

Corporation Commission

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OIL & GAS CONSERVATION DIVISION



Tim Baker, Director

January 4, 2016

**Contact: Matt Skinner
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Media Advisory – Edmond area earthquakes

The Oklahoma Corporation Commission's Oil and Gas Conservation Division (OGCD) is implementing a plan in response to recent earthquakes in the Edmond area. The plan calls for changes to oil and gas wastewater disposal well operation in the area that dispose into the Arbuckle formation.

There are five operating Arbuckle disposal wells within 10 miles of the center of the earthquake activity in question. The plan calls for the well within about 3.5 miles of the activity to reduce its disposal volume 50 percent while the other wells within 10 miles of the activity will reduce volume 25 percent.

The plan also calls for all Arbuckle disposal wells within 15 miles of the activity to conduct reservoir pressure testing.

OGCD Director Tim Baker says this is part of an ongoing process.

"We are working with researchers on the entire area of the state involved in the latest seismic activity to plot out where we should go from here," said Baker. "We are looking not only at the Edmond area, but the surrounding area as well, including the new seismic activity that has occurred in the Stillwater area."

To aid in the research effort, the operators of the C.J. Judy and the Harvey disposal wells have agreed to suspend operations.

A full listing of the wells, operators, and action for each well can be found attached. A map showing the Arbuckle disposal well locations within the 3-6, 6-10, and 10-15 mile areas, and the recent earthquake activity, is also attached, as is a list of most of the actions taken in 2015 regarding earthquake activity.

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OIL & GAS CONSERVATION DIVISION



Tim Baker, Director

TO:

FROM: Tim Baker, Director, Oil and Gas Conservation Division

RE: Reduction in Volumes for Wells Located in Area of Interest for Induced Seismicity

DATE: January 4th, 2016

The Commission's Oil and Gas Conservation Division (OGCD) is expanding its efforts to reduce the risk of earthquakes potentially triggered by saltwater disposal wells. The following addresses the reduction of volumes being disposed in the Arbuckle formation within the defined area of interest. Any company that has been identified as operating one or more Arbuckle disposal well(s) located within one of the four zones in the defined area will need to reduce volumes disposed into such well(s) according to the schedule outlined at the end of this letter. The zones are shown on the attached map and are defined from the center point of the December 29th magnitude 4.3 earthquake, as reported by the Oklahoma Geological Survey (OGS).

- Zero to three miles (0-3 miles)
- Three to six miles (3-6 miles)
- Six to ten miles (6-10 miles)
- Ten to fifteen miles (10-15 miles).

The area highlighted on the attached map has been designated based upon the earthquakes within the immediate area. The OGCD has reviewed the earthquake activity of magnitude 2.5 and greater within 17 miles of the center of the area of interest. Earthquake data is as reported by the Oklahoma Geological Survey (OGS). The attached map shows earthquake activity of the last 30 days.

As part of a joint effort to decrease the risk of induced seismicity, you will need to complete reduction of disposal volumes in accordance with the following schedule and as indicated for the wells below. All disposal well volumes shall be calculated on a daily basis. In addition, gauges and flow meters should be placed on any such wells not so equipped on or before Monday, January 18, 2016 so that Commission Field Inspectors can verify pressures and volumes. As has been the practice, pressures and volumes for such wells should continue to be supplied every Monday to the Commission, on a weekly basis, at ogvolumes@occcemail.com.

The following schedule applies to all wells within the defined zones in the Area of Interest:

- Zero to three miles (0-3 miles):
 - No wells were found to be located within three miles of the epicenter.
- Three to six miles (3-6 miles): Fifty percent reduction (50%).
 - On or before Monday, January 18, 2016, daily volumes should be reduced by twenty-five percent (25%) of the daily average of the total volume reported to the Commission on the weekly volume reports through December 28, 2015.
 - On or before Monday, February 1, 2016, daily volumes should be reduced by an additional twenty-five percent (25%), for a total volume reduction of fifty percent (50%) of the daily average of the total volume reported to the Commission on the weekly volume reports through December 28, 2015.
- Six to ten miles (6-10 miles):
 - On or before Monday, January 18, 2016, daily volumes should be reduced by thirteen percent (13%) of the daily average of the total volume reported to the Commission on the weekly volume reports through December 28, 2015.
 - On or before Monday, February 1, 2016, daily volumes should be reduced by an additional twelve percent (12%), for a total volume reduction of twenty-five percent (25%) of the daily average of the total volume reported to the Commission on the weekly volume reports through December 28, 2015.
- 10 to fifteen miles (10-15 miles):
 - Maintain current levels at this time. This letter shall serve as notification that future seismic activity might result in an expanded area for reductions to include these wells.

