

ILLINOIS POLLUTION CONTROL BOARD
November 29, 1988

CITY OF SPRINGFIELD,)
)
 Petitioner,)
)
 v.) PCB 88-113
)
 ILLINOIS ENVIRONMENTAL)
 PROTECTION AGENCY,)
)
 Respondent.)

MR. WILLIAM P. MURRAY APPEARED ON BEHALF OF PETITIONER;

MR. JOHN J. BRESLIN APPEARED ON BEHALF OF RESPONDENT.

OPINION AND ORDER OF THE BOARD (by R. C. Flemal):

This matter comes before the Board upon filing by the City of Springfield ("Springfield") of a Petition for Variance ("Petition") on July 22, 1988 and Amended Petition for Variance ("Amended Petition") on September 14, 1988. Springfield requests variance for five years from 35 Ill. Adm. Code 302.206 as that section relates to dissolved oxygen ("DO") in the Sangamon River. Section 302.206 requires that DO shall not be less than 6.0 mg/l during at least 16 hours of any 24 hour period, nor less than 5.0 mg/l at any time.

On August 23, 1988 the Illinois Environmental Protection Agency ("Agency") filed its Recommendation ("Agency Rec.") that the requested relief be granted subject to conditions. Springfield subsequently has stipulated to the acceptability of the conditions recommended by the Agency (R. at 106-109). The Agency also notes that "[t]here are no known federal laws or regulations which would prohibit the granting of this Petition for Variance" (Agency Rec. at 4).

Hearing in this matter was originally waived by Petitioner (Petition at 18). However, the Board received several written objections to grant of the requested variance¹, thereby

¹ Letters of objection and their dates of filing include: City of Petersburg, August 10, 1988; Village of Riverton, August 11, 1988; City of Athens, August 12, 1988; Talisman Riverboat Excursions, August 12, 1988; and the Illinois Department of Conservation, August 26, 1988. An additional letter of objection was filed at hearing on behalf of Doyle Farms, Inc. (Public Exh. 3A and 3B).

triggering automatic hearing pursuant to Section 37(a) of the Illinois Environmental Protection Act (Ill.Rev.Stat.1987, ch. 111^{1/2}, par. 1037(a); "Act"). Hearings were held on October 17, 18, and 19, 1988 in the Springfield Municipal Building.

Although the variance Springfield here requests is from an ambient water quality standard, the motivation for the request lies in Springfield's desire to provide a short-term solution to drought-related water supply problems. The linkage between these two seemingly distant issues is that Springfield wishes to be able to use the Sangamon River as an emergency source of raw water; to do so, Springfield desires to temporarily dam the Sangamon River, which requires a permit from the Army Corps of Engineers pursuant to Section 404 of the Clean Water Act (R. at 59), which in turn requires a certification from the Agency that water quality violations will not occur as a result of the proposed activity pursuant to Section 401 of the Clean Water Act (Id.). The Agency, for its part, believes that it cannot provide the needed certification unless Springfield is relieved from the need to comply with the Board's DO standard.

BACKGROUND

Springfield operates a City Water, Light, and Power Department, which is a municipal electric and water utility which provides service to the City of Springfield and adjacent communities and areas. Water utilities are routinely provided to the City of Springfield, the Villages of Chatham, Grandview, Jerome, Leland Grove, and Rochester, to the Southern View, Sugar Creek, and Sherman-Williamsville Public Water Districts, and to certain unincorporated areas adjacent to Springfield (Petition, p. 1). Approximately 41,000 customers, representing a population of more than 138,000, are served (R. at 12-13); the service population is anticipated to grow to 147,000 by 1990 and 159,000 by 2000 (R. at 13). Average water delivery in 1987 was approximately 21 million gallons per day (R. at 78), with a peak of 36 million gallons per day (R. at 14). Daily water demand is anticipated to reach 23^{1/2} million gallons by the year 2000 (R. at 44).

Springfield's principal source of raw water is Lake Springfield ("the Lake"), a 4,000 acre reservoir constructed in 1935 and situated to the southeast of the City. In addition to serving as a raw water source, Lake Springfield also serves as a source for once-through condenser cooling water for Springfield's two electric power plants, as a recreational facility, and as site of a lake-side residential area (R. at 15-17).

