

H 57



State of Wisconsin \ DEPARTMENT OF HEALTH AND SOCIAL SERVICES

February 16, 1978

DIVISION OF HEALTH  
MAIL ADDRESS: P. O. BOX 309  
MADISON, WISCONSIN 53701

IN REPLY PLEASE REFER TO:

Mr. Orlan Prestegard  
Revisor of Statutes  
411 West Capitol  
Madison, WI

RECEIVED  
FEB 22 1978  
REVISOR OF STATUTES  
BUREAU

Dear Mr. Prestegard:

As provided in Section 227.023, Wis. Stats., there is hereby submitted a certified copy of sections H 57.16 through H 57.28, Chapter H 57, Wisconsin Administrative Code. These sections are that portion of the U. S. Environmental Protection Agencies' National Primary Drinking Water Regulations pertaining to radiation, as adopted by the Secretary of the Department of Health & Social Services on November 29, 1977. In accordance with Section 227.018(3), Wis. Stats., the 30-day review by the appropriate legislative committee members expired on January 16, 1978, with no objections being raised.

These rules are being submitted to the Governor as required by Section 14.06, Wis. Stats., and to the Secretary of State as required by Section 227.023, Wis. Stats.

It is hoped that the rules can be published in the March 1978 edition of the Wisconsin Administrative Register and become effective April 1, 1978.

Sincerely,

Ralph L. Andreano, Ph.D.  
Administrator

Enclosure

STATE OF WISCONSIN )  
 ) ss  
DEPARTMENT OF HEALTH AND SOCIAL SERVICES )

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Donald E. Percy, Secretary of the Department of Health and Social Services and custodian of the official records of said department, do hereby certify that the repeal, recreation and amendments of the rules and regulations, relating to sections H 57.16 through H 57.28, Chapter H 57, Wisconsin Administrative Code were duly approved and adopted by this department on November 29, 1977.

I, further certify that to the best of my knowledge, my official representative, has compared said copy with the original on file in this department and that the same is a true copy thereof, and of the whole of such original.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the official seal of the department in the city of Madison, this 16th day of February, 1978.



Donald E. Percy, Secretary  
Department of Health & Social Services

RECEIVED  
FEB 22 1978  
1:00 pm  
REVISOR OF STATUTES  
BUREAU


SEAL

ORDER OF THE DEPARTMENT OF HEALTH & SOCIAL SERVICES ADOPTING RULES

Pursuant to authority vested in the Department of Health and Social Services in Chapter 162, Laws of 1973, and in accordance with Chapter 227, Wis. Stats., the following rules are hereby promulgated.

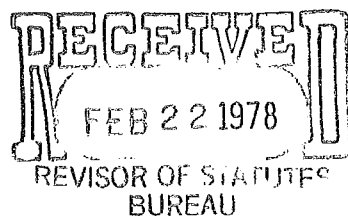
Sections H 57.16 through H 57.28, CHAPTER H 57 of the WISCONSIN ADMINISTRATIVE CODE is repealed, recreated and amended to read:

The rules contained herein shall take effect on April 1, 1978 as provided in Section 227.026(1), Wis. Stats., subject to the provisions of Section 14.06, Wis. Stats.

  
Donald E. Percy, Secretary  
Department of Health & Social Services

Dated February 16, 1978

SEAL



H 57.16 Definitions as used in sections H 57.17 through H 57.28.

(1) CONTAMINANT. Any physical, chemical, biological or radiological substance or matter in water.

(2) MAXIMUM CONTAMINANT LEVEL. The maximum permissible level of a contaminant in water which is delivered to the consumer service outlet of the ultimate user of a public water system, except in the case of turbidity where the maximum permissible level is measured at the point of entry to the distribution system. Contaminants added to the water under circumstances controlled by the user, except those resulting from corrosion of piping and plumbing caused by water quality, are excluded from this definition.

(3) PERSON. An individual, corporation, company, association, cooperative, trust, institution, partnership, state, municipality or federal agency.

