ILLINOIS POLLUTION CONTROL BOARD
December 14, 1978

IN THE MATTER OF:	)	
	)	
AMENDMENTS TO THE	)	R77-13
PUBLIC WATER SUPPLY	)	
REGULATIONS	)	

PROPOSED OPINION OF THE BOARD (by Mr. Dumelle)*:

On August 5, 1977 the Agency filed a Petition which called for widespread revisions to Chapter 6: Public Water Supplies. The Petition was published in Environmental Register #153 on August 12, 1977. Hearings were held on November 1, 1977 in Springfield and November 15, 1977 in Chicago. An Amended Petition (Exhibit 4) was submitted at the second hearing. A study entitled Economic Impact of Revisions of the Public Water Supply Regulations was filed with the Board on June 13, 1978. Economic impact hearings were held on August 1, 1978 in Chicago and August 4, 1978 in Springfield. Additional amendments to the Agency's Petition were submitted to the Board on July 25, 1978, August 21, 1978 and October 6, 1978. On November 30, 1978 the Board adopted proposed amendments to Chapter 6 which are supported in this Opinion. In addition this Opinion summarizes amendments which were adopted on August 24, 1978.

This Opinion references the record with roman numerals (RI-10, RII-15, etc.). This system was used because the page numbering was not continuous. The roman numerals refer to individual hearing transcripts.

PRIMARY ENFORCEMENT RESPONSIBILITY UNDER THE SAFE DRINKING WATER ACT

The main impetus behind this proceeding has been the assumption of primary enforcement responsibility (primacy) under the Safe Drinking Water Act (SDWA). Section 1413 of SDWA (42 U.S.C. §300 g-2) sets out a procedure which states must follow to obtain primacy. Specifically Illinois must show that its regulations are no less stringent than the national interim primary drinking water regulations (NIPDWS). In addition, Illinois must employ adequate inspection, monitoring, and record keeping procedures. Exhibit 1 contains the SDWA and the Federal regulations promulgated under it which describe these requirements in greater detail.

---

*The Board expresses its appreciation to Richard Christopher for his work as Hearing Officer in this proceeding and to Carolyn Hesse for her technical support. Both of these Administrative Assistants collaborated in the preparation of this Opinion.

Section 2(j) of the Environmental Protection Act (the Act) defines a public water supply as a system which serves or is intended to serve ten or more separate lots. The Federal regulations apply to every system with at least 15 service connections or 25 daily users at least 60 days of the year. Since the Federal definition is broader than the authority vested in the Board, Illinois is asking USEPA to approve a program of split jurisdiction. The Agency's proposal here would have no effect on those systems which are smaller than the definition in Section 2(j) of the Act. The Illinois Department of Public Health will retain jurisdiction over these systems. Primacy will be split between the two agencies (RI-23).

NATIONAL INTERIM PRIMARY DRINKING WATER REGULATIONS

NIPDWS were adopted in two increments. All but the standards concerning radionuclides were adopted on December 24, 1975 (40 F.R. 59566). The radionuclide portion followed on July 9, 1976 (41 F.R. 28402). They can be found at 40 CFR §141. Much of the Agency's Petition copies these standards verbatim. This rigid application of Federal guidance can be justified for three reasons: 1) It leaves little doubt that the Board's standards are no less stringent than Federal; 2) It removes any confusion which may result from a recent amendment to Section 35 of the Act which requires Board variances to be consistent with SDWA; and 3) It recognizes the fact that the Federal standards have been binding on Illinois public water supplies since June 24, 1977.

Those portions of the Agency's Petition which align Chapter 6 with the Federal standards were adopted by the Board on August 24, 1978. This action was taken quickly in an attempt to obtain primacy by September 30, 1978, the end of the Federal fiscal year. A summary of the changes follows.

The new definitions in Rule 104 all come from NIPDWS except for the following two. "Certified laboratory" is defined as any laboratory meeting the minimum standards prescribed in Sections 4(o) and 4(p) of the Act. "Chemical analysis" is defined to differentiate the types of analyses which must be performed.

The twelve month running average standard for compliance with chemical and physical water quality standards has been dropped in the new Rule 304(b)(3). In its place is the NIPDWS requirement that any analysis exceeding a standard in Table I be reported to the Agency, with additional monitoring and possible public notification.

In Table I of Rule 304(b)(4) the following maximum contaminant levels (MCL's) were lowered.

Arsenic - from 0.1 mg/l to 0.05 mg/l

Fluoride - from 2.0 mg/l to 1.8 mg/l

Endrin - from 0.0005 mg/l to 0.0002 mg/l

Lindane - from 0.005 mg/l to 0.004 mg/l

The allowable excursion over the nitrate standard has been dropped. The old fluoride standard is retained for those northern Illinois counties with an annual average maximum daily air temperature of 58.4 to 63.8° F. An additional monitoring and public notification requirement is included in the event any sample exceeds the turbidity standard. The compliance dates in Table I have all been deleted because they have either passed or been pre-empted by NIPDWS.