Under most conditions water levels in Lake Springfield are maintained by natural inflow, including that from the two principal tributaries, Sugar Creek and Lick Creek. Under these conditions the amount of water is sufficient to meet withdrawal

demands and to maintain a pool elevation adequate for withdrawing treatable water, for supply cooling water for the electrical utilities, and for support of the Lake's recreational and residential uses. However, during times of limited natural inflow, capacity falls below both the supply and pool maintenance needs. Moreover, during drought conditions both supply and pool elevations have or are projected to fall below acceptable levels.

Springfield has met some of the Lake Springfield shortfalls by increasing the storage capacity of the Lake and by augmenting natural inflow. Storage capacity has been increased by past and on-going dredging (R. at 19-21). Augmentation of inflow is carried out on an as-needed basis by two methods, recycling of clarified ash pond water and diversion of water from the South Fork of the Sangamon River (R. at 25). Recycling of ash pond water consists of discharging water from certain ponds located at Springfield's electric generating stations back into the Lake rather than downstream from the Lake.

Springfield has also met some of the supply shortfalls by developing a graduated program of voluntary and mandatory water conservation measures (R. at 47; 56-57).

Diversion of water from the South Fork is of particular interest because it is identical in concept to the action Springfield desires to carry out on the Sangamon River. The South Fork diversion is enabled by the existence of a movable dam on the South Fork which, when emplaced, causes a pool to form upstream from the dam. A pumping station adjacent to this pool is then used to pump water over the low divide which separates Lake Springfield from the South Fork. The South Fork diversion has been utilized to some degree in at least 10 of the last 12 years (R. at 27; Exh.² 3).

The proposed Sangamon River dam would be located at river mile 85.24, immediately downstream from the confluence of the Sangamon River with the high-flow channel of the South Fork of the Sangamon River, and immediately upstream from the confluence

² The record in this matter contains three numbered series of exhibits. Two of these sets have been submitted by Petitioner, one as attachments to the Petition and one at hearing. For the purpose of distinguishing these exhibits, those submitted with the Petition are herein identified as "Pet. Exh" and those submitted at hearing simply as "Exh.". It is to be noted that a few of the exhibits in these two series are identical. The third series was submitted at hearing by various members of the public. For reference purposes these exhibits are cited as "Public Exh".

of the Sangamon River and Sugar Creek (Exh. 9). This dam would enable channel pools to be formed extending up both the Sangamon River and the South Fork. The Sangamon River pool would extend a distance of 5 to 6 miles upstream (R. at 54, 153). The South Fork pool would extend a maximum distance of 13 miles up that stream (R. at 54, 159). The latter pool includes the site of the present South Fork/Lake Springfield pumping station, thus allowing the present pumping station to serve the proposed new pools (R. at 56, 159).

The overall proposal also involves a second new dam which would prevent overflow from the new South Fork pool into Sugar Creek via the existing low-flow channel (Exh. 9). Construction of both the Sangamon River dam and the anti-overflow dam would require approximately 60 days and would cost less than \$1 million (R. at 58).

The Sangamon River dam would be constructed in a manner which would allow a minimum continuous release rate of 41 cubic feet per second ("cfs"). This would be accomplished by providing the dam with an approximately 30-inch diameter by-pass pipe extending through the base of the dam (R. at 55; Exh. 48). The by-pass pipe would also be equipped with a "saxophone" discharge, which would provide for some aeration of the by-passed water (R. at 114, 154, 185). Further aeration would be promoted for that water which flows over the dam crest by providing a splash-type cascade and splash plates for the 12-foot fall on the downstream side of the dam (R. at 64-65, 153-154).

The 41 cfs discharge rate would be augmented immediately downstream from the dam by the minimum 10 cfs discharge of Sugar Creek (R. at 193); 10 cfs is the discharge of Springfield's Sugar Creek Wastewater Treatment Plant, which discharges to Sugar Creek below the Lake Springfield Dam and above the confluence of Sugar Creek with the Sangamon River. Thus, the minimum flow in the Sangamon River immediately below the proposed new dam would be 51 cfs (R. at 244). This figure contrasts to the present 7-day 10-year low-flow rate of 49 cfs, and the natural 7-day 10-year low-flow rate of 13 cfs³ (R. at 140), as measured at Riverton several

³ The present and the natural 7-day 10-year low flow rates differ because the low flow rate of the Sangamon River has been increased by artificial discharges, principally wastewater treatment plant discharges. It is also to be noted that the present 7-day 10-year low flow at Riverton is cited as 35.6 cfs in some portions of the record (i.e., R. at 241), as a 58 cfs elsewhere (e.g., Public Exh. 1). The discrepancy between these figures and the 49 cfs figure is unexplained in the record, although the date of the calculation would appear to be one factor.

miles below the proposed Sangamon River dam. An additional minimum of 20 cfs is added to the Sangamon River from Springfield's Spring Creek Wastewater Treatment Plant, which discharges downstream from Riverton (R. at 194). Other wastewater treatment plants in the immediate downstream reach of the proposed dam which would also continue to augment Sangamon River flows include Riverton, Athens, and Petersburg (R. at 190).

Both proposed new dams are intended to be temporary structures which would be used for no more than the five years proposed as the term of the variance. Moreover, Springfield agrees to maintain in force its mandatory water conservation measures during the time the dams are in place, and to remove the dams when normal levels on the Lake are restored (R. at 106).

HARDSHIP

In consideration of any variance, the Board is required to determine whether the petitioner would suffer an arbitrary or unreasonable hardship if required to comply with the Board's regulations at issue (Ill.Rev.Stat.1987, ch. 111^{1/2} par. 1035(a)). It is normally not difficult to make a showing that compliance with regulations involves some hardship, since compliance with regulations usually requires some effort and expenditure. However, demonstration of such simple hardship is of itself insufficient to allow the Board to find for a petitioner. A petitioner must go further by demonstrating that the hardship resulting from denial of variance would outweigh the injury of the public from a grant of the petition (Caterpillar Tractor Co. v. IPCB (1977), 48 Ill. App. 3d 655, 363 N.E. 2d 419). Only with such showing can hardship rise to the level of arbitrary or unreasonable hardship.

Moreover, a variance by its nature is a temporary reprieve from compliance with the Board's regulations. Compliance is expected "regardless of the hardship which the task of eventual compliance presents an individual polluter" (Monsanto Co. V. IPCB (1977), 67 Ill. App. 2d 276, 367 N.E.2d 684).

Springfield's instant request is prompted most recently by the severe drought conditions of 1987 and 1988, and projected continued low water levels in Lake Springfield for 1989. The long-term average annual range of the level of the Lake is about 1.7 feet, between approximately 557.9 and 559.6 feet MSL; highest levels typically occur in June and the lowest in November (R. at 79-80; Exh. 12). Although Lake levels were normal as recently as April 1988 (R. at 81), by the end of September 1988 they were about 2.75 feet below the normal September datum of 558.3 feet (R. at 82). If this deficit is not made up by natural winter and spring runoff into the Lake, Springfield fears that it will be entering the critical summer season of 1989 with an unrecoverable

deficit (R. at 85). Springfield estimates, based on the present rate of decline and the long-term trend of seasonal variations, that the Lake level will be at an elevation of about 552 feet by February 1, 1989 (R. at 102), or approximately 6 feet below the February norm (Exh. 12). Moreover, any repeat of a drought in the summer of 1989 will further exacerbate the situation. Operating problems for the water supply and electrical utilities (as opposed to recreation) are predicted to occur at elevations of about 550 feet and to become critical operational constraints at about 546 feet (R. at 102), including inability to pump water from the Lake to supply water use needs (R. at 197), restrictions in the ability to generate electrical power (R. at 197), and possible loss of the ability to adequately treat waste waters (R. at 195). It is also noted that the Lake level actually fell to a low of 547.4 feet during the drought of 1953-1955 (Petition, p. 2), at a time when water demands were significantly less than at present.

