

OKLAHOMA

# Corporation Commission

P.O. BOX 52000  
OKLAHOMA CITY OKLAHOMA 73152-2000

255 Jim Thorpe Building  
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**OIL & GAS CONSERVATION DIVISION**



**Tim Baker, Director**

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December 03, 2015

Contact: Matt Skinner  
405-521-4180  
m.skinner@occemail.com

## **Media Advisory – Continuing response to earthquakes in the Medford and Cherokee areas**

The Oklahoma Corporation Commission's Oil and Gas Conservation Division (OGCD) is continuing its evolving response to earthquake activity in the Medford and Cherokee areas. The latest step is implementation of plans for the Byron/Cherokee area and for the Medford area. As with previous steps, the plans call for changes to oil and gas wastewater disposal wells in the area that dispose into the Arbuckle formation. Additional steps can be expected depending on earthquake activity.

### **Byron/Cherokee area Plan**

The plan for the Byron-Cherokee area calls for the 4 disposal wells within 3 miles of the earthquake activity in question to stop operations ("shut in"), and for cuts of 25 to 50 percent in disposed volumes for 47 other wells farther from the activity.\*

The net volume reduction is 47%.

In addition, 28 disposal wells within 10 to 15 miles of the earthquake activity are being placed on notice to prepare for possible changes to their operations.

### **Medford Plan**

The latest Medford plan calls for the 3 disposal wells within 3 miles of the earthquake activity in question to stop operations ("shut in"), and for cuts of 25 to 50 percent in disposed volumes for 19 other wells farther from the activity.\*

The total net volume reduction for the area in question is 42 percent.

In addition, 39 disposal wells within 10 to 15 miles of the earthquake activity are being placed on notice to prepare for possible changes to their operations.

\*Maps, a sample letter to operators, and a full listing of the wells, operators, and action for each well is attached.

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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

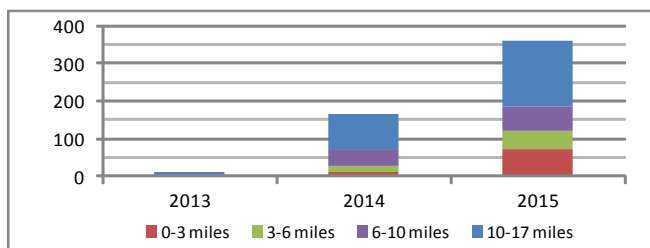
DATE: December 2, 2015

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 shut-in and reduction zones are shown on the attached map and are defined from the center point of the recent magnitude 4.4 earthquake, as reported by the Oklahoma Geological Survey (OGS), near the town of Byron, as follows:

- 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 dramatic increase in earthquakes within the immediate area. The OGCD has reviewed the earthquake activity of magnitude 2.5 and greater within two miles of the zones of interest, as reported by the Oklahoma Geological Survey (OGS). The earthquake activity from January 1, 2013 through December 1, 2015 is shown below. The attached map shows earthquake activity of the last 30 days.

Earthquake Activity Magnitude 2.5 or Greater					
Year	0-3 miles	3-6 miles	6-10 miles	10-17 miles	Total
2013	0	0	5	9	14
2014	12	15	46	95	168
2015	72	51	65	173	361
<b>Total</b>	<b>84</b>	<b>66</b>	<b>116</b>	<b>277</b>	<b>543</b>



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 such wells on or before Friday, December 11, 2015 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@occemail.com](mailto:ogvolumes@occemail.com).

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

- Zero to three miles (0-3 miles):
  - A shut-in of wells on or before December 9, 2015.
  
- Three to six miles (3-6 miles): Fifty percent reduction (50%).
  - On or before December 16, 2015, 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 November 30, 2015.
  - On or before December 30, 2015, 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 November 30, 2015.
  
- Six to ten miles (6-10 miles):
  - On or before December 16, 2015, 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 November 30, 2015.
  - On or before December 30, 2015, 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 November 30, 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.