(4) PUBLIC WATER SYSTEM. A system for the provision to the public of piped water for human consumption, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year. Such system includes (a) any collection, treatment, storage and distribution facilities under control of the operator of such system and used primarily in connection with such system, and (b) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. A public water system is either a "community water system" or a "non-community water system."

1. Community water system. A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

2. Non-community water system. A public water system that is not a community water system.

(5) SUPPLIER OF WATER. Any person who owns or operates a public water system.

(6) DOSE EQUIVALENT. The product of the absorbed dose from ionizing radiation and such factors as account for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the international commission on radiological units and measurements (ICRU).

(7) REM. The unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A milliren (mrem) is 1/1000 of a rem.

(8) PICOCURIE. (pCi). That quantity of radioactive material producing 2.22 nuclear transformations per minute.

(9) GROSS ALPHA PARTICLE ACTIVITY. The total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

(10) MAN-MADE BETA PARTICLE AND PHOTON EMITTERS. All radionuclides emitting beta particles and/or photons listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69, except the daughter products of thorium-232, uranium-235 and uranium-238.

(11) GROSS BETA PARTICLE ACTIVITY. The total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

(12) DEPARTMENT. The department means the department of health and social services.

H 57.17 Applicability. The provisions of sections H 57.16 through H 57.28 establish radioactivity regulations which apply to each community water system, unless the community water system meets all of the following conditions:

(1) Consists only of distribution and storage facilities (and does not have any collection and treatment facilities); and

(2) Obtains all of its water from, but is not owned or operated by, a public water system to which such regulations apply; and

(3) Does not sell water to any person; and

(4) Is not a carrier which conveys passengers in interstate commerce.

H 57.18 Maximum contaminant levels for radium-226, radium-228 and gross alpha particle radioactivity in community water systems. The following are the maximum contaminant levels for radium-226, radium-228 and gross alpha particle radioactivity:

(1) Combined radium-226 and radium-228 -- 5 pCi/l.

(2) Gross alpha particle activity (including radium-226 but excluding radon and uranium) -- 15 pCi/l.

H 57.19 Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in community water systems.

(1) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year.

(2) Except for the radionuclides listed in Table A, the concentration of man-made radionuclides causing 4 mrem total body for organ dose equivalents shall be calculated on the basis of a 2 liter per day drinking water intake using the 168 hour date listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NSB Handbook 69, as amended August 1963, U.S. department of commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 millirem/year.

Table A - Average annual concentrations assumed to produce a total body or organ dose of 4 mrem/year

Radionuclide	Critical Organ	pCi per liter
Tritium	Total body	20,000
Strontium-90	Bone marrow	8

H 57.20 Analytical methods for radioactivity. (1) The methods specified in Interim Radiochemical Methodology for Drinking Water, Environmental Monitoring and Support Laboratory, EPA-600/4-75-008, USEPA, Cincinnati, Ohio 45268, or those listed below, are to be used to determine compliance with sections H 57.18 and H 57.19 except in cases where alternative methods have been approved in accordance with section H 57.22.

(a) Gross Alpha and Beta -- Method 302 "Gross Alpha and Beta in Water" Standard Methods for the Examination of Water and Wastewater, 13th edition American Public Health Association, New York, New York, 1971.

(b) Total Radium -- Method 304 "Radium in Water by Precipitation" *ibid.*

(c) Radium-226 -- Method 305 "Radium-226 by Radon in Water" *ibid.*

(d) Strontium-89, 90 -- Method 303 "Total Strontium and Strontium-90 in Water" *ibid.*

(e) Tritium -- Method 306 "Tritium in Water" *ibid.*

(f) Cesium-134 -- ASTM D-2459 "Gamma Spectrometry in Water," 1975 Annual Book of ASTM Standards, Water and Atmospheric Analysis, Part 31, American Society for Testing and Materials, Philadelphia, PA (1975).



(g) Uranium -- ASTM D-2907 "Microquantities of Uranium in Water by Fluorometry," ibid.

(2) When the identification and measurement of radionuclides other than those listed in subsection (1) is required, the following references are to be used, except in cases where alternative methods have been approved in accordance with section H 57.22.

