

ILLINOIS POLLUTION CONTROL BOARD  
August 24, 1978

IN THE MATTER OF: )  
 )  
AMENDMENTS TO CHAPTER 6: ) R77-13  
PUBLIC WATER SUPPLIES )

INTERIM ORDER OF THE BOARD (by Mr. Dumelle):

On August 5, 1977 the Agency filed a petition to amend Chapter 6: Public Water Supplies. A great deal of the Agency's proposal would conform Chapter 6 with the National Interim Primary Drinking Water Regulations which were promulgated by the United States Environmental Protection Agency on June 24, 1977. These Federal standards have been binding and enforceable against public water supplies in Illinois since June 24, 1977.

In order to avoid conflicting State and Federal standards and to enable the Agency to obtain primary enforcement responsibility under the Safe Drinking Water Act, the Board hereby orders that Chapter 6 be amended in the following respects.

The following definitions are hereby added to Rule 104:

"Certified laboratory" means any laboratory approved by the Agency or the Illinois Department of Public Health for the specific parameters to be examined.

"Community water supply" means a public water supply which serves year-round residents.

"Dose equivalent" means 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).

"Gross alpha particle activity" means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

"Gross beta particle activity" means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

"Man-made beta particle and photon emitters" means 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.

"Non-community water supply" means a public water supply that is not a community water supply.

"Picocurie (pCi)" means that quantity of radioactive material producing 2.22 nuclear transformations per minute.

"Rem" means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A "millirem (mrem)" is 1/1000 of a rem.

"Chemical analysis" means analysis for any inorganic or organic substance, with the exception of radiological or microbiological analyses.

Rule 304 B 3 is hereby amended to read as follows:

If the result of an analysis made pursuant to these Rules indicates that the level of any contaminant listed in Table I exceeds the maximum allowable concentration, the owner or operator of the public water supply shall report to the Agency within 7 days and initiate three additional analyses at the same sampling point within one month. When the average of four analyses, rounded to the same number of significant figures as the maximum allowable concentration for the substance in question, exceeds the maximum allowable concentration, the owner or operator of the public water supply shall notify the Agency pursuant to Rule 310 B and give notice to the public pursuant to Rule 313 D of these Rules. Monitoring after public notification shall be at a frequency designated by the Agency and shall continue until the maximum allowable concentration has not been exceeded in two successive samples or until a monitoring schedule as a condition to a variance or enforcement action shall become effective.

Rule 304 B 4 is hereby amended to read as follows:

The concentration of substances listed in Table I shall not exceed in the finished water the limits listed.

Rule 304 B 4 note b is hereby amended to read as follows:

The provisions of Rule 304 B 3 notwithstanding, compliance with the maximum allowable concentration for nitrate shall be determined on the basis of the mean of two analyses. When a level exceeding the maximum allowable concentration for nitrate is found, a second analysis shall be initiated within 24 hours, and if the mean of the two analyses exceeds the maximum allowable concentration, the owner or operator of the public water supply shall report his findings to

the State pursuant to Rule 310 B and shall notify the public pursuant to Rule 313 D.

A new Rule 304 B 4, note e is hereby added which shall read as follows:

Those counties of the State north of and including the counties of Henderson, McDonough, Fulton, Tazewell, McLean, Ford and Iroquois shall have a maximum allowable concentration of 2.0 mg/l.

Rule 304 B 4, note d is hereby amended to read as follows:

Turbidity in drinking water shall not exceed one turbidity unit at the point where water enters the distribution system unless it can be demonstrated that a higher turbidity not exceeding 5 NTU does not:

- 1) interfere with disinfection, or
- 2) cause tastes and odors upon disinfection, or
- 3) prevent the maintenance of an effective disinfection agent throughout the distribution system, or
- 4) result in deposits in the distribution system, or
- 5) cause customers to question the safety of their drinking water.

The provisions of Rule 304 B 3 notwithstanding, if a turbidity measurement exceeds the maximum allowable concentration, a resample must be taken as soon as practicable, and preferably within one hour. If the check sample confirms that the standard has been exceeded, the Agency must be notified within 48 hours. The value of the check sample shall be the value used in calculating the monthly average. If the monthly average of the daily samples taken in accordance with Rule 309 D exceeds the maximum allowable concentration, or if the average of two samples taken on consecutive days exceeds 5 NTU, the owner or operator of the public water supply shall report to the Agency and notify the public as directed in Rule 310 B and Rule 313 D.

