

Drought Emergency Planning

PHILADELPHIA ASSOCIATION OF GOLF COURSE SUPERINTENDENTS RESPONDS

by MICHAEL R. SMITH, Secretary

THE ISSUE of water use on golf courses is rapidly developing into the central theme around which all future golf course management plans will be made. Though this was accepted long ago by superintendents in the West, it is only beginning to hit home in the Mid-Atlantic, Eastern regions, where adequate rainfall and irrigation water sources have always been taken for granted.

The drought of 1980 brought about the most serious water shortage to the Mid-Atlantic region since the mid-60s. In 1981, in response to the drought of the previous year, state agencies in the Delaware River Basin area — which includes all or parts of New York, New Jersey, Pennsylvania, Maryland, and Delaware — enacted restrictions on golf course irrigation. These restrictions initially ranged from total elimination of irrigation (greens, tees, fairways) in New Jersey to a voluntary reduction of water use in Delaware. Pennsylvania's restrictions stated that all fairway irrigation be eliminated and that green and tee irrigation be limited to hours between 5 p.m. and 9 a.m. These restrictions, imposed in haste during a critical water shortage, were formulated without consulting anyone responsible for maintaining courses.



Philadelphia Association of Golf Course Superintendents Board Meeting on Drought Emergency Planning.

When the drought regulations were made public, early in 1981, a coalition of the New Jersey Green Industry was the only group able to mount a successful campaign to modify restrictions affecting irrigation. Responsible people in other affected states made no concerted effort to effect changes in the regulations.

Fortunately, 1981 was a year of above average precipitation, and as summer approached, it became obvious that, in most areas, irrigation restrictions would not be rigidly enforced. The restrictions did prove to many area superintendents that they had in fact been overwatering for many years, and that they could

reduce irrigation without compromising the quality of their golf courses. Time passed and drought regulations and our close call with turf disaster were forgotten. Several superintendents did, however, continue programs of reduced irrigation and planned changes in maintenance operations to provide quality playing conditions and aesthetics while using less water.

Late in 1983 drought emergency regulations again cropped up. The Delaware River Basin Commission (DRBC), in an effort to be prepared for the next emergency, required member states to draw up contingency plans, providing reasonably uniform regulations throughout the region. In Pennsylvania, public hearings on the proposed regulations were held in February, 1984. Representatives of the PAGCS attended these hearings to present our viewpoint and learn what could be done to modify the proposed regulations.

Proposed regulations divided a drought condition into three stages of severity; drought watch, drought warning, and drought emergency. During a drought watch, education to increase public awareness of the need to conserve water and general voluntary water use reductions were the only guidelines set

forth by the DRBC. Proposed regulations, affecting golf courses during a drought emergency did not vary from the 1981 regulations: No fairway irrigation and restriction of green and tee irrigation to between 5 p.m. and 9 a.m. However, during a drought warning, golf courses would be asked to abide voluntarily by drought emergency regulations. When asked how often we could expect drought warning and drought emergency conditions to occur, DRBC officials estimated a drought emergency would occur every seven to 10 years, but a drought warning would occur every two to three years. Potentially, this could mean that golf courses would be asked to restrict their irrigation voluntarily every other year.

It became clear after the public hearings that a concerted effort would be needed to modify these regulations before they became law. The PAGCS board of directors began looking for ways to approach this problem effectively.

IN MARCH 1985, the board of directors of the PAGCS unanimously passed a resolution to commission a study of "The Impacts of the Drought Contingency Plan on Golf" by the Greely-Polhemus Group (GPG), a consulting firm that specializes in industrial and municipal water use and hazardous material handling. The purpose of the study was to pinpoint the economic impact of the drought regulations affecting golf in the Pennsylvania portion of the Delaware River Basin and identify the impact of the golf course water use on Delaware River Basin water resources.

To gather the information, the GPG, with PAGCS guidance, developed a questionnaire that was distributed to a randomly selected group of golf clubs in eastern Pennsylvania. The results provided us with the information needed to present an alternative to the proposed regulations.

The GPG divided its report into four objectives: 1. Address the inequity of the proposed percentage depletive water use

(water that is lost from the system by evaporation or other means) reduction by golf courses; 2. Establish the economic significance of the golf industry; 3. Identify the regulations' economic impact on golf; 4. Propose revisions to the DRBC drought contingency plan consistent with the golf industry's willingness to do its fair share to conserve water during drought.

1. Water Use

The DRBC drought emergency plan established as a goal to reduce depletive water use by 15 percent in each member state. In Pennsylvania, this goal is to be reached by reducing the depletive use of the four user classifications by certain percentages.

The figures in *Table 1* illustrate that golf is being asked to bear a disproportionate share of the depletive use reduction, even though it is the smallest depletive user classification. Of the 5,974.9 mgd water use withdrawal in the Pennsylvania portion of the basin, golf courses account for only 0.2 percent, and account for only 3.7 percent of the 327.3 mgd depletive use total. It will become clear that the water savings gained from such a severe reduction of golf course irrigation is insignificant compared to the potential economic impact of the reduction.

