



**State Regulations and Policies for
Control of Naturally-Occurring and
Accelerator Produced Radioactive
Materials (NARM) and
Technologically Enhanced Naturally-
Occurring Radioactive Materials
(TENORM)**

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**Radiation Focus Group
Federal Facilities Research Center**

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ASTSWMO is an organization supporting the environmental agencies of the States and Territories (States). ASTSWMO's mission is to enhance and promote effective State and Territorial programs and to affect relevant national policies for waste and materials management, environmentally sustainable practices, and environmental restoration. The mission of the Radiation Focus Group is to identify national level radiation issues, coordinate State input, encourage improved partnership between State and federal agencies; and produce issue papers and other products as necessary to promote State interests on national radiation issues.

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Note: This document represents the final project undertaken by the Radiation Focus Group as part of the ASTSWMO Federal Facilities Research Center. The group is now the Radiation Task Force within the ASTSWMO Materials Management Subcommittee.

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State Regulations and Policies for Control of Naturally-occurring and Accelerator Produced Radioactive Materials (NARM) and Technologically Enhanced Naturally-occurring Radioactive Material (TENORM).

I. INTRODUCTION

Between 2011 and 2012, the Association of State and Territorial Solid Waste Management Officials' (ASTSWMO's) Radiation Focus Group developed three reference documents on naturally-occurring, radioactive materials (NORM). The first, *Incidental TENORM: A Guidance for State Solid Waste Managers* (April 2011), provides information to inform solid waste managers about technologically-enhanced, naturally-occurring, radioactive materials (TENORM), including an introduction to these materials, toxicity, waste generation, and disposal. This guidance document was followed up by the release of two fact sheets: *TENORM Associated with Drinking Water Treatment* (May 2011) and *TENORM Associated with Shale Gas Operations* (July 2012).

The Radiation Focus Group has responded to many requests from States and Territories (States) seeking information on existing State regulatory controls since the release of the three ASTSWMO documents. In response to these requests and to continued State interest, the Focus Group has developed this compendium of State regulations and policies concerning the control of Naturally-occurring and Accelerator-produced Radioactive Materials (NARM), NORM, and TENORM.

Between 2011 and 2014, the Focus Group requested regulatory information from all State waste and/or radiation programs specific to licensing and disposal of NARM, NORM and TENORM. Forty (40) States responded to the Focus Group's request for information. The information received from States is provided in this report with a short analysis from the Focus Group. This report does not include recommendations for States or federal programs.

To produce the survey we asked the following questions:

- Does your State have regulations that govern the licensing of NARM and/or TENORM? If so, please provide a reference to the regulations.
- Does your State have regulations that govern the disposal of NARM and/or TENORM? If so, please provide a reference to the regulations.
- Has your State adopted Conference of Radiation Control Program Directors (CRCPD) Suggested State Regulations (SSR) Part N regarding regulation and licensing of TENORM?
- Does your State allow TENORM to be disposed in municipal landfills, industrial landfills (RCRA Subtitle D) or hazardous waste landfills (RCRA Subtitle C)? Please provide reference to regulations that either allow or prohibit such disposal.
- What agency or department in your State addresses issues of disposal of TENORM? Please provide contact information for this agency if appropriate.

As stated above, information was collected between 2011 and 2014. If a State would like to add new or updated information to the survey report, it can be sent to Kerry Callahan in the ASTSWMO office at kerry@astswmo.org.

II. OVERVIEW OF NARM, NORM and TENORM

In 2005, Congress passed the Energy Policy Act of 2005 (EPAct) which expanded the jurisdiction of the United States Nuclear Regulatory Commission (NRC) to include discrete sources of radium-226, accelerator-produced radioactive materials and discrete sources of naturally occurring radioactive materials. These materials were referred to as NARM. Prior to the passage of the EPAct, regulation of these materials was left to the States. When the EPAct passed, jurisdiction of NARM was retained by the 37 States which are NRC Agreement States and therefore have sole jurisdiction over all radioactive materials used in their States. After the EPAct, jurisdiction of NARM in the 13 non-agreement States was transitioned from the States to the NRC.

