



KANSAS GEOLOGICAL SOCIETY

BULLETIN

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S.J. Mazzullo and Chellie S. Mazzullo
Mazzullo Exploration, LLC

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Mazzullo beach-bar headquarters at Palmetto Bay, Roatan

CALL FOR PAPERS

The Kansas Geological Society Bulletin, which is published bimonthly both in hard-copy and electronic format, seeks short papers dealing with any aspect of Kansas geology, including petroleum geology, studies of producing oil or gas fields, and outcrop or conceptual studies. Maximum printed length of papers is 5 pages as they appear in the Bulletin, including text, references, figures and/or tables, and figure/table captions. Inquiries regarding manuscripts should be sent to Rebecca Radford, manager@kgslibrary.com or mailed to 212 N. Market, Ste. 100, Wichita, KS 67202. Specific guidelines for manuscript submission appear in each issue of the Bulletin, which can also be accessed on-line at the Kansas Geological Society web site at <http://www.kgslibrary.com>

SOCIETY Technical Meetings

2016 Technical Talks

May 17— **“ 6 hours of films”** - We will be showing 3 hours of films starting at 9:00 AM running until noon. Break for lunch and 3 hours starting back up at 1:15 PM. Bring a sack lunch or dine out but we will have beverages available in the Wisdom Center with a donation jar to help with expenses. Films will cover more of the Valley Fill Systems—SIPES lectures and other various films to be announced. Watch the web site for the most up-to-date information.

May 24— **“Subsurface Lower to Middle Mississippian Stratigraphy and Petroleum reservoirs in Southern Kansas and Northern Oklahoma”** - Sal Mazzullo, Mazzullo Exploration, LLC, Professor Emeritus, WSU Geology Department.

May 30— **“WSU Student Presentations”** - Larry Richardson Petroleum Class Field Studies

Please remember to check the website for the most up to date information on Technical Talks
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For More Information or suggestions of speakers please contact Dave Clothier: dave@mccoypetroleum.com

*Tech Talks are held at Landmark Square
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Note: For those geologists who need 30 points to renew their licenses, there will be a sign-in sheet at each presentation and also a certificate of attendance.



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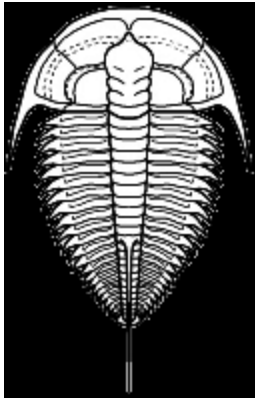
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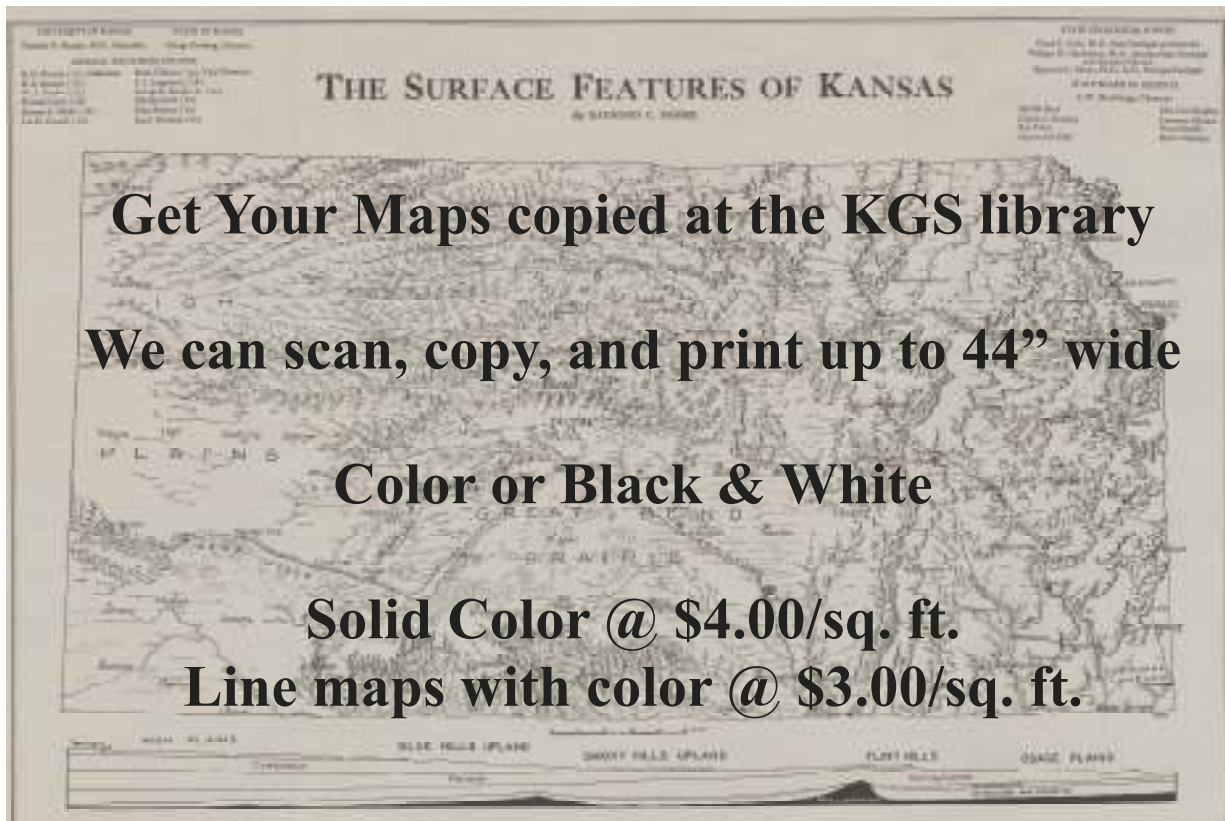
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President's Letter

Society and Library Members,

I hope all is well with each of you as the oil prices seem to have risen somewhat and the hope of higher prices will continue a much needed climb. The April 2016 American Oil and Gas Reporter magazine listed that gas in storage was 51.9 % above our 5 year average, but down 116 BCF from February. Maybe we'll see some help on the gas side of our prices eventually and get away from the less than \$2 natural gas numbers we've experienced for a while. In retrospect, it's a shame that for our prices to go up we will have to endure more hardships throughout the industry that has taken years of manpower, investment capital and technology to achieve.



