California Public Utilities Commission

Aliso Canyon Working Gas Inventory, Production Capacity, Injection Capacity, and Well Availability for Reliability

Revised Report – Public Utilities Code Section 715

Energy Division

7/19/2017

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Introduction

Public Utilities Code (PU Code) Section 715 requires the California Public Utilities Commission (CPUC) to publish a report assessing the need for natural gas from the Aliso Canyon storage facility to meet the region's natural gas and electricity demand. Specifically, the statute requires the CPUC to determine:

1. *The range of working gas necessary at the Aliso Canyon storage facility to ensure safety and reliability at just and reasonable rates in California;*
2. *The amount of natural gas production at the facility needed to meet safety and reliability requirements;*
3. *The number of wells and associated injection and production capacity required; and*
4. *The availability of sufficient natural gas production wells that have satisfactorily completed required testing and remediation.*

The most critical of the findings required by PU Code Section 715 is the finding of the range of working gas necessary at the Aliso Canyon storage facility to ensure safety and reliability at just and reasonable rates. As discussed in detail below, in this updated 715 report we find that the range of working gas necessary to maintain reliably is 14.8 billion cubic feet (Bcf) at the low end and 23.6 Bcf at the high end.

On June 28, 2016, the CPUC issued the first version of the report required by PU Code Section 715. That report was based on the working conditions of the field at the time and the fact that new injections would likely be prohibited over the course of the summer. The report acknowledged that it would need to be update in the future as conditions in the field changed.

On January 17, 2017, the CPUC issued an update to the June 28, 2016, Section 715 report (January 2017 Section 715 Report) to address near-term winter and summer seasons based on the then-existing conditions of the Aliso facility and the Southern California Gas Company (SoCalGas) system.[1]

This update to the Section 715 report incorporates information acquired since January 17, 2017, chiefly from the *Aliso Canyon Risk Assessment Technical Report Summer 2017 Assessment* (2017 Summer Assessment) issued May 19, 2017. In addition, it incorporates changes to storage levels, well conditions, and storage withdrawal capacity at all SoCalGas storage facilities since the time of the 2017 Summer Assessment. This update also considers a higher level risk from an unplanned outage for the summer of 2017 than that presented in

[1] For planning purposes SoCalGas defines winter as beginning on November 1 and ending on March 31. Summer begins April 1 and ends on October 31.

the 2017 Summer Assessment. The higher level of risk is based on findings and recommendations made by the Independent Review Team as a result of its review of the 2017 Technical Assessment.

Conditions are likely to continue to change over time depending on the operational capabilities of wells in the field, SoCalGas' ability to inject into the field, and the effectiveness of mitigation measures. In anticipation of new regulations concerning storage fields, SoCalGas independently implemented a storage plan that reduces the short-term ability of other storage facilities to absorb any shortfalls caused by conditions at Aliso. These changing conditions will require the CPUC to further update this report in the future.

The determination of whether and how the storage facility will be used over the long term will be the subject of CPUC proceeding I.17-02-002.

As written, the statute requires the four determinations to be made independent of each other. That is, the determination of the amount of inventory necessary for reliability is to be identified independently of whether there is sufficient injection and production capacity. However, these factors are interrelated. For example, since withdrawal rates increase with higher pressure, fewer wells are needed to achieve a specific production rate when the volume of gas in the facility is increased.

This report endeavors to make the statutorily required determinations based on current conditions, while acknowledging that a variety of combinations of inventory, capacity, and wells could address the identified reliability needs. Additionally, injections into the field are currently prohibited.

The January 2017 Section 715 Report and its findings are based on the *Aliso Canyon Risk Assessment Technical Report* dated April 4, 2016, (2016 Summer Assessment) that addressed summer reliability risks, and the *Aliso Canyon Winter Risk Assessment Technical Report* dated August 23, 2016, as supplemented with information concerning updated peak demand levels and the impacts of measures taken to mitigate demand. Additionally, the January report recognized the expected impacts of reconfigured wells with reduced withdrawal capacity and the limited availability of wells at Aliso Canyon.

The revised findings in this report are based on the results of the 2017 Summer Assessment, the SoCalGas Modified Storage Safety Enhancement Plan presented to the CPUC by SoCalGas in its letter of March 30, 2017, the SoCalGas Advice Letter 5139 filed with the CPUC on May 19, 2017,[2] and on confidential information provided by SoCalGas to the CPUC concerning the status of wells at Aliso Canyon and current storage withdrawal capacity. In

[2] SoCalGas Advice Letter 5139 was approved by the Commission on June 29, 2017, in Resolution G-3529. The resolution can be found at http://docs.cpuc.ca.gov/resolutionsearchform.aspx.

addition, it incorporates findings and recommendations concerning unplanned outages in the Independent Review Team's review of the 2017 Technical Assessment.

The technical assessments were prepared by the CPUC, the California Energy Commission (CEC), the California Independent System Operator (CAISO), and the Los Angeles Department of Water and Power (LADWP). The reports were independently reviewed by Los Alamos National Lab and other outside experts.[3] SoCalGas also participated in the preparation of the technical assessments.

This report also considers:

1. *The methodology and revised tables that form the monthly gas balance and storage simulation that was prepared by the California Energy Commission and incorporated in the Aliso Canyon Gas and Electric Reliability Winter Action Plan (Winter Action Plan);*[4]
2. *Forecasted gas demand information provided by SoCalGas for the 2016 California Gas Report (CGR);*[5]
3. *Publicly available data including information posted on the Sempra Envoy website (https://scgenvoy.sempra.com), which provides historical daily operating information including information on sendout and receipts and storage injections and withdrawals; and*
4. *Additional data provided by SoCalGas in response to CPUC data requests*.