NORM is present in the environment; in soils, air and water. Industrial processes can separate and concentrate this material into TENORM. The CRCPD has defined TENORM as meaning naturally occurring materials not regulated under the Atomic Energy Act of 1954, as amended, whose radionuclide concentrations have been increased by or as a result of human practices.

TENORM is commonly associated with specific industries and practices. Examples include uranium mining and overburden, phosphate waste, coal waste, petroleum production scale and sludge, drinking water treatment, mineral mining/overburden and processing/extraction, and geothermal wastes. TENORM is primarily associated with NORM decay chains of uranium-238 and thorium-232 and their progeny. Radium and radon are the main risk drivers in these decay chains. TENORM can present serious health and safety hazards if it is not handled and disposed of properly. It is predicted that the problems of TENORM waste would increase in the future because of the expansion of fracking technology, specifically with the exploration and production of shale and Marcellus gas. Most producers of TENORM are not required to have a radioactive materials license and may not have the radiological expertise necessary to deal with the myriad of TENORM waste streams.

The term NARM encompasses discrete sources of naturally-occurring radioactive materials and accelerator-produced radioactive materials. NARM does not include diffuse sources of NORM or TENORM. The federal government does not have regulatory authority of NORM or TENORM. Regulation of these materials is left to the States.

As previously indicated, between 2011 and 2014, the Focus Group requested regulatory information from all State waste and/or radiation programs specific to licensing and disposal of NARM, NORM and TENORM. The focus of this survey was the regulation of TENORM.

III. LICENSING OF NARM, NORM AND TENORM

The Focus Group asked States to provide regulatory information for licensing of NARM, NORM or TENORM. Of the 38 States that responded to this question, 27 States have regulations that govern the licensing of NARM and/or TENORM. Of those 27 States, six States responded that they do not have regulations that specifically pertain to TENORM, but these materials are licensed under the State's authority to regulate radioactive material.

Alabama	Rule 420-3-26-.02(4)(a)4.&5, Licensing of Radioactive Material http://www.adph.org/radiation/assets/RulesPart02renumbered.pdf
Alaska	No
American Samoa	Did not respond
Arizona	Yes, R12-1-301 through 325 of Arizona Administrative Code (A.A.C.). Title 12 Chapter (1) Article 3. Radioactive Material Licensing.
Arkansas	NORM rules are in Section 7 of the rules available here: http://www.healthy.arkansas.gov/programsServices/hsLicensingRegulation/RadiationControl/Pages/RulesandRegulations.aspx
California	Did not respond
Colorado	No, but we have a policy and guidance document which can be downloaded at https://www.colorado.gov/pacific/cdphe/tenorm-policy-development-stakeholder-process
Commonwealth of the Northern Mariana Islands	Did not respond
Connecticut	Did not respond
Delaware	Although Delaware radiation control regulations still contain Part C describing licensure of NARM radioactive material, licensing & enforcement authority for NARM material was transitioned by Governor Minner to the NRC in 2007. Part C is scheduled for review/amendment to reflect this change in 2011. Delaware continues to register all radioactive material facilities, but licensing and enforcement is handled directly by NRC.
Florida	Chapter 64E-5, Florida Administrative Code (FAC): Control of Radiation Hazard Regulations. https://www.flrules.org/gateway/ChapterHome.asp?Chapter=64E-5
Georgia	Yes, Georgia Radioactive Materials Regulation chapter 391-3-17
Guam	Did not respond
Hawaii	Did not respond
Idaho	No
Illinois	In some cases Illinois will license radium through radioactive materials regulations, Title 32 Illinois Administrative Code (IAC) 310, 326, 330, and 340. Specific exemptions from licensing of certain concentrations of water treatment residuals are contained in part 330(d). http://iema.illinois.gov/iema/legal/regs/RegChart.asp
Indiana	Indiana does not have specific regulations governing NARM or TENORM.
Iowa	Did not respond
Kansas	Regulations are applicable to any radioactive material, whether NARM or TENORM. TENORM licensing issues are handled on a case-by-case basis. Regulations are found here: http://www.kdheks.gov/radiation/regs.html
Kentucky	Did not respond
Louisiana	NORM rules are in Chapter 14 of Part XV, at the link here: http://www.deq.louisiana.gov/portal/Default.aspx?tabid=1674
Maine	Did not respond
Maryland	Code of Maryland Regulations 26.12.01.01, Regulations for the Control of Ionizing Radiation http://www.mde.state.md.us/programs/Air/RadiologicalHealth/RegulationsforControlofIonizingRadiation/Documents/www.mde.state.md.us/assets/document/air/RH_c_omar/Regs_final.pdf

