



# Analytical Methods Approved for Drinking Water Compliance Monitoring of Radionuclides

Analysis for the following contaminants shall be conducted in accordance with the methods in the following table, or their equivalent as determined by EPA. The methods for these contaminants are specified in 40 CFR 141.25 and Appendix A to Subpart C of Part 141. The monitoring requirements are specified in 40 CFR 141.26.

*The CFR is the legal reference for approved methods and takes precedent over this table. The table should accurately reflect the analytical methods information published in 40 CFR 141. If you find discrepancies, please notify The Safe Drinking Water Hotline (800-426-4791) so that EPA can correct the table.*

Contaminant	Method Organization	Method Number	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
<b>Naturally Occurring Radionuclides</b>							
	<b>Gross alpha</b>		Natural uranium and thorium-230 are approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods; americium-241 is approved with co-precipitation methods.				
EPA	EPA 00-02	Radiochemistry Procedures Manual	December 1987	EPA 520/5-84-006	PB 84-215581	National Technical Information Service (NTIS)	
Standard Methods	7110 C	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods	
Standard Methods	7110 C	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods	
Standard Methods	7110 C	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods	
Standard Methods	7110 C	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods	
Standard Methods Online	7110 C-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>	
	<b>Gross alpha and beta</b>		Natural uranium and thorium-230 are approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods; americium-241 is approved with co-precipitation methods.				
EPA	EPA 00-01	Radiochemistry Procedures Manual	December 1987	EPA 520/5-84-006	PB 84-215581	National Technical Information Service (NTIS)	

Contaminant	Method	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
Organization	Number					
<b><i>Naturally Occurring Radionuclides</i></b>						
<b>Gross alpha and beta</b>		Natural uranium and thorium-230 are approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods; americium-241 is approved with co-precipitation methods.				
EPA	EPA 900.0	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	<a href="http://www.nemi.gov">http://www.nemi.gov</a>
EPA	Page 1 in EMSL LV 053917	Radiochemical Analytical Procedures for Analysis of Environmental Samples	March 1979		EMSL LV 053917	National Technical Information Service (NTIS)
EPA	Page 1 in EPA 600/4-75-008	Interim Radiochemical Methodology for Drinking Water	revised March 1976	EPA 600/4-75-008	PB 253258	National Technical Information Service (NTIS)
Standard Methods	302	Standard Methods for the Examination of Water and Wastewater, 13th Edition	1971			Standard Methods
Standard Methods	7110 B	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7110 B	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7110 B	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7110 B	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7110 B	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods Online	7110 B-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>

Contaminant	Method	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
Organization	Number					
<b>Naturally Occurring Radionuclides</b>						
<b>Gross alpha and beta</b>		Natural uranium and thorium-230 are approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods; americium-241 is approved with co-precipitation methods.				
U.S. Geological Survey	R-1120-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>
<b>Radium 226</b>						
ASTM International	D2460-07	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D2460-97	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D3454-05	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D3454-97	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
Department of Homeland Security	Ra-04	EML Procedures Manual, 28th Edition, Vol. I, Department of Energy Report HASL-300	1997		PB97-162549	<a href="http://www.eml.st.dhs.gov/publications">http://www.eml.st.dhs.gov/publications</a>
EPA	EPA 903.0	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	EPA 903.1	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	<a href="http://www.nemi.gov">http://www.nemi.gov</a>
EPA	EPA Ra-03	Radiochemistry Procedures Manual	December 1987	EPA 520/5-84-006	PB 84-215581	National Technical Information Service (NTIS)
EPA	EPA Ra-04	Radiochemistry Procedures Manual	December 1987	EPA 520/5-84-006	PB 84-215581	National Technical Information Service (NTIS)

Contaminant	Method	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
Organization	Number					
<b>Naturally Occurring Radionuclides</b>						
<b>Radium 226</b>						
EPA	Page 13 in EPA 600/4-75-008	Interim Radiochemical Methodology for Drinking Water	revised March 1976	EPA 600/4-75-008	PB 253258	National Technical Information Service (NTIS)
EPA	Page 16 in EPA 600/4-75-008	Interim Radiochemical Methodology for Drinking Water	revised March 1976	EPA 600/4-75-008	PB 253258	National Technical Information Service (NTIS)
EPA	Page 19 in EMSL LV 053917	Radiochemical Analytical Procedures for Analysis of Environmental Samples	March 1979		EMSL LV 053917	National Technical Information Service (NTIS)
Georgia Institute of Technology	GA	The Determination of Radium-226 and Radium-228 in Drinking Water by Gamma-ray Spectrometry Using HPGE or Ge(Li) Detectors, Revision 1.2	December 2004			Georgia Institute of Technology
This method may be used to analyze for radium-226 and radium-228 in samples collected after January 1, 2005 to satisfy the radium-226 and radium-228 monitoring requirements specified at 40 CFR 141.26.						
NY Department of Health	NY	Determination of Ra-226 and Ra-228 (Ra-02)	January 1980, Revised June 1982			Radiological Sci Inst Ctr for Lab & Research
Standard Methods	304	Standard Methods for the Examination of Water and Wastewater, 13th Edition	1971			Standard Methods
Standard Methods	305	Standard Methods for the Examination of Water and Wastewater, 13th Edition	1971			Standard Methods
Standard Methods	7500-Ra B	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-Ra B	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-Ra B	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods

