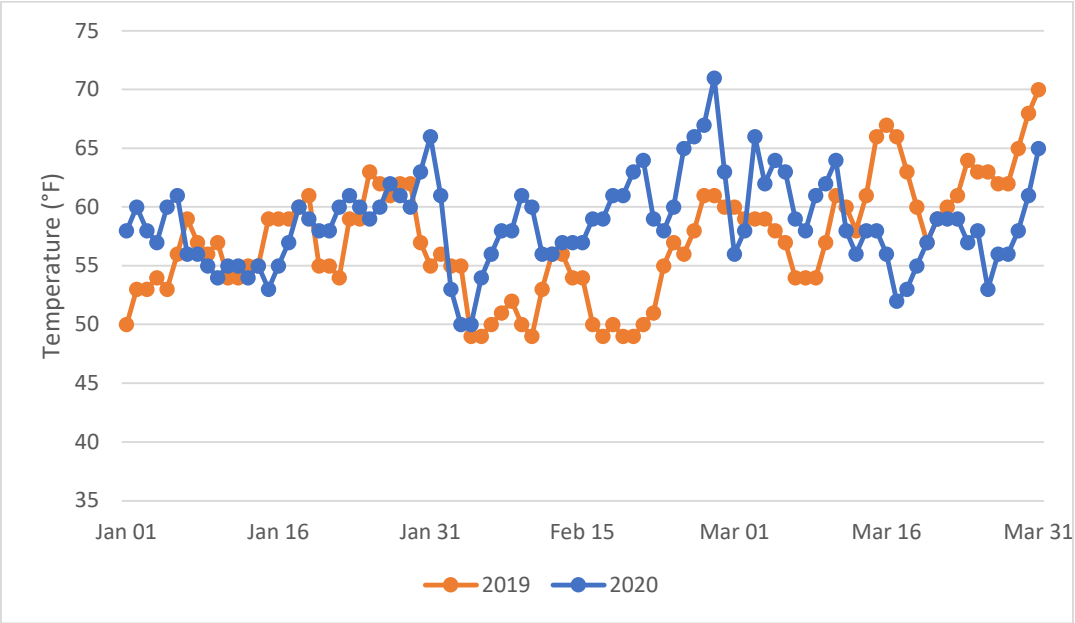
Figure 1: November-December 2018 and 2019 Composite Weighted Average Temperatures



[8] Composite weighted average temperature can be found on SoCalGas' Envoy. The calculation first takes the average daily temperature of several locations in the territory, then averages those into one number.

[9] For further analysis of winter 2018-19, refer to *Winter 2018-19 SoCalGas Conditions and Operations Report*: https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/News_Room/News_and_Updates/Winter2018-19LookbackReport-Final-January2020.pdf

Figure 2: January-March 2019 and 2020 Composite Weighted Average Temperatures

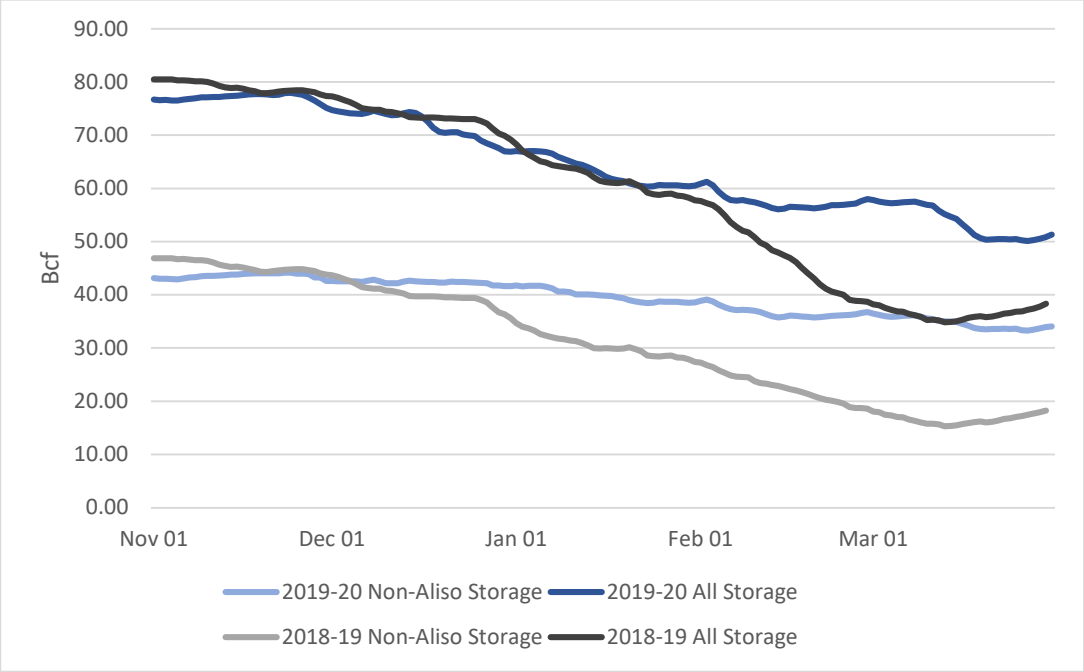


Second, a healthy amount of storage inventory remained in the non-Aliso fields at the end of March 2020, in sharp contrast to the end of March 2019. Figure 3 shows that although winter 2018-19 began with total storage inventory approximately 95 percent full on November 1, 2018, prolonged use of storage during the latter half of winter caused storage inventory to drop to 42 percent full by mid-March 2019. In contrast, storage inventory was 61 percent full by the end of March 2020. Furthermore, the non-Aliso fields experienced significant decline in winter 2018-19 (the grey line) compared to winter 2019-20 (the light blue line). From November 1, 2018, to March 31, 2019, the non-Aliso fields declined from approximately 93 percent full to 36 percent full. During the same period in 2019-20, the non-Aliso fields declined from approximately 86 percent full to 68 percent full.