The OGCD plan also includes survey of reservoir pressures of all the Arbuckle disposal wells within the 15 mile radius of the earthquakes that are the subject of this plan. The reservoir pressures will be measured by taking a fluid level after the well has been shut in for a minimum of 48 hours. The fluid level measurements shall be witnessed by an oil and gas field inspector. The OGCD will be in contact to schedule the reservoir pressure measurement.

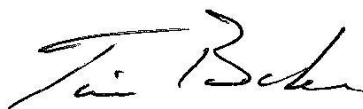
If you have any questions contact the OGCD:

Charles Lord or
(405) 522-2751
c.lord@occemail.com

Jim Marlatt
(405) 522-2758
j.marlatt@occemail.com

Thank you in advance for your continued cooperation and attention to this matter.

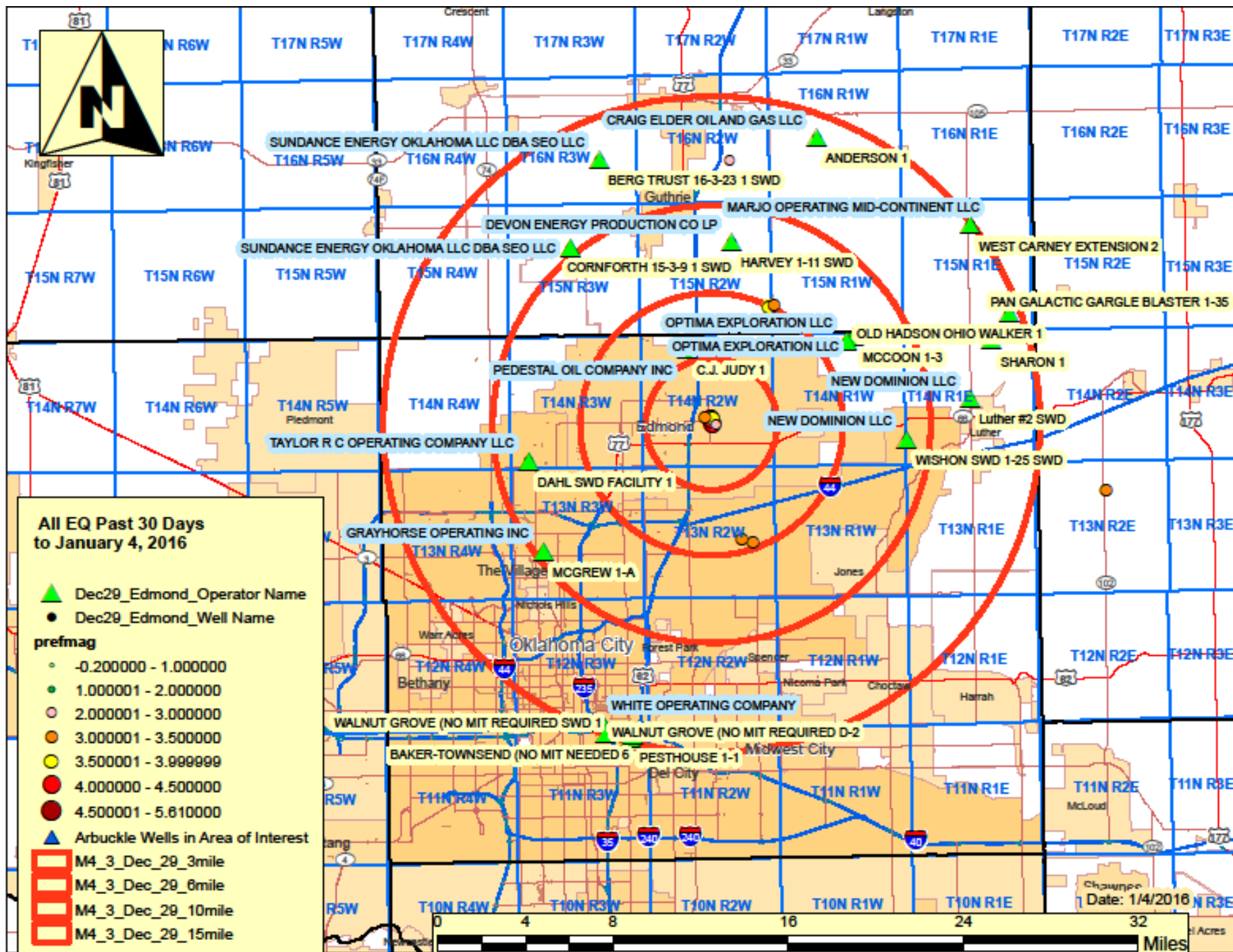
Sincerely,



Tim Baker, Director
Oil and Gas Conservation Division

The wells in this area operated by your company, and the volume reduction schedule are listed below:

