

ILLINOIS POLLUTION CONTROL BOARD  
June 29, 1984

VILLAGE OF WEST DUNDEE, )  
 )  
 ) Petitioner, )  
 )  
 ) v. ) PCB 83-164  
 )  
 ) ILLINOIS ENVIRONMENTAL PROTECTION )  
 ) AGENCY, )  
 )  
 ) Respondent. )

MR. WARREN E. STROM, VILLAGE ATTORNEY, APPEARED FOR PETITIONER;  
MR. WAYNE WIEMERSLAGE, ATTORNEY AT LAW, APPEARED FOR RESPONDENT;  
MR. BERNARD Z. PAUL, VILLAGE ATTORNEY, APPEARED FOR OBJECTOR,  
VILLAGE OF CARPENTERSVILLE.

OPINION AND ORDER OF THE BOARD (by B. Forcade):

This matter comes to the Board on a November 8, 1983, Petition for Variance from barium limitations on drinking water, filed by the Village of West Dundee ("West Dundee"), with amended petitions filed on November 28, 1983, December 28, 1983, and March 6, 1984. On December 2, 1983, Mr. Herbert Radtke, Village President, Village of Carpentersville ("Carpentersville") filed an Objection to the variance. On March 19, 1984 the Illinois Environmental Protection Agency ("Agency") filed a recommendation that variance be granted, subject to certain conditions. A hearing was held April 27, 1984 in West Dundee. The transcript and exhibits were filed May 16, 1984, however two exhibits were missing; Carpentersville filed the two missing exhibits May 23, 1984. By Order of May 29, 1984 the Board provided seven days for the parties to object to the accuracy of the late filed exhibits.

West Dundee previously requested a barium variance in 1978. The Board denied that variance request because West Dundee had not demonstrated economic hardship and had not provided an ultimate compliance program (West Dundee v. Illinois Environmental Protection Agency, (PCB 78-1, August 23, 1979, 35 PCB 187)).

West Dundee owns and operates a public water supply system providing potable water to approximately 3400 residents; the

system consists of two wells (Well #1 is a Galesville sandstone well and Well #2 is a drift well), one 100,000 gallon elevated water storage tank and a system for water distribution (Third Am. Pet., ¶ 1). Well #1 has a 1000 gallon per minute ("gpm") pumping capacity (Third Am. Pet., p. 1), is located on the southeast corner of West Dundee (Pet. Ex. 1) and has barium concentrations tested on one occasion at 12 mg/l (Rec. ¶ 5). Well #2 has a 500 gpm pumping capacity (Third Am. Pet., p. 1), is located approximately 3500 feet north of Well #1 in the northern portion of West Dundee, adjacent to the storage tank (Pet. Ex. 1) and has barium concentrations tested on one occasion at 0.143 mg/l (Rec. ¶ 15). These two wells, and the 100,000 gallon storage tank must serve West Dundee's present water demand of 320 gpm (Average Day), 725 gpm (Maximum Day), and 1284 gpm (Peak Hour), reliably (Pet. Ex. 3, p. 6). Thus, the pumping capacity of the low barium well (Well #2) is adequate to serve the present average daily demand but inadequate to serve the maximum daily demand or peak hourly demand. When the high barium well (Well #1) is pumped to meet higher demands, those users nearest Well #1 are likely to receive finished water with barium concentrations in excess of 1 mg/l. Public water supplies, such as West Dundee, are prohibited from delivering finished water with barium concentrations above 1 mg/l by 35 Ill. Adm. Code 604.206.

West Dundee is requesting a variance from those barium limitations until November 1, 1985. West Dundee requests the variance to, in effect, allow the high barium well (Well #1) to be used as a standby well to augment supply when peak water demand exceeds the capacity of the low barium well (Well #2). During the period of the variance West Dundee plans to develop two new drift wells, each producing approximately 600 gpm, construct a storage reservoir, and rehabilitate Well #2 (Third Am. Pet., p. 4). By November, 1985 West Dundee anticipates the increased capacity will allow delivery of finished water within the barium limitations and the high barium well would be used only for emergency purposes.

The Agency recommends that the variance be granted subject to certain conditions. Those conditions, in essence, require West Dundee to implement the well/reservoir development program, minimize use of the high barium well, and to inform the users of the results of a water supply sampling and analysis program. Carpentersville has objected to the variance if any high barium water would be delivered to a relatively new shopping center, Spring Hill Mall, on the northern border of West Dundee; Carpentersville does not object to the variance if a condition prohibits such delivery.

In an effort to meet future water demand with a supply

meeting regulatory limitations West Dundee has evaluated many options, including Fox River water, spring water, shallow wells, deep wells, and purchased water. Quantities available from spring water appear far too low for West Dundee's demand, and securing water from the Fox River (which requires significant treatment) is not economical until average daily demand exceeds 10 million gallons (Pet. Ex. 3, p. 12). Treating the high barium well so that its finished water complies with regulatory limits was also evaluated (Third Am. Pet., p. 3).

