

The NORM Report

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Naturally Occurring Radioactive Material Contamination SPRING 1997

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Regulations for the Control of NORM - Update

The status of regulations for the control of NORM is summarized below for 21 states, the federal government, Canada, and the CRCPD. 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 to control NORM in other industries, e.g., mineral extraction and phosphates. Each regulatory agency was contacted during May and June 1997.

The last state to enact NORM regulations was Ohio. Ohio's regulations became effective June 9, 1997 and are summarized in this issue of **The NORM Report**. The New Mexico and South Carolina regulations were summarized in the Summer 1995 issue of **The NORM Report**. Louisiana, Mississippi, Arkansas, Texas and Georgia have previously enacted regulations for the control of NORM. Oregon enacted regulations in January 1990. Although the Oregon regulations were specifically written for control of NORM in zircon sands, the Oregon regulations do apply to all NORM contamination in the state. The Oregon regulations were summarized in the Winter 1996 issue of **The NORM Report**.

There currently are no federal regulations specifically for the control of NORM.

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

The status of NORM regulation in 21 states, the federal government and Canada follows:

ARKANSAS

The revised regulations are in effect. The revised regulations should be available to the public by September, 1997.

The Arkansas NORM regulations constitute Section 7 of the Arkansas Rules and Regulations for Control of Sources of Ionizing Regulations.

The revised regulations were summarized in the Fall 96 issue of **The**

NORM Report.

COLORADO

Senate Bill 97-154 *Controlling Regulation of Radioactive Material*, did not pass out of the Senate Appropriations Committee and the Legislature adjourned without further action. (See the Winter 97 issue of **The NORM Report** for a summary of Bill 97-154.)

Both Envirocare cases have been

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COLORADO (continued) dismissed with prejudice. (See the Winter 97 issue.)

CONNECTICUT

The Connecticut Department of Environmental Protection (DEP) has withdrawn the Request for Proposal (RFP) to have a contractor draft proposed regulations for the control of low-level radioactive wastes, including NORM and NARM. It is not known when or if the proposal will be reactivated.

FLORIDA

The 18 month study of phosphate NORM, funded by the Florida Institute of Phosphate Research at the state's request, began in July, 1996. The study's goal is to identify and evaluate the extent of occupational and public radiation exposure risks related to phosphate NORM. The Institute, located in Bartow and affiliated with the University of South Florida, selected the Polk County Public Health Unit and a private consulting firm to conduct the study as a joint project. Florida hopes the data provided by the study will provide guidance on the extent of regulatory intervention needed to address phosphate NORM in the state.

It appears now that the phosphate study will be extended beyond the original date. The Park County Health Unit was responsible for collecting hard data and they have had delays. A status meeting will be held on July 16, to determine how long the delay will be.

GEORGIA

Georgia's regulations for the control of NORM became effective in October 1994. There have been no changes in the rules since. Revisions to the general rules and regulations for the control of radiation have been drafted and were adopted by the Board. The revisions

became effective May 6, 1997. However, there are no changes in the NORM rules in this revision.

ILLINOIS

Illinois does not yet have a draft of NORM regulations. The regulations, when drafted will probably focus on areas where NORM problems exist with the expectation that revisions to the rules will be made when new NORM problem areas are recognized.

A NORM problem has been discovered in Illinois which has national and international implications.

The U.S. import division of a tin mining company in Brazil has been importing a tin-lead-bismuth mixture from the mines in Brazil. Since December 1996, it has been noted that the lead has been contaminated with lead-210 and its radioactive daughters from the small quantities of uranium present in the ore. Consequently solder-like material containing 65% tin, 34.5% lead, and 0.5% bismuth was found to contain 4 ± 2 nanocuries ($4,000 \pm 2000$ picocuries) of total activity per gram of solder. The lead-210 concentration is further diluted by about a factor of 10 while being made into lead products.

All the lead imported was sent to a St. Louis company who sent it to an Illinois company for processing. This company is a large supplier of lead powder used to make medical products such as aprons. For about 7 or 8 months there has been lead-210, bismuth-210, and polonium-210 contamination in these products.

