

The Aliso Canyon gas storage field and the Santa Susana earthquake fault: is there a hazard?

An independent geologic evaluation of the Santa Susana earthquake fault at the Aliso Canyon gas storage field is still needed despite the State's determination that the field is safe for gas storage. No consensus exists on the fault hazard and risk as outlined in recent LA County vs State of California legal actions. Neither the State nor SoCal Gas has sufficiently addressed the hazard created by all the wells at the field crossing the fault in the subsurface. Could future fault movement damage many wells and release methane gas to the surface, creating a significant risk to public safety, the environment, and energy supplies worse than the massive 2015-16 blowout? Neither the State nor SoCal Gas has shown this is impossible or offered a mitigation and safety plan if it is a possibility.

The State and SoCal Gas claimed there is no safety issue, but published geologic research shows the fault has a high movement-rate over recent geologic time, meaning it has likely experienced more frequent, large earthquakes relative to most other faults in California. The State claimed that LA County was relying on "the vague possibility of a future, hypothetical catastrophic earthquake," to oppose gas injection but this claim is inconsistent with the geologic facts. Rather, the geology shows the fault hazard is neither vague nor hypothetical but is unique and clear, and needs further independent research. Perhaps the State was relying on SoCal Gas' submitted Storage Risk Management Plan #2 of 10/11/2016 (an incomplete and misleading document that seems SoCal Gas' only publically available response to the hazard).

The people of LA County for 40 years of Aliso's operation have not been informed of the fault hazard and risk. Regulators, plus SoCal Gas and its consultants, have had ample time, and in some cases the responsibility to address such a threat. In response to the 2015-16 blowout, the State's Division of Oil and Gas and Geothermal Resources (DOGGR) and the Public Utilities Commission, and nationally, the Pipeline and Hazard Materials Safety Administration (PHMSA) seem ready to adopt new regulations more appropriate for Texas than seismically active California. Recommended Practices (RP) 1171 developed by the American Petroleum Institute for gas storage wells and fields declares "Depleted hydrocarbon reservoirs are candidates for natural gas storage because the reservoir integrity has been demonstrated over geologic time by hydrocarbon containment at initial pressure conditions." True, except gas wells have not existed over geologic time and are a weak link if subjected to fault movement. RP 1171 insufficiently deals with the faulting hazard in the seismically prone areas of the US: In its 60-pages, faulting is mentioned once, earth movements twice and active faults never. Contrast this with the United

States Nuclear Regulatory Commission's entire publication devoted to earthquake and fault hazards: [Seismic and Geologic Siting Criteria for Nuclear Power Plants](#). PHMSA now proposes that RP 1171 be mandated for the nation's gas storage wells, and DOGGR proposes it for California.

Did the State rely on its in-house fault hazard experts, the California Geologic Survey (CGS), for any advice or to support its court claims? State law, via the Alquist-Priolo and Fields Acts, and enforced and advised by the CGS, ban or limit construction of habitable structures and schools over portions of the Santa Susana fault. An odd regulatory situation has emerged that recognizes fault rupture hazard at the earth's surface but not high-pressure gas wells crossing faults in the subsurface: an untenable position with respect to geology where surface rupture is derived from subsurface fault movement coming from a deeper earthquake source. Fault hazards have become restricted by regulatory definition, rather than geology determining what is a hazard, and this undermines public safety.

One important lesson learned from the blowout at Aliso was that subsurface problems in gas wells can be much more difficult to control than leaks in surface pipelines. Yet the earthquake faulting hazard at the surface is regulated and the subsurface faulting hazard to gas wells remains mostly ignored and unregulated. The State also claims that Aliso has received more scrutiny than any facility in the US. This may be true for engineering, but may also indicate a limited scrutiny of the geology of other storage fields, especially in seismically prone areas. Regardless, LA County is yet to see a truly independent geologic evaluation of the hazard and risk posed by the Santa Susana fault to the Aliso facility and that and its regulatory history should be of paramount concern to the county's residents.

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