If you have any questions contact the OGCD:

Charles Lord  
(405) 522-2751

or

Jim Marlatt  
(405) 522-2758

[c.lord@occemail.com](mailto:c.lord@occemail.com)

[j.marlatt@occemail.com](mailto: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 (table continued onto next page):

Company	Status	Well Name	Buffer	Reduction	Data				Requested Average Daily Volume
					Max of Volume	Average of Volume	Sum of Volume	Max of Rolling 30	
SANDRIDGE EXPL & PROD, LLC	Not in Granite	ROXY SWD 1-30	6-10	25%	44966	26195	6915565	28770	19646
		GRISWOLD SWD 2811 1-25	3-6	50%	40319	23876	6303236	28726	11938
		DIAMONBACK SWD 2710 2-5	0-3	Shut In	33318	17959	4741189	22766	0
		DIAMONBACK SWD 2710 1-5	0-3	Shut In	32320	21521	5681604	27539	0
		LIDIA SWD 2710 1-7	0-3	Shut In	31369	22325	5893677	26131	0
		CLARK W SWD 2811 1-27	3-6	50%	31245	23086	6094782	24771	11543
		CRICKET SWD 1-21	6-10	25%	30695	22568	5958054	25394	16926
		MILA SWD 2610 1-28	6-10	25%	29424	14419	3806517	19837	10814
		DUSTIN SWD 2709 1-6	3-6	50%	25160	9967	2631399	12407	4984
		MIGUEL SWD 2611 1-9	6-10*	25%	24840	12345	3259161	18917	9259
		POPPINS SWD 2810 2-21	3-6	50%	22742	16042	4235076	18793	8021
		TATUM ROSE SWD 2710 1-17	0-3	Shut In	21052	10851	2864748	15376	0
		ROSE SWD 2810 1-26	3-6	50%	19798	5906	1559145	9592	2953
		LIZZIE SWD 2711 1-33	6-10*	25%	19426	10493	2770102	12301	7870
		ASHLEY SWD 2-36	3-6	50%	19244	9755	2575243	13189	4877
		MIGUEL SWD 2611 2-9	6-10*	25%	17578	8061	2128087	12364	6046
		LAUREN SWD 2609 1-3	6-10*	50%	15176	8000	2112081	9920	4000
		MILLIE SWD 2810 1-9	3-6	50%	12544	8104	2139337	8950	4052
		SIDNEY SWD 1-3	6-10	25%	10411	4814	1270907	6415	3611
		GATILLO SWD 2-34	6-10	25%	8917	3445	434116	4697	2584
		DORADO SWD 1-32	6-10	25%	7315	4381	552057	5602	3286
		ROBYN SWD 1-14	6-10	25%	5590	3639	960757	4240	2729
		ROSE KELLY SWD 1-3	6-10	25%	4414	2462	649866	3454	1846
	ROSE KELLY SWD 2-3	6-10	25%	3309	1863	491908	2796	1397	
	LILY SWD 1-27	6-10	25%	2468	1247	157174	1375	936	
	Plugged Back	DUSTIN SWD 2709 2-6	3-6	50%	29624	12596	3325366	20028	6298
		PHIN SWD 2811 1-11	6-10	25%	27900	17110	4516944	20490	12832
		PHIN SWD 2811 2-11	6-10	25%	24611	15828	4178489	18230	11871
		FIONA SWD 2610 1-5	3-6	50%	23132	12796	3378015	17509	6398
		JUDY SWD 2-12	6-10	25%	21828	10077	2660262	14274	7558
		JUDY SWD 1-12	6-10	25%	19365	7647	2018678	12936	5735
		ASHLEY SWD 1-36	3-6	50%	17409	10877	2871502	14378	5438
		GATILLO SWD 1-34	6-10	25%	16104	7302	817872	8743	5477
		ROSE SWD 2810 2-26	3-6	50%	15036	8635	2279537	11941	4317
		BAKER SWD 2810 1-20	3-6	50%	13088	3661	966438	8523	1830
		DOTTY SWD 2-27	6-10	25%	9908	4760	599758	6773	3570
		PRESLEY SWD 1-27	6-10*	25%	7996	280	74035	2468	210
		PRESLEY SWD 2-27	6-10*	25%	6428	979	258416	5087	734
		BAILEY SWD 2-1	6-10	25%	6419	3576	901107	5203	2682
		BAILEY SWD 1-1	6-10	25%	5728	126	31688	759	94
		DONNA FAYE SWD 2708 2-19	6-10*	50%	5617	1456	384373	3699	728
		DOTTY SWD 1-27	6-10	25%	0	0	0	0	0
	Not injecting	BONNIE JEAN SWD 1-22	6-10*	50%	0	0	0	0	0
DONNA FAYE SWD 1-19		6-10*	50%	0	0	0	0	0	