In the summer of 1988 Springfield began instituting both voluntary and mandatory water conservation measures. The initial trigger to this activity was deteriorating water system pressures during peak hourly demands (R. at 87). Springfield notes that on some occasions system pressure was reduced to approximately half of the normal 50 psi, which endangered fire-fighting ability (R. at 87-88) among other matters. As conditions worsened, the Springfield City Council ordered mandatory water conservation via ordinance (R. at 89-100; Exh. 13, 14, and 15). Springfield estimates that the conservation programs realized about a 16% decrease in water consumption (R. at 96).

Besides the hardship that mandatory water conservation itself imposes, Springfield points to other hardships that could result if the water conservation programs are insufficient to curtail water demands beyond available supply. These include discontinuance of electric generation, rationing of water, decrease in fire-fighting capability, inability to serve critical public health facilities (hospitals constitute some the largest individual consumers of Springfield's water supply), and economic loss to businesses and their employees (Petition, p. 11-12).

ENVIRONMENTAL IMPACT

Presence of the dams during the cold weather months⁴ should have relatively little likelihood of inducing DO problems either upstream or downstream from the dams. Oxygen solubility is

⁴ It is to be noted in this context that a large portion of the historical diversion of the South Fork into Lake Springfield has occurred during November through March (Exh. 3). The record does not indicate whether this pattern would persist if the Sangamon River project were undertaken.

inversely proportional to water temperature, which allows the DO of cold water, unless the water is severely disturbed by pollution, to be well above standard.

A different DO circumstance prevails during the warm weather months. Then the typically elevated water temperatures can limit DO solubility to near that of the DO standard. Moreover, algal populations tend to be higher in warm waters, and algal respiration alone can produce sufficient oxygen demand to cause DO concentrations to fall near or below the standard. A further strain can be placed on the DO if the stream discharges are also low due to the lower rates of reaeration which are associated with sluggish stream flow⁵. Thus, most of the DO concern regarding Springfield's proposal is centered on the possible negative impact at times of warm weather low-flow.

Data collected by both Springfield and the Agency do show that the DO standard in the Sangamon River is not now consistently met at warm weather low-flow (R. at 258; Exh. 33). The detailed cause of this circumstance is not resolvable from the instant record. However, there is substantial reason to believe that the cause is related to natural conditions of temperature, biotic activity, and low flow, rather than to the impact of pollution (Petition, p. 13-14; R. at 71-72). Lowest observed DO concentrations in fact occur when the waters are warmest, the algal net consumption of oxygen is at its maximum, and flows are low (R. at 267).

Springfield contends that emplacement of the two dams would not cause a significant negative impact on the existing DO situation. As evidence for this conclusion Springfield notes that sampling in the pools upstream from two existing channel dams on the Sangamon River in the vicinity of Springfield during low river stages has not revealed any endemic DO problems (R. at 180-182, 203-205; Exh. 24). Similarly, analysis of DO in the pool formed by the existing South Fork dam have not revealed any violations of the DO standard (R. at 252; Exh. 31). Springfield

⁵ A modeling study conducted by the Illinois Natural History Survey, at the request of Springfield, indicates that at water temperatures typical of warm weather months Sangamon River discharges would have to be on the order of 237 cfs to allow continuous maintenance of even 5.0 mg/l DO. Although Springfield contends that the modeling results are at odds with empirical data (R. at 76, 261-265; Exh. 21), it notes that the 237 cfs is approximately 6 times greater than the measured flow in the Sangamon under the drought conditions experienced in summer 1988 (R. at 75). On this basis Springfield concludes that natural low-flow conditions are themselves sufficient to allow violations of the DO standard (Petition, p. 14).

further suggests that the deeper water maintained in the proposed pools would provide for a dampening of the large diel DO swings witnessed in the shallow free-flowing reaches (R. at 267-268), and thus inhibit rather than promote violations of the DO standard in the new pools.

Springfield further contends that DO would not be adversely affected below the proposed Sangamon River dam (R. at 184). Analyses using a Streater-Phelps model (Exh. 26) indicate virtually no difference in DO patterns at low flow with or without the proposed dam (R. at 235). The exception exists for the river segment immediately below the proposed Sangamon River dam, where DO concentrations are projected to be higher under the with-dam scenario due to reaeration at the dam (R. at 233). Springfield reaches a similar conclusion based on diel field sampling (R. at 266).

