

RADIONUCLIDE RULE MONITORING AND REPORTING JOB AID

GROSS ALPHA, RADIUM-226, RADIUM-228, AND URANIUM

Abbreviations:

CE = Counting Error
CWS = Community Water System
EP = Entry Point
EPA = Environmental Protection Agency
GA = Gross Alpha
MCL = Maximum Contaminant Level
M/R = Monitoring/Reporting
RAA = Running Annual Average

MCLs and Detection Limits

Contaminant	MCL	EPA Method Detection Limit
Gross Alpha particle	15 pCi/L ¹	3 pCi/L
Radium-226		1 pCi/L
Radium-228		1 pCi/L
Combined radium 226/228 ²	5 pCi/L	
Uranium ³	30 µg/L	1 µg/L

¹ The MCL for gross alpha does not include radon or uranium. If a gross alpha result exceeds the MCL, uranium (and radon if a non-evaporative procedure was used) should be analyzed and reported. DEP will subtract uranium from gross alpha to determine the adjusted gross alpha value. The adjusted value can be used to determine compliance and the new monitoring frequency.

² Combined radium-226/228 is used to determine compliance and the next monitoring frequency. Radium-226 and radium-228 will always be on the same monitoring frequency.

³ Uranium mass (µg/L) to activity (pCi/L) conversion factor = 0.67 pCi/µg.
Laboratories are required to report uranium in activity (pCi/L)

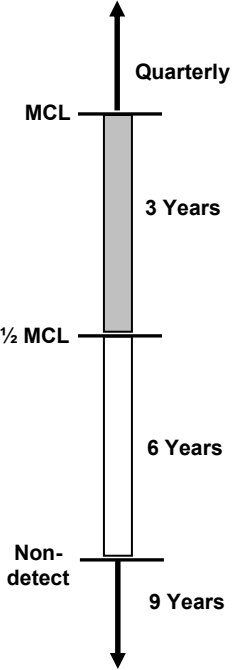
Radionuclides Monitoring and Reporting Requirements for Gross Alpha, Ra-226, Ra-228, and Uranium

Table 1 - Initial Monitoring and Reporting (All CWSs):

Start Date for Initial Monitoring	Contaminants	Required Sampling	Options for Analysis	It is a violation if:	Continuation of Initial Monitoring	Report:
Population Served: >3,300 = January 1, 2005 500 to 3,300 = January 1, 2006 < 500 = January 1, 2007 New entry points with new sources begin monitoring the quarter after they start to serve the public	Gross alpha particle, uranium, radium-226, and radium-228 (combined ra-226/228 used for compliance) May substitute gross alpha (GA) for radium-226, if GA plus counting error (CE) ≤ 5 pCi/L ¹ May substitute GA for uranium, if GA plus CE ≤ 15 pCi/L ¹	4 consecutive quarters at each EP for each contaminant Shortened Sampling Option: If the first two quarterly samples for any contaminant at an EP is non-detect, the final two quarters are waived.	Quarterly for each contaminant to determine running annual average (RAA) OR Composite of 4 quarters from a single EP	MCL Quarterly Monitoring: RAA or composite result exceeds MCL for any contaminant at an entry point. M/R Major: No samples collected and/or reported during initial monitoring period Minor: Some, but not all samples collected during initial monitoring period	If the RAA of any contaminant at an entry point exceeds the MCL during initial monitoring, continue quarterly until 4 consecutive quarterly results are <u>less than or equal to</u> the MCL value.	On SDWA-4 form: <ul style="list-style-type: none"> • Quarterly results for each contaminant (state will determine running annual average) OR <ul style="list-style-type: none"> • For each contaminant, same composite result on four separate forms (one for each quarter) NOTE: Substituted values for uranium or radium-226 will not be reported. State will determine if the gross alpha result can be substituted. Results less than the EPA detection limit, report as zero (0).

¹ If gross alpha is less than the detection limit, use 1.5 pCi/L as the substitution value. Detection limit is defined as the EPA method detection limits shown on Page 1.

