The Policy Surveillance Program
A LawAtlas Project

Research Protocol for Regulation of Oil & Gas Wastes Containing TENORM

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Regulation of Oil & Gas Wastes Containing TENORM

I. Date of Protocol: January 13, 2017

II. Scope: To compile state-based states, regulations, and standards governing the handling of Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) waste from oil and gas operations, as well as state licensing requirements for TENORM and/or Naturally Occurring Radioactive Materials (NORM). The state-based survey includes coding questions pertaining to oil and gas operations, such as assessing whether worker protections are in place, disposal options available, prohibited disposal methods, and assessment of what is included in the definition of TENORM.

III. Primary Data Collection


b. Dates covered in the dataset: January 1, 1986 – December 1, 2016. This is a cross-sectional dataset, displaying the most recent versions of relevant laws in each state, up to December 1, 2016.

c. Data Collection Methods:

   1. To determine which states possessed TENORM and/or NORM regulations or statutes for oil and gas operations, coders conducted a preliminary literature review to compile relevant laws, regulations, and/or standards for all 50 states and the District of Columbia using LexisNexis. Coders restricted the search to state statutes and regulations and restricted the search to include key search terms, technologically-enhanced naturally occurring radioactive material (TENORM) and/or naturally occurring radioactive material (NORM) for all 50 states and the District of Columbia. Collected laws suitable for coding were separated out and coders were tasked to develop questions suitable to the pre-identified coding scheme. After the laws were collected, coders entered the questions into the Law Atlas Workbench and coded the questions, citing the applicable laws and regulations. Coding was verified by a naïve coder, and finished by the final coder, and reviewed by a supervisor.
2. Databases used: LexisNexis State Laws and Regulations; state legislature websites; LegiScan


IV. Coding

a. Development of Coding Scheme: Coders developed a set of questions after conducting the preliminary compilation of state laws and regulations that govern TENORM or NORM disposal. The questions were based on commonality criteria with regards to the preliminary search about relevant information to TENORM or NORM waste disposal. The coders developed 21 questions and entered them into Law Atlas Workbench, after a consensus was reached on word choice and order for the questions.

b. Coding methods: The states were evenly divided up amongst the coders and each coder answered the following questions for their designated grouping. The coders then switched states to check the previous coders work. Coders discussed any discrepancies and were agreed upon in the coding scheme. A final coder verified the coding. Coding was based on 21 questions total, but with 13 primary questions, some with additional child questions, that were asked in relation to TENORM or NORM waste disposal:

The first question considered whether there were specific provisions regarding TENORM or NORM disposal in regards to oil and gas exploration, which were answered as wither yes or no. Three additional child questions were asked regarding the type of limit, the amount of the limit, and the radionuclide pertaining to the limit set forth in the provision.

The second question asked whether the state had general provisions regarding the licensing of NORM or TENORM in a yes or no manner. Additionally, two child questions were added exploring the exemption limit in pCi/g and the radionuclide that the exemption limit pertained to in the provision.

The third question considered whether the state was an agreement state, answered in the following ways: yes; no, not an agreement state; and no, this is a letter of intent state.

The next set of question (fifth and six) evaluated whether NORM or TENORM are defined under state law, with the possible answers of yes or no.

The seventh question considered whether the state excludes TENORM from the definition of RCRA regulated wastes, with the possible answers of yes or no. Additionally, one child question asks whether the state includes TENORM in RCRA regulated wastes.
The eighth question dealt with disposal options available, if any, for TENORM or NORM waste. The following were options that could be checked off:

- Disposal at a Licensed Land Disposal Facility
- Disposal at a Low-Level Radioactive Waste Facility
- Disposal at a Permitted Solid Waste Disposal Facility
- Disposal in Plugged and Abandoned Wells
- Burial
- Land-spreading
- Incineration
- Deep Well Injection
- Disposal in Non-Retrieved Flow-lines and Pipelines
- Reuse
- Treatment Prior to Disposal
- Other

The ninth question asks whether the state has a prohibited disposal method, answered yes or no. An additional child question asks what the prohibited disposal is, set out in the state law, regulation, or standard.

The tenth and eleventh questions ask whether the state has any provisions to protect the public or workers in regards to TENORM/NORM that can be applied to oil and gas operations, answered yes or no.

The twelfth and final set of questions considered whether produced water, drill cuttings, scale, sludge, and contaminated equipment are addressed in the state law or regulation as TENORM or NORM, with the answers yes or no.

V. Quality Control

After coding was completed, a naïve coder reviewed the coding records and verified coding. To ensure consistency, all coders discussed any discrepancies and came to agreement. Additionally, a final coder was brought on to the assignment after some changes were made by the naïve coder, to ensure accuracy in the coding. Coding was verified by a faculty supervisor to further ensure accuracy. The dataset was not redundantly coded.