A new Rule 304 C is hereby added which shall read as follows:

#### Radiological Quality

1. Maximum allowable concentrations for radium-226, radium-228, and gross alpha particle radioactivity in community water systems.

The following are the maximum allowable concentrations for radium-226, radium-228, and gross alpha particle radioactivity:

- (a) Combined radium-226 and radium-228 - 5 pCi/l.
- (b) Gross alpha particle activity (including radium-226, but excluding radon and uranium) - 15 pCi/l.

2. Maximum allowable concentrations for beta particle and photon radioactivity from man-made radionuclides in community water systems.

(a) 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.

(b) Except for the radionuclides listed in Table II, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents shall be calculated on the basis of a 2 liter per day drinking water intake using the 168 hour data listed in "Maximum permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS 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 II. - Average annual concentrations assumed to produce a total body or organ dose of 4 mrem/yr.

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

3. To judge compliance with the maximum allowable concentrations listed in Rules 304 C 1 and 304 C 2, averages of data shall be used and shall be rounded to the same number of significant figures as the maximum allowable concentration for the substance in questions.

Table I, Rule 304 is hereby amended to read as follows:

TABLE I - MAXIMUM ALLOWABLE CONCENTRATIONS - Finished Water Quality

Substance	Reported As	Maximum Concentration mg/l
Arsenic	As	0.05
Barium	Ba	1.
Cadmium	Cd	0.010
Chromium	Cr	0.05
Color	Color Units	15.
Copper	Cu	1.
Cyanide	CN	0.2
Fluoride	F	1.8 (c)

Foaming Agents	MBAS	0.5
Iron	Fe	0.3 (a)
Lead	Pb	0.05
Manganese	Mn	0.05 (a)
Mercury	Hg	0.002
Nitrate-Nitrogen	N	10. (b)
Nitrite-Nitrogen	N	1.
Odor	Threshold Odor Number	3.
Organics		
Carbon Adsorbable		
Carbon-Chloroform Extract	CCE <sub>m</sub>	0.7 (c)
Pesticides		
Chlorinated Hydrocarbon Insecticides		
Aldrin		0.001
Chlordane		0.003
DDT		0.05
Dieldrin		0.001
Endrin		0.0002
Heptachlor		0.0001
Heptachlor Epoxide		0.0001
Lindane		0.004
Methoxychlor		0.1
Toxaphene		0.005
Organophosphate Insecticides		
Parathion		0.1
Chlorophenoxy Herbicides		
2,4-Dichlorophenoxyacetic acid (2,4-D)		0.02
2,4,5-Trichlorophenoxypropionic acid (2,4,5-TP or Silvex)		0.01
Selenium	Se	0.01
Silver	Ag	0.05
Turbidity	NTU	1.0 (d)
Zinc	Zn	5.

Rule 309 A is hereby amended to read as follows:

Representative samples of the finished water are to be submitted monthly by each community water supply owner, official custodian, or his authorized personnel to a certified laboratory for bacteriological analysis. The minimum number of samples to be submitted monthly is dependent upon the population served as shown in Table III. A greater number of samples may be required by the Agency to be analyzed each month.

It shall be the responsibility of the community water supply to have the analyses performed either at its own certified laboratory or at any other certified laboratory. The Agency may require that some or all of the monthly samples be submitted to its

laboratories.

Each non-community water supply owner, official custodian, or his authorized personnel, at the discretion of the Agency, may be required to submit one representative water sample per calendar quarter to a certified laboratory for bacteriological analysis; or at a higher frequency as determined by the Agency.

Rule 309 B is hereby amended to read as follows:

A minimum of one representative sample each of the raw and finished water is to be submitted every year to the Agency's laboratory for chemical analysis from community water supplies which utilize a surface water source. Community water supplies which utilize a ground water source are to submit such samples to the Agency for analysis at least every two years. Sampling for specific parameters may be required by the Agency more frequently whenever there is reason to believe that these parameters are or may be in excess of the limits listed in Table I, or if the presence of other dangerous or potentially dangerous substances is suspected. Non-community water supplies shall submit representative samples of raw and finished water to the Agency's laboratory for chemical analysis at frequencies required by the Agency.