A new Rule 304(c) has been added to include NIPDWS requirements concerning radiological quality.

Rule 309 has been amended to incorporate NIPDWS standards for sampling frequency. The new Rule 310 picks up NIPDWS requirements for reporting and record maintenance. A new Rule 313(d) provides for a Federally mandated elaborate system of public notification in the event a water supply exceeds a standard or is granted a variance.

ADDITIONAL REVISIONS

In addition to the revisions necessary for primacy, the following MCL's have also been revised.

Color and Odor

The standards for color and odor are being dropped since both standards were based entirely on aesthetics and did not directly indicate the safety of a drinking water supply (R.III-27). The major problem which could result from dropping the standards is that consumers might switch to a less safe, but colorless and/or odorless, water supply if color and/or odor become too objectionable, (Ex. 8, p. III-27) However, in Illinois, the color (Ex. 9) and odor levels are relatively low so that no problem is expected from dropping either standard.

Foaming Agents

The standard for foaming agents is no longer necessary since the surfactant that was limited by this standard is no longer used in laundry detergents (Ex. 9, pp. 21-22). Hence, the standard for foaming agents is dropped. No economic impact is anticipated from this action.

Copper

The maximum contaminant level for copper is raised from 1 mg/l to 5 mg/l, measured as Cu. Copper is an essential mineral and its presence in drinking water is not likely to

cause any adverse health effects. The taste threshold for copper in water is 1-5 mg/l with levels greater than 5-7.5 mg/l making the water undrinkable (Ex. 7). Dosages as high as 30 mg/l have been consumed with no adverse health effects (Ex. 7). Since no water supplies exceed copper concentrations of 5 mg/l at the present time, raising the standard would eliminate the need for five communities to remove copper. The only remaining costs associated with the copper standard will be for sampling once per year or once per two years. However, retaining a standard would protect consumers from excessive levels of copper that may exist in a new water supply or contamination of a current supply. The copper concentration of 5 mg/l was chosen since that is the level at which water starts becoming undrinkable due to taste (as opposed to taste threshold). (Ex. 7).

Five supplies were identified with copper levels between 1-5 mg/l (R.III-54,55). The cost savings to these supplies have not been quantified, but were estimated as small. (Ex. 9, p.32;R.III-55)

Iron and Manganese

The Board is raising the standard for iron from 0.3 mg/l to 1.0 mg/l, measured as Fe, and the standard for manganese from 0.05 to 0.15 mg/l, measured as Mn. Although these standards are not health based, dropping them could lead to problems due to aesthetics (i.e. color and taste) and material damages from staining of laundry and plumbing fixtures or decreasing the carrying capacity of water mains due to deposition.

Information in the record (Ex. 7) indicates that iron levels in excess of 1 mg/l cause the water to taste so unpleasant that most people would not drink it. This concentration represents 4.0-0.2% of the estimated lethal dose range of 28-460 g (1 ounce-1 pound) for a 150 pound man (Ex. 7). [The exact lethal dose of iron for a healthy person is uncertain since most of the iron toxicity data was obtained from medication overdoses (Ex. 7)]. Five letters which addressed the problems of iron in public water supplies were received as public comments (P.C. 1,3,5,6,7). One of the individuals who wrote a letter also testified at hearing regarding this matter (starting on R.I-98).

According to the Board's R73-13 Opinion (15 PCB 103, January 3, 1975) adopting the current drinking water regulations, manganese can cause a worse laundry spotting problem than iron. The Board also takes notice of Quality Criteria for Water, U.S. Environmental Protection Agency, July 1976 (the "Red Book") which states that "Consumer complaints arise when manganese exceeds a concentration of 0.15 mg/l in water supplies." These complaints are ". . . primarily from brownish staining of laundry and taste" (p. 95). Hence, the Board finds that some protection from excessive levels of iron and manganese is needed and except for small supplies is most economically provided at the water treatment plant.

According to IEPA data, there are currently 566 public water supplies (including numerous wells under the jurisdiction of a single supplier) which do not meet the old iron and/or manganese standards. By raising iron to 1 mg/l and manganese to 0.15 mg/l, the number of sources that would have to treat for one or both of these elements would be reduced by half. [The same treatment method may be used to remove both iron and manganese (Ex.8).] The number of supplies that would have to treat for iron and/or manganese would be further reduced since supplies which provide less than 10,000 gallons per day and non-community water supplies will be exempt from this rule.

It was estimated (Ex.9, pp.33-34) that completely dropping the iron and manganese standards would result in an annual savings of $14.2 million. This estimate was described as being "on the order of 50%, plus or minus." (R.III-65) The Board has chosen not to drop the standards but to raise iron to 1 mg/l and manganese to 0.15 mg/l and to exempt small water supplies.

