

# The NORM Report

Naturally Occurring Radioactive Material Contamination  
WINTER 1995

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## Regulations for the Control of NORM - Update

The status of regulations for the control of NORM is summarized below for 49 states (Hawaii is not included), including 27 of the important petroleum-producing states. Since NORM contamination is not limited to the petroleum industry, some of the non-petroleum states are also drafting or preparing to draft NORM regulations. The status of NORM regulations in the federal government as well as in Canada is also summarized below. Each regulatory agency was contacted during the first three weeks of January, 1995.

The last state to enact NORM regulations was Georgia. The Georgia regulations became effective March 16, 1994. Louisiana, Mississippi, Arkansas and Texas also have specific regulations for the control of NORM. Several states, e.g. New Mexico, Oklahoma, Illinois, South Carolina, Kentucky, Connecticut and others may have NORM regulations by the end of 1995. Other states are in various stages of drafting NORM regulations.

Louisiana has a major revision of that state's regulations which became effective January 20, 1995. The Texas NORM disposal regulations became effective February 1, 1995. The CRCPD draft of suggested guidelines for the control of NORM continues to be reviewed after receiving voluminous comments on its latest draft.

Several states are continuing to revise their general regulations for the control of radiation to include the revised 10 CFR 20 regulations that became effective January 1, 1994. The revised 10 CFR 20 incorporates modern radiation protection philosophy for the establishment of new dose limits and ALARA programs. The changes closely follow the recommendations of the International Commission of Radiological Protection (ICRP) and the National Council on Radiation Protection and Measurements (NCRP).

Although there currently are no federal regulations specifically for the control of NORM, it is probable that there will be federal NORM regulations -- possibly beginning in 1995.

Enactment of regulations specifically for the control of NORM will require compliance by companies with NORM contamination. Companies should already be in compliance with state general regulations for the control of radiation and the OSHA radiation regulations.

A summary of the status of NORM regulations in the individual states, the federal government and Canada follows:

### ALABAMA

Alabama is still redrafting their proposed NORM regulations. There is no  
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**ALABAMA** (continued)

timetable for the regulations to be adopted. There has been some recent interest in plugging wells, but there have been no requests for NORM regulations.

**ALASKA**

Charles Tedford recently retired as Chief, Radiological Health Program in the Department of Health and Social Services and has not been replaced as yet. Recruiting for the open position continues. Information can be obtained from:

Dr. Gregory Hayes  
State Public Health Laboratory  
Section of Laboratories  
3256 Hospital Drive  
Juneau, AK 99801  
907-586-3586

Alaska has no specific NORM regulations and nothing is planned -- at least until Tedford is replaced.

**ARKANSAS**

There have been no changes in the Arkansas NORM rules and regulations. However, the state is making an extensive update in the licensing of NORM users on a case-by-case basis. Inquiries can be directed to Jared Thompson at 501-661-2301. There are some remediation sites in Arkansas that are receiving a lot of attention from potential licensees. The Arkansas Department of Health is almost to the point of accepting the application from a remediation company from out-of-state and one from in-state is close to being licensed also.

**ARIZONA**

All radioactive materials, including NORM, are addressed in Arizona's general regulations for the control of radiation. At present, NORM is not specifically addressed, but consideration is being given to enacting NORM regulations in about a year.

**CALIFORNIA**

As a preliminary to drafting NORM regulations, California has made surveys of petroleum facilities for NORM contamination and collected samples for laboratory analyses. Water, brine, soil and other appropriate samples have been collected. A draft report of the surveys has been prepared but has not as yet been approved for release. Some areas in California were found to be contaminated, but in general the contamination was not as great as generally found in Texas and Louisiana. There is no timetable for the report to be released. A meeting will be scheduled with oil and gas industry representatives and other interested parties before making a decision on the next step to NORM regulations.

**COLORADO**

There has been no progress in the enactment of the proposed NORM regulations in Colorado.