A new Rule 309 C is added which shall read as follows:

Monitoring Frequency for Radioactivity in Community Water Supplies

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

(a) 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 percent ( $1.65 \sigma$  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 radium-226 and/or radium-228 analyses may be required by the Agency 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) Suppliers of water shall monitor at least once every four years. When an annual record taken in conformance with paragraph 1 (a) has established that the average annual concentration is less than half the maximum contaminant levels established by Rule 304 C 1, analysis of a single sample may be substituted for the quarterly sampling procedure required by paragraph 1 (a).

(1) More frequent monitoring shall be conducted when ordered by the Agency in the vicinity of mining or other operations.

(2) A community water supply 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 Agency.

(3) Monitoring for compliance with radium-228 levels need be done only in the initial test of each source and when specifically requested by the Agency, provided that the average annual concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by paragraph 1 (a).

(4) Owners and operators of public water supplies shall conduct annual monitoring of any community water system in which the radium-226 concentration exceeds 3 pCi/l, except when specifically exempted by the Agency.

(c) If the average annual maximum allowable concentration for gross alpha particle activity or total radium is exceeded, the owner or operator of a community water system shall give notice to the Agency pursuant to Rule 310 B and notify the public as required by Rule 313 D. 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) Systems using surface water sources and serving more than 100,000 persons and such other community water supplies as are designated by the Agency shall be monitored for compliance with Rule 304 C 2 by analysis of a composite of four consecutive quarterly samples or analysis of four

quarterly samples. Compliance with Rule 304 C 2 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 II, 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 Rule 304 C 2.

(2) Owners and operators of public water supplies shall conduct additional monitoring, as ordered by the Agency, to determine the concentration of man-made radioactivity in principal watersheds designated by the Agency.

(3) At the discretion of the Agency, owners and operators of public water supplies utilizing only ground waters may be required to monitor for man-made radioactivity.

(b) Owners and operators of public water supplies shall monitor for beta activity at least every four years.

(c) Within two years of the effective date of these regulations the owner and operator of any community water system designated by the Agency as utilizing waters contaminated 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. 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 Rule 304 C 2.

(2) For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. If ordered by the Agency, 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 of four quarterly samples.

(4) The Agency may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man-made radioactivity by the owner or operator of a community water supply where the Agency determines such data is applicable to that particular community water supply.

(d) If the average annual maximum allowable concentration for man-made radioactivity set forth in Rule 304 C 2 is exceeded, the operator of a community water supply shall give notice to the Agency pursuant to rule 310 B and to the public as required by Rule 313 D. Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the maximum allowable concentration or until a monitoring schedule as a condition to a variance or enforcement action shall become effective.

A new Rule 309 D is hereby added which shall read as follows:

Owners and operators of community and non-community water systems utilizing surface water sources shall take samples at a representative entry point to the distribution system at least once per day, and make a turbidity determination on the sample immediately. The testing of the sample shall be done by a specific individual who has been approved by the Agency as qualified to make the test.

A new Rule 309 E is hereby added which shall read as follows:

When a public water supply provides water to one or more other public water supplies, the Agency may modify the monitoring requirements imposed by this rule to the extent that the interconnection of the supplies justifies treating them as a single supply for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the Agency.

A new Table III is hereby added to Rule 309 which shall read as follows:

TABLE III - MINIMUM ALLOWABLE MONTHLY SAMPLES FOR BACTERIOLOGICAL ANALYSIS

Population Served	Minimum Number of Samples per Month
2,500 or less-----	2
2,501 to 3,300-----	3
3,301 to 4,100-----	4
4,101 to 4,900-----	5
4,901 to 5,800-----	6
5,801 to 6,700-----	7
6,701 to 7,600-----	8
7,601 to 8,500-----	9
8,501 to 9,400-----	10
9,401 to 10,300-----	11
10,301 to 11,100-----	12
11,101 to 12,000-----	13
12,001 to 12,900-----	14
12,901 to 13,700-----	15
13,701 to 14,600-----	16
14,601 to 15,500-----	17
15,501 to 16,300-----	18
16,301 to 17,200-----	19
17,201 to 18,100-----	20
18,101 to 18,900-----	21
18,901 to 19,800-----	22
19,801 to 20,700-----	23
20,701 to 21,500-----	24
21,501 to 22,300-----	25
22,301 to 23,200-----	26
23,201 to 24,000-----	27
24,001 to 24,900-----	28
24,901 to 25,000-----	29
25,001 to 28,000-----	30
28,001 to 33,000-----	35
33,001 to 37,000-----	40
37,001 to 41,000-----	45
41,001 to 46,000-----	50
46,001 to 50,000-----	55
50,001 to 54,000-----	60
54,001 to 59,000-----	65
59,001 to 64,000-----	70
64,001 to 70,000-----	75
70,001 to 76,000-----	80
76,001 to 83,000-----	85
83,001 to 90,000-----	90
90,001 to 96,000-----	95
96,001 to 111,000-----	100
111,001 to 130,000-----	110
130,001 to 160,000-----	120
160,001 to 190,000-----	130
190,001 to 220,000-----	140
220,001 to 250,000-----	150

250,001 to 290,000-----	160
290,001 to 320,000-----	170
320,001 to 360,000-----	180
360,001 to 410,000-----	190
410,001 to 450,000-----	200
450,001 to 500,000-----	210
500,001 to 550,000-----	220
550,001 to 600,000-----	230
600,001 to 660,000-----	240
660,001 to 720,000-----	250
720,001 to 780,000-----	260
780,001 to 840,000-----	270
840,001 to 910,000-----	280
910,001 to 970,000-----	290
970,001 to 1,050,000-----	300
1,050,001 to 1,140,000-----	310
1,140,001 to 1,230,000-----	320
1,230,001 to 1,320,000-----	330
1,320,001 to 1,420,000-----	340
1,420,001 to 1,520,000-----	350
1,520,001 to 1,630,000-----	360
1,630,001 to 1,730,000-----	370
1,730,001 to 1,850,000-----	380
1,850,001 to 1,970,000-----	390
1,970,001 to 2,060,000-----	400
2,060,001 to 2,270,000-----	410
2,270,001 to 2,510,000-----	420
2,510,001 to 2,750,000-----	430
2,750,001 to 3,020,000-----	440
3,020,001 to 3,320,000-----	450
3,320,001 to 3,620,000-----	460
3,620,001 to 3,960,000-----	470
3,960,001 to 4,310,000-----	480
4,310,001 to 4,690,000-----	490
4,690,001 or more-----	500

Rule 310 is hereby amended to read as follows:

Reporting Requirements and Record Maintenance.

A. Operating Reports - Monthly reports shall be submitted to the Agency by all public water supplies within 30 days following the last day of each month, on forms provided or approved by the Agency.

B. Reporting Requirements

1. Except where a shorter reporting period is specified in these Rules or by the Agency, the owner or operator of a public water supply shall report to the Agency within 40 days following a test, measurement or analysis required to be made by these Rules, the results of that test, measurement or analysis.

2. The owner or operator of a public water supply shall report to the Agency within 48 hours the failure to comply with any requirement (including failure to comply with monitoring requirements) set forth in these Rules.

3. The owner or operator of a public water supply is not required to report analytical results to the Agency in cases where an Agency laboratory performs the analysis and reports the results to the Agency office which would normally receive such notification.

C. Record Maintenance

1. Any owner or operator of a public water supply subject to the provisions of these Rules shall retain on its premises or at a convenient location near its premises the following records:

(a) Records of bacteriological analyses made pursuant to these Rules shall be kept for not less than 5 years. Records of chemical analyses made pursuant to these Rules shall be kept for not less than 10 years. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, provided that the following information is included:

(1) The date, place, and time of sampling, and the name of the person who collected the sample;

(2) Identification of the sample as to whether it was a routine distribution system sample, check sample, raw or process water sample or other special purpose sample;

(3) Date of analysis;

(4) Laboratory and person responsible for performing analysis;

(5) The analytical technique/method used; and

(6) The results of the analysis.