An important reason why the non-Aliso fields contained more inventory this past winter is the revised Withdrawal Protocol, which no longer classifies Aliso Canyon as "an asset of last resort." SoCalGas was able to use Aliso Canyon if any of four conditions in the revised Withdrawal Protocol were met in order to reduce system stress, preserve the inventory levels of the non-Aliso fields, and tame the price spikes that can occur as a result of limited gas supply and high customer demand.[10] Balancing withdrawals from the four fields is important because it enables the utility to preserve a higher level of combined withdrawal capacity than it can if some fields are severely depleted and others nearly full. It is important to preserve the inventory levels of the non-Aliso fields to ensure higher total withdrawal rates, particularly at Honor Rancho and Playa del Rey, which are geographically closer to the Los Angeles basin than La Goleta.

[10] Refer to Footnote 1 for a link to the revised Withdrawal Protocol. The four independent conditions under which gas may be withdrawn from Aliso Canyon are listed in in the revised Withdrawal Protocol.

Figure 3: November 2018–March 2019 and November 2019–March 2020 Storage Inventory Comparison

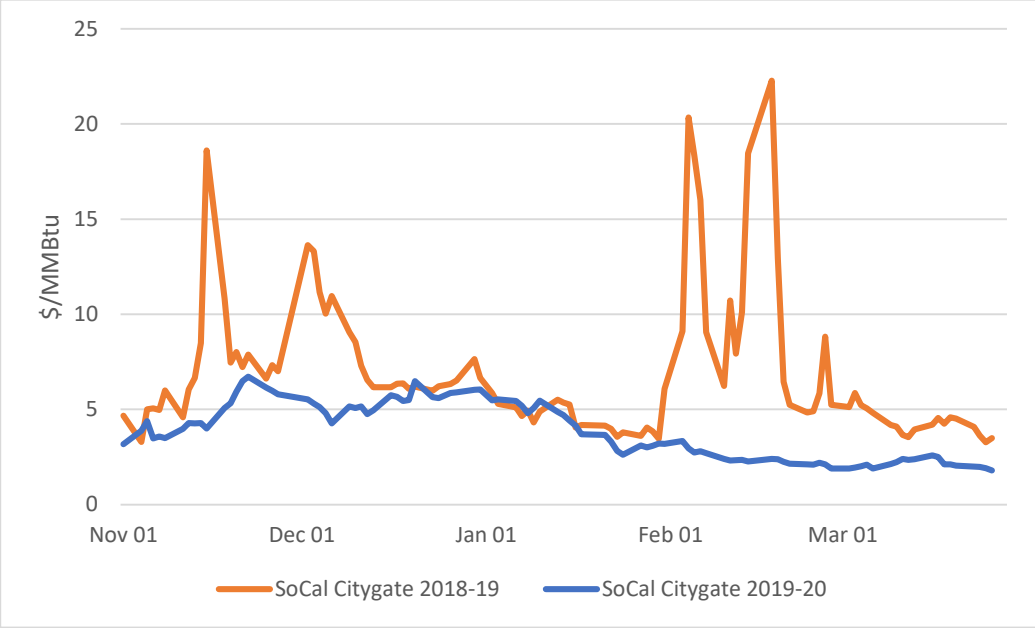


Third, SoCal Citygate gas prices did not exhibit volatile behavior during extreme weather or tight system conditions, as was seen in the previous winter. As mentioned above, this can partially be attributed to the revised Withdrawal Protocol, which no longer classifies Aliso Canyon as "an asset of last resort." Under Condition 1 of the revised Withdrawal Protocol, Aliso Canyon's inventory can be used if preliminary calculations indicate a Stage 2 or higher low operational flow order (OFO). Low operational flow orders are called when there is insufficient gas on the system, and they mandate increasingly severe financial penalties for customers who do not match their gas deliveries with their gas burn. Under the revised Withdrawal Protocol, higher stage OFOs were avoided, which in turn led to more price stability in both the gas and electric markets. On March 3, 2020, S&P Global's *Gas Daily* stated, "Lower price volatility this season is largely attributable to policy changes at the California Public Utilities Commission and accompanying operational changes at SoCalGas that have helped to ensure supply deliverability on the coldest winter days."[11] In other words, the revised Withdrawal Protocol, along with other factors such as the return of Line 235-2, has assuaged concerns of tight gas supply on the system, which then led to lower price volatility. It is also true that fewer unplanned outages occurred during the period, which previous analysis had shown to be a key contributor to price spikes.[12]

[11] "Gas Daily." S&P Global Platts. (March 3, 2020)