Photo by A.J.

The Kansas Geological Foundation's 21st Annual Mixer will have happened by the time you read this and I hope all, if not, most of you, attended this event. The Petroleum Club staff has always been great to work with and the Club provides a great meeting place for all of us to get together and share ideas of our plans as we try to gear up for some year-end activity if prices continue to rise. This year's event was used as a fund raiser for the digital integration which is so important to the Library's ever increasing database. As a bonus, David Doyel was going to present the development and history of the Scoda Field in Rawlins County, which is truly an interesting discovery. Unfortunately I was unable to attend this event because of an earlier commitment that required my attention in Colorado. The mixer is always a fun event for Brenda and me to attend.

Later this summer, we will be having the KGS Golf, the Fishing Tournament and the much enjoyed KGS Picnic. Please plan to attend these upcoming events and if possible, help with any financial contributions. These events are some of the best places to network and enjoy the camaraderie of fellow geologists and families.

Tim Hellman
President



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From The Manager

Dear Members,

I know we have all felt these trying times but I believe that we are seeing the natives getting restless and chomping at the bit to get back out in the oil patch. We can only sit idle for so long and we just have to do what we were built to do.

As we move into the summer, we have our **Annual KGS Golf Tournament** coming up on Monday, June 27th. We will be back out at Rolling Hills Country Club with David Barker planning a wonderful day for you all. The registration flyer is in this Bulletin and also on-line at www.kgslibrary.com/events.

Please help support this event if you get a phone call and if you are a golfer, this is one of the best events the KGS puts on and is always a fun, relaxing day with lots of prizes!



The Foundation had its Annual Spring Mixer on Thursday, April 28th and it was very well attended. David Doyel, Murfin, Inc., gave a great talk on the Scoda Field in Rawlins County and a heart felt plea for the Foundation's Integration Project. Stating that if it wasn't for the log library, this field might never have been discovered. Please consider giving what funds you can to keep this important project going. Your KGS staff is also contributing to the integration of old logs into our library. A special thank you to those of you who have provided us with a new log or geo report copy when one of ours is bad.

We will be winding down with our Technical Talks schedule as we wrap up the month of May. We will be adding a day of film viewing for those who may be needing more points. We are planning May 17th as a catch up day and will be showing several tapes of interest. Viewing will start at 9:00AM and run until noon. We will break for lunch and resume viewing at 1:15 PM. We will have a cooler of sodas, water, and beer available with a donation jar to help with expenses. So you can bring a sack lunch if you want or dine out. Could be a fun way to gain some points and hang with your colleagues to discuss geology over a beer or two.

On page 18 you will find a repeat story by Bob Stolzle which is intended to revive the Tales From The Doghouse stories. I encourage you to tell us a few tales, give us some memories, describe some favorite characters from the oil patch. I know you have some stories out there, give them a share!

Respectfully submitted,

Rebecca Radford

Manager



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Memorials — Monna Manes



Monna was born December 2, 1935 in Villisca, Iowa to her parents Chalmer and Gladys Manes. Chalmer was a farmer and teacher. Her mother Gladys was a housewife. Monna had two sisters: Maxown who is deceased, and Mary Lou who worked for St. Francis Hospital for 50 years. Monna's parents were both killed in the Andover tornado in 1991. The family still owns the family farm in Nodaway County, Missouri.

Monna attended country schools until the eighth grade, and then attended high school in Elmo, Missouri. After high school she attended Clarinda Junior College in Clarinda, Iowa where she graduated with an A.A. degree in 1956.

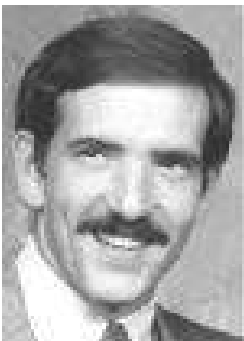
Moving to Wichita after Junior College, Monna found employment with Enmar Incorporated on an assembly line filling paint cans. In 1957, she went to work for the Fourth National Bank where she stayed for nine years. Although she advanced to a loan teller position, she found the work to be quite boring. Eventually deciding there was more to life, she enrolled at Wichita State. A friend suggested she try Geology. After taking the introductory class, she was hooked!

At Wichita State, Monna was fortunate to have Dr. Robert Berg as an instructor and mentor. Monna graduated in Geology in 1970 and received her Master's in 1973. She was the first female to receive a Master's in Geology at Wichita State. It was Monna's opinion that Dr. Berg was instrumental in securing a research assistantship and an instructor position for her at Wichita State. She continued teaching at WSU until 1979, and also taught geology at Butler County Community College.

In 1980, she was hired by R.R.A. Inc. as a field geologist to work in Eastern Kansas and in 1981, she was employed by Energy Exploration Inc. as an Exploration Manager and head Geologist. Here she met Nelson Thomas who was completing the company's wells. He taught Monna how to set wells in Western Kansas. Although she did not label Nelson as the biggest character she had encountered, she did describe him as very entertaining. Monna went on to become an Independent Geologist in 1983 continuing in wellsite work and writing prospectuses for clients. During this period she met many interesting people and promoters, especially being a woman in a very male dominated business.

Monna maintained her interest in geology and continued her membership in the Kansas Geological Society. In the later part of her life, she transferred her interests in rocks and minerals to a jewelry and lapidary business and in doing so, she put to use the information derived from a course in Mineralogy. She cut stones, did silver smithing and design mountings. Monna enjoyed camping and traveling. She also volunteered her time to help a friend teach a science course at West High School in Wichita.

Monna passed away January 17, 2016. Graveside services were held on January 23, 2016 at Andover Cemetery.



