CLERK OF THE BOARD
U.S. EPA
ENVIRONMENTAL APPEALS BOARD
1201 CONSTITUTION AVE. NW
WJC EAST, ROOM 3332
WASHINGTON, DC 20004.

MAY 10, 2014

THIS ADDRESS TAKEN FROM CERTIFIED LETTER 7011 1150 0000 2642 5302 APR. 9. 2014. ✓

DEAR CLERK OF THE BOARD:

ENCLOSED ARE 1 ORIGINAL AND 2 COPIES OF: APPEAL OF: UIC PERMIT NO MI-015-2D-0010 - CLASS II PERMIT. WEST BAY EXPLORATION CO JACKSON, MI HAMSTEAD #9 SWD

PLEASE STAMP ALL 3 COPIES, SEND ONE STAMPED COPY BACK TO ME - IF THAT IS STILL PROTOCOL.

THANK YOU.!

SINCERELY,
X Sandra K. Yerman

SANDRA K. YERMAN
6600 RIVERSIDE RD
BROOKLYN MI 49230
517-358-2315

ENCL.
4 PC APPEAL W/
i TABLE OF CONTENTS, W PG REFS
ii A TABLE OF AUTHORITIES W. PG REFS
iii TABLE OF ATTACHMENTS
iv STATEMENT OF COMPLIANCE;
V'd FOR CONTENT: NO MISSING PGS, ✓
NO DUPLICATE PAGES! ✓

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BEFORE THE USEPA
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WASHINGTON, DC 20004

MAY, 10, 2014

UIC APPEAL NO. 14-
WEST BAY EXPLORATION COMPANY.
JACKSON, MI HAYSTEAD #9 SWD
CLASS II UIC PERMIT NO. MI-075-2D-0010
PERMITTEE

V.

SANDRA K. YERMAN
6600 RIVERSIDE RD.
BROOKLYN, MI 49230.
PETITIONER

X Sandra K. Yerman
SANDRA K YERMAN
PETITIONER

15 PGS IN ALL

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STATEMENT OF COMPLIANCE/WORD LIMITATION

I STATE MY UIC APPEAL CONTAINS 800 WORDS NOT INCL. ATTACHMENTS AS ALLOWED SKY

THIS UIC APPEAL V1d FOR CONTENT - BY MAILING. NO DUPLICATES!

CROSS. REF. 3.

FINDING OF FACT THAT IS CLEARLY ERRONEOUS.

Attachment A, RAISE SPECIFIC GRAVITY - REDUCE MIP.
I don't believe I have Attach. A.; (nor did I receive Attach. A. w/ UIC PERMIT NO MI-OK-2D-0009 in 2013, FOR SWD #22.)
(On page 10 of RTC to Peter Bormuth; EPA states "... EPA adds a safety factor of .05 to the Specific Gravity of West Bay Exploration's representative brine analysis, when calculating MIP (maximum injection pressure); This ... generally minimizes injection pressure."

But, since Haystead #9 SWD well CAN ACCEPT FRACTURING FLUIDS FROM HORIZONTAL FRACKING PROCESSES, I believe that safety factor for Specific Gravity needs to be raised up considerably - thus minimizing injection pressure (ie MIP) even more - due to the fact that these reinjected produced fluids will contain REMNANT PROPPANTS FROM FRACTURING OPERATIONS. HOW MANY 1000S OF POUNDS? I DON'T KNOW.

According to Geology.com - "What is Frac Sand?" "A few thousand tons (ie 4000+!) of frac sand can be required to stimulate a single well." (re Oil/Gas well). (Pg 1 of 9). And on Pg 3. of 9 " ... (Bauxite beads have a very high crush resistance ... (t)he specific gravity of the beads and their size can be matched to the viscosity of the hydraulic fracturing fluid ..." + more types of PROPPANTS are listed - SEE: 3 Pg. TOTAL.

ATTACHMENT A; RAISE SPECIFIC GRAVITY – REDUCE MIP.
Therefore, more calculations must be done because Halstead #9 SWD well does not fracture – but can accept fracturing fluid for horizontal fracturing operations that may have had tons of ! of proppants!

