

Kansas Administrative Regulations

Kansas Corporation Commission

Article 3.—Production and Conservation of Oil and Gas

82-3-1212. Operation, monitoring, and measurement requirements for cavern storage wells.

(a) Each operator shall monitor each cavern storage well according to the storage well integrity plan signed by a licensed professional engineer and a licensed professional geologist. The operator shall submit a storage well integrity plan that includes information required by, and demonstrates compliance with, subsections (b) through (n).

(b) Each operator shall monitor the quality of the air to be injected into each storage well before the commencement of storage operations and at least once every 90 days after operations have commenced. The operator shall test for fuel-fired turbine exhaust contaminants, water, and moisture.

(c) Each operator shall report the monitoring results for each cavern storage well to the conservation division, on a form provided by the conservation division, annually on or before April 1.

(d) Each operator shall monitor cavern storage wells daily. If the cavern storage wells consistently operate in a manner that appears to be protective of public safety, usable water, and soil, monitoring according to a time frame based on the air injection and withdrawal cycles may be allowed by the director.

(e) Each operator shall include in the storage well integrity plan descriptions of the equipment, processes, and criteria used to determine the pressure, temperature, water and moisture content, total volume, and air flow rate. Each operator shall report any change in the equipment, processes, and criteria by submitting updated descriptions to the conservation division within 30 days after the change.

(f) Each operator shall install, within 30 feet of the electrical generating facility or at each cavern storage well, equipment including any alarm and safety device that prevents the injection of water and moisture.

(g) Each operator shall equip each cavern storage well with sensors and safety devices to continuously monitor the well and prevent the well from operating outside of the allowable operating limits for pressure, temperature, water and moisture, total volume, and air flow rate. If the cavern storage well is constructed with tubing and a packer, the sensors and safety devices shall also monitor the pressure in the annulus between the casing and tubing for any unexpected increase or decrease in pressure.

(1) The sensors shall be capable of recording maximum and minimum values during a 24-hour period.

(2) Each operator shall submit any monitoring data, including historic continuous monitoring, to the conservation division within 48 hours of a request by the conservation division.

(h) Each operator shall ensure that any cavern storage well conforms to the maximum allowable operating pressure according to the following requirements:

(1) The operator shall perform a site-specific geomechanical core analysis of the fracture gradient that is calibrated to the open hole log for each storage well and determines mechanical rock properties for the bedded salt formation.

(2) The operator shall not subject the cavern to pressures in excess of the maximum allowable operating pressure associated with abnormal operating conditions, including pressure pulsations from the electrical generating facility.

(3) No operator shall allow the maximum allowable operating pressure or test pressure to exceed the lower of either 80 percent of the fracture gradient for the cavern measured in PSIG or 0.8 pounds per square inch per foot of depth, measured at the higher elevation of either the casing seat or the highest interior elevation of the cavern roof.

(i) If underground communication exists between cavern storage wells due to fracturing or coalescing, each operator shall immediately plug all cavern storage wells that are in communication according to a plugging plan submitted pursuant to K.A.R. 82-3-1219.

(j) Each operator shall operate any cavern storage well according to the minimum allowable operating pressure according to site-specific geomechanical studies from core

analysis or any representative offset operating history, including any site-specific geomechanical core analysis for LPG, natural gas, or crude oil storage facilities.

(k) Each operator shall operate any cavern storage well within the injection and withdrawal rates and based on casing and tubing limitations, the placement of any production tubing and packer in relation to the salt roof, the stability of the cavern, and the flow rate requirements for the electrical generating facility.

(l) Each operator shall operate each cavern storage well at or below the maximum wellhead temperature based on the natural thermal gradient of the cavern, air temperature variations due to injection and withdrawal operations, heat transfer across the storage cavern wall, and core analysis of the bedded salt formation.

(m) The wellhead injection temperature and the normal thermal gradient of the salt formation shall be in a range that will not significantly increase the time-dependent salt creep of the bedded salt formation.

(n) The operator shall develop an inventory balance plan, as part of the cavern storage well integrity plan, that demonstrates the maximum air injection or withdrawal volume from each storage well. The inventory balance plan shall include the cushion air and working air volumes. The operator shall reevaluate the inventory balance plan whenever monitoring, testing, or logging data indicate that a change in cavern volume has occurred.

(Authorized by and implementing K.S.A. 2011 Supp. 66-1274; effective Dec. 21, 2012.)

***** Authenticated Kansas Administrative Regulation *****