

ILLINOIS POLLUTION CONTROL BOARD
September 20, 1985

CITY OF GENEVA,)
)
Petitioner,)
)
v.) PCB 85-93
)
ILLINOIS ENVIRONMENTAL)
PROTECTION AGENCY,)
)
Respondent.)

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

This matter comes before the Board on a Petition for Variance filed on July 1, 1985 by the City of Geneva. The Petitioner has requested a five-year variance from the public water supply rules concerning Illinois Environmental Protection Agency (Agency) issuance of construction or operating permits delineated in 35 Ill. Adm. Code 602.105(a) and Agency listing of water supplies on restricted status set forth in 35 Ill. Adm. Code 602.106(b) as these rules pertain to the maximum allowable concentration of 5 picocuries per liter (pCi/l) for combined radium-226 and radium-228 of 35 Ill. Adm. Code 604.301(a) and to the 15 pCi/l gross alpha particle activity limit specified in 35 Ill. Adm. Code 604.301(a). The City of Geneva has also requested a variance from 35 Ill. Adm. Code 602.106(a) defining restricted status. (Pet. 1-11).

The Petitioner waived its right to a hearing and no hearing was held in this matter. (Pet. 11).

On July 30, 1985, the Agency filed its Recommendation which recommended that the Board grant the Petitioner a variance, subject to certain conditions, for a time period not to exceed five years from 35 Ill. Adm. Code 602.105(a) and 602.106(b) as these rules relate to 35 Ill. Adm. Code 604.301(a) on combined radium-226 and radium-228 only. (Rec. 10). However, the Agency also recommended that variance from 35 Ill. Adm. Code 602.105(a) and 602.106(b) as these rules apply to gross alpha particle activity in 604.301(b), and variance from 35 Ill. Adm. Code 602.106(a), be denied as unnecessary. (Rec. 10).

On August 8, 1985, the City of Geneva filed a Motion and Request for Expedited Decision on its Request for Variance.

On August 15, 1985, the Board entered an Interim Order which denied the Petitioner's motion for expedited decision, as moot, based on its action the same day adopting an emergency rule in R85-14 In The Matter Of Proposed Amendments to Public Water Supply Regulations (35 Ill. Adm. Code 602.105 and 602.106). This

emergency rule, which is effective for 150 days (i.e., until January 12, 1986), allows the Agency to issue permits for water main extensions to public water supplies presently on restricted status for delivering finished water containing levels of fluoride, combined radium-226 and radium-228, or gross alpha particle activity concentrations in excess of those allowed by Board regulations, as long as those concentrations do not exceed 4.0 mg/l, 20 pCi/l, and 60 pCi/l respectively.

In a letter to the Board dated September 10, 1985, Mr. Charles A. Radovich, the City Attorney for the City of Geneva, strongly objected to the possibility that the Board would deny or dismiss as moot the variance petition in PCB 85-93 in light of the Board's adoption of the emergency rule in R85-14. The Board finds that this matter is not moot. The emergency rule will expire in some four months. The record in R85-14 will likely not be completed by that date, as 1) an additional merit hearing will be scheduled this November, 2) the Department of Energy & Natural Resources is in the process of determining the scope of the Economic Impact Study (EcIS) which it has determined should be made, and hence cannot accurately project a completion date for the EcIS and 3) the Board must hold hearings on the EcIS. Thus, upon the January 12 expiration of the emergency rule, Geneva will once again be subject to the "no water main extension permits" effects of restricted status. Geneva has expended resources in preparation of the petition, as has the Agency in reviewing it, and this record is now complete. Therefore, the Board sees no reason not to adjudicate the matter on its merits.