**CONNECTICUT**

The Department of Environmental Protection is currently doing in-house editing on a prepared draft of NORM regulations. After the DEP has approved the draft, the proposed regulations will be sent to Legal and then to the State Legislature for enactment. There is no timetable -- enactment is dependent on the new state administration.

**DELAWARE**

There are no specific regulations for the control of NORM in Delaware. NORM, NARM and other radioactive materials are considered to be covered in the general regulations for the control of radiation enacted in 1983. There could be some revisions in these general radiation regulations in 1995, particularly in tightening compliance requirements.

**FLORIDA**

Florida's Office of Radiation Control in the Department of Health and Rehabilitation Services has recently hired a new staff member who is in the process of researching NORM prior to preparing a draft of NORM regulations.

**GEORGIA**

Georgia has completed their "cleanup" of the NORM regulations to correct typos, etc. Only very minor changes were made in the regulations. The revised regulations became effective in October, 1994. No further revisions in the regulations are planned for the near future.

**IDAHO**

Idaho is not doing anything at present with NORM other than reviewing the latest CRCPD NORM draft guidelines. There is no program for the development of specific NORM regulations. There are provisions in the general regulations for the control of radiation that can be used for NORM problems if the need arises.

**ILLINOIS**

The Division of Radioactive Materials in the Illinois Department of Nuclear Safety is again working on a draft of proposed NORM regulations. The goal is to have a proposal ready by March or April with enactment of the regulations by the end of 1995. Comments from the API and others on the latest draft of the CRCPD NORM guidelines are being reviewed to determine if changes should be made in the Illinois draft. Meetings with interested parties will be held and written comments will be invited prior to submitting the proposed draft of the regulations for enactment.

**INDIANA**

No new regulations for the control  
(Continued on page 3)

**INDIANA** (continued)

of NORM have been enacted or proposed in Indiana. There have been a few incidents involving NORM contaminated materials in scrap yards, etc.

**IOWA**

Iowa has no specific regulations for the control of NORM. Problems are handled on a situation-specific basis using the state's general regulations for the control of radiation. There are no plans for specific NORM regulations unless the state legislature requests them.

**KANSAS**

There has been little or no action in the last few months in Kansas leading to the promulgation of regulations for the control of NORM. The Kansas Department of Health and the Environment will be having a meeting with the Kansas Corporation Commission to discuss NORM issues. The Corporation Commission regulates the oil and gas industry in Kansas. It has not been determined who will have the regulatory jurisdiction for NORM in the oil and gas industry. The Kansas Petroleum Council NORM Study Group remains active and there are indications that the Kansas petroleum industry is becoming interested in tackling the NORM problem.

Kansas continues to handle NORM problems on a case-by-case basis. People with NORM problems are being advised to store NORM wastes on-site or dispose of the wastes through one of the commercial facilities, e.g. Envirocare, US Ecology, Campbell Wells, or Newpark.

**KENTUCKY**

In the last issue of *The NORM Report* it was erroneously reported that Kentucky had distributed a draft of NORM regulations. This

was in error -- Dr. Rice Leach, Commissioner of the Cabinet of Human Resources distributed a document which was to be used as a point of departure for discussing what information should be contained in NORM regulations.

Nothing has been done at this time to promulgate NORM regulations in Kentucky. A resolution of the negotiations with oil companies concerning the Martha Oil Field situation in the absence of applicable state and federal NORM regulations is awaited before taking any steps to formally promulgate regulations. Once an agreement is reached, Kentucky will very quickly work on their NORM regulations.

**LOUISIANA**

The Louisiana revisions to their NORM regulations became effective January 20, 1995 when they were published in the Louisiana Register. Details of the revisions were given in the SPRING, 1994 issue of *The NORM Report* in a release prepared by Karen Fisher-Brasher of the Louisiana DEQ. Karen has since moved to DEQ's enforcement area and Jason Talbert now heads up the NORM activities.

