

ILLINOIS POLLUTION CONTROL BOARD  
May 1, 1981

VILLAGE OF LEMONT, )  
)  
Petitioner, )  
)  
v. ) PCB 80-48  
)  
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, )  
)  
Respondent. )

JOHN ANTONOPOLOUS APPEARED ON BEHALF OF PETITIONER.

STEPHEN GUNNING APPEARED ON BEHALF OF RESPONDENT.

OPINION AND ORDER OF THE BOARD (by J. Anderson):

This matter comes before the Board on the petition for variance filed March 24, 1980 as amended March 4, 1981 by the Village of Lemont (Village) pursuant to an interim order of the Board dated February 19, 1981. The Village seeks variance from the 15 pCi/l gross alpha particle activity limitation of Rule 304(C) of Chapter 6: Public Water Supply. The Illinois Environmental Protection Agency (Agency), in its original Recommendation of May 4, 1980 and in the amendments thereto of May 19, 1980 and March 18, 1981, has supported grant of variance. As several objections to the petition were filed with the Board, a public hearing was held May 16, 1980 at which Village residents asked questions and presented comments.

The Village of Lemont, Cook County, serves the water needs of approximately 5,000 of its residents from three primary wells. Well No. 2, which is about 250 feet deep, is seldom used because of its comparatively high iron content. Wells No. 3 and 4 are both deep (about 1650 feet) wells drawing water from the Galesville aquifer. Well No. 3 was the Village's primary production well until late 1979 or early 1980, when Well No. 4 became operational; the Village now uses the deep wells on an alternating basis (Am. Pet. 2, R. 13).

The Agency has provided test results of four water samples from the Village's distribution system. The most recent sample, analyzed after correction of the Agency's radiological testing methodology problem noted in City of Minonk, PCB 80-136 (October 2, 1980), shows gross alpha particle activity of  $19.1 \pm 4.55$  pCi/l. Three "suspect" samplings done in 1979 show measurements in pCi/l of  $14.7 \pm 3.64$ ,  $25.1 \pm 4.87$ , and  $14.3 \pm 5.49$ . As of May, 1980 only one of the wells had been individually tested: a 1973 test showed activity of  $9.1 \pm 3.6$  pCi/l for deep Well No. 3 (Rec. 1-2, Am. Pet. 3).

On the basis of the two 1979 tests whose results were then on file, in December, 1979 the Agency notified the Village that permits for water main extensions could not be granted until the Village proved that it was not in violation of the gross alpha standard.\* The Village seeks variance to allow issuance of any necessary permits.

At hearing, George William Feathering of Joseph Schudt and Associates, the Village's engineering consultant, explained that his firm recommended one of three solutions, assuming that further testing showed that the Village was actually in violation of the gross alpha standard. The first, and most economical, would be the blending of the water from deep wells 3 and 4 with water lower in alpha particle activity either from shallow Well 2 or another source (R. 18-19). Costs to the Village of this alternative were not computed.

The second option would be a lime zeolite softening process. While this process does reduce the radiological content of water, manufacturers who produce this sort of system declined to guarantee to the Village that their equipment would remove enough radiation to comply with the Board's rules, since radiation removal is only a secondary by-product of the equipment's guaranteed purpose of water softening. Installation costs of treatment facilities at each well were estimated to be \$340,000 per well, for a total cost in excess of \$1 million for equipment alone. Use of the softening equipment would, in addition, produce a residue, or sludge, containing a low level of radiation whose disposal would

---

\*Board notes the dissatisfaction expressed at hearing concerning the Agency's notification to the Village of its possible violation of the Board's rules. As the Agency explained, this sort of notification is not punitive in nature, but is made in compliance with the Agency's interpretation of the requirements of Section 39(a) of the Environmental Protection Act (Act).

Section 39(a) of the Act provides in pertinent part that when application is made for a required permit, such as for a water extension, that "it shall be the duty of the Agency to issue such a permit upon proof by the applicant that the facility...will not cause a violation of the Act or of regulations hereunder." If the Agency denies a permit, it must then specify the "sections of this Act" and "provision of the regulations, promulgated under this Act, which may be violated if the permit were granted" (emphasis added).