Chuck Immich

Immich, Charles George, Jr. was born July 8, 1951 in Wichita, KS to Charles G and Rita (Hughes) Immich. He died on March 16, 2016, in Wichita at the age of 64. After 15 years as a geologist, Chuck finished his career as a Systems Analyst for Spirit. He was a loving husband, father, grandfather and Shocker fan. He is preceded in death by his parents. He is survived by his wife of 43 years, Jeanne; daughters, Rachel (James) Overheul, Stephanie (Kevin) King and Tish (Andrew) Best; sister, Barbara (Ron) Hipp; 8 grandchildren, C.J. and Ainsley Overheul, Kyle, Logan, and Brittany King, Drew, Stephanie, and Reagan Best. A Celebration of Life was held Tuesday, March 29, 2016, at the Wichita Art Museum. In lieu of flowers, memorial contributions can be made to the Chuck Immich Memorial fund at St. Jude's Children Research. Condolences may be sent to the family at www.oldmissionmortuary.com

William Lamb

Bill Lamb passed away March 4, 2016 at the age of 67. Bill was a petroleum engineer for Berexco and was a member of the Kansas Geological Society.

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Photos From the Foundation's Spring Mixer



The Foundation's 21st Annual Spring Mixer was held at the Petroleum Club on Thursday, April 28th. A good time was had by all!

David Doyel gave a talk on the discovery of the Scoda Field in Rawlins County. I believe every time David said something was "good" the crowd gave a toast.

That discovery was "good" and therefore, there was a lot of toasting going on!



OF CARIBBEAN PIRATES AND THE GEOLOGY OF ISLAND-FRAGMENTS OF OLD MOUNTAIN RANGES (ROATAN)

S.J. Mazzullo¹ and Chellie S, Mazzullo
Mazzullo Exploration, LLC

¹Professor emeritus, Geology Department
Wichita State University

Our quest to identify some of the more beautiful places in the Caribbean, and to sample their finest cuisines and adult beverages, led us to Roatan this past March. Roatan is the largest of the Bay Islands in the Gulf of Honduras. It is east of Belize (Figure 1) and belongs to the Republic of Honduras. Christopher Columbus sailed by the Bay Islands on his fourth journey to the New World in 1502. On a decidedly more leisurely journey than Columbus', we departed from Houston on a clear and sunny day, after a while flying directly over the Chicxulub crater as the aircraft crossed over the northern coast of the Yucatan Peninsula. This is the subsurface crater that resulted from the end-Cretaceous bolide impact that presumably ended the dinosaur's reign on earth. After traversing the peninsula and then the southern part of the western Caribbean we spotted Roatan in the distance as the plane descended toward the international airport on the south side of the island. Roatan is 37 miles long and 5 miles at its widest point, but we were quite concerned that, from what we saw from the plane, the airstrip at which we were headed didn't seem quite long enough to handle our 737 jet. Alas, the opportunity to purchase nerve-sedating beverages was already past, so we tightened our seat belts, secured the tray tables, and trusted that the airlines certainly must have successfully accomplished this landing many times before. The plane came to a screeching halt

with hardly any runway to spare, and we were safely in Roatan. Upon de-planing the sights, sounds, and odors of the Caribbean wonderfully assailed our senses. Roatan is home to about 45,000 people, the majority of which are English-speaking, native "islanders", as they refer to themselves, of European and British-African-Caribbean descent. Garifuna, and American and Canadian expatriates, are included in the population. The island was also home to swashbuckling, rum-drinking pirates (as in "arghhh") from the 1500s to about 1700. The Bay Islands were colonized by the British, then the Spanish, and then the British again, who relinquished control of the islands to Honduras in 1859.