KENTUCKY

The Kentucky Department of Environmental Protection contin-

ues to work on a satisfactory long term disposal site for NORM. In the meantime, remediation activities continue as weather and field conditions permit. Remediated materials are being stored in a temporary site pending the resolution of discussions on long term storage.

LOUISIANA

The DEQ has an application from an oil company for a license to dispose of their own NORM in an injection well. The license which is being prepared by the DEQ could be issued shortly. There are no commercial injection wells for the disposal of NORM wastes in Louisiana.

Meetings have been held with the Hazardous Waste Division to discuss disposal of NORM contaminated mixed waste in a hazardous waste landfill. A recent shipment of RCRA waste triggered the radiation gate monitor at a landfill. The waste had a radiation reading of about 200 microrem/hr.

The meeting with the Hazardous Waste Division was an attempt to come to an agreement which would allow this kind of wastes to continue to be disposed of in hazardous waste landfills.

MICHIGAN

There have been no changes in the draft of the Michigan guidance documents for the control of NORM.

Most attention at present is still focused on radium luminous products of military origin and radium contaminated warehouses. EPA has allotted over 12 million dollars toward the cleanup of the warehouses and other contaminated buildings. It is expected that after the removal of the gauges the build

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MICHIGAN (continued)

ing contamination will be small and much of the remaining debris might be able to be disposed of in a landfill under new landfill guidelines. The Michigan guidelines for disposal in a type 2 municipal solid waste landfill allow up to 50 pCi/gm radium-226 to be disposed. This can be a large cost saving. Analysis has shown that this level shows insignificant risk to the public.

The EPA superfund cleanup of the warehouses should begin at any time.

Michigan continues to find high concentrations of NORM in pipe scale. Concentrations over 100,000 pCi/gm are commonly seen. The highest level seen has been 200,000 pCi/gm.

MISSISSIPPI

Responsibility for NORM in Mississippi is currently divided between the Department of Health and the Oil and Gas Board. The Oil and Gas Board has authority for NORM at the well site (effective July 1, 1995). After the petroleum leaves the well site the Department of Health has jurisdiction for any NORM contamination.

However, the Mississippi legislature has enacted legislation that gives the Oil and Gas Board jurisdiction over all oil and gas wastes. The Oil and Gas Board's NORM rules which became effective July 1, 1995 assumes jurisdiction only over NORM at the well site.

The Department of Health has asked the Attorney General for an opinion as to who will have jurisdiction for NORM in the future. This has been challenged in court by an attorney who has been very active in NORM litigation in the

state. The Attorney General has stated he will not render his opinion until the court challenge is settled. It is expected that the Attorney General will find that the Oil and Gas Board has jurisdiction over all NORM associated with oil and gas production in Mississippi.

In the interim, the Department of Health continues to function. Licenses are still being processed for remediation contractors, etc. Complaints are being received by the Department of Health concerning health problems associated with exposures to NORM. However, very little is being done about the complaints since the Department of Health has been told they have no jurisdiction over NORM. The attorney for the Department of Health believes that any commercial remediation, etc. will still have to be licensed by the Department.

On August 11, 1995, the Oil and Gas Board issued a proposed **Rule 69: Control of Oil Field NORM**. The rule provides the regulations for the control of oil field NORM to ensure that radiation exposures of workers and members of the general public are negligible. The rule applies to NORM that has been derived from the exploration and production activities of oil and gas operations within Mississippi.

A public hearing on Rule 69 was to have been held in January 1996. This was postponed until March and at the request of attorneys on both sides of the issue, the hearing was again postponed until April 2-4, 1996. The changes made to the August 1995 draft were summarized in the Winter 96 issue of **The NORM Report**.

Rule 69 is being implemented. Oil and gas operators are conducting NORM surveys on all their proper-

ties. Many of the surveys have been turned in and a computer program is being developed to enter survey information to determine which operators have not yet submitted their survey data.

