TITLE 32: ENERGY
CHAPTER II: ILLINOIS EMERGENCY MANAGEMENT AGENCY
SUBCHAPTER d: LOW LEVEL RADIOACTIVE WASTE/TRANSPORTATION

PART 622
HANDLING AND DISPOSAL OF WATER TREATMENT RESIDUALS

Section

AUTHORITY: Implementing and authorized by Sections 10, 11, and 12 of the Radiation Protection Act of 1990 [420 ILCS 40].

SOURCE: Adopted at 48 Ill. Reg. 8966, effective June 12, 2024.

Section 622.10 Purpose and Scope

This Part establishes requirements for the possession and disposal of water treatment residuals including requirements for worker protection and training. This Part applies to all entities that produce or possess water treatment residuals.

Section 622.20 Definitions

The following terms found in this Part have the definitions set forth in this Section:

"Agency" means the Illinois Emergency Management Agency and Office of Homeland Security.

"As low as is reasonably achievable" or "ALARA" means making every reasonable effort to maintain exposures to radiation as far below the dose limits of Sections 622.30 and 622.40 as is practical, consistent with the purpose for which

the registered activity is undertaken, taking into account the state of technology and the economics of improvements in relation to the state of technology, the economics of improvements in relation to benefits to public health and safety and other societal and socioeconomic considerations, and to the use of nuclear energy and licensed or registered sources of radiation in the public interest.

"Combined Radium" means the sum of the results of the analysis for radium-226 and the analysis for radium-228.

"Curie" or "Ci" is as defined in 32 Ill. Adm. Code 310.20.

"Dry weight basis" is as defined in 32 Ill. Adm. Code 310.20.

"Groundwater" means underground water which occurs within the saturated zone and geologic materials where the fluid pressure in the pore space is equal to or greater than atmospheric pressure. [415 ILCS 5/3.210]

"IEPA" means the Illinois Environmental Protection Agency.

"Low-level radioactive waste" means the definition contained in Section 3 of the Low Level Radioactive Waste Management Act [420 ILCS 20].

"Naturally occurring radioactive material" or "NORM" means materials that are undisturbed as a result of human activities and that contain any of the primordial radionuclides or radioactive elements as they occur in nature, such as radium, uranium, thorium, potassium, and their radioactive decay products. NORM does not include accelerator-produced, byproduct, source, or special nuclear material.

"Occupied" means any frequently occupied areas, including but not limited to offices, conference rooms, and breakrooms, as well as restricted areas when entered by workers. "Occupied" does not include infrequently used areas such as storage rooms, stairwells, restrooms, utility closets, elevator shafts, or hallways unless posted as a restricted area.

"Picocurie" or "pCi" means the quantity of radioactive material producing 2.22 nuclear transformations per minute.

"Person" means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this State, any other State or political subdivision or agency thereof, and any legal successor, representative, agent, or agency of the foregoing, other than the United States Nuclear Regulatory Commission, or any successor thereto, and

other than federal government agencies licensed by the United States Nuclear Regulatory Commission, or any successor thereto. "Person" also includes a federal entity (and its contractors) if the federal entity agrees to be regulated by the State or as otherwise allowed under federal law. [420 ILCS 40/4(e)]

"Publicly regulated treatment works" means private companies that the Illinois Commerce Commission regulates as public utilities engaged in the disposal of domestic and industrial wastes.

"Publicly owned treatment works" or "POTW" is as defined in Subpart A of 35 Ill. Adm. Code 310.

"Registrant" means persons who, due to the nature of the water treatment residuals they produce or possess, have additional regulatory requirements under this Part.

"Rem" means the special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rem is equal to the absorbed dose in rad multiplied by the quality factor (1 rem = 0.01 Sv).

"Sludge" means any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effects. [415 ILCS 5/3.465]

"Technologically enhanced naturally occurring radioactive material" or "TENORM" means naturally occurring radioactive material whose radionuclide concentrations are increased by or as a result of past or present human practices. TENORM does not include background radiation or the natural radioactivity of rocks or soils. TENORM does not include "source material" and "by-product material" as both are defined in the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.), as amended, and relevant regulations implemented by the NRC.

"Total effective dose equivalent" or "TEDE" means the sum of the deep dose equivalent for external exposures and the committed effective dose equivalent for internal exposures.

"Treatment" means, for purposes of water treatment residuals only, any process that changes the physical, chemical, microbiological, or radiological properties of water, is under the control of the supplier, and is not a point-of-use treatment device or a point-of-entry treatment device as defined in 35 Ill. Adm. Code 611.101. Treatment includes, but is not limited to, aeration, coagulation,

sedimentation, filtration, activated carbon treatment, disinfection, and fluoridation.

"USEPA" means the United States Environmental Protection Agency.

"Wastewater" means sewage, industrial waste, or other waste, or any combination of these, whether treated or untreated, plus any admixed land runoff.

"Wastewater treatment facility" means a treatment works owned by a municipality, sanitary district, county, or State agency that treats domestic and industrial wastes collected by a publicly owned or regulated sewer system. For the purposes of this Part, "wastewater treatment facility" encompasses both publicly owned treatment works and publicly regulated treatment works.