In the identification of regulated equipment and material, several revisions have been made. The exemption level for NORM is 5 pCi/g or less of radium-226 or -228. The use of the 30 pCi/g of technologically enhanced radium-226 or -228 averaged over any 100 square meters has been removed. The use of radon emanation has also been removed.

Revisions have been made for the exemption of land if it contains concentrations of 5 pCi/g or less of radium-226 or -228, above background, averaged over the first 15 cm and 15 pCi/g, above background, averaged over each

subsequent 15 cm thick layer of soil, or 30 pCi/g or less of radium-226 or -228, averaged over 15 cm depth increments, provided the total effective dose equivalent from the contaminated land does not exceed 0.1 rem (100 mrem) in year. Both of the above may be applied to samples averaged over 100 square meters with no single non-composite sample exceeding 60 pCi/g of soil.

The maximum radiation exposure level for the regulation of equipment has been changed from 25 microrem/hr over background to 50 microrem/hr including background at any accessible point. This change makes the Louisiana regulations consistent with those of Texas and Arkansas. It will also remove the need to correct for background.

A provision has been included to allow pipe yards, storage yards, and production equipment yards to apply for a one time authorization to conduct property cleanup. The revision in LAC 33:1410 will require the submission to the Division of a plan for the removal of NORM contaminated soil in excess of 200 pCi/g of radium-226 or -228 or 50 microrem/hr at one meter from the soil. The plan must include a schedule for cleanup and be approved by the Division.

**MAINE**

Maine has general regulations for the control of radiation, but does not have specific NORM regulations. There may be an apparent need for NORM regulations, however, especially for the control of water treatment wastes. Many water supplies in Maine contain significant concentrations of radium and radon. Chemicals, e.g. ion exchange resins used in water treatment, can become quite "high" in radium and carbon filters used to remove radon from water are

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**MAINE** (Continued)

giving waste filters "hot" with radon daughter products, lead-210, bismuth-210, and polonium-210.

**MARYLAND**

Maryland has no specific regulations for the control of NORM. NORM is handled under the general radiation regulations. Scrap dealers sometimes report a problem with radium-226, but NORM is not considered to be a large problem in the state.

**MASSACHUSETTS**

Massachusetts has no specific regulations for the control of NORM. There are no plans at present for NORM regulations.

**MICHIGAN**

The status quo is being maintained in Michigan as regards NORM regulations. Michigan has issued a draft of standards and guides for the control of NORM and are presently awaiting a decision as to whether to proceed with regulations.

**MINNESOTA**

Minnesota has no specific regulations for the control of NORM. The Pollution Control Agency has adopted by reference a statute in the Environmental Quality Board which says that natural materials may be buried. The statute does not give any concentration information and the Health Department is trying to work with these other agencies to define the concentrations of these natural materials which may be disposed of by burying. There have been no other statutes or regulations enacted in Minnesota recently relating to NORM.

**MISSISSIPPI**

There have been no revisions in the Mississippi NORM regulations and no revisions are planned or anticipated at the present time.

Mississippi has promulgated Rule 68 - Disposal of NORM Associated with the exploration and production of oil and gas. This rule was accepted August 17, 1994 and became effective September 9, 1994. Rule 68 states that any dry, abandoned or plugged back oil and/or gas well may be considered as a potential disposal site for NORM. Each owner, operator and/or producer of a well shall be responsible for the proper disposal of NORM in that well in accordance with all applicable rules and regulations of all appropriate state or federal authorities.

Provisions of Rule 68 include:

In order to qualify for disposal pursuant to this Rule, the NORM must have been derived from the exploration and production of oil and gas within the State of Mississippi.

Acceptable methods of disposal of NORM shall be limited to the following:

- A. NORM material can be placed between cement plugs; or
- B. encapsulated in pipe then placed between cement plugs; or
- C. NORM slurry can be mixed with gel or mud and placed between cement plugs; or
- D. NORM slurry can be placed into a formation; or
- E. NORM material can be disposed of offsite at a licensed low level radioactive waste or NORM disposal facility.