Data from Reference 8, Appendix 4, Exhibit 9, indicate that 22 supplies which would be above the new levels will be exempt due to the 10,000 gpd limit. These smaller supplies typically have per capita treatment costs which are higher by 50% or more compared to larger supplies (Reference 8, Appendix 4, Ex. 9). Thus, the cost savings to these smaller supplies due to the exemption may be low in an absolute sense, but they are large on a per capita basis. The annual per capita treatment cost for the larger sources is approximately $5.00 or less. This cost is small compared to an estimated annualized average cost of $204. for home treatment for a family of four (Ex. 9, p. 37) or an undetermined amount of damage from laundry staining. Annual per capita treatment costs for small supplies were estimated as high as $31.50 (Ex. 9, p. 33).

Nitrite-Nitrogen (nitrite-N)

The Board finds that the standard for nitrite-N is not necessary since nitrite-N rapidly oxidizes to nitrate-N on contact with air (R.III, 31) and has not been found in any Illinois water supplies (R.II, 18). Exposure to oxidizing agents, such as chlorine which is frequently used for disinfection, would also oxidize nitrite-N to nitrate-N (R.II-9).

The author of the economic impact study concluded that ". . . No significant environmental or economic impact may be anticipated to result from its (nitrite-N's) omission. . ." (R.III-31)

Carbon-Chloroform Extract Organics

The standard for carbon-chloroform extract organics is being dropped since no one is sure what the test for this group of chemicals really measures (R.III-30). This particular test mea-

sures only those carbon fractions which are extractable with chloroform (Ex. 9, p. 24) and is not related to health or other effects. More sophisticated tests are done for specific pesticides which may pose a health hazard. Hence, it appears that testing for carbon-chloroform extract organics is not necessary. The economic impact of dropping this standard was described as "negligible" (R.III-30).

PARATHION

Since parathion decomposes rapidly and would not be expected to be found in drinking water supplies, the Board finds that the standard for parathion is unnecessary. Parathion's half-life ranges from 65 hours to one week (Ex. 16). Therefore, it is rarely detected in the routine surveillance of natural waters. However, even with such a relatively short half life, there may be sufficient time to permit the contamination of public water supplies due to its inadvertent application to areas immediately adjacent to water supply intakes (Ex. 16). Although parathion is not among the substances known to be carcinogenic and is reported to be non-teratogenic, removal of the standard may pose some adverse environmental effects which are not yet known (Ex. 9). Similarly, there could be some adverse economic impact from dropping this standard, but none is anticipated at present (R.III-30).

DICHLOROPHENOXYACETIC ACID (2,4-D)

The MCL for the herbicide dichlorophenoxyacetic acid (2,4-D) is raised from 0.02 mg/l to 0.1 mg/l which is in accord with the new federal regulation. The relaxation has been proposed because of improved knowledge of its toxicity and its long history of relatively safe use (R.III-29). Although 2,4-D is not a known carcinogen or mutagen, it is a known teratogen (Ex. 16). The no adverse effect level suggested in an NAS-NRC report is 0.09 mg/l which is comparable to the new MCL of 0.1 mg/l (Ex. 16). The record does not indicate what precise economic impact, if any, this relaxation will have.

ZINC

The standard for zinc of 5 mg/l, measured as Zn, is being retained. Zinc imparts a bad taste to water at concentrations greater than 5 mg/l which is considerably below the concentration necessary to produce any known adverse health effects (R. III-35, Ex. 8). [At concentrations ranging from 675 to 2,280 mg/l, zinc acts as an acute but transitory emetic (Ex. 7).] Since no supplies currently exceed 5 mg/l of zinc in Illinois, the only economic impact from retaining the current standard would be the cost of analysis. Retaining the standard protects consumers from contamination of new or existing supplies which would taste bad due to excessive levels of zinc.

RULES 104 and 105

The definition of "standards" in Rule 104 is being changed to

conform with the most recent edition of the Recommended Standards for Water Works as adopted by the Great Lakes-Upper Mississippi River Board of State Sanitary Engineers.

The allowable analytical techniques are described in Rule 105. The revised rule conforms Chapter 6 with NIPDWS and allows the Agency to prescribe techniques for those standards not covered by NIPDWS.

ECONOMIC IMPACT

Changes in the Illinois regulations which were necessary to obtain primacy should be viewed as having minimal economic impact. Public water supplies in the state are already subject to USEPA's regulations. Conforming Illinois' regulations to the Federal regulations in order to obtain primacy does not change what is required. Obtaining primacy does make Illinois eligible for Federal funds which would otherwise be unavailable. Approximately $200,000 in additional funds could result from primacy for 1979. After 1979, primacy is a prerequisite to obtaining any grants for public water system supervision programs (Ex. 9, pp. 30-31).

There are several changes made to the Illinois regulations which are not being made to conform the Illinois and federal requirements. Hence, some economic impact may be attributable to these rule changes. These changes were discussed above.

The Board hereby makes the determination, pursuant to §27(b) of the Act, that the regulation has no significant adverse economic impact on the people of the State of Illinois.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion was adopted on the 14th day of December, 1978 by a vote of 3-0.

Christan L. Moffett, Clerk
Illinois Pollution Control Board