In the City of Rolling Meadows v. IEPA, PCB 80-70 (July 10, 1980), and the Village of Wheeling, PCB 80-59 (July 10, 1980), both variance cases, the Board declined to decide the correctness of the Agency's interpretation of the Act in the context of a variance petition, preferring instead to have the issue addressed in a permit appeal. The Board did, however, determine to grant variance on the basis of a single sample in each case.

be costly. Since there are presently no landfills in Illinois which are authorized to accept this sludge, it would be necessary to locate an authorized out-of-state landfill and transport the sludge there for disposal (R. 20-22). The Village has stated that since its current assessed value is only \$19 million, the financing of the \$1 million softening equipment would be beyond its levy powers (Am. Pet. 4).

The Agency did not specifically address the problems of softening waste disposal and the financing of softening equipment at hearing. In its May 9, 1980 Recommendation, however, the Agency addresses both issues. In something of a departure from past practice, the Agency states that, disposal costs aside, due to the fact that softening waste is acceptable at few if any landfills since it bears low level radiation, "substantial questions are raised as to whether softening can be regarded as an available treatment technique." The Agency then expresses its belief that if softening equipment must be installed, that the Village could issue general obligation or revenue bonds. It is however admitted that the statutory limitation on interest for such bonds "may severely limit their present attractiveness" (Rec. 3-4).

The third alternative would be substitution of Lake Michigan water for the Village's current well water. It was explained that the Village was pursuing a Lake Michigan water allocation, but that even if such an allocation were received, that the substitution could not be made immediately, because of the need to arrange for some transmission system to deliver water to the Village (R. 22). The Village did not allege that it is part of a regional waste system. [The Board notes that it has been reported that the Village has received an allocation but which will not be available until 1985. See Pet. Ex. B in Village of Arlington Heights v. IEPA, PCB 80-229 (April 16, 1981).]

An explanation of the source of the radioactivity in the Village's water, and effect of consumption of the water was then presented by Dr. Robert E. Rowland, Director of the Radiological and Environmental Research Division of Argonne National Laboratory, as well as the Director of the Center for Human Radial Biology. Radium is a natural element produced by the decay of the element uranium. Both elements are a common constituent of "every shovel-full of dirt that you take out of your lawn," and a natural part of the environment. However, it has been concluded that the waters of the Galesville aquifer underlying most of Northern Illinois, part of southern Wisconsin, and part of eastern Iowa, "picks up" more than the usual amounts of both elements, and therefore has a naturally elevated radium level (R. 31-32).

It has been established under the federal law and the Board's rules that drinking water may contain a total of only 5 pCi/l radium-226 and radium-228 in combination. As the unstable element uranium decays into radium, and that unstable element decays into unstable radon, which itself further decays, alpha particles are emitted. When alpha particles are ingested, the ions they produce

can induce harmful chemical reactions in tissues. The standard for gross alpha particle activity, exclusive of that produced by the decay of uranium and radon is 15 pCi/l. In general, if gross alpha activity exceeds 5 pCi/l, an analysis must then be made to determine the exact levels of radium-226 and 228 in a water sample. Alpha activity then, is an indicator of the presence in water of radium and other radioactive elements (Rules 304(C)(1), 309(C)(1), Chapter 6).

Consumption of excessive levels of radium in food or drinking water over a sufficient number of years is believed to lead to bone cancer, as a fraction of the radium ingested acts like calcium in the body and becomes part of the body's bone structure. In order to determine what amounts are "excessive" for workers in the nuclear and x-ray industries, the International Commission on Radiological Protection (ICRP) as well as the National Commission on Radiological Protection and Measurement (NCRP) have for many years conducted scientific monitoring and research activities. Their guidelines for the nuclear industry, reduced by a factor of 30, served in 1974 as the basis for the radium standard under the federal Safe Drinking Water Act (SDWA) and the Board's Chapter 6 standard (which can be no "looser" than the federal standards).

However, since then, research done by IRCP and Dr. Rowland himself has shown that the level of the radium standard was set too low by a factor of ten, since the human body disposes of more of the radium it takes in than was originally thought. Based on these studies and revised IRCP guidelines, Dr. Rowland has advocated to Congress that the combined level for radium 226 and 228 be raised by a factor of 6 from 5 pCi/l to 30 pCi/l. He therefore believes that the risk of drinking the Village's water if, as he opines, it contains 5 pCi/l radium is "vanishing small" (R. 36-50, EPA Ex. A).

