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No Credible Evidence Supports EPA Order Against Range

Mounting Evidence Raises Serious Questions about EPA's Actions and Motives

By Gene Powell, Publisher/Editor – *Powell Barnett Shale Newsletter*®

The *Powell Barnett Shale Newsletter*® published on December 13, 2010, the report [EPA Wrong - Barnett Shale Not Responsible for Gas in Water Wells](#) exposing the U.S. Environmental Protection Agency (EPA) with bringing wrongful actions against Range Production Company, (Range Resources), without proof or cause. The EPA's Emergency Order claimed that natural gas present in two private shallow water wells was caused by Range Production Company's two deep Barnett Shale horizontal wells in the area. The EPA Region 6, headed by Administrator Al Armendariz, sent a letter¹ to Range on December 7, 2010, declaring an *"imminent and substantial endangerment to a public drinking water aquifer has occurred (or may occur) through methane contamination which is directly related to oil and gas production facilities under your operation..."* Further, "The Order describes the actions you must take to ensure the Butler Unit and Teal Unit production facilities pose no imminent and substantial endangerment to public health through methane contamination of an underground source of drinking water." The letter went on to demand "Within five (5) days of receipt of this Order, Respondents shall submit to EPA a survey listing and identifying the location description (latitude and longitude) of all private water wells within 3,000 feet of the Butler wellbore track and 3,000 feet of the Teal well bore track and all of the Lake Country Acres (TXII 10059) public water supply system wells."

The *Powell Barnett Shale Newsletter*® (PBSN) research looked at the area prior to January 1, 2006 (over 5 years prior to any Barnett Shale activity in the area) and discovered the first neighboring Hurst Water Well², drilled to a total depth of 180 feet on October 15, 2005, and the Driller's Report of October 15, 2005, stating:

Comments: **Surface Completion: Steel Sleeve**

Well has natural gas coming into well at intermitting times.

¹ [EPA Findings & Emergency Order Ltr to Range Prod Co 12-7-2010](#)

² [Gas in Water Hurst Water Well Report Tracking 226387 10-15-2005](#)



Larry Peck, owner of *Peck's Well Service*, drilled many of the wells in this area. This included drilling the first Hurst water well above that produced natural gas, more than likely from the Strawn Sand which lies directly beneath the Paluxy water sand in this area. We interviewed Mr. Peck, Saturday, December 11, 2010. He remembered the well and told us it was flaring enough natural gas to heat 6 or 7 homes. When asked why the first Hurst well drilled October 15, 2005, that had natural gas in with the water was not plugged, he said that the owner told him he had experience with gas and wanted the well water produced, even with the gas. First, Mr. Peck said, the well was flowed to see if the gas was limited and would quit but it did not. Then Mr. Peck said his client decided to use the water from the well to water his landscape and not hook it up to his home. Mr. Peck did not know the source of the natural gas. He took nine photos of the gas burning and below is one of the photos taken on October 15, 2005, which shows a 5 – 6 ft. flare:



Hurst Water Well Photo by Larry Peck, 10-15-2005

Shortly after the *PBSN* published historical facts that natural gas appearing in private water wells had existed years before the drilling of any Barnett Shale horizontal wells other significant information was published confirming its existence by many neutral parties. This included an interview³ with Mr. Bob Patterson, General Manager of the *Upper Trinity Groundwater Conservation District*⁴. Mr. Patterson said natural gas has contaminated

³ [Ruling on Parker County Water Contamination Is Questioned by Jack Z. Smith, Fort Worth Star Telegram, 12-18-2010](#)

⁴ [Reference UTGCD 12-18-2010](#)



shallow, water-bearing sands "for an estimated 40 years" in the same area where the EPA says the Range gas wells fouled the water wells. Patterson said there are an estimated 40,000 to 70,000 private wells just in the *Upper Trinity Groundwater Conservation District* which includes Parker, Wise, Hood and Montague counties. The Barnett Shale underlies 24 North Texas counties at an average depth of over a mile.