Massachusetts	<p>Massachusetts has an Agreement with the Nuclear Regulatory Commission (NRC) which prohibits the licensing of federal facilities, exempt distribution, nuclear power plants, and special nuclear material in quantities that can cause criticality.</p> <p>Since NARM and TENORM are radioactive material and are not explicitly prohibited from licensing in Massachusetts' Agreement with the NRC, they can be licensed under Massachusetts' existing regulations – 105 Code of Massachusetts Regulations (CMR) 120.100 and other specific licensing regulations.</p> <p>105 CMR 120.100 is the primary set of regulations governing the licensing of radioactive materials in Massachusetts. Additional specific licensing requirements can also be found in 105 CMR 120.300 (industrial radiography), 105 CMR 120.500 (medical), and 105 CMR 120.620 (irradiators).</p> <p>105 CMR 120.005 defines 'radioactive material' as any solid, liquid, or gas which emits radiation spontaneously. In addition, 105 CMR 120.005 defines radiation as alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions.</p> <p>http://www.mass.gov/courts/case-legal-res/law-lib/laws-by-source/cmr/100-199cmr/105cmr120.html</p>
Michigan	<p>At the present time, Michigan has not implemented a full licensing program for NARM or TENORM. We are registering sites with NORM or TENORM and expect them to comply with the requirements in Michigan's "Ionizing Radiation Rules." The rules are available online at http://michigan.gov/deg/0,4561,7-135-3312_4120_4244-10069--,00.html. Sites must also comply with Michigan's "Cleanup and Disposal Guidelines for Sites Contaminated with Radium-226." These guidelines are available online at http://michigan.gov/documents/deg/whm-rps-EQC-1602-200703-cleanup-disposal-guidelines-radium-226_192499_7.pdf.</p>
Minnesota	Did not respond
Mississippi	<p>Title 15, Part 21, Subpart 78: Radiological Health. http://msdh.ms.gov/msdhsite/_static/30,0,102,60.html</p>
Missouri	Did not respond
Montana	N/A
Nebraska	<p>Our regulations currently do not govern the licensing of TENORM. NARM is defined in 180 NAC 1 and 180 NAC 3-01403 <u>Licensing the Incorporation of Naturally Occurring Accelerator-Produced Radioactive Material Into Gas and Aerosol Detectors</u></p> <p>http://www.sos.state.ne.us/rules-and-regs/regsearch/Rules/Health_and_Human_Services_System/Title-180/Chapter-01.pdf</p> <p>http://www.sos.state.ne.us/rules-and-regs/regsearch/Rules/Health_and_Human_Services_System/Title-180/Chapter-03.pdf</p>