[3] These reports have undergone an independent review by the Los Alamos National Lab and Walker & Associates (*Independent Review of Hydraulic Modeling for Aliso Canyon Risk Assessment*, Walker & Associates Consultancy, Los Alamos National Laboratory, August 19, 2016, and *Independent Review of Southern California Gas Hydraulic Modeling*, Walker & Associates Consultancy, Los Alamos National Laboratory, May 19, 2017). The reviews noted that the modeling used in the technical assessments is consistent methodologically with industry practice. Furthermore, the reviews noted that the modeling produced reasonable outcomes and that the SoCalGas capacity estimates used are appropriate.

[4] *Aliso Canyon Gas and Electric Reliability Winter Action Plan*, California Public Utilities Commission, California Energy Commission, the California Independent System Operator and the Los Angeles Department of Water and Power, August 22, 2016. The gas balance and storage simulation examines supply and demand over the course of the winter and considers system wide needs and their impact on Aliso. The gas balance analysis was prepared by the California Energy Commission (CEC) independent of SoCalGas. The analysis included herein relies on the balance analysis in the August 22, 2016, Winter Action Plan, as modified by the CPUC and CEC and updated to reflect current information.

[5] *2016 California Gas Report*. Southern California Gas Company, Pacific Gas and Electric Company, San Diego Gas & Electric Company, Southwest Gas Corporation City of Long Beach Gas & Oil Department, Southern California Edison Company.

Statutorily Required Determinations

Consistent with SB 380, the CPUC has a statutory requirement to make four determinations concerning the Aliso Canyon storage facility prior to the approval of injections. These determinations are summarized below. The background and analysis supporting these determinations are provided later in this report.

1. *The range of working gas necessary at the Aliso Canyon storage facility to ensure safety and reliability at just and reasonable rates in California:*

   The CPUC provided a range of working gas inventory at Aliso Canyon necessary for adequate reliability in the CPUC's January 2017 Section 715 Report. The amounts identified in the January report ranged from a targeted minimum level of 15.4 Bcf to a maximum of 29.7 Bcf. The 15.4 Bcf represents the minimum amount that would be expected to be maintained at the end of the winter season, which ends on March 31. From that minimum Aliso Inventory was to increase over the course of the summer to 29.7 Bcf, a level determined to be sufficient to support summer demand. At the time the report was produced, inventory at Aliso was approximately 14.9 Bcf and minor withdrawals made on January 24-25 reduced inventory to an estimated 14.8 Bcf.[6]

   The January 2017 Section 715 Report anticipated that updates would be required to reflect changing conditions and new information. To date, restrictions on injecting into Aliso remain in place. However, information provided since the last report indicates that revisions should be made.

   Taking into account new conditions, in this update, the CPUC has determined that 23.6 Bcf of inventory at the Aliso Canyon Storage Field is necessary for SoCalGas to maintain safe and reliable service, limited by the mandated maximum safe operating pressure as specified by Division of Oil Gas and Geothermal Resources (DOGGR)[7]. As seasonal demand declines, the inventory may be appropriately drawn down if necessary but should be maintained within a range that is managed to target 23.6 Bcf and should not drop below 14.8 Bcf. Managing the facility in this manner is estimated to address safety and reliability needs while providing sufficient flexibility to respond to gas market conditions to support just and reasonable rates.

   <u>Range Maximum</u>

   The 23.6 Bcf maximum reflects the Aliso inventory needed to provide withdrawal capacity at rates necessary to meet the following conditions:

[7] DOGGR identified safe pressure for the field based on its current information. That pressure corresponds to an inventory level of 67 Bcf. The inventory range in this report at 23.6 Bcf falls significantly below that limit.

- 95% of flowing gas supplies;
- Unplanned outages of up to 400 MMcfd;
- 1.57 billion cubic feet per day (Bcfd) gas withdrawal capacity from non-Aliso storage facilities
- 85% electric transmission import utilization; and
- 1–in–10 peak day electric demand

These conditions, after incorporating actions taken to reduce gas demand for electric generation and additional factors as reported in the 2017 Technical Assessment, result in a withdrawal capacity need at Aliso Canyon of .860 Bcfd.

The conditions used to set the maximum of the range differ in part from those used in the 2017 Technical Assessment. The 2017 Technical Assessment used a 90% flowing supply level. This 10% reduction from 100% of flowing supply capacity in the assessment represented 5% to account for new balancing rules that reduced the mismatch between customer deliveries and customer demand and 5% to account for unplanned outages. The 5% for unplanned outages equates to an outage of approximately 150 MMcfd. The Independent Review Team's findings determined that the 150 MMcfd unplanned outage level does not sufficiently account for the level of outage risk. Based on discussions with the Independent Review Team, this report increases the 150 MMcfd for unplanned outages from the assessment to 400 MMcfd. Finally, based on information provided by SoCalGas, the withdrawal capacity from non-Aliso storage facilities has been increased to 1.57 Bcfd. from the 1.47 used in the assessment.

As indicated in the January 2017 Section 715 Report, .839 Bcfd of withdrawal capacity is needed at Aliso in the event of such a January peak day. As such the indicated inventory level of 23.6 Bcf with a withdrawal capacity of .860 Bcfd is sufficient to meet both the summer peak and winter peak.

