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**Aliso Canyon Risk Assessment Technical Report Winter 2018-19
Supplement**

Additional submitted attachment is included below.



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November 2, 2018

California Energy Commission
Docket Office
1516 Ninth Street
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Re: Aliso Canyon Risk Assessment Technical Report Winter 2018-19 Supplement

Southern California Gas Company (SoCalGas) appreciates the work performed by the California Energy Commission (CEC), California Public Utilities Commission (CPUC), the California Independent System Operator (CAISO), and the Los Angeles Department of Water and Power (LADWP) in preparing the Aliso Canyon Risk Assessment Technical Report Winter 2018-19 Supplement. SoCalGas has prepared its own Technical Assessment for the upcoming winter operating season and has attached it to this letter. While the two independent studies differ in some details, the overall conclusions are consistent: (1) ongoing pipeline outages continue to impact the sendout capacity of the SoCalGas system; (2) there will likely be the need to use gas stored at Aliso Canyon this winter; and (3) sendout capacity will fall short of supporting all customer demand during extreme temperature conditions. As detailed more fully in the SoCalGas Technical Assessment, SoCalGas has also determined that prudent and active management of its storage inventory through the winter season will be necessary to provide reliability to our core customers. This management includes the potential preemptive use of Aliso Canyon to avoid loss of service to core customers by maintaining specified withdrawal targets at all fields, and the possible curtailment of noncore demand in accordance with the Aliso Canyon Withdrawal Protocol, SoCalGas Rule No. 23, and SDG&E Gas Rule No. 14.

SoCalGas remains committed to providing safe, reliable, and affordable natural gas service to our 21 million customers across our service territory as part of the State's efforts to ensure a reliable supply of energy to California's residents, businesses, and economy.

Sincerely,

A handwritten signature in blue ink that reads "Rodger R. Schwecke".

Rodger R. Schwecke
Senior Vice President
Gas Transmission, Storage and Engineering

Enclosure



SOUTHERN CALIFORNIA GAS COMPANY WINTER 2018-19 TECHNICAL ASSESSMENT

October 16, 2018

Executive Summary

This technical assessment provides a forecasted outlook of system reliability during the coming winter season (November 1, 2018 through March 31, 2019) and analyzes the associated risks to energy reliability during this period. For this assessment, SoCalGas analyzed the following: pipeline capacity available to bring gas into the system, the forecasted winter demand, available system capacity given the forecasted winter supply and demand, and the forecasted winter storage inventory.

SoCalGas will begin the winter season with levels of natural gas in storage that were higher than predicted in the Summer 2018 Technical Assessment.¹ This was due to the mild summer conditions which allowed for late season injection versus the predicted withdrawal during this time-period. During the summer season, SoCalGas executed its Second Injection Enhancement Plan² and the California Public Utilities Commission (“CPUC” or “Commission”) increased the allowable inventory limit at Aliso Canyon to 34 billion cubic feet (BCF)³ in support of increasing storage inventory levels in advance of the winter season; both efforts were successful.

SoCalGas forecasts a demand of 4,965 million cubic feet per day (MMcfd) under the Commission mandated 1-in-10 year cold day design standard, in which service is provided to both core and noncore customers, and a demand of 3,527 MMcfd under the 1-in-35 year peak day design standard, in which all noncore customers are assumed to be fully curtailed. Even with the use of Aliso Canyon, SoCalGas has insufficient capacity to meet the 1-in-10 year cold day design standard given the expected withdrawal capacity of its storage fields and the transmission pipeline outages that are expected to remain throughout the winter season. With prudent management of its storage levels to maintain sufficient inventory to provide reliability, including the use of Aliso Canyon to maintain that inventory through critical periods, SoCalGas has calculated an approximate maximum system-wide capacity range available to serve end-use customers of 3.75 to 4.15 billion cubic feet per day (BCFD), depending upon the extent of existing and potential outages on transmission and storage facilities. This range is sufficient to meet the 1-in-35 year peak day design standard and still provide some level of service to critical noncore customers. SoCalGas believes that the use of Aliso Canyon to maintain service to core and critical

¹ Advice Letter (AL) No. 5275, Attachment C.

