Title 15 - Mississippi Department of Health

Part III – Office of Health Protection

Subpart 78 – Division of Radiological Health

CHAPTER 01 REGULATIONS FOR CONTROL OF RADIATION IN MISSISSIPPI

1100 **Licensing of Naturally Occurring Radioactive Materials (Norm**)

1100.01 Purpose. This section establishes radiation protection standards for the possession, use, transfer, transport, storage and disposal of naturally occurring radioactive materials, NORM, not subject to regulation under the Atomic Energy Act of 1954, as amended.

1100.02 Scope. These regulations apply to any person who engages in the extraction, mining, beneficiating, processing, use, transfer, transport, storage, waste generation or disposal of NORM in such a manner as to alter the chemical properties or physical state of the NORM or its potential exposure pathways to humans.

The regulations in this section address the introduction of NORM into materials or products in which neither the NORM nor the radiation emitted from the NORM is considered to be beneficial to the materials or products. The manufacture and distribution of materials or products containing NORM in which the NORM and/or its associated radiation(s) is considered to be a beneficial attribute are licensed under the provisions of Section 300.

These regulations also apply to sludges and scale deposits in tubulars and equipment and to soil or water contaminated by the cleaning of scale deposits. These regulations include the contamination of soil from produced waters.

This section also addresses waste generation, waste management, transfer, and disposal with regard to both inactive and active sites and facilities involved in storage and/or cleaning of tubulars and contaminated equipment. In the case of closed or inactive pits, surveys are required only at the time of transfer for unrestricted use.

1100.03 Definitions. As used in this section, the following definitions apply:

"Beneficial attribute" or "beneficial to the product" means the radioactivity of the product is necessary to the use of the product.

"Beneficiating" means the processing of materials for the purpose of altering the chemical or physical properties to improve the quality, purity or assay grade.

"Decontamination" means the removal of NORM contaminants from surfaces or equipment to reduce levels of radiation.

"Decontamination facility" means a facility that provides services to reduce levels of NORM contamination.

"Equipment" means tubulars, wellheads, separators, condensers, or any other related apparatus associated with the potential enhancement of NORM.

"Facility" means all contiguous land and structures, other appurtenances, and improvements on land or water that contain NORM.

"Fluid" means any material or substance which flows or moves, whether in a semi-solid, liquid, sludge, gas, or any other form or state.

"Naturally occurring radioactive material (NORM)" means any nuclide which is radioactive in its natural physical state (i.e., not man-made), but does not include byproduct, source or special nuclear material.

"Product" means something produced, made, manufactured, refined, or beneficiated.

"Storage" means the containment of NORM waste in such a manner as not to constitute disposal of NORM waste.

"Technologically enhanced" means natural sources of radiation which would not normally appear without some technological activity not expressly designed to produce radiation.

1100.04 Exemptions.

1. Persons who receive, possess, use, process, transfer, transport, store, distribute, and dispose of NORM are exempt from the requirements of these regulations if:

   a. The materials contain, or are contaminated at, concentrations less than 5 picocuries per gram of radium - 226 or radium - 228 above background; or, concentrations less than 30 picocuries per gram (1.11 kBq/kg) of technologically enhanced radium-226 or radium-228, averaged over any 100 square meters, provided the radon emanation rate does not exceed 20 picocuries (740 mBq) per square meter per second, or 150 picocuries per gram (5.55 kBq/kg) of any other NORM radionuclide, provided that these concentrations are not exceeded at any time; or

   b. Equipment does not exceed 25 microroentgens per hour above background radiation at any accessible point.

2. Persons who receive products or materials containing NORM distributed in accordance with a specific license issued by the Agency pursuant to 1100.15(1) or an equivalent license issued by another Licensing State are exempt from these regulations.

3. The manufacturing, distribution, use, transportation, and disposal of potassium and potassium compounds which have not been isotopically enriched in the radionuclide K-40 are exempt from the requirements of these regulations.

4. The wholesale and retail distribution (including custom blending), possession, and use of the following products or materials are exempt from the requirements of these regulations;

   a. Phosphate and potash fertilizer; and

   b. Phosphogypsum for agricultural uses provided such commercial distribution and uses meet the requirements of 40 CFR 61.204.

5. The possession, use, and transportation of natural gas, and natural gas products, and crude oil, and crude oil products as a fuel are exempt from the requirements of these regulations. The manufacturing and distribution of natural gas and crude oil and natural gas and crude oil products are exempt from the specific license requirements of this section but are subject to the general license requirements in Sections 1100.10, 1100.11, and 1100.12.

6. Produced waters from crude oil and natural gas production are exempt from the requirements of these regulations if the produced waters are reinjected in a well approved by the Mississippi State Oil and Gas Board and Mississippi Department of Environmental Quality and as a Class II Injection and Disposal well.