The *Railroad Commission of Texas (RRC)*, the state regulatory agency which oversees the oil and gas industry, called a hearing on the matter beginning on January 19, 2011, at the RRC offices in Austin, Texas. Both the EPA and Complainant No. 1 Steve Lipsky elected not to appear in the hearing, although each was given every opportunity to participate. Complainant No. 2 Richard Hayley also chose not to appear nor did any other area water well owner or landowner participate. The RRC meeting lasted two days but was held open by the RRC Examiners for an EPA deposition to be presented which had been ordered by a U.S. District Judge. Not only did the EPA and Mr. Lipsky fail to appear at the hearing, both resisted providing any sworn deposition testimony or relevant documents. Range was allowed to take Mr. Lipsky's deposition and sample his water well only after obtaining an order from the Examiners on a motion to compel. When Range obtained Commission subpoenas to obtain discoverable information from the EPA regarding the basis of its Order, the EPA refused to comply, and then removed the subpoena proceedings to Federal Court. Range was finally able to depose an EPA representative only after the EPA was ordered by a U.S. District Judge to provide a representative for deposition.

Range Resources Testimony & Evidence

The Commission Staff entered an appearance through Staff Counsel, David Cooney. Range appeared and presented live testimony from highly-qualified experts in all areas pertinent to the Lipsky complaint and the erroneous conclusions drawn by the EPA. Each of Range's witnesses was cross examined by the Commission Staff's counsel, and each witness was also questioned by the Hearing Examiners. Range presented sworn deposition testimony (through video excerpts) from Mr. Lipsky and his consultant, Alisa Rich.

In addition, so that the Commission might have the benefit of all materials marshaled by Range in the course of its investigation, Range tendered into the record the complete



Commission file on the Lipsky Complaint, the complete transcript of all depositions taken in this matter, including those of Mr. Lipsky, Ms. Rich and of long-time water well drillers Larry Peck and Leland Malone, test results gathered by Ms. Rich, and other information from public records relating to the history of the presence of natural gas in water wells in this immediate area of Texas.

The evidence presented by Range through expert testimony showed facts that were established including a long history of natural gas in water wells in the area prior to Range drilling their Butler #1H and Teal #1H Barnett Shale wells beginning in the first quarter of 2009. Even the Lake Country Acres subdivision public water system had detected natural gas components since 1995. In 2003, the Lake Country Acres water well No. 4 flowed 122,000 cubic feet of natural gas per day and had to be plugged because it made more natural gas than water. The signage on the Lake Country Acres *water storage tanks* warns "**DANGER: FLAMMABLE GAS**" and "**DANGER: NO SMOKING, NO OPEN FLAMES, NO SPARKS,**" warnings not typically associated with water wells or water storage.

The geological evidence presented confirmed the *PBSN's* earlier findings of Strawn Sand production in the immediate area of the water wells with the natural gas production from the Expanding Energy / Ruth Brite #4, #5, and #6 from 407 – 414 ft. of 1,598 MCF gas from 1985 – 1986 before being plugged and abandoned, not for lack of any natural gas but lack of commercial natural gas. It also established shallow natural gas 24 years before 2009.

A summary of the Range experts includes testimony from some of the foremost experts in geochemical gas fingerprinting. Mark McCaffrey, Ph.D., an expert in the field, testified that "that nitrogen... can be used to distinguish Barnett formation reservoir gas from Pennsylvanian Strawn reservoir gas. Specifically high nitrogen, low CO2 samples are characteristic of gasses produced from the shallower Pennsylvanian reservoirs. The natural gas component of the most recently collected Lipsky well headspace gas samples... contain higher nitrogen than is in Barnett gas." The Barnett Shale is over a mile deeper in the earth than the shallower Strawn Sand in this area. The full report⁵ by Dr. Alan S. Kornacki and Dr. Mark A. McCaffrey, *Weatherford Labs*, shows the research results of area water and bradenhead samples of the natural gas. The isotopic composition of methane shows the

⁵ [5 RRC 7B-0268629 Dr Mark McCaffrey Study 01-19-2011](#)



difference between the high levels of nitrogen in Strawn gas and the low levels of nitrogen in Barnett Shale gas. This critical testing of nitrogen levels of the gases was not performed by the EPA in their rush to condemn Range and their Barnett Shale wells based on sampling and analysis by Alisa Rich, dba *Wolf Eagle Environmental*.

