

PUBLIC UTILITIES COMMISSION
SAFETY AND ENFORCEMENT DIVISION



DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, & GEOTHERMAL RESOURCES

REQUEST FOR DATA AND WRITTEN INFORMATION

to

SOUTHERN CALIFORNIA GAS COMPANY

regarding

STANDARD SESNON 25 (API 037-00776) WELL LEAK

at

SOUTHERN CALIFORNIA GAS COMPANY'S ALISO CANYON NATURAL GAS
STORAGE FACILITY

PORTER RANCH, CALIFORNIA

as requested by

CALIFORNIA PUBLIC UTILITIES COMMISSION – SAFETY AND ENFORCEMENT
DIVISION

DEPARTMENT OF CONSERVATION – DIVISION OF OIL, GAS, & GEOTHERMAL
RESOURCES

this date

JANUARY 26, 2016

RESPONSE DUE BY:

FEBRUARY 1, 2016

Southern California Gas Company (SoCalGas) is required to submit the following data in electronic format. Where noted, the data shall be submitted in the format specified.

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DATA REQUEST NOTES:

Narrative – SoCalGas shall provide a written, graphical and photographic explanation as may be necessary, from SoCalGas staff, employees, supervisors, managers or subject matter experts historically involved with the operation of Aliso Canyon Field Storage Facility. Those record sources and witness sources shall be referenced in each response item.

Records – The following requests include any and all records and historical documents retained/inherited by SoCalGas acting as owner, operator, lessee/lessor, and/or manager transmitter/distributor of the Aliso Canyon Storage Facility (Site) properties facilities, and/or natural resources. Records include any and all physical documents, facsimiles, photographs, microfilms, bound records, books, electronic records, and graphical representations. Records include any and all recordings of information generated for the life of as such stated facility and/or property, including conception, prospecting, pre-construction, and supporting documentation. Records include any and all recordings of information retained at the Site and offsite, archived/stored offsite by a third party, and recordings in/under temporary or permanent possession/custody of another party.

Data – All data records shall be specified by source location: storage, electronic, on the Site, etc.... All records shall be available for examination and/or confirmation by CPUC Safety and Enforcement Division inspectors and/or DOGGR staff at the original record location source site upon request of the CPUC and/or DOGGR.

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THIS REQUEST IS FOR:

A. Detailed Well Data – “Standard Sesnon” 25 (SS-25) (API 037-00776)

1. All well records.
2. Complete history of well SS-25 from drilling to the date of the well failure; including, but not limited to, all permanent and non-permanent alteration of casing, all tubing, packer, subsurface safety valves, plugs, sliding sleeve, perforations, cementing and remedial operations, logs.
3. A description of all remedial operations, when conducted, and for what purpose. (include all non-permitted and permitted operations.) Provide copies of the daily report of well operations (engineer’s log) for each well operation.
4. Information on the current subsurface safety valve (SSSV) installed in the well.
 - a. Depth and date the current SSSV was installed. If the SSSV was installed in 1979, provide the history. If a SSSV was required, please provide documentation.
 - b. A recorded description of the purpose and function of the current SSSV. Document description of the current SSSV.
 - c. Manufacturers specification/design sheet of all SSSVs assemblies used historically on SS-25
 - d. The narrative reason for installation of a SSSV in SS-25.
 - e. Manufacturer’s specifications of the SSSV currently in the well.
5. Historical operational narrative overview of ALL SSSVs
 - a. Include original SSSVs installed or removed, decommissioned in place, replaced, and repaired.
 - b. Why are SSSVs installed in SS-25?
 - c. Manufacture specifications All SSSVs installed or removed, decommissioned in place, replaced, and repaired.
 - d. maintenance history and issues
 - e. Functionality or improvements needed
6. The operational history of the current SSSV, including maintenance history and any problems.
 - a. Whether or not the SSSV was functioning as designed prior to the well failure. If not, reason why.
 - b. Provide all correspondence between SoCalGas and DOGGR related to the SSSV since 1977.
7. Describe the operational design of injection and withdrawal mechanisms for well SS-25.
 - a. What was the injection/withdrawal plan for the past 10 years?
 - b. Was gas injected through tubing and packer?
 - c. Was gas injected through tubing and tubing/casing annulus simultaneously?