Please send me a copy of attachment A so that when Reg 5 Counsel of the RA responds to my Petition for Review – as he/she they MUST DO ACCORDING TO 40 CFR 124.19 (b)(2), I will be ready with proper info to look at

What I do have, in my UIC type PERMIT PKG, MI-075-2D-0010, PAGE A-1 OF 1: Injection 737 PSIG Pressure Limitation needs to be REDUCED after PROPER CALCULATIONS ESTIMATING HOW MANY TONS POUNDS ARE REMAINING IN THOSE PRODUCED FLUIDS OF PROPPANTS)
TO BE REINJECTED – UNDER PRESSURE – INTO HALSTEAD #9 SWD WELL?

THIS ISSUE WAS RAISED IN EPA'S RESPONSE TO PETER BORMUTH, RTC 5, PG 10; + MINE, 14.1 P.40, 13.1 P30. PLUS BORMUTH RAISED ISSUE OF EARTHQUAKES; PER YOUR REVIEW/UNDERSTANDING AND FOR THE ADMINISTRATIVE RECORD, I GIVE YOU AS ATTACHMENTS:
1.) GEOLOGY.COM – WHAT IS FRAC SAND AND
2.) OHIO ANNOUNCES TOUGHER PERMIT CONDITIONS FOR DRILLING ACTIVITIES NR. FAULTS AND AREAS OF SEISMIC ACTIVITY (PRESS RELEASE
3. ODNR FINDS "PROB. CONN." BET. FRACKING & EARTHQUAKES

IMPORTANT POLICY CONSIDERATION THAT EPAB SHOULD REVIEW

PART 1 B. PERMIT ACTIONS. TERMINATION OF PERMIT
THIS PERMIT MAY BE... TERMINATED FOR CAUSE AS SPECIFIED IN 40 CFR 144.40 (a)(2): The Permittee) failure... during the permit issuance proceed to disclose fully ALL RELEVANT FACTS, or the Permittee) MISREPRESENTATION OF ANY RELEVANT FACTS AT ANY TIME..."
(SEE 40 CFR 144.40 (a)(2)
I, PETITIONER, REQUEST AND RIGHTFULLY DEMAND THE IMMEDIATE TERMINATION OF UIC PERMIT MI-075-2D-0010, IN DIRECT VIOLATION OF 40 CFR 144.40 (a)(2) DUE TO THE PERMITEE - West Bay Exploration Co.'s FAILURE, DURING THE PERMIT ISSUANCE PROCESS, TO DISCLOSE ALL RELEVANT FACTS (FOUND UNDER TESTS FOR MECHANICAL INTEGRITY) ie "THERE ARE... VERTICAL CHANNELS ADJACENT TO THE INJECTION WELL BORE."
THIS "VERTICAL CHANNEL" WOULD HAVE TO BE BETWEEN THE CEMENT (COVERING THE STEEL CASINGS) AND THE INJECTION WELL BORE HOLE; I NEVER HEARD OF THAT - EVER!
FURTHER, RE: TESTING FOR MECHANICAL INTEGRITY:
"AN INJECTION WELL HAS MECHANICAL INTEGRITY IF:
1.) THERE IS NO SIGNIFICANT FLUID MOVEMENT INTO AN USDW THROUGH VERTICAL CHANNELS ADJACENT TO THE INJECTION WELL BORE." *(40CFR 146.8(a) P. 20 OR 40CFR 146.8(b) P. 61-RPG SETS HER)
*2 DIFF
THAT BEGS THE QUESTION I WAS NOT ALLOWED TO ASK - DUE TO WEST BAY'S LACK OF DISCLOSURE DURING THE PERMIT ISSUANCE PROCESS:
Q. IF THERE IS INSIGNIFICANT FLUID MOVEMENT INTO AN USDW - IS THAT O.K. WITH SDWA, THE USEPA, AND WEST BAY EXPLORATION CO.? AND DOES THIS HAPPEN? OFTEN?
I WOULD HAVE THOUGHT THAT WOULD BE A VIOLATION OF THE SDWA - HAD I BEEN INFORMED TO ASK THAT QUESTION!?