"Water treatment facility" means a plant or facility whose primary function is to treat raw water and to produce potable water for distribution, together with all the other real and personal property reasonably necessary to collect, treat, or distribute the water.

"Water treatment residuals" or "WRS" means biosolids, sludge, filter media, anthracite, scales, or other solids, either alone or as a component of liquid mixtures or solutions, that are technologically enhanced in combined radium concentration (radium-226, radium-228 or associated progeny) as a result of the treatment of water or sewage containing naturally occurring radium from groundwater.

"Working level" or "WL" means any combination of short-lived radon daughters in 1 liter of air that will result in the ultimate emission of 1.3 x 105 MeV of potential alpha particle energy. The short-lived radon daughters are for:

radon-222: polonium-218, lead-214, bismuth-214 and polonium-214; and

radon-220: polonium-216, lead-212, bismuth-212 and polonium-212.

"Working level month" or "WLM" means an exposure to 1 working level (WL) for 170 hours. (2,000 working hours per year divided by 12 months per year is approximately equal to 170 hours per month.)

Section 622.30 Persons in Possession of Water Treatment Residuals

a) The following persons shall register with the Agency within 60 days of producing or possessing water treatment residuals:

1) Water treatment facilities permitted by the IEPA that treat groundwater with a treatment technology identified in subsections (a)(2)(B).

AGENCY NOTE: Persons who possess groundwater wells only as an emergency or backup source (i.e., a primary source of purchased or surface water) do not meet the registration requirements in subsection (a)(1) or (a)(2).

2) Water treatment facilities permitted by IEPA whose groundwater sources and utilized treatment technologies are identified in subsections (a)(2)(A) and (B):

A) Table 1. Aquifers designated to contribute elevated concentrations of radium to groundwater:

i) Cambrian

ii) Ordovician

iii) Devonian

iv) Silurian

v) Any other aquifer that gives rise to a maximum contaminant level for combined radium as specified in 35 Ill. Adm. Code 611.330.

B) Table 2. Treatment Technologies Capable of Concentrating Radium:

i) Ion exchange

ii) Reverse osmosis

iii) Lime softening

iv) Green sand filtration

v) Co-precipitation with Barium sulfate

vi) Electrodialysis/electrodialysis reversal

vii) Pre-formed hydrous manganese oxide filtration

viii) Activated alumina

ix) Enhanced coagulation filtration

x) Any other treatment technology that increases the combined radium concentration in the media or resulting water treatment residuals beyond that which is naturally present.

3) Wastewater treatment facilities permitted by IEPA and receiving treatment process backwash from a water treatment facility described in subsection (a)(2).

4) IEPA-permitted municipal solid waste landfills if the water treatment residuals generated by a registrant identified in subsections (a)(1), (a)(2), or (a)(3) are disposed of in those landfills;

5) Land applicators permitted by IEPA who apply water treatment residuals generated by a registrant identified in subsections (a)(2) or (a)(3); and

6) Any other person that the Agency determines is required to register.

b) Registrants in compliance with Section 622.30 who elect to dispose of water treatment residuals at a licensed low-level radioactive waste disposal facility will be exempted by the addition of Section 622.30(m).

c) Registrants may dispose or repurpose water treatment residuals under the provisions of this subsection (c) and the requirements of Title 35 of the Illinois Administrative Code, Subtitles C and G, as implemented by IEPA:

1) If the concentration of combined radium in the water treatment residuals is greater than 3.1 pCi/g and less than or equal to 100 pCi/g (dry weight basis), water treatment residuals may be:

AGENCY NOTE: Water treatment residuals with a combined radium concentration less than or equal to 3.1 pCi/g (dry weight basis) are not subject to the disposal requirements in this Section. However, registrants must maintain records of the combined radium concentration and the location where the material was disposed of.

A) Disposed at a facility authorized to receive such material under any federal or State solid or hazardous waste laws provided:

i) Combined radium concentration in pCi/g (dry weight basis) has been determined by a laboratory meeting the accreditation requirements in subsection (e)(1) with methods approved by the USEPA in Title 40 of the Code of Federal Regulations or by a screening method approved by the Agency in accordance with subsections (c)(1)(A)(ii);

ii) A registrant may apply to the Agency for approval to use a screening method instead of laboratory analysis to determine the combined radium concentration of water treatment residuals. Each application shall include: a description of the water treatment residuals being screened, including the physical and chemical properties of the material; a description of the proposed screening method including instruments or equipment to be used, calculations performed, and procedures for how a representative combined radium concentration can be obtained; and analyses and procedures to ensure that doses are maintained ALARA and within the dose limits in this Section;

iii) Water treatment residuals transported in compliance with the Illinois Vehicle Code [625 ILCS 5/15-109];

iv) Water treatment residuals that are easily dispersible are packaged or stabilized to prevent dispersion during transportation and/or landfill placement;

v) There is at least 10 feet of non-contaminated overburden between the water treatment residuals and grade level (at the time of landfill closure); and