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- d. Describe the mechanism for gas withdrawal in well SS-25. Was gas withdrawn through tubing and casing?
 - e. Provide technical analysis for injection and withdrawal through the tubing/casing annulus. Why is this injection and withdrawal method used instead of tubing only? Was this method approved for injection? If so, provide documentation.
 - f. Describe the stress on the casing of annual cycles of injection and withdrawal through casing?
8. Casing diagram detailing the physical condition of the well at the time of the well failure (October 23, 2015) including all subsurface equipment, tubing, packers, subsurface safety valves (SSSV), sleeves, etc.
- a. Details should include, and not limited to: size and depth of holes, casing, tubing, packer, perforations, casing centralizers, cement ports, cement, fish, stubs, plugs, etc. Casing diagram shall include the location of corrosion, well failures, repairs, remedial cementing operations, base of fresh water, base of USDW, lost circulation zones, tops of formations, markers, faults, etc.
 - b. All data shall be clearly marked on the wellbore drawing and at a scale that is proportional and easy to read. The wellbore diagram shall be in pdf format no less than 300dpi.
 - c. Detailed information should be listed in a column next to the wellbore schematic.
9. Details of surface wellhead, pressure gauges, and valves, and their function. Include:
- a. Wellhead equipment schematics, include manufacture’s specifications.
 - b. Recent, within 3 years, wellhead equipment changes
 - c. Type and purpose of safety valves. Their testing schedule and results of tests.
10. History of all well leaks, surface and subsurface, since SS-25 was placed on production and later on injection/withdrawal.
- a. Provide depth of casing collars, and problems with casing threads.
 - b. Documentation of the location of the leak on the 7” casing and cause.

B. Abnormal Conditions Data – “Standard Sesnon” 25 (SS-25) (API 037-00776)

1. A narrative identifying, describing and analyzing any problems encountered during operational history of the well.
2. Any casing failures, ruptures, holes, corrosion and their location on the well.
3. History of all well leaks, surface and subsurface, since SS-25 was placed on production
4. Records of history of safety concerns, near misses, upset conditions, outside forces near misses, incidents, failures or any concerns for the operational safety and integrity of SS-25.

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C. Construction - SS-25, S-25A, SS-25

1. For well sites SS-25, S-25A, SS-25, provide any and all design and construction records for since well inception.
2. SS-25, S-25A, SS-25B: Provide any and all well drilling logs since well inception
3. SS-25: Provide any and all well packer seating and unseating(s), changes, reworks, replacements, etc., whether required for DOGGR inspection or not.

D. Tests

1. All mechanical integrity tests run on well SS-25 since 1976, including, but not limited to, casing pressure test, noise logs, temperature logs and radioactive tracer surveys. Include whether or not each test was required by DOGGR.
 - a. Provide the date of each MIT run and results of the test. Include all Temperature and noise logs for SS-25; include an explanation of all acronyms used. Include the smoothing and sample rate of each log. If available, provide the temperature logs in ASCII/LAS files.
 - b. Provide records of MIT evaluations for SS-25.
 - c. Provide all documentation of monitoring from 1979 to October 2015. (Refer to remarks on the 1989 temperature survey.)
 - d. In the 1989 temperature log there is an anomaly. Provide information on the anomaly and steps taken to identify the cause. Describe the relationship between the anomaly and the SSSV in the well at the time.
 - e. In 1991 noise log there is reading. Provide record information on the anomaly and record of steps taken to identify the cause and further investigation and/or mitigation. Describe the relationship between the anomaly and the SSSV in the well at the time.
2. All mechanical integrity tests run on gas storage wells, including idle and abandoned, located within 1/4 mile of well SS-25, and the results of the tests. If available, provide the tests in ASCII/LAS files.
 - a. What was the required frequency for conducting temperature surveys and other MITs?
 - b. What were the reasons for running a particular type of survey?
 - c. What is the frequency for measuring annulus pressure? Provide a history of annulus pressures.
 - d. What is the requirement for running noise logs and radioactive tracer (RA) surveys? Provide a history of noise logs and RA surveys.
 - e. What is the required frequency of reservoir shut-in periods to measure static bottom-hole pressure? Provide a history of reservoir shut-in period and static bottom-hole pressure measurements.

