

Comparison Of Water Sources

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I do not believe there is anyone who does not recognize that the subject for this opening panel, "Water Sources," is the very heart-throb for any successful, well-kept golf course.

We may take a minute to note the possible different interests pertaining to our subject Water Sources. There could be those who may be associated with a group that is planning the development and construction of a new country club. On the other hand, there may be those who are presently associated with an existing country club whose source of water supply is either diminishing or has reached a dangerously low level. There could be a third group, and they would perhaps be in the minority, whose existing source of supply is either limited or restricted, which naturally prohibits the expansion, modernization and improvement of their club. In this group may be those who are served from a municipal water supply.

In order to determine the source of supply to be accepted or developed for any country club in any section of the country, we must first determine from several accepted methods the volume of water which can be expected to be used at the club or course in question.

For example, it is recognized that at an average 18-hole golf course in the Mid-Atlantic area, having a conventional water system—and by conventional, I am referring to a system which has outlets at tees and greens only—a competent superintendent using such a system during the recognized watering season in this area, namely from the middle of May into September, may on certain days water his greens once or twice. He may if necessary syringe them off at several other times. The outlets on such a system generally deliver approximately 15 gallons per minute. If the superintendent has three men watering at a time and they in turn have four sprinkler heads open, we arrive at a simple mathematical calculation such as: three men with four heads open each (12 heads) times 15 gal-

lons per minute = 180 gallons per minute. This multiplied by the time required for watering will naturally give the gallons per day; and by days will give gallons per week, etc.

On courses with more elaborate watering systems, such as a course with outlets at the tees, greens, landing areas and approaches, we would naturally extend this demand per minute to perhaps double, 360 gallons per minute.

For golf courses which may have a complete fairway watering system, although the number of outlets opened at one time may not increase, the size of the outlets may demand in excess of 500 gallons per minute.

I realize that some of the explanation may overlap into following panels, but this point is important as we move along in our subject to developing a source of supply.

The most recognized sources of water supply are rivers, lakes, wells, and municipal sources.

The first, rivers, or large creeks or streams on which there has been a reasonable amount of preliminary research, such as the proven flow and the established fact that the water level does not diminish below a certain level during the dry season, are the best sources of water supply to have available. In recognizing the flow of the stream, we may refer back to the gallons per minute that may be demanded of the particular system in question. If the flow of the stream exceeds the demand by 50 per cent, this percentage is accepted in most cases as being adequate. Naturally, the country club fortunate enough to have this source of supply has little or no problem.

It has been found impractical when using this source of supply to place the intake from the pump directly into the flowing stream. In lieu of such a practice, an offset pond should be excavated from 30 to 50 feet back from the bank of the creek and dug to a depth of approximately six to eight feet below the mean

low water level of the river. A channel four to six feet wide and at the same depth should be opened from the river into the pond. During heavy rains, when the stream may be carrying a considerable amount of debris and silt, a swift flow naturally would bypass the pond and eliminate a considerable amount of damage. Where the stream is recognized as a boundary, the offset pond affords a means of protection from vandalism.

The second most popular recognized source of supply is a lake or a series of ponds. Mr. Latham's accompanying article contains a discussion of some of the factors involved in reservoir construction and use.

The third recognized source, wells, in certain sections of the country is the only source that can be developed. This source perhaps is more expensive than the two previously mentioned sources. The cost of wells in different sections of the country can vary widely.

It has been recognized, where a well or wells are the exclusive source of water supply for the country club, that it is more practical and economical to have the two systems separated; that is, the system for the domestic supply and the system for the golf course. It is a costly operation to have the necessary power on a single well supplying the clubhouse and the golf course. Where the water supply for the golf course may be needed on an average of six months, and the supply to the clubhouse for 12 months, there is a considerable amount of idle power during the six months when the irrigation system for the course is not in service. The more practical and economical method is to have a single pump deliver water into a storage pond and a second pump set up to pump from the storage pond into the water system for the golf course. This storage pond may also prove a safety margin in the event of a pump breakdown. The pond location can also take advantage of runoff water and other natural sources. In the majority of cases the large motor required for a single operation will perhaps invoke a demand charge by the local utility company. This can be a 12-month expense regardless of the time the pump is used. In certain areas expert and competent advice is needed before developing a well or system of wells for source of supply. What

may seem adequate at the time can diminish in a few years with constant pumping and the encroachment of housing developments and industry in the area. Industry and housing developments in seeking large volumes of water by well systems go to greater depths than the original wells for the country club. Thus in time they tap or drain the shallow sources being used for the golf course.

The fourth, and perhaps the most expensive recognized source of water supply for the country club, is the municipal system. The most noted drawback from this source of supply is that at times a country club may be restricted or limited severely as to the volume it could use. Such a restriction naturally would come at the most critical dry season of the year. Restrictions also may be placed on the time at which the water may be used.

There are certain mechanical drawbacks which can be encountered in a municipal system such as pressures too high or too low. In one known case the pressure was too high and did considerable damage to a newly installed fairway watering system which used plastic pipe.

Booster pumps in most cases have proved almost a necessity between the municipal system and the club system. Pressure changes and surges from the municipal system, if not controlled, at times make a very inefficient operation of certain large sprinkler heads.

In summing up our subject, Water Sources, invariably the committee for the country club and the expert discussing the subject will reach a common point on one major issue, and that is: Shall a source of water supply be developed to meet the demand that may be required by the plans and specifications, or will the plans and specifications be adjusted to suit what is known to be an economical, permanent source of supply? Unless a sound, unlimited, economical source of supply is available, certain elaborate, costly watering systems should perhaps be limited and kept within reason for such a known source. To one who, though not an agronomist, is ever aware of the diminishing sources of water supply, it seems that more emphasis could be placed on the types of grasses, especially for fairways and roughs, that do not require the quantity of water as do other grasses.