1100.05 Reserved.

1100.06 Radiation Survey Instruments.

1. Radiation survey instruments used to determine exposure rates pursuant to this section shall be capable of measuring 1 microroentgen per hour through at least 500 microroentgens per hour.

2. Radiation survey instruments used to make surveys required by this section shall be calibrated and operable.

3. Each radiation survey instrument shall be calibrated:

   a. by person licensed by the Agency, another Agreement State, or the U. S. Nuclear Regulatory Commission to perform such service;

b. at energies and radiation levels appropriate for the licensee's use;

c. at intervals not to exceed six months and after each instrument servicing other than battery replacement; and

d. to demonstrate an accuracy within plus or minus 20 percent of the true radiation level on each scale.

4. Records of these calibrations shall be maintained for 3 years after the calibration date for inspection by the Agency.

1100.07 Reserved.

1100.08 Reserved.

1100.09 Reserved.

General Licenses

1100.10 General Licenses.

1. A general license is hereby issued to mine, extract, receive, possess, own, use, process, and transfer NORM not exempted in 1100.04 without regard to quantity. This general license does not authorize the manufacturing or distribution of products containing NORM in concentrations greater than those specified in 1100.04(1) nor the disposal of wastes from other persons.

2. Facilities and equipment contaminated with NORM in excess of the levels set forth in Appendix A of this section shall not be released for unrestricted use. The decontamination of equipment, facilities and land shall be performed only by persons specifically licensed by the Agency or another Licensing State to conduct such work. Each general licensee shall establish and submit to this Agency written procedures for performing on-site maintenance on contaminated equipment, components and facilities and for surveying (or screening) equipment, components and facilities prior to release for unrestricted use to ensure that the levels in Appendix A of this section are not exceeded.

3. person shall transfer land for unrestricted use contaminated with technologically enhanced radium-226 or radium-228, averaged over any 100 square meters, in which the radon emanation rate is less than 20 picocuries (740 mBq) per square meter per second and in which the concentrations of technologically enhanced radium-226 or radium-228 are in excess of 30 picocuries per gram (1.11 kBq/kg), averaged over a maximum depth of 15 cm of soil below the surface. No person shall transfer land contaminated with technologically enhanced radium-226 or radium-228, averaged over any 100 square meters, in which the radon

emanation rate is 20 picocuries (740 mBq) per square meter per second or more and in which concentrations of technologically enhanced radium-226 or radium-228 are in excess of:

i. 5 pCi/g (185 Bq/kg), averaged over the first 15 cm of soil below the surface; and

ii. 15 pCi/g (555 Bq/kg), averaged over 15 cm thick layers of soil more than 15 cm below the surface.

4. Equipment contaminated with NORM in excess of the levels set forth in Appendix A of this section may be released for maintenance and/or overhaul provided the recipient is specifically licensed to perform the activity on contaminated equipment.

5. The decontamination of equipment and facilities, as described in 1100.13(2), shall only be performed by persons specifically licensed by the Agency or another Licensing State to conduct such work.

6. The transfer of NORM not exempt from these regulations from one general licensee to another general licensee shall be authorized by the Agency if:

i. The equipment and facilities contaminated with NORM are to be used by the recipient for the same purpose or at the same site;

ii. The transfer of control or ownership of land contaminated with NORM includes an annotation of the deed records to indicate the presence of NORM; or

iii. The materials being transferred are ores or raw materials for processing or refinement.

7. Transfers made under 1100.10(6)(i) do not relieve the general licensee who makes the transfer from the responsibilities of assessing the extent of NORM contamination or material present, evaluating the hazards of the NORM, informing the general licensee receiving the NORM of these assessments and evaluations, and maintaining records required by these regulations prior to and up to the time of documented transfers.

1100.11 Protection of Workers and the General Population. Each person subject to the general license in Section 1100.10 or a specific license shall conduct operations in compliance with the standards for radiation protection set out in Sections 400 and 1000, except for disposal, which shall be governed by Section 1100.12.

1100.12 Disposal and Transfer of Waste for Disposal.

1. Each person subject to the general license in Section 1100.10 or a specific license shall manage and dispose of wastes containing NORM:

   a. in accordance with the applicable requirements of the U.S. Environmental Protection Agency for disposal of such wastes;

   b. in a manner equivalent to the requirements for uranium and thorium byproduct materials in 40 CFR 192;

   c. by transfer of the wastes for disposal to a land disposal facility licensed by the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State; or

   d. in accordance with alternate methods authorized by the Agency upon application or upon the Agency's initiative.

2. Records of disposal, including manifests, shall be maintained pursuant to the provisions of Section 400 of these regulations.

3. Transfers of waste containing NORM for disposal shall be made only to a person specifically authorized to receive such waste.