B) Used for soil conditioning purposes on agricultural cropland (e.g., corn, soybeans) provided:

i) Land application is performed in accordance with and under the authorization of a current IEPA land application permit;

ii) Water treatment residuals are transported in compliance with the Illinois Vehicle Code [625 ILCS 5/15-109] covered during transportation;

iii) The combined radium concentration of the water treatment residuals (in pCi/g, dry weight basis) has been determined by a laboratory meeting the accreditation standards in subsection (e)(1) with methods approved by the USEPA in Title 40 of the Code of Federal Regulations or by a screening method approved by the Agency in accordance with subsection (c)(1)(B)(iv);

iv) A registrant may apply to the Agency for approval to use a screening method instead of laboratory analysis to determine the combined radium concentration of water treatment residuals. Each application shall include: a description of the water treatment residuals being screened, including the physical and chemical properties of the material; a description of the proposed screening method including instruments or equipment to be used, calculations performed, and procedures for how a representative combined radium concentration can be obtained; and analyses and procedures to ensure that doses are maintained ALARA and within the dose limits in Section 622.30.

v) Water treatment residuals shall be incorporated in accordance with the registrant's land application permit. All water treatment residuals applied to land for soil conditioning purposes under this subsection (c)(1)(B)(v) shall be mixed with soil such that the limits specified in items (vi) and (viii) are not exceeded;

vi) The concentration of combined radium in the water treatment residuals and the application rate is such that, after the water treatment residuals are mixed with soil, the cumulative increase of the combined radium concentration in the soil does not exceed 1.0 pCi/g (compliance with this Section shall be calculated as an addition of 1778 microcuries per acre, dry weight basis);

vii) This increased limit applies to the sum of all land applications of water treatment residuals on a specific tax parcel of land;

viii) At no time shall the application of water treatment residuals result in the combined radium concentration in the soil exceeding 3.1 pCi/g (the mean natural background as determined by the Agency of 2.1 pCi/g and the soil concentration increase limit of 1.0 pCi/g due to water treatment residuals application);

ix) The landowner or an authorized agent of the landowner must acknowledge awareness that water treatment residuals are being applied to the land (this acknowledgement must be updated as landownership changes). The acknowledgement shall contain, at a minimum, the language provided in 622.APPENDIX A;

x) Before using a parcel of land for the application of water treatment residuals for the first time, the registrant must determine the combined radium concentration in the soil;

xi) Soil sample collection shall be conducted to be representative of the entire water treatment residual application site at a depth of 12 inches and may be submitted for analysis as a single composite sample;

xii) Land receiving application of water treatment residuals shall not be used for the cultivation of tobacco; and

xiii) When calculating the increase in combined radium concentration, a soil density value of 90 pounds/cubic foot and a mixing depth of 1 foot shall be used unless the registrant is utilizing site-specific soil density values. Corrections to the cumulative increase of combined radium may be adjusted for the decay of radium-228.

C) Disposed by release into sanitary sewerage.

D) Disposed using an alternative method approved by the Agency before disposal, under 32 Ill. Adm. Code 340.1020.

2) If the concentration of combined radium in the water treatment residuals is greater than 100 pCi/g (dry weight basis) and less than or equal to 200 pCi/g (dry weight basis), water treatment residuals may be disposed of:

A) Using an alternative method approved by the Agency before disposal, under 32 Ill. Adm. Code 340.1020;

B) In an IEPA-permitted facility authorized to receive such material. Disposals shall:

i) Be reviewed and approved by the Agency in advance.

ii) Comply with all requirements in subsection (c)(1)(A).

C) By release into sanitary sewerage.

D) At a facility authorized to dispose of such material under any federal or State solid or hazardous waste laws as long as the registrant ensures compliance with 32 Ill. Adm. Code 340.1060, as applicable.

d) Registrants identified in subsection (a)(2), which requires workers, contractors, or other persons to come into contact with water treatment residuals during routine and maintenance work shall sample the residuals and receive results before the next scheduled service, or as soon as practicable for emergency work, to determine compliance under this Section and Section 622.40 and to identify potential worker exposure concerns.

e) All analysis of water treatment residuals shall be conducted:

1) By a laboratory certified to perform radiological analysis by the U.S. Environmental Protection Agency, the International Organization of Standardization (ISO 17025- general requirements for the competence of testing and calibration laboratories), or the National Environmental Laboratory Accreditation Conference (NELAC). The combined radium concentration will be determined by a method approved by the Agency.

2) At a frequency specified in the registrant's IEPA land application permit. If an IEPA permit does not specify a radium sampling frequency, or for landfill or alternative disposals approved by the Agency, sample frequency shall be no less than one representative sample per year.