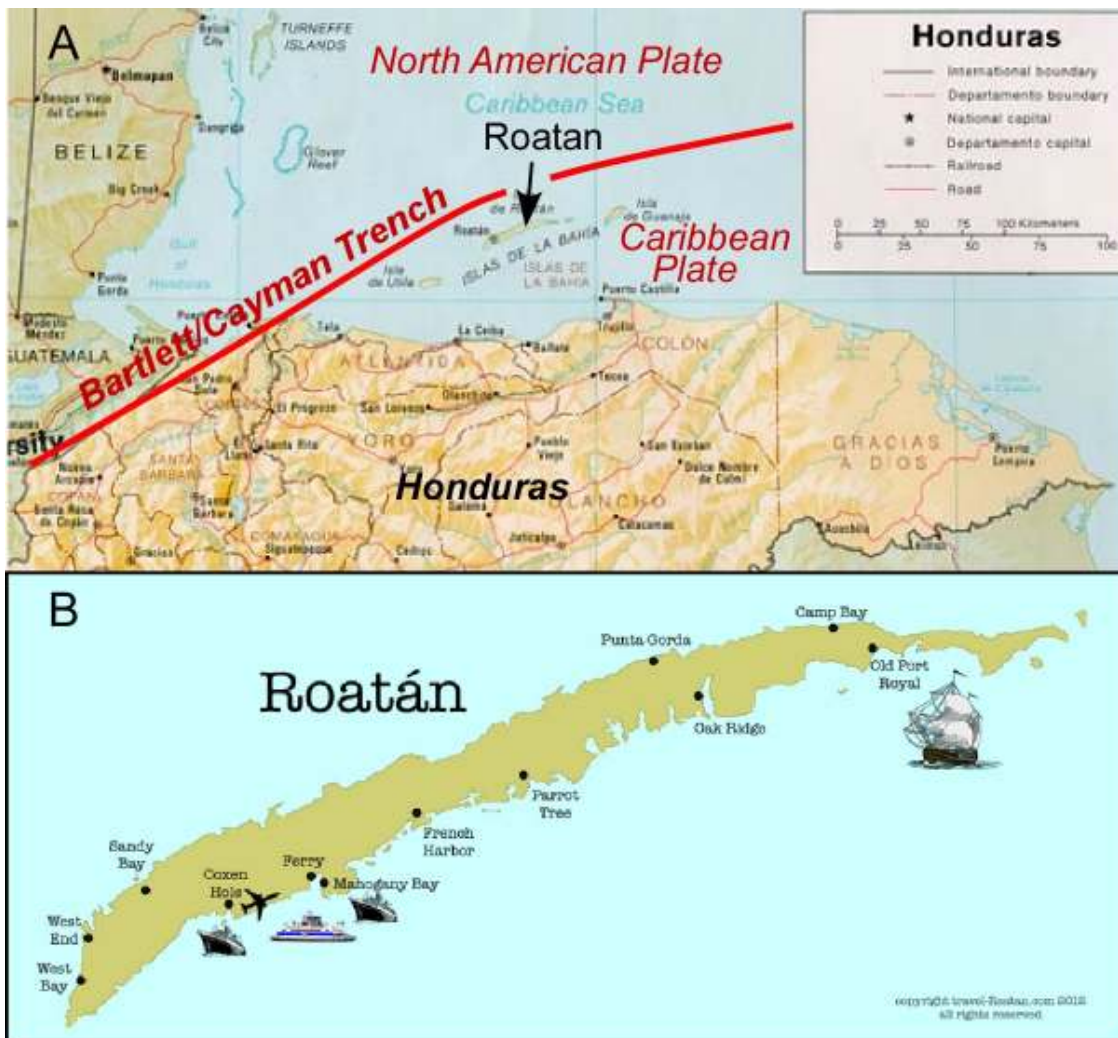


Figure 1. (A) Map of Honduras and location of Roatan in the Bay Islands. (B) Map of Roatan with some towns and villages.

Continued on page 14

After the perfunctory check of our citizenship credentials we rented a vehicle and drove east a few miles along the south coast of the island to our turn-off -- the un-marked Jackson Highway that leads to our rented residence at Palmetto Bay. The term “highway” in this case is used in the very loosest of senses inasmuch as the road is an unpaved, mostly unimproved and poorly maintained, very bumpy and rutted gravel and boulder road that cuts across the back-bone ridge of the island (Figure 2) to the northern coast. In places the road adjoins steep jungle-covered cliffs and has no guard rails, which was a bit disconcerting. The highest point on the island is along this ridge and is 1011 ft above sea level. We confidently rented a 4-wheel drive vehicle to make this journey, although we quickly realized from its lackluster performance climbing the ridge that at least half of the horses of its approximately 180-horsepower engine had expired some time ago.



Figure 2. Aerial view looking southeast across the high back-bone of Roatan. The light-colored marine sediments are, fortunately, of calcium carbonate composition. Photo courtesy of Google.

ics and uplift along the transform fault (marked by the deep Bartlett/Cayman Trench) that separates the North American and Caribbean plates (Figure 1A). This plate boundary lies about 35 miles north of Roatan. The horst was initially uplifted in the late Eocene to early Oligocene, although local periodic uplift has continued into the Holocene. The island is the exposed fragment of an old mountain range that extends beneath the sea to the Honduran mainland. The rocks holding up the ridge are mainly south-dipping schists (Figure 3) that, accordingly to published literature, are of unknown age. Our numerous examinations of outcrops of these rocks indicate that they are low-grade metamorphically-altered chert and quartz-clast conglomerates (relatively fine-grained), shales, and sandstones. We actually took the time to examine the rocks with hand-lenses and also, for the sake of comparison, through the bottoms of emptied beer bottles. The hand-lenses definitely worked better, although consuming the liquid contents of the bottles was most refreshing in this tropical environment. The shales and sandstones appear to be of deep-water origin by virtue of their thin-bedded nature. Amphibolites, peridotites, and quartz pegmatites are locally intruded into the schists as sills and dikes. The island is surrounded by turquoise-blue waters and lots of modern shallow-water sediments of the *good kind* – that is, carbonates derived from a fringing coral reef (Figure 2) that encircles nearly the entire island. Water depths immediately seaward of the reef are 150-200 ft and increase dramatically northward into the Bartlett/Cayman Trenches.



Figure 3. Gently east-dipping schists along the high back-bone of Roatan.

Once settled into our beach-front rental residence at Palmetto Bay we then set our sights on learning the lay of the land, about old-time pirates, and the geology of the island. Our first major discovery was that the nearest pub on the beach was a mere 4-minute walk from our house. So we set up our headquarters there because of the view (Figure 4), and made plans with the bar-keep to have a local fisherman take us out to sea in a few days to conduct a survey of fish populations in the nearby waters. We learned that the pirates that once roamed the seas here were of English, French, and Dutch extraction and

This seems like a good time to address what we ultimately learned about the high back-bone of the island after traversing it several times over the course of our vacation. The island is a horst block that resulted from transpressional tecton-

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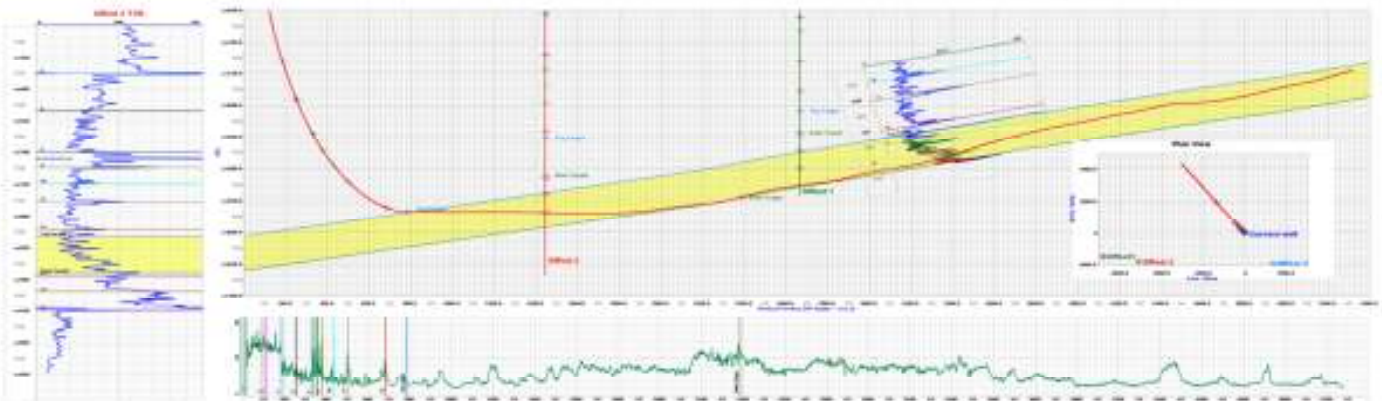
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included the infamous *Blackbeard* (real name: Edward Teach). Pirates no longer ply the seas here, although we initially were somewhat suspicious of the old-timer who rowed up to our fishing boat in a hand-cut mahogany dugout (Figure 5) and offered us a lionfish he had just caught (Figure 5 insert). Not even Capt Jack Sparrow's ship was as dinky as this