PART 1B. PERMIT ACTIONS. TERMINATION OF PERMIT

SINCE, APPARENTLY, THERE IS A "VERTICAL CHANNEL ADJACENT TO THE INJECTION WELL BORE..." IT WOULD BE LOGICAL THAT, OVER GEOLOGIC TIME, PRODUCED FRACTURING FLUIDS, COMBINED WITH CRUSH RESISTANT SAND-OR ALUMINUM-PROPPANTS REINJECTED UNDER PRESSURE COULD BE AGRESSIVE TO THE NIAGARAN INJECTION ZONE ROCK LAYERS IN THAT "VERTICAL CHANNEL ADJACENT TO THE INJECTION WELL BORE." THESE PRODUCED FLUIDS WOULD BE CALLED "SEEPAGE," 1. THE SLOW MOVEMENT OF WATER THROUGH SMALL CRACKS, PORES, INTERSTICES, ETC OF A MATERIAL INTO OR OUT OF A BODY OF SURFACE OR SUBSURFACE WATER.
(USGS WATER SCIENCE GLOSSARY OF TERMS; HTTPS://WATER.USGS.GOV/EDU/DICTIONARY.HTML)
SO OVER GEOLOGIC TIME, PRODUCED FLUIDS AS DESCRIBED ABOVE- COULD SEEP AROUND THE INJECTION WELL BOTTOM IN THE NIAGARAN, SEEP UP THRU THE SALINA GROUP NEAR THAT WELL BORE CHANNEL; SEEP UP INTO/THRU THE IMPERMEABLE SHALE LAYERS, INCL. THE COLDWATER SHALE, AGAIN, ALONG THAT WELL BORE CHANNEL, INTO OUR USDWs - WHICH MANY COMMENTER STATED* THEY WANTED OUR USDWs PROTECTED THROUGH UNCOUNTABLE GENERATIONS OF GRANDCHILDREN - THRU TIME IMMEMORIAL! (*THIS COMMENT STATED QUITE LARGE!)
COULD THE ABOVE SCENARIO HAPPEN DOWN THRU THE AGES OVER A PERIOD OF GEOLOGIC TIME; THIS UIC PERMIT DOES NOT GIVE WEST BAY EXPLORATION CO A WAIVER TO CAUSE/ALLOW PRODUCED-FLUID CONTAMINATION OF OUR AQUIFERS/USDWs EVEN INTO GEOLOGIC TIME PERIODS! WEST BAY HAS VIOLATED TITLE 40 RULE 40 CFR 144.40 (a)(2) BY NOT ALLOWING US THE ABILITY TO KNOW AND DISPUTE "NEW" INFORMATION RE: "VERTICAL CHANNELS ADJACENT TO THE INJECTION WELL BORE!"

CERTIFICATE OF SERVICE

ON THIS DATE, I SERVED NOTICE TO ALL BELOW USING 1ST CLASS MAIL:

CLERK OF THE BOARD
USEPA - EAB
1201 CONSTITUTION AVE - NW
WJC EAST, ROOM 3332
WASHINGTON, DC 20004

WEST BAY EXPLORATION CO
13685 WEST BAY SHORE DR. SUITE 200
TRAVERSE CITY, MI 49684.

USEPA
REGIONAL ADMIN. REG. 5
SUSAN HEDMAN ET AL
77. W. JACKSON BLVD
CHICAGO, IL 60604.

