

**From:** [Harold G. Hamm](#)  
**To:** [Boren, David L.](#); [Bishop, Catherine F.](#); [Grillot, Larry R.](#)  
**Cc:** [Blu Hulse](#); [Kristin Miskovsky](#)  
**Subject:** News article  
**Date:** Friday, December 20, 2013 9:24:12 AM  
**Attachments:** [crlgo-color14b6.png](#)  
[121913 Oklahoman Business Section.pdf](#)

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As feared and even faster than anyone imagined, the Senate democrats who are opposed to all fossil fuels production and usage, have seized on the recent public statements made tying the Oklahoma earthquakes to oil & gas activity. Though the bulk of this seismicity is in an area totally devoid of any oil & gas activity, you can now bet they are on a path to bring forth testimony in congress which will lead to more unnecessary regulations of the state's number one industry as well as more unmerited publicity.

HH



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**From:** [Harold G. Hamm](#)  
**To:** [Boren, David L.](#)  
**Subject:** Experts Eye Oil and Gas Industry as Quakes Shake Oklahoma - NYTimes.com  
**Date:** Friday, December 13, 2013 1:18:02 PM

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<http://mobile.nytimes.com/2013/12/13/science/earth/as-quakes-shake-oklahoma-scientists-eye-oil-and-gas-industry.html?hp=>

I am glad you put Catherine Bishop in charge. This situation could spiral out of hand easily.

Sent from my iPhone

**From:** [Harold G. Hamm](#)  
**To:** [Boren, David L.](#)  
**Cc:** [Evans, Sherry L.](#)  
**Date:** Tuesday, November 26, 2013 3:54:52 PM

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David,

I think it's obvious from this, we have the wrong guy delivering the media message. Austin and Randy are begging for a buffer with the media. They're good scientists, they just aren't well equipped to deal with the pressure. Catherine is a seasoned veteran with the media who could clearly articulate the great research you guys are doing.

HH

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**From:** Harold G. Hamm  
**Sent:** Tuesday, November 26, 2013 3:44 PM  
**To:** Boren, David L. (dboren@ou.edu)  
**Cc:** Evans, Sherry L. (sevans@ou.edu)  
**Subject:** FW:

Here is the link from today.

HH

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**From:** Kristin Miskovsky  
**Sent:** Tuesday, November 26, 2013 1:39 PM  
**To:** Harold G. Hamm  
**Subject:**

<http://www.koco.com/news/Earthquakes-rocking-Oklahoma-but-why/-/9844352/23162870/-/y1rptz/-/index.html>

**Kristin Miskovsky**  
Vice President, Public Relations

Continental Resources, Inc.  
20 N. Broadway  
OKC, OK 73102  
P: 405.234.9480  
[www.clr.com](http://www.clr.com)

**Mailing**  
P.O. Box 269097  
OKC, OK 73126

**Hall, Jim III**

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**From:** Heeney, Neil  
**Sent:** Wednesday, January 22, 2014 3:34 PM  
**To:** Hall, Jim III  
**Cc:** Harper, Kyle  
**Subject:** Continental Resources and Mr. Hamm

HT  
Jeff Hume

Tripp:

Thanks for the heads-up regarding your upcoming conversation with Dean Grillot and later Harold Hamm regarding a \$25 million (+/-) proposal to connect Continental Resources more closely with OU. At your request, I've given you three paragraphs below that will give you the basics of what energy related analytic and predictive analytics are. You might consider a quick visit with Kyle prior to your meeting with Dean Grillot tomorrow as he has a much better grasp of the incredible potential of this collaborative, cross-college idea.

In addition, I feel I should mention that a gift of this size from Continental might also be utilized, in part, to fast-track the development of industry specific certificate or advanced degree programs that the energy industry seems to be craving. Such certificate programs or advanced degree programs have very significant, non-traditional income potential for OU. I feel we're missing a great opportunity if the development of these certificate and advanced degree energy programs are not at least a part of the conversation with Mr. Hamm. Let me know if and how I can help.

### **ENERGY RELATED ANALYTICS AND PREDICTIVE ANALYTICS**

*Analytics is one area forward-thinking oil and gas companies are looking to as they seek to improve how they run and operate their businesses and deliver their capital projects. In the years ahead, more and more energy companies will be deploying predictive analytics to optimize every facet of their industry. They will ramp up their investments in technological infrastructure, processes, governance, culture, and most of all—talent.*

*Energy companies routinely run huge volumes of data; for example, through complex models for seismic interpretation or to adjust refining configurations as feedstocks change. But with competition for resources heating up, cost pressures multiplying and project demands proliferating, data is more crucial than ever for gaining a competitive edge. And that makes analytics talent and technology more important than ever.*