Figure 4. View from our beach-bar headquarters at Palmetto Bay.

man's dugout, and we quickly surmised he wasn't a threat or even a real pirate. Anyhow, lionfish have no predators because their spines are poisonous, and they are voracious eaters and breeders. Hence, they are decimating endemic fish populations throughout the Caribbean since their accidental release from Florida in the 1990s. So what are people doing to try to control their numbers? All over the Caribbean they have come up with and broadly advertised many recipes for cooking the fish (the meat is delicious) and set no limits on lionfish catches. I guess we'll see how that works out. A few days later we drove down to West End and West Bay (Figure 1B) where we saw outcrops of what is referred to as "ironshore", which is the local name for uplifted Pleistocene limestone weathered into short, sharp karst pinnacles that can rip into you if you're not careful walking. We had encountered similar rocks in Belize which are known by the Mayan name "cha-why" (phonetic spelling). Having spotted these potentially dangerous rocks from a pleasant beach-side bar, we wisely decided not to approach them lest our ability to walk possibly might have been somewhat impaired by the many local beers and rum drinks in which we had imbibed. Supposedly older (34,000-43,000 years old), uplifted Pleistocene reef limestones also have been reported in this area (Cox et al., 2008). Also exposed locally in the western part of the island is dark-colored limestone (Figure 6), the age of which also is not known according to published sources but which we suspect might be Jurassic or Cretaceous based on similarity to limestones in neighboring Belize. These rocks definitely caught our attention because of their very strong odor of hydrocarbons when struck together! Might there be undiscovered oil fields in the area? At this point, congratulating ourselves that we had begun to piece together some of the complex stratigraphy of this apparently little-studied island, we ordered another round.

A few days later we drove east to Camp Bay on Roatan's northeastern coast (Figure 1B). On the way we drive by a quarry that exposed a thick dolomite whose age also is not known (Sutton et al., 2015). These rocks might possibly be Jurassic as the only ancient dolomites in Belize are of this age. At Camp Bay we encountered quite great exposures of thick red shales, sandstones, and chert-clast, schist-clast, and red sandstone-clast conglomerates (Figure 7), but we did not determine their stratigraphic position relative to the dolomite because it was, after all, happy hour. Alas, the age of these rocks also is not known based on published studies, although McBirney and Bass (1969) indicated that they are pre-Tertiary. That's nailing it, huh? These rocks do indicate, however, that there was a significant period of uplift and erosion in eastern Roatan accompanied by deposition of siliciclastics perhaps in grabens. While celebrating our geologic accomplishments at a

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Figure 5. Local fisherman in a mahogany dug-out canoe, and in the insert, the lionfish he gave us.



Figure 6. Petroliferous, dark-colored limestone of possible Jurassic or Cretaceous age. Scale is 1.5”

nearby pub on the beach we noted that the shoreline sediments here consisted mostly of fine siliciclastic gravel eroded from the supposed “pre-Tertiary” siliciclastics. We saw this same thing elsewhere on Roatan’s north coast beaches – that is, carbonate sediments that rapidly passed laterally into siliciclastics eroded from the high back-bone of the island. We surmised that the siliciclastics are being transported to the coast by small streams draining the more elevated areas of the island. We realized that such lithologic changes would wreak geologic havoc in interpreting similar subsurface rocks from wireline logs, so we ordered more beverages.

Not every day was spent doing some geology while we were in Roatan. Most of the days we lounged by the beach and enjoyed long strolls picking up different types of sea shells, corals, and calcareous algae. These “trinkets” are in abundance along the beach because of the proximity to the reef. But, give two semi-professional beach-combing geologists enough idle time and some drink and what happens? We ultimately filled a large basket with a cache of shells that

we had numbered with an indelible marker and for which we prepared an identification key (genus and species) for the gracious owners of the residence to enjoy and learn about. In true pirate tradition that was the treasure chest we left behind. *Arghhh!*



Figure 7. Exposure of coarse conglomerate in eastern Roatan. The tick attacking the author’s leg is 1/8” long.

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Revival of Tales From The Doghouse

The following piece refers to oil observed in wells drilled for salt water (for the salt) on the Allegheny River near the town of Tarentum, twenty miles above Pittsburg. These oil shows had been noted as early as 1809. From, "Sketches in Crude-Oil", self published by the author, John J. McLaurin in 1896.....

"He thought the Donnelly well, which produced salt-water only, if enlarged and pumped vigorously, would produce oil. Humes received twenty-thousand dollars for his farm. The hole was reamed out and yielded five barrels of petroleum a day. This was in 1856. A specimen sent to Baltimore was used successfully in oiling wool at the carding-mills and the total production was sent to that city for eight years. Eastern capitalists bought the farm and well in 1864, organized "The Tarentum Salt and Oil Company" and determined to dig a shaft down to the source of supply! The wells were four-hundred to five-hundred feet deep. The officers of the company argued that it was feasible to reach that far into the bowels of the earth with pick and shovel and discover a monstrous cave of brine and oil! They picked a spot twenty rods from the Donnelly well, sent to England for skilled miners and started a shaft about eight feet square. Over two years were employed and forty thousand dollars spent in sinking this shaft. Heavy timbers walled the upper portion, the hard rock below needing none. The water was pumped through iron pipes, nine men formed each shift and the work proceeded merrily to the depth of four-hundred feet. Then the salt-water in the Donnelly well was affected by the fresh-water in the shaft, losing half its strength whenever the latter was let stand a few hours, showing their intimate connection by veins or crevices.