X Sandra K. Yerman
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MAY 10, 2014
DATE

5

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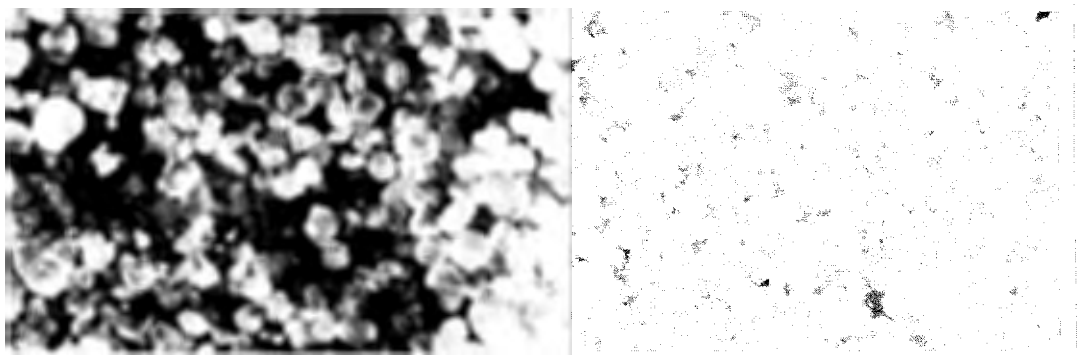
Home » Oil and Gas » What is Frac Sand?

What is Frac Sand?

This special sand is one of the keys to producing oil and natural gas from tight shale formations



Close-up view of frac sand (on the right) and a typical sand of similar grain size (on the left). Notice how the frac sand has a very uniform grain size, nicely rounded grain shapes and a uniform composition. It is also a very tough material that can resist compressive forces of up to several tons per square inch. Grains in this image are about 0.50 millimeter in size. Photo © BanksPhotos, iStockphoto.

A Crush-Resistant Sand for Oil and Gas Wells

"Frac sand" is a high-purity quartz sand with very durable and very round grains. It is a crush-resistant material produced for use by the petroleum industry. It is used in the hydraulic fracturing process (known as "fracking") to produce petroleum fluids, such as oil, natural gas and natural gas liquids from rock units that lack adequate pore space for these fluids to flow to a well. Most frac sand is a natural material made from high purity sandstone. An alternative product is ceramic beads made from sintered bauxite or small metal beads made from aluminum.

The demand for frac sand has exploded in the past several years as thousands of oil and natural gas wells are being stimulated using the hydraulic fracturing process. (See the production chart in the right column of this page.) A hydraulic fracturing job on one well can require a few thousand tons of sand. This surge of specialized drilling has created a billion dollar frac sand industry in a very short time. Between 2009 and 2012 the amount of frac sand used by the oil and gas industry has tripled.

How is Frac Sand Used?

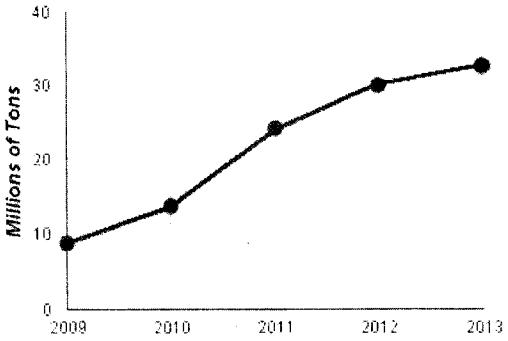
Some subsurface rock units such as organic shale contain large amounts of oil, natural gas or natural gas liquids that will not flow freely to a well. They will not flow to a well because the rock unit either lacks permeability (interconnected pore spaces) or the pore spaces in the rock are so small that these fluids can not flow through them.

The hydraulic fracturing process solves this problem by generating fractures in the rock. This is done by drilling a well into the rock, sealing the portion of the well in the petroleum-bearing zone, and pumping water under high pressure into that portion of the well. This water is generally treated with a chemicals and thickeners such as guar gum to create a viscous gel. This gel facilitates the water's ability to carry grains of frac sand in suspension.

Large pumps at Earth's surface increase the water pressure in the sealed portion of the well until it is high enough to exceed the breaking point of the surrounding rocks. When their breaking point is reached they fracture suddenly and water rushes rapidly into the fractures, inflating them and extending them deeper into the rock. Billions of sand grains are carried deep into the fractures by this sudden rush of water. A few thousand tons of frac sand can be required to stimulate a single well.