John McBeath, P.E., Texas Certified Petroleum Engineer, stated that “basically from the information we have in these wellbores, there is no evidence of faulting that could be — that could join up with a potential hydraulic fracture even if you could get past the physics of not having enough volume or enough pressure to reach all the way from the Barnett through a mile of rock up to the surface.” McBeath went on to say that there was no scenario in which hydraulic fracturing could be a source for contamination in the fresh water wells in the area. He stated that he didn’t see how the EPA order can be justified based on the actions that have gone on through the fall of 2010, and the ongoing investigation. McBeath said he was somewhat confused by the EPA finding and certainly did not agree with it. McBeath’s conclusion was that the presence of gas in the Lipsky well and the other wells in the area is due to a natural connection between the Cretaceous and the Strawn that is probably exacerbated with the water wells being drilled too deep. McBeath's testimony also proved that the mechanical integrity of the Teal and Butler wells is irrefutable. The integrity of these wells has been tested and double tested and they can be ruled out as the source for the gas in area water wells, according to his sworn testimony.

Another of the many experts to testify was Dr. Charles W. Kreitler, an expert in geology and hydrogeology with 35 years of experience in groundwater investigations. Dr. Kreitler testified that the gas found in the Lipsky well occurs as a result of a widespread naturally occurring geologic contact between the shallow Strawn gas-bearing formation and the shallow Cretaceous fresh water-bearing formation which lies on top of the Strawn. 3-D seismic showed there are no faults anywhere near the wellbore path of the Teal and Butler wells. From a geological perspective, given the nature and thickness of the formations located between the Barnett Shale at a depth of over 5,000' and the Cretaceous at a depth of approximately 400', leakage from the Barnett Shale to the Cretaceous is simply not a reasonable concern, according to Dr. Kreitler.



Other sworn testimony included that of Dr. Norman Warpinski, Director of Technology, Pinnacle-Halliburton Service, a Division of Halliburton. Of his many credentials, he was Executive Editor of SPE Production and Operator Journal of the Society of Petroleum Engineers. He stated that in Parker County, the hydraulic fractures extend no higher than 4500' below the surface, approximately 4000' below the base of usable water. His conclusion was that hydraulic fracturing cannot be the source of contamination in water wells in the area of the Range Teal and Butler wells. In Dr. Warpinski's words, *"it is impossible."*

These are but a few of the witnesses who testified under oath before the RRC hearing on behalf of Range Resources. There are far too many to list in this update report but all their points are covered by footnotes in this report.

Points in the Deposition of EPA's John Blevins

John Blevins, Director of the Compliance Assurance and Enforcement Division for EPA Region 6, was designated as the agency's official to be deposed in response to a court order by Judge Lee Yeakel of the U. S. District Court for the Western District of Texas on January 19, 2011. Blevins was represented by Brian Lynk of the U. S. Department of Justice, Washington, D. C. Attorneys for Range Production Company (Range Resources) were John Riley, Vinson & Elkins, Austin, Texas and Andrew Sims, Harris, Finley & Bogle, Fort Worth, Texas. The deposition is 327 pages long not including 9 exhibits so we have chosen to hit the high points with footnote excerpt references from the deposition.

1. EPA admits it had knowledge of natural gas in water wells in the area of the Lipsky well prior to issuing its December 7 Order, and that such natural gas existed before Range drilled the Butler and Teal.⁶
2. EPA admits that it had a responsibility to consider alternative scenarios as to how gas may be occurring in the Lipsky water well.⁷
3. EPA admits it did not evaluate the geology below the Lipsky water well.⁸
4. EPA admits that the Strawn formation is a natural gas bearing formation, that the Strawn formation exists in the general vicinity of the Lipsky and Hayley water wells, but

⁶ [EPA Blevins Deposition Jan 25 2011 Page 58 Lines 7-21](#)

⁷ [EPA Blevins Deposition Jan 25 2011 Page 93 Line 18 - Page 94 Line 4](#)

⁸ [EPA Blevins Deposition Jan 25 2011 Page 95 Lines 15-17](#)



EPA admits it does not know where the formation exists under the surface of the earth and that it did no geologic investigation.⁹