3) Utilizing a sampling methodology that ensures analyses are representative of the water treatment residuals being disposed of or repurposed. The registrant shall:

A) Utilize applicable guidance, such as EPA SW-846, American Water Works Association B100, or USEPA's RCRA Waste Sampling Guidance, where procedures for representative sampling are absent (i.e., those for disposal of water treatment resins or filters);

B) To the extent practicable, collect samples before removing the water treatment residuals from the treatment system; and

C) Ensure composite samples comply with the following requirements:

i) Sub-samples comprising a composite shall be drawn from homogenous waste (i.e., process waste that has been shown to be homogenous);

ii) If homogeneity cannot be confirmed, then a representative composite sample comprised of six sub-samples shall be taken to determine the average concentration;

iii) No single measurement used to calculate an average shall exceed five times the exemption criteria (i.e., 1000 pCi/g); and

iv) Each waste container is considered a separate waste volume (i.e., two waste volumes cannot be averaged).

f) Nothing in this Section relieves the registrant from complying with all other applicable federal, State and local government regulations governing toxic or hazardous properties of water treatment residuals that are disposed of or repurposed under this Section.

g) No person producing or possessing water treatment residuals shall cause violations of the requirements of Title 35 of the Illinois Administrative Code, Subtitles C and G, as implemented by the IEPA.

h) The total effective dose equivalent to workers or individual members of the public from the registrant's operation shall not exceed 1 millisievert (0.1 rem) in any year, exclusive of the dose contribution from:

1) Background radiation;

2) Any medical administration the individual has received;

3) Exposure to individuals administered radioactive material and released in accordance with 32 Ill. Adm. Code 335;

4) Voluntary participation in medical research programs;

5) A radioactive material licensee's disposal of radioactive material into sanitary sewerage under 32 Ill. Adm. Code 340.1030; and

6) Radon and its progeny.

i) Registrants shall limit radon exposure to workers.

1) Registrants identified in subsections (a)(1), (a)(2), and (a)(3) shall conduct radon measurements in accordance with 32 Ill. Adm. Code 422 by [date certain], and at least once every five calendar years following the initial testing.

A) Measurements shall be conducted immediately before exchanging of exhausted filter media, or if the media is not scheduled to be exchanged during the measurement window, as close to the end of the measurement window as practical to allow for maximum loading of radium onto the filter media.

B) Radon concentrations shall be retested following the guidance outlined above within a year of any of the following circumstances occurring:

i) A new addition is constructed or alterations for building reconfiguration or rehabilitation occur;

ii) A ground contact area not previously tested is occupied;

iii) Treatment technologies capable of concentrating radium are newly installed or altered. Altering treatment

technologies does not include activities such as replacing worn-out equipment or filter media while leaving the remainder of the system unchanged;

iv) A facility begins receiving treatment process backwash from a new (additional) water treatment facility or alterations are made to the treatment technologies at existing facilities that supply treatment process backwash. Alterations to treatment technologies do not include activities such as replacing worn-out equipment or filter media while leaving the remainder of the system unchanged;

v) The use of a new or different primary water source drawn from an aquifer designated to contribute elevated concentrations of radium to groundwater;

vi) Heating or cooling systems are altered with changes to air distribution or pressure relationships;

vii) Ventilation is altered by extensive weatherization, changes to mechanical systems, or comparable procedures;

viii) Alterations or renovations resulting in sizable openings are made to the facility's foundation, or flooring or natural settlement occurs causing major cracks to develop; or

ix) An installed mitigation system is altered or repaired.

AGENCY NOTE: Agency recommends radon mitigation when radon concentrations in routinely occupied areas are found to be greater than 4.0 pCi/L, and recommends considering mitigation for concentrations between 2.0 and 4.0 pCi/L.

2) Registrants shall ensure that worker exposure from radon within all occupied areas does not exceed 30 pCi/L or 0.3 WL, based on continuous workplace exposure for 40 hours per week, 52 weeks per year, and shall not exceed 4 WLM over a 12-month period, using an equilibrium ratio of 50 percent to convert radon exposure to WLM.

j) Persons producing or possessing water treatment residuals shall not cause contamination of any area exceeding the values specified in Appendix A of 32 Ill. Adm. Code 340.

k) For fixed facilities, registrants shall comply with 32 Ill. Adm. Code 340.920(e) and post each area, tank, basin, or room in which an amount of material exceeding ten times the quantity of radium-226 and radium-228 specified in Appendix C to 10 CFR 20, effective January 1, 2004, is used or stored with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION RADIOACTIVE MATERIALS" or "DANGER RADIOACTIVE MATERIALS". Areas visible to the public may be posted within the confines of the barrier (fencing, hatch, etc.) but must remain visible to workers entering the restricted area;

AGENCY NOTE: The referenced value is 1.0 microcurie. This equates to 5 kg at 200 pCi/g.

l) Registrants shall comply with 32 Ill. Adm. Code 310.60 through 310.90, the Radon Industry Licensing Act [420 ILCS 44] and 32 Ill. Adm. Code 422.

m) Registrants in compliance with Section 622.30 are exempt from the requirements of 32 Ill. Adm. Code 340.1060(e).