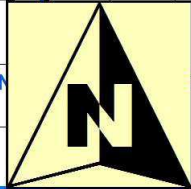
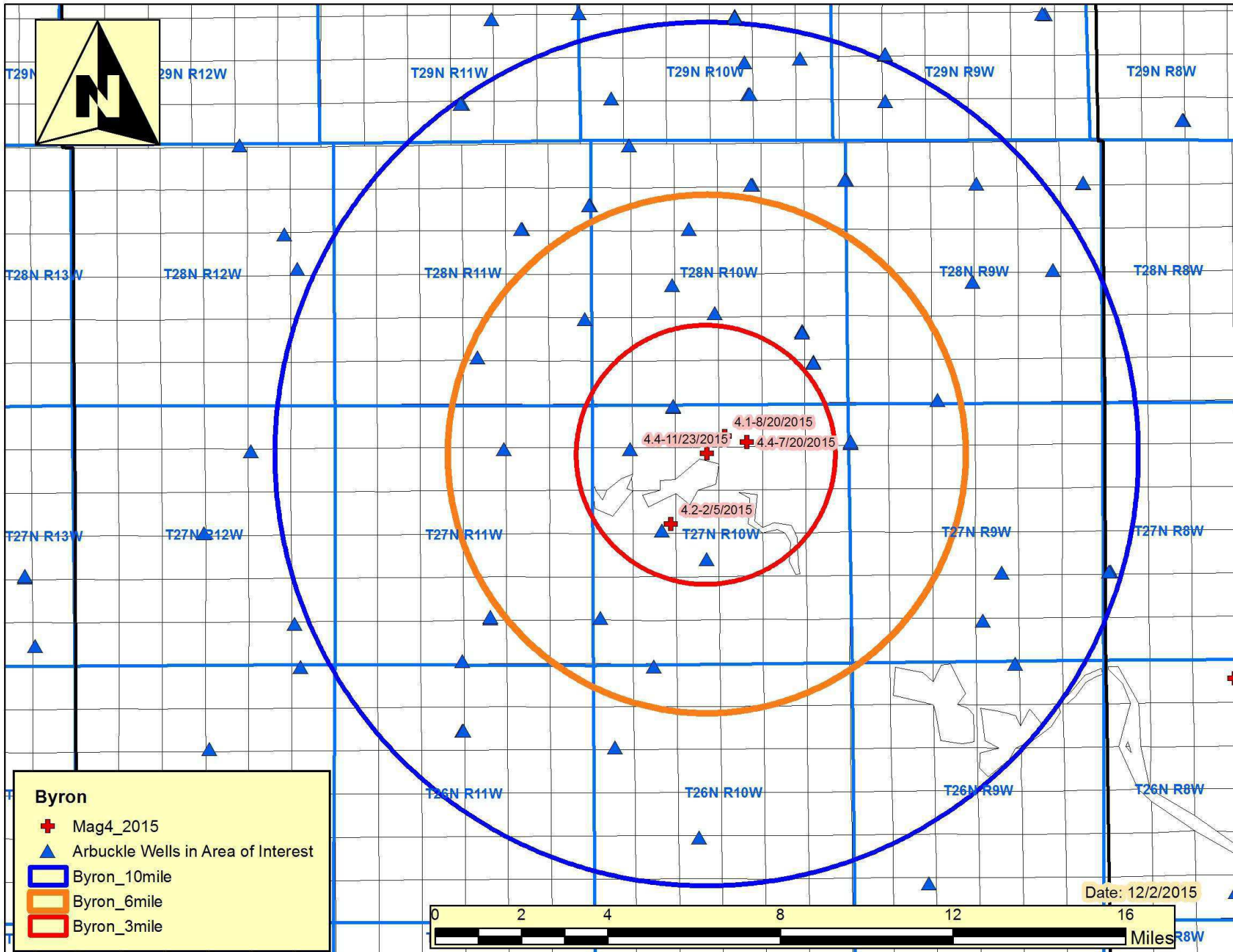
CHESAPEAKE OPERATING INC	Plugged Back	YELLOW 30-27-10 SWD 1	3-6	50%	48257	22411	4706324	39630	11206
		PULLER 7-26-10 SWD 1	6-10*	25%	30475	21936	5834882	27754	16452
		THAMES 33-28-9 SWD 1	3-6	50%	20407	12724	3384663	16935	6362
	Plugged Back - Not Reporting	Amazon 1-25	6-10	25%					0
EAGLE EXPLORATION PRODUCTION, LLC	Not in Granite	REITZ 1 SWD	3-6	50%	14718	9668	2581404	12254	4834
TRIAD ENERGY INC	Not in Granite	WILLIAMS SWD 1-6	6-10	25%	4463	2813	751045	3408	2110
D & J OIL COMPANY INC	Not in Granite	MYERS 1-34 SWD	6-10*	50%	930	508	121434	568	254
					<b>Sum of Daily Averages</b>	<b>481090</b>	<b>Reduced Daily Avgs</b>		<b>256308</b>
							<b>% Reduction</b>		<b>47%</b>