² AL No. 5275, approved by the Commission in Resolution G-3540.

³ Aliso Canyon Working Gas Inventory, Production Capacity, Injection Capacity, and Well Availability for Reliability, Summer 2018 Supplemental Report, Public Utilities Code Section 715, July 6, 2018.

noncore customers is consistent with the Commission's Aliso Canyon Withdrawal Protocol dated November 2, 2017.⁴

SoCalGas also performed an analysis of projected system-wide storage inventory levels (all fields, including Aliso Canyon) through the winter season. Using demand forecast data prepared for the 2018 California Gas Report (CGR), the projected SoCalGas capacity to receive pipeline supplies, and an estimate of storage field inventory levels on November 1, 2018, SoCalGas finds that noncore curtailment will be required during the winter season under all but the most optimistic conditions (warm temperature conditions with minimal facility outages). SoCalGas may need to curtail between 3.2 and 63.5 BCF of forecast noncore demand throughout the winter season, given certain assumptions regarding weather and facility outages, to maintain minimum inventory levels needed for core reliability. The analysis indicates that without the noncore curtailments, SoCalGas storage inventory levels will be fully depleted before the end of the winter season, putting core service at risk.

System Reliability Assessment of Winter Months

The CPUC has mandated two design standards for the winter operating season: the 1-in-10 year cold day standard, in which service is to be maintained to core customers and noncore customers under a temperature condition expected to recur once in a ten-year period; and the 1-in-35 year peak day standard, in which service is to be maintained to core customers under a temperature condition expected to recur once in a thirty-five-year period and service to all noncore customers is curtailed.

In assessing reliability in the upcoming winter, SoCalGas analyzed the supply outlook for the system and the winter demand forecasts. These are addressed in turn, below.

Supply Outlook

Available Flowing Pipeline Supplies

The SoCalGas/SDG&E gas transmission system is nominally designed to receive up to 3.775 BCFD of flowing supply on a firm basis. This means, if customers deliver that much supply to the SoCalGas

⁴ This Technical Assessment examines capacities to serve the 1-in-35 year peak day, during which service to core customers may be at risk if storage inventories are depleted, and includes the preemptive use of Aliso Canyon to avoid loss of service to core customers by maintaining specified withdrawal targets. The Aliso Canyon Withdrawal Protocol permits withdrawals from Aliso Canyon "when, in coordination with the Balancing Authorities, it is determined that withdrawals are necessary to maintain reliability overall, to respond to a risk to electric system reliability, and/or to avoid or to limit curtailments to core and noncore customers." Further, in response to a SoCalGas request for guidance on whether the Withdrawal Protocol restricted SoCalGas from "curtail[ing] to maintain withdrawal capacity targets," Energy Division responded that "SoCalGas should manage its system as a prudent operator." (see Email from Edward Randolph to Devin Zornizer, dated 12/21/2017). Consistent with this clarification, this winter SoCalGas plans to prudently manage the inventory levels across all the storage fields to maintain withdrawal capacity targets, which could include implementation of noncore curtailments and withdrawals from Aliso Canyon.

system, and there is a sufficient level of customer demand,⁵ SoCalGas can redeliver that gas supply to customers' burners. Supplies delivered to the SoCalGas system, however, do not reach these maximum receipt levels for a variety of reasons, including that customers may choose to use SoCalGas' balancing service rather than deliver supplies, California production has declined over time, system demand frequently does not require maximum delivery of supply, or flowing supplies may not be available due to weather patterns or maintenance impacting the interstate pipelines upstream of the SoCalGas system. Additionally, planned and unplanned pipeline outages can reduce receipt capacity.