Table 2 - Repeat Monitoring and Reporting (All CWSs)¹:

Contaminants	Monitoring Frequencies	Monitoring Year	It is a violation if:	Report:
<p>Gross alpha particle, uranium, radium-226, and radium-228 (combined Ra-226/228 used for compliance)</p> <p>May substitute gross alpha (GA) for radium-226, if GA plus counting error (CE) ≤ 5 pCi/L²</p> <p>May substitute GA for uranium, if GA plus CE ≤ 15 pCi/L¹</p>	<p>Repeat³ monitoring at an EP is based on the most recent sampling results at that EP. If RAA of quarterly results, or if single repeat sample results are⁴:</p> <p>Non-detect: 1 sample 9 years from most recent year of required monitoring</p> <p>Detected, but $\leq \frac{1}{2}$ MCL: 1 sample 6 years from most recent year of required monitoring</p> <p>$> \frac{1}{2}$ MCL to \leq MCL: 1 sample 3 years from most recent year of required monitoring</p> <p>Increased monitoring if:</p> <p>Any single sample exceeds the MCL value, begin quarterly monitoring (starting with the next calendar quarter) until 4 consecutive quarterly results are below the MCL level. Then return to repeat monitoring schedule based on RAA of last 4 quarters.</p> 	<p>The repeat monitoring year is based on the year in which you previously sampled for a contaminant. For complete explanation, see <i>Table 3 – Repeat Monitoring: When to Monitor</i>.</p>	<p>MCL RAA of quarterly (increased) monitoring exceeds the MCL.</p> <p>Any single repeat sample result exceeds 4 times the MCL value.</p> <p>M/R Major: No samples collected and/or reported during a monitoring period Minor: Some, but not all samples collected during a monitoring period</p>	<p>All sample results for each contaminant at each entry point in SDWA-4 format.</p> <p>NOTE: Substituted values for uranium or radium-226 will not be reported. State will determine if the gross alpha result can be substituted.</p> <p>Results less than the EPA detection limit, report as zero (0).</p>

¹ If an EP has treatment installed, repeat monitoring does not apply for the treated contaminant at that EP. The system must complete compliance monitoring annually for the treated contaminant at that EP.

² If gross alpha is less than detection, use 1.5 pCi/L. Detection limit is defined as the EPA method detection limits shown on Page 1.

³ Repeat monitoring rules do not apply to entry points where treatment has been installed for radionuclide removal.

⁴ If more than 1 sample collected during a quarter when on quarterly monitoring or more than 1 sample during year when on 3, 6, or 9 frequency, average all samples.

Table 3 – Repeat Monitoring: When to Monitor

Based on the results of initial monitoring, DEP's data system will store the next required monitoring year for each contaminant. The contaminant must be sampled in this required year. Sampling early will not reset the monitoring frequency. After each repeat monitoring year, the monitoring frequency and next required monitoring year are reset. You can use the table below to help you determine the next monitoring year.

Table Instructions:

1. In column 1, find the row that corresponds to the most recent required monitoring year for each contaminant. For initial monitoring, the most recent required year is based on population, as shown below.
2. Move across the row to the column that corresponds to the required frequency for each contaminant to find your next required monitoring year.
3. Repeat for each contaminant at each entry point.

Most Recent Required Monitoring Year ¹	Next Required Monitoring Year		
	Required to take 1 sample 3 years from most recent year of required monitoring, (from Table 2, Column 2) sample in:	Required to take 1 sample 6 years from most recent year of required monitoring (from Table 2, Column 2) sample in:	Required to take 1 sample 9 years from most recent year of required monitoring (from Table 2, Column 2) sample in:
2005 (Initial Mon. for >3,300)	2008	2011	2014
2006 (Initial Mon. for pop'n served of 500 to 3,300)	2009	2012	2015
2007 (Initial Mon. for <500)	2010	2013	2016
2008	2011	2014	2017
2009	2012	2015	2018
2010	2013	2016	2019
2011	2014	2017	2020
2012	2015	2018	2021
2013	2016	2019	2022
2014	2017	2020	2023
2015	2018	2021	2024
2016	2019	2022	2025
2017	2020	2023	2026
2018	2021	2024	2027
2019	2022	2025	2028
2020	2023	2026	2029
2021	2024	2027	2030
2022	2025	2028	2031
2023	2026	2029	2032
2024	2027	2030	2033
2025	2028	2031	2034

¹ If an EP must continue quarterly monitoring (per column 6 of Table 1), the year in which the EP achieves four quarters below the MCL becomes the "Most Recent Required Monitoring Year."