\* Well falls in a higher reduction zone of adjacent event; protocol for adjacent event supersedes this event and the higher reduction is noted in the spreadsheet.  
Note: Reductions from overlapping events do not compound; the higher reduction will take precedence as noted in the list above.

The wells in this area operated by your company in the 10-15 mile zone and do not require action for this event (may require action from overlapping event):

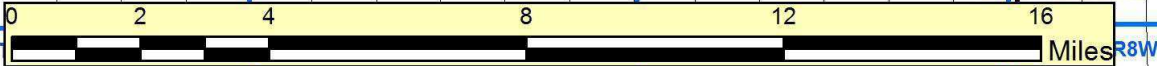
Company	Current_St	WellName	Buffer	Reduction
ARP OKLAHOMA LLC (ATLAS ENERGY)	Not in Granite	JACKDAW SWD 1	10-15*	25%
CHAPARRAL ENERGY LLC	Volume Reporting-no action	WESSEL SWD 1	10-15*	25%
CHESAPEAKE OPERATING INC	Not in Granite	CLAY 7-25-10 SWD 1	10-15*	25%
		EUPHRATES 11-27-12 SWD 1	10-15*	Permit
		GIDEON 1-32	10-15*	25%
	Plugback procedure approved	MISSISSIPPI 14-26-12 SWD 1	10-15*	50%
		NILE 14-28-12 SWD 1	10-15	Permit
		RIO GRANDE 16-27-12 SWD 1	10-15*	Permit
	Plugged Back	COLUMBIA 36-27-12 SWD 1	10-15*	25%
EAGLE ENERGY EXPLORATION PRODUCTION LLC	Plugged Back	GEORGE SWD 1	10-15*	Shut In
MIDSTATES PETROLEUM COMPANY LLC	Plugged Back	Murrow SWD 1-10	10-15*	50%
SAND CREEK OPERATING LLC	Not in Granite	KRAFT (KRAFT 1) 1-13	10-15	Permit
SANDRIDGE EXPL & PROD, LLC	Not in Granite	BETTY ELLEN SWD 1-20	10-15	Permit
		BETTY ELLEN SWD 2909 2-20	10-15	Permit
		CASH SWD 2-32	10-15*	Permit
		DONNIE SWD 1-15	10-15*	50%
		FIERO SWD 2-23	10-15	Permit
		HARLEY SWD 1-11	10-15*	Shut In
		SHARON SWD 2-22	10-15	Permit
		TIBURON SWD 1-1	10-15*	Permit
		TIBURON SWD 2-1	10-15*	Permit
	Plugback procedure approved	CASH SWD 1-32	10-15*	Permit
	Plugged Back	Aquarius 1-22	10-15	Permit
		Bailar SWD 1-35	10-15	Permit
		Claude SWD 1-13	10-15	Permit
		Fiero SWD 1-23	10-15	Permit
		HARLEY SWD 2-11	10-15*	Shut In
		Sharon 1-22	10-15	Permit

\* Well falls in a higher reduction zone of adjacent event; protocol for adjacent event supersedes this event and the higher reduction is noted in the spreadsheet.