Mr. Peterson said of it: "The digging of the shaft was finally abandoned in the darkest period of the war, from the necessities of time. A New Yorker named Ferris, and Wm. McKeown, of Pittsburg, bought the property, shaft and all. The daring piece of engineering was neglected and finally commenced to fill up with cinders and dirt, until at last it was level again with the surface of the ground. You may walk over it to-day and I could point it out to you if I was up there. Dig it out and you will find those iron pipes and timbers still there, just as they were originally put in."

Dyed-in-the-wool Tarentumites insist that natural gas caused the suspension of work, flowing into the shaft at such a gait that the miners refused to risk the chances of a speedy trip to Kingdom Come by suffocation or the ignition of the subtile vapor.".....

I think it is worth noting that shortly after 1800, wells were being drilled to six or eight hundred feet deep for brine and the oil sold for lubrication, medicinal purposes and occasionally fuel. In 1862, 400,000 gallons were sold in New York at a price of 36 cents per gallon (that's a price of \$15. 27 per barrel). It is also worth noting that these folks had a good understanding of fracture permeability....and that, even then, the locals knew a good show hole when they saw one!

Hope you enjoyed it!
Bob Stolze

Note: Let's try this Tales From The Dog House idea again.....think about some of the stories you know from the oil patch. We can clean them up if necessary but these are dying stories unless someone tells them. Send them in to the library by email to: kgsbulletin@gmail.com

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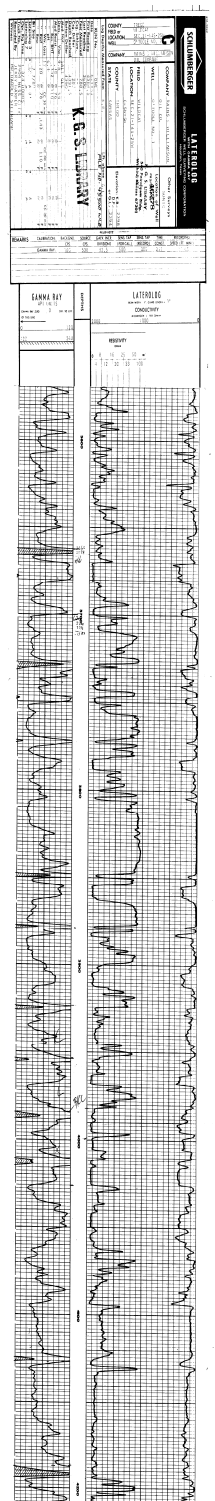
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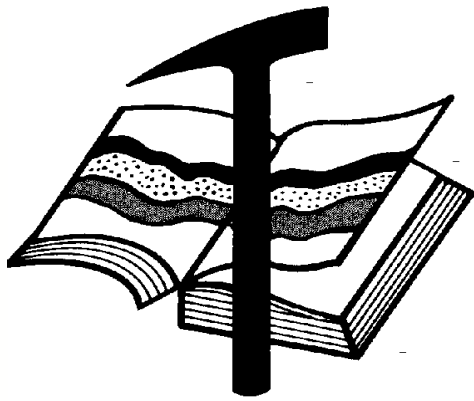
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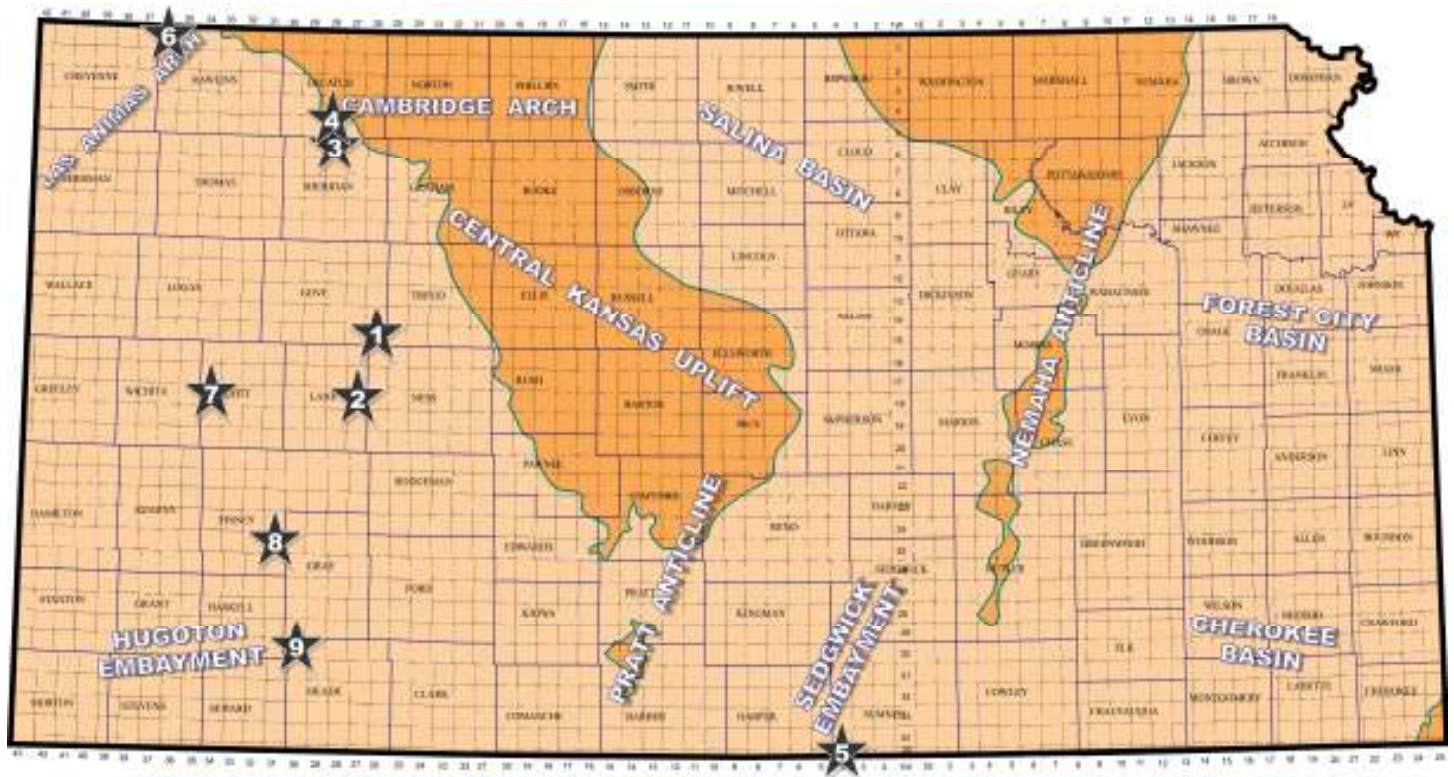
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Exploration Highlights