SoCalGas determined ranges of flowing pipeline supplies by analyzing "best" and "worst" case scenarios. Under a "best case" scenario, only Line 235-2 between the Newberry and Adelanto compressor remains out of service during the full winter season.⁶ Line 4000 would continue to experience a temporary pressure reduction and the current associated capacity reduction under this scenario, limiting the volumes received from Transwestern and El Paso at North Needles and Topock, respectively. Additionally, sufficient supply is assumed delivered at Otay Mesa in order to fully utilize the Southern System receipt capacity of 1,210 MMcfd.

Under a "worst case" scenario, Line 4000 between Newberry compressor station and the Cajon Pass would be removed from service for remediation. This, along with the outage of Line 235-2, eliminates the receipt of supply at North Needles and Topock. Additionally, supply at Otay Mesa is assumed to be unavailable as, historically, little to no supply has been delivered at Otay Mesa. The ability to receive supply at Otay Mesa beyond 400 MMcfd is dependent upon local demand in San Diego or displacing supplies that would otherwise be delivered at Ehrenberg.

In addition to the outages and restrictions discussed above, SoCalGas factored in that customers do not typically fully balance their supply with their demand even given SoCalGas' balancing rules. While a review of scheduled deliveries from the last 5 years shows that customers have used on average 80% of interstate receipt capacity, SoCalGas has adopted a 90% utilization factor for this assessment. This factor reflects that SoCalGas expects to require tighter balancing requirements through this winter season in response to the storage capabilities and supply outlook. SoCalGas has therefore adopted the assumption of 90% in the capacity calculations in this report for all supplies except for local California production, which is assumed at the current production rate.⁷

SoCalGas' ability to maintain uninterrupted service also depends upon customers delivering sufficient supply to the SoCalGas system. Given SoCalGas' use of all its regulatory tools available as authorized by the CPUC, SoCalGas expects that there may be times during the winter season when gas supply from the

⁵ Customer demand may also be required to be in a specific location, such as on the Southern System in order to receive the full receipt capacity of 1,210 MMcfd at Blythe and Otay Mesa.

⁶ Line 2000 on the Southern System has been operating at reduced pressure since 2011, and was abandoned in March 2018 across the Morongo Reservation, thereby reducing the receipt capacity at Blythe to 980 MMcfd dependent on load along the southern system. Similarly, receipt of gas supply at Otay Mesa depends upon the level of demand in San Diego to a certain extent.

⁷ In its Scenarios Framework I.17-02-002, dated September 13, 2018, the Energy Division has assumed an 85% utilization factor for certain aspects of its analyses. SoCalGas believes that 85% is more appropriate for that framework given the planning horizons used in the framework versus the single operating season used in this technical assessment.

interstate pipelines is unavailable due to weather conditions elsewhere in the country or pipeline constraints upstream of SoCalGas' system, such that supplies delivered to the system may be less than the 90% assumed in this assessment. These situations are beyond the scope of this technical assessment, and additional customer curtailment may be necessary to maintain system integrity and service to core and critical noncore customers.

Using the scenario information outlined above, the resulting "best" and "worst" case receipt capacities are detailed below in Tables 1 and 2.

Table 1
"Best Case" Available Flowing Pipeline Supplies

Receipt Point	Capacity/Supply (MMcfd)	Details
North Needles/Topock	270	Reduced receipt capacity due to Line 235 outage and Line 4000 temporary pressure reduction.
Kramer Junction	600	Increased capacity due to reduced receipt capacity at North Needles and Topock.
Blythe	980	
Otay Mesa	230	Otay Mesa has a firm receipt capacity of 400 MMcfd, but is limited by the total 1,210 MMcfd receipt capacity of the Southern System. 230 MMcfd represents the remaining capacity to receive firm supply. Historically, little supply has been delivered at Otay Mesa.
Wheeler Ridge/Kern River Station	765	
California production	70	SoCalGas' firm receipt capacity is reduced from 310 MMcfd to 210 MMcfd following the derating of pipeline in the Line 85 Zone. However, local California producers are currently utilizing only approximately 70 MMcfd of that capacity.
Total	2,915	
Assumed Pipeline Supplies	2,630	Assumes 90% pipeline utilization and current CA production.