Section 622.40 Worker Protection and Disposal Requirements for Water Treatment Residuals Greater than 200 pCi/g

a) This Section only applies to persons producing or possessing water treatment residuals with concentrations of combined radium greater than 200 pCi/g (dry weight basis).

b) Persons producing or in possession of water treatment residuals identified in subsection (a) shall:

1) Register with the Agency within 60 days of becoming subject to subsection (a) in a format specified by the Agency;

2) Limit Dose to Workers and Members of the Public. Registrants shall conduct operations so that:

A) The dose in any unrestricted area from external sources, exclusive of the dose contributions from patients administered radioactive material and released in accordance with 32 Ill. Adm. Code 335, does not exceed 0.02 millisievert (0.002 rem) in any single hour.

B) Before allowing a worker or a member of the public to enter a restricted area, instructions are given on radiation hazards and protective measures to that individual. These instructions must comply with subsection (b)(11).

C) Persons entering restricted areas or performing work in contact with water treatment residuals identified in subsection (a) are supplied with appropriate personal protective equipment (PPE). PPE shall include, at a minimum, protective barriers to prevent inadvertent ingestion or inhalation of airborne particles of radioactive material as well as to limit the spread of contamination from the work area.

D) Procedures are in place to ensure doses to workers are kept as low as reasonably achievable and in compliance with this Part. Emergency work that results in work duties or exposures outside the scope of TENORM awareness training provided for workers as outlined in Section 622.50(a) shall be reported to the Agency within 45 days. The report shall include proposed revisions to the registrant's training agenda or operating procedures necessary to maintain compliance with this Part.

AGENCY NOTE: Calculation of doses for compliance with this subsection may be based upon calibrated radiation meter survey data and worker occupancy times, or work area monitoring, rather than an individual worker dosimetry program.

3) Employ institutional and engineered controls to limit exposure of water treatment residuals to personnel and the environment.

A) If, during the course of operation, noncompliance with the limits specified in subsection (b)(2) is discovered, the registrant shall submit alternative procedures to the Agency within 45 days after discovery.

B) Continued inability to comply with the protective limits specified in subsection (b)(2) may result in the Agency requiring the registrant to comply with the specific license requirements in 32 Ill. Adm. Code 330 and additional training required for workers.

4) Afford the Agency, at all reasonable times, the opportunity to inspect sources of radiation and the premises and facilities in which those sources of radiation are used or stored, and records maintained under this Section.

5) Perform radiation surveys to demonstrate compliance with this Section. Surveys shall be done to evaluate:

A) Gamma radiation exposure rate in all occupied areas, at a minimum, of once per year;

B) Gamma radiation exposure rate in restricted areas before, during, and after work requiring entry; and

C) Potential contamination of workers and the work area immediately following work in restricted areas.

6) Ensure use of calibrated radiation detection instruments. Instruments and equipment used for quantitative radiation measurements (e.g., exposure rate and contamination monitoring) shall be calibrated at intervals not to exceed 12 months for the radiation measured. To satisfy this requirement, the registrant shall:

A) Post a legible note on the instrument showing the date of calibration; and

B) Ensure that instrument calibrations are performed by persons specifically licensed by the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State to perform such calibrations.

7) Provide notices and instructions to workers.

A) Each registrant shall post, in conspicuous places easily visible to workers, current copies of the following documents:

i) This Part;

ii) Agency Form KLA.001 “Notice to Employees”;

iii) The operating procedures applicable to activities under the registration;

iv) Any notice of violation or administrative order involving radiological working conditions and any response from the registrant; and

v) All radiological surveys, analytical media analysis results, and radon testing results.

B) If the posting of a document specified in subsection (b)(7)(A) is not practicable, the registrant may post a notice summarizing the documents and the location where the documents may be examined.

C) The registrant shall post Agency notices of violation or administrative orders involving radiological working conditions, along with any responses from the registrant, within 5 working days after receipt of the notice or order. The registrant's response, if any, shall be posted within 5 working days after the registrant sends it to the Agency. The documents shall remain posted for a at least 5 working days or until action correcting the violation has been completed, whichever is later.

D) All individuals whose job duties do not require entry into restricted areas or contact with material identified in subsection (a) shall be provided instruction which includes, at a minimum, the material identified in Section 622.50(a), (b), and (c). The initial instruction and annual refreshers must last at least one hour.

E) All individuals working in, or the performance of whose duties requires access to any portion of a restricted area or who frequent areas where radioactive material is used or stored shall be instructed, at a minimum, in all content described in Section 622.50.

F) The registrant shall maintain records of initial and annual employee training for five years after the date of the training.

8) Shall identify a responsible individual with sufficient knowledge and authority to prevent unsafe practices, approve radiation safety-related issues and communicate promptly to an appropriate level of management. The designated official shall be responsible for ensuring the requirements specified in this Part are adequately implemented.

c) Any person who receives, possesses, uses, or transfers water treatment residuals with concentrations of combined radium greater than 200 pCi/g (dry weight basis), and is not otherwise a registrant under Section 622.30 (including, but not limited to, vendors, contractors, service providers, consultants, low-level radioactive waste brokers, or persons performing decommissioning work) shall obtain a radioactive material license 32 Ill. Adm. Code 330.