The 23.6 Bcf inventory level is 5.8 Bcf lower than the 29.4 Bcf inventory identified in the January 2017 Section 715 Report as necessary for winter and the 29.7 Bcf determined to be necessary for summer. This lower level is in part a result of the higher Aliso Canyon withdrawal rates presented in SoCalGas' Advice Letter 5139. However, these withdrawal rates are uncertain estimates and are not a replacement for the gathering of actual well flow data. Therefore these withdrawal rates should be reviewed prior to the end of the summer and in the context of the results of a future technical assessment.

Range Minimum

The minimum of the range, 14.8 Bcf, equals the current Aliso inventory level. This level recognizes that as winter peak demand declines, inventory levels at Aliso can be drawn down until the beginning of the injection season at the start of spring. The 14.8 Bcf provides a sufficient minimum withdrawal capacity to meet demand when demand

tends to be at lower levels. Importantly, the level provides a base/floor sufficient for injections to build inventory to meet higher summer demand. Depending on circumstances including weather and overall demand and inventory drawdown needs, actual inventory levels may remain above the minimum. However, as indicated in the discussion of the range maximum, inventory levels should be managed to the maximum of the range as discussed above.

2. *The amount of natural gas production at the facility needed to meet safety and reliability requirements:*

   To meet reliability requirements, the CPUC estimates that SoCalGas needs to provide .839 Bcfd of Aliso withdrawal capacity to meet winter peak day needs, which are typically at their maximum in the month of January. An Aliso withdrawal capacity of ..860 Bcfd is required to meet peak summer demand.[8] This improvement from the .906 Bcfd required in the 2016 Summer Assessment is due in large part to tighter gas system balancing rules and CAISO electric transmission upgrades. See the Aliso Canyon Demand-Side Resource Impact Report (May 2017 Update).

3. *The number of wells and associated production and injection capacity required:*

   Using estimates based on the model used in the previous Section 715 report and updated confidential SoCalGas data, a total of 69 wells at 23.6 Bcf of inventory would be necessary to meet the highest summer withdrawal rate of .860Bcfd. However, wells not yet brought into service may not perform at the same level as estimated, and there is substantial uncertainty as to actual well performance (see "Current Situation" below). Based on current SoCalGas estimates, Aliso Canyon will not have 69 wells ready for withdrawal until the first quarter of 2018.

4. *The availability of sufficient natural gas production wells that have satisfactorily completed required testing and remediation:*

   As of June 1, 2017, 42 Aliso Canyon wells have completed DOGGR testing and remediation and are available for service. SoCalGas' intent is to continue having DOGGR test wells that have been isolated. For those wells that have passed DOGGR tests, SoCalGas will complete any remediation needed, and then wells will become available for service. However, a significant number of wells may need to be plugged and abandoned. Based on SoCalGas estimates and considering wells that may need to be plugged and abandoned, the number of wells available may increase by as few as four wells per month.

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[8] The Aliso withdrawal capacity is in addition to the 1.57 Bcfd assumed to be available from non-Aliso storage fields.

Assuming that an average of four wells can be returned to service per month, it would take until sometime in the first quarter of 2018 to reach 69 wells that have passed testing, been remediated, and are available for service.

To summarize the interdependence of these determinations, Determination #1 above accurately states the inventory level required, but as indicated in Determination #4, there are currently not enough wells to support the production required for reliability at their current withdrawal rates for summer peak. However, increasing the amount of inventory beyond the amount identified for working gas volume needs in Determination #1 would increase the withdrawal capacity of each well, which presumably would reduce the number of wells required to achieve the withdrawal rates needed for reliability purposes.

Aliso Canyon Reliability Developments Since January 17, 2017

The January 2017 Section 715 Report goes into great detail about the background of the Aliso Canyon gas leak. In the interest of brevity, that background information is omitted for this report. Instead, this report will focus on the notable developments that have occurred since January 17, 2017. These developments are listed on the CPUC's Aliso Canyon page at http://www.cpuc.ca.gov/aliso/. A summary of the comments to the January 2017 Section 715 Report as well as CPUC staff responses is attached as Appendix A to this report.

On January 27, 2017, the CPUC issued an Order Instituting Investigation pursuant to Senate Bill 380 to determine the feasibility of minimizing or eliminating the use of the Aliso Canyon natural gas storage facility (CPUC Proceeding I.17-02-002).

On February 1 and February 2, 2017, DOGGR and the CPUC held a public meeting in Woodland Hills to seek public comment on the findings from DOGGR's well safety review and proposed pressure limits. The CPUC submitted a presentation summarizing the CPUC's involvement and role. Participants submitted comments, which are summarized in Appendix B to this report along with CPUC staff responses.

On March 23, 2017, the CPUC issued Decision (D.) 17-03-020, which extended the tighter gas balancing rules through November 30, 2017.

On February 15, 2017, SoCalGas sent a letter to the CPUC announcing its Storage Safety Enhancement Plan in which the utility would begin converting all non-Aliso wells to tubing-only flow starting on March 1, 2017. The utility stated that any well that was not converted by April 1, 2017, would be temporarily plugged and isolated from the storage field. Under this proposal, SoCalGas estimated that withdrawal capacity would be reduced by 50% to 80% at the Honor Rancho field and by up to 34% at the Goleta and Playa del Rey fields. The utility estimated that the proposal would have impacts of a similar magnitude on injection capacity. SoCalGas planned to have eight to 10 Honor Rancho wells back in service by August 1, 2017, which is typically the beginning of the peak summer load period.

