

ILLINOIS POLLUTION CONTROL BOARD
April 16, 1987

VILLAGE OF PLAINFIELD,)
)
 Petitioner,)
)
 vs.) PCB 87-9
)
 ILLINOIS ENVIRONMENTAL)
 PROTECTION AGENCY,)
)
 Respondent.)

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

This matter comes before the Board on the January 26, 1987 petition for variance filed by the Village of Plainfield (Village). The Village seeks a five year variance from 35 Ill. Adm. Code 602.105(a), Standards for Issuance, and from 35 Ill. Adm. Code 602.105(b), Restricted Status, but only to the extent those rules involve 35 Ill. Adm. Code 604.301(a) (combined radium-226 and radium-228 concentration) and 604.301(b) (gross alpha particle activity). On March 11, 1987, the Illinois Environmental Protection Agency (Agency) filed its Recommendation in support of grant of variance. Hearing was waived and none has been held.

The Village of Plainfield, located in Will County, provides drinking water from its wells for a population of 1300 residential and 200 industrial and commercial utility customers representing some 4,000 residents and some 200 industries. The water supply system includes two deep wells, pump and distribution facilities. The Village by ordinance imposes a user charge.

By letter dated October 4, 1985, the Village was first advised by the Illinois Environmental Protection Agency (hereafter "Agency") that the 5.0 pCi/l maximum allowable concentration of combined radium-226 and radium-228 was exceeded. The Agency analyses indicated a combined radium concentration of 9.8 pCi/l. By letter dated May 20, 1986, the Agency notified Petitioner that Petitioner was going to be placed on Restricted Status.

By letter dated May 5, 1986, the Village was first advised by the Illinois Environmental Protection Agency (hereafter "Agency") that the 15 pCi/l maximum allowable concentration of gross alpha particle activity was exceeded. The Agency analyses indicated a gross alpha particle activity of 19 pCi/l. By letter

dated May 20, 1986, the Agency notified Petitioner that Petitioner was going to be placed on Restricted Status.

Since receiving the Agency's report, the Village conducted its own analyses of its water in its water supply system and its water distribution system. These analyses of the Village's water samples show the following results in pico curies per liter;

<u>E OF</u> <u>PLE</u>	<u>LOCATION</u>	<u>RAW OR</u> <u>DISTRIBUTION</u>	<u>RESULTS</u>	
9-86	1400 Division St.	Distribution	8.2 ± 2.4	pCi/l Gross Alpha
9-86	Well #4	Raw	9.8 ± 2.6	pCi/l Gross Alpha
9-86	Well #3	Raw	7.3 ± 2.2	pCi/l Gross Alpha

<u>OF</u> <u>E</u>	<u>LOCATION</u>	<u>RAW OR</u> <u>DISTRIBUTION</u>	<u>RADIUM</u> <u>226</u>	<u>RADIUM</u> <u>228</u>	<u>COMBINED</u>
86	1400 Division St.	Distribution	6.6±0.2	3.3±1.0	9.9±1.2 pC
86	Well #4	Raw	7.7±0.2	3.5±1.0	11.2±1.2 pC
86	Well #3	Raw	8.0±0.2	4.2±1.1	12.2±1.3 pC

By letter of October 23, 1986, the Agency reported to the Village that another analysis it had performed indicated a combined radium level of 12.8 pCi/l, with the radium-226 level at 8.1 pCi/l and the radium-228 level at 4.7 pCi/l.

The Village has identified two possible compliance options. One such option would involve searching for alternative sources of water, such as the construction of shallow wells. The Village notes that it currently has no shallow wells which can be used for blending purposes, and asserts without elaboration that interconnections with other systems to obtain low radium water would be "excessively costly" due to the distance from existing water lines to other water supply systems. The Village has not as yet begun investigating the particulars of this option, and so has no estimate of the potential costs or time required for implementation.

Another option would involve construction of treatment facilities to properly treat all water supplied by the wells. Again, as the Village has not begun its investigation of the particulars of this option, it has presented no estimate of the potential costs or time required for implementation.