*OU has a very successful and well documented history in working with extremely large and complex data sets such as genome and weather data. With our varied expertise in petroleum engineering, geology, petrophysics, computer science etc., an academic institution like OU is uniquely positioned to help our key energy partners, like Continental, gain access to the analytics talent and technology and allow them to more fully utilize statistics, quantitative analysis and information-modeling techniques to make intelligent business decisions.*

**Neil Heeney**  
The University of Oklahoma  
405.795.2345

From: [Grillot, Larry R.](#)  
To: [Keller, G. Randy](#); [Holland, Austin A.](#)  
Subject: OGS "Position Statement"  
Date: Tuesday, January 14, 2014 10:27:46 AM  
Attachments: [OGS POSITION STATEMENT-Feb. 2014.docx](#)

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Randy and Austin,

I think it would be appropriate for the OGS to have a <sup>3</sup>position statement<sup>2</sup> regarding Oklahoma earthquake activity, etc. This would basically be a statement about <sup>3</sup>what we think we know from current data<sup>2</sup>, and <sup>3</sup>what work we are undertaking to better understand things.<sup>2</sup> As such, I have prepared a draft document (attached) for you to edit as you see fit. I will freely admit to having just made up some things, with the intent of you making the necessary corrections, additions, deletions.

In the long run, this could be a statement we release to document our position BASED ON CURRENT DATA AT THE TIME OF THE STATEMENT RELEASE. It also will outline our work, including what we believe should be published, placed on the OGS website, etc. Overall, I think we need to do a better job of <sup>3</sup>getting our story out there<sup>2</sup> for the good of the OGS, and individual professional development.

Anyhow, please take some time to edit this to: (a) make sure it covers the necessary topics/concepts, (b) is factual, and (c) is something you can support. I anticipate that any statement release would be from the OGS, and not attributed to any specific individual (we would leave that to individual projects/publications).

Once we get this full text to a point that we think it is comprehensive and accurate, we can start the more difficult process of considering a public release that would, of necessity, be summarized and worded differently for the general public. But that<sup>1</sup>s a subject for future consideration after we get the full text where we think it should be.

Thanks for the help.

Larry

*Larry R. Grillot*

*Dean & Lester A. Day Family Chair  
Mewbourne College of Earth & Energy  
University of Oklahoma  
(405) 325-3821*

OGS POSITION STATEMENT-OKLAHOMA EARTHQUAKE ACTIVITY  
FEBRUARY, 2014

Oklahoma has experienced a significant increase in seismic activity (earthquakes) since 2009. The Oklahoma Geological Survey (OGS) recognizes that this is a topic of interest to the citizens of Oklahoma, and the purpose of this statement is to communicate what, in the opinion of the OGS, the data are currently telling us and to outline our plans for monitoring possible future activity and conducting research/studies to better understand Oklahoma seismicity.

**What does the current data tell us?**

- Since 2009, the earthquake activity in Oklahoma has been 10-20 times higher than the previous 40 years, the period during which the OGS has maintained a seismic monitoring system in the state.
- The majority of the earthquakes (>90%) are too small to be felt, but are recorded by the OGS seismic monitoring system.
- Based on reported “felt” earthquakes prior to the establishment of the OGS seismic monitoring system, this recent increase in seismicity is probably significantly higher than the past 100 years. However, even a 100-year timeframe is not statistically representative in geological terms.
- The majority of the historical and more recent earthquakes are located on or near the Nemaha Ridge, and the Ouachita-Arbuckle-Wichita mountain front, which are major geological paleo-structures. Over geological time, these features have been a source of significant tectonic/seismic activity.
- Oklahoma has always been more seismically active than much of the mid-western United States, perhaps due to these major geological features
- Consistent with the observation above, the implied movement within the earth (focal mechanisms) for the majority of the earthquakes appears to be consistent with regional (natural) stresses in Oklahoma.

Regarding the possible relationship between recent earthquake activity and oil & gas activities, we can make the following observations:

- Most of the earthquakes are located in deeper, granitic basement and not the shallower, sedimentary section where water injection/disposal is taking place. This does not rule out the possibility of small, shallower earthquakes acting as a “trigger” for larger, deeper earthquakes, but there is currently little if any direct evidence for this.
- The energy released by earthquakes is thousands of times greater than the energy that has been required for water injection/disposal, which demonstrates that the earthquakes themselves are, in the end, the result of the release of natural stresses. In the case of the 2011 “Prague Earthquake Series”, the energy released by the earthquakes was approximately 100,000

- times greater than the energy required for water injection/disposal in that area since 1998, when such activities were initiated.
- Statistically, there appears to be a correlation in time and space (earthquakes and the start of water injection occurring within one year and 15 kilometers of each other) for about 2% of water injection wells, representing about 10% of the earthquakes. Again, the majority of these earthquakes are too small to be felt.
  - The majority of water disposal wells operate at very low pressure, but much of the injection is also near granitic basement.
  - There have been a few earthquake sequences where there appears to be a more defined relationship between water injection and the earthquakes, with earthquake series in Love County and Garvin County being the best examples.
  - The “Jones Earthquake Series” appears, in part, has shown some activity (not necessarily a majority) that appears to statistically deviate from the regional stresses, but we do not believe that any direct correlation between earthquakes and water injection has been scientifically proven (other than a statistical correlation) at this time. Of some interest, activity in the original “Jones area” appears to be lessening over time.