By John H. Morrison, III
Independent Oil & Gas



1-Palomino Petroleum Inc., Newton (KS), has established a new oil-producing field in Gove County with the successful completion of the #1 Clodfelter Families Trust. The new discovery is located in the NW/4 of section 14- T 15s- R 26W, about eight miles north of the city of Utica. The Mississippian formation was perforated from 4,300 to 4,318 ft where it produced on pump at the rate of 65 barrels of oil and 18 barrels of water per day. WW Drilling tools were used to bottom the well at a total depth of 4,454 ft. Field area lies nearly one mile from recognized Lansing-Kansas City oil production in the Bearcub Field (1986).

2-L. D. Drilling, Inc., Great Bend (KS), has completed its #1-15 Francis and Joyce Dowd well for an estimated 70 barrels of oil per day in Lane County. The well is producing crude from the Marmaton (4,434 to 4,436 ft) and Cherokee (4,540 to 4,544 ft) formations at site located in the SE/4 of section 15- T 18s- R 27W. The well is a development well in the Alamota Field (1971), where the Lansing-Kansas City and Cherokee zones have been productive. Marmaton production is a new pay source for the field. Company rotary tools drilled the well to a total depth of 4,704 ft. Field area is situated almost two miles northeast of the town of Alamota, Kansas.

3-Suemaer Exploration & Production LLC, Corpus Christie (TX), has discovered new Lansing – Kansas City oil reserves at their #1 Schroeder spotted in the SE/4 of section 26- T 6s- R 28W in Sheridan County. The wildcat pool opener was drilled to a total depth of 4,475 ft at site located over three miles from now abandoned LKC oil production in the Geisinger Field (1968). The new Rejuvenation field lies about three miles south and eight miles east of the town of Selden, Kansas.

4-Elsewhere, Suemaer E & P has completed the 1 Jacobs Brothers in Decatur County to establish a new oil-producing area two miles south and one mile west of Dresden, Kansas. The remote wildcat well is producing an undisclosed amount of crude from the Lansing - Kansas City formation at site located over five miles east of the Chipmunk Southeast Field (2008). The Chipmunk Southeast pool gave up nearly 5,300 bbl of oil from the LKC zones prior to it's abandonment in January 2016. Suemaer's latest Jacobs Brothers discovery has been designated as the Six Pack pool opener.

5-K3 Oil & Gas Operating Company, Inc., The Woodlands (TX), has discovered new oil reserves in the Simpson Sand formation at the 3-3 Boyer in Sumner County. Spotted in the NW/4 of section 3- T 35s- R 4W, the wildcat pool opener was drilled to a total depth of 5,050 ft at site located almost seven miles west of the city

of Caldwell. Closest established production in the area lies over one mile to the northwest in the Eden Road Field (2008). The new field has been named Eden Road South.

ADDITIONAL UPDATES

6-Murfin Drilling Company, Inc., Wichita (KS), established the Scoda Field in Rawlins County at the end of 2013. The new oil field was opened with the completion of the 1-1 Mary Ann for 97 bbls of oil per day, no water, in section 1- T 1s- R 36W. Pay was recovered from the Lansing-Kansas City formation below 4,100 ft in depth. The Scoda Field has since produced nearly 962,000 bbls of oil from 23 completed oil wells drilled by Murfin Drilling, with the exception of two wells that were drilled by Wichita-based **BEREXCO, LLC**. Field area lies about fifteen miles north and three miles east of McDonald, Kansas.

7-Hartman Oil Company, Inc., Wichita (KS), discovered new Marmaton and Cherokee oil deposits in Scott County in early 2014 with the completion of their 1-11 Prime Pork. The well was completed for 30 bbls of oil per day, no water, in section 11- T 18s- R 34W, about one mile north and two miles east of Modoc, Kansas. The well established the Prime Pork Field that has produced nearly 16,000 bbls of crude from three producing wells. **New Gulf Operating, LLC**, Tulsa (OK), drilled two of the development wells.

8-American Warrior, Inc., Garden City (KS), completed its 1-2 Clark in Finney County for 60 bbls of oil per day in April 2014. The well was drilled in section 2- T 25s- R 31W, near the town of Pierceville, and was thus recognized as the Pierceville Field discovery well. It is still producing oil from the Mississippian formation at around 4,500 ft in depth. Since that time American Warrior has successfully completed six development wells, and has found additional reserves in the Fort Scott member of the Marmaton formation at one of those wells. The seven producers have yielded over 18,000 bbls of crude.

9-McCoy Petroleum Corporation, Wichita (KS), opened the Mertilla Southeast Field in early 2014 after the Mississippian Chester formation produced 25 bbls of oil per day, no water, from a depth of 5,300 ft. The discovery well, 1-17 Patterson - O'Brate was drilled to a total depth of 5,708 ft in section 17- T 30s- R 30W, about twelve miles north and two miles west of Plains, Kansas in Meade County. McCoy has completed five additional development wells in the field. The wells have produced a cumulative total of over 62,000 bbls of oil.