While Dr. Rowland has made no formal recommendation concerning raising of the alpha activity limit, he did address that issue on cross-examination. It is his thought that, as to the Galesville aquifer alone, raising the gross alpha activity level by a factor of 6 from 15 pCi/l to gross alpha activity level of 90 pCi/l would not be inappropriate. However, as a general matter he believes that setting of the level at 30 pCi/l would act as a more effective screening or "further tests necessary" method (R. 54-55). Mr. Charles Bell, Manager of the Agency Field Operations Section in which Lemont is located, concurred with Dr. Rowland's recommendation that the limits should be raised, as well as his estimation that the risk to health in drinking Lemont's water is low (R. 60).

Since this action was commenced, the radiological quality standards have not been raised by USEPA, but the exemption date of Section 1416 of the SDWA, 42 USC §300(g)-5, has been extended until January 1, 1984 for all systems, and until January 1, 1986 for systems which have joined a regional waste supply. Under all the circumstances here presented, the Board finds that denial of variance would impose an arbitrary or unreasonable hardship on the

Village and its residents, and grants variance until January 1, 1984. The Board agrees with the Agency in that it also is persuaded by Dr. Rowland's testimony that drinking water, over the next three years, with gross alpha in the quantities present in the Village's water presents no immediate threat to public health (Rec. May 9, 1980, ¶8, p. 4). To require immediate installation of softening equipment would make no economic sense; instead, the Village is ordered to continue testing the water in its wells and distribution system for gross alpha activity, to initiate testing for radium, and to explore the economic feasibility both of the blending option and of replacement of its well water source with Lake Michigan water. Finally, in response to the concerns about notification expressed by citizens at hearing, and as required by Rule 303(D)(1) of Chapter 6, the Village shall provide each water user with quarterly written notice of the grant of this variance.

This Opinion constitutes the Board's findings of fact and conclusions of law in this matter.

#### ORDER

Petitioner, the Village of Lemont, is granted variance from the 15 pCi/l gross alpha particle activity limitation of Rule 304(C)(1) of Chapter 6: Public Water Supplies, until January 1, 1984, subject to the following conditions:

1. Petitioner shall, in consultation with the Agency, continue its sampling program to determine as accurately as possible the level of radioactivity in its wells and finished water. Testing for radium 226 and 228 shall be commenced.
2. Petitioner shall investigate the possibility and economic feasibility of a) developing additional water sources to be used to replace its well water supply, b) blending water from Well No. 2 with that of its deep wells, and c) developing additional water sources to blend with its current well sources, to reduce the radiation level in its finished water.
3. In the event that replacement or blending is not feasible, petitioner shall communicate with the Agency at least every six months to determine whether landfill sites are available to accept wastes generated by the lime softening process.
4. As expeditiously after identification of a feasible compliance method as is practicable, but no later than January 1, 1984, Petitioner shall submit to the Agency a program (with increments of progress) for bringing its system into compliance with radiological quality standards.

- 5. Pursuant to Rule 313(D)(1) of Chapter 6, on or before June 1, 1981 and every three months thereafter, Petitioner will send to each user of its public water supply a written notice to the effect that Petitioner has been granted a variance from the radiological quality standards by the Pollution Control Board. The notice shall state the average content of gross alpha particle activity and radium in samples taken since the last notice period during which samples were taken.
- 6. Within forty-five days of the date of this Order, Petitioner shall execute and forward to the Illinois Environmental Protection Agency, PWS Enforcement Programs, 2200 Churchill Road, Springfield, Illinois 62706, a Certificate of Acceptance and Agreement to be bound to all terms and conditions of this variance. This forty-five day period shall be held in abeyance for any period this matter is being appealed. The form of the certificate shall be as follows:

CERTIFICATE

I, (We), \_\_\_\_\_, having read the Order of the Illinois Pollution Control Board in PCB 80-48, dated \_\_\_\_\_, understand and accept the said Order, realizing that such acceptance renders all terms and conditions thereto binding and enforceable.

\_\_\_\_\_  
Petitioner


\_\_\_\_\_  
By: Authorized Agent

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

IT IS SO ORDERED.

I, Christan L. Moffett, Clerk of the Illinois Pollution Board, hereby certify that the above Opinion and Order were adopted on the 15<sup>th</sup> day of May, 1981 by a vote of 4.

  
\_\_\_\_\_  
Christan L. Moffett, Clerk  
Illinois Pollution Control Board