On March 16, 2017, the CPUC replied to SoCalGas' February 15th letter, stating that the Safety Enhancement Plan would result in insufficient withdrawal capacity to meet summer demand, increasing risks to energy reliability. The CPUC ordered SoCalGas to attain a minimum system wide storage withdrawal capacity of 2.065 Bcfd by June 1, 2017, and increase withdrawal capacity to 2.420 Bcfd as quickly as possible. SoCalGas was required to submit a revised plan by March 30, 2017.

On March 30, 2017, SoCalGas submitted the revised plan as required, noting that the CPUC was imposing a new requirement for SoCalGas to maintain sufficient inventory and withdrawal capacity to support noncore customers. SoCalGas stated that the revised plan would require the continued use of tubing and casing flow at the non-Aliso storage fields. With these changes, SoCalGas said it could achieve 2.070 Bcfd of system wide withdrawal capacity by June 1, 2017. To reach that level of inventory, SoCalGas would need to inject .050 Bcfd at Goleta and .085 Bcfd at Honor Rancho between April 1 and June 1. The utility estimated that it could reach a withdrawal capacity of 2.420 Bcfd by October 1, 2017, with withdrawals from Aliso Canyon. However, the utility noted several scenarios under which it would be difficult to attain or maintain that level of withdrawal capacity. Lastly, SoCalGas predicted that frequent High and Low OFOs would make it challenging for customers to bring in extra gas for injection and proposed making gas allocated to the balancing function available in Cycle 1 so that it could be used for injection.

On April 28, 2017, SoCalGas submitted a letter to the CPUC, CAISO, and CEC warning that above normal temperatures are predicted for summer 2017 and arguing that the conditions assumed in the 2017 Summer Assessment are too optimistic. SoCalGas stated that the non-Aliso storage fields had 40% less inventory than the previous year due to increased use in winter 2016-17 and limited spring injection. At these reduced inventory levels, withdrawal rates might be insufficient to support peak summer and winter demand. SoCalGas also maintained that if Aliso Canyon is used as a back-up, its withdrawal capacity could decline rapidly without new injection.

On May 8, 2017, the CPUC responded to SoCalGas' letter, directing the utility to file an expedited Advice Letter with a proposal for how it would increase storage injection. The proposal was required to include the following: minimum month-end storage targets, a forecast of the additional gas that the SoCalGas Gas Acquisition Department would need to procure to meet those targets, and an estimate of the cost to procure the additional gas on an accelerated timetable.

SoCalGas submitted Advice Letter 5139 on May 19, 2017. In it, the utility stated that it had already begun releasing 100,000 dekatherms (Dth) of gas allocated to the balancing function on Cycle 1 for injection and deferring maintenance not critical for safety or regulatory compliance. In addition, SoCalGas proposed to 1) set aside a portion of the injection allocated to the balancing function before the monthly Bid Week so that Gas Acquisition could obtain reliable, reasonably priced gas supplies for injection; 2) determine whether additional gas can be released for injection on Cycle 1 on the day before each flow day; 3) determine whether additional gas can be released for injection on Cycle 3 on the

morning of each flow day; 4) post injection capacity that exceed the actual physical injection capacity; 5) direct the Gas Acquisition Department to accelerate procurement of 3 Bcf of gas to meet summer inventory targets; and 5) create a memorandum account to track the costs of accelerated procurement, which were estimated to range from $1.5 to $3 million. Since the Gas Acquisition Department is legally precluded from communicating with the System Operator under normal conditions, the Advice Letter also proposed an Injection Enhancement Memorandum, which would expire on September 30, 2017, to determine how interactions between the two groups will be conducted to maximize storage injections.

The Indicated Shippers filed a response to Advice Letter 5139 on May 26, 2017, in which they noted that the proposal violates three settlement agreements and maintained that it would lead to more frequent High OFO events and receipt point capacity reductions. Resolution G-3529 was approved by the Commission on June 29, 2017. The resolution granted most of SoCalGas' requests but did not approve posting injection capacity above actual physical injection capacity.

Current Situation

As of June 1, 2017, 42 Aliso wells have successfully completed DOGGR testing and are available for service.[9] The remaining wells have been isolated from the field. Having completed these steps, on November 1, 2016, SoCalGas requested authorization to resume injections at Aliso Canyon.[10] That request initiated the review and inspection of the field. On February 1 and February 2, 2017, DOGGR and the CPUC held a public meeting in Woodland Hills to seek public comment on the findings from DOGGR's well safety review and proposed pressure limits. However, as of June 30, 2017, DOGGR has yet to make a determination about whether the storage field can operate safely and thus has not yet made a determination about allowing injection of gas at Aliso Canyon.

As of July 17, 2017, the estimated withdraw capacity was 1.570 Bcfd at non-Aliso gas storage facilities and .500 Bcfd at Aliso Canyon for a total system wide capacity of approximately 2.070 Bcfd. This is slightly above the 2.065 Bcfd target set forth by the

[9] The actual number of wells is subject to change and does not include wells that have passed DOGGR testing but have not yet been remediated by SoCalGas to be available for service. Additional wells may be approved and made available for service (pending the DOGGR/CPUC certification that the field is safe for use) in the near term and a well may be taken out of service if issues are identified. It is anticipated that additional wells will go through testing and, if approved, be incorporated into use pending the certification that the field is safe for use.

[10] Letter from Rodger R. Schwecke (Vice President, Gas Transmission and Storage, SoCalGas) to both Kenneth A. Harris Jr. (State Oil and Gas Supervisor, Division of Oil, Gas, and Geothermal Resources) and Timothy Sullivan (Executive Director, California Public Utilities Commission), "Safety Review for Underground Gas Storage Facilities at Aliso Canyon," November 1, 2016.