Specific Licenses

1100.13 Specific Licenses.

1. Unless otherwise exempted under the provisions of Section 1100.04 or licensed under the provisions of Section C of the regulations, the manufacturing and distribution of any material or product containing NORM shall be specifically licensed pursuant to the requirements of this section or pursuant to equivalent regulations of another Licensing State.

2. Persons conducting the following activities involving equipment or facilities contaminated with NORM in excess of the levels set forth in Appendix A of this section and land contaminated with radium-226 or radium-228 in excess of the limits set forth in 1100.10(3) shall be specifically licensed pursuant to the requirements of this section:

   a. Decontamination of equipment, facilities, and land; or

   b. Disposal of the resulting waste.

1100.14 Filing Application for Specific Licenses. Applications for specific licenses shall be filed in accordance with 300.08 of these regulations.

1100.15 Requirements for the Issuance of Specific Licenses.

1. In addition to the requirements set forth in Section 300.09, and application for a specific license to decontaminate equipment, land, or facilities contaminated with NORM in excess of the levels set forth in 1100.04(1), 1100.10(3), or Appendix A of this section, as applicable and to dispose of the resulting waste will be approved if:

    a. The applicant has adequately addressed the following items in the application:

        i. Procedures and equipment for protection of workers;

        ii. An evaluation of the radiation levels and concentrations of contamination expected during normal operations;

        iii. Operating and emergency procedures, including procedures for waste reduction and quality assurance of items released for unrestricted use; and

        iv. Method of disposing of the NORM removed from contaminated equipment, facilities, and/or land.

2. An application for a specific license to manufacture and/or initially transfer products or materials containing NORM to persons exempted from these regulations pursuant to 1100.04(2), will be approved if:

    a. The NORM is not contained in any food, beverage, cosmetic, drug, or other commodity designed for ingestion or inhalation by, or application to, a human being; and

    b. The applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control procedures, labeling or marking, and conditions of handling, storage, use, and disposal of the NORM material or product to demonstrate that the material or product will meet the safety criteria set forth in 1100.16. The information shall include:

        i. A description of the material or product and its intended use or uses;

        ii. The type, quantity, and concentration of NORM in each material or product;

        iii. The chemical and physical form of the NORM in the material or product, and changes in chemical and physical form that may occur during the useful life of the material or product;

iv. An analysis of the solubility in water and body fluids of the NORM in the material or product;

v. The details of manufacture and design of the material or product relating to containment and shielding of the NORM and other safety features under normal and severe conditions of handling, storage, use, reuse, and disposal of the material or product;

vi. The degree of access of human beings to the material or product during normal handling, use, and disposal;

vii. The total quantity of NORM expected to be distributed annually in the material or product;

viii. The expected useful life of the material or product;

ix. The proposed method of labeling or marking each unit of the material or product with identification of the manufacturer and/or initial transferor of the product and the radionuclide(s) and quantity of NORM in the material or product;

x. The procedures for prototype testing of the material or product to demonstrate the effectiveness of the containment, shielding, and other safety features under both normal and severe conditions of handling, storage, use, reuse, and disposal;

xi. The results of the prototype testing of the material or product, including any change in the form of the NORM contained in it, the extent to which the NORM may be released to the environment, any change in radiation levels, and any other changes in safety features;

xii. The estimated external radiation doses and dose commitments relevant to the safety criteria in 1100.16 and the basis for such estimates;

xiii. A determination that the probabilities with respect to doses referred to 1100.16 meet the safety criteria;

xiv. The quality control procedures to be followed in the production of production lots of the material or product, and the quality control standards the material or product will be required to meet; and

xv. Any additional information, including experimental studies and tests, required by the Agency to facilitate a determination of the radiation safety of the material or product.

3. Notwithstanding the provisions of 1100.16(2), the Agency may deny an application for a specific license if the end uses of the product are frivolous or cannot be reasonably foreseen.

1100.16 Safety Criteria. An applicant for a license under 1100.15(2) shall demonstrate that the product is designed and will be manufactured so that:

1. In normal use and disposal, it is unlikely that the external radiation dose in any one year, or the dose commitment resulting from the intake of NORM, excluding radon and radon decay products, in any one year, to a suitable sample of the group of individuals expected to be most highly exposed to radiation or NORM from the material or product, will exceed the doses in Column I of 1100.17

2. In normal handling and storage of the quantities of the material or product likely to accumulate in one location during marketing, distribution, installation, and servicing of the material or product, it is unlikely that the external radiation dose in any one year, or the dose commitment resulting from the intake of NORM, excluding radon, in any one year, to a suitable sample of the group of individuals expected to be most highly exposed to radiation or NORM from the material or product, will exceed the doses in Column II of 1100.17

3. In normal use, disposal, handling, and storage, it is unlikely that the radon released from the material or product will result in an increase in the average concentration in air of more than 0.4 picocurie per liter (14.8 Bq/m3).