As of May 5, 1997, the Mississippi Department of Health's Part 801 Section N is still in effect. Section N is entitled *Licensing of Naturally Occurring Radioactive Materials (NORM)*.

NEW JERSEY

The Bureau of Environmental Radiation continues to address the comments received on the interested party draft of N.J.A.C. 7:28-12, *Remediation Standards for Radioactive Materials*. Publication of the rule proposal in the New Jersey Register is planned for early 1998.

NEW MEXICO

The New Mexico NORM regulations, *Subpart 14: Naturally Occurring Radioactive Materials (NORM) in the Oil and Gas Industry* became effective August 3, 1995.

Rule 714, Disposal and Transfer of Regulated NORM for Disposal provides the regulatory framework for the disposal options addressed in the Part 14 NORM regulations. Rule 714 became effective July 15, 1996. Rule 714 was summarized in the Summer 96 issue of **The NORM Report**.

New Mexico is currently finalizing a guidance document for use with the NORM regulations.

New Mexico has received the first application for a specific license for NORM decontamination.

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NORTH DAKOTA

North Dakota is currently revising their Radiation Control Regulations. No changes are expected with respect to NORM.

OHIO

Ohio has revised its regulations for the control of radiation including NARM (in the Ohio regulations NARM includes NORM).

These rules, under Chapter 3701-39 of the administrative Code, govern the requirements for licensure for "persons who receive, possess, use, process, transfer, transport, store or commercially distribute NARM or products that contain NARM or are contaminated with NARM...". De minimus levels are provided for exemption from licensure under these rules.

The radiation regulations entitled "Standards for Handling Radioactive Material" are found in the Ohio Administrative Code 3701-39-021.

(A) In accordance with section 3748.21 of the revised code, this rule does not apply to any person to the extent that the person is subject to regulation by the United States Nuclear Regulatory Commission. Except for a facility that is licensed for the disposal of low-level radioactive waste, and except as otherwise provided in paragraphs (B) to (E) of this rule, any facility that handles radioactive material for which a license is required by Chapter 3748 of the Revised Code and this rule shall comply with standards and requirements set forth in 10 C.F.R. parts 19 to 20, parts 30 to 36, parts 39 to 40, part 61, parts 70 to 71, and part 150, as those parts exist on the effective date of this rule, and as if those parts had included naturally occurring or accelerator-produced material. This rule supersedes provisions

of Chapters 3701-38, 3701-39, 3701-40, 3701-70 and 3701-71 of the Administrative Code that were effective prior to September 1, 1995, relating to standards and requirements for the receipt, possession, use, storage, installation, transfer, servicing, and disposal of radioactive material, including the closure, decontamination, decommissioning, reclamation, and long-term surveillance and care of radioactive material. Standards set forth for byproduct material in 10 C.F.R. parts 19 to 20, parts 30 to 36, part 39, part 61, part 71, and part 150 shall apply to NARM. Standards set forth for source material in 10 C.F.R. part 40 shall apply to NARM. 10 C.F.R. part 70 shall not apply to NARM. As used in this rule, "Naturally Occurring Radioactive Material" or "NORM" means any nuclide that is radioactive in its natural physical state; but does not include source material, byproduct material, or special nuclear material. As used in this rule, "Naturally Occurring or Accelerator-Produced Radioactive Material" or "NARM" means naturally occurring or accelerator-produced radioactive material, including naturally occurring material that is technologically enhanced, and those nuclides that are generated in a charged-particle accelerator, but does not include source material, byproduct material, or special nuclear material. As used in this rule, "technologically enhanced" means the chemical properties or physical state of natural sources of radiation have been altered or the potential exposure pathways of natural sources of radiation to humans have been altered to increase the human radiation exposure.

The rules which went into effect June 9, 1997 are summarized below, particularly those parts which include NORM.