Table 2
“Worst Case” Available Flowing Pipeline Supplies

Receipt Point	Capacity/Supply (MMcfd)	Details
North Needles/Topock	0	No receipt capacity due to Line 235 and Line 4000 outage.
Kramer Junction	700	Increased capacity due to lost receipt capacity at North Needles and Topock
Blythe	980	
Otay Mesa	0	
Wheeler Ridge/Kern River Station	765	
California production	70	SoCalGas’ firm receipt capacity is reduced from 310 MMcfd to 210 MMcfd following the derating of pipeline in the Line 85 Zone. However, local California producers are currently utilizing only approximately 70 MMcfd of that capacity.
Total	2,515	
Assumed Pipeline Supplies	2,270	Assumes 90% pipeline utilization and current CA production.

SoCalGas has labeled the capacities shown in Table 2 as “worst case,” based upon current known potential projects which may impact receipt capacity. However, unexpected outages on the transmission system, such as those resulting from third-party damage and safety related conditions, may still occur throughout the winter season, further reducing receipt capacity beyond the level projected in Table 2.

Available Storage Supplies

Table 3 below presents the maximum available withdrawal capabilities for SoCalGas’ four storage fields for the winter season at the maximum inventory levels. SoCalGas does not expect to be at maximum inventory levels system-wide during the peak demand periods of December through February, therefore withdrawal capability will not be at the maximum rates stated below. We also do not expect to be at minimum inventory levels, and minimum withdrawal capability, during the peak demand period; inventory levels necessary for core reliability are presented later in this assessment. The withdrawal rates presented in Table 3 assumes that well work currently in progress and planned will be completed in time for the peak winter season; to the extent that this work is not completed, withdrawal capacities will be less.

Table 3
Maximum Projected Storage Withdrawal Capacity, Winter 2018-19

Field	Inventory (BCF)	Maximum Withdrawal Capacity (MMCFD)
Aliso Canyon	34 *	1317
Non-Aliso Canyon **	49.9	1343

* Aliso Canyon Working Gas Inventory, Production Capacity, Injection Capacity, and Well Availability for Reliability Summer 2018 Supplemental Report, Public Utilities Code Section 715, July 6, 2018.

** Combined Honor Rancho, La Goleta, and Playa del Rey

This data is based on wells currently or forecast to be in service during the winter operating season. SoCalGas assumes that there will be no outages at any of the storage fields that would impact their ability to provide the withdrawal capacity assumed for this assessment. However, well performance is currently untested across all inventory levels. SoCalGas' storage capacities are continually re-assessed in light of performance and the safety-related work planned, in progress, or completed at our storage fields. To the extent that the withdrawal capacities shown in Table 3 change during the winter season, the results and findings of this assessment may change as well.

Peak Winter Demand Forecast and System Capacity Calculation

Demand Outlook: 1-in-10 Year Cold Day Event

For the upcoming winter season, SoCalGas forecasts a 1-in-10 year cold day demand of 5.0 BCFD, consisting of the following in Table 4 below:

Table 4
Customer Demand Forecast, 1-in-10 Year Cold Day Event

Customer Type	Winter Demand (BCFD)
Core (including wholesale core)	3.4
Noncore, Non-Electric Generation	0.8
Noncore, Electric Generation (EG)	0.8
Total	5.0

Given the supply available from interstate pipelines, local California production, and expected storage withdrawal (including the use of Aliso Canyon), SoCalGas expects that it will have insufficient supplies to meet the 1-in-10-year cold day⁸ demand forecast. In a 1-in-10-year cold day scenario, some level of noncore curtailment will be required, either voluntary or involuntary, beginning with EG demand in accordance with the CPUC-approved procedure specified in SoCalGas Rule No. 23 and SDG&E Gas Rule No. 14.

⁸ This cold day event has the potential to occur in December or January, and may also occur more than once per season.

