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OCC DIRECTIVES CHANGING DISPOSAL WELL OPERATIONS IN EARTHQUAKE AREAS

Directives issued by the Oklahoma Corporation Commission's Oil and Gas Conservation Division (OGCD) in March have resulted in significant changes in the operation of the oil and gas wastewater disposal wells viewed by researchers as having the highest potential for causing triggered seismicity.

The primary focus is on high-volume wells found to be disposing below the Arbuckle formation in earthquake areas. There is broad agreement among seismologists that injecting below the Arbuckle poses the highest potential risk of triggering earthquakes in Oklahoma. The Arbuckle formation encompasses almost all of Oklahoma, and is the most commonly used formation for disposal well operation.

To date, under the directives:

- More than 50 disposal wells have had to shut down operations and reduce total depth to provide disposal into only the Arbuckle formation to mitigate the potential risk. *
- Approximately 150 other disposal wells have reduced their volumes by 50 percent.*
- Other wells are keeping volumes below 1,000 barrels a day.

*Totals are revised regularly as response continues.

OGCD director Tim Baker said while the response to the directives has been positive, much more remains to be done.

"While our primary concern is the high-volume wells wastewater disposal wells because they pose the greatest potential risk, the lower-volume Arbuckle wells are also subject to the same directives and must be addressed," Baker said. "It's also important to understand that these

actions are based on quickly addressing the areas of highest potential risk as defined by the research. We continue to work with the Oklahoma Geological Survey and other researchers on this critical issue and our ‘traffic light’ system. All options available to us to address this are on the table. There is no issue more important to us.”

The “traffic light” system was first put in place in 2013 in response to the concerns over the possibility of earthquake activity being caused by oil and gas wastewater disposal wells in Oklahoma. It has been in a state of constant evolution since then, as new data becomes available.

Other elements of the traffic light system include:

- Required seismicity review for any proposed disposal well.
 - Those proposed wells that do not meet “red light” (stop) standards but are still of concern:
 1. Must have public review
 2. Permit is temporary (six months)
 3. Permit language requires:**
 - a. Seismometers
 - b. Shut down if rise in background seismicity or there is a defined seismic event
 - c. Shut in and perform reservoir pressure testing every 60 days
- Weekly volume reporting requirements for and close scrutiny of all disposal wells in an Area of Interest (AOI):
 - AOI now defined as a 10 kilometer area (more than 100 square miles, depending on size and shape) with the center mass of an earthquake “cluster” serving as the center point.
- Rules increasing the required recording of volume from disposal wells that dispose into the Arbuckle formation (the state’s deepest injection formation) from monthly to daily recording.
- Rules requiring Mechanical Integrity Tests for wells disposing of volumes of 20,000 barrels a day or more have increased from once every five years to every year, or more often if so directed by the Commission.

Again, none of these elements should in any way be viewed as a final step. The traffic light system will continue to evolve.

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All OCC advisories and releases are available at www.occeweb.com

Editors, Producers: See www.occeweb.com for maps, directives and other information on earthquake response