5. EPA admits that its fingerprinting analysis only distinguishes between thermogenic and biogenic gas.¹⁰
6. EPA admits it did no analysis of whether Strawn formation gas is thermogenic or biogenic.¹¹
7. EPA admits the compositional analysis of the Butler bradenhead gas is different than the production gas and different than the Lipsky water well gas.¹²
8. EPA admits that different levels of nitrogen in the gas samples may mean that they are from different sources.¹³
9. EPA admits that Dennis Coleman of Isotech told EPA that it needed to “evaluate the potential for other sources that would be thermogenic and the geology or structures that would store or transmit the gas from origin to aquifer to be certain.”¹⁴
10. EPA admits that Dr. Doug Beak of the EPA, an environmental chemist, told the EPA that he could not compare the gas fingerprinting and compositional data on which EPA relies, and that the “only way to compare the data would be to make assumptions to fill in data and gaps and I don’t believe we have enough experience at this site or data to do this at this time.”¹⁵
11. EPA admits that it agrees with Dr. Beak’s analysis, but it nonetheless issued the December 7 Order.¹⁶
12. EPA admits that it does not understand how gas is migrating into the Lipsky or Hayley water wells, and that it issued the December 7 Order to force Range to gather data to answer that question.¹⁷
13. EPA admits that Range *may not* have caused or contributed to the natural gas in the Lipsky water well, and contrary to Conclusion 46 in its December 7 Order, will say under oath only that Range *may* have caused or contributed to natural gas in the Lipsky water well.¹⁸

⁹ [EPA Blevins Deposition Jan 25 2011 Pages 99 104 106 168](#)

¹⁰ [EPA Blevins Deposition Jan 25 2011 Page 101 Lines 2-7](#)

¹¹ [EPA Blevins Deposition Jan 25 2011 Page 107 Lines 10-23](#)

¹² [EPA Blevins Deposition Jan 25 2011 Page 108 Line 21 - Page 109 Line 15](#)

¹³ [EPA Blevins Deposition Jan 25 2011 Page 173 Line 9 - Page 174 Line 6](#)

¹⁴ [EPA Blevins Deposition Jan 25 2011 Page 264 Line 23 - Page 265 Line 11](#)

¹⁵ [EPA Blevins Deposition Jan 25 2011 Page 269 Line 22 - Page 273 Line 4-9](#)

¹⁶ [EPA Blevins Deposition Jan 25 2011 Page 274 Line 4-9](#)

¹⁷ [EPA Blevins Deposition Jan 25 2011 Page 301 Line 9 - Page 302 Line 4](#)

¹⁸ [EPA Blevins Deposition Jan 25 2011 Page 225 Lines 17 - 22 Page 226 Line 19 - Page 228 Line 2](#)



14. EPA admits that it does not know whether hydraulic fracturing contributed to any gas in the Lipsky or Hayley water wells.¹⁹

Deposition Highlights of Alisa Rich, dba Wolf Eagle Environmental LLC

Alisa Rich dba Wolf Eagle Environmental LLC (Texas) was deposed as she was the consultant hired by Steve Lipsky and her sampling, tests and analysis was a prime source for the EPA. Her objectivity, professional accreditation and education claims have been questioned by the *PBSN*²⁰ while sources independent of the oil and gas industry have condemned her sampling methods, reporting and analysis as it pertains to her work as an environmental consultant going back several years.

Rich's sworn depositional evidence shows a pattern of dishonesty with repeated embellishments and misstatements of fact with regards to her educational background, employment history, and theoretical sampling not using acceptable scientific procedures. For example, on March 12, 2008, Rich told the Flower Mound, Texas, Oil and Gas Board of Appeals that *"My name is Alisa Rich. I have been on the Board for over ten years on the Zoning Board as well as the Oil and Gas Board now for five as vice chair or chair, either one. I have a master's in environmental toxicology.... I have a Ph.D. in air pollution control design. If that does not satisfy you, I don't know what possibly could. I'm a specialist in the oil and gas. I am not only a specialist, I am a consultant to oil and gas... I am an air specialist. I have a doctorate in air pollution."*²¹ However, under oath in her deposition, Rich admitted all of her claims highlighted above were untrue.²²

This pattern of dishonesty was manifested in this case with evidence showing Rich concocted a strategy or scheme to come up with trumped-up test results which would get the EPA involved and bypass the state regulatory agencies. Depositional evidence indicates Alisa Rich pinned the blame on Range's deep Barnett Shale wells *before she obtained any results from the first tests of the Lipsky water well*. Yet, when questioned, Rich denied under oath

¹⁹ [EPA Blevins Deposition Jan 25 2011 Page 200 Line 10 - Page 201 Line 1](#)

²⁰ [20 PBSN Editorials on Alisa Rich](#)

