



**EARTHWORKS**

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Environmental Health Section  
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VIA ELECTRONIC MAIL SENT TO: [sradig@nd.gov](mailto:sradig@nd.gov)

Director Radig and Colleagues:

On behalf of Earthworks' Oil & Gas Accountability Project please accept the following comments regarding North Dakota's proposed rule changes for Technologically Enhanced Normally Occurring Radioactive Material (TENORM) tracking and disposal.

Earthworks' Oil & Gas Accountability Project is a national nonprofit organization dedicated to working with communities to protect their environment and public health when oil and gas development occurs. We have over 340 members in North Dakota and Montana, and 54,000 members nationwide.

Our members recognize the numerous reports and investigative news articles that have highlighted the overwhelming impacts of the Bakken oil boom. They also understand the resulting pressures on state and federal regulatory resources. Earthworks, and our members, support the State of North Dakota in establishing and enforcing effective oil and gas regulations that are protective of health, environment and communities.

As the second highest oil producing state in the country, North Dakota bears a responsibility for creating leading regulatory frameworks for oil and gas development. The state must permit oil and gas activities only at a pace by which it can effectively carry out inspection and enforcement of the development inside North Dakota. In addition, we believe that regulators must ensure that negative impacts from the development do not leave the state.

### **Managing Volumes of Waste**

A primary concern is whether North Dakota can handle the TENORM waste it is generating. Increasing concentration limits for TENORM to 50 pCi/g at special waste and industrial landfills will enable North Dakota officials to begin managing waste streams rather than

shipping the waste out of state. It may also help stop some illegal dumping. However, North Dakota should address the substances that operators and/or landfills will utilize to down-blend TENORM to meet regulatory limits. The State should evaluate, monitor and regulate the practice of combining substances like coal ash with pipe scale, sludge, filter socks, and other TENORM waste. It should also calculate the additional amounts and volumes of waste that will be produced from down-blending and make this information available to the public.

The proposed rule excludes drill cuttings from the definition of TENORM. While Earthworks recognizes that this is a current operating procedure nationwide, disposing drill cuttings on well sites “exposes this material to the accessible environment”, which is part of EPA’s definition of TENORM. Therefore, drill cuttings must be evaluated and included in North Dakota’s TENORM definition.

The exclusion of drill cuttings from the TENORM rule was addressed by the Department of Health (DoH) at their public meeting in Williston, North Dakota in January 2015. The DoH explained their reasoning to exclude drill cuttings was because adding drill cuttings to the rule would mean that soil excavated from house foundations would also need to be identified as TENORM. Earthworks encourages the State to evaluate and articulate the differences between these activities, including depth and chemical differences. We believe that such an evaluation will show that the State should adhere to EPA’s definition of TENORM with regard to drill cuttings.

Very little is known about the levels of TENORM found in drill cuttings or their rate of degradation. In addition, minimal information is available about the radioactive daughter products, granddaughter products and leads that occur through the TENORM decay process. Data is needed to determine the amount of TENORM that will occur in the breakdown products as the drill cuttings are brought to surface through the drilling process and then buried and disposed of.

In a 2011 environmental impact statement, the New York State Department of Environmental Conservation found that approximately 5,000 pounds of drill cuttings were produced from each well in the Marcellus Shale. Although the study did not identify how much TENORM was present in the cuttings or what the daughter and granddaughter products are when the TENORM is brought to surface, it did raise concerns about both. In a paper from Oklahoma State University titled, An Introduction to the Land Application of Drilling Mud in Oklahoma, where drill cuttings were included in the description of drilling muds, the same conclusion was reached. “Little to no data is available on the metals and NORM content of drilling mud.” In June, 2014, Allison Ritter, oil and gas division public information officer, said in a Bismarck Tribune article, “ ‘A typical Bakken well could produce approximately 25 semi loads of dry cuttings,’ Ritter described, ‘which could be buried on-site depending on the site’s environmental conditions. If not stored on-site, they’re dried and disposed of at special landfills within North Dakota.’ ”

It is extremely important to evaluate drill cuttings and their disposal. TENORM will degrade into daughter products that will potentially increase in radioactivity. Without enough scientific information on drill cuttings, the State should err on the side of caution.

The proposed rule does not include evaluation or disposal of drill stem, drill pipe or downhole equipment. Earthworks encourages the State to evaluate the TENORM levels of all downhole equipment, including drill stem and drill bits. In addition, the disposal of this equipment and all byproducts produced by the re-conditioning, cleaning and grinding of this equipment must be addressed in the proposed rule to ensure the protection of workers and the public.

The proposed rule does not include evaluation of storage tank bottom sludge or byproducts from gas refining separation processes, which are recognized as largely unregulated TENORM material(s). Earthworks encourages the State to evaluate the TENORM levels of these sludge and byproducts at production facilities, as well as drilling facilities, and include methods for their disposal in the proposed rule.

### **Logistical and Enforcement Issues**

In the Argonne National Laboratory report titled, Radiological Dose and Risk Assessment of Landfill Disposal of Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) in North Dakota, disposal of TENORM in its special waste and industrial landfills is discussed. Although Earthworks supports the construction and monitoring guidelines for landfills outlined in the report, we encourage the State to require TENORM to be disposed of in a separate area of the landfill, specifically engineered to accept TENORM waste. This would ensure TENORM waste is isolated when there is a need to reinforce containment of the waste, or should any type of down-blending or remediation be undertaken.

Earthworks also encourages the State to identify and evaluate the landfills already being used as disposal facilities, in order to determine any threat to the environment, workers and public from these existing disposal sites. Where needed, clean up must be conducted and monitoring put in place in and around the sites.

Without full investigation of equilibrium status of the waste, it is unknown how the waste stream will change. The radioactivity could significantly increase over time. To adequately investigate equilibrium status, radiation detection systems with specific characteristics are needed in all current, proposed and previously used TENORM disposal sites.

### **Worker Health Issues**

In addition to protection of the general public, we recommend the State pay particular attention to the exposures of TENORM for workers in the oil and gas industry. Outside of uranium or other mining operations, there are no strict national building codes that require evaluation of occupational exposure to radon decay products or TENORM. Earthworks encourages the State of North Dakota to investigate the impacts and exposures to TENORM for all people working in the oil and gas industry from exploration to the refinery.

In closing, Earthworks asks that all data and information used to construct this proposed rule, along with the methods and calculations used to develop the information, be made available to the public.

Thank you for your consideration of these comments. We look forward to your written response.

Sincerely,



Deb Thomas  
Earthworks



Jennifer Goldman  
Earthworks