**What are the plans for future study/research by the Oklahoma Geological Survey to better understand Oklahoma seismicity?**

- The Oklahoma Geological Survey, in cooperation with faculty in the Mewbourne College of Earth and Energy at the University of Oklahoma, industry, the Oklahoma Cooperation Commission, the Office of the Oklahoma Secretary of Energy and the Environment, submitted and recent received a research grant from the Research Partnership to Secure Energy for America (RPSEA). The title of the grant is “4D Integrated Study Using Geology, Geophysics, Reservoir Modeling and Rock Mechanics to Develop Assessment Models for Potential Induced Seismicity Risk”. RPSEA is administered through the U.S. Department of Energy.
- The RPSEA Grant will provide resources for increased monitoring of seismic activity (additional monitoring stations). This will include increased detection of smaller events (not felt), improved public access to seismic (earthquake) data, and faster and more accurate location of earthquakes.
- Additionally, the RPSEA grant provides for basic research to better understand the geological, geophysical and engineering aspects of induced seismicity.
- The OGS is actively working with industry (through the Oklahoma Independent Petroleum Association, OIPA), the Oklahoma Corporation Commission, the Office of the Oklahoma Secretary of Energy and Environment and researchers at the University of Oklahoma to improve our understanding of subjects such as the distribution of geologic faults, seismic



- velocity of the subsurface (to improve calculating locations and other key parameters of earthquakes).
- In support of this work, the OGS is increasing its overall resources in the area of earthquake seismology. This will provide additional capability to not only improve our overall monitoring and reporting of earthquakes, which is the primary responsibility of the OGS, but to perform studies on selected and more “localized” earthquake series to better understand these within the context of overall Oklahoma seismicity. Such studies could include:
    - Continued analysis of the 2011 Prague earthquakes sequence
    - Continued analysis of the Jones sequence
    - Arcadia Lake sequence - 2013
    - Wellston/Luther sequence – 2013
    - Love County sequence - 2013
    - Other sequences as appropriate

### **Summary of Current Oklahoma Seismicity**

Overall, the majority, but not all, of the recent earthquakes appear to be the result of natural stresses, since they are consistent with the regional Oklahoma natural stress field. Additionally, not enough energy is being added into the system through fluid disposal to materially change the natural stresses. This does not rule out, however, that some earthquakes may have a relationship to water disposal/injection, and based on statistical analysis, this could be around 10% of the total earthquakes, the large majority of which are not felt. But correlation does not necessarily mean causality, and modeling doesn't mean that we understand what is happening, but rather we can construct a model.

The OGS is increasing its overall resources in the area of earthquake seismology. This will provide additional capability to not only improve our overall monitoring and reporting of earthquakes, which is the primary responsibility of the OGS, but also to better understand key geophysical, geological and engineering concepts within the context of overall Oklahoma seismicity, and communicate these findings to the citizens of Oklahoma.

**From:** [Darold, Amberlee P.](#)  
**To:** [Austin Holland](#)  
**Subject:** RE: I would like your opinion  
**Date:** Thursday, February 6, 2014 5:37:37 PM  
**Attachments:** [OGS Position Statement #6 AD.docx](#)

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I have attached a version with my thoughts. Feel free to call me if you have questions or want to discuss it!

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**From:** holland.austin@gmail.com [holland.austin@gmail.com] on behalf of Austin Holland [austin.holland@ou.edu]  
**Sent:** Thursday, February 06, 2014 3:03 PM  
**To:** Darold, Amberlee P.  
**Subject:** Re: I would like your opinion

On Thursday, February 6, 2014, Darold, Amberlee P. <[adarold@ou.edu](mailto:adarold@ou.edu)> wrote:  
What number? I haven't entered you into either of my current phones...

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**From:** Holland, Austin A.  
**Sent:** Thursday, February 06, 2014 2:58 PM  
**To:** Darold, Amberlee P.  
**Subject:** Re: I would like your opinion

Calling may be better.

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**From:** <Darold>, "Amberlee P." <[adarold@ou.edu](mailto:adarold@ou.edu)>  
**Date:** Thursday, February 6, 2014 at 2:56 PM  
**To:** Austin Holland <[austin.holland@ou.edu](mailto:austin.holland@ou.edu)>  
**Subject:** RE: I would like your opinion

So you want me to call or just give you my thoughts...

