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Governor Mary Fallin Says USGS Earthquake Hazard Map Shows State Regulators Are Taking Correct Action

OKLAHOMA CITY — Governor Mary Fallin today said the first-ever map developed by the United States Geological Survey (USGS) showing potential ground-shaking hazards from both human-induced and natural earthquakes illustrates why action taken earlier this year by the Oklahoma Corporation Commission (OCC) was necessary.

Researchers say the state's rise in earthquakes is caused by the disposal of produced saltwater deep into the Arbuckle formation. The OCC, which has constitutional authority over oil and natural gas activity in the state, is following the recommendation of researchers and is continuing to work with operators to significantly reduce the overall disposal of produced water into the area of seismic interest within the Arbuckle formation area to 40 percent below the 2014 total.

The OCC last month issued a wide-ranging directive to saltwater disposal well operators in areas experiencing earthquakes. In the past year, regulators have issued more than a dozen directives to disposal well operators to limit activity or shut down in areas of earthquakes.

"Recent declines in produced wastewater disposal in Oklahoma are not reflected in the USGS map," Fallin said. "This gives us even a stronger base in going forward and gives state regulators further justification for what they are doing."

Today's USGS report, which used earthquake data from 2015, states that some places in Oklahoma may experience damage if the induced seismicity continues unabated.

"Oklahoma remains committed to doing whatever is necessary to reduce seismicity in the state. The report supports the actions that we are taking," said Fallin, who in 2014 formed

the Coordinating Council on Seismic Activity, which organizes state resources and related activities to address Oklahoma's earthquakes.

She said the USGS report will be reviewed to evaluate how recommendations can be included into the state Emergency Operations Plan and ongoing preparation efforts.

The governor, during a meeting with her Cabinet secretaries earlier this month, discussed how the state would respond to a large-scale seismic event. Fallin asked Department of Emergency Management Director Albert Ashwood to lead a statewide working group to develop an earthquake response plan.

Ashwood and several agency directors held their first meeting this morning.

"In Oklahoma, we recognize the importance of being prepared for all types of disasters that could affect the state, including earthquakes," Ashwood said. "The Oklahoma Department of Emergency Management is reviewing the report released today by the United States Geological Survey to determine how it may aid our catastrophic earthquake planning efforts. However, it is important to note that for emergency management, the cause of a disaster is not as critical as the outcome of the event and how it impacts our residents, infrastructure and communities. Preparing for, responding to, recovering from and mitigating against those outcomes will continue to be our focus."

Oklahoma Energy and Environment Secretary Michael Teague said the USGS report released today highlights why action has been taken to address induced seismic risk in the state of Oklahoma.

"The Oklahoma Corporation Commission's work to further reduce the overall disposal of produced water into the Arbuckle Formation is in line with researchers from across the country as the best way to lower the potential for seismic hazard highlighted in the USGS report," he said.

For more information on earthquake preparedness, visit <http://earthquakes.ok.gov/earthquake-preparedness>

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Oklahoma's Response to Earthquakes

- Researchers largely agree that wastewater injection into the Arbuckle formation

poses the largest potential risk for earthquakes in Oklahoma. Most of the wastewater comes not from hydraulic fracturing operations, but rather from producing wells. The water exists in the producing formation and comes up with the oil and natural gas.

- The Oklahoma Corporation Commission's Oil and Gas Conservation Division (OGCD) took its first action on Arbuckle disposal wells regarding earthquakes concerns in September 2013, resulting in one well shutdown and the prevention of the startup of another. There are currently 27 Arbuckle disposal wells shut in as a result of OGCD actions.
- In early 2015, new research and data provided the basis for a switch from isolated actions on individual wells to larger plans covering more square mile and wells, resulting in plans that have reduced total disposed volume in earthquake areas by more than one million barrels a day over 2014 levels.
- The volume reduction area currently covers about 11,000square miles, and a 15,000-square-mile "Area of Interest" (AOI) has been established.

Latest Actions

- March 7, 2016 – Central Oklahoma Regional Volume Reduction Plan and Expansion of Area of Interest

<http://www.occeweb.com/News/2016/03-07-16ADVISORY-AOI,%20VOLUME%20REDUCTION.pdf>

- February 16, 2016 – Western Oklahoma Regional Volume Reduction Plan:

<http://www.occeweb.com/News/2016/02-16-16WesternRegionalPlan.pdf>

- January, 20, 2016 – Medford, Byron-Cherokee areas**: Sandridge Energy - 8 wells to stop disposal, 9 wells to be used by researchers. 36 wells to reduce volume. Total

volume reduction: 191,327 barrels/day, (40 percent). A barrel is 42 gallons.