	Yes. Our definition of “By-product Material” and “Radioactive Material” covers NORM, NARM and TENORM, even though these terms are not used specifically. (R185-08, Sections 48 & 49)
Nevada	Nevada has not adopted regulations for TENORM (i.e., SSRCR Part N).
New Hampshire	Did not respond
New Jersey	New Jersey Administrative Code (N.J.A.C.) 7:28-4, Licensing of Diffuse Naturally Occurring or Diffuse Accelerator Produced Radioactive Materials. http://www.state.nj.us/dep/rpp/RPRP_Rules/sub04.pdf N.J.A.C. 7:28-12, Remediation Standards for Radioactive Materials. http://www.state.nj.us/dep/rpp/RPRP_Rules/sub12.pdf
New Mexico	New Mexico NORM Regulations (these regulations may include TENORM if directly applicable to the oil and gas production) apply to those materials encountered in the oil and gas production industries (20 NMAC 14). Any radioactive material meeting the criteria of NORM/TENORM but is outside the arena of the oil and gas industry will be treated as “source material” if greater than “exempt” quantities and/or radium (no exempt quantity outside the 20 NMAC 14 regulations). NARM is treated as “bi-product material” in New Mexico if greater than “exempt” quantities.
New York	Part 16 of the New York State Sanitary Code, Section 100 (16.100), Licensing of Radioactive Materials. http://www.health.ny.gov/environmental/radiological/radon/radioactive_material_licensing/docs/part16.pdf
North Carolina	No. We have generally applied our regulations for licensing radioactive material to licensing of TENORM. For example, we have licensed drinking water radium removal systems under our rules for licensing radioactive material. These regulations are in 15A NCAC 11, generally in the .0300 Section, and can be found on our website, http://ncradiation.net/ . We have not licensed NORM.
North Dakota	No
Ohio	Yes. Ohio Administrative Code Chapters 3701:1-38 and 3701:1-40 http://codes.ohio.gov/oac/3701%3A1
Oklahoma	No
Oregon	Yes, Oregon Administrative Rules, 333-102-0030, 333-102-0255, 333-102-0260
Pennsylvania	NARM is licensed as “byproduct material,” but only when accelerator produced radioactive material and discrete radium sources as defined by NRC regs and guidance.
Puerto Rico	Did not respond
Rhode Island	All licensing of radioactive materials is addressed in the Rules and Regulations for the Control of Radiation [R23-1.3-RAD]. The regulations do not specify any unique requirements for NARM or TENORM.
South Carolina	Did not respond
South Dakota	No
Tennessee	We do not have regulations that specifically reference the terms NARM or TENORM. However, the nuclides that make up NARM and TENORM are regulated as any other radioactive material addressed in the Tennessee State Regulations for Protection Against Radiation.

Texas	Railroad Commission of Texas rules on oil & gas NORM are here: http://info.sos.state.tx.us/pls/pub/readtac\$ext.ViewTAC?tac_view=5&ti=16&pt=1&ch=4&sch=F&rl=Y
Utah	Yes. Utah's rules on NARM are principally focused on an exempt concentration for radium-226 (15 pCi/gm), as found in Rule R313-19-13(d)(B) of the Utah Administrative Code. Material concentrations (soil, pipe scale, etc.) of radium-226 above this limit are regulated, and require a Utah Radioactive Materials License.
Vermont	Did not respond to this question
Virginia	12 Virginia Administrative Code (VAC) 5-481-3460. Part XVI, Regulation and Licensing of Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) http://leg1.state.va.us/cgi-bin/legp504.exe?000+reg+12VAC5-481-3460 https://www.vdh.virginia.gov/epidemiology/radiologicalhealth/materials/Regulation/12VAC5-481%2012-3-09.doc
Virgin Islands	Did not respond
Washington	WA State does not have a specific definition for TENORM, thus does not have TENORM specific regulations. Radioactive material (including what would be defined as "TENORM") is licensed in accordance with the requirements of chapter 246-232 WAC.
West Virginia	West Virginia Code of State Rules (CSR)-64-23: Radiological Health Rules http://apps.sos.wv.gov/adlaw/csr/rule.aspx?rule=64-23 Section 11: Registration of Radioactive Materials Section 16: Radiation Safety Requirements for TENORM
Wisconsin	No, not specifically.
Wyoming	Did not respond

IV. DISPOSAL OF NARM, NORM and TENORM

The Focus Group asked States if they have regulations that govern the disposal of NARM and/or TENORM. Of the 40 States that responded to the survey, 22 States responded that they do have regulations that govern the disposal of NARM and/or TENORM.