Contaminant	Method Organization	Method Number	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
<b><i>Naturally Occurring Radionuclides</i></b>							
<b>Radium 226</b>							
	Standard Methods	7500-Ra B	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
	Standard Methods	7500-Ra B	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
	Standard Methods	7500-Ra C	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
	Standard Methods	7500-Ra C	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
	Standard Methods	7500-Ra C	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
	Standard Methods	7500-Ra C	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
	Standard Methods	7500-Ra C	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
	Standard Methods Online	7500-Ra B-01	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
	Standard Methods Online	7500-Ra C-01	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>

Contaminant	Method	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
Organization	Number					
<b>Naturally Occurring Radionuclides</b>						
<b>Radium 226</b>						
U.S. Geological Survey	R-1140-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>
U.S. Geological Survey	R-1141-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>
<b>Radium 228</b>						
Department of Homeland Security	Ra-05	EML Procedures Manual, 27th Edition, Vol. I, Department of Energy Report HASL-300-ED.27-VOL.1	1990		DE 91010178	National Technical Information Service (NTIS)
EPA	EPA 904.0	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	EPA Ra-05	Radiochemistry Procedures Manual	December 1987	EPA 520/5-84-006	PB 84-215581	National Technical Information Service (NTIS)
EPA	Page 19 in EMSL LV 053917	Radiochemical Analytical Procedures for Analysis of Environmental Samples	March 1979		EMSL LV 053917	National Technical Information Service (NTIS)
EPA	Page 24 in EPA 600/4-75-008	Interim Radiochemical Methodology for Drinking Water	revised March 1976	EPA 600/4-75-008	PB 253258	National Technical Information Service (NTIS)

Contaminant	Method	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
Organization	Number					
<b>Naturally Occurring Radionuclides</b>						
<b>Radium 228</b>						
Georgia Institute of Technology	GA	The Determination of Radium-226 and Radium-228 in Drinking Water by Gamma-ray Spectrometry Using HPGE or Ge(Li) Detectors, Revision 1.2	December 2004			Georgia Institute of Technology
This method may be used to analyze for radium-226 and radium-228 in samples collected after January 1, 2005 to satisfy the radium-226 and radium-228 monitoring requirements specified at 40 CFR 141.26.						
NJ Department of Environmental Protection	NJ	Determination of Ra-228 in Drinking Water	August 1980			State of New Jersey Department of Environmental Protection
NY Department of Health	NY	Determination of Ra-226 and Ra-228 (Ra-02)	January 1980, Revised June 1982			Radiological Sci Inst Ctr for Lab & Research
Standard Methods	7500-Ra D	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-Ra D	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-Ra D	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7500-Ra D	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7500-Ra D	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods Online	7500-Ra D-01	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>

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Organization	Number					

### *Naturally Occurring Radionuclides*

#### **Radium 228**

U.S. Geological Survey	R-1142-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>
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#### **Uranium**

If uranium (U) is determined by mass, a 0.67 pCi/ug of uranium conversion factor must be used. This conversion factor is based on the 1:1 activity ratio of U-234 and U-238 that is characteristic of naturally occurring uranium.