**MISSOURI**

There are no specific NORM regulations in Missouri and none are planned at present. Occurrences of NORM problems are handled under the state's general regulations for the control of radiation. Some NORM regulations may be required in the future.

**MONTANA**

There have been no new developments applicable to NORM regulations in Montana. The regulations for the control of radiation have not been revised since 1980. NORM is not considered to be included in the radiation regulations. The Montana Department of Health and Environmental Sciences does have the statutory authority for NORM regulations, but there is no funded program for their development.

**NEBRASKA**

There has been no change in status of NORM regulations in Nebraska. Nebraska believes that NORM is included in their general regulations for the control of radiation. There are no plans for specific NORM regulations.

**NEVADA**

No specific NORM regulations have been proposed. Comprehensive statutes for the general control of radiation address NORM and NARM similarly.

**NEW HAMPSHIRE**

New Hampshire considers NORM to be a subset of NARM and the state has always regulated NARM in the same manner as byproduct, source, and special nuclear materials are regulated as an agreement state. One area that may not presently be regulated and may have to be are water treatment systems. There are significant quantities of radon in New Hampshire water supplies together with NORM materials from the granite sources in the state. Some water treatment facilities become quite "hot". Regulations similar to those adopted in Texas may be adopted in the future.

**NEW JERSEY**

New Jersey's general regulations for the control of radiation have  
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**NEW JERSEY** (Continued)  
just been repropoed without change (a requirement of the New Jersey sunset laws), except for eliminating Subchapter 12 which was the transportation regulation. The reason was, as advised by the attorney general, state transportation regulations were preempted by the federal Hazardous Materials Transportation Uniform Safety Act.

New Jersey is trying to move in concert with the chemical industry in setting cleanup standards for radiation and chemical contamination at the same time.

### **NEW MEXICO**

A New Mexico Environmental Improvement Board hearing was held December 8, 1994 in Albuquerque to consider Subpart 14: Naturally Occurring Radioactive Materials (NORM) in the Oil and Gas Industry. Subpart 14 establishes radiation protection standards for the possession, use, transfer, transport, storage and disposal of NORM associated with the oil and gas industry, and which are not subject to regulation under the Atomic Energy Act of 1954, as amended.

The exemptions listed in Section 1403 of the proposed Subpart 14 include:

A. For release for unrestricted use. Persons who receive, etc. NORM are exempt from the requirements of these regulations if the NORM present is at concentrations of 30 pCi/g or less of radium-226, above background, or 150 pCi/g or less of any other NORM radionuclide, above background, in soil, in 15 cm layers, averaged over 100 square meters. Samples should be taken if gamma radiation readings are equal to or exceed twice background readings when surveyed at a distance of 1 cm from

the surface of the soil, in accordance with Department guidelines.

B. The possession and use of natural gas and natural gas products and crude oil and crude oil products as fuels are exempt from the requirements of these regulations.

C. NORM not otherwise exempted and equipment from oil, gas, and water production containing NORM are exempt from the requirements of these regulations if the maximum radiation exposure reading at any accessible point does not exceed 50 microrentgens per hour, including background radiation levels. Sludges and scales contained in oil, gas and water production equipment are exempt from the requirements of these regulations if the maximum radiation exposure reading within 1 cm of the surface of the sludge or scale does not exceed 50 microrentgens per hour, including background radiation levels. If the radiation readings exceed 50 microrentgens per hour, removable sludges and scale are exempt from the requirements of these regulations if the concentration of radium-226, in a representative sample, does not exceed 30 pCi/g.

D. NORM not otherwise exempted and equipment from gas processing, fractionation, and dry gas distribution containing NORM are exempt from the requirements of these regulations if the removable surface NORM contamination does not exceed 1000 dpm per 100 square cm and otherwise conforms with the requirements of Section 1403 A. Removable scale from gas processing, fractionating, and dry gas distribution is exempt from the requirements of these regulations if the concentration of lead-210, in a representative sample, does not

exceed 150 pCi/g.