4. It is unlikely that there will be a significant reduction in the effectiveness of the containment, shielding, or other safety features of the material or product from wear and abuse likely to occur in normal handling and use of the material or product during its useful life.

1100.17 Table of Organ Doses.

	Column I*	Column II*
Part of Body	Dose in Rem	Dose in Rem
Whole body; head and trunk; active blood-forming organs; gonads; or lens of eye	0.005 (0.05 mSv)	0.5 (5 mSv)
Hands and forearms; feet and ankles; localized areas of skin averaged over areas no larger than 1 square centimeter	0.075 (0.75 mSv)	7.5 (75 mSv)

Other organs	0.015 (0.15 mSv)	1.5 (15 mSv)

*Dose limit is the dose above background from the product.

1100.18 Issuance of Specific Licenses. The Agency will issue a specific license in accordance with 300.14 of these regulations.

1100.19 Conditions of Licenses Issued Under Section 1100.15.

1. Each license issued pursuant to this section shall be subject to all the requirements set forth in Section 300.15.

2. Each person licensed by the Agency pursuant to this section is subject to the general license provisions of 1100.11.

3. In addition to the requirements set forth in Section 300.15 each person listed under 1100.15(2) shall:

   a. Carry out adequate control procedures in the manufacture of the material or product to assure that each production lot meets the quality control standards approved by the Agency;

   b. Label or mark each unit to identify the manufacturer, processor, producer, or initial transferor of the material or product and the NORM in the material or product; and

   c. Maintain records identifying, by name and address, each person to whom NORM is transferred for use under 1100.04(2) or the equivalent regulations of another Licensing State, and stating the kinds, quantities and uses of NORM transferred. An annual summary report stating the total quantity of each radionuclide transferred under the specific license shall be filed with the Agency. Each report shall cover the year ending December 31, and shall be filed within 30 days thereafter. If no transfers of NORM have been made pursuant to 1100.15(2) during the reporting period, the report shall so indicate.

1100.20 Expiration and Termination of Licenses. Each licensee shall comply with the provisions in 300.16 of these regulations.

1100.21 Renewal of License. Applications for renewal of specific licenses shall be filed in accordance with 300.17 of these regulations.

1100.22 Amendment of Licenses at Request of Licensee. Applications for amendment of a license shall be filed in accordance with 300.18 of these regulations.

1100.23 Agency Action on Application to Renew and Amend. In considering an application by a licensee to renew or amend the license, the Agency will apply the criteria set forth in 300.19 of these regulations.

1100.24 Modification and Revocation of Licenses. The terms and conditions of all licenses shall be subject 300.25 of these regulations.

1100.25 Reciprocal Recognition of Licenses. The out-of-state licensee shall comply with the provisions of 300.26 of these regulations.

Subpart 78

Section 1100

APPENDIX A

Acceptable Surface Contamination Levels For Norm

RADIONUCLIDE[a]	AVERAGE[bcf]	MAXIMUM[bdfg]	REMOVABLE[bcef]
U-nat, U-235, U-238, and associated products (including Po-210), except Ra-226, Th-230, Ac-227, and Pa-231	5,000 dpm alpha/100 cm^2	15,000 dpm alpha/100 cm^2	1,000 dpm alpha/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230 Th-228, Pa-231, Ac-227	100 dpm/ 100 cm^2	300 dpm/ 100 cm^2	20 pm/ 100 cm^2
Th-nat, Th-232, Ra-223, Ra-224, U-232	1,000 dpm/ 100 cm^2	3,000 dpm/ 100 cm^2	200 dpm/ 100 cm^2
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission, including Pb-210), except others noted above.	5,000 dpm beta, gamma/100 cm^2	15,000 dpm beta, gamma/100 cm^2	1,000 dpm beta, gamma/100 cm^2

(a) Where surface contamination by both alpha and beta-gamma emitting radionuclides exists, the limits established for alpha and beta-gamma emitting radionuclides should apply independently.

(b) As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

(c) Measurements of average contamination levels should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each object.

(d) The maximum contamination level applies to an area of not more than 100 cm2.

(e) The amount of removable radioactive material per 100 cm2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

(f) The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr (2 μGy/hr) at 1 cm and 1.0 mrad/hr (10 μGy/hr) at 1 cm respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

(g) Equipment containing NORM shall not exceed a maximum radiation exposure level of 25 microroentgens per hour above background radiation at any accessible point.

CERTIFICATION OF REGULATION

This is to certify that the above **PUT REGULATION NAME HERE** was adopted by the Mississippi State Board of Health on Put Date Here to become effective Put Date Here .

Brian W. Amy, MD, MHA, MPH
Secretary and Executive Officer