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- f. Who runs and provides oversight of the MIT field test? What are their qualifications?
 - g. How MITs were evaluated during and after the field test (provide any written report).
 - h. For failed or questionable MITs, at what depth and date were anomalies determined?
 - i. Were wells remediated if the MIT failed? If DOGGR was notified, please provide date, contact person, and type of communications.
 - j. Most recent fluid levels for wells within ¼ mile of SS-25. Include the method used to determine fluid level.
 - k. Data detailing pressure communication between wells.
 - l. Any data collected or study conducted by SoCalGas on the effects of wells subject to expansion and contraction during gas cycling in Aliso Canyon Gas Storage project. Provide findings and recommendations for evaluating integrity of wells in the project and risks of long term use of wells.
3. Tests for corrosion potential of all fluids encountered in well SS-25 and corrosion management plan incorporated into the design and operation of wells in the GS projects with 1 mile of well SS25.
 4. SS-25, S-25A, SS-25B: Provide any and all well water noise logs in scale readable format (1"=200)
 5. SS-25, S-25A, SS-25B: Provide any and all well water temperature logs in scale readable format (1"=200)
 6. SS-25, S-25A, SS-25B: Provide any and all well ion logs in scale readable format (1"=200)

E. Injection Pressure

1. Surface injection pressure (preferably daily) and flow rate for well SS-25 for the past 10 years.
 - a. Wellbore deviation angle (from directional survey)
 - b. Pipe inside diameter
 - c. Temperature of the gas injected at the surface
 - d. Reservoir temperature and depth
 - e. Gas gravity
2. For SS-25, is the pressure gauge permanently installed or portable type? Please provide calibration schedule and any calibration documentation.
3. Did SS-25 well ever inject above MASP? What is the design pressure limit of the reservoir, wells, and wellhead?
4. For the monthly surface injection pressure data for gas storage wells, submitted to DOGGR:

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- a. How is the rate calculated? Is it based on 30-day average?
- b. Is the Tubing or Casing pressure?
5. Provide daily and monthly injection tubing and casing pressure and rate for SS-25 since initial injection.

F. Gas Storage Monitoring Program:

1. Provide a copy of the gas storage project well monitoring program.
2. Has the monitoring program changed over time? If so, describe the changes.
3. SS-25: Provide any and all well pumping logs for life of well

G. Communication History:

1. All correspondence between SoCalGas and the DOGGR Ventura district office, related to Aliso Canyon GS project, including, but not limited to, field inspections, well integrity testing, rework operations, notices, permits, removal and installation of the SSSV and the sliding sleeve.
2. Provide dates MIT survey results were submitted to the DOGGR Ventura office since 1989.
3. How did SoCalGas communicate with DOGGR before, during, and after running MITs for GS wells? If DOGGR was notified, please provide date, contact person, subject, and type of communications (e-mails, letters, phone-calls, etc.).
4. Provide list of communications (e-mails, letters, and phone calls) made by SoCalGas to the DOGGR Ventura district office specific to the SS-25 well failure, prior to start of remedial operations. Include the date, time, subject, contacts and message.

H. Operations and Maintenance:

1. SS-25, S-25A, SS-25B: Provide any and all maintenance, repair and improvement records since well inception
2. SS-25, S-25A, SS-25B: Provide any and all well Operations and Maintenance records since well inception
3. SS-25, S-25A, SS-25B: Provide any and all well related management directives, analysis, investigations
4. SS-25, S-25A, and SS-25B: Provide any and all well water circulation, fluid levels, and annular reading records for life of each well.
5. SS-25: Provide any and all well records cathodic, sacrificial plan and corrosion monitoring records of life of well
6. SS-25: Provide any and all well cathodic, sacrificial plan and monitoring records of life of well
7. SS-25: Provide any and all well fluid compatibility records of life of well

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8. SS-25: Provide any and all well fluids, formation fluids, corrosion due to fluid monitoring records of life of well