(a) Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions, H. L. Krieger and S. Gold, EPA-R4-73-014. USEPA, Cincinnati, Ohio, May 1973.

(b) HASL procedure Manual, Edited by John H. Harley, HASL 300, ERDA Health and Safety Laboratory, New York, New York, 1973.

(3) For the purpose of monitoring radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of plus or minus 100 percent at the 95 percent confidence level ( $1.96\sigma$  where  $\sigma$  is the standard deviation of the net counting rate of the sample).

(a) To determine compliance with section H 57.18 (1) the detection limit shall not exceed 1 pCi/l. To determine compliance with subsection H 57.18(2), the detection limits shall not exceed 3 pCi/l.

(b) To determine compliance with section H 57.19 the detection limits shall not exceed the concentrations listed in Table B.

Table B

Detection Limits for Man-Made Beta Particle and Photon Emitters

Radionuclide	Detection Limit
Tritium	1,000 pCi/l
Strontium-89	10 pCi/l
Strontium-90	2 pCi/l
Iodine-131	1 pCi/l
Cesium-134	10 pCi/l
Gross beta	4 pCi/l
Other radionuclides	1/10 of the applicable limit

(4) To judge compliance with the maximum contaminant levels listed in sections H 57.18 and H 57.19 averages of data shall be used and shall be rounded to the same number of significant figures as the maximum contaminant level for the substance in question.

Note: The publications referred to in this section are available for inspection at the office of the department of health and social services, the secretary of state's office and the office of the revisor of statutes.

H 57.21 Monitoring frequency for radioactivity in community water systems.

(1) Monitoring requirements for gross alpha particle activity, radium-226 and radium-228.

(a) Initial sampling to determine compliance with section H 57.18 shall begin by June 24, 1979 and the analysis shall be completed by June 24, 1980. Compliance shall be based on the analysis of an annual composite of four consecutive quarterly samples or the average of the analyses of four samples obtained at quarterly intervals.

1. A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis provided that the measured gross alpha particle activity does not exceed 5 pCi/l at a confidence level of 95% ( $1.96\sigma$  where  $\sigma$  is the standard deviation of the net counting rate of the sample). In localities where radium-228 may be present in drinking water, the department may require radium-226 and/or radium-228 analyses when the gross alpha particle activity exceeds 2 pCi/l.

2. When the gross alpha particle activity exceeds 5 pCi/l, the same or an equivalent sample shall be analyzed for radium-226. If the concentration of radium-226 exceeds 3 pCi/l, the same or an equivalent sample shall be analyzed for radium-228.

(b) For the initial analysis required by subsection H 57.21(1)(a), data acquired after June 24, 1976 may be substituted at the discretion of the department.

(c) Suppliers of water shall monitor at least once every four years following the procedure required by subsection H 57.21(1)(a). At the discretion of the department, when an annual record taken in conformance with subsection H 57.21(1)(a) has established that the average annual concentration is less than half the maximum contaminant levels established by section H 57.18, analysis of a single sample may be substituted for the quarterly sampling procedure required by subsection H 57.21(1)(a).

1. More frequent monitoring shall be conducted when ordered by the department in the vicinity of mining or other operations which may contribute alpha particle radioactivity to either surface or groundwater sources of drinking water.

2. A supplier of water shall monitor in conformance with subsection H 57.21(1)(a) within one year of the introduction of a new water source for a community water system. More frequent monitoring shall be conducted when ordered by the department in the event of possible contamination or when changes in the distribution system or treatment processing occur which may increase the concentration of radioactivity in finished water.

3. A community water system using two or more sources having different concentrations of radioactivity shall monitor source water, in addition to water from a free-flowing tap, when required by the department.

4. Monitoring for compliance with section H 57.18 after initial period need not include radium-228 except when required by the department, provided that the average annual concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by subsection H 57.21(1)(a).

5. Suppliers of water shall conduct annual monitoring of any community water system in which the radium-226 concentration exceeds 3 pCi/l, when required by the department.