ASTM International	D2907-97	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
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ASTM International	D3972-02	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
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ASTM International	D3972-09	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
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ASTM International	D3972-97	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
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ASTM International	D5174-02	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
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ASTM International	D5174-07	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
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ASTM International	D5174-97	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
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ASTM International	D5673-03	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
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ASTM International	D5673-05	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
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<b>Uranium</b>		If uranium (U) is determined by mass, a 0.67 pCi/ug of uranium conversion factor must be used. This conversion factor is based on the 1:1 activity ratio of U-234 and U-238 that is characteristic of naturally occurring uranium.				
Department of Homeland Security	U-02	EML Procedures Manual, 27th Edition, Vol. I, Department of Energy Report HASL-300-ED.27-VOL.1	1990		DE 91010178	National Technical Information Service (NTIS)
Department of Homeland Security	U-02	EML Procedures Manual, 28th Edition, Vol. I, Department of Energy Report HASL-300	1997		PB97-162549	<a href="http://www.eml.st.dhs.gov/publications">http://www.eml.st.dhs.gov/publications</a>
Department of Homeland Security	U-04	EML Procedures Manual, 27th Edition, Vol. I, Department of Energy Report HASL-300-ED.27-VOL.1	1990		DE 91010178	National Technical Information Service (NTIS)
Department of Homeland Security	U-04	EML Procedures Manual, 28th Edition, Vol. II, Department of Energy Report HASL-300	1997		PB97-162549	<a href="http://www.eml.st.dhs.gov/publications">http://www.eml.st.dhs.gov/publications</a>
EPA	200.8 Rev 5.4	In Methods for the Determination of Metals in Environmental Samples Supplement 1	May 1994	EPA/600/R-94/111	PB95-125472	<a href="http://www.nemi.gov">http://www.nemi.gov</a>
EPA	EPA 00-07	Radiochemistry Procedures Manual	December 1987	EPA 520/5-84-006	PB 84-215581	National Technical Information Service (NTIS)
EPA	EPA 908.0	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	EPA 908.1	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	Page 33 in EMSL LV 053917	Radiochemical Analytical Procedures for Analysis of Environmental Samples	March 1979		EMSL LV 053917	National Technical Information Service (NTIS)
Standard Methods	3125	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods

Contaminant	Method	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
Organization	Number					

### *Naturally Occurring Radionuclides*

#### Uranium

If uranium (U) is determined by mass, a 0.67 pCi/ug of uranium conversion factor must be used. This conversion factor is based on the 1:1 activity ratio of U-234 and U-238 that is characteristic of naturally occurring uranium.

Standard Methods	7500-U B	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-U B	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-U B	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7500-U B	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7500-U B	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods	7500-U C	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-U C	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-U C	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7500-U C	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7500-U C	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods Online	7500-U B-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>

Contaminant	Method	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
Organization	Number					

### *Naturally Occurring Radionuclides*

#### **Uranium**

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Standard Methods Online	7500-U C-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
U.S. Geological Survey	R-1180-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>
U.S. Geological Survey	R-1181-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>
U.S. Geological Survey	R-1182-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>

### *Man-made Radionuclides*

#### **Gamma Emitters**

ASTM International	D3649-06	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
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Contaminant Organization	Method Number	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
<b><i>Man-made Radionuclides</i></b>						
<b>Gamma Emitters</b>						
ASTM International	D3649-91	Annual Book of ASTM Standards, Vol. 11.02				ASTM International (ASTM)
ASTM International	D3649-98a	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D4785-00a	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D4785-08	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D4785-93	Annual Book of ASTM Standards, Vol. 11.02				ASTM International (ASTM)
Department of Homeland Security	4.5.2.3	EML Procedures Manual, 27th Edition, Vol. I, Department of Energy Report HASL-300-ED.27-VOL.1	1990		DE 91010178	National Technical Information Service (NTIS)
Department of Homeland Security	Ga-01-R	EML Procedures Manual, 28th Edition, Vol. I, Department of Energy Report HASL-300	1997		PB97-162549	<a href="http://www.eml.st.dhs.gov/publications">http://www.eml.st.dhs.gov/publications</a>
EPA	EPA 901.0	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	EPA 901.1	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	EPA 902.0	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	Page 92 in EMSL LV 053917	Radiochemical Analytical Procedures for Analysis of Environmental Samples	March 1979		EMSL LV 053917	National Technical Information Service (NTIS)
Standard Methods	7120	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods

Contaminant Organization	Method Number	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
<b><i>Man-made Radionuclides</i></b>						
<b>Gamma Emitters</b>						
Standard Methods	7120	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7120	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods	7500-Cs B	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-Cs B	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-Cs B	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7500-Cs B	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7500-Cs B	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods	7500-I B	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-I B	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-I B	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7500-I B	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7500-I B	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods

Contaminant	Method	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
Organization	Number					

### *Man-made Radionuclides*

#### **Gamma Emitters**

Standard Methods Online	7120-97	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
Standard Methods Online	7500-Cs B-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
Standard Methods Online	7500-I B-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
U.S. Geological Survey	R-1110-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>

#### **Radioactive Cesium**

ASTM International	D2459-72	Annual Book of ASTM Standards, Vol. 11.02				ASTM International (ASTM)
ASTM International	D3649-06	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D3649-91	Annual Book of ASTM Standards, Vol. 11.02				ASTM International (ASTM)