AGENCY NOTE: The requirement to obtain a license does not apply to the transportation of water treatment residuals. However, persons transporting water treatment residuals must comply with all other applicable federal, State and local government regulations.

d) The registrant shall notify the Agency before removing material identified in subsection (a) from the facility for disposal, treatment, or transport. Such notification shall include the location, quantity, proposed dates, and proposed method for disposal.

AGENCY NOTE: For the purposes of this subsection, "disposal, treatment, or transport" does not apply to discharge to a sanitary sewer.

1) Unless specifically authorized by a radioactive material license or elsewhere in this Section, registrants are not authorized to transport material identified in subsection (a) outside the site where the registrant is authorized to produce and possess the material.

2) Before releasing, repurposing, or repair of equipment (piping, pumps, tanks, etc.) that has been contaminated with material identified in subsection (a), the registrant shall remove or provide for the removal of such contaminants and ensure that:

A) The equipment is decontaminated to the lowest practicable level before release. Unless the Agency specifies another value, the values specified in Appendix A of 32 Ill. Adm. Code 340 shall serve as guidelines for this purpose.

B) The total amount of contamination does not exceed the quantities listed in Appendix C to 10 CFR 20.

AGENCY NOTE: Notification to the Agency is not required when transport is incidental to shipment for analytical services.

e) Registrants may dispose of material by:

1) Disposal by Release into Sanitary Sewerage. A registrant may discharge material into the sanitary sewer if each of the following conditions is satisfied:

A) The registrant provides information on the nature of the discharge to the water treatment facility and receives written authorization from that facility before discharge;

B) Wastewater treatment facilities receiving discharges authorized this subsection are registered and in compliance with the provisions of Section 622.30; and

AGENCY NOTE: Discharges of material identified in subsection (a) to a wastewater treatment facility will require that facility to register under Section 622.30 due to the unquantified impact the material will have on the facility's water treatment residuals. Receiving wastewater treatment plants may have local pretreatment standards restricting such discharges.

C) The total quantity of material identified in subsection (a) that the registrant releases into the sanitary sewer in a year does not exceed 1.0 Ci.

2) An alternative disposal method may be used if the Agency reviews and approves it beforehand under 32 Ill. Adm. Code 340.1020; or

3) The material may be disposed of at a facility authorized to dispose of such material in accordance with any federal or State solid or hazardous waste laws as long as the following conditions are satisfied:

A) Packaging, decommissioning, preparation of manifests, and shipment of material is performed by persons with a specific radioactive material license from the Agency, authorized Agreement State or the NRC to perform such work; and

B) The registrant ensures compliance with 32 Ill. Adm. Code 340.1060, as applicable.

f) Persons producing or possessing water treatment residuals shall not cause contamination of any area exceeding the values specified in Appendix A of 32 Ill. Adm. Code 340.

Section 622.50 TENORM Awareness Training for Registrants

a) For those registrants identified in Section 622.40, TENORM awareness training (1-2 hours at a minimum) shall be included as part of the facility's health and safety training program and conducted before starting of any job duties associated with a radiological hazard.

b) TENORM Awareness Training shall contain, at a minimum, policies and procedures for each facility, including the management policy to maintain all personnel exposure as low as reasonably achievable. Additionally, workers shall be:

1) Kept informed of the storage, transfer, or use of sources of radiation and the identity of restricted areas;

2) Instructed, at appropriate levels of detail, in the health protection problems associated with exposure to radiation or radioactive material, in the risks of radiation exposure to the embryo and fetus, in precautions or procedures to minimize exposure, and in the purposes and functions of protective devices employed;

3) Instructed in, and instructed to observe to the extent within the worker's control, the requirements in Section 622.40 for the protection of personnel from exposure to radiation or radioactive material;

4) Instructed to report promptly to the licensee or registrant any condition that may constitute, lead to, or cause a violation of the Radiation Protection Act of 1990 [420 ILCS 40], the requirements of Section 622.40 or unnecessary exposure (i.e., exposure that results when prescribed safety measures are not followed) to radiation or radioactive material;

5) Advised of the mechanisms in place to ensure workers' exposures within the limits established in Sections 622.30(i)(2) and 622.40(b)(2).

c) These instructions shall be of sufficient detail to avoid radiological hazards and shall be given directly to each worker either in writing or in an orientation course, with the workers signing a statement that they have received the information listed in subsection (b) and understand it. Refresher training that covers all of the required topics shall be provided at intervals not to exceed 12 months.

d) In addition to TENORM Awareness Training, training for workers whose job duties may involve entering restricted areas or contact with material identified in Section 622.40(a) shall include the following:

1) Fundamentals of Radiation Safety:

A) Introduction to NORM and TENORM;

B) Characteristics of alpha, beta, and gamma radiation;

C) Units of radiation dose and quantity of radioactivity associated with TENORM;

D) Hazards of exposure to different kinds of radiation;

E) Levels of radiation from TENORM sources of radiation;

F) Methods of controlling radiation dose through time, distance and shielding, ventilation, decontamination, and source reduction to reduce doses as low as practicable; and

G) Methods of avoiding intake or exposure to radiation through the use of personal protective equipment, proper working procedures, and decontamination.