**Byron**

- ✚ Mag4\_2015
- ▲ Arbuckle Wells in Area of Interest
- Byron\_10mile
- Byron\_6mile
- Byron\_3mile



Date: 12/2/2015

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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

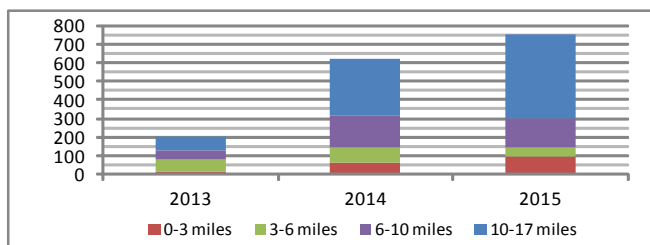
DATE: December 2, 2015

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 shut-in and reduction zones are shown on the attached map and are defined from the center point of the recent magnitude 4.5 earthquake, as reported by the Oklahoma Geological Survey (OGS), near the town of Medford, as follows:

- 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 dramatic increase in earthquakes within the immediate area. The OGCD has reviewed the earthquake activity of magnitude 2.5 and greater within two miles of the zones of interest, as reported by the Oklahoma Geological Survey (OGS). The earthquake activity from January 1, 2013 through December 1, 2015 is shown below. The attached map shows earthquake activity of the last 30 days.

Earthquake Activity Magnitude 2.5 or Greater					
Year	0-3 miles	3-6 miles	6-10 miles	10-17 miles	Total
2013	11	66	53	72	202
2014	63	81	176	302	622
2015	92	56	150	457	755
<b>Total</b>	<b>166</b>	<b>203</b>	<b>379</b>	<b>831</b>	<b>1579</b>



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 such wells on or before Friday, December 11, 2015 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@occemail.com](mailto:ogvolumes@occemail.com).

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

- Zero to three miles (0-3 miles):
  - A shut-in of wells on or before December 9, 2015.
- Three to six miles (3-6 miles): Fifty percent reduction (50%).
  - On or before December 16, 2015, 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 November 30, 2015.
  - On or before December 30, 2015, 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 November 30, 2015.
- Six to ten miles (6-10 miles):
  - On or before December 16, 2015, 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 November 30, 2015.
  - On or before December 30, 2015, 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 November 30, 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.

If you have any questions contact the OGCD:

Charles Lord                      or  
(405) 522-2751  
[c.lord@occemail.com](mailto:c.lord@occemail.com)

Jim Marlatt  
(405) 522-2758  
[j.marlatt@occemail.com](mailto: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	Reduction	Data				Requested Average Daily Volume
					Max of Volume	Average of Volume	Sum of Volume	Max of Rolling 30	
SANDRIDGE EXPL & PROD, LLC	Not in Granite	LAUREN SWD 2609 1-3	3-6	50%	15176	8000	2112081	9920	4000
		DONNIE SWD 1-15	3-6	50%	3880	1466	386910	2893	733
		HARLEY SWD 1-11	0-3	Shut In	3337	1625	429009	1985	0
	Plugged Back	AMANDA LYNN SWD 2-33	3-6	50%	6597	2982	787168	3228	1491
		DONNA FAYE SWD 2708 2-19	3-6	50%	5617	1456	384373	3699	728
		TAYLOR SWD 1-21 SWD	6-10	25%	4542	1764	444434	2213	1323
		HARLEY SWD 2-11	0-3	Shut In	3588	1082	285637	1458	0
	Not injecting	CAVIN SWD 1-31	6-10	25%	2048	26	6529	342	19
		AMANDA LYNN SWD 1-33	3-6	50%	0	0	0	0	0
		LOUIE SWD 1	6-10	25%	0	0	0	0	0
DONNA FAYE SWD 1-19		3-6	50%	0	0	0	0	0	
CHESAPEAKE OPERATING INC	Not in Granite	GIDEON 1-32	6-10	25%	2520	1231	310288	1980	923
	Plugged Back	THAMES 33-28-9 SWD 1	6-10*	50%	20407	12724	3384663	16935	6362
EAGLE EXPLORATION PRODUCTION, LLC	Plugged Back	GEORGE 1 SWD	0-3	Shut In	3278	1790	478054	2291	0
D & J OIL COMPANY INC	Not in Granite	DENNIS SWD 1-6	3-6	50%	1600	1025	272781	1200	513
		MYERS 1-34 SWD	3-6	50%	930	508	121434	568	254
CHAPARRAL ENERGY LLC	Shut In	Messenger A-1	6-10	25%	1058	254	67899	589	191
CISCO OPERATING LLC	Not in Granite	BOLSER SWD 33-1 SWD	3-6	50%	785	254	69728	382	127
ARP OKLAHOMA LLC (ATLAS ENERGY)	Not in Granite	JACKDAW SWD 1	6-10	25%	18425	7780	1960497	11938	5835
		Dalmatian SWD #1	6-10	25%	13622	7644	1177252	11204	5733
	Decreased injection by half	K-9 1	6-10	25%	25479	8552	2154981	18640	6414
<b>Sum of Daily Averages</b>					<b>60164</b>	<b>Reduced Daily Avgs</b>		<b>34646</b>	
						<b>% Reduction</b>		<b>42%</b>	