CPUC's March 16, 2017 letter. However, it was in line with SoCalGas's targets in AL 5139. SoCalGas expects to reach its AL 5139 targets for July and for the rest of the summer.

Authorization to inject would allow both withdrawing gas from and injecting gas into the field and for Aliso to be used to support operations and to manage reliability. However, there is significant uncertainty concerning injection and withdrawal capacity as well as the amount of inventory achievable over the short term at Aliso.

That uncertainty reflects questions including but not limited to concerns about:

- the performance of wells using tubing-only flow as required by Senate Bill 380 (Pavley, 2016), as opposed to flowing gas through tubing and casing;
- the performance of the Aliso Canyon field at low starting pressures;
- the performance of Aliso Canyon if further depleted;
- the impact of fluids at the bottom of the well that could lead to lower well performance;
- the lack of historical data about field-level operating performance at low inventory levels for an extended period of time; and
- the uncertainty as to whether the SoCalGas Gas Acquisition Department will be able to inject enough gas into the non-Aliso Canyon storage fields to meet the targets set out in Advice Letter 5139 despite frequently called High OFOs and receipt point capacity reductions.

Given the uncertainties noted above, the inventory level and availability of wells needed to support necessary withdrawals indicated in this report are subject to change as conditions change and new information becomes available.

APPENDIX A

Reliability-Related Public Comments to January 17, 2017, Aliso Canyon Working Gas Inventory, Production Capacity, Injection Capacity, and Well Availability for Reliability Revised Report pursuant to Public Utilities Code Section 715

Public Comments on Reliability: Aliso Canyon Working Gas Inventory, Production Capacity, Injection Capacity and Well Availability (Revised Report – Public Utilities Code Section 715, Energy Division 1/17/2017)	
Gary Saleba: EES Consulting For the County of Los Angeles	
Comments	Staff Response
EES comments/assessments regarding the need to utilize the Aliso Canyon gas storage facility. • Approval of gas injection in February 2017 would have no material impact on gas reliability for the period February through June • Mitigation measures and increased availability of hydro will reduce gas demand and provide greater generation such that withdrawals from Aliso 'should' not be necessary this summer. • There will not be enough wells available at Aliso Canyon to meet summer peak day demand. • Absent an unlikely extreme worst-case scenario, there should not be a need to withdraw gas from Aliso Canyon during the summer of 2017 • There is sufficient time to implement demand-side management and mitigation measures that will eliminate the need for 2017/18 winter withdrawals. • Withdrawals from Aliso can be made without additional injections using the 14.8 Bcf currently in Aliso. This supports the argument that there is no need to inject at Aliso.	The CPUC staff agrees with several overall aspects of the EES analysis. Most notably we agree that several mitigation measures have been successful in *helping* avoid the use of Aliso Canyon and that additional effort should be made to refine measures and implement new ones. The success of the mitigation measures was already incorporated into the analysis for this Draft Revised 715 Report. We also agree on the need to further refine the estimated impacts of mitigation measures, particularly those that impact electricity demand, and the May 2017 update of our Aliso Demand-Side Mitigation Efforts report will provide these refinements. However, we note that many EES assertions are not fully supported, and the probability (defined in the Technical Assessment) and consequences of the worst-case scenario presented as Scenario 4 in the Summer Technical Assessment are dismissed in the EES report. Additionally, the impact of mild winter and summer weather in 2016 and into 2017 was not acknowledged as an uncontrollable contributing factor to the ability to limit the use of Aliso Canyon. While the summer of 2016 was on average historically warm, there were only two weekdays where temperatures exceeded 90 degrees on the coast. Peak electric (and thus summer gas) demand generally occur during sustained heat events with multiple days above 90 degrees on the coast. Injections before June do not eliminate reliability risk during that period, however, if made they will lower the risk and the impact of a supply shortfall that could result in curtailments. Given limitations on how much can be injected on a particular day, injections in advance of the summer will allow for an inventory more able to support withdrawals if needed to meet summer peak. This reasoning also extends to the conclusion concerning the number of wells available. As noted in the Section 715 report, there are a number of combinations of inventory and wells that can yield differing results.

Public Comments on Reliability: Aliso Canyon Working Gas Inventory, Production Capacity, Injection Capacity and Well Availability (Revised Report – Public Utilities Code Section 715, Energy Division 1/17/2017)	
Gary Saleba: EES Consulting For the County of Los Angeles	
Comments	Staff Response
EES comments/assessments contd. • Various CPUC/CEC reports are confusing and fail to provide a complete picture of the mitigation measures and need for withdrawal. • Based on CPUC reliability studies the withdrawals on 1/24 and 1/25 were not necessary. • Impact of DR omitted and impact of all mitigations omitted. • Mitigation measures have been successful in preventing gas curtailments and forestalled the need for Aliso withdrawals.	Response to EES Comments/Assessments/Recommendations, contd. For example, generally the withdrawal capacity of a given well increases with the inventory in the field (up to a physically limited maximum). Thus, while a curtailment may not be able to be avoided, the risk is lowered and the depth of the curtailment could be mitigated. Hydro will have limited impact on local needs that drive electric generators (EG) demand for gas. The amount of impact is not yet known. There is no quantification/analysis in the EES report to support the statement that with increased hydro combined with other mitigation measures Aliso withdrawals 'should' not be required. There is an opportunity to identify potential new mitigation measures and implement them and to further refine existing measures in advance of next winter. However, those mitigation measure need to be active before we can 'eliminate' the need for withdrawals. This is particularly true given that there has been no apparent consideration of the possibility of more extreme weather than that experienced over the last two seasons. The EES statements concerning the availability of inventory to support multiple withdrawals do not consider the key relationship between the level of inventory and the ability to withdraw it at the rate required to meet demand. While there is inventory in Aliso that can be withdrawn, the analysis does not account for the fact that withdrawal capacity declines as inventory (and thus pressure in the field) declines. While only a limited amount of supply may be used on a particular day, the key metric is the ability to withdraw it with the speed needed to meet immediate short term and sustained periods of 3-4 hours of peak demand (typically occurring twice a day).