Notwithstanding its belief that the dams will not adversely impact the DO of the Sangamon River, Springfield does agree, as condition to grant of the variance, to mitigate any fish kills associated with placement of the dams (R. at 107). Additionally, Springfield agrees to conduct monitoring of DO in the Sangamon River both upstream and downstream of the proposed Sangamon River dam, and upstream of the proposed South Fork dam (R. at 109) while the dams are in place⁶.

A second environmental issue, not related to DO, concerns whether a proposed 41 cfs minimum release rate would provide for sufficient aquatic habitat downstream from the proposed Sangamon River dam. The Illinois Department of Conservation, Division of Water Resources, conducted an instream flow analysis (Pet. Exh. 1; Exh. 17) study which concludes that the release rate would be sufficient to maintain aquatic habitat (R. at 135, 142), and would actually, for some species, increase the amount of usable habitat (R. at 134). Springfield also contends that the pools upstream from the dams would tend to provide needed deep water refuge during times of drought (R. at 271, 287; Exh. 24 at 1).

Concern has also been expressed by communities located downstream from Springfield that the modifications proposed by Springfield for the Sangamon River would adversely affect their water supply wells. Springfield counters that it perceives no immediate impact on these water wells (R. at 188), and notes that the program for continuous release of water from the proposed dam should not decrease Sangamon River flows below the existing 7-day, 10-year low-flow discharges (R. at 193-194).

⁶ Springfield has also analyzed various methods of instream aeration of the Sangamon pool (R. at 220-226; Exh. 26), but has rejected these as impractical (Petition, p. 9). The Agency concurs (Pet. Exh. 7).

COMPLIANCE PLAN

Because a variance is inherently a temporary form of relief, it is incumbent upon a petitioner to show that compliance can be timely achieved. In this context, Springfield contends that its compliance plan consists of removing the temporary dams upon cessation of the variance, or when they are no longer needed to maintain an adequate Lake level. When achieved, this would restore the status quo, thus eliminating connection between Springfield's activities and the Sangamon River DO standard, and effectively bringing Springfield into compliance.

Springfield has several options as solutions for its long-term water supply needs. Among these is the construction of a second reservoir to supplement existing Lake Springfield. This second reservoir, informally known as Lake II, has been under consideration for over two decades, and various exploratory and design studies have been undertaken (R. at 39). Springfield continues to believe that Lake II constitutes an option for remedying its long-term water problems (R. at 110), and the City Water, Light, and Power has requested that the Springfield City Council provide a recommendation for proceeding with Lake II by November 1, 1988⁷ (R. at 105). However, because construction of Lake II would require approximately eight years (R. at 46), the Lake II plan cannot be expected to alleviate the immediate water shortfalls.

A second option is development of groundwater wells. Like the other options, this option is being explored (R. at 116). However, Springfield is currently uncertain that sufficient groundwater supplies are available and that the groundwater system could be economically developed (R. at 162-164). Additionally, this option could not be implemented in time to meet an emergency occurring in the near future.

A third option consists of using existing gravel pits as collection reservoirs, and transferring the water from these to Lake Springfield (R. at 165). This option also has questions related to sufficiency of supply and cost (Petition, p. 10; R. at 167), and could not be implemented within a short-time frame.

CONCLUSION

The instant matter is unusual among matters before the Board in that the issue involves not a weighing of the cost of a

⁷ The Board notes that this date is now in the past. The record does not indicate what, if any action, was actually taken by this date.

pollution control facility versus the environmental gain which accrues from its presence, but rather a weighing of two matters of public injury. On the one hand there is the injury which would be suffered by Springfield's citizens in the absence of an adequate water supply; on the other hand there is the injury which would be suffered by the public environment of the Sangamon River.

The Board believes that Springfield faces a substantial hardship if it cannot proceed with its plans for securing an emergency water source for its residents and the other customers which rely upon it. This hardship stems not only from the inconvenience associated with a less-than-abundant water supply, but more critically from the health and safety risks plus economic losses which are associated with an inadequate public water supply.

While the Board is not pleased that Springfield's circumstances may cause additional stresses to be placed on the Sangamon River, particularly at times when natural stresses may be at their greatest, it is to be noted that Springfield has offered a program which appears to provide for prudent mitigation of these additional stresses.