Frac Sand as a "Proppant"

United States Frac Sand Production



This chart illustrates the spectacular rise in the production of frac sand in the United States. Data from the United States Geological Survey Minerals Yearbook, Silica, 2011.

6.

Sedimentary Rocks
Subsidence
Teacher Resources
Tsunami
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Wisconsin Map
Wyoming Map

When the pumps are turned off, the fractures deflate but do not close completely - because they are propped open by billions of grains of frac sand. This only occurs if enough sand grains to resist the force of the closing fractures have been delivered into the rock.

The new fractures in the rock, propped open by the durable sand grains, form a network of pore space that allows petroleum fluids to flow out of the rock and into the well. Frac sand is known as a "proppant" because it props the fractures open.

Other materials that have been used as a proppant include ceramic beads, aluminum beads and sintered bauxite. Frac sand generally delivers the highest level of performance and it is currently the proppant most frequently used by the petroleum industry.

What Type of Sand?

Petroleum industry proppants must meet very demanding specifications. The characteristics of a high quality frac sand include:

- high-purity silica sand
- grain size perfectly matched to job requirements
- spherical shape that enables it to be carried in hydraulic fracturing fluid with minimal turbulence
- durability to resist crushing forces of closing fractures

Frac sand is produced in a range of sizes from as small as 0.1 millimeter in diameter to over 2 millimeters in diameter depending upon customer specifications. Most of the frac sand consumed is between 0.4 and 0.8 millimeters in size.

Rock units such as the St. Peter Sandstone, Jordan Sandstone, Oil Creek Sandstone and Hickory Sandstone have been potential sources of frac sand material. These rock units are composed of quartz grains that have been through multiple cycles of weathering and erosion. That long history has removed almost all mineral grains other than quartz and produced grains with very round shapes. This is why sand dredged from rivers, excavated from terraces or removed from beaches is unlikely to produce a good product.

Where these rock units are produced they are usually soft, poorly cemented and sometimes lightly weathered. This allows them to be excavated and crushed with minimal damage to the quartz grains. High-purity sand from areas such as the Appalachians is often not suitable for frac sand because it has been subjected to tectonic forces which have deformed the rock and weakened the sand grains.

Frac Sand Processing Plants

Frac sand is not used straight from the ground. It requires processing to optimize its performance. After mining it is taken to a processing plant. There it is washed to remove fine particles.

After washing the sand is stacked in piles to allow the wash water to drain off. This operation is done outdoors and is restricted to times of the year when temperatures are above freezing. After the sand is drained it is placed in an air dryer to remove all moisture. The dry grains are then screened to obtain specific size fractions for different customers.

Sand that is not suitable for fracking is separated and sold for other uses. Some frac sand might be resin coated to improve its performance in the fracking operation. This material will be sold as a premium product. After processing most sand is loaded directly into train cars for rail delivery.

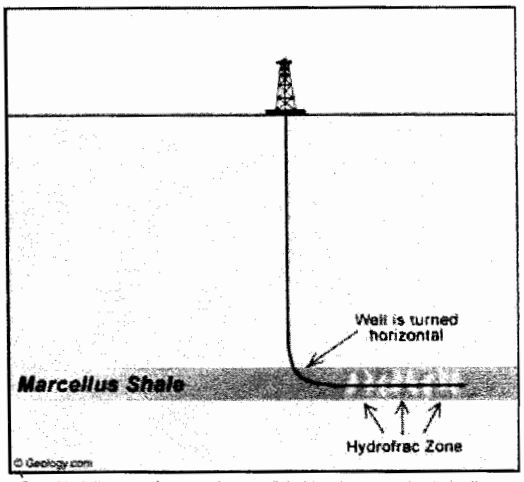
Some processing plants are located at the mine site. However, processing plants are very expensive to build and are sometimes shared by multiple mines. These are centrally located to several mines and the sand is delivered by truck, train or conveyer.

Where is Frac Sand Produced and Used?