The City of Geneva, which has a population of about 10,500 people, is located in Kane County. The Petitioner owns and operates a deep well water supply system which provides "potable water supply and distribution for a population of 3,315 residential, 28 industrial and 350 commercial utility customers". (Pet. 4). According to the Petitioner's 1980 estimates, the 28 local industries and businesses served by its water facilities employ about 5,000 people. The City of Geneva's public water distribution system includes 6 deep wells (Wells #2 to #7) ranging in depth from 1,350 feet to 2,300 feet which were placed in operation at various times between 1924 and 1983 (Well #1, which was placed in operation in 1896 and was 850 feet deep, was later abandoned in 1947); two ground level storage reservoirs; two elevated storage tanks; and various pumps, appurtenances, and distribution facilities. (Pet. 4-5).

The Illinois Environmental Protection Agency's recent tests on the Petitioner's deep well water indicated a radium-226 count of 4.4 pCi/l and a radium-228 content of 9.2 pCi/l, thereby resulting in a combined radium-226 and radium-228 level of 13.6 pCi/l which is in excess of the applicable 5 pCi/l standard. Water samples "of an annual composite of four consecutive quarterly samples or the average of the analyses of four samples obtained at quarterly intervals" from the Petitioner's facilities were taken by the Agency, while the actual water sample testing

was performed by the United States Environmental Protection Agency's (USEPA) laboratory and the results were subsequently reported to the Illinois Environmental Protection Agency. (Rec. 5). On September 14, 1984, the analysis was reported to the City of Geneva and the Petitioner's own recent water sampling analyses have confirmed the Agency's findings. (Pet., Attachment #3). Samples of well water taken on February 20, 1985 by the City of Geneva's Public Works Department, when subsequently analyzed by the Argonne National Laboratory, indicated combined radium levels ranging from 8.45 pCi/l to 18.08 pCi/l in the various wells. (Pet., Attachment #3). The preliminary results of this recent test are as follows:

<u>Sample Source</u>	<u>Radium-226</u>	<u>Radium-228</u>	<u>Combined</u>
Well No. Two	5.47 +/- 0.82	4.49 +/- 0.98	9.96
Well No. Three	8.83 +/- 1.32	9.25 +/- 1.85	18.08
Well No. Five	7.53 +/- 1.12	7.65 +/- 1.53	15.18
Well No. Six	4.62 +/- 0.69	5.09 +/- 1.18	9.71
Well No. Seven	3.83 +/- 0.57	4.62 +/- 0.92	8.45
Distribution	5.85 +/- 0.88	8.21 +/- 1.64	14.06

Note: All results reported in picocuries per Liter

(Pet., Attachment #3)

According to these water sampling tests, the average combined radium-226 and radium-228 level is 12.57 pCi/l which is in excess of the present 5 pCi/l standard and in the same general range as the test results (i.e., 13.6 pCi/l) obtained in Agency testing.

Although the Agency's letter dated June 14, 1979 (See: Attachment #1 to the variance petition) implied that the radiological (i.e., gross alpha particle) content of the Petitioner's water may have exceeded the 15 pCi/l limit at one time, the Agency subsequently sent another letter to the City of Geneva on October 16, 1980 which indicated that the Petitioner was in compliance with applicable standards. This October 16, 1980 letter stated that:

"Recently we sent you a copy of the radiological analysis report for the composite sample made up from the four samples which you submitted over the past several months. The gross alpha analysis indicated an activity of 12.2 pCi/l. This is below the maximum allowable concentration (MAC) for gross alpha activity."

(Rec. 4).

Accordingly, the Agency emphasizes that it does not have any records demonstrating that the City of Geneva is currently exceeding the gross alpha particle limit of 15 pCi/l of 35 Ill. Adm. Code 604.301(b). Therefore, the Agency has contended that

the City of Geneva "does not need, and should not receive, a variance from 35 Ill. Adm. Code 602.105 or 602.106(b), to the extent those rules involve 35 Ill. Adm. Code 604.301(b) (gross alpha particle activity)". (Rec. 4). The Board believes that the Agency is entirely correct in its viewpoint, and will therefore deny the variance from 35 Ill. Adm. Code 602.105(a) and 602.106(b) as they involve 35 Ill. Adm. Code 604.301(b) (gross alpha particle activity) as unnecessary.