The survey figures also showed that by following proposed restrictions, depletive golf course water use would actually be reduced by 77 percent, not 54 percent, the DRBC target listed in *Table 1*.

As you can see, figures in *Table 2* show a 77 percent reduction in water use by eliminating fairway irrigation. This strongly suggests that DRBC arbitrarily chose water use reduction figures for golf courses, due to their lack of information about golf.

2. Economic Significance

Pennsylvania drought regulations categorize golf courses as institutional non-essential water users. This category also includes playgrounds, hospitals and industrial landscapes, and college campuses. In New Jersey, the golf industry was able to have its user classification changed from institutional to industrial by demonstrating its economic impact within the state. After we studied information gathered from our survey and other sources, we established changing the golf business classification from institutional to industrial as one of the primary goals of the GPG report. By grant-

TABLE 1.

Category	Total Depletive Use 1980	Depletive Use Reduction Objective	% Reduction
Public Water Supply Users	66.0 mgd*	25.0 mgd	39
Golf Courses	11.2 mgd	6.0 mgd	54
Thermal Electric	24.5 mgd	2.5 mgd	10
Industrial/Commercial	122.4 mgd	4.0 mgd	4

*Million gallons/day

TABLE 2.

Golf Course Water Use in Pennsylvania Delaware River Basin

Area	MGD Used	% of Total
Greens	1.7	14
Tees	1.1	9
Fairways	9.5	77
	12.3	100

TABLE 3.

Drought Incurred Losses Significant Losses Likely

Area	% Yes	% No	% Loss	Renovation Cost
Fairways	87	13	50	\$18,800
Tees	36	64	16	6,000
Greens	43	57	10	8,200
Shrubberies	64	36	28	5,500
				\$38,500

ing the industrial classification to golf courses, DRBC would be obligated to distribute depletive water use reductions more equitably throughout all industries, the largest depletive users.

Here are some facts and figures to support our contention that golf qualifies as an industry in Pennsylvania.

- The average annual revenue for golf clubs responding to our survey was \$1.414 million.
- Based on the estimated 150 golf clubs in the Pennsylvania portion of the Delaware River basin, golf produces \$212 million per year in primary economic activity.
- Employment represents approximately 2,000 full-time and 3,000 part-time employees combining to earn \$60 million per year.
- *The Standard Industrial Classification Manual* and the *1977 Census of Service Industries* both classify golf courses as industries.

These facts support our contention that the DRBC grossly underestimated the impact of golf in Pennsylvania when it classified it as an institutional non-essential user.

3. Impact of Drought Regulations

Response to the GPG questionnaire indicated that 80 percent of the golf clubs in the Pennsylvania portion of the basin had suffered previous occurrences of drought damage and resultant renovation costs. *Table 3.* shows the estimated percent damage and restoration costs that the average club would incur by following the proposed DRBC irrigation restrictions.

Projected throughout the affected area in Pennsylvania, the direct economic impact to golf amounts to nearly \$6 million per drought emergency.

Estimating loss in income caused by a drought emergency proved more difficult. Respondents generally agreed that revenue would decrease as course conditions deteriorated; the average reduction falling between 11 and 14 percent. Using the previously mentioned average gross revenue of \$1.414 million per club, losses would total \$200,000 per club, \$30 million through the Pennsylvania portion of the basin. These figures would be very sensitive to the length and severity of a drought emergency. The average club member is more often than not as interested in the aesthetics of the golf course as the playing conditions. Many members of private



(Left) "We are a non-polluting, smokeless, industry."

Drought loss.



clubs would probably rethink their membership costs as course conditions deteriorated during a protracted drought condition.

4. Conditions and Recommendations

After the survey data was compiled, representatives of the PAGCS held several meetings with the Greely-Polhemus Group to formulate modifications to the portions of the DRBC Drought Emergency Plan that affect golf course operations. The following recommendations were made to the DRBC:

- Classify golf in Pennsylvania as an industry.
- Establish a depletive water use reduction of 25 percent (or other percentages as may be applied in all industry), and do not prohibit irrigation practices (grant the industry flexibility to determine where irrigation is needed to protect its economic investments in turf and ornamental plantings, and maintain a playable golf course to protect revenues).
- Set time of day restrictions, for example 5 p.m. to 9 a.m., to prevent irri-

gation during peak evaporation periods, including greens, tees and fairways.

d. Assist the industry in developing projects where recycled municipal wastewater can be used.

e. Assist in research of drought resistant grass, and demonstrate the use of tensiometers and improved practices for optimal irrigation.

The PAGCS feels that these recommendations are consistent with our desire to do our part during a drought emergency. It was obvious after reviewing the DRBC plan that golf was singled out to bear a disproportionate share of the drought burden because of lack of knowledge of the game and its high visibility. Other non-essential industries (candy and ice cream manufacturers, car wash establishments) were not singled out, or else they had lobbied successfully to modify rulings that affected them. If our study accomplishes nothing else, we hope that it results in a more careful study of the impacts of the drought regulations and that it produces more equitable depletive use reductions.