The Village notes that the two primary treatment methods used for radium removal, lime or lime-soda softening and ion exchange softening, each produce large quantities of sludge in which the removed radium is concentrated, which can create disposal and handling problems. Additionally, if an ion exchange softener is regenerated with salt, the sodium content of the

finished water is increased, creating health risks for those with hypertension or heart problems.

The Village notes with interest, therefore, news reports of research which is currently being conducted concerning radium removal by means of absorption using a resin product which would absorb radium isotopes (Petition, Exh. 4-5). The Agency has elaborated on these reports in its Recommendation:

To provide help for small communities, a long-term, USEPA-funded project has been undertaken to evaluate the single contaminant removal processes (activated alumina and ion exchange) versus the desalting processes (electro-dialysis with reversal and reverse osmosis). To accomplish this project, contaminated water sources in a series of small U.S. communities are being studied with the use of a mobil drinking water treatment research facility.

The objectives of the pilot-scale studies conducted at the Mobile Drinking Water Treatment Research Facility in Lemont and the bench-scale research undertaken at the University of Houston include the following:

1. To evaluate RO (reverse osmosis), IX (ion exchange), EDR (electro-dialysis with reversal) and specific adsorbents for the treatment of Lemont and similar small-community water supplies for the removal of radium, and to a lesser extent barium.
2. To obtain valid design and cost information for the scale-up of these processes.
3. To develop recommended means for the most economical operation of each of these processes, i.e. to establish: pretreatment requirements for all processes, bypass water allowances for all processes, types of adsorbents including Isoclear beads, acid-regenerated filter sand (Valentine's method) and Dow radium selective adsorbent, type of resins, optimum detention times and capacity changes during cyclic operation, regenerant dosage, concentration and flow direction (cocurrent or countercurrent) and types of membranes including polyamide, thin film composite, and cellulose triacetate.
4. To evaluate radium removal efficiency of point-of-use treatment systems consisting of

cellulose acetate and thin-film composite RO modules.

5. To make a techno-economic comparison of RO, IX, EDR and specific adsorbents for central treatment.

This study began in January, 1987 and will end in mid-March, 1988, according to Dr. Dennis Clifford Prof. Eng., Associate Professor and Director, Environmental Engineering Program of the Department of Civil Engineering, The University of Houston-University Park, Houston, TX 77004.

A second study may be done by Iso-Clear Systems Corporation of Yorkville, Illinois which says it has developed a product for the efficient removal of Radium from drinking water. The material is used in packed vertical columns, through which the drinking water is passed. As the water passes through the column, radium is adsorbed into the resin and retained. Iso-Clear is currently negotiating with the State of Illinois to establish design parameters for full-scale usage. A mobile trailer mounted pilot plant is proposed which would allow testing water from various municipalities. The Agency has been informed it would take about six months to complete the study but the starting date is uncertain as it is dependent on the company getting a state grant for the study.

After the studies are completed, USEPA approval is likely required. (35 Ill. Adm. Code 653.202(b)).

The Village asserts that denial of variance during the period in which it is exploring compliance options would impose an arbitrary or unreasonable hardship. The village notes that the investigation of the resin absorption method will take several months, and that in the interim the Village does not wish to have proceeded with more expensive alternatives which may not completely solve its radioactivity problem. The only hard economic data which the Village has presented concerns its ability to pay for improvements, including bonding authority, the Village states that its 1985 assessed valuation is \$31,517,555, that the statutory debt limit of assessed evaluation (8.625% of assessed valuation) is \$2,718,389, and the Village's legal debt margin (1985-86 FY Audit) is \$2,638,280. No data is given concerning the level of current water use charges, or other projects which would place demands on the Village's bonding capability.

The Village notes that because it is on restricted status, that the Agency cannot lawfully issue permits for water main extensions. The Village asserts that there is a great need for the expansion of the water distribution system in order to serve the domestic and fire protection requirements of the local population. The Village states that its current system is in need of new mains to "loop" the existing mains to increase fire flow. The Village additionally states that it anticipates future water service demand from and need for water main extensions to land which is currently vacant. The Village has provided no further details concerning the above stated assertions.

