1. **Can you elaborate on the types of recommended leak detection options for the waste pond?** There can be multiple designs to accomplish leak detection. It is a great concern to DOGRM that the waste pond only has a single layer of protection between the waste and the environment. As stewards of the environment, we would recommend (and intend to require in the upcoming rule package) a dual liner system with a leak collection zone. Therefore, an earthen waste impoundments would have a prepared sub-base; a secondary liner covering the entire sub-base; a leak detection & collection system designed to intercept, detect, collect and rapidly transmit seepage in the zone between the secondary and primary liners to a collection sump; and a primary liner. We would recommend there be no penetrations through the system and all withdrawals be by suction, pumping or siphon over the liner. DOGRM is also recommending leak detection and collection systems for constructed waste vaults. These types of storage vessels are easier to install sumps and tanks and
2. **When you mention disclosure of chemical reagents and MSDS, is this only for what is used on-site diesel fuel, quick lime, cement, and degreaser?** Yes, disclosure of reagents to be used at the facility in the storage, processing, recycling, treatment of the brine or other waste substances. Not necessary to include fuels unless they would be used in the above processes.
3. **How often is it required to do TENORM testing?** There is not a simple answer to this question, but I will provide some information that may help in clarification of TENORM management.

It is the generator’s responsibility to test for TENORM, be it the owner of the well or someone authorized by the owner. If the TENORM is generated from processes occurring at a facility, such as tank bottoms, settled solids, filter socks or cakes, etc., then the facility must test each load going for disposal. It is also the responsibility of the facility to ensure worker exposure is limited to as low as possible. We recommend development of a radiological protection plan. Also, DOGRM has a memorandum of understanding with the Ohio Dept. of Health (ODH), utilizing them as our consultant pertaining to radiological issues, including testing. To ensure that a representative sampling is performed on TENORM generated from processes occurring at a facility, operators must adhere to sampling and analytical methods approved by ODHand combined radium 226 and 228 concentrations are below the regulatory limit of 5 picocuries per gram above natural background for disposal in Ohio. ODH approved sampling protocols (See web site, **http://www.odh.ohio.gov/odhprograms/rp/radprot/radppub1.aspx**) state that a representative composite sample shall be obtained from each containerused to collect waste defined as TENORM.  Taking one sample for a production operation or geographic region is not acceptable. The intent is that each waste container presented to a landfill for disposal must be individually sampled and analyzed.

The ORC 1509.074 governing TENORM testing and disposal options is printed below.

**1509.074 Analysis and disposition of material resulting from construction, operation, or plugging of a horizontal well.**

(A) With regard to material that results from the construction, operation, or plugging of a horizontal well, all of the following apply:

(1) Except as provided in division (A)(2) of this section, the owner shall determine the concentration of radium-226 and of radium-228 in representative samples of the material if the material is technologically enhanced naturally occurring radioactive material. The owner shall provide for the collection and analysis of the representative samples of the material. The collection and analysis of the representative samples shall be performed in accordance with requirements approved by the chief of the division of oil and gas resources management. The owner shall not remove the material from the location associated with the production operation of the horizontal well until the analysis is complete and the results are available. However, the owner may do one of the following:

(a) Temporarily store the material in an area adjacent to the location associated with the production operation of the well while the results from the analysis of the representative samples are pending if the material is located in an area that is designated by the division of oil and gas resources management and the owner complies with all conditions imposed by the chief;

(b) Prior to the collection of representative samples under division (A)(1) of this section, transport the material to a location for which a permit or order has been issued under division (C) of section 1509.22 of the Revised Code. The owner shall provide for the collection of representative samples of the material at that location in accordance with that division and shall temporarily store the material at that location while the results from the analysis are pending.

(2) The owner is not required to determine the concentration of radium-226 and of radium-228 of the material that is technologically enhanced naturally occurring radioactive material if any of the following applies:

(a) The material is reused in the horizontal well from where it originated or is transferred to another site for reuse in a horizontal well. For purposes of division (A)(2)(a) of this section, a material is reused if the material is used in a substantially similar manner as it was originally used.

(b) The owner disposes of the material at an injection well for which a permit has been issued under section 1509.22 of the Revised Code.

(c) The owner uses the material in association with a method of enhanced recovery for which a permit has been issued under section 1509.21 of the Revised Code.

(d) The material is transported out of the state for lawful disposal. The owner shall retain records that substantiate the lawful disposal and provide them to the chief upon request.

(3) Except as provided in division (A)(2) of this section, the owner shall transport and dispose of material that is technologically enhanced naturally occurring radioactive material in accordance with all applicable laws.

(4) If the material is not technologically enhanced naturally occurring radioactive material and the material has come in contact with a refined oil-based substance, the owner shall do one of the following:

(a) If the material is removed from the location associated with the production operation of the well or from a location specified in a permit or order issued under division (C) of section 1509.22 of the Revised Code, dispose of the material at a solid waste facility that is authorized to accept the material in accordance with Chapter 3734. of the Revised Code and rules adopted under it;

(b) If the material is removed from the location associated with the production operation of the well or from a location specified in a permit or order issued under division (C) of section 1509.22 of the Revised Code, beneficially use the material in accordance with rules adopted by the director of environmental protection under section 3734.125 of the Revised Code;

(c) If the material is not removed from the location associated with the production operation of the well, recycle or reuse the material with the approval of the chief.

(5) If the material is not technologically enhanced naturally occurring radioactive material and the material has not come in contact with a refined oil-based substance, the material may be used at the location associated with the production operation of the horizontal well or at another location associated with a production operation.

(B) An owner who has obtained results under division (A)(1) of this section shall keep and maintain the results for a period of three years. In addition, the owner shall provide a copy of the results to the chief upon request.

(C) As used in this section:

(1) "Technologically enhanced naturally occurring radioactive material" has the same meaning as in section 3748.01 of the Revised Code.

(2) "Owner" includes a person that is an authorized agent of an owner.

Added by 130th General Assembly File No. 25, HB 59, §101.01, eff. 9/29/2013.