Contaminant Organization	Method Number	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
<b>Man-made Radionuclides</b>						
<b>Radioactive Cesium</b>						
ASTM International	D3649-98a	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
Department of Homeland Security	4.5.2.3	EML Procedures Manual, 27th Edition, Vol. I, Department of Energy Report HASL-300-ED.27-VOL.1	1990		DE 91010178	National Technical Information Service (NTIS)
Department of Homeland Security	Ga-01-R	EML Procedures Manual, 28th Edition, Vol. I, Department of Energy Report HASL-300	1997		PB97-162549	<a href="http://www.eml.st.dhs.gov/publications">http://www.eml.st.dhs.gov/publications</a>
EPA	EPA 901.0	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	EPA 901.1	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	Page 4 in EPA 600/4-75-008	Interim Radiochemical Methodology for Drinking Water	revised March 1976	EPA 600/4-75-008	PB 253258	National Technical Information Service (NTIS)
EPA	Page 92 in EMSL LV 053917	Radiochemical Analytical Procedures for Analysis of Environmental Samples	March 1979		EMSL LV 053917	National Technical Information Service (NTIS)
Standard Methods	7120	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7120	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7120	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods	7500-Cs B	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-Cs B	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods

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Organization	Number					
<b><i>Man-made Radionuclides</i></b>						
<b>Radioactive Cesium</b>						
Standard Methods	7500-Cs B	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7500-Cs B	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7500-Cs B	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods Online	7120-97	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
Standard Methods Online	7500-Cs B-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
U.S. Geological Survey	R-1110-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>
U.S. Geological Survey	R-1111-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>

Contaminant	Method	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
Organization	Number					
<b>Man-made Radionuclides</b>						
<b>Radioactive Iodine</b>						
ASTM International	D3649-06	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D3649-91	Annual Book of ASTM Standards, Vol. 11.02				ASTM International (ASTM)
ASTM International	D3649-98a	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D4785-00a	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D4785-08	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D4785-93	Annual Book of ASTM Standards, Vol. 11.02				ASTM International (ASTM)
Department of Homeland Security	4.5.2.3	EML Procedures Manual, 27th Edition, Vol. I, Department of Energy Report HASL-300-ED.27-VOL.1	1990		DE 91010178	National Technical Information Service (NTIS)
Department of Homeland Security	Ga-01-R	EML Procedures Manual, 28th Edition, Vol. I, Department of Energy Report HASL-300	1997		PB97-162549	<a href="http://www.eml.st.dhs.gov/publications">http://www.eml.st.dhs.gov/publications</a>
EPA	EPA 901.1	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	EPA 902.0	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	Page 6 in EPA 600/4-75-008	Interim Radiochemical Methodology for Drinking Water	revised March 1976	EPA 600/4-75-008	PB 253258	National Technical Information Service (NTIS)
EPA	Page 9 in EPA 600/4-75-008	Interim Radiochemical Methodology for Drinking Water	revised March 1976	EPA 600/4-75-008	PB 253258	National Technical Information Service (NTIS)

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Organization	Number					
<b><i>Man-made Radionuclides</i></b>						
<b>Radioactive Iodine</b>						
EPA	Page 92 in EMSL LV 053917	Radiochemical Analytical Procedures for Analysis of Environmental Samples	March 1979		EMSL LV 053917	National Technical Information Service (NTIS)
Standard Methods	7120	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7120	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7120	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods	7500-I B	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-I B	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-I B	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7500-I B	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7500-I B	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods	7500-I C	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-I C	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-I C	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods

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Organization	Number					
<b><i>Man-made Radionuclides</i></b>						
<b>Radioactive Iodine</b>						
Standard Methods	7500-I C	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7500-I C	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods	7500-I D	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-I D	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-I D	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7500-I D	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7500-I D	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods Online	7120-97	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
Standard Methods Online	7500-I B-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>