\* Well falls in a higher reduction zone of adjacent event; protocol for adjacent event supersedes this event and the higher reduction is noted in the spreadsheet.  
 Note: Reductions from overlapping events do not compound; the higher reduction will take precedence as noted in the list above.

The wells in this area operated by your company in the 10-15 mile zone and do not require action for this event (may require action from overlapping event):

Company	Current Status	Well Name	Buffer Zon	Reduction
ARP OKLAHOMA LLC (ATLAS ENERGY)	Not in Granite	K-9 2	10-15	Permit
		OTTERHOUND SWD 1	10-15	Permit
CHAPARRAL ENERGY LLC	Not in Granite	CLIFFORD SWD 1	10-15	Permit
CHESAPEAKE OPERATING INC	Plugged Back	PULLER 7-26-10 SWD 1	10-15*	50%
		YELLOW 30-27-10 SWD 1	10-15*	50%
	Volume Reporting - preparing documentation	HDW 1-2	10-15	Permit
EAGLE EXPLORATION PRODUCTION, LLC	Not in Granite	DOWNING 1 SWD	10-15*	Permit
KIRKPATRICK OIL COMPANY INC	Plugged Back	LITTLE BEAVER SWD 1-26	10-15	Permit
MIDSTATES PETROLEUM COMPANY LLC	Not in Granite	ALFALFA 1	10-15	Permit
SANDRIDGE EXPL & PROD, LLC	Not in Granite	ASHLEY SWD 2-36	10-15*	50%
		CASH SWD 2-32	10-15*	Permit
		CHARLY SWD 2407 1-9	10-15	Permit
		CHRISSEY SWD 1-35	10-15	Permit
		CRICKET SWD 1-21	10-15*	25%
		DIAMONBACK SWD 2710 1-5	10-15*	Shut In
		DIAMONBACK SWD 2710 2-5	10-15*	Shut In
		DUSTIN SWD 2709 1-6	10-15*	50%
		KIMBERLY SWD 1-32	10-15	Permit
		LIDIA SWD 2710 1-7	10-15*	Shut In
		MILA SWD 2610 1-28	10-15*	25%
		POPPINS SWD 2810 2-21	10-15*	50%
		ROBYN SWD 1-14	10-15*	25%
		ROSE SWD 2810 1-26	10-15*	50%
		SIDNEY SWD 1-3	10-15*	25%
		TATUM ROSE SWD 2710 1-17	10-15*	Shut In
		TIBURON SWD 1-1	10-15*	Permit
		TIBURON SWD 2-1	10-15*	Permit
		TROY SWD 2408 1-1	10-15	Permit
	Not injecting	LYNCH SWD 1-10	10-15	Permit
	Plugged Back	ASHLEY SWD 1-36	10-15*	50%
		BAILEY SWD 1-1	10-15*	25%
		BAILEY SWD 2-1	10-15*	25%
		CASH SWD 1-32	10-15*	Permit
		CHARLY SWD 2407 2-9	10-15	Permit
		DUSTIN SWD 2709 2-6	10-15*	50%
		FIONA SWD 2610 1-5	10-15*	50%
		LYNCH SWD 2-10	10-15	Permit
		ROSE SWD 2810 2-26	10-15*	50%
SPECIAL ENERGY CORPORATION	Plugged Back	CONRADY 19-28N-6W 1 SWD	10-15*	25%

\* Well falls in a higher reduction zone of adjacent event; protocol for adjacent event supersedes this event and the higher reduction is noted in the spreadsheet.