Information which West Dundee secured from USEPA indicates that barium can be removed successfully from Well #1's water by either lime softening or ion exchange. Preliminary cost estimates show the following (Third Am. Pet., p. 3):

	<u>Lime Softening</u>	<u>Ion Exchange</u>
Construction Cost	\$3 million	\$1.5 million
Annual O & M Cost	\$60,000	\$30,000
Annual Debt Service Cost	\$300,000	\$150,000

Any efforts to develop a new deep well would undoubtedly encounter the same high barium levels as found in the present deep well (Well #1), and would incorporate the above treatment costs in addition to well development costs.

West Dundee could purchase satisfactory water from either Elgin or Carpentersville. Connections to Elgin would require approximately \$2.75 million to construct the water main, pumping station and purchase plant capacity. Contractual arrangements with Carpentersville would require a \$750,000 connection fee (to offset some improvements needed to the Carpentersville system) and normal user fees plus 25% (Third Am. Pet., p. 4).

West Dundee has rejected each of the above alternatives and proposes to come into compliance by developing two new shallow drift wells, each producing approximately 600 gpm, rehabilitating Well #2, and making improvements to the existing system (Third Am. Pet., p. 4-5). They believe this to be the most cost effective method of providing satisfactory water to meet future demand. Once the new wells are on line, West Dundee will use the high barium well (Well #1) only for emergency purposes (Third Am. Pet., p. 5). The new wells and equipment will be completed by November 30, 1984; the reservoir and pumping station will be completed by April 30, 1985 (Pet. Ex. 14).

To the extent consistent with applicable provisions of the Safe Drinking Water Act, and regulations, this Board may grant variances upon a finding compliance would impose an arbitrary or

unreasonable hardship, Section 35 of the Illinois Environmental Protection Act ("Act"). Because Illinois has been delegated primacy for enforcement of the barium standard by USEPA, state variances must be at least as stringent as federal variances. In granting a variance this Board must find that:

- (1) Because of characteristics of the raw water sources which are reasonably available to the system, the system cannot meet the requirements respecting the maximum contaminant levels of the drinking water regulations despite application of the best technology, treatment techniques, or other means, which the Administrator finds are generally available (taking costs into consideration); and
- (2) The granting of a variance will not result in an unreasonable risk to the health of persons served by the system. (Section 1415 of the Safe Drinking Water Act, 42 U.S.C. Section 300(g)-4).

In effect, under criterion #1, the Board must determine what is the best technology, treatment technique, or other means for West Dundee, taking costs into consideration. The Board finds, based on cost data provided by West Dundee, that development of two new shallow drift wells is an "other means" generally available to West Dundee. Further, the Board finds that the two new wells will constitute a raw water source that is reasonably available to the system by the end of the variance term.

The second criterion is more complicated. The barium limitation of 1 mg/l was based on projected effects on the peripheral nervous and cardiovascular systems (Rec., ¶ 23). Since 90% of West Dundee's present water supply comes from Well #2 on the northern edge of the village, most of the users will receive low barium water most of the time. However, when demand exceeds the capacity of Well #2, Well #1 on the southeast edge of the Village will be turned on. In this circumstance, those users nearest Well #1 will be receiving water at essentially the barium concentration of the well itself. The two analyses in the record from Well #1 show barium levels of 12.11 and 9.37 mg/l (Rec. ¶ 15). This is far above the maximum limitation, but would be expected to occur with limited frequency, duration, and in a limited area. In view of the water conservation efforts the Board will require as a condition of this variance, and the short term of the variance, the Board finds that it will not constitute an unreasonable risk to the health of persons served by the system.

Returning to Illinois law, West Dundee does not have immediate access to a sufficient quantity of low barium water to serve its

needs. Whether West Dundee constructs a new source or treatment capacity for its existing well, each option would take time. Immediate compliance would require West Dundee to use only Well #2, which can service only 90% of the demand. Therefore the Board holds that it would be an arbitrary and unreasonable hardship to require immediate compliance by West Dundee and that the approximately one year schedule (Pet. Ex. 14) constitutes a reasonable compliance time. The Board specifically does not excuse West Dundee's past non-compliance.

On November 22, 1974 this Board adopted a maximum barium concentration for finished water of 1 mg/l (R73-13, 14 PCB 555). Public water supplies were given until January 1, 1978 to comply. The best evidence in the record is that West Dundee has never been in compliance with this nearly ten year old regulation. Moreover, West Dundee's completion schedule (Pet. Ex. 14) shows that from preliminary review to complete construction takes approximately one year. The record is missing any justification for the many years of non-compliance.