Alabama	Yes, inasmuch as if a license is required, the licensee must follow all disposal rules as well.
Alaska	No
American Samoa	Did not respond
Arizona	Yes, R12-1-309; R12-1-434 through 439 of A.A.C. Administrative Code Article 3 Radioactive Material Licensing and Article 4 Standards for Protection against ionizing radiation.
Arkansas	NORM rules are in Section 7 of the rules available here: http://www.healthy.arkansas.gov/programsServices/hsLicensingRegulation/RadiationControl/Pages/RulesandRegulations.aspx
California	Did not respond

Colorado	No, but we have a policy and guidance document which can be downloaded at https://www.colorado.gov/pacific/cdphe/tenorm-policy-development-stakeholder-process
Commonwealth of the Northern Mariana Islands	Did not respond
Connecticut	Did not respond
Delaware	No
Florida	Yes, "Control of Radiation Hazard Regulations" Chapter 64E-5, Florida Administrative Code
Georgia	Yes, Georgia Radioactive Materials Regulation chapter 391-3-17
Guam	Did not respond
Hawaii	Did not respond
Idaho	Yes – IDAPA 58.01.10 - Rules Regulating the Disposal of Radioactive Materials Not Regulated Under the Atomic Energy Act of 1954 As Amended
Illinois	Yes. For water treatment residuals or sewage treatment sludge containing radium as the result of treating drinking water - 32 Ill. Adm. Code 330.40(d). All other situations are covered under the Agency's radioactive materials regulations previously cited.
Indiana	No specific regulations, however, we provide guidance on proper disposal of NARM and TENORM by each individual incident/investigation or facility. We work closely with the Indiana Department of Environmental Management so proper disposal is followed according to all suggested guidelines for environment.
Iowa	Did not respond
Kansas	Regulation regarding disposal of radioactive material is found here: 28-35-223a.
Kentucky	Did not respond
Louisiana	NORM rules are in Chapter 14 of Part XV, at the link here: http://www.deq.louisiana.gov/portal/Default.aspx?tabid=1674
Maine	Did not respond
Maryland	Code of Maryland Regulations 26.12.01.01
Massachusetts	Our disposal regulations allow licensees or registrants to dispose radioactive material pursuant to 105 CMR 120.251 through 120.257. Hence, only if the NARM or TENORM is possessed under a license or registration, issued by the Radiation Control Program, is the disposal subject to the above regulations.
Michigan	The requirements for the disposal of NARM and TENORM are contained in Michigan's "Cleanup and Disposal Guidelines for Sites Contaminated with Radium-226." These guidelines are available online at http://michigan.gov/documents/deq/whm-rps-EQC-1602-200703-cleanup-disposal-guidelines-radium-226_192499_7.pdf
Minnesota	Did not respond
Mississippi	No
Missouri	Did not respond
Montana	N/A
Nebraska	No

Nevada	Yes. When these concentrations exceed that specified in NAC 459.186, they are regulated by R185-08, Section 20.
New Hampshire	No
New Jersey	No
New Mexico	The regulations governing the disposal of NORM oil and gas production industries are found in 20.3.14.1407 NMAC "DISPOSAL AND TRANSFER OF REGULATED NORM FOR DISPOSAL". These regulations may include TENORM (if directly applicable to the oil and gas production). However, if materials meeting the criteria of NARM and/or TENORM are outside the arena of the oil and gas industry, they will be treated as "bi-product material" (NARM) or "source material" and/or radium (if present) (TENORM) and are governed under 20.3.3 NMAC.
New York	<p>6 NYCRR Part 380-1.2 (e) 6 NYCRR Part 360-1.1 (a) 6 NYCRR Part 382-1.1 (c) (5) 6 NYCRR Part 383</p> <p>Part 380 applies to "processed and concentrated NORM" (TENORM) but not to NORM. Part 360 (Solid Waste Regulations) prohibits disposal of radioactive materials that are subject to regulation under the Part 380 series. Part 382 and 383 establish criteria for design and siting of, and operation and closure of, a Low-Level Radioactive Waste disposal facility, and would accept TENORM, if such a facility were to be developed.</p>
North Carolina	No. We have generally applied our regulations for disposal of radioactive material to disposal of TENORM. For example, we have licensed drinking water radium removal systems under our rules for licensing radioactive material. We require the TENORM waste to be disposed as radioactive waste. Regulations governing disposal of radioactive waste are in 15A NCAC 11, generally in the .1600 Section, and can be found on our website, http://ncradiation.net/ .
North Dakota	No
Ohio	Yes. Ohio Administrative Code Rule 3701:1-38-19. http://codes.ohio.gov/oac/3701%3A1
Oklahoma	No
Oregon	No
Pennsylvania	Licensed NARM disposal regulated under our NRC Agreement State status and NRC regulations incorporated by reference [see PA Title 25, Chapter 217]. Monitoring and disposal of TENORM regulated under Solid Waste regulations [see Title 25, Chapter 273].
Puerto Rico	Did not respond
Rhode Island	See response in Section III.
South Carolina	Did not respond
South Dakota	No
Tennessee	Not specifically
Texas	Railroad Commission of Texas rules on oil & gas NORM are here: http://info.sos.state.tx.us/pls/pub/readtac\$ext.ViewTAC?tac_view=5&ti=16&pt=1&ch=4&sch=F&rl=Y