[12] Final 2019 Integrated Energy Policy Report. California Energy Commission. Page 176 TN# 231883. The report can be found here: https://efiling.energy.ca.gov/GetDocument.aspx?tn=231883

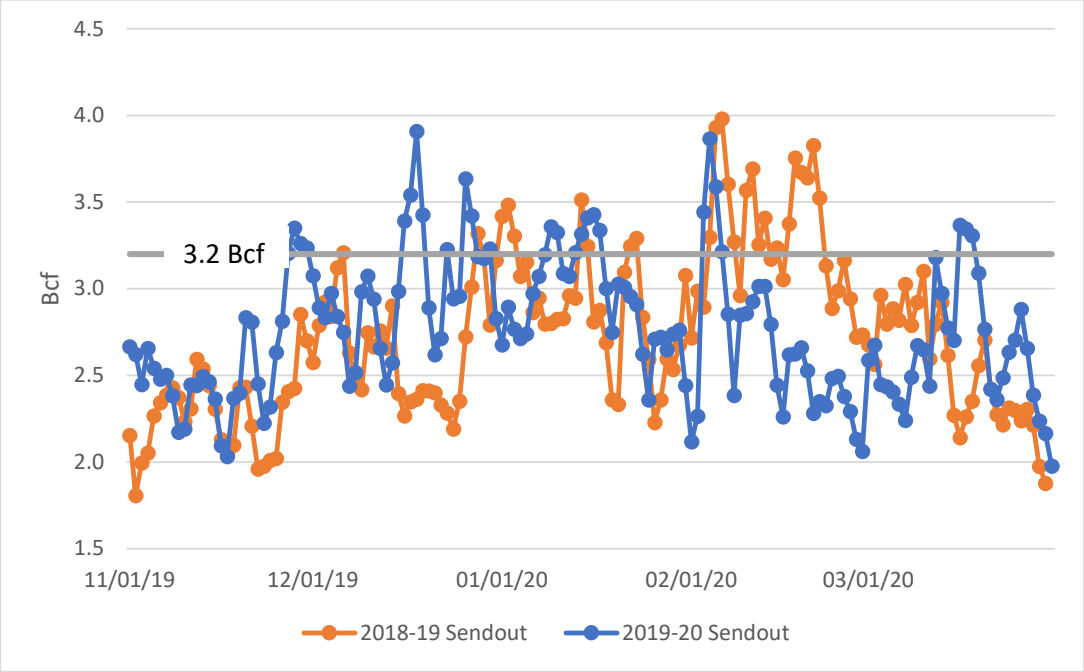
Figure 4: November 2018–March 2019 and November 2019–March 2020 SoCal Citygate Prices



Fourth, there was a sustained cold snap in February–March 2019 that heavily drew down storage inventory; there was no similar cold weather event this winter. As seen in Figure 5, in winter 2019-20, there were several high demand days from November to January, followed by a comparatively mild February and then a cold snap in March. Sendout exceeded 3.2 Bcf on 25 days from November 1, 2018, to March 31, 2019, compared to 26 days from November to March 2020.[13] However, in winter 2018-19, 23 out of the 25 days occurred from January to March. In contrast, sendout exceed 3.2 Bcf on 12 days from November to December 2019 and on 14 days from January to March 2020.

[13] Demand of 3.2 Bcf or more has been identified as challenging conditions for the SoCalGas system since the Aliso Canyon leak.