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Gary Saleba: EES Consulting For the County of Los Angeles	
Comments	Staff Response
Additionally EES comments made related to LADWP: • SCE or LADWP should consider pursuing demand responses *outside* of the LA Basin. • LADWP should expand its demand response program offerings to target residential customers • Measures should be put in place to assure that the Castaic pumped storage project's reservoir elevation is maintained during summer days with potentially high peak system demands. • Additional solar and wind generation should be expedited in southern California and incentivized with long-term contracts with the LADWP and SCE.	Response to EES Comments/Assessments/Recommendations, contd. As inventory decreases withdrawal rates decrease. The 715 report makes this clear, and the inventory levels indicated in that report and other CPUC reports are significantly driven by the withdrawal capacity needed to support demand, rather than the amount of inventory. The report specifically notes that during periods where peaks are lower, inventory can be managed lower, for example during the shoulder months of the spring. The CPUC is currently revising its assessment of the impact of mitigation measures with the goal of providing an ongoing accurate, consistent, and understandable method of defining and presenting those impacts. This information will provide more meaningfully data to evaluate the impacts of mitigation measures on the reliability risk and role of Aliso Canyon in meeting those needs. The intent is to incorporate the new data into the updated versions of the Section 715 report. The Section 715 Report did incorporate revised peak data as it relates to the 1-in-10 peak day. Those revisions lowered the amount of inventory needed to meet the peak. A reexamination of the 1-in-10 and 1-in-35 day reliability standards is beyond the scope of the Section 715 Report and would require a longer term formal proceeding to revise the current standards. The Aliso Canyon Risk Assessment Technical Report dated April 4, 2016, addressed summer risk. The Curtailment Risk Assessment section (pages 32-39) describes the methodology and outcomes of a risk assessment based on historical data. Page 37 of the report presents a 'forecast' of the likelihood/frequency with which each of the four scenarios could be expected to occur.

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Gary Saleba: EES Consulting For the County of Los Angeles	
Comments	Staff Response
EES provided a number of recommendations as part of its comments. These are summarized below: • Continue and expand 17 mitigation measures • Prepare a report detailing impact to date and anticipated new impacts and incorporating results into risk assessments • Re-evaluate the existing 1-in-10 and 1-in-35 planning criteria • Assess the probability of Scenario 4 identified in the Summer Technical Assessment.	Response to EES Comments/Assessments/Recommendations, contd. Responses provided by LADWP to EES comments regarding LADWP operations: The LADWP service area is the city of Los Angeles which is entirely within the LA Basin. As a result there is no opportunity for LADWP-related demand response outside of the basin. LADWP is currently developing a residential Demand Response pilot program along with its existing commercial program. Castaic Power Plant (CPP) is an important resource for LADWP. DWP plans and operates CPP to provide energy, flexible reserves necessary to reliably integrate renewables, and provide regulation and contingency reserves (spin and non-spin). CPP is and will always be energy limited as there are limitations to the working elevations at both Pyramid Lake and Elderberry tail bay. These limitations effectively limit the amount of energy that can be generated on any given day. DWP currently does coordinate the reservoir elevations to maximize CPP full capability, particularly in the summer. The good water year will have minimal impact on the overall daily capability of the plant as the lake elevations change quickly during full output, and daily water schedules into Pyramid will not make up the difference. Pumping can restore some of the capability for future days, but there is inadequate time and ability to fully restore the lake elevations to optimum levels by pumping. All maintenance to all DWP generation facilities is done in preparation for the summer run when loads are the highest. This includes Castaic. LADWP has added a significant amount of renewables throughout the last year and this year. They have contracts to build up to 150 MW more throughout the summer months.

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Name: Issam Najm, Ph.D., P.E.: Porter Ranch Neighborhood Council (PRNC)	
Comments	Staff Response
In the cover letter Re: Comments on the "Aliso Canyon Working Gas Inventory, Production Capacity, Injection Capacity, and Well Availability" and attached report, "Reliable Gas Delivery without the Aliso Canyon Gas Storage & Processing Facility" PRNC indicated its intent to address three main areas regarding the Section 715 report. These are: • The Volume Calculation – specific reference is made to limiting "supply" to 85% of capacity in the technical assessment, a storage volume of 18.2 Bcf at Aliso and the number of wells available for withdrawal at Aliso. • The Lack of Risk Analysis Component – i.e., consideration of the potential health risk and damage to the environment • The Status of the Facility – i.e., that Aliso Canyon only be maintained as an "emergency supply" facility	Of the PRNC three main areas of comment, only the first, "The Volume Calculation" is specific to the Section 715 Report. The report attached to the letter does not reference the Section 715 Report but provides analyses that dispute the need for additional inventory at Aliso Canyon. The PRNC report is the source of the eight recommendations (mandates). Section 715 of the Public Utilities Code requires that the CPUC provide a report that makes four specific and distinct determinations. These determinations concern the range of gas at Aliso (inventory), the amount of gas production (withdrawal capacity), the number of wells for production and injection and the availability of production wells. The required determinations are listed on page 1 of the report. Other than the first item, The Volume Calculation, the remaining two areas noted in the PRNC letter and the eight mandates in the accompanying report are beyond the scope of the Section 715 report. Some of the items raised are addresses elsewhere (e.g., retiring Aliso Canyon is subject to a proceeding, core balancing and forecasting will be addressed in an Application to the CPUC this September), and certain issues, such as consideration of health and environmental issues are the domain of other state and/or local agencies. CPUC staff disagrees with the specific statements concerning the Volume Calculation that state that SoCalGas could support a gas demand of 4.1 Bcf without the use of Aliso Canyon. The remarks comment on use of a receipt point utilization rate of 85% associated with a support level of 4.1 Bcf.