Because it was unaware of the excessive combined radium content of its water until September 1984, the City of Geneva has considered various control strategies in a general way but has not yet identified the compliance option that it wishes to utilize. (Pet. 6-8).

In the supplement to the City of Geneva's variance petition, the Petitioner notes three possible alternative water sources which include: (1) Lake Michigan water; (2) Fox River water; and (3) shallow wells. (Pet. Supp. 6-8).

The Petitioner notes that it does not presently have an allocation for Lake Michigan water and estimates that it would take about 5 years to receive such an allocation by pursuing one through the appropriate agencies and would take 10 years to physically receive Lake Michigan water. (Pet. Supp. 6). Moreover, the substantial costs entailed in such a project are estimated to require water rates of about \$5-\$6 per 1,000 gallons as compared to the existing rate which is much lower (i.e., \$1.25 per 1,000 gallons).

If the City of Geneva attempted to utilize Fox River water as a portion of its water supply, it would cost an estimated \$7,000,000 to construct the requisite river water treatment plant; require an increase of the city's water department staff from 3 to 8 people (costing about \$140,000 extra per year in wages); and result in an estimate annual increase of \$50,000 in chemical costs and \$100,000 in energy costs.

Shallow wells, which are about 350 to 400 feet deep, are another possible alternative water source. Installation of shallow blending wells (to blend radium free shallow well water with deep well water in order to reduce the radium levels to 5 pCi/l or less) would have an estimated time for implementation of 5 years and would necessitate purchase of the requisite land sites, "water main easements, well drilling, housing, chlorination and fluoridation, iron removal and 2 elevated tanks estimated to cost approximately \$7,152,720.00 (see Exhibit #9)." (Pet. Supp. 7). Although a single high capacity well is not currently available close to the Petitioner, the City of Geneva has spent \$4,962.00 as its share of a study made in conjunction with the University of Illinois, Kane County, and various cities "for a cooperative investigation of the geophysical and hydrologic properties of the shallow groundwater resources in Kane County" in order to help locate appropriate

groundwater sources. (Pet. Supp. 6-8). The installation of shallow blending wells, if feasible, would also require an increase in the municipal water department staff at a cost of about \$140,000 annually in wages and would result in proportionate increases in chemical, energy and maintenance costs. (Pet. Supp. 7-8). If such shallow well utilization were implemented, the City of Geneva has indicated that "when the best locations are determined, shallow wells will be constructed along with necessary mains and appurtenances." (Pet. 6). However, the City of Geneva believes that the abandonment and sealing-off of \$2.5 million dollars worth of deep wells and investment of \$7,452,720.00 in shallow wells is not economically justified at the present time.

The City also discussed treatment of its current water source by lime or lime-soda softening and ion exchange softening. It noted that each method concentrates radium in the resulting treatment sludge, causing handling and disposal problems and hazards. The ion exchange process also can increase the sodium content in the finished water if salt is used to regenerate the softener; this can pose a health risk to persons who suffer from hypertension or heart problems.

Ion softening or reverse osmosis also have other drawbacks because such methods mandate large plant construction and are estimated to cost over \$8 million dollars. (Pet. Supp. 8).

The City of Geneva has contended that the denial of the requested variance would impose an arbitrary or unreasonable hardship because: (1) presently "available methods of compliance are so expensive that they are practically prohibitive"; (2) future expansion of the Petitioner's municipal water distribution system "will include shallow wells that are radium free"; (3) the existing standards for radionuclides are currently being reviewed and will probably be relaxed so that "any attempt at removing or diluting radium during the interim period will, for the most part, be wasted effort and money"; (4) the Petitioner has "more pressing infrastructure problems" including pending water and sewer rehabilitation, street rehabilitation, police and fire projects, etc. which are estimated to cost over \$8.8 million dollars (see: Exhibits #1-3); (5) water and sewer rates must be raised 41% to fund normal system maintenance programs, and (6) the city is financially strapped for cash, having over \$3 million dollars worth of outstanding Revenue and General Obligation bonds and a maximum general obligation bonding capacity which is at its limit (without referendum). (Pet. Supp. 1-11; see: Exhibits 1-17).