Figure 5: November 2019-March 2020 Daily Gas Sendout



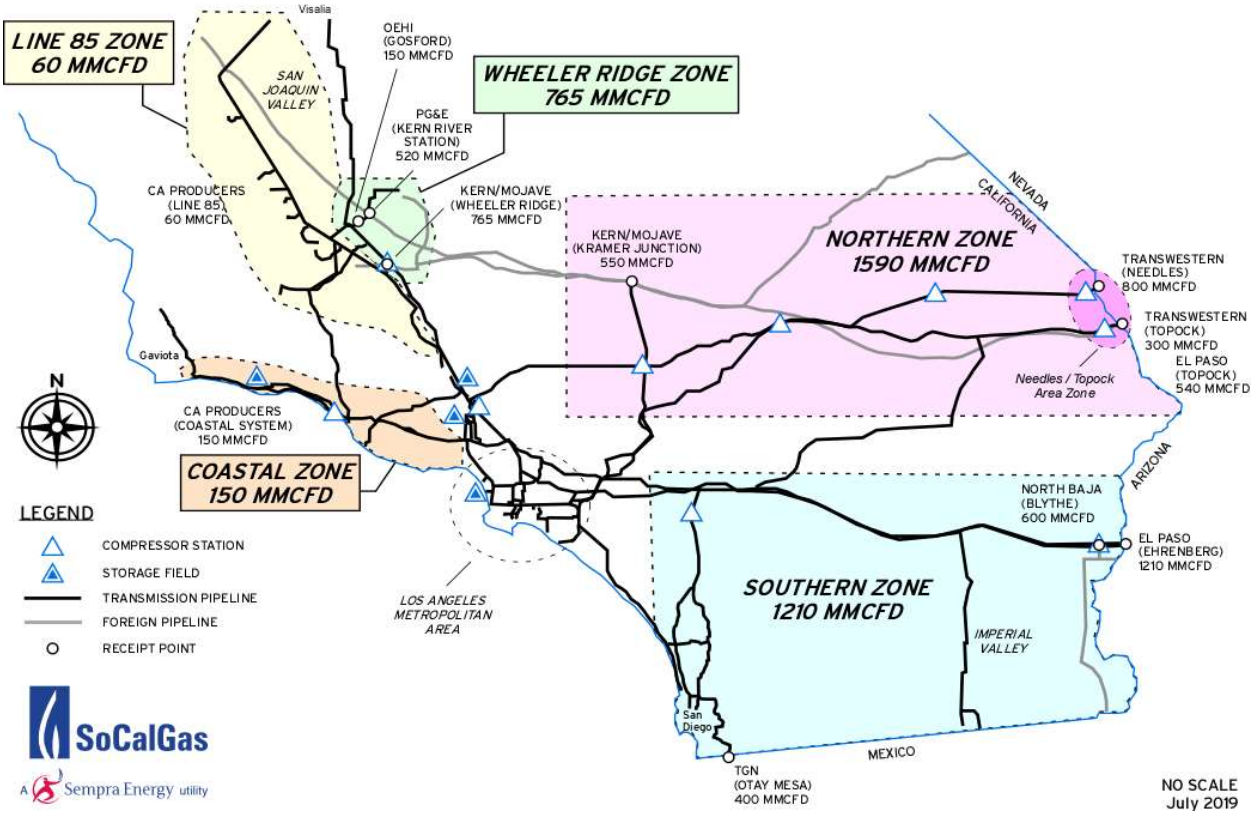
While winter 2019-20 didn't see a sustained late-season cold snap, it did end with an even more unprecedented event: the COVID-19 pandemic. California residents began sheltering at home due to the pandemic just as a cold snap rolled into Southern California in the middle of March. The composite weighted average temperature on March 11 was 64°F, followed by a drop to 58°F on March 12. SoCalGas' March 12 Cycle 1 forecasted receipts were approximately 2,267 MMcf, and forecasted sendout was approximately 2,520 MMcf. However, total sendout that day rose unexpectedly to 3,181 MMcf. This prompted SoCalGas to withdraw gas from Aliso Canyon on an emergency basis, using Withdrawal Protocol Condition 4 for the first time. There were several factors that contributed to this usage, including unusually high hourly sendout throughout the morning and afternoon caused by more people staying in their homes, increased natural gas-fired electric generation, and cold, stormy weather conditions.

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 6: Receipt Points and Transmission Zone Firm Capacity[14]



In the Northern Zone, Line 235-2 and Line 4000 returned to service in October 2019, which boosted the overall capacity of the SoCalGas transmission system.[15] Both pipelines are currently operating at reduced pressure, and the current transmission capacity of the Northern Zone is 990 MMcfd. The best-case scenario evaluated below assumes that Northern Zone capacity is increased to 1,250 MMcfd in May 2020.

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 Southern Zone to burn that much gas. 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 the three gas balance analyses presented below, staff assumes that 670 MMcfd is delivered to Blythe from April through June based on available capacity from summer 2019. That assumption is increased to 980 MMcfd from July through December to include interruptible supply that may be available during high

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

[15] Line 235-2 had been out of service since it ruptured on October 1, 2017. Line 4000 was out of service in September and October for inline inspection and validation work.

demand periods.[16] In addition, staff assumes that 30 MMcfd is delivered to Otay Mesa during the summer months and 50 MMcfd is delivered during the forecasted high-demand months of November and December.

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. With Line 235-2 in service, less gas can be delivered from Wheeler Ridge. The optimistic and base cases below assume 765 MMcfd of capacity at Wheeler Ridge Zone. The worst-case scenario below assumes both Line 235-2 and 4000 are out of service, thereby allowing 810 MMcfd of capacity in the Wheeler Ridge Zone.

The gas balance scenarios also reflect the capacities posted in SoCalGas' upcoming Backbone Transmission System (BTS) Open Season. During the BTS Open Season, market participants can bid on firm transmission rights on the SoCalGas system.[17] Newly executed BTS contracts will go into effect on October 1, 2020. The overall capacity offering is lower than that of the 2017 BTS Open Season because of maintenance- and demand-related reductions.

The Northern Zone capacity offering is 990 MMcfd, which is consistent with the current available capacity. However, if the capacity increases to 1,250 MMcfd, any additional firm capacity will be made available for purchase. The capacity offering in the Southern Zone is 750 MMcfd, which is lower than the 980 MMcfd of pipeline capacity available. However, SoCalGas has chosen to release a lower amount of firm BTS capacity due to limited demand within the zone. Since there is no storage on the Southern System and only a limited amount of gas can be sent west toward Los Angeles from the Southern System, the SoCalGas System Operator cannot accept much more gas than is burned regionally and still stay below the maximum allowable pipeline pressure. Thus, SoCalGas is only selling BTS rights that correspond with the amount of firm capacity it expects to be able to serve year-round. Nevertheless, interruptible capacity in the Southern Zone will be available during high demand periods.