Demand Outlook: 1-in-35 Year Peak Day Event

SoCalGas forecasts a 1-in-35 year peak day demand of 3.53 BCFD, consisting entirely of core demand⁹ per the design standard. With prudent and active management of storage inventory, including the use of Aliso Canyon to maintain inventory levels in the other storage fields needed for core reliability, SoCalGas expects to have sufficient supply and capacity to meet this design standard under both the “best” and “worst” case pipeline supply scenarios. SoCalGas does not believe, therefore, that core service is at risk this winter season. However, without the use of supply from Aliso Canyon, SoCalGas cannot support the 1-in-35 year peak day demand under either pipeline supply scenario. For this reason, SoCalGas must maintain target levels of storage supply throughout the winter season to protect core reliability.

Using inventory and withdrawal relationships for the storage fields, SoCalGas optimized the minimum inventory level required at each storage field to produce the needed withdrawal rates for core reliability. These levels are shown below in Table 5. SoCalGas must use supply from Aliso Canyon and our curtailment procedures (as necessary) to preserve these minimum inventory levels at all four storage fields throughout the winter season, in accordance with the Aliso Canyon Withdrawal Protocol, SoCalGas Rule No. 23, and SDG&E Gas Rule No. 14.

Table 5
Month-End Minimum Inventory Requirements for Core Reliability

Storage Field	Month-End Minimum Inventory (BCF)				
	NOV 2018	DEC 2018	JAN 2019	FEB 2019	MAR 2019
Aliso Canyon	5.7	5.1	4.4	3.8	2.1
Honor Rancho	13.9	13.2	12.6	7.5	5.0
La Goleta	8.0	7.9	7.7	7.6	7.5
Playa de Rey	1.9	1.9	1.5	1.1	0.7
TOTAL	29.5	28.1	26.2	20.0	15.3

Ventura compressor station is necessary to fill the Goleta storage field, and because of the capacity at the station, if SoCalGas were to draw La Goleta inventory down to those minimum levels, it is expected that the field could not be refilled in the summer 2019 operating season to sufficient levels needed to support winter 2019-20 demand. SoCalGas will therefore manage its system to maintain 7.5 BCF at La Goleta through March 2019, and has included that additional inventory in Table 5 above.

SoCalGas also calculated the capacity to serve noncore customers assuming inventory levels approached the levels shown in Table 5. The SoCalGas system has sufficient capacity to support 3.75 to 4.15 BCFD of customer demand under the “worst” and “best” case pipeline supply assumptions, respectively, with the use of Aliso Canyon. This capacity allows for approximately 200 to 600 MMcfd of noncore demand during the peak day event; given that noncore non-EG demand is forecast at approximately 800 MMcfd, this will require the curtailment of all EG demand and some noncore non-EG demand as well. To the

⁹ Retail and wholesale.

extent that the core demand is less than 3.53 BCFD (i.e., a warmer temperature condition), that difference will be available to serve noncore customers.

Based on the forecast Winter 2018-2019 demand and system capacity, SoCalGas can meet the forecasted 1-in-35 year peak day demand under either the “best” or “worst” case scenarios with the use of Aliso Canyon. Without Aliso Canyon, SoCalGas is unable to meet forecast peak day demand under either a “best case” or “worst case” pipeline supply scenario unless storage field inventory levels are higher than those shown in Table 5 and used in this calculation.

Note that in all scenarios, the system capacity is always less than the sum of the available pipeline and storage supplies. This is a result of the system hydraulics. Customer demand is not constant over the course of the day, and gas supplies from interstate pipelines travel slowly across the pipeline network. Those supplies simply cannot meet the changing customer demand in time before minimum operating pressures are reached, and are also scheduled on a ratable basis based on daily expected demand rather than hourly peaks. SoCalGas’ storage fields are closer to the customer demand center in the Los Angeles Basin than the interstate pipeline receipt points and are the “flex supply” available to meet imbalances between the scheduled pipeline supplies and intraday customer demand.

Likewise, when customer demand drops off, gas supplies need to be actively managed and reduced to avoid overpressuring the pipeline system. Once again, storage supplies serve the critical purpose of “flex supply”, and are reduced by SoCalGas’ Gas Control department to keep the pipeline supplies flowing. In theory, SoCalGas can also begin injecting gas supply into its storage fields if the pipeline supplies far exceed the customer demand even with all withdrawal reduced to zero. However, as system-wide injection capacity is diminished, it may become increasingly difficult to achieve high levels of pipeline utilization consistently through the winter season.