Utah	Yes, but only in so far as the material is regulated by the conditions of a radioactive materials license.
Vermont	Not in the Department of Health
Virginia	Yes: 12VAC5-481-3520
Virgin Islands	Did not respond
Washington	All licensed radioactive material shall be disposed of in accordance with chapter 246-221 WAC.
West Virginia	TENORM - Section 16.8 of WV CSR-64-23
Wisconsin	Not specifically. The WI Dept. of Natural Resources does have regulations in NR 506.12 (http://docs.legis.wisconsin.gov/code/admin_code/nr/500/506.pdf) that limit the disposal of ultra-low level radioactive waste to a licensed landfill that is approved in writing by the DNR. The DNR has established acceptance criteria (policy) for radium waste. Essentially, waste containing no more than 5 pCi/g of radium 226/228 combined may be disposed of with no separate review. Higher radium concentrations require a case-by-case review and approval.
Wyoming	Did not respond

V. SUGGESTED STATE REGULATIONS ON TENORM

The Focus Group asked States if they had adopted the CRCPD SSR Part N regarding regulation and licensing of TENORM. Of the 35 States that responded to this question, only three States -- Ohio, Virginia and Mississippi -- indicated that they had adopted CRCPD Part N. One additional State, Alabama, indicated that they use the limits recommended in Part N as their regulatory threshold.

VI. DISPOSAL OF TENORM IN LANDFILLS

The Focus Group asked States if they allowed for and/or regulated the disposal of TENORM in municipal, industrial or hazardous waste landfills. Of the 34 States that responded to this question, 16 indicated that they do allow disposal of TENORM in municipal, industrial and/or hazardous waste facilities. Of those 16, two States indicated that they do not allow disposal of TENORM in RCRA Subtitle D facilities.

	If the radium concentrations are below the thresholds, they are exempt and allowed by our office to be disposed of in such facilities. However, the licenses for such landfills generally prohibit any RAM, and the fact that we would allow it does not mean that the facility operator must accept it.
Alabama	In addition, we can use Rule 420-3-26-.02(4)(a)5. to allow such disposal, if and only if, both the Alabama Department of Environmental Management and the facility operator agree.
Alaska	No
American Samoa	Did not respond