(d) If the average annual maximum contaminant level for gross alpha particle activity or total radium as set forth in section H 57.18 is exceeded, the supplier of a community water system shall give notice to the department pursuant to section H 57.25 and notify the public as required by section H 57.26. Monitoring at quarterly intervals shall be continued until the annual average concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(2) Monitoring requirements for man-made radioactivity in community water systems.

(a) By June 24, 1979 systems using surface water sources and serving more than 100,000 persons and such other community water systems as are designated by the department shall be monitored for compliance with section H 57.19 by analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. Compliance with section H 57.19 may be assumed without further analysis if the average annual concentration of gross beta particle activity is less than 50 pCi/l and if the average annual concentrations of tritium and strontium-90 are less than those listed in Table A, provided, that if both radionuclides are present the sum of their annual dose equivalents to bone marrow shall not exceed 4 millirem/year.

1. If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with section H 57.19.

2. Suppliers of water shall conduct additional monitoring, as required by the department, to determine the concentration of man-made radioactivity in principal watersheds designated by the department.

3. At the discretion of the department suppliers of water utilizing only groundwaters may be required to monitor for man-made radioactivity.

(b) For the initial analysis required by subsection H 57.21(2)(a) data acquired since June 24, 1976 may be substituted at the discretion of the department.

(c) After the initial analysis required by subsection H 57.21(2)(a) suppliers of water shall monitor at least every four years following the procedure given in subsection H 57.21(2)(a).

(d) By June 24, 1979 the supplier of any community water system designated by the department as utilizing waters subject to contamination by effluents from nuclear facilities shall initiate quarterly monitoring for gross beta particle and iodine-131 radioactivity and annual monitoring for strontium-90 and tritium.

1. Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended. If the gross beta particle activity in a sample exceeds 15 pCi/l, the same or an equivalent sample shall be analyzed for strontium-89 and cesium-134. If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with section H 57.19.

2. For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As required by the department, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

3. Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples.

4. The department may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man-made radioactivity by the supplier of water where the department determines such data is applicable to a particular community water system.

(e) If the average annual maximum contaminant level for man-made radioactivity set forth in section H 57.19 is exceeded, the operator of a community water system shall give notice to the department pursuant to section H 57.25 and to the public as required by section H 57.26. Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

H 57.22 Alternative analytical techniques. With the written permission of the department, concurred in by the administrator of the U.S. environmental protection agency, an alternative analytical technique may be employed. An alternative technique shall be acceptable only if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with any maximum contaminant level. The use of the alternative analytical technique shall not decrease the frequency of monitoring required by section H 57.21.

H 57.23 Approved laboratories. For the purpose of determining compliance with sections H 57.17 through H 57.22, samples may be considered only if they have been analyzed by the department's laboratory or a laboratory approved by the department.

H 57.24 Monitoring of consecutive public water systems. When a public water system supplies water to one or more other public water systems, the department of natural resources may modify the monitoring requirements imposed by this section to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the department of natural resources and concurred in by the administrator of the U.S. environmental protection agency.

H 57.25 Reporting requirements. (1) Except where a shorter reporting period is specified in this section, the supplier of water shall report to the department within 40 days following a test, measurement or analysis required to be made by sections H 57.16 through H 57.26, the results of that test, measurement or analysis.

(2) The supplier of water shall report to the department within 48 hours the failure to comply with any primary drinking water regulation (including failure to comply with monitoring requirements) set forth in sections H 57.16 through H 57.26.

(3) The supplier of water is not required to report analytical results to the department when the department performs the analysis and reports the results to the department.

H 57.26 Public notification. Public notification shall be provided as prescribed in section NR 109.81, Wisconsin Administrative Code.

H 57.27 Record maintenance. The supplier of water shall maintain records as prescribed by section NR 109.82, Wisconsin Administrative Code.

H 57.28 Variance and exemptions. Variances and exemptions may be granted from any requirement respecting a maximum contaminant level for radioactivity as prescribed in sections NR 109.90 through NR 109.98, Wisconsin Administrative Code.

11/14/77