I. Materials

1. Explain and show historical documents that convey procedures for:
 - a. Provide record of review for integrity of SS-25 casing, concrete casing for well surface casing and production casing as inherited by SoCalGas circa 1973.
 - b. Provide record of review for inherited surface casing, circa 1973 forward, establishing set elevation as functionally sound set at approximately 990’.
 - c. When setting casing, what determines the set depth? Provide a specific example sourced from records you provide to us as requested elsewhere, herein.
 - d. How does the depth depend on the loss of circulation? [SS25.RPT.20160118.WH-01.29]
 - e. Explain difference between casing material wt.42-47#/T&C/H-40/J-55
 - f. What is grade(s) of steel are presently used for outer casing?
 - g. If different from aged wells, when did the industry change and why (cite all factors, technology/reference new codes and regulations/new standards of practice)?
2. Explain the historical mixing and setting of casing mix. [DR] SS-25, S-25A, SS-25B
 - a. 1 dry sack of Diamix(or equal) cement = (equals) how many cf wet (casing) cement mix.
 - b. Neat cement same?
 - c. Installation/pumping records
 - d. Specify equipment used, hose size to install casing cement
 - e. Hole fill methodology; how is the cement mixture installed based on casing depth?
3. Provide narrative identifying, analyzing and describing “sidetracking a hole” in gas and oil terms? Provide records referenced to complete narrative.
 - a. Identify historical narrative of events of this occurring in SoCalGas drilling operations on SS-25, SS-25A, SS-25B since inception of these wells.
 - b. Identify elevations of occurrence.
 - c. What corrective actions took place?

J. Well Life

1. SS-25 historical decommission plans and monitoring
 - a. Prior to October of 2015, provide records of how well was to be permanently inoperable and sealed.
 - b. Provide narrative and records of projected well abandonment plan.

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2. Provide evaluation records of well facility as inherited. What expected lifespan was given based on the age of well, former operation as an oil well.
3. Provide record of well diagnostics at time of SoCalGas conversion. Condition of casings, concrete, corrosion, etc.
4. Provide monitoring, cleaning and pumping records of storage sands, tag sands, fill sands, etc.
 - a. Provide diagnostics and analysis of sand draw
 - b. Provide critical events signaling beginning well decommissioning phase.

K. Geology-Topography

1. Provide all recorded seismic event records at Site SS-25, SS-25A, SS-25B since inception
2. Provide all seismic event related inspections at Site SS-25, SS-25A, SS-25B.
 - a. Standard SoCalGas inspections
 - b. Third party inspections
 - c. Contractors – tools used, contracts, scope of
 - d. Expert consultants – scope, reports
3. Provide records for all seismic repairs and replacements
4. Provide all topographic surveys at SS-25, SS-25A, SS-25B.
5. A type log showing the character and depth of the formations, formation tops, marker beds, correlations, fault picks, other geologic features.
 - a. Preferably on an SP and resistivity curve.
 - b. Include Gamma Ray, density, neutron, and sonic curves, if available.
6. All logs, including but not limited to, e-logs (SP and resistivity), gamma, and density neutron, in pdf (300dpi). If available, log data in LAS format on an excel spreadsheet, of any e-log and gamma ray logs run on the SS-25 well or any wells in the vicinity. All logs shall have elevation references, preferably in mean sea level.
7. Geologic structure map of the area within a 1 mile radius of well SS-25, including faults, and other geologic features.
8. Geologic cross-section clearly detailing the geology, formations, structure, faults, and identifying base of freshwater, base of USDWs, all oil and gas bearing zones, and wells. The cross-section shall be drawn incorporating the SS-25 well and include the gamma or elog traces used for correlation.
9. Contour map (1 mile radius of well SS-25) of the top of the gas storage reservoir (Sesnon Frew formation).
10. Isopach map of the gas storage reservoir extending in a 1 mile radius of well SS-25.
11. A surface map identifying all (active and inactive) wells within a 1 mile radius of well SS-25, labeled with the API number and current operational status, such as: OG (oil/gas producer), GS (Gas storage), idle, abandoned, OB (observation), WF (water flood), WD (water disposal). Including any other wells types not listed.

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12. Was SS-25 affected by the Northridge earthquake? What analysis was conducted to evaluate whether the earthquake affected the well. Were any wells in the area affected?
13. All maps and cross-sections shall include direction, scale, elevation and references clearly marked. Submitted in electronic pdf format (300dpi) so it can be expanded without blurring details. Most useful scale must show locations and distances accurately and small enough to read data for the purpose it was intended.
14. Provide reports of all Geotechnical studies conducted in the Aliso Storage Reservoir
15. Provide SCG analysis of the study and subsequent actions
16. Provide any and all water level/circulation log records for SS-25, SS-25A, SS-25B

L. Timing of Response

Provide all answers and responsive records on a rolling basis, as they are completed or identified. If SoCalGas is unable to complete its response by February 1, 2016, explain the reason that additional time is needed and identify the date when SoCalGas expects to complete its response.

[END]