2) Radiation Detection Instruments, including:

A) Use, operation, and limitations of radiation survey instruments for alpha, beta and gamma radiation;

B) Survey techniques, including ambient and frisking methods;

C) Surveying and sampling for NORM and TENORM; and

D) Monitoring equipment and action levels for radon.

3) Proper Use of Personnel Protective Equipment (PPE), including:

A) Different types of PPE;

B) Donning of PPE;

C) Removal of PPE;

D) Decontamination techniques; and

E) Use of respiratory protection equipment and radon mitigation as needed.

4) Identification of areas requiring posting and labeling, including identification of known and potential TENORM-containing areas. This includes pumps and piping where mineral scale accumulates; lagoons, flocculation tanks, and sedimentation tanks where residual sludge accumulates; filters, pumping stations, and storage tanks where scales and sludge accumulate; facilities where filter backwash, brines, or other contaminated water accumulates; facilities that are enclosed (radon); and residuals processing or handling areas.

5) Containerization, storage, and disposal of TENORM wastes.

6) Requirements of pertinent federal and State of Illinois regulations.

7) Topics and discussions of assigned activities during normal and abnormal situations involving exposure to TENORM that can reasonably be expected to occur during work activities.

e) Recommended Training for Instructors. Instructors of TENORM courses should have adequate and commensurate experience in field operations associated with TENORM activities at water and wastewater facilities. The field experience work needs to include sufficient time in radiation protection and the use of radiation detection equipment.

Section 622.60 General Variance

A variance is a temporary exemption from this Part, that the Agency may grant with or without conditions for a period of up to five years upon the presentation of adequate proof by the petitioner that compliance with a requirement would impose an undue hardship. A person filing a petition for a variance shall provide the information in subsections (a) through (h) to the Agency. If the petitioner believes that any of the required information does not apply to the specific variance requested, the petitioner shall include an explanation.

AGENCY NOTE: The filing of a petition for a variance does not stay enforcement of a requirement of this Part.

a) A statement describing the requirement from which the petitioner seeks a variance. The statement must include the citation to that requirement;

b) A complete and concise description of the nature of the petitioner's activity that is the subject of the proposed variance, including:

1) Location of, and area affected by, the petitioner's activity;

2) Location of points of disposal or repurposing, and, as applicable, the identification of the receiving waterway or land;

3) Identification of any prior variance issued to the petitioner and, if known, the petitioner's predecessors, concerning similar relief;

4) An explanation of other permits or licenses held by any other federal, state, or local agency that is affected by this variance request;

5) Nature and amount of the materials used in the process or activity for which the petitioner seeks a variance, and a full description of the particular process or activity in which the materials are used;

6) Description of the relevant measures to mitigate the accumulation of TENORM already in use; and

7) Nature and amount of disposal, discharges, or releases of the material in question currently generated by the petitioner's activity.

c) A description of the efforts that would be necessary for the petitioner to achieve immediate compliance with the requirement at issue. All possible compliance alternatives, with the corresponding costs for each alternative, shall be identified. The description of compliance alternatives shall include the availability of alternate methods of compliance, the extent that the methods were studied, and the comparative factors leading to the selection of the proposed alternative for compliance. The description of the costs of immediate compliance should include the overall capital costs and the annualized capital and operating costs, if applicable;

d) Facts setting forth the reasons the petitioner believes immediate compliance with the requirement would impose an arbitrary or unreasonable hardship;

e) A detailed description of the compliance plan, including:

1) Discussion of the proposed equipment or proposed alternative measures to mitigate TENORM accumulation to be undertaken to achieve full compliance with the requirement;

2) Schedule for the implementation of all phases of the proposed alternative compliance measures from initiation of design to program completion; and

3) The estimated costs involved for each phase and the total cost to achieve compliance.

f) A description of the environmental impact of the petitioner's activity, including:

1) Nature and amount of disposals, discharges, or releases of the material in question if the Agency grants the requested variance, compared to that identified in subsection (b)(7);

2) Quantitative demonstration that actions undertaken during the period of variance will not result in any individual members of the public receiving more than 1 millisievert (0.1 rem) TEDE annually (excluding the contribution from radon) from all licensed or registered sources of radiation, including water treatment residuals; and

3) A statement of the measures to be undertaken during the period of the variance to minimize the impact of the discharge of contaminants on human, plant, and animal life in the affected area, including the numerical interim discharge limitations that can be achieved during the period of the variance.

g) A proposed beginning and ending date for the variance. If the petitioner requests that the term of the variance begin on any date other than the date on which the Agency takes final action on the petition, a detailed explanation and justification for the alternative beginning date; and

h) Any other information the Agency deems necessary.

Section 622.70 Maintenance of Records & Inspections

a) Maintain records. Each registrant shall maintain records showing compliance with this Part for five years. Records may be stored in electronic media with the capability to produce legible, accurate, and complete records during the required retention period. Records such as letters, drawings, and specifications shall include all pertinent information such as stamps, initials, and signatures.