A few years ago producers in Wisconsin and Texas were supplying much of the frac sand used by the oil and gas industry. However, a huge spike in demand caused by the natural gas and shale oil boom has motivated many companies to provide this product. Many of these companies are in the central part of the United States where the St. Peter Sandstone and similar rock units are close to the surface and easily excavated. These areas are also where tectonic forces have not caused severe folding of the rock units and weakened the sand grains. The prime area is in the mid-western states (Illinois, Indiana, Iowa, Kansas, Kentucky, Minnesota, Michigan, Missouri, Nebraska and Wisconsin).

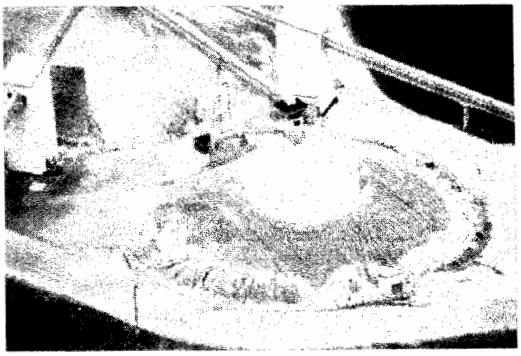
Most of the high-purity silica sands in the United States have been known for decades. They have been used for glass-making and metallurgical uses. The current search for frac sand is not about "discovering new sources of sand," it is instead about determining which sources produce superior materials.

Frac sand is used to produce natural gas, natural gas liquids and oil



Simplified diagram of a natural gas well that has been constructed with horizontal drilling to increase the length of penetration through the Marcellus Shale. Hydraulic fracturing is typically done in the horizontal portion of the well to stimulate a flow of gas from the shale. This well configuration is used in shale plays of the United States

Aerial view of a frac sand mining operation in Wisconsin. Frac sand is a highly specialized product that can only be produced from a small number of sand deposits. Photo © BanksPhotos, iStockphoto



Aerial view of a frac sand processing facility in Wisconsin. Photo © BanksPhotos, iStockphoto

7.

from shales and other tight rocks where hydraulic fracturing is required. These include: the Marcellus Shale, Utica Shale, Bakken Formation, Haynesville Shale, Fayetteville Shale, Eagle Ford Shale, Barnett Shale and many other shale plays throughout the United States.

Frac Sand Sources and Prices

The demand for frac sand in North America has risen sharply in the last few years in response to numerous shale plays developing in many parts of the United States and Canada. The United States Geological Survey reports the source of this production:

> The Ordovician St. Peter Sandstone in the Midwest is a primary source of silica sand for many end uses and is a major source of frac sand as well. Mined in five States, frac sand from the St. Peter Sandstone is within reasonable transport distance to numerous underground shale formations producing natural gas.
> In 2011, 59% of frac sand was produced in the Midwest.

Reported average prices for frac sand in the U.S. Geological Survey Minerals Yearbook were between $45 per ton and $50 per ton in 2010. In 2011 the average price had risen to $54.83. This is significantly higher than the average price of $35 per ton for specialty sand sold outside of the construction industry.

Sintered Bauxite Proppants

Powdered bauxite can be fused into tiny beads at very high temperatures. These beads have a very high crush resistance and that makes them suitable for use as a proppant. The specific gravity of the beads and their size can be matched to the viscosity of the hydraulic fracturing fluid and to the size of fractures that are expected to develop in the rock. Manufactured proppants provide a wide selection of grain size and specific gravity compared to a natural proppant known as frac sand. Frac sand is currently used instead of manufactured proppants because it has a cost and transportation advantage.

Contributor: Hobart King

A photo of the St. Peter Sandstone capped by the Joachim Dolomite taken near Pacific, Missouri. Public domain image by Kbh3rd

Video by US Silica demonstrating the characteristics of a high-quality frac sand.

Find it on Geology.com

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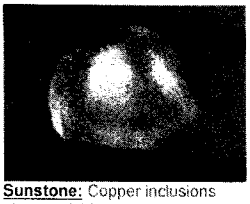
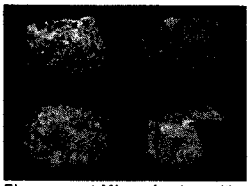
More from Geology.com

Coal Through a Microscope: Coal is more than a black rock. It's THE most interesting rock.