(B) Notwithstanding Paragraph (A) of this rule, in addition to the exemptions listed in 10 C.F.R. 30.71, the following activities are exempt from licensure, unless the director determines that the dose received by workers or the public would reach the occupational dose limits set forth in 10 C.F.R. 20.1502:

(1) The handling, distribution, or processing of:

(a) Soil containing technologically enhanced radium-226 or radium-228 with a radon emanation rate less than $7.4E-1$ becquerels per square meter per second (20 picocuries per square meter per second), provided that the concentration of technologically enhanced radium-226 or radium-228 in the soil, averaged over any one hundred square meters, and averaged over the first fifteen centimeters of soil below the surface, does not exceed 1.0 becquerel per gram (27 picocuries per gram);

(b) Soil containing technologically enhanced radium-226 or radium-228 with a radon emanation rate equal to or greater than $7.4E-1$ becquerels per square meter per second (20 picocuries per square meter per second) provided that the concentration of technologically enhanced radium-226 or radium-228 in the soil, averaged over any one hundred square meter, and averaged over the first fifteen centimeters of soil below the surface does not exceed $1.85E-1$ becquerels per gram (5 picocuries per gram);

(c) Media, other than soil, containing technologically enhanced radium-226 or radium-228 with a radon emanation rate less than $7.4E-1$ becquerels per square meter per second (20 picocuries per square meter per second) provided

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OHIO (continued)

that the concentration of technologically enhanced radium-226 or radium-228 does not exceed 1.0 becquerel per gram (27 picocuries per gram);

(d) Media, other than soil, containing technologically enhanced radium-226 or radium-228 with a radon emanation rate equal to or greater than $7.4E-1$ becquerels per square meter per second (20 picocuries per square meter per second) provided that the concentration of technologically enhanced radium-226 or radium-228 does not exceed $1.85E-1$ becquerel per gram (5 picocuries per gram) or less;

(e) Soil containing NARM other than technologically enhanced radium-226 or radium-228 provided that the concentration of NARM averaged over any one hundred square meters, and averaged over the first fifteen centimeters of soil below the surface is 4.995 becquerels per gram (135 picocuries per gram) or less;

(f) Media, other than soil, containing NARM other than technologically enhanced radium-226 or radium-228 provided that the concentration of NARM is 4.995 becquerels per gram (135 picocuries per gram) or less; or

(g) Materials in the recycling process contaminated with scale or residue not otherwise exempted or other equipment containing NARM with a radiation exposure level that does not exceed 0.25 micrograys (25 microrads) per hour above background at any accessible point.

(2) The manufacture, wholesale or retail commercial distribution, use, or disposal of the following products or materials, or the recycling of equipment used to produce, contain, or transport the following:

(a) Potassium or potassium compounds that have not been isotopically enriched in the radionuclide potassium-40;

(b) Fossil fuel or byproducts from fossil fuel combustion, including bottom ash, fly ash, and flue-gas emission control byproducts; or

(c) Material used for building construction, industrial processing, sandblasting, metal casings, or other NARM in which the radionuclide content has not been concentrated to a level higher than is found in its natural state, or zirconium-bearing sands and products produced from those sands provided that the radioactive constituent is consistent with the radioactive levels stated in the material safety data sheet accompanying the zirconium-bearing materials,

(3) The wholesale and retail commercial distribution, including custom blending, possession, and use of the following products or materials or the recycling of equipment or containers used to produce, contain, or transport these products as follows:

(a) Phosphate or potash fertilizer;

(b) Phosphogypsum for agricultural uses if such commercial distribution and uses meet the requirements of 40 C.F.R. 61.204; or

(C) Materials used for building construction if the materials contain NARM that has not been concentrated to higher levels than found in its natural state.

The exemptions contained in this paragraph do not apply to the manufacture of phosphate or potash fertilizer.

(4) The possession, storage, use, transportation, or commercial dis-

tribution of natural gas and natural gas products or of crude oil and crude oil products containing NARM. The exemptions contained in this paragraph do not apply to the processing of natural gas or crude oil or the manufacture of natural gas products or crude oil products containing NARM.

(5) Possession of produced waters from crude oil or natural gas production provided that the produced waters are reinjected in a well approved by the United States Environmental Protection Agency or discharged under the authority of the United States Environmental Protection Agency.