Lastly, SoCalGas de-rated Line 85 as part of its Pipeline Safety Enhancement Plan.[18] Line 85 serves California natural gas producers, and with de-rating, the pipeline's capacity is reduced from 160 MMcfd to 60 MMcfd. However, the actual impact of this change is roughly 20 MMcfd, substantially less than the nominal capacity loss, due to the decline in California gas production. Due to the PSEP-related de-rating, SoCalGas has limited the total capacity provided by California production in the 2020 BTS Open Season.

[16] SoCalGas has a planned hydrotest on Line 2001 in April and June, which should not impact the 670 MMcfd capacity deliverability at Blythe. SoCalGas Envoy Maintenance Outlook: https://scgenvoy.sempra.com/#nav=/Public/ViewExternalSystemMaintenance.getMaintenanceLedger%3Frand%3D402.

[17] For more information on the BTS Open Season, see: https://www.socalgas.com/for-your-business/energy-market-services/backbone-transportation.

[18] See SoCalGas Advice Letter 5493-G: https://www.socalgas.com/regulatory/tariffs/tm2/pdf/5493.pdf.

Gas Storage Facilities

Aliso Canyon's maximum allowable inventory of 34 Bcf remains unchanged.[19] The table below compares the amount of gas in storage on March 31, 2020, compared to March 31, 2019.

Table 1: Total Storage Inventory

Bcf	March 31, 2019	March 31, 2020
Non-Aliso	18.2	34
Aliso Canyon	20.1	17.3
Total	38.3	51.3

As shown in Table 1, the combined non-Aliso inventory was markedly low prior to the start of the 2019 summer season, which can be attributable to two factors. The non-Aliso fields were severely depleted throughout winter 2018-19 because Aliso Canyon could only be used as an asset of last resort; thus all but emergency withdrawals had to come from the other three fields. The February–March 2019 cold snap then exacerbated the already low levels of storage in the non-Aliso fields. The combination of the pipeline outages and depletion of the non-Aliso fields in winter 2018-19 made it difficult for SoCalGas to build inventory during summer 2019 in preparation for winter 2019-20.

In contrast, the non-Aliso fields enter summer 2020 with relatively healthy inventory levels, which can be partially attributed to the revised Withdrawal Protocol, since it allows for more balanced storage withdrawals. Furthermore, as discussed below in the "CPUC Actions and Updates" section of this report, the CPUC issued the Triennial Cost Allocation Proceeding decision, D.20-02-045, on February 28, 2020, which increases Gas Acquisition's[20] ability to inject gas into storage during the summer months and replaces the Rule 30 provision that gave load balancing a higher priority than core reliability when injection capacity is limited.[21] Prior to the adoption of the current TCAP decision, the lesser of 345 MMcfd or the full amount of available injection capacity was allocated to the balancing function, which limited core customers' ability to inject gas into storage once Aliso Canyon became full. Thus, the recent TCAP decision, which goes into effect May 1, should help boost Gas Acquisition's ability to inject gas into storage.

[19] 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

[20] SoCalGas' Gas Acquisition Department procures gas for SoCalGas and San Diego Gas & Electric (SDG&E) core customers, which are made up of residential and small business customers. There is a firewall between Gas Acquisition and the System Operator; Gas Acquisition only has access to public information about the SoCalGas system.

[21] For a link to D.20-02-045, please see footnote 4.

Gas Balance Analysis

Gas demand figures for the summer are derived from the forecasts in the *2018 California Gas Report*,[22] then used in several gas balance analysis scenarios. The COVID-19 pandemic raises some uncertainty about projected demand if customers continue to spend more time at home and some businesses remain closed indefinitely. Staff prepared gas balances in order to provide a reliability assessment independent of SoCalGas' own assessment.[23] 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 allows us to assess the average daily difference, or margin, between capacity (or supply) and demand to determine in general whether capacity is enough to meet demand. It also allows us to simulate 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 base hydro weather scenarios. There will be days in the summer that will have higher or lower demand than the averages shown. In previous reports, Joint Agency staff have sought to demonstrate a positive deliverability margin in the gas balances of roughly 15 percent, which would mean there is more capacity than demand. This buffer is intended to ensure that the system retains reserve capacity to deal with unplanned outages or days with above-average demand. There are three gas balance scenarios, a best case, a base case, and a worst case. All three scenarios include injection limits posed by the semiannual storage field shut-ins, which are required by California Geologic Energy Management Division (CalGEM, formerly DOGGR) regulations. While the gas balance scenarios do not automatically discount pipeline capacity supply, it is important to note that analyses of past pipeline utilization have shown that customers rarely use 100 percent of pipeline capacity. However, when total system pipeline capacity is constrained, pipeline utilization increases compared to historical norms.

The first gas balance scenario, Scenario A in the appendix, is the best-case scenario with Line 235-2 in service and Line 4000 operating at increased pressure by May 1, 2020. In Scenario A, the non-Aliso fields reach their maximum capacity of 50.4 Bcf by the end of July, and Aliso Canyon reaches its maximum authorized capacity of 34 Bcf by the end of August. Scenario A maintains a near-15 percent reserve margin for most of the summer months, and storage withdrawals are not needed to meet customer demand on average weather days. Scenario A demonstrates a favorable level of inventory in preparation for the winter months.