The Village has made no formal assessment of the effect of this variance on the environment, although it refers the Board and Agency to the testimony and exhibits presented by Richard E. Toohy, Ph.D. and James Stebbings, Ph.D. both of the Argonne National Laboratory, on July 30 and August 2, 1985 in R85-14, Proposed Amendments to Public Water Supply Regulations, 35 Ill. Adm. Code 602.105 and 602.106. However, it is the opinion of the Village that the granting of this variance for the limited time period of the requested variance will not cause any significant harm to the environment or to the people served by potential water main extensions that would be allowed if this variance is granted.

In its Recommendation, the Agency does not dispute any of the Village's contentions. The Agency believes that while radiation at any level creates some risk, the risk associated with the level in the Village's water is very low. The Agency further believes an incremental increase in the maximum allowable concentration (MAC) for radium even up to a maximum of four times the current 5 pCi/l should cause no significant health risk for the limited population served by new water main extensions for the time period of this recommended variance. The Agency notes that the MAC for combined radium is currently under review at the federal level, but also that the Agency does not expect any proposal to change the standard before 1987 or early 1988.

The Agency's conclusion is that:

the hardship resulting from denial of the recommended variance from the effect of being on Restricted Status would outweigh the injury of the public from grant of that variance. In light of the cost to the Petitioner of treatment of its current water supply, the likelihood of no significant injury to the public from continuation of the present level of the contaminant in question in the Petitioner's water for the limited time period of the variance, and the possibility of compliance with the MAC standard ... the Agency concludes that denial of a variance from the

effects of Restricted Status would impose an arbitrary or unreasonable hardship upon Petitioner.

The Agency observes that this grant of variance from restricted status affect only those users who consume water from any newly extended water lines. This variance should not affect the status of the rest of Petitioner's population drawing water from existing water lines, except insofar as the variance by its conditions may hasten compliance. Grant of variance may also, in the interim, lessen exposure for that portion of the population which will be consuming more effectively blended water. In so saying, the Agency emphasizes that it continues to place a high priority on compliance with the radium standards.

The Agency recommends a grant of variance with conditions for the full five year term requested by the Village. The Agency agrees with the Village that use of a promising treatment method should not be foreclosed by requiring submittal of a compliance plan which does not consider the new methods due to lack of data whose development is ongoing. The Agency would therefore recommend that the petitioner be given 18 months in which to investigate compliance options and file a compliance plan, with the balance of the five year period to be devoted to implementation of the selected plan.

Based on all of the facts and circumstances here presented, the Board finds that denial of variance would impose an arbitrary or unreasonable hardship.

The Board does not, however, believe that the grant of a five year variance is appropriate in this case, and will instead grant a twenty-two month variance. The Board believes that the Village's situation merits review before the end of five years. The Village has been aware since October, 1985 that the combined radium content of its water is nearly double the 5.0 pCi/l, and since May, 1986 that the gross alpha particle activity level exceeds the 15 pCi/l standard by nearly 5 pCi/l. However, this petition indicates that the only step the Village has taken toward compliance is testing to confirm the violation; moreover, the petition is largely devoid of facts to support conclusory assertions even as to economic hardship. While the Board might well deny this petition for insufficiency, the Board believes that the better course is to grant variance subject to conditions which require the Village secure professional assistance, to begin seriously investigating compliance costs and feasibility of options. In recognition of the fact that studies concerning the resin absorption method for radioactivity removal will not end for approximately one year, the Board will accept the Agency's suggestion that the filing of a compliance plan not be required

before the end of 18 months, and the Board will add four months to this period to provide for Board deliberation of any timely-filed petition for variance.

However, while the Agency has suggested that reports concerning compliance activities be filed every six months, the Board will require that reports be filed every three months to insure the Village's diligence. A twenty-two month variance will provide the Village 18 months in which to perform additional sampling and testing, to complete its studies, to choose and commence a compliance option; the four months added to this period provides for Board deliberation of any timely filed petition for extension of variance.