Sunstone: Copper inclusions give this feldspar an aventurescent flash.

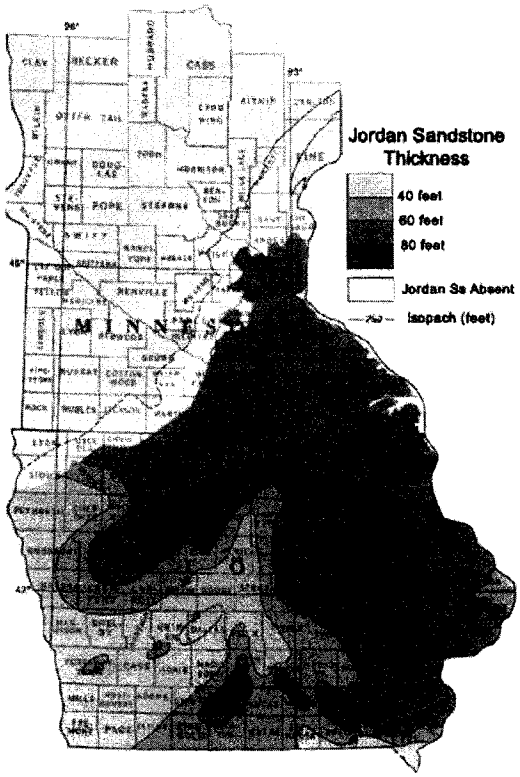


Fluorescent Minerals glow with spectacular colors under ultraviolet light.

eruptions past and present.

metamorphic rocks.

Argentina with wall paintings that date back to about 7000 BC.



Many of the rock units that are currently being mined for frac sand are also aquifers. This makes ground water research publications, such as the ground water atlas series of the United States Geological Survey, valuable prospecting documents for determining the presence, thickness and structure of sandstone rock units. This map is from the Ground Water Atlas of the United States for Iowa, Michigan, Minnesota and Wisconsin. It shows the geographic extent and thickness of the Jordan Sandstone in Minnesota and Iowa. Similar maps have been published in this series for other sandstone rock units and other geographic areas.

Ohio Announces Tougher Permit Conditions for Drilling Activities Near Faults and Areas of Seismic Activity

4/11/2014 Ohio DNR in Oil and Gas

COLUMBUS, OH – Today Ohio Department of Natural Resources (ODNR) Director James Zehringer announced new, stronger permit conditions for drilling near faults or areas of past seismic activity. The new policies are in response to recent seismic events in Poland Township (Mahoning County) that show a probable connection to hydraulic fracturing near a previously unknown microfault.

New permits issued by ODNR for horizontal drilling within 3 miles of a known fault or area of seismic activity greater than a 2.0 magnitude would require companies to install sensitive seismic monitors. If those monitors detect a seismic event in excess of 1.0 magnitude, activities would pause while the cause is investigated. If the investigation reveals a probable connection to the hydraulic fracturing process, all well completion operations will be suspended. ODNR will develop new criteria and permit conditions for new applications in light of this change in policy. The department will also review previously issued permits that have not been drilled.

"While we can never be 100 percent sure that drilling activities are connected to a seismic event, caution dictates that we take these new steps to protect human health, safety and the environment," said Zehringer. "Not only will this reasonable course of action help to ensure public health and safety but it will also help us to expand our underground maps and provide more information about all types of seismicity in Ohio."

"ODNR's directives are a sensible response to a serious issue that regulators across the country are closely examining," said Gerry Baker, Associate Executive Director of the Interstate Oil and Gas Compact Commission. "IOGCC is pleased to work with Ohio and other states to share scientific data to better understand the nature of these occurrences."

"These additional standards add even more strength to Ohio's already comprehensive regulatory program," said Mike Paque, Executive Director of the Groundwater Protection Council. "State regulators are taking an aggressive lead in tackling tough and complicated oil and gas issues and ODNR is no exception."