(b) Records of action taken by the supply to correct violations of the Act and these Rules shall be kept for a period not less than 3 years after the last action taken with respect to the particular violation involved.

(c) Copies of any written reports, summaries or communications relating to sanitary surveys of the supply conducted by the supply itself, by a private consultant, or by any local, State or Federal agency, shall be kept for a period not less than 10 years after completion of the sanitary survey involved.

(d) Records concerning a variance granted to the supply shall be kept for a period ending not less than 5 years following the expiration of such variance.

A new Rule 313 D is hereby added which shall read as follows:

Public Notification.

1. If a community water supply fails to comply with an applicable maximum allowable concentration established in Rule 304, fails to comply with an applicable testing

procedure established in these Rules, is granted a variance from an applicable maximum allowable concentration, fails to comply with any requirement of any schedule prescribed pursuant to a variance or fails to perform any monitoring required pursuant to these Rules, the owner or operator of such supply shall notify persons served by the supply of the failure or grant by inclusion of a notice in the first set of water bills of the supply issued after the failure or grant and in any event by written notice within three months. Such notice shall be repeated at least once every three months so long as the supply's failure continues or the variance remains in effect. If the supply issues water bills less frequently than quarterly, or does not issue water bills, the notice shall be made by or supplemented by another form of direct mail.

2. If a community water supply has failed to comply with an applicable maximum allowable concentration, the owner or operator of such supply shall notify the public of such failure, in addition to the notification required by paragraph 1 of this Rule as follows:

(a) By publication on not less than three consecutive days in a newspaper or newspapers of general circulation in the area served by the supply. Such notice shall be completed within fourteen days after the owner or operator learns of the failure.

(b) By furnishing a copy of the notice to the radio and television stations serving the area served by the supply. Such notice shall be furnished within seven days after the owner or operator learns of the failure.

3. If the area served by a community water supply is not served by a daily newspaper of general circulation, notification by newspaper required by paragraph 2 of this section shall instead be given by publication on three consecutive weeks in a weekly newspaper of general circulation serving the area. If no weekly or daily newspaper of general circulation serves the area, notice shall be given by posting the notice in post offices within the area served by the supply.

4. If a non-community water supply fails to comply with an applicable maximum allowable concentration established in Rule 304, fails to comply with an applicable testing procedure established in these Rules, is granted a variance from an applicable maximum allowable concentration, fails to comply with any requirement of any schedule prescribed pursuant to a variance or fails to perform any monitoring required pursuant to these Rules, the owner or operator of such supply shall give notice of such failure or grant to the persons served by the supply. The form and manner of such notice shall be prescribed by the Agency for each

specific case, and shall insure that the public using the supply is adequately informed of the failure or grant.


5. Notices given pursuant to this section shall be written in a manner reasonably designed to inform fully the users of the supply. The notice shall be conspicuous and shall not use unduly technical language, unduly small print or other methods which would frustrate the purpose of the notice. The notice shall disclose all material facts regarding the subject including the nature of the problem and, when appropriate, a clear statement that a drinking water regulation has been violated and any preventive measures that should be taken by the public. Where appropriate, or where designated by the Agency, bilingual notice shall be given. Notices may include a balanced explanation of the significance or seriousness to the public health of the subject of the notice, a fair explanation of steps taken by the supply to correct any problem and the results of any additional sampling.

6. Notice to the public required by this section may be given by the Agency on behalf of the owner or operator of the supply.

7. In any instance in which notification by mail is required by paragraph 1 of this section but notification by newspaper or to radio or television stations is not required by paragraph 2 of this section, the Agency may order the owner or operator of the supply to provide notification by newspaper and to radio and television stations when circumstances make more immediate or broader notice appropriate to protect the public health. In cases of emergency, more expeditious means such as door to door notification by water supply personnel, police or others may be required by the Agency.

IT IS SO ORDERED.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Order was adopted on the 24<sup>th</sup> day of August, 1978 by a vote of 5-0.

  
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Christan L. Moffett, Clerk  
Illinois Pollution Control Board