The City additionally asserts that:

"Geneva has four residential developers wishing to begin construction now or in the very near future. . . . Those projects [whose worth on completion will be \$4.978 million] are or will be delayed as a result of the withholding of IEPA

watermain extension permits. In addition to these developments, the City presently desires to construct a 12" arterial watermain along East Side Drive to reinforce our existing water distribution system as well as providing adequate fire flow capacity to a growing area of the City. The withholding of these watermain extension permits denies the City of the related tax revenues as well as hindering the City from fulfilling its public service responsibilities."

(Pet. Supp. 3).

In recommending grant of variance from Rule 602.11(1), the Agency stated its belief that:

"...While radiation at any level creates some risk, the risk associated with this level is very low. Original estimates were that 5 pCi/l could result in bone cancer to somewhere between 0.7 and 3 persons per million exposed. More recent feeling is that this is probably a high estimate since much less radium is retained in the body than what was previously thought. The maximum allowable concentration ("MAC") for radium is currently under review at the Federal level. However, the Agency does not expect any proposal to change the standard before late 1985...

The Agency believes an incremental increase in the allowable concentration for combined radium-226 and radium-228, even up to a maximum of 20 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."

(Rec. 6-7).

In support of this conclusion, the Agency incorporated by reference testimony submitted in PCB 85-51, City of Aurora v. IEPA, July 11, 1985. This testimony presented by Dr. Richard E. Toohey, measurements group leader for the Center for Radiobiology of Argonne National Laboratory, was summarized by the Board in PCB 85-51.

The Agency suggests that, in determining whether the costs of compliance are an unreasonable or arbitrary hardship upon the Petitioner, the Board should evaluate "whether significant adverse health effects are likely if the variance is granted as well as whether there is a reasonable possibility of compliance with the radium standard in the foreseeable future." (Rec. 8).

The Agency has concluded that "the grant of the requested variance would impose no significant injury on the public or on the environment for the limited time period of the requested variance and that denial of the recommended variance would be an arbitrary and unreasonable hardship to Petitioner." (Rec. 8).

As to the request for variance from the rule requiring the Agency to list communities on restricted status, the Agency states that:

If the Board grants Petitioner a variance from 35 Ill. Adm. Code 602.105(a) (Standards for Issuance) so that the Agency legally may not deny permits to Petitioner due to Petitioner violating the combined radium-226 and radium-228 standard, then the Agency should not be required to publish that Petitioner is on the Agency's Restrictive Status List for violating those standards, because that would mislead developers and other persons who check the Restricted Status List. Hence, a variance should also be granted from 35 Ill. Adm. Code 602.106(b), but only to the extent it involves the combined radium-226 and -228 standard."

(Rec. 8-9).

However, the Agency recommends that the Board deny the Petitioner's request for a variance from 35 Ill. Adm. Code 602.106(a) because this provision merely defines restricted status. (Rec. 9).

The Board finds that denial of variance would impose an arbitrary or unreasonable hardship on Geneva, given its economic situation and need to increase its fire-fighting capabilities. Variance to allow continued issuance of water main extension permits will be granted for the period beginning January 12, 1986 and ending March 30, 1987, subject to conditions. A variance term of approximately 15 months rather than 5 years has been chosen because, due to the fact that Geneva has known of its radium problem for just a year, it has only begun its exploration of compliance options and has made no commitment to achieve compliance by a date certain as has, for instance, the City of Aurora. Variance for this time period will allow the City to develop a plan and timetable to achieve and finance compliance with applicable radium standards, as well as allowing the Board adequate time to complete the R85-14 rulemaking. Geneva may then apply for any necessary extension of variance.