More than 800 wells have been drilled in Ohio's Utica and Marcellus shale play, including as many as 16,000 hydraulic fracturing stages from those wells. Regarding the seismic events in

Poland Township, Mahoning County, ODNR geologists believe the sand and water injected into the well during the hydraulic fracturing process may have increased pressure on an unknown microfault in the area. Further hydraulic fracturing at the site is suspended but the company will be permitted to recover resources from five of the previously drilled wells located on the pad. This is also expected to have the beneficial effect of reducing underground pressure and decreasing the likelihood of another seismic event.

Under ODNR's lead, Ohio has joined a consortium of state regulators dedicated to learning more about seismic activity, especially as it relates to oil and gas activity. The members of this consortium are currently working with the Interstate Oil and Gas Compact Commission and Groundwater Protection Council to share information and knowledge. The working group also hopes to draw upon current and future research to develop common procedures for how to monitor for seismic activity and respond if activity occurs.

The Ohio Seismic Network, coordinated by ODNR and operated by various partners, began recording seismic events in 1999. Before that time, the recording of seismic events varied from distant machines and felt reports. Ohio has a history of seismic activity, and since the network has established, Ohio has experienced 109 events greater than 2.0 magnitude. Data from the Ohio Seismic Network will be used as part of our new application review process.

A map of underground seismic faults and past seismic events is available at oilandgas.ohiodnr.gov.

ODNR ensures a balance between wise use and protection of our natural resources for the benefit of all. Visit the ODNR website at ohiodnr.gov.

10.

Updated

ODNR finds "probable connection" between fracking and earthquakes

Posted: Apr 11, 2014 11:45 AM EST

COLUMBUS, Ohio - The Ohio Department of Natural Resources plans issued a moratorium on hydraulic fracturing within a three mile radius of last month's earthquakes in Poland Township.

In early March, several tremors were reported in the area of gas wells near the Carbon Limestone Landfill in Poland.

Five earthquakes were measured over the course of two days at that time.

The moratorium means there will be no permits issued until further notice for hydraulic fracturing wells and existing wells will not be permitted to do any new drilling or fracturing.

Meanwhile, ODNR has changes its permitting process. Permits issued by ODNR for horizontal drilling within 3 miles of a known fault or area of seismic activity greater than 2.0 magnitude would require companies to install seismic monitors. If seismic activity in excess of 1.0 magnitude is recorded, activities will be paused. If the investigation reveals a probably connection to hydraulic fracturing, activities will be suspended.

"This will allow us to determine if something does happen. This new data will allow us to be able to find out what caused the potential event and determine if it was natural or if it did in fact relate to oil and gas activity," said Mark Bruce a spokesperson with ODNR.

While scientists have made links in the past between injection wells and seismic activity, this is the first time in the United States a probable connection has been made between hydraulic fracturing and seismic activity.

"We need to be cautious. With any industry there are inherent risks, but the idea is to identify those risks and then minimize those risks and that is what we are trying to do," said Ohio State Representative Sean O'Brien.

Dr. Jeffrey Dick, the chair of the Geological and Environmental Sciences Department at Youngstown State University believes ODNR'S new permit conditions are the best possible solution. He says seismic monitors are very reliable. However, it's impossible to identify every fault line.

"It would be silly, in my opinion, to shutdown all oil and gas operations because there is a suspected link between earthquake activity and hydraulic fracturing. It makes far better sense to put the proper monitoring equipment in place and go from there," said Dr. Jeffrey Dick with Youngstown State University.

According to ODNR, HilCorp will be able to recover resources from their five existing wells as long as seismic monitors are installed. HilCorp released a statement saying they "remain fully committed to public safety and acting in a manner consistent with being a good corporate citizen in the communities where we operate."

Meanwhile, the Ohio Gas Association released a statement saying they believe the seismic

activity in Poland Township was "a rare and isolated event that should not cast doubt about the safety of hydraulic fracturing, a process that has been conducted on more than one million oil and gas wells in the U.S., including 80,000 in Ohio, since the 1950s."

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