Public Comments on Reliability: Aliso Canyon Working Gas Inventory, Production Capacity, Injection Capacity and Well Availability (Revised Report – Public Utilities Code Section 715, Energy Division 1/17/2017)	
Name: Issam Najm, Ph.D., P.E.: Porter Ranch Neighborhood Council (PRNC)	
Comments	Staff Response
The report concludes (10.0 Moving Forward) with eight recommendations: 1. Mandate that SoCalGas develop better predictions of its gas demand, including hourly fluctuations. 2. Mandate that SoCalGas impose on itself the same core demand balancing as those imposed on non-core customers. 3. Mandate that SoCalGas maintain the same gas storage volume of 60 Bcf in its four fields as it had done between April and November 2016. This includes no more than 15 BCF in Aliso Canyon 4. Mandate that SoCalGas restrict its use of Aliso Canyon as an emergency supply only and only after maximizing its supply capacity. 5. Mandate that SoCalGas expeditiously replenish any gas it withdraws from its fields to restore them to the "emergency" supply volume of 60 Bcf noted above. 6. Mandate that SoCalGas provide full transparency on days that it withdraws gas from any of its storage fields. This should include an explanation for why the supply was not sufficiently adjusted to match its demand. 7. Mandate that SoCalGas design and implement the necessary measures to remove the hydraulic bottlenecks from its system. 8. Mandate that SoCalGas develop a clear and expeditious short-term roadmap to retiring the Aliso Canyon facility.	However as noted in the winter Technical assessment, historically receipt point utilization has been between 60 and 80%. The PRNC report appears to suggest that the utilization rate should be 100% of the sum of the highest historic utilization levels. Assuming 100% receipt point utilization ignores the very real risk that physical and market place circumstances out of the control of California entities (e.g., freeze-offs that limit the physical ability to produce gas on certain cold days and demand in other regions that may limit the availability of gas supply) will result in deliveries of less than receipt point capacity and any probability of an outage of any type on a high demand day. Additionally, the analyses suggest that SoCalGas could or should have brought in additional supply on those days when receipt point utilization was below 100%. This may not be possible. The analysis indicates that systemwide inventories significantly below 60 Bcf have been experienced without concern in the past. However, the analyses does not acknowledge that the extremely low historic inventory levels cited were remedied by significantly greater injection capacity than is currently available at Aliso Canyon and the fact that the low inventory levels were after very aggressive systemwide withdrawals (including withdrawals from Aliso) from inventory levels at the beginning January and in response to cold weather conditions. As indicated in the Section 715 Report, meeting summer reliability needs requires inventory levels above those indicated for winter. The PRNC letter and analysis does not consider nor challenge the summer requirements identified in the Section 715 Report.

APPENDIX B

Public Comments Concerning the DOGGR/CPUC Aliso Safety Presentation on February 1-2, 2017

On February 1 and February 2, 2017, DOGGR and CPUC held a public meeting in Woodland Hills to seek public comment on the findings from DOGGR's well safety review and proposed pressure limits. The CPUC submitted a presentation summarizing the CPUC's involvement and role.

On February 6, the County of Los Angeles submitted comments to the Division of Oil, Gas and Geothermal Resources in response to the Aliso Canyon Comprehensive Safety Review. While beyond the scope of the *safety* review, the County incorporated comments concerning the *reliability* of gas service. CPUC staff responses are below.

Los Angeles County Comments to DOGGR's Comprehensive Safety Review:

Los Angeles County Comment 1: Page 5, "Injection Should not be Approved Until After the CPUC Concludes its Legislatively Required Investigation to Determine the Feasibility of Minimizing or Eliminating Aliso Canyon. A. The CPUC Will Be Voting on Opening the Proceeding on the Future of Aliso Canyon and a Final Decision is Expected in Mid-2018."

The County requests that a decision on approving injections at Aliso Canyon be delayed until after the completion of this legislatively mandated CPUC process.

> ***CPUC Staff Response:*** *SB 380 (Pavley, 2016) acknowledges that Aliso Canyon could be needed for reliability in the short term and that changes could be made to the overall gas system in Southern California that could reduce or eliminate that need in the long term. The investigation referred to in comment "A" is the long-term study required under Public Utilities Code 714. Public Utilities Code section 715 addresses the requirement to assess short-term reliability issues by requiring the CPUC to issue a report that determines the range of working gas needed in the field to ensure reliability and for the CPUC Executive Director to order the utility maintain that specified range of working gas. The County does not provide any basis for why the directive in Public Utilities Code Section 715 should be ignored. Later comments suggest that mitigation measures are working, thus eliminating the need for Aliso as a reliability resource. These comments are best framed as suggesting that the 715 report should set the amount of need working gas needed for reliability at or near zero. Those comments are discussed further below.*

Los Angeles County Comment 2: Page 6, B. A Review by Engineering and Consulting Firm EES Demonstrates that the Success of Mitigation Measures in Reducing Gas Demand Provide Sufficient Time to Delay a Decision on Injection until After the CPUC Proceeding. The County further comments that "Based on the success of the mitigation measures in reducing gas demand, and recommended actions in EES's comment letter, it is EES's opinion that withdrawals from Aliso Canyon are very unlikely to be necessary between now and the end

of 2018. As a result, there is time to complete the CPUC feasibility proceeding and for all parties to have the benefits of that proceeding on the future of Aliso Canyon before authorizing re-injections at the facility."