The second gas balance scenario, Scenario B in the appendix, is the base-case scenario with Line 235-2 in service and Line 4000 continuing at its current pressure. In this scenario, Northern Zone deliveries are limited to 990 MMcfd, and interruptible capacity is not possible at Kramer Junction and in the Wheeler Ridge Zone due to competition from the other pipelines. In Scenario B, the

[22] The *2018 California Gas Report* and its supporting workpapers can be found at: https://www.socalgas.com/regulatory/cgr.shtml.

[23] 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.

non-Aliso fields become full by the end of September and Aliso Canyon becomes full by the end of October. In order to maximize injections, Scenario B does not maintain a 15 percent reserve margin throughout the summer months, except for October. Withdrawals from Aliso are needed in the high demand month of December.

The third gas balance scenario, Scenario C in the appendix, is the worst-case scenario with both Line 235-2 and Line 4000 out of service. In this scenario, staff is unable to hold a reserve margin for any of the projected months due to the thin margins between forecasted gas supply and demand. With Line 235-2 assumed to be out of service, interruptible supply at the Wheeler Ridge Zone and Kramer Junction are possible, increasing their total capacities to 810 MMcfd and 710 MMcfd, respectively. Gas demand exceeds flowing supplies in August, and withdrawals from the non-Aliso fields are assumed. With limited flowing supplies, SoCalGas is unable to fill the storage fields to maximum levels in preparation for the winter months, and withdrawals from Aliso are needed in the high demand month of December.

Summer Peak Day Analysis

In addition to the average weather/base hydro analyses, staff performed a summer high sendout day analysis for the base-case and worst-case scenarios to determine whether assumed supplies would be sufficient to meet a high demand day. The high summer demand day is forecasted to occur in September and is driven primarily by electric generation peak demand. This analysis is different from the analyses presented in the gas balances, because the latter is based on average gas demand that does not account for a potential increase in gas use due to electric peak demand. Column (a) below in Tables 2 and 3 include the forecasted summer high sendout demand figure from the *2018 California Gas Report*. Column (b) shows the assumed pipeline capacities in the base- and worst-case scenarios. In Column (c), the projected withdrawal capacity is the combined capacity allocated to core customers and the balancing function for the summer months, if Aliso's withdrawal capacity is not available.[24] Staff analysis shows that the combined allocation would be available for use under both gas balance scenarios. The projected surplus in Column (e) represents the remaining non-Aliso withdrawal capacity after projected withdrawals occur to meet the peak demand.

Table 2 examines a peak day under the base case scenario, Scenario B, which assumes that Line 235-2 is in service and Line 4000 is operating at reduced pressure. It shows that non-Aliso withdrawals

[24] TCAP Appendix A, Storage Capacity Allocation, Table 2: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M328/K301/328301730.pdf

would be needed to meet peak summer demand; however, a surplus of 364 MMcfd of non-Aliso withdrawal capacity would remain.

Table 2: Summer High Demand Day with Line 235-2 In Service and Line 4000 at Reduced Pressure

Scenario B, Base Case	(a) Summer Peak Day Demand	(b) Pipeline Capacity	(c) Projected Non-Aliso Withdrawal Capacity	(d) Projected System Capacity	(e) Projected Surplus/Shortfall (e=d-a)
September	3,211	2,825	750	3,575	364

Table 3 examines a peak day under the worst-case scenario, Scenario C, which assumes that both Line 235-2 and Line 4000 are out of service. It shows that non-Aliso withdrawals would be needed to meet peak demand; however, a surplus of 129 MMcfd of non-Aliso withdrawal capacity would remain. The analyses in Tables 2 and 3 do not capture or model the hourly peaks that are likely to occur on a peak summer demand day. It is also important to note that the non-Aliso fields provide varying degrees of usefulness in meeting gas demand. Honor Rancho is the most important non-Aliso field due both to its size and proximity to Los Angeles. Playa del Rey also performs an important supporting role in meeting intraday demand changes. While small, it is close to the largest demand load and has a large amount of withdrawal capacity for its size. La Goleta is the least useful field despite its relatively large inventory because it is far from the major load centers. Thus, the non-Aliso fields may not be able to respond to a surge in peak hourly demand without the aid of Aliso Canyon's withdrawal capacity. In addition, while Column (c) does not consider Aliso Canyon's withdrawal capacity, withdrawals from Aliso Canyon may occur if Condition 1 or Condition 4 of the revised Withdrawal Protocol are triggered.

Table 3: Summer High Demand Day with Both Lines 235-2 and 4000 Out of Service

Scenario C, Worst Case	(a) Summer Peak Day Demand	(b) Pipeline Capacity	(c) Projected Non-Aliso Withdrawal Capacity	(d) Projected System Capacity	(e) Projected Surplus/Shortfall (e=d-a)
September	3,211	2,590	750	3,340	129

CPUC Actions and Updates

The CPUC has issued several decisions recently, which will have short- and long-term impacts on gas and electric system reliability. On January 16, 2020, the CPUC voted to open a new rulemaking, R.20-01-007, to examine long-term gas system planning and reliability.[25] The CPUC's existing

[25] R.20-01-007: http://docs.cpuc.ca.gov/SearchRes.aspx?docformat=ALL&DocID=325641802.