	<p>Yes, per Arizona Revised Statutes Title 30 Chapter 4 Control of Ionizing Radiation Article 3 and 4. Section 30-654-B The agency shall:</p> <p>10. Adopt standards for the storage of radioactive material and for security against unauthorized removal.</p> <p>11. Adopt standards for the disposal of radioactive materials into the air, water and sewers and burial in the soil in accordance with 10 Code of Federal Regulations part 20.</p> <p>13. In individual cases, impose additional requirements to protect health and safety or grant necessary exemptions which will not jeopardize health or safety, or both.</p>
Arizona	We've received no requests for disposal.
Arkansas	Did not respond
California	Did not respond
Colorado	Yes, see policy and guidance at https://www.colorado.gov/pacific/cdphe/tenorm-policy-development-stakeholder-process
Commonwealth of the Northern Mariana Islands	Did not respond
Connecticut	Did not respond
Delaware	No
Florida	Specifically licensed radioactive materials must comply with the waste disposal criteria specified in Chapter 64E-5, Florida Administrative Code. Specific licensees who wish to terminate their licensed activities must satisfy criteria for license termination for either unrestricted release or restricted conditional release. This criteria is the same as 10 CFR Part 20 Subparts E (License termination criteria) and K (Waste disposal).
Georgia	Did not respond to this question
Guam	Did not respond
Hawaii	Did not respond
Idaho	Disposal can only occur in Idaho at RCRA Subtitle C Landfills as per IDAPA 58.01.10.020.03(a).
Illinois	Yes. 32 Ill. Adm. Code 330.40(d) allows water treatment residuals and sewage treatment sludge with total radium concentrations of 200 pCi/g or less may be disposed in a landfill permitted by the IEPA. The Agency has allowed the landfill disposal of other type of NORM/TENORM wastes on a case-by-case basis.
Indiana	Indiana looks at each disposal item individually. This is done with the assistance of Indiana Department of Environmental Management – Office of Land Quality so disposal follows all regulations of Municipal Solid Waste Landfill requirements - operating as Subtitle D or more stringent.
Iowa	Did not respond
Kansas	No
Kentucky	Did not respond
Louisiana	Did not respond
Maine	Did not respond
Maryland	No. Prohibited by permit condition.

Massachusetts	<p>In Massachusetts only 'Solid Waste' can be disposed in a RCRA D landfill. The definition of Solid Waste, found in 310 CMR 16.2, excludes “source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954, as amended.” Hence, technically it appears that TENORM could be allowed to be disposed into RCRA D landfills in Massachusetts. But a Massachusetts’ RCRA D landfill knowingly accepting any quantity of TENORM for disposal is handled on a case-by-case basis.</p> <p>Pursuant to 310 CMR 30.104(1)(d), RCRA C landfills also exclude (i.e., prohibit) disposal of “source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954, as amended.” Hence, technically it appears that TENORM could be allowed to be disposed into RCRA C landfills in Massachusetts. But a Massachusetts’ RCRA C landfill knowingly accepting any quantity of TENORM for disposal is handled on a case-by-case basis.</p>
Michigan	<p>TENORM may be disposed in RCRA Subpart C or Subpart D landfills as described in Michigan’s “Cleanup and Disposal Guidelines for Sites Contaminated with Radium-226.” These guidelines are available online at http://michigan.gov/documents/deg/whm-rps-EQC-1602-200703-cleanup-disposal-guidelines-radium-226_192499_7.pdf</p>
Minnesota	Did not respond
Mississippi	No
Missouri	Did not respond
Montana	N/A
Nebraska	No
Nevada	<p>When radioactive material concentrations exceed those listed in NAC 459.186 or when NORM contains more than 5 picocuries of Ra-226 per gram, they are regulated according to R185-08, Section 20. In Nevada, these wastes are shipped to US Ecology, operating out of Grand View, ID.</p> <p>The Radiation Control Program is not aware of the licensing of any landfills permitted for this disposal. This question should be further presented to the Nevada Division of Environmental Protection (NDEP) RCRA program.</p>
New Hampshire	Did not respond to this question
New Jersey	We may allow it if it met the unrestricted use remediation standards, but we have yet to find a facility that wants to take TENORM.
New Mexico	New Mexico Solid Waste Regulations 20.2.9.10 A. (10) prohibits the disposal of any radioactive material in solid waste landfills. Any declared radioactive waste must be disposed in the appropriate licensed disposal facility.
New York	<p>Subtitle D - No. Subtitle C - Yes, pursuant to a disposal site permit condition. However, it requires specific case-by-case approval from DEC, and is only allowed for trace concentrations, and only if its presence is incidental to a non-rad hazardous constituent that requires disposal at the site. No disposals are approved specifically for rad content.</p> <p>Therefore, taking into account the answer to 3. and 5., NORM may be disposed of in a Part 360 regulated disposal facility but not TENORM, with the very limited exception noted for the Subtitle C facility.</p>
North Carolina	No