**Supersedes Sandridge Energy portion of plans issued 12/3/15.

<http://www.occeweb.com/News/01-20-16SANDRIDGE%20PROJECT.pdf>

- January 13, 2016 - Fairview area: 27 disposal wells to reduce volume. Total volume reduction for the area in question: 54,859 barrels a day or (18 percent). <http://www.occeweb.com/News/01-13-16ADVISORY.pdf>
- January 28, 2016: Governor Mary Fallin approved the transfer of nearly \$1.4 million in emergency funds to fully fund the requests of the Oklahoma Corporation Commission and the Oklahoma Geological Survey to receive additional support for their research and response to earthquakes. Click [here](#) for a copy of the press release.
- January 4, 2016 - Edmond area: 5 disposal wells to reduce volumes by 25 to 50 percent. Wells 15 miles from epicenter to conduct reservoir pressure testing. (Two disposal wells ceased operation as part of the action). <http://www.occeweb.com/News/01-04-16EQ%20ADVISORY.pdf>
- December 3, 2015 – Byron/Cherokee area: 4 disposal wells shut-in, volume cuts of 25 to 50 percent for 47 other disposal wells. **

http://earthquakes.ok.gov/wp-content/uploads/2015/10/12-03-15BYRON-CHEROKEE_MEDFORD.pdf

**see 01-20-16 plan for changes

- December 3, 2015 – Medford area: 3 disposal wells shut-in and f cuts of 25 to 50 percent in disposed volumes for 19 other wells. The total net volume reduction for the area in question is 42 percent <http://earthquakes.ok.gov/wp->

[content/uploads/2015/10/12-03-15BYRON-CHEROKEE_MEDFORD.pdf](http://www.occeweb.com/uploads/2015/10/12-03-15BYRON-CHEROKEE_MEDFORD.pdf)

- November 20, 2015 – Crescent: 4 disposal wells shut-in, 7 others reduce volume 50 percent.

<http://www.occeweb.com/News/11-20-15CRESCENT%20ADVISORY.pdf>

- November 19, 2015 – Cherokee: 2 disposal wells shut-in, 23 others reduce volume 25 to 50 percent.

<http://www.occeweb.com/News/CHEROKEE%20ADVISORY-VOLUME,%20OPERATOR.PDF>

- November 16, 2015 – Fairview: 2 wells reduce volume 25 percent, 1 well stop operations and reduce depth.

<http://www.occeweb.com/News/11-16-15FAIRVIEW%20and%20MAP.pdf>

- November 10, 2015 – Medford: 10 wells reducing volume disposed 25 to 50 percent.

<http://www.occeweb.com/News/11-10-15MEDFORD02.pdf>

- October 19, 2015 – Cushing: 13 wells either ceasing operations or cutting volume disposed 25 percent.

<http://www.occeweb.com/News/10-19-15CUSHING%202.pdf>

- August 3, 2015 – Volume cutback plan for area that includes portions of northern Oklahoma, Logan, Lincoln, and Payne counties. Goal is to bring total disposed volume in area to 30 percent below 2012 total (pre seismicity). Plan covers 23 wells.

<http://occeweb.com/News/08-03-15VOLUME%20ADVISORY%20RELEASE.pdf>

- July 28, 2015 – Crescent: 2 wells shut in, 1 reducing volume 50 percent.

<http://www.occeweb.com/News/Crescent%20wells.pdf>

- ** July 17, 2015 – Directive for 211 disposal wells in the Arbuckle to check depth. Must prove that that depth is not in communication with basement rock, or a plug back operation is completed to bring the bottom of the well at least 100 feet up into the Arbuckle. <http://www.occeweb.com/News/DIRECTIVE-2.pdf>
- ** March 25, 2015 – Directive for 347 wells in the Arbuckle to check depth, etc.

<http://www.occeweb.com/News/2015/03-25-15%20Media%20Advisory%20-%20TL%20and%20related%20documents.pdf>

** To date, the July 17 and March 25 directives have resulted in 224 wells plugging back (i.e., reducing depth), and 14 wells reducing their disposed volume by half.

Some other actions taken:

Beginning in 2014, all applications for Arbuckle disposal wells in an AOI required to go through a seismicity review and a public court hearing process. No administrative approval is allowed. Any permit that may eventually be granted is only good for six months and well can be shut in at any time because of seismicity concerns. Monitoring for seismicity and other requirements are also placed on the wells.

All Arbuckle disposal wells operating in an “Area of Interest” have to record daily and report weekly their volumes and pressures for use by researchers and regulators.

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