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

ORDER

1. Petitioner, the Village of Plainfield is hereby granted a variance from 35 Ill. Adm. Code 602.105(a) (Standards of Issuance) and 602.106(b) (Restricted Status) but only as they relate to the 5 pCi/l combined radium-226, radium-228 standard of 35 Ill. Adm. Code 604.301(a), and the 15 pCi/l gross alpha particle activity standard of 35 Ill. Adm. Code 604.301(b) subject to the following conditions:
 - A) This variance expires on February 15, 1989, or at such earlier time as either analysis pursuant to 35 Ill. Adm. Code 605.105(a) shows that compliance with the radioactivity standards has been achieved or for failure by Petitioner to file a variance petition pursuant to paragraph 1 (I) of this Order;
 - B) In consultation with the Agency, Petitioner shall continue its sampling program to determine as accurately as possible the level of radioactivity in its wells and finished water. i) As to sampling the finished water, until this variance expires, Petitioner shall collect quarterly samples of its water from its distribution system, shall composite and shall analyze them annually by a laboratory certified by the State of Illinois for radiological analysis so as to determine the concentration of radium-226 and radium-228. The results of the analyses shall be reported to the Water Quality Unit, Division of Public Water Supplies, 2200 Churchill Road, IEPA, Springfield, Illinois 62706, within 30 days of receipt of each analysis. At the option of Petitioner, the quarterly samples may be analyzed when collected. The running average of the most recent four quarterly sample results shall be reported to the above address within 30 days of receipt of the most recent

quarterly sample, ii) As to sampling the raw water in the wells, Petitioner shall follow the procedures outlined in subparagraph i) above, except that only four quarterly samples shall be collected and analyzed for each well.

- C) Within 3 months of the grant of the variance, the Petitioner shall secure professional assistance (either from present staff or an outside consultant) in investigating compliance options, including the possibility and feasibility of achieving compliance by blending water;
- D) Within 4 months of the grant of the variance, evidence that such professional assistance has been secured shall be submitted to the Agency's Division of Public Water Supplies, FOS, at 2200 Churchill Road, Springfield, Illinois 62706;
- E) Within 17 months of the grant of the variance, the Petitioner shall complete investigating compliance methods, including those treatment techniques described in the Manual of Treatment Techniques for Meeting the Interim Primary Drinking Water Regulations, USEPA, May 1977, EPA-600/8-77-005, and prepare a detailed Compliance Report showing how compliance shall be achieved with the shortest practicable time; but no later than five years from the date of this variance;
- F) This Compliance Report shall be submitted within 18 months of the grant of this variance to IEPA, DPWS;
- G) Within three months thereafter Petitioner shall apply to IEPA, DPWS, Permit Section, for all permits necessary for construction of installations, changes or additions to the Petitioner's public water supply needed for achieving compliance with the maximum allowable concentration for radium;
- H) If compliance has not been earlier achieved, and if Petitioner has not filed a variance petition on or before October 15, 1988, this variance shall terminate;
- I) Pursuant to 35 Ill. Adm. Code 606.201, in its first set of water bills or within three months after the date of this Variance Order, whichever occurs first, 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 by the Pollution Control Board a variance from 35 Ill. Adm. Code 602.105(a) Standards of Issuance and 35 Ill. Adm. Code

602.106(b) Restricted Status, as it relates to the combined radium standard;

- J) Pursuant to 35 Ill. Adm. Code 606.201, in its first set of water bills or within three months after the date of this Order, whichever occurs first, and every three months thereafter, Petitioner will send to each user of its public water supply a written notice to the effect that Petitioner is not in compliance with the combined radium-226, radium-228 standard. The notice shall state the average combined radium in samples taken since the last notice period during which samples were taken;
 - K) The Petitioner shall take all reasonable measures with its existing equipment to minimize the level of radium in its finished water;
 - L) The Petitioner shall provide written progress reports to IEPA, DPWS, FOS every 3 months concerning steps taken to comply with paragraph B and F. Progress reports shall quote each of the above paragraphs and immediately below each paragraph state what steps have been taken to comply with each paragraph.
2. Within forty-five days of the date of this Order, Petitioner shall execute and forward to Thomas Davis, Enforcement Programs, Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, Illinois 62706, a certificate of Acceptance and Agreement to be bound to all terms and conditions of the variance. This forty-five day period shall be held in abeyance during any period that this matter is being appealed. The form of Said Certification shall be as follows:

I (We), _____, having read the Order of the Illinois Pollution Control Board in PCB 87-9, dated April 16, 1987, 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.

J. D. Dumelle and B. Forcade dissented.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 16th day of April, 1987 by a vote of 4-2.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board