North Dakota	No
Ohio	No. Ohio Administrative Code rules 3701:1-38-19, 3745-27-19, and rule 3701:1-43-18.
Oklahoma	Did not respond
Oregon	Oregon Department of Environmental Quality follows 40 CFR Parts 266.230 for storage and treatment for exemption of low level waste if licensed by the state of Oregon radiation protection services or the Nuclear Regulatory Commission.
Pennsylvania	Yes, disposal allowed if public is not endangered and dose criteria met per PA Solid Waste regulations [see Title 25, Chapter 273]. http://www.portal.state.pa.us/portal/server.pt/community/radioactive_material_in_solid_waste_monitoring/21933/pennsylvania_regulations/1924647
Puerto Rico	Did not respond
Rhode Island	As noted above, the regulations currently do not specifically address TENORM.
South Carolina	Did not respond
South Dakota	Yes. Our rules are silent on this subject therefore there is no specific restriction on disposal at a MSW. TENORM would be considered solid waste and allowed to be disposed of at a MSW.
Tennessee	In Tennessee, decisions relative to NORM are made on a case-by-case basis. In rare instances, some material of very low volume and very low concentrations have been disposed in municipal landfills.
Texas	Did not respond
Utah	No
Vermont	Disposal issues are not addressed in the Department of Health, though we assist with investigations where TENORM is found, wherever it is found.
Virginia	Yes: 12VAC5-481-3480 exempts them from the regulations.
Virgin Islands	Did not respond
Washington	WA State does not have any RCRA Subtitle C or D landfills that are authorized to dispose of licensed radioactive material (waste); municipal landfills are not authorized to dispose of licensed radioactive material (waste). All licensed radioactive material shall be disposed of in accordance with chapter 246-221 WAC.
West Virginia	Section 16.8 of WV CSR-64-23
Wisconsin	Yes. The WI Department of Natural Resources (DNR) does have regulations in NR 506.12 (http://docs.legis.wisconsin.gov/code/admin_code/nr/500/506.pdf) that limit the disposal of ultra-low level radioactive waste to a licensed landfill that is approved in writing by the DNR. The DNR has established acceptance criteria (policy) for radium waste. Essentially, waste containing no more than 5 pCi/g of radium 226/228 combined may be disposed of with no separate review. Higher radium concentrations require a case-by-case review and approval. The WI Department of Health Services' (DHS) Radiation Protection Section performs a health assessment for each request to dispose of waste containing higher concentrations and advises DNR on any disposal restrictions.
Wyoming	Did not respond

VII. SUMMARY AND CONCLUSIONS

State licensing of NARM and TENORM

The majority of the States that responded indicated that they have regulations that govern the licensing of NARM and/or TENORM. Many of these States indicated that these materials are being regulated as other radioactive materials are being regulated including specific licensing when appropriate.

State adoption of CRCPD Suggested State Regulations Part N

The CRCPD publish their SSR as guidance to the States on various radiation topics. Most States adopt the language in the suggested regulations, thus providing for better uniformity in the regulatory community. However, this survey showed that only three States have adopted the CRCPD SSR Part N on regulation and licensing of TENORM. The Focus Group would recommend that CRCPD evaluate the Part N suggested regulation to determine why it has not been adopted by more States. Part N may need to be revised to meet State needs for regulation of TENORM.

Disposal of wastes containing TENORM in municipal, industrial or hazardous waste landfills

Sixteen States indicated that they allow TENORM to be disposed in municipal, industrial or hazardous waste landfills. Responses indicate that there are a variety of approaches to authorizing this type of disposal. It would be helpful for further guidance to be developed regarding disposal of TENORM in municipal, industrial or hazardous waste landfills.