natural gas reliability standards were established more than a decade ago. In 2006, the CPUC issued Decision (D.) 06-09-039, which concluded that the existing gas infrastructure was sufficient to meet California's needs at that time. The circumstances upon which these reliability standards were established has changed. Since that decision, several events, such as (1) climate legislation, (2) operational issues and constraints, and (3) gas pipeline and storage safety-related incidents, such as the San Bruno explosion and the Aliso Canyon natural gas leak, require the CPUC to reevaluate the policies, processes, and rules that govern gas utilities. The CPUC will consider several issues in the rulemaking. The first track of the proceeding will assess gas utilities' current system capabilities and reliability standards, the reliability of interstate supplies, and whether electric generators should be required to hold firm transportation capacity. The second track will examine the long-term planning that is needed for safe and reliable gas infrastructure in the event that demand for fossil gas decreases over time given California's climate goals and policies to decarbonize the energy sector.

As noted above in the "Supply Outlook" section, the CPUC issued a decision in the SoCalGas/SDG&E TCAP on February 28, 2020, which, in part, adopted an Energy Division Staff Proposal on Storage Allocation. The decision recognized that there is regulatory uncertainty regarding the amount of capacity that will be allowed at Aliso Canyon both in the short and long term. When the previous TCAP decision was adopted, the future of Aliso Canyon was unknown, and the approved storage and balancing proposals were based on the operational status of Aliso Canyon prior to the gas leak. In the aftermath of that decision, the discrepancy between the approved storage allocation and actual inventory capacity negatively impacted both core and noncore customers.[26] For that reason, the recent TCAP decision adopted a mechanism whereby the storage capacity allocation is dependent upon Aliso Canyon's maximum authorized capacity. The current storage allocation is based on Aliso Canyon's current maximum authorized capacity of 34 Bcf. If Aliso Canyon's inventory capacity shifts upward or downward, then the storage capacity allocated to core and the balancing function will change accordingly. The decision also recognized that the injection and withdrawal allocations are based on the maximum capacities that may be available at the beginning of the summer and winter seasons respectively.[27] Thus, the decision allows a daily proration of the injection and withdrawal capacity allocated to core customers and the balancing function. This decision should help provide core customers with more injection opportunities and enhance system reliability.

Lastly, pursuant to CPUC decision, D.19-08-002, SoCalGas core customers are required to balance gas deliveries to their estimated actual consumption as of April 1, 2020.[28] This change may reduce OFOs and lead to less system stress, as highlighted in prior Joint Agency technical assessments and mitigation measure recommendations. CPUC staff will monitor and assess the impact of the modified balancing rules.

[26] TCAP Appendix A at 2. Refer to Footnote 23 for a link to the document.
[27] There is more injection capacity when the storage fields, and particularly Aliso, are relatively empty, as they typically are at the beginning of summer. Conversely, there is more withdrawal capacity when the storage fields are full, which usually happens in the fall.
[28] D.19-08-002: http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=310135933

Appendix

SoCalGas Monthly Gas Balance

Scenario A

Line 235-2 in service. Line 4000 operating at increased pressure in May.

SoCalGas Monthly Gas Balance NORMAL WEATHER										
California Gas Report 2020 Demand (MMcfd)		**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Core		997	754	649	608	613	630	712	1,046	1,476
Noncore including EG		1,015	963	1,084	1,420	1,573	1,520	1,326	1,142	1,179
Wholesale & International		390	327	313	376	405	396	352	374	488
Co. Use and LUAF		31	26	26	31	33	33	31	33	40
Subtotal Demand		2,433	2,070	2,072	2,435	2,624	2,580	2,421	2,596	3,183
Storage Injection (Non-Aliso Fields)		30	250	150	100	0	0	0	0	0
Storage Injection (Aliso)		0	150	150	150	100	0	0	0	0
Storage Injection Total		*30*	*400*	*300*	*250*	*45*	*0*	*0*	*0*	*0*
System Total Throughput		2,463	2,470	2,372	2,685	2,669	2,580	2,421	2,596	3,183
Supply (MMcfd)										
California Line 85 Zone		60	60	60	60	60	60	60	60	60
Wheeler Ridge Zone		765	765	765	765	765	765	765	765	765
Blythe (Ehrenberg) into Southern Zone		670	670	670	980	980	980	980	980	980
Otay Mesa into Southern Zone		30	30	30	30	30	30	30	50	50
Kramer Junction into Northern Zone		550	550	550	550	550	550	550	550	550
North Needles into Northern Zone		200	350	350	350	350	350	350	350	350
Topock into Northern Zone		240	350	350	350	350	350	350	350	350
Sub Total Pipeline Receipts		2,515	2,775	2,775	3,085	3,085	3,085	3,085	3,105	3,105
Storage Withdrawal (Non-Aliso Fields)		0	0	0	0	0	0	0	0	78
Storage Withdrawal (Aliso)		0	0	0	0	0	0	0	0	0
Total Supply		2,515	2,775	2,775	3,085	3,085	3,085	3,085	3,105	3,183
DELIVERABILITY BALANCE (MMcfd)		52	305	403	400	416	505	664	509	0
Reserve Margin		2%	12%	17%	15%	16%	20%	27%	20%	0%
Non-Aliso Month-End Storage Inventory (Bcf)	34.0	35	43	47	50	50	50	50	50	48
Aliso Month-End Storage Inventory (Bcf)	17.3	17	22	26	31	34	34	34	34	34
Total Storage Inventory	51.3	52	65	74	81	84	84	84	84	82

SoCalGas Monthly Gas Balance

Scenario B

Line 235-2 in service. Line 4000 operating at reduced pressure.