²¹ [21 Alisa Rich Falsifying Education & Experience Flower Mound 3-12-2008](#)

²² [22 Rich Deposition Education O&G Experience](#)



three times that there was any scheme or strategy to get the EPA involved from the outset.²³ One example was: *Question: Did you ever advise Mr. Lipsky of a strategy to take air samples, and how to take them, to get the EPA involved in this case? Rich Answer: No, sir. No, sir.*

However, Rich was then forced to read Deposition Exhibit 20 (shown on the next page) which was an e-mail message she had written to Steve Lipsky dated August 12, 2010, with a Subject: gas fired microturbine. The message clearly contradicts Rich's sworn testimony as she suggests employing such a strategy or scheme to get the EPA involved in the case and bypass the Texas state regulatory agencies, which she disparages.

From: Alisa Rich <rich@wolfeagleenvironmental.com>
Date: August 12, 2010 3:24:35 PM CDT
To: lipsky@mac.com
Subject: gas fired microturbine

Steve,
I left a message for you earlier today regarding an air test at the wellhead. Yes, I know it is expensive - but after serious consideration I am strongly recommending we take an air sample 5 feet away from the hose that is hooked up to the well head. This is my thinking...
TCEQ does not have any jurisdiction over water, only the RRC - and you saw how helpful they were. Just wait, it gets better. However, TCEQ has total jurisdiction over air emissions. Once the natural gas leaves the water it is an airborne issue; and therefore falls into their laps to get involved - which they will jump because they are in the middle of SunSet Review (oversight by EPA).


Also, I can then contact the EPA and discuss the fact that we have a multi-issue environmental concern, including potential for explosion AND impact to human health (especially children) they will be very receptive.

It is worth every penny if we can get jurisdiction to EPA who oversees TCEQ. I would like to get my tech out there tomorrow if you approve of this strategy. Please advise.

Second issue - harnessing natural gas for energy. What you are looking for is called a gas fired microturbine. This is a smaller scale turbine much like is used in generation of electric power from natural gas. They are sized for residential use. Capacity is approximately 25-500 KW of electricity and their size is about the size of a 55 gallon barrel. They tell me there are easy to install and really efficient. I do not know an installer right off but I am sure I can find one pretty quick. Free energy....great idea. But let's get your water fixed first.

Regards,
Alisa

Alisa Rich, MPH, PhD
President
Wolf Eagle Environmental
682-502-6056 office
682-502-6069 fax



²³ [23 Alisa Rich Deposition Denial Of Scheme & E-Mail 8-12-2010](#)



The testimony of the EPA's Blevins indicated that the EPA did not question Rich's work and depended significantly on her test results for its investigation. Rich was questioned if she had looked at any other available public information about other water wells in the area and whether they contained methane. She responded that she did not.²⁴ Instead, the EPA ordered Range to take samples of all the private water wells in the area and to have them tested at Range's expense. The results of wells drilled prior to Range's two Barnett Shale wells are in the Range Exhibit 031.²⁵

Summary

All of the evidence presented to this point shows that the EPA did not use any geological analysis in determining the source of natural gas in the two water wells in question nor in historical evaluation of its presence probably for centuries in area water wells before issuing their directive order blaming Range for the two water wells containing gas. Evidence conclusively shows there was not, nor had been, any imminent danger of explosions which the EPA claimed in their order and is the basis for the agency's assessment of daily fines of \$16,500 against Range. It is hoped that additional testimony or depositions from the two additional EPA persons involved in the case will be granted by Judge Yeakel based on documents filed February 3, 2011, requested by Range and being opposed by the EPA.²⁶ If Range's request for the two EPA depositions is granted by Yeakel, it is our understanding they may be added to the RRC hearing record.

The best summary of everything presented thus far at the RRC hearing is found in the Range Production Company's Closing Statement submitted to the RRC on February 4, 2011.²⁷ It is a thorough, factual accounting summary of the evidence to date and is footnoted due to its length. Be sure you read it. It presents point by point why the EPA's order is not justified and lists key points about the EPA's flawed investigation and the role that Alisa Rich has played in this case.