(6) The possession, storage, use, transportation or commercial distribution of compressed gases or compressed gas products containing NARM.

OKLAHOMA

The Radiation Management Advisory Council met June 5, 1997 but there were only minor discussions concerning NORM. The NORM draft will be discussed at the September meeting of the Council.

OREGON

There are no new developments regarding NORM in Oregon. Ray Paris, Manager of Radiation Protection Services in the Oregon Department of Human Resources is also the Chairman of CRCPD's NORM Commission. Oregon is "waiting" for the CRCPD NORM Commission to complete its work before revising or writing new NORM rules for the state.

Oregon does have NORM regulations entitled *Regulation and Licensing of Naturally Occurring Radioactive Materials (NORM)*.

The rules which became effective

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OREGON (continued)

in January 1990 are found in the Oregon Administration Rules, Chapter 333, Division 117 - Health Division. The Oregon NORM rules were summarized in the Winter 96 issue of **The NORM Report**.

SOUTH CAROLINA

Part IX-Licensing of Naturally Occurring Radioactive Material (NORM) became effective June 30, 1995 in South Carolina. There have been no changes in the regulation and none are proposed at the present time. Part IX was summarized in the Summer 95 issue of **The NORM Report**.

TEXAS

The Texas Department of Health has jurisdiction for NORM except for the disposal of NORM. The Railroad Commission has jurisdiction for the disposal of oil and gas industry NORM wastes, while the Texas Natural Resource Conservation Commission has responsibility for the disposal of NORM wastes not associated with oil and gas exploration and production.

The Department of Health is still planning to make some modifications to their NORM rules. The changes will primarily be in classifications of NORM and adding some requirements for processing of NORM from other persons. The Department is waiting for the new CRCPD Part N draft before proposing changes. The revisions will be coordinated with the Railroad Commission, particularly where they concern jurisdictional issues.

The Texas Railroad Commission's *Statewide Rule 94: Disposal of Oil and Gas NORM Wastes* took effect February 1, 1995. This rule sets

forth requirements for the safe disposal of NORM that constitutes, is contained in, or has contaminated oil and gas wastes. Rule 94 was summarized in the Winter 95 issue of **The NORM Report**. There are no plans at present to revise Rule 94.

The Texas Department of Health is Cooperating with the Railroad Commission in setting up training for radiation surveyors.

The Texas Natural Resource Commission has not started drafting rules for the disposal of NORM wastes not associated with oil and gas exploration and production. Although there is no firm schedule yet, the drafting of specific NORM disposal rules could begin later in 1997.

UTAH

NORM is considered to be included in Utah's comprehensive radiation control regulations. No specific NORM regulations have been proposed at the present time in Utah.

There is a proposal for a new NORM and low-level waste disposal facility. Laidlaw Environmental currently has a hazardous waste facility ten miles north of Envirocare's NORM site and wants to convert one of their industrial waste cells to a low-level NORM cell. Laidlaw must submit a siting criteria document, get local approval, go through the licensing process and get the governor's and legislative approval. Laidlaw is currently on step one.

Envirocare is still under investigation. Semnani, the president and owner of Envirocare resigned from the company for a period of at least three years and also resigned from the Utah Radiation Council. Envirocare remains in operation.

WASHINGTON

The Department of Health and Ecology have reviewed the environmental checklists and supporting information for three upcoming actions related to US Ecology's commercial low-level radioactive waste disposal facility located near Richland, Washington.

The three actions are: renewal of the facility operating license, approval of a closure plan, and a rule making establishing an annual disposal limit for naturally occurring and accelerator produced radioactive materials (NARM). In making the determination of significance, the two agencies have found that among the proposed actions, there are several probable direct or indirect impacts to elements of the environment such as air quality, soils, groundwater, and habitat. When considered together, these impacts may be significant. Therefore, an Environmental Impact Statement (EIS) must be prepared before any of the actions may be taken.