> ***CPUC Staff Response:*** *We agree that mitigation measures were successful in reducing gas demand and that extension of and enhancements to these measures as well as the addition of new ones will further limit gas demand. However:*
>
> 1. *The Section 715 Report already accounts for the success of the mitigation measures.*
>
> 2. *EES does not consider the impact of a mild summer, in terms of peaking temperature which drives peak demand on the need for withdrawals. While the summer of 2016 was on average historically warm there were only two weekdays where temperatures exceeded 90 degrees on the coast. Peak electric (and thus summer gas) demand generally occur during sustained heat events with multiple days above 90 degrees on the coast. By ignoring a key driver of demand — temperatures (daily and hourly) — EES inappropriately attributes the lack of withdrawals solely to mitigation measures;*
> 3. *EES' analysis focused on balancing the gas system over a full day; in the summer gas storage is critical to meet hourly changes in demand caused by ramping of electric generation. While the joint agency Summer Analysis modeled hourly demand, EES did not;*

Los Angeles County Comment 3: Page 21, IX. Approval of Gas Injection Would Have No Material Impact on Gas Reliability for the Two Months Remaining this Winter because it Will be the Middle of February, at the Earliest, Before Any Injection Could Occur. A. Approval of Injection in the Near Term Would Not Materially Impact Gas Reliability For the Rest of the Winter.

> ***CPUC Staff Response:*** *This comment is now moot since the focus is on summer reliability and not winter.*

Los Angeles County Comment 4: Mitigation Measures are Proving to be Successful in Reducing Overall Demand for Gas and Gas Withdrawals Should not be Necessary During Summer 2017 or Winter 2017-18. The comments further note that higher hydro generation and the impacts of mitigation measures will eliminate the need to withdraw from Aliso Canyon. Further the comment states that even with injections there will not be sufficient wells available to meet peak day demand.

> ***CPUC Staff Response:*** *Due to electric transmission constraints, increased hydro generation will only minimally reduce the need for generation in the Los Angeles region, and those impacts will be addressed in updates to the 715 Report. We agree the mitigation measures will reduce gas demand, and the success of these programs is incorporated into* the Public Utilities Code Section 715 Report.

In addition to Los Angeles County's comments, there were three reliability related comments made during the February 1 and 2 Public Meetings:

Comment 1: Dr. Najm of the Porter Ranch Neighborhood Council stated that his own extensive analysis of the data makes clear that the natural gas delivery infrastructure can operate without Aliso Canyon.

> ***CPUC Staff Response:*** *Dr. Najm's analysis was submitted with a cover letter as comment to the CPUC mandated Public Utilities Code Section 715 report. A summary of the recommendations from that analysis and staff's response is provided in Appendix A.*[11]

Comment 2: Multiple people expressed their belief that the facility is not needed to meet California's energy needs.

> ***CPUC Staff Response:*** *The CPUC independently and jointly with the California Energy Commission, the California Independent System Operator, and Los Angeles Department of Water and Power conducted and made public multiple studies and analyses of the natural gas infrastructure. These studies and analyses identified the need for the use of the Aliso Canyon Gas Storage Facility to avoid curtailments and maintain public safety under conditions that have occurred and are reasonably expected to occur in the future. These studies have also been peer reviewed by Los Alamos National Laboratories.*
>
> *Specific information describing the operation of the gas system, demand, supply and the role of storage can be found in the Aliso Canyon Risk Assessment Technical Report, April 4, 2016; the Aliso Canyon Winter Risk Assessment Technical Report, August 23, 2016; the Aliso Canyon Action Plan to Preserve Gas and Electric Reliability for the Los Angeles Basin, 2016; the Aliso Canyon Gas and Electric Reliability Winter Action Plan, August 22, 2016; and the Aliso Canyon Risk Assessment Technical Report Summer 2017 Assessment, May 19, 2017. These and additional studies can be accessed on the CPUC website at: http://www.cpuc.ca.gov/aliso/.*

Comment 3: One commenter supported reopening of the facility following completion of tests in the interest of ensuring a reliable energy supply.

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[11] Correction: Based on Feedback on the 7/19/17 715 report, Comment 1 by Dr. Najm for the Porter Ranch Neighborhood Council has been corrected indicate that his letter and accompanying were timely submitted ;and remove a reference to support of the use of Aliso Canyon as an emergency facility. Dr. Najmdid not reference the use of Aliso as an emergency supply facility at the workshop. References to use as an emergency supply facility were included in the cover letter to his analysis and made in the context of an overall statement that the field should not be returned into service as an operating facility.

CPUC Staff Response: *As noted in the responses to comments 1 and 2 above, the CPUC and the joint energy agencies have conducted extensive analysis to determine and identify the risk of curtailments without the use of Aliso Canyon. Additionally, the CPUC and joint energy agencies have developed and implemented independently and with the cooperation of SoCalGas measures to reduce demand or otherwise limit the risk. The technical assessments and action plans as well as additional supporting analyses are available at the CPUC website at: http://www.cpuc.ca.gov/aliso/ .*