²⁴ [24 Rich Did Not Check History Area Water Wells](#)

²⁵ [25 RRC 7B-0268629 Exhibit 031 Gas In Wells Prior to Range 01-19-2011](#)

²⁶ [Range Request Judge Yeakel for 2 EPA Depos 2-3-2011](#)

²⁷ [Range Closing Statement for Docket 7B-0268629 2-4-2011 pp1-48](#)



We also found that the EPA had, earlier in their investigation, asked the Texas Commission on Environmental Quality (TCEQ) to supply any technical information which might be helpful in determining the likely cause of the gas in the water wells, and TCEQ, with quite a bit of historic and geologic data on the Strawn gas contamination in its records, obliged. One TCEQ person said that the TCEQ was prepared to give EPA its opinion that it was highly unlikely that the alleged contamination resulted from the Range wells, but EPA didn't want to hear it, according to published sources.²⁸

A RRC Staff Closing Statement to the RRC Examiners hearing this case was submitted on and filed on February 8, 2011.²⁹ It concludes that the “Site Remediation staff is expecting to receive further reports with information such as laboratory data reports. Staff has not closed its investigation file.” It went on to state that there “is sufficient evidence in the record for the examiners to make an informed and credible decision.”

Later, we obtained new evidence showing EPA Region 6 Administrator Al Armendariz gleefully announced the agency's order against Range Resources to several environmental activists by email only minutes after it was issued. Furthermore, the emails indicate that Armendariz notified WFAA-TV, Channel 8 in Dallas, minutes before informing then Texas Railroad Commission Chairman Victor Carrillo about the EPA's action.³⁰

These emails present a disturbing development, in our opinion, and suggest Armendariz, a top EPA official, was more interested in publicity and furthering the agenda of his environmental activist allies (he has admitted he himself is an activist) than he was in actually pursuing an action that was based on solid science and indisputable facts.

So far, Armendariz has refused to provide an explanation of his role in this case. This evidence suggests he and the EPA have something to hide, a stance which has been demonstrated by the agency's refusal to appear at the Railroad Commission hearing and its attempts in court to block Range's attorneys from obtaining information from the EPA about its investigation.

Therefore, it is all the more imperative that Armendariz be forced to explain, under oath, his role in directing the EPA's Region 6 office to pursue what appears to be a badly-flawed

²⁸ [EPA Aggressively Pursues Gas Contamination Claim In Barnett Shale by Bob Landreth, Midland Reporter-Telegram Feb. 9, 2011](#)

²⁹ [Range RRC - RRC Staff Closing Statement 2-8-2011](#)

³⁰ [Armendariz Emails Dec 6-7-2010](#)



investigation that the evidence shows was prompted by the suspect actions of Alisa Rich, with whom Armendariz has worked on projects in the past.³¹

The more that is uncovered about the EPA's action in this case, the more suspicious it becomes in our opinion. We believe, after reading the depositions, evidence and exhibits in this case that a Congressional investigation is warranted into the total abuse of power by the EPA and its Region 6 Administrator Al Armendariz, who is responsible for all its actions. This case has national importance and should be based on fact, not theoretical supposition, innuendo, or misinformed beliefs.

Such an investigation should be treated as an example of the "transparency of federal government" that President Barack Obama has promised us since being in office.

About the author

Michael E. (Gene) Powell, Jr. (72) is publisher/editor of the *Powell Barnett Shale Newsletter*, a weekly electronic newsletter since 2003. He has 45+ years of executive and 'hands-on' operational experience in the oil and gas industry. Career highlights include founding or co-founding several successful oil and gas companies. He is credited with the discovery of ten (10) new oil and/or gas fields in Texas through his research. He is Chairman/CEO of *Powell Royalty, Inc.*, an oil and gas exploration company. His experience includes ten (10) years with a major international oil company (CONOCO); two years with a large independent (*Bass Brothers/Sid Richardson*) and eight years as an independent operator (*Thomas-Powell Royalty, Inc.*) He became an independent oil operator in Texas in 1978. He studied geology, pre-law and business at *Texas Christian University, Baylor University*, and took a case management course at *Massachusetts Institute of Technology (MIT)*. He has served on such national committees as the *National Bureau of Standards (NBS)*, *American Society of Testing & Materials (ASTM)*, *American Society Quality Control (ASQC)* and many other organizations. He has patents assigned in high temperature reactor design, a gas chromatograph, and other areas. He managed a chemical and physical laboratory at a large plant during college.

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³¹ [Sattler Deposition on Alisa Rich - Worked With Armendariz 7-24-2009](#)