A concerned look at Barnstable's water supply

[**Ed. Note:** The first of the following letters was written by W. H. Leonard of Osterville commenting on Gilbert Newton's **Environmental Impact column** published in the **Advertiser** on June 21, 1984. In the second letter, Newton responds to Leonard's comments concerning Barnstable's water supplies.]

Everything's still OK!

Dear Mr. Newton,

My wife and I have been readers of your column for many years and with much enjoyment.

In the June 21, '84 issue of the Village Advertiser you spoke of the Cape's crowding and the various environmental strains including those on the water supplies. In thinking about this, it seems inevitable that at some point the demands on the water supplies and the supplies available will be equal. This is the point, of course, where population increase must be terminated. I would like to propose a method by which this point may be easily calculated using historically available data relating to annual demand and annual precipitation. It is important to note that the critical information to be derived is AREA of wellfield "zones of contribution" which are needed. It is not the total volume of precipitation for the entire town since much of this area is unavailable for wellfields or is already hopelessly polluted.

In 1980 the municipal water systems in the Town of Barnstable pumped 1.9 billion gallons (roughly 2 billion). At this time the resident population of the town was about 30,000.

To calculate the area of "zones of contribution" required to supply this amount of water proceed as follows.

- Annual precipitation on the Cape averages 44 inches per year.
- The loss from evaporation, transpiration etc. averages 26 inches per year.
- Net re-charge is 18 inches or 1½ feet per year.
- One acre is roughly 44,000 sq. ft.
- 44,000 sq. ft. times 1½ feet is 66,000 cubic ft/year/acre.
- One cubic foot contains about 7.5 gallons.
- 7.5 gallons/cubic foot times 66,000 cubic feet is about 500,000 gallons per acre per year re-charge.
- 2 billion gallons a year demand divided by 500,000 gallons per acre re-charge yields a requirement for 4,000 acres of "zones of contribution" to supply 30,000 year round residents. This is a large number of acres of "zones of contribution." Obviously, a population of 45,000 would require 6,000 acres.

I think it is an important question whether or not the town presently has the acreage of pollution-free land available as "zones of contribution" and it is self-evident that these acres mut be pollution-free and must remain so.

It is also worth noting that over-pumping a wellfield will create a water table "zone of depression" into which surrounding polluted water will inevitably flow over time. An extreme case might be where heavy over-pumping of the Mary Dunn wellfield would suck water from under the sewage plant filter beds in spite of the natural north to south gradient between the two areas.

In short, it is mandatory that a positive hydraulic head be maintained at any wellfield. This precludes drawing upon "Cape-wide" or "town-wide" underground water supplies since much of these are now polluted. The latest report by SEA consultants show 29% of working wells have nitrate levels above normal.

Unfortunately, there are a number of people and lobbying groups such as "Citizens for Sensible Growth" who take the position that there is "plenty of water" and "everything is still OK."

So I will close by telling a little story. It seems that this fellow (a typical present-minded optimistic American) fell off the Empire State Building. And as he passed his friend on the 29th floor, he hollered out, "Everything's still OK!"

Thank you very much for your attention. I hope you will continue to find time in your busy schedule to continue your column.

Very truly yours,
W. H. Leonard
218 Parker Rd.
Osterville

Dear Mr. Leonard,

Thank you, Mr. Leonard, for your comments concerning the Barnstable water supplies. You raised several interesting points which I think are worth emphasizing.

I agree that Barnstable's carrying capacity will be determined by the condition and availability of an adequate water supply. It seems to me that the amount of development in this town makes it mandatory that we quickly determine that level of capacity. As you pointed out, several active wells are already showing signs of nitrate contamination.

I am also in agreement with the conclusions based on your calculations. The town must protect large areas of open space, particularly in the zones of contribution to groundwater supplies. The Town of Barnstable has made progress in this area. Ongoing water quality studies along with a moratorium in water recharge zones will provide the town with the baseline data needed to assess further development.

Most recently the Barnstable Conservation Commission released on Open Space Plan for the town which addresses these concerns. More importantly, it offers a five-year action plan for the acquisition and protection of environmentally sensitive lands. I hope that you and other residents of the town will examine this plan, and support its conclusions.

Your concern, and that of others, is encouraging to me. We are rapidly running out of time in which to secure and protect one of our most critical natural resources, our drinking water. