Maxxam
A Bureau Veritas Group Company

ENVIRONMENTAL SERVICES

ANALYSIS OF RADIOACTIVITY IN WATER

Radioactivity can occur naturally in water due to dissolved uranium, thorium and their daughter isotopes. Health Canada's Guidelines for Canadian Drinking Water Quality (2014) lists six radionuclides that are commonly detected in water. Health Canada has established maximum acceptable concentrations in drinking water for two natural and four artificial radionuclides and for total uranium in chemical form (analyzed using Maxxam's standard analysis for metals).

The radionuclides most commonly detected in our radiological analysis of Canadian drinking water are:

- Natural: Lead-210 (^{210}Pb), Radium-226 (^{226}Ra)
- Artificial: Tritium, Strontium-90(^{90}Sr), Iodine-131 (^{131}I), Cesium-137 (^{137}Cs)

Health Canada Guidelines

Maxxam performs radiological testing of water samples for all provinces and territories following federal guidelines from Health Canada. Our analysis can be used to evaluate potential health risks associated with water quality. The results provide a starting point to assess treatment system requirements and costs. Health Canada's "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document - Radiological Parameters"(1) lists the Maximum Acceptable Concentrations (MAC) for radionuclides. There are special requirements for Ontario which are summarized in a separate section below.

Maxxam recommends an initial screening for radioactivity by measuring gross alpha and gross beta activity. Compliance with Health Canada's Guidelines may be inferred if the results for gross alpha and gross beta activity are less than 0.5 Bq/L and 1 Bq/L, respectively (^{226}Ra for alpha activity; ^{90}Sr for beta activity). Maxxam's detection limits are below these levels unless the drinking water contains >300 mg/L of dissolved solids. When the gross alpha activity concentration exceeds 0.5 Bq/L or the gross beta activity concentration exceeds 1 Bq/L, Maxxam will make recommendations for further sampling, identification and quantification of the specific radionuclides that are at the source of the elevated results.

Special Guidelines for Ontario

Maxxam is the only commercial laboratory licensed by the Ontario Ministry of the Environment (MOE) for radionuclide analysis on drinking water samples. Ontario drinking water samples require special handling. A special submission form is required for the analysis of water samples for human consumption in Ontario (unless the water supply is federally regulated).

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"We recommend an inexpensive, initial screening for radioactivity by determining the gross alpha and gross beta activity. This shows the level of radioactivity in the water but not the specific radioisotopes. Health Canada suggests that compliance with the guidelines may be inferred if the measurements for gross alpha and gross beta activity are less than 0.5 Bq/L and 1 Bq/L, respectively."

– Steven Simpson, B.Sc./MBA
Lab Director

Maxxam is the Canadian market leader in analytical services and solutions to the energy, environmental, food and DNA industries and a member of the Bureau Veritas Group of companies – a world leader in testing, inspection and certification services. We support critical decisions made by our customers through the application of rigorous science and the knowledge and expertise of our over 2500 employees.

For more information please contact:
Email: rad@maxxam.ca or
Call us toll-free: 1 877 726 3080

Maxxam provides measurements of the over 70 radionuclides listed in the Ontario Safe Drinking Water Act. Specific regulations vary by municipality, but we typically recommend starting with the "Ontario Radionuclide Screen" for gross alpha, gross beta and Tritium. We also offer the "Ontario MOE Certificate of Approval Analysis package". Both services are offered to comply with O.Reg 170/03 and require the submission of a Chain of Custody document BQL FCD-00080 "Drinking Water Chain of Custody Record for Radiological Parameters".(2)

Logistics

All water samples for radioactivity analysis are processed by Maxxam's laboratory in Mississauga, Ontario. Standard turn-around-time (TAT) is 10 working days (2 weeks) from date of receipt at the lab. The turn-around-time for ^{210}Pb is typically 3 weeks and the TAT for multiple isotopes is 3-4 weeks.

The Maxxam Advantage

Experience: Test protocols are conducted using proven technologies operated by our highly experienced staff of scientists and technicians. With over 30 years of experience, Maxxam's experts in radiological analysis can provide advice on applying the appropriate analytical method(s) to meet your requirements. Upon request, we can also customize analysis packages to meet your objectives.

Quality: Maxxam has a strong Quality Management System (QMS) which encompasses both quality assurance and quality control. More than 30 people are employed on Maxxam's Quality Assurance (QA) team as Regional Managers, Specialists and Coordinators. QA staff are responsible for carrying out the monitoring, documentation and training required by the company's QMS. To ensure independence, integrity and effectiveness of their functions, these employees report to the National Director of Quality, who reports directly to Maxxam's CEO.

NOTES:

(1) http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/radiological_para-radiologiques/index-eng.php

(2) http://maxxam.ca/resources/chain-of-custody-coc-forms

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