Company	Status	Well Name	Buffer Zone	Data				Reduction	Requested Average Daily Volume
				Max of Volume	Average of Volume	Sum of Volume	Max of Rolling 30		
DEVON ENERGY PRODUCTION CO LP	Plugged Back	HARVEY 1-11 SWD	6-10	181	30	8846	61	25%	22
SUNDANCE ENERGY OKLAHOMA LLC DBA SEO LLC	Not in Granite	BERG TRUST 16-3-23 1 SWD	10-15	1295	287	84610	911	0%	287
		CORNFORTH 15-3-9 1 SWD	10-15	747	141	41448	512	0%	141
GRAYHORSE OPERATING INC	Not in Granite	MCGREW 1-A	6-10	661	241	72458	432	25%	181
NEW DOMINION LLC	Plugged Back	WISHON SWD 1-25 SWD	6-10	6863	3045	831252	4617	25%	2284
	Not injecting	Luther #2 SWD	10-15	0	0	0	0		Permitted Volume
OPTIMA EXPLORATION LLC	Not injecting/Out of business	OLD HADSON OHIO WALKER 1	6-10	0	0	0	0		0
		MCCOON 1-3	6-10	0	0	0	0		0
PEDESTAL OIL COMPANY INC	Plugged Back	C.J. JUDY 1	3-6	1461	589	178609	980	50%	295
TAYLOR R C OPERATING COMPANY LLC	Plugged Back	DAHL SWD FACILITY 1	6-10	9890	5814	906984	8026	25%	4361
CRAIG ELDER OIL AND GAS LLC	Well plugged	ANDERSON 1	10-15	0	0	0	0	0%	0
TNT OPERATING COMPANY INC	Not in Granite	BAKER-TOWNSEND 6	10-15	9985	7994	1223079	9566	0%	7994
WHITE OPERATING COMPANY	Not in Granite	WALNUT GROVE SWD 1	10-15	10348	8796	448580	8767		Permitted Volume
		WALNUT GROVE D-2	10-15	650	643	32800	650		Permitted Volume
RAINBO SERVICE COMPANY	Not in Granite	PESTHOUSE 1-1	10-15	3104	1433	186246	2707		Permitted Volume
SPECIAL ENERGY CORPORATION	Not injecting	SHARON 1	10-15	0	0	0	0		Permitted Volume
		PAN GALACTIC GARGLE BLASTER 1-35	10-15	192	56	16806	95		Permitted Volume
MARJO OPERATING MID-CONTINENT LLC	Volume Reporting-no action	WEST CARNEY EXTENSION 2	10-15	558	144	21278	344		Permitted Volume





Earthquake Response as of 12/3/2015 (a partial list)

12/03/15 – Byron/Cherokee area: 4 disposal wells shut-in, volume cuts of 25 to 50 percent for 47 other disposal wells. http://www.occeweb.com/News/12-03-15BYRON-CHEROKEE_MEDFORD%20EARTHQUAKE%20RESPONSE.pdf

12/03/15 – Medford: 3 disposal wells shut-in, volume cuts of 25 to 50 percent for 19 other disposal wells. http://www.occeweb.com/News/12-03-15BYRON-CHEROKEE_MEDFORD%20EARTHQUAKE%20RESPONSE.pdf

11/20/15 – Crescent: 4 disposal wells shut-in, 7 others reduce volume 50 percent
<http://www.occeweb.com/News/11-20-15CRESCENT%20ADVISORY.pdf>

11/19/15 – Cherokee: 2 disposal wells shut-in, 23 others reduce volume 25 to 50 percent.
<http://www.occeweb.com/News/CHEROKEE%20ADVISORY-VOLUME,%20OPERATOR.PDF>

11/16/15 – 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>

11/10/15 – Medford: 10 wells reducing volume disposed 25 to 50 percent
<http://www.occeweb.com/News/11-10-15MEDFORD02.pdf>

10/19/2015 – Cushing: 13 wells either ceasing operations or cutting volume disposed 25 percent.
<http://www.occeweb.com/News/10-19-15CUSHING%202.pdf>

8/3/2015 – 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://www.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>

(more)

(Response, pg 2)

** July 17, 2015 – Directive for 211 disposal wells in the Arbuckle to check depth, not resume until it is proven 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 197 wells plugging back (i.e., reducing depth), and 14 wells reducing their disposed volume by half.**

Response continues.

Some of the other actions taken:

All applications for disposal wells must go through a seismicity review. If approved, permit 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 well.

All Arbuckle disposal wells operating in earthquake areas (“areas of interest”) have to record daily and report weekly their volumes and pressures. The data is then put on an FTP site where it can be accessed by researchers.

-OCC-