SoCalGas Monthly Gas Balance NORMAL WEATHER										
California Gas Report 2020 Demand (MMcfd)		**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Core		997	754	649	608	613	630	712	1,046	1,476
Noncore including EG		1,015	963	1,084	1,420	1,573	1,520	1,326	1,142	1,179
Wholesale & International		390	327	313	376	405	396	352	374	488
Co. Use and LUAF		31	26	26	31	33	33	31	33	40
Subtotal Demand		2,433	2,070	2,072	2,435	2,624	2,580	2,421	2,596	3,183
Storage Injection (Non-Aliso Fields)		0	230	100	100	60	45	0	0	0
Storage Injection (Aliso)		0	100	150	100	80	100	15	0	0
Storage Injection Total		*0*	*330*	*250*	*200*	*140*	*145*	*15*	*0*	*0*
System Total Throughput		2,433	2,400	2,322	2,635	2,764	2,725	2,436	2,596	3,183
Supply (MMcfd)										
California Line 85 Zone		60	60	60	60	60	60	60	60	60
Wheeler Ridge Zone		765	765	765	765	765	765	765	765	765
Blythe (Ehrenberg) into Southern Zone		670	670	670	980	980	980	980	980	980
Otay Mesa into Southern Zone		30	30	30	30	30	30	30	50	50
Kramer Junction into Northern Zone		550	550	550	550	550	550	550	550	550
North Needles into Northern Zone		200	200	200	200	200	200	200	200	200
Topock into Northern Zone		240	240	240	240	240	240	240	240	240
Sub Total Pipeline Receipts		2,515	2,515	2,515	2,825	2,825	2,825	2,825	2,845	2,845
Storage Withdrawal (Non-Aliso Fields)		0	0	0	0	0	0	0	0	248
Storage Withdrawal (Aliso)		0	0	0	0	0	0	0	0	100
Total Supply		2,515	2,515	2,515	2,825	2,825	2,825	2,825	2,845	3,193
DELIVERABILITY BALANCE (MMcfd)		82	115	193	190	61	100	389	249	10
Reserve Margin		3%	5%	8%	7%	2%	4%	16%	10%	0%
Non-Aliso Month-End Storage Inventory (Bcf)	34.0	34	41	44	47	49	50	50	50	43
Aliso Month-End Storage Inventory (Bcf)	17.3	17	20	25	28	30	33	34	34	31
Total Storage Inventory	51.3	51	62	69	75	80	84	84	84	74

SoCalGas Monthly Gas Balance

Scenario C

Line 235-2 and 4000 are out of service.

SoCalGas Monthly Gas Balance NORMAL WEATHER										
California Gas Report 2020 Demand (MMcfd)		**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Core		997	754	649	608	613	630	712	1,046	1,476
Noncore including EG		1,015	963	1,084	1,420	1,573	1,520	1,326	1,142	1,179
Wholesale & International		390	327	313	376	405	396	352	374	488
Co. Use and LUAF		31	26	26	31	33	33	31	33	40
Subtotal Demand		2,433	2,070	2,072	2,435	2,624	2,580	2,421	2,596	3,183
Storage Injection (Non-Aliso Fields)		0	210	58	55	0	10	100	10	0
Storage Injection (Aliso)		0	0	150	100	0	0	69	0	0
Storage Injection Total		0	210	208	155	0	10	169	10	0
System Total Throughput		2,433	2,280	2,280	2,590	2,624	2,590	2,590	2,606	3,183
Supply (MMcfd)										
California Line 85 Zone		60	60	60	60	60	60	60	60	60
Wheeler Ridge Zone		810	810	810	810	810	810	810	810	810
Blythe (Ehrenberg) into Southern Zone		670	670	670	980	980	980	980	980	980
Otay Mesa into Southern Zone		30	30	30	30	30	30	30	50	50
Kramer Junction into Northern Zone		710	710	710	710	710	710	710	710	710
North Needles into Northern Zone		0	0	0	0	0	0	0	0	0
Topock into Northern Zone		0	0	0	0	0	0	0	0	0
Sub Total Pipeline Receipts		2,280	2,280	2,280	2,590	2,590	2,590	2,590	2,610	2,610
Storage Withdrawal (Non-Aliso Fields)		100	0	0	0	34	0	0		300
Storage Withdrawal (Aliso)		53	0	0	0	0	0	0	0	273
Total Supply		2,433	2,280	2,280	2,590	2,624	2,590	2,590	2,610	3,183
DELIVERABILITY BALANCE (MMcfd)		0	0	0	0	0	0	0	4	0
Reserve Margin		0%	0%	0%	0%	0%	0%	0%	0%	0%
Non-Aliso Month-End Storage Inventory (Bcf)	34.0	31	38	39	41	40	40	43	44	34
Aliso Month-End Storage Inventory (Bcf)	17.3	16	16	20	23	23	23	25	25	17
Total Storage Inventory	51.3	47	53	59	64	63	64	69	69	51