To further aggravate the situation, the low barium well currently produces 90% of the Village demand (Third Am. Pet., p. 1) and historically could have produced 50% of the demand (35 PCB 187). Yet, until as recently as several months before the filing of this proceeding West Dundee was supplying up to 99% of its demand from the high barium well (Third Am. Pet., p. 1). This caused finished water supplies throughout the system of from 4 to 10 times permissible levels - for many years. The simple act of switching to Well #2 as the predominant supply results in 90% compliance. The Board received no explanation, in this record, of why the switch was not made many years ago. Whatever the reason, the result is that West Dundee users have been exposed to finished water contaminated at levels well above regulatory limits for many years. The Board will impose as a condition of this variance a public notification program to inform users of the current levels during the term of the variance.

Since Well #2 cannot supply all demand, Well #1 must be used occasionally. The higher the demand the more Well #1 must be used. Since water from Well #1 enters the distribution system from the south side, each time it is used the probability that southern users will receive high barium water increases. If water demand decreases, the exposure of southern users will decrease. Consequently, the Board will act to reduce demand. First, the Board will prohibit new large user connections to the system. This should prevent growth in average water demand above the capacity of Well #2. Second, the Board will require a public awareness/notification program urging users to restrict non-essential water usage during peak demand times: those periods where historical

usage data is higher than the capacity of Well #2. This should reduce the amount of time when Well #1 must be turned on to a minimum. These two steps should minimize exposure of southern users to high barium water.

Carpentersville has requested as a condition of this variance that West Dundee be prohibited from providing water above 1 mg/l barium to the Spring Hill Mall. West Dundee does not presently provide water to the Spring Hill Mall (R. 125, 126). The Board's restriction on new non-residential usage connections, which will prevent high usage of Well #1 and consequently protect residents in the southern portion of the Village, effectively disposes this request.

The last point of concern involves the schedule for compliance. West Dundee has provided a completion schedule that calls for complete construction by April 30, 1985 (Pet. Ex. 14), yet asks for a variance until November 1, 1985. Since the evidence in the record only supports a variance until April 30, 1985, the Board will grant variance until that date only.

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

#### ORDER

The Village of West Dundee is hereby granted a variance for its public water supply from the barium limitations of 35 Ill. Adm. Code 604.202, subject to the following conditions:

1. This variance shall expire April 30, 1985, or as soon as the two new drift wells are developed and producing potable water whichever is sooner.
2. West Dundee shall develop two new drift wells, each capable of producing approximately 600 gpm as soon as possible, but not later than April 30, 1985.
3. West Dundee shall use Well #2 as the primary source of water until the two new drift wells are developed and in use.
4. West Dundee shall use Well #1 only at times of peak demand (or emergency) during the term of this variance. At the conclusion of the peak demand or emergency the water mains shall be flushed within two days to remove any water with barium in excess of the limit.

5. Whenever Well #1 is used, West Dundee shall conduct a barium sampling and analysis program at the nearest available sampling site sufficient to identify those users that may have been exposed to finished water above the barium limit and the maximum barium limit to which any user may have been exposed.
6. West Dundee shall maintain records of all results from paragraph 5, and any results from prior barium testing, and make them available upon request by the Agency or any person.
7. Pursuant to 35 Ill. Adm. Code 606.201, 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 the 1.0 mg/l barium standard 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 content of barium in samples taken since the last notice period during which samples were taken.
8. West Dundee shall not allow new non-residential connections to its water supply where anticipated usage exceeds 1000 gallons per day.
9. West Dundee shall prepare a notice informing residents and users that high water demand increases the probability that some users will be exposed to barium levels above regulatory limits and requesting users to restrict non-essential uses (such as watering lawns) during periods of peak demand. This notice:
  - a. shall be sent to each user in each water bill after acceptance of this variance, and
  - b. shall be published in a newspaper of general circulation once each month that water demand is expected to exceed the capacity of Well #2.
10. West Dundee shall take all reasonable measures with its existing equipment to minimize the level of barium in its finished water.
11. West Dundee shall inform the Agency (Regional Manager, Public Water Supplies, Illinois Environmental Protection

Agency, 595 South State Street, Elgin, Illinois 60120) within ten days of receipt of any and all complaints about West Dundee's water which has as its source or may have as its source Well #1.

- 12. West Dundee shall construct and use a ground water reservoir with a minimum capacity of 135,000 gallons, no later than April 30, 1985.
- 13. Within forty-five days of the date of this Order, West Dundee shall execute a Certification of Acceptance and Agreement to be bound to all terms and conditions of this variance. Said Certification shall be submitted to the Agency at 2200 Churchill Road, Springfield, IL 62706. The 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:

CERTIFICATION

I, (We) \_\_\_\_\_, hereby accept and agree to be bound by all terms and conditions of the Order of the Pollution Control Board in PCB 83-164, June 29, 1984.

\_\_\_\_\_  
Petitioner

\_\_\_\_\_  
Authorized Agent

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

IT IS SO ORDERED.

Board Members J. Anderson and J. Marlin concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 29<sup>th</sup> day of June, 1984, by a vote of 5-0.

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