



**Summary of Substantive Changes
between the 2018 and the 2019 editions of
NSF/ANSI/CAN 60 “Drinking Water Treatment Chemicals – Health Effects”**

Presented to the IAPMO Standards Review Committee on December 16, 2019

General: The changes to this standard should not have an impact on currently listed products. The substantive changes are:

- Expanded the scope to include remineralization to the processes covered by drinking water treatment chemicals (see Sections 5.1, and 5.2.6)
- Changed the primary use of sodium chlorate to chlorine dioxide production instead of disinfection and oxidation and added footnote 11 to Table 6.2 to explain the uses of these chemicals (see Table 6.2)
- Added language to normative Annex N-1 (previously Annex B) to provide guidance on how the potassium-40 correction method is conducted for radionuclide analysis, and standardizes the threshold for conducting gross beta particle speciation (see Annex N-1, sections N-1.4.4.1 and N-1.4.4.2)
- Revised Table 7.1 to lower the typical use level for fluoride products from 1.2 mg/L to 1.0 mg/L (see Table 7.1 and footnote 3)

Section 5, Chemicals for corrosion and scale control, softening, precipitation, sequestering, and pH adjustment: Expanded the scope to include remineralization to the processes covered by drinking water treatment chemicals as follows:

5.1 Coverage

This section covers chemicals and chemical blends used in drinking water treatment for softening, [remineralization](#), precipitation, and pH adjustment, and to control corrosion, scale, and metallic color problems.

5.2 Definitions

5.2.6 remineralization chemical: *A chemical used to increase dissolved mineral content in water following treatment processes (e.g., reverse osmosis, distillation) for purposes of reducing corrosion of metallic and cementitious materials, stabilizing water chemistry, providing essential minerals, and for aesthetic effects.*

(remaining sections renumbered)

Table 4.1, Coagulation and flocculation products – Product identification and evaluation: Increased (TUL) value from 16 to 100 mg/L.

Table 5.1, Chemicals for corrosion and scale control, softening, sequestering, precipitation, and pH adjustment – Product identification and evaluation: Increased (TUL) value from 16 to 100 mg/L.



Table 6.2, Disinfection and oxidation products – Product identification, and evaluation: Changed the primary use of sodium chlorate to chlorine dioxide production instead of disinfection and oxidation and added footnote 11 to explain the uses of these chemicals.

Table 7.1, Miscellaneous treatment application products – Product identification, and evaluation: The table was revised to lower the typical use level (TUL) for fluoridation products from 1.2 mg/L to 1.0 mg/L. Footnote 3 for this table was revised as follows:

³ *Based on mg fluoride ion per L water. Total concentration of fluoride ion in finished water may include fluoride which occurs naturally in the source water. ~~US Centers for Disease Control and Prevention recommends an optimal concentration of 0.7 mg/L fluoride ion in drinking water.~~*

~~Annex B~~ Normative Annex 1, Sampling, preparation, and analysis of samples: Added language to normative Annex N-1 (previously Annex B) to provide guidance on how the potassium-40 correction method is conducted for radionuclide analysis, and standardizes the threshold for conducting gross beta particle speciation as follows:

~~B-4.4~~ N-1.4.4 Radionuclides

Analyses for radionuclides shall be performed in accordance with Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, except as otherwise provided for herein. When no US EPA Method is provided, analyses shall be performed in accordance with Standard Methods for the Examination of Water and Wastewater (most current edition).

If neither of these references includes the required method, a method from another recognized source shall be allowed, and the method cited and validated. If no recognized method is available, a method shall be developed, provided the method is fully documented, including all appropriate quality assurance procedures. The method used to determine the contaminant level shall have an analytical concentration range, such that the report limit is no greater than 50% of the lowest contaminant concentration being sought. Quality control standards shall be run at concentrations of 0.5, 1.0, 2.0, 5.0, and 10.0× the target limit.

N-1.4.4.1 Potassium-40 correction for gross beta

If the normalized concentration for gross beta exceeds the health effects evaluation criteria, analysis shall be completed for the naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity. As indicated in the Code of Federal Regulations (CFR 40 §141.26 (b)(4))²⁴, the potassium-40 beta particle activity (pCi/L) is calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82. The gross beta particle and photon activity attributable to potassium-40 is then subtracted from the total gross beta particle activity value. The potassium-40 corrected gross beta particle and photon activity shall be compared against the health effects evaluation criteria.

N-1.4.4.2 Requirements for gross beta speciation

When the potassium-40 corrected gross beta particle and photon activity exceeds a normalized concentration of 15 pCi/L, the beta emitting radioisotopes shall be speciated. Speciation testing is required for all radioisotopes at risk of exceeding the health effects evaluation criteria. Appendix I in USEPA Implementation Guidance for Radionuclides (2002) details a list of radioisotopes and associated doses (in pCi/L) to produce a 4 mrem/y dose²⁵. The USEPA Implementation Guidance for Radionuclides (2002)²⁶ provides example calculations to determine the fractional contribution in mrem/yr dose for each



speciated radioisotope. The fractional contributions shall be summed for comparison to the health effects evaluation criteria.

²⁴ *Code of Federal Regulations, Monitoring Frequency and Compliance Requirements for Radionuclides in Community Water Systems, Title 40, Sec. 141.26.*

²⁵ *US EPA Implementation Guidance for Radionuclides, Appendices A through J, Appendix I Comparison of Derived Values of Beta and Photon Emitters.*

²⁶ *US EPA Implementation Guidance for Radionuclides, Section II through B.2, Violation / Compliance Determination of Gross Beta and Photon Emitters.*