The Board agrees with the Agency that the risk of adverse health effects to the limited population consuming water delivered by the new water main extensions permitted pursuant to this 15 month variance will not be significant.

In summary, the Board will grant the Petitioner a variance from 35 Ill. Adm. Code 602.105(a) (Standards for Issuance) and from 35 Ill. Adm. Code 602.106(b) (Restricted Status) but only as they relate to 35 Ill. Adm. Code 604.301(a) (combined radium-226 and radium-228), subject to various specified conditions. The requested variance from 35 Ill. Adm. Code 602.105(a) and 602.106(b) as they relate to 604.301(b) is hereby denied and variance from 35 Ill. Adm. Code 602.106(a) is also denied.

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

ORDER

1. The Petitioner, the City of Geneva, is granted variance from 35 Ill. Adm. Code 602.105(a) and from 35 Ill. Adm. Code 602.106(b) but only as they relate to the 5 pCi/l combined radium standard of 35 Ill. Adm. Code 604.301(a), subject to the following conditions.

- (a) This variance begins on January 12, 1986 and expires on March 30, 1987, or when analysis pursuant to 35 Ill. Adm. Code 605.105(a) shows compliance with the combined radium standard, whichever comes first.
- (b) By January 1, 1986, the Petitioner shall secure professional assistance (either from present staff or an outside consultant) in investigating compliance options, including a review of the possibility and feasibility of achieving compliance by blending water from shallow wells with that of its deep wells. By February 1, 1986, 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.
- (c) As expeditiously after identification of a feasible compliance method as is practicable, but no later than January 1, 1987, the Petitioner shall submit a program (with increments of progress) for bringing its system into compliance with radiological quality standards to the Agency's Division of Public Water Supplies, Permit Section, at 2200 Churchill Road, Springfield, Illinois 62706. The City of Geneva shall adhere to all timetables contained in this compliance program.
- (d) Pursuant to 35 Ill. Adm. Code 606.201, the Petitioner shall send to each user of its public water supply a written notice to the effect that the Petitioner has been granted by the Illinois Pollution Control Board a variance from 35 Ill. Adm. Code 602.105(a) (Standards for Issuance) and from 602.106(b) (Restricted Status) as they relate to combined radium-226 and radium-228 in the first set of water bills issued after the grant of this variance and every three months thereafter. The notice shall state the average concentration of radium-226 and radium-228 in samples taken since the last notice period in which samples were taken.
- (e) Until full compliance is reached, the Petitioner shall take all reasonable measures with its existing equipment to minimize the level of combined radium-226 and radium-228 in its finished drinking water.

2. Variance from 35 Ill. Adm. Code 602.105(a) and 35 Ill. Adm. Code 602.106(b) as they relate to 35 Ill. Adm. Code 604.301(b) and variance from 35 Ill. Adm. Code 602.106(a) are hereby denied as unnecessary.

3. Within forty-five days of the date of this Order, the City shall execute and forward to Mr. Wayne Wiemerslage, 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 this variance. This forty-five days period shall be held in abeyance for any period this matter is being appealed. The form of this certificate shall be as follows:

CERTIFICATION

The City of Geneva hereby accepts and agrees to be bound by all terms and conditions of the Order of the Pollution Control Board in PCB 85-90, dated September 20, 1985.

The City of Geneva

By: Authorized Agent

Title

Date

IT IS SO ORDERED.

Chairman Dumelle and Board Members B. Forcade and R. Flemal dissented.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board hereby certify that the above Opinion and Order was adopted on the 20th day of September, 1985 by a vote of 4-3.

Dorothy M. Gunn
Dorothy M. Gunn, Clerk
Illinois Pollution Control Board