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<b>Man-made Radionuclides</b>						
<b>Radioactive Iodine</b>						
Standard Methods Online	7500-I C-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
Standard Methods Online	7500-I D-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
<b>Radioactive Strontium 89 and 90</b>						
Department of Homeland Security	Sr-01	EML Procedures Manual, 27th Edition, Vol. I, Department of Energy Report HASL-300-ED.27-VOL.1	1990		DE 91010178	National Technical Information Service (NTIS)
Department of Homeland Security	Sr-01	EML Procedures Manual, 28th Edition, Vol. II, Department of Energy Report HASL-300	1997		PB97-162549	<a href="http://www.eml.st.dhs.gov/publications">http://www.eml.st.dhs.gov/publications</a>
Department of Homeland Security	Sr-02	EML Procedures Manual, 27th Edition, Vol. I, Department of Energy Report HASL-300-ED.27-VOL.1	1990		DE 91010178	National Technical Information Service (NTIS)
Department of Homeland Security	Sr-02	EML Procedures Manual, 28th Edition, Vol. II, Department of Energy Report HASL-300	1997		PB97-162549	<a href="http://www.eml.st.dhs.gov/publications">http://www.eml.st.dhs.gov/publications</a>
EPA	EPA 905.0	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	EPA Sr-04	Radiochemistry Procedures Manual	December 1987	EPA 520/5-84-006	PB 84-215581	National Technical Information Service (NTIS)

Contaminant Organization	Method Number	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
<b><i>Man-made Radionuclides</i></b>						
<b>Radioactive Strontium 89 and 90</b>						
EPA	Page 29 in EPA 600/4-75-008	Interim Radiochemical Methodology for Drinking Water	revised March 1976	EPA 600/4-75-008	PB 253258	National Technical Information Service (NTIS)
EPA	Page 65 in EMSL LV 053917	Radiochemical Analytical Procedures for Analysis of Environmental Samples	March 1979		EMSL LV 053917	National Technical Information Service (NTIS)
Standard Methods	303	Standard Methods for the Examination of Water and Wastewater, 13th Edition	1971			Standard Methods
Standard Methods	7500-Sr B	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-Sr B	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-Sr B	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7500-Sr B	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods
Standard Methods	7500-Sr B	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods Online	7500-Sr B-01	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
U.S. Geological Survey	R-1160-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>

Contaminant Organization	Method Number	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
<b><i>Man-made Radionuclides</i></b>						
<b>Tritium</b>						
ASTM International	D4107-08	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
ASTM International	D4107-91	Annual Book of ASTM Standards, Vol. 11.02				ASTM International (ASTM)
ASTM International	D4107-98 (Reapproved 2002)	Annual Book of ASTM Standards, Vol. 11.02				<a href="http://www.astm.org">http://www.astm.org</a>
EPA	EPA 906.0	Prescribed Procedures for Measurement of Radioactivity in Drinking Water	August 1980	EPA 600/4-80-032	PB 80-224744	National Technical Information Service (NTIS)
EPA	EPA H-02	Radiochemistry Procedures Manual	December 1987	EPA 520/5-84-006	PB 84-215581	National Technical Information Service (NTIS)
EPA	Page 34 in EPA 600/4-75-008	Interim Radiochemical Methodology for Drinking Water	revised March 1976	EPA 600/4-75-008	PB 253258	National Technical Information Service (NTIS)
EPA	Page 87 in EMSL LV 053917	Radiochemical Analytical Procedures for Analysis of Environmental Samples	March 1979		EMSL LV 053917	National Technical Information Service (NTIS)
Standard Methods	306	Standard Methods for the Examination of Water and Wastewater, 13th Edition	1971			Standard Methods
Standard Methods	7500-3H B	Standard Methods for the Examination of Water and Wastewater, 17th Edition	1989			Standard Methods
Standard Methods	7500-3H B	Standard Methods for the Examination of Water and Wastewater, 18th Edition	1992			Standard Methods
Standard Methods	7500-3H B	Standard Methods for the Examination of Water and Wastewater, 19th Edition	1995			Standard Methods
Standard Methods	7500-3H B	Standard Methods for the Examination of Water and Wastewater, 20th Edition	1998			Standard Methods

Contaminant	Method	Reference Title	Date	EPA Publication Number	Publication Order Number	Source of Method
Organization	Number					
<b><i>Man-made Radionuclides</i></b>						
<b>Tritium</b>						
Standard Methods	7500-3H B	Standard Methods for the Examination of Water and Wastewater, 21st Edition	2005			Standard Methods
Standard Methods Online	7500-3H B-00	Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.				<a href="http://www.standardmethods.org/">http://www.standardmethods.org/</a>
U.S. Geological Survey	R-1171-76	Methods for the Determination of Radioactive Substances in Water and Fluvial Sediments, in USGS Series: Techniques of Water-Resource Investigation Report Number: 05-A5; by Thatcher, L.L., Janzer, V.J., and Edwards, K.W.	1977		05-A5	<a href="http://infotrek.er.usgs.gov/pubs/">http://infotrek.er.usgs.gov/pubs/</a>

**Contact information for methods that are not available on the Internet are summarized in the report titled "Sources of Approved Analytical Methods for National Drinking Water Regulations."**