1) Each registrant with a combined radium concentration greater than 3.1 pCi/g (dry weight basis) shall maintain records of the following:

A) Registrants who dispose of water treatment residuals in an IEPA-permitted municipal solid waste landfill or a facility authorized to dispose of that material in accordance with any federal or State solid or hazardous waste laws:

i) Quantity of water treatment residuals disposed of;

ii) Concentration of combined radium in pCi/g (dry weight basis) contained in the water treatment residuals;

iii) Dates the water treatment residuals were disposed of in a landfill;

iv) Name and location of the landfill receiving the water treatment residuals; and

v) Any additional records showing compliance with this Part requested by the Agency.

B) Registrants who land apply water treatment residuals:

i) Tax parcel identification number of lands utilized for application of water treatment residuals;

ii) County, township, section, and range in which the tax parcel lies;

iii) Tillable acres for the tax parcel;

iv) A signed landowner acknowledgement form for the tax parcel;

v) Total dry tons of water treatment residuals applied to the tax parcel;

vi) For each application, the concentration of radium-226 and radium-228 in pCi/g (dry weight basis) contained in the water treatment residuals;

vii) Dates the water treatment residuals were land applied;

viii) The cumulative increase and total combined radium concentration in the soil for each tax parcel having received application of water treatment residuals; and

ix) Any additional records showing compliance with this Part requested by the Agency.

2) Registrants identified in Section 622.40 who dispose of residuals via release into sanitary sewerage shall maintain documentation demonstrating that the total quantity of material released in a year does not exceed 1.0 Ci.

3) Registrants who dispose or repurpose water treatment residuals approved by the Agency under 32 Ill. Adm. Code 340.1020 shall maintain documentation in accordance with this Section.

4) All Registrants shall maintain documentation pertaining to radon measurements.

b) Registrants shall make records available for Agency inspection in accordance with Section 27 of the Radiation Protection Act of 1990 [420 ILCS 40/27]. In addition, the registrant shall afford the Agency, at all reasonable times, an opportunity to inspect sources of radiation, and the premises and facilities in which those sources of radiation are used or stored, and records maintained under this Section.

c) Registrants shall post or make available to employees all records of radiation survey measurements, water treatment residuals analysis results, and radon measurements.

Section 622.80 Noncompliance and Reporting of Incidents

a) Each registrant shall report to the Agency any noncompliance with this Part within 30 days after the noncompliance is discovered.

b) Each registrant shall, within 30 days of discovery of the event, report to the Agency each event involving loss of control of water treatment residuals possessed by the registrant that may have caused, or threatens to cause, an

unplanned contamination event outside of a restricted area exceeding the values specified in Appendix A of 32 Ill. Adm. Code 340.

AGENCY NOTE: Reports can be made to EMA.RadiumResiduals@illinois.gov or the 24-hour IEMA-OHS Communications Center (217-782-7860).

c) Persons found to have caused or contributed to violations of the requirements of this Part may be required to:

1) Remediate under the Agency's rules in Title 32 of the Illinois Administrative Code;

2) Reimburse for remediation efforts initiated on the person's behalf under 32 Ill. Adm. Code 310; and

3) Obtain a radioactive material license in accordance with 32 Ill. Adm. Code 330.

Section 622.90 Notifications to the Agency

All notifications to the Agency concerning the requirements of this Part shall be sent to EMA.RadiumResiduals@illinois.gov.

Section 622.APPENDIX A Landowner Acknowledgement Form

At a minimum, the following language shall be included in the landowner acknowledgement form required in Section 622.30(c)(1)(B)(ix). Failure to include this language and to have the landowner sign and date shall invalidate the acknowledgement.

> The Illinois Environmental Protection Agency, as well as the U.S. Environmental Protection Agency, requires the water treatment residuals you are receiving to be monitored for trace metals, organic and inorganic chemicals, and pathogens. In addition, the Illinois Emergency Management Agency and Office of Homeland Security (IEMA-OHS) requires the monitoring of radium under 32 Ill. Adm. Code 622 (Part 622). Radium is naturally present in soil and groundwater. When removed from water and land-applied, these water treatment residuals could elevate the radium content in the soil above natural levels.
>
> IEMA-OHS, as the regulatory agency for ionizing radiation, requires that land-applied water treatment residuals be monitored for radium, including the cumulative amount of radium, deposited on agricultural fields. Fields that approach the regulatory limit of 3.1 pCi/g are required to utilize alternative sources of fertilizer (i.e., water treatment residuals without elevated radium from water). The additional monitoring and land application provisions of Part 622 ensure that the public is protected from significant health, environmental, and agricultural impacts.
>
> This form serves as an acknowledgement of awareness by the landowner, or authorized agent of the landowner, that biosolids applied to fields for beneficial nutrient purposes contain radium. For further information, you may contact IEMA-OHS at EMA.RadiumResiduals@illinois.gov.
>
> I hereby acknowledge my awareness of the above conditions resulting from application of treatment residuals to my property.
>
> SIGNATURE OF LANDOWNER OR LANDOWNER'S DESIGNEE
>
> PRINTED NAME
>
> DATE