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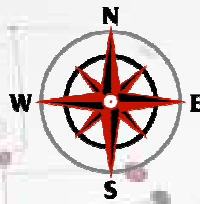
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Ray Anderson, Jr.	11/90	1990	Elwyn Nagel	03/03	2003
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Nancy Lorenz	02/93	1993	Lloyd Tarrant	05/04	2004
Norman R. Stewart	07/93	1993	Robert J. "Rob" Dietterich	08/96	2004
Robert W. Watchous	12/93	1993	Mervyn Mace	12/04	2004
J. George Klein	07/94	1994	Donald Hoy Smith	04/05	2005
Harold C.J. Terhune	01/95	1995	Richard M. Foley	06/05	2005
Carl Todd	01/95	1995	Wayne Brinegar	06/05	2005
Don R. Pate	03/95	1995	Charles B. Moore	09/96	2005
R. James Gear	05/95	1995	Jack Heathman	05/06	2006
Vernon Hess	06/95	1995	Charles Kaiser	09/06	2006
E. K. Edmiston	06/95	1995	Rod Sweetman	08/06	2006
Jack Rine	07/95	1995	Karl Becker	10/06	2006
Lee Cornell	08/95	1995	Frank Hamlin	10/06	2006
John Graves	10/95	1995	Marvin Douglas	12/06	2006
Wilson Rains	10/95	1995	Robert W. Hammond	04/07	2007
Heber Beardmore, Jr.	09/96	1996	Eldon Frazey	04/07	2007
Elmer "Lucky" Opfer	12/96	1996	Pete Amstutz	05/07	2007
Raymond M. Goodin	01/97	1997	Charles Spradlin	05/07	2007
Donald F. Moore	10/92	1997	Donald R. "Bob" Douglass	09/07	2007
Gerald J. Kathol	03/97	1997	Vincent Hiebsch	11/07	2007
James D. Davies	08/88	1997	Glen C. Thrasher	03/08	2008
R. Kenneth Smith	04/97	1997	Peg Walters	06/08	2008
Robert L. Dilts	05/97	1997	Theodore "Ted" Sandberg	07/08	2008
Delmer L. Powers	06/72	1997	James Ralstin	11/08	2008
Gene Falkowski	11/97	1997	Earl Brandt	04/09	2009
Arthur (Bill) Jacques	01/98	1998	Walter DeLozier	05/09	2009
Bus Woods	01/98	1998	Don D. Strong	01/10	2010
Frank M. Brooks	03/98	1998	John Stone	02/10	2010
Robert F. Walters	04/98	1998	Craig Caulk	03/10	2010
Stephen Powell	04/98	1998	Joseph E. Moreland, Jr.	03/10	2010
Deane Jirrels	05/98	1998	Gene Garmon	03/10	2010
William G. Iversen	07/98	1998	James F. Dilts	05/10	2010
Ann E. Watchous	08/98	1998	Jerry Pike	05/10	2010
W.R. "Bill" Murfin	09/98	1998	Donald Hollar	06/10	2010
Donald L. Hellar	11/98	1998	Delbert Costa	08/10	2010
Joseph E. Rakaskas	01/99	1999	John Tanner	08/10	2010
Charles W. Steincamp	02/99	1999	William (Bill) Owen	09/10	2010
Robert and Betty Glover	10/96	1998	Harold (Hal) Brown	10/10	2010
Howard E. Schwerdtfeger	11/98	1999	Edmund G. Lorenz	11/10	2010
W. W. "Brick" Wakefield	03/99	1999	Thomas E. Black	05/11	2011
V. Richard Hoover	01/00	2000	Wayne E. Walcher	07/11	2011
Warren E. Tomlinson	01/00	2000	Henry F. Filson	07/11	2011
James A. Morris	01/00	2000	Thomas Ray	07/11	2011
Eric H. Jager	03/00	2000	Edgar E. Smith	09/11	2012
Kenneth W. Johnson	03/00	2000	Marilyn Messenger	06/13	2013
Dean C. Schaake	03/00	2000	Micheal Mitchell	09/13	2013
Fred S. Lillibridge	05/00	2000	Orvie Howell	11/13	2013
Jerry A. Langrehr	07/00	2000	James Thompson	11/13	2013
Clark A. Roach	07/00	2000	Dick Rowland	09/13	2014
Floyd W. "Bud" Mallonee	10/00	2000	Robbie Thompson	12/13	2014
Ralph W. Ruuwe	09/00	2000	Kris Kennedy	04/14	2015
Robert L. Slamal	02/01	2001	Annette Hedke	02/15	2015
Jerold E. Jespersen	06/01	2001	James Devlin	04/15	2015
William A. Sladek	06/01	2001	Robert Gensch	09/15	2015
Harlan B. Dixon	06/01	2001			
Edward B. Donnelly	08/01	2001			
Richard P. Nixon	02/02	2002			
Robert W. Frensley	12/01	2002			
Gerald W. Zorger	01/02	2002			
Don L. Calvin	03/02	2002			



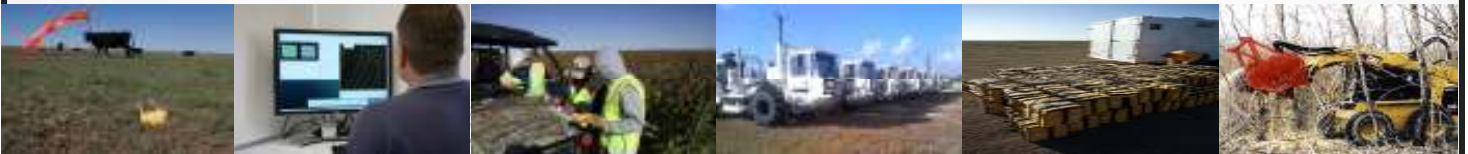
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Sun	Mon	Tue	Wed	Thu	Fri	Sat
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June 2016

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