E. Produced water is exempt from the requirements of these regulations if it is reinjected into Class I or Class II Underground Injection Control well permitted the Division and/or stored or disposed in a double synthetically lined surface impoundment permitted by the Division.

In Section 1405 is the requirement that licensees shall incorporate hazard identification and training into their hazard communication programs as required by OSHA and as required under Part 10 of these regulations for personnel working on or around equipment and materials that contain Regulated NORM. Regulated NORM material that has been removed from equipment and containerized shall be labeled as per the requirement of Part 4-220

In Section 1407, Disposal and Transfer of Regulated NORM for Disposal, the following are specified:

A. Disposal of Regulated NORM on or near the surface of the ground shall be done pursuant to a specific license issued under Section 1410 and Subpart 13 of these regulations and pursuant to NMOCD Rule 711, except that a general license may blend or discard Regulated NORM contaminated soils in place provided that:

1. the soils were contaminated at that site and prior to promulgation of these regulations, and
2. the limits established in Part 1403 A are met.

B. Disposal of Regulated NORM in nonretrieved flowlines and pipelines, in plugged and abandoned wells or by deep-well injection shall be done pursuant to

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**NEW MEXICO** (Continued)  
a general license issued under section 1409 and pursuant to applicable Division rules and regulations.

C. All licensees shall store, transfer and/or dispose of Regulated NORM in accordance with the Worker Protection Plan required under Section 1405. All requirements of this Worker Protection Plan shall be available for inspection by the Department.

D. Regulated NORM shall only be disposed by the methods enumerated below, except that the Department will consider and approve alternative methods of disposal if the applicant demonstrates that such alternative methods will protect the environment, public health and fresh waters, and otherwise is consistent with these regulations, with other provisions of the NMRPR and with applicable Division rules and regulations.

1. Disposal in Nonretrieved Flowlines and Pipelines.
2. Disposal at Commercial and Centralized Facilities.
3. Disposal in Plugged and Abandoned Wells.
4. Disposal by Injection.
5. Other Disposal Methods.

Persons subject to the general license established in these proposed regulations shall conduct radiation surveys of equipment and facilities in their control or possession and maintain that information on file. Surveys would be conducted for all of the following events.

1. Prior to working on facilities or equipment where potential release of regulated NORM could occur or

where workers could be exposed to regulated NORM.

2. Prior to any transfer of equipment to another operator, the general public, or a salvage firm.
3. Prior to the movement or removal of equipment from any facility or facility reclamation.
4. At facilities where pipe has been cleaned.
5. At facilities where materials are known to have been spread, spilled or stockpiled.

B. Surveys required by this subpart shall be conducted using instruments that meet the requirements of section 1404.

C. Surveys required by this subpart shall be performed pursuant to guidelines issued by the Department and by persons who possess the knowledge and/or training to perform such surveys pursuant to Department and Division Guidelines.

Other sections of Subpart 14 establish standards for radiation survey instruments, protection of workers during operations, protection of the general population from releases of radioactivity, requirements for storage of regulated NORM, and requirements for general and specific licenses.

The New Mexico Oil and Gas Association worked closely with the State of New Mexico Environment Department in the development of the proposed NORM regulations.

### **NEW YORK**

Any licensed NORM in New York comes under their Part 380 regulations for disposal. New York also has a soil decommissioning and cleanup

standard that was adopted in September, 1994. This standard was sent to the EPA for their consideration for use as a federal standard.

### **NORTH CAROLINA**

Nothing presently is being proposed on NORM regulations. The state would like to be doing more on NORM, but there are too many other "alligators" biting at them right now.

### **NORTH DAKOTA**

The Oil and Gas Division of the Industrial Commission has put on NORM training. About 20 people attended the course in November, 1994, including industry and regulatory people.

North Dakota recently started looking at ash from coal-fired power plants. Initial indications are that there may be some NORM problems. Concentrations about 6.5 pCi/g combined radium-226 and -228 were reported. If the radium concentrations are greater than 5 pCi/g, the material is subject to the North Dakota Radiological Health rules. It would as a minimum have restricted use criteria placed on it. The coal ash issue may force North Dakota to look harder at the whole NORM contamination area. Contact will be made with other states to determine what these states are doing about coal ash.

### **OHIO**

Ohio is going through a massive revision of their radiation regulations as part of the process of becoming an Agreement State. NORM will be added to the regulations during this revision. It will be one to two years before the revision is complete.

### **OKLAHOMA**

Oklahoma's Radiation

(Continued on page 7)

**OKLAHOMA** (Continued)

Management Advisory Council continues to revise the May 7, 1993 draft of proposed regulations Subchapter 19, Licensing of Naturally Occurring Radioactive Materials (NORM). Some of the features included in the proposed draft or in the revisions under consideration include the following:

(1) NORM are exempt from the requirements of these rules if the materials contain, or are contaminated at, concentrations of

(A) 30 pCi/g or less of technologically enhanced radium-226 or -228 in soil, averaged over 100 square meters and averaged over the first 15 cm of soil below the surface,

(B) 30 pCi/g or less of technologically enhanced radium-226 or -228 in media other than soil,

(C) 0.05% by dry weight or less of uranium or thorium, or

(D) 150 pCi/g or less of other NORM radionuclides, provided that these concentrations are not exceeded; or

(2) Materials in the recycling process, including scale or residue not otherwise exempted, and other equipment containing NORM are exempt from the requirements of these rules if the maximum radiation exposure level does not exceed 50 microrentgens per hour including the background radiation level at any accessible point.

The following products/materials are under consideration to be non-exempt from the requirements of the proposed regulations:

Potassium and its compounds  
Byproducts from fossil fuel combustion (bottom ash, fly ash,

and flue-gas emission control byproducts

Materials used for building construction, industrial processes, sand blasting, and metal casings  
Phosphate and potash fertilizer  
Phosphogypsum for agricultural uses.

Possession of produced waters from crude oil and natural gas production are exempt from the requirements of these rules if the produced waters are re-injected in a well approved by the authorized regulatory agency or if the produced waters are discharged under authority of the authorized agency.

Each person subject to the general license shall manage and dispose of wastes containing NORM:

(1) by transfer of the wastes for disposal to a land disposal facility licensed by the U.S. NRC, an Agreement State, or a Licensing State;

(2) in accordance with alternate methods authorized by the Department of Environmental Quality which may include for solid residues:

1. Landspreading
2. Landspreading with dilution
3. Non-retrieval of surface pipe
4. Burial with unrestricted site use
5. Disposal at a commercial oil field waste site
6. Disposal at a licensed NORM waste disposal site
7. Disposal at a licensed low-level radioactive waste disposal site
8. Burial in surface mines
9. Plugged and abandoned wells
10. Well injection
11. Hydraulic fracturing
12. Injection into salt domes

Or for equipment containing

NORM:

1. Release for general use, if appropriate release criteria
2. Release for re-use within the petroleum industry
3. Storage in an oil-field equipment yard
4. Release to a smelter, and
5. Burial with NORM sludges/scales.

The transfer of NORM, not exempt from these rules, from one general licensee to another general licensee authorized by the Department if:

(1) the equipment and facilities contaminated with NORM are to be used by the recipient for the same purpose or at the same site;

(2) The materials being transferred are ores or raw materials for processing or refinement; or

(3) The materials being transferred are in the recycling process.

Facilities and equipment contaminated with NORM in excess of the level set forth in the proposed regulations shall not be released for unrestricted use.

Land contaminated with technologically enhanced radium-226 or -228, averaged over 100 square meters, in which the concentrations of technologically enhanced radium-226 or -228 are in excess of 30 pCi/g, over a maximum depth of 15 cm of soil below the surface, shall not be transferred for unrestricted use.

**It must be emphasized that many of the items tabulated and discussed above in the proposed draft of Oklahoma NORM rules are not included for consideration and discussion by the Radiation**

(Continued on page 8)