Seasonal Reliability Assessment

Using demand forecast data prepared for the 2018 California Gas Report for the winter season (November 2018 through March 2019, cold and hot temperature conditions with base hydro) and a projection of expected storage inventory levels on November 1 (78.9 BCF), SoCalGas performed a mass balance examining the impact on its storage supplies, including supply stored in Aliso Canyon, and our ability to meet customer demand under both the “best” and “worst” case pipeline capacity scenarios. These mass balances are presented below in Tables 6 and 7.

Table 6
Monthly Storage Assessment, “Best” Case Supply Assumption (MMCF)

	Nov -18	Dec-18	Jan-19	Feb-19	Mar-19	Curtailment Total
Pipeline supply	78,915	81,546	81,546	73,654	81,546	
COLD TEMPERATURE CONDITION						
CGR Demand	86,880	104,811	102,269	88,004	88,009	
Storage WD	7,965	23,266	20,724	14,350	6,464	
Mth-end Inv	70,935	47,670	26,946	12,596	6,133	
Min Inv Req	29,500	28,100	26,200	20,000	15,300	
Curtailment	0	0	0	7,404	1,764	9,168
HOT TEMPERATURE CONDITION						
CGR Demand	80,040	90,799	86,335	75,292	77,128	
Storage WD	1,125	9,254	4,790	1,638	0	
Mth-end Inv	77,775	68,522	63,732	62,094	62,094	
Min Inv Req	29,500	28,100	26,200	20,000	15,300	
Curtailment	0	0	0	0	0	0

Table 7
Monthly Storage Assessment, “Worst” Case Supply Assumption (MMCF)

	Nov -18	Dec-18	Jan-19	Feb-19	Mar-19	Curtailment Total
Pipeline supply	68,115	70,386	70,386	63,574	70,386	
COLD TEMPERATURE CONDITION						
CGR Demand	86,880	104,811	102,269	88,004	88,009	
Storage WD	18,765	34,426	31,884	24,430	17,624	
Mth-end Inv	60,135	25,710	-6,174	-30,604	-48,228	
Min Inv Req	29,500	28,100	26,200	20,000	15,300	
Curtailment	0	2,391	29,984	18,230	12,924	63,528
HOT TEMPERATURE CONDITION						
CGR Demand	80,040	90,799	86,335	75,292	77,128	
Storage WD	11,925	20,414	15,950	11,718	6,743	
Mth-end Inv	66,975	46,562	30,612	18,894	12,152	
Min Inv Req	29,500	28,100	26,200	20,000	15,300	
Curtailment	0	0	0	1,106	2,043	3,149

Tables 6 and 7 show that on a monthly basis under most supply and temperature conditions, SoCalGas has sufficient pipeline receipts and storage inventory supplies to serve all noncore customer demand without curtailment up to the system capacity, without regard to core reliability requirements. The exception is the cold temperature condition with the “worst” case supply assumption, in which the system-wide storage inventory is depleted in January, and SoCalGas is short 48.2 BCF of storage inventory supplies; that much noncore demand would need to be curtailed over the winter season. However, using all storage inventory supplies leaves insufficient withdrawal capability to maintain core reliability, and minimum inventory levels must be maintained for that purpose as previously discussed.

Maintaining the minimum inventory requirements in Tables 6 and 7 results in noncore curtailment required in most supply and temperature conditions, potentially up to 63.5 BCF over the winter season.

These mass balance calculations assume that gas supplies are delivered to the SoCalGas system equal to the receipt capacities assumed. In this sense, the mass balances provide the most optimistic assessment of the capability to meet demand thorough the winter season. To the extent that customers are unwilling or unable to deliver supply to the SoCalGas system, the curtailment of noncore demand will increase from those figures calculated in Tables 6 and 7.