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**From:** Holland, Austin A.  
**Sent:** Thursday, February 06, 2014 2:05 PM  
**To:** Darold, Amberlee P.  
**Subject:** I would like your opinion

Attached is a position statement primarily written by the Dean. I have also attached a couple documents for background. I will call in a few so we can discuss.

Regards,

Austin

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Austin Holland

**From:** [Grillot, Larry R.](#)  
**To:** [Grillot, Larry R.](#)  
**Subject:** FW: Visit  
**Date:** Monday, July 21, 2014 7:40:08 PM  
**Attachments:** [crlogo-color28ce.png](#)

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**From:** <Grillot>, Grillot <[lrgrillot@ou.edu](mailto:lrgrillot@ou.edu)>  
**Date:** Wednesday, July 16, 2014 at 6:46 PM  
**To:** Danny Hilliard <[dhilliard@ou.edu](mailto:dhilliard@ou.edu)>  
**Cc:** "Catherine F. Bishop" <[cbishop@ou.edu](mailto:cbishop@ou.edu)>  
**Subject:** FW: Visit

Danny,

This afternoon, I visited with Harold Hamm (at his request), to discuss his concerns about reporting of earthquake activity by select OGS staff. I won't try to go over all the discussion in an email, but the following points are of some interest:

- (1) Mr. Hamm is very upset at some of the earthquake reporting to the point that he would like to see select OGS staff dismissed.
- (2) I understand that he will be visiting with Governor Fallin on the topic of moving the OGS out of the University of Oklahoma.
- (3) You will see from his note below, that he has expressed an interest in participating on the Search Committee for the OGS Director position.
- (4) He asked, and I gave him the names of the current members of the Search Committee, along with the reasons for their participation.
- (5) As I was waiting to be taken up to see Mr. Hamm, I saw President Boren leaving the Continental offices. I noted this to Mr. Hamm during our conversation (approximately 1.5 hours) and commented that I assumed I might be getting some guidance on all this. He responded that was possible. So it would appear that Mr. Hamm discussed some of his concerns with President Boren, and I'm sure that his has been a topic at Continental BOD meetings.

Certainly, I can be available to further discuss this at your convenience.

Larry

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**From:** Harold Hamm [<mailto:Harold.Hamm@clr.com>]  
**Sent:** Wednesday, July 16, 2014 4:30 PM  
**To:** Grillot, Larry R.  
**Subject:** Visit

Larry, what the salary range for the Director's position? Thanks. HH

Larry,

Thanks for your time and visiting with me this afternoon. I appreciate the historical background and your perspective on things. Since, as you pointed out, the mission of the USGS is to provide for the development of the natural resources in Oklahoma, particularly oil and gas, I strongly feel that your search committee should include a representative from the oil and gas industry. I would be very interested and willing to sit on your search committee.

As discussed, please forward to me the qualification for the Directorship that we spoke of. Again, thanks so much for your time and insight and please let me know if you have any questions and/or need additional information from me.

HH

Harold Hamm  
Chairman and CEO  
Continental Resources  
P O Box 269097  
Oklahoma City, OK 73126  
Tel: 405/234-9130  
e-mail: [Harold.hamm@clr.com](mailto:Harold.hamm@clr.com)



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**From:** [Grillot, Larry R.](#)  
**To:** [Grillot, Larry R.](#)  
**Subject:** FW: Visit  
**Date:** Monday, July 21, 2014 7:40:30 PM  
**Attachments:** [image001.png](#)  
[ATT00001.htm](#)  
[OGS Director Ad-2014.docx](#)  
[ATT00002.htm](#)  
[ATT00003.htm](#)

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**From:** <Grillot>, Grillot <[lrgriillot@ou.edu](mailto:lrgriillot@ou.edu)>  
**Date:** Wednesday, July 16, 2014 at 6:56 PM  
**To:** Harold Hamm <[Harold.Hamm@clr.com](mailto:Harold.Hamm@clr.com)>  
**Subject:** RE: Visit

Mr. Hamm,

The ad for the OGS Director position is attached.

Larry

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**From:** Harold Hamm [<mailto:Harold.Hamm@clr.com>]  
**Sent:** Wednesday, July 16, 2014 3:27 PM  
**To:** Grillot, Larry R.  
**Subject:** Visit

Larry,

Thanks for your time and visiting with me this afternoon. I appreciate the historical background and your perspective on things. Since, as you pointed out, the mission of the USGS is to provide for the development of the natural resources in Oklahoma, particularly oil and gas, I strongly feel that your search committee should include a representative from the oil and gas industry. I would be very interested and willing to sit on your search committee.

As discussed, please forward to me the qualification for the Directorship that we spoke of. Again, thanks so much for your time and insight and please let me know if you have any questions and/or need additional information from me.

HH

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