The EIS process is continuing. Notices are being sent out informing interested parties the extent of the EIS process. A Draft and Final EIS will be prepared, a process expected to take one to two years to complete. While the EIS is in preparation, US Ecology may continue to operate under the timely renewal provisions of its license.

US Ecology has always met state regulations. The Environmental Impact Statement will evaluate the effects of the three actions to show that the site will be safe for at least 1,000 years.

WISCONSIN

Wisconsin has no specific regulations for the control of NORM, except those imposed by the

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WISCONSIN (continued)

Department of Natural Resources for the disposal of materials containing radium-226. The state does have general regulations for the control of radiation.

Wisconsin is drafting an enforcement standard for radioactive contaminants in ground water with the primary isotope being radium-228. The main purpose is to establish a ground water enforcement standard for use in monitoring, controlling, and if necessary, limiting human exposure to radioactive materials introduced into ground water by regulated human activities.

The rule making is proceeding with the next step a public hearing which should be held this summer or early fall.

FEDERAL ACTIONS**ENVIRONMENTAL PROTECTION AGENCY (EPA)**

The EPA has a contract with S. Cohen and Associates to revise the draft report *Diffuse NORM Wastes - Waste Characterization and Preliminary Risk Assessment* issued in April 1993. The report was reviewed by EPA's Science Advisory Committee (RAC). The RAC issued their report *A SAB Report: Review of Diffuse NORM Draft Scoping Document. Review of the Office of Radiation and Indoor Air Draft Document on Diffuse Naturally Occurring Radioactive Material (NORM): Waste Characterization and Preliminary Risk Assessment* in May 1994. The final draft of the EPA report will respond to the comments detailed in the RAC report.

The S. Cohen and Associates draft will be limited to the characteriza-

tion of NORM wastes, postponing the risk assessment section. It is expected the waste characterization section will be completed by the end of the year.

A contract has been issued to the National Academy of Science for a study of the scientific basis for EPA recommendations on NORM. The study was mandated in the last session of Congress. The NAS study will begin this summer and be completed in 1998.

When the NAS study is complete, the EPA will decide on further risk assessment studies and the completion of the EPA diffuse NORM document.

EPA is participating with the NRC, the Department of Energy, and the Department of Defense in looking at NORM in sewage sludge in publicly owned treatment facilities, including the disposal of the sludge.

EPA is currently working on a draft rule for low-level waste disposal. The draft is directed primarily at Department of Energy contaminated sites.

NUCLEAR REGULATORY COMMISSION (NRC)**The NRC "Decommissioning Rule"**

After issuing a proposed rule on this subject in 1994, the NRC has approved an amendment to its regulations which would establish maximum permissible radiation levels when a nuclear facility permanently shuts down, is released for other uses, or if the license is terminated. Commonly known as the "Decommissioning Rule," this rule has attracted lots of attention at both the federal agencies as well as Congress recently.

In NRC Commission correspondence issued by Chairman Jackson on 21 May 1997 to interested members of Congress on this subject, the following redacted portions below highlight the reasons why the Commission voted for the rule despite the noted differences between the EPA and NRC proposed standards.

"I am writing in response to your letter . . . in which you expressed concern over differences between the Nuclear Regulatory Commission (NRC) and the Environmental Protection Agency (EPA) regarding the content of the Commission's draft final rule for cleanup of groundwater and soil at decommissioned sites.

"Differences between the two agency staffs have focused primarily on two specific elements of the NRC's draft final rule addressing radiological criteria for license termination: (1) the selection of an appropriate all-pathways dose standard to be met before a license could be terminated and (2) the desirability of a separate standard for the groundwater pathway as a supplement to the all-pathway dose standard.

"NRC proposed the 25 mrem/yr, all-pathways criterion in the draft final rule after careful consideration of stakeholder comments and considers it to be adequately protective of public health and safety. It must be remembered from the outset that this criterion is not a radiation protection standard for members of the public. That standard is 100 mrem/yr and was previously defined through an NRC rule making (10 CFR Part 20). The 25 mrem/yr, all-pathways criterion is a value intended to insure that no individual member of the public could receive an annual dose

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