The Agency summarizes its position as follows:

The Agency believes that Petitioner has evaluated the alternatives and, given the limited amount of time for implementation of a plan, has chosen the best alternative for providing Springfield with an emergency water supply. ... [I]nstallation of the temporary equipment would require a lead time of four to six months before equipment could be delivered to the project site. This lag time could be critical during a severe drought condition. The Agency therefore agrees with the Petitioner that "continuous compliance at all times with 35 Ill. Adm. Code 302.206 by Petitioner would impose a substantial, arbitrary and unreasonable hardship on the Petitioner." (Variance Request, p. 9).

Agency Rec., p. 4 (emphasis in original)

Based on the facts before it, the Board concurs with the Agency's analysis, and finds that Springfield would suffer an arbitrary or unreasonable hardship if denied the requested relief. Accordingly, the variance will be granted, subject to conditions consistent with this Opinion and with the Illinois Environmental Protection Act.

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

ORDER

Petitioner, the City of Springfield, is hereby granted variance from 35 Ill. Adm. Code 302.206 as it relates to dissolved oxygen in the Sangamon River, subject to the following conditions:

- a. Within one year after receiving the variance, Petitioner shall submit to the Illinois Environmental Protection Agency a firm schedule detailing the planning and implementation time frame for obtaining a long term water supply.
- b. Petitioner shall remove the temporary dams (one on the Sangamon River and one on the South Fork River) when the normal levels on Lake Springfield are obtained.
- c. Petitioner shall mitigate any losses of fish with the Illinois Department of Conservation if a fish kill would occur as a result of placement of the dams.
- d. Petitioner shall initiate mandatory water conservation measures before the dams are constructed. These measures shall be initiated in such a way that water conservation will lessen the need for damming the Sangamon River. Petitioner shall submit to the Illinois Environmental Protection Agency for comment any mandatory water conservation measures which may be approved by the City Council.
- e. The mandatory water conservation measures shall remain in effect as long as the dams remain in place. The measures may be withdrawn only when the temporary dams are actually removed from the rivers.
- f. Petitioner shall assure a minimum release of 41 cubic feet per second of water from the Sangamon River dam in accordance with the Illinois Department of Transportation Division of Water Resources instream flow analysis and August 19, 1987 letter to the U.S. Army Corps of Engineers. (Petition, Exhibits 1 and 2).
- g. Petitioner shall conduct monitoring for dissolved oxygen at stations located both above and below the dam to be installed on the Sangamon River and above the dam to be installed on the South Fork of the Sangamon River. Results of such monitoring shall be submitted to the Illinois Department of Conservation, Illinois Department of Transportation Division of Water Resources, and the Illinois Environmental Protection Agency on an annual basis, or upon reasonable request.

- h. This variance shall expire within 5 years or upon Petitioner receiving a second water supply source, whichever occurs first.
- i. Within 45 days of the date of this Order, Petitioner shall execute and forward to Illinois Environmental Protection Agency, Division of Water Pollution Control, Compliance Assurance Section, 2200 Churchill Road, Post Office Box 19276, Springfield, Illinois 62794-9276, a Certification of Acceptance and Agreement to be bound to all terms and conditions of this variance. The 45-day period shall be held in abeyance during any period that this matter is being appealed. Failure to execute and forward the Certificate within 45 days renders this variance void and of no force and effect as a shield against enforcement of rules from which variance was granted. 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 88-113, November 29, 1988.

Petitioner

Authorized Agent

Title

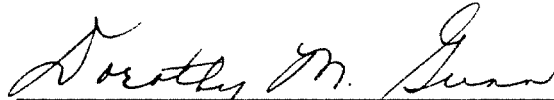
Date

Section 41 of the Environmental Protection Act, Ill. Rev. Stat. 1987 ch. 111¹/₂ par. 1041, provides for appeal of final Orders of the Board within 35 days. The Rules of the Supreme Court of Illinois establish filing requirements.

IT IS SO ORDERED.

Board Members Jacob D. Dumelle and Michael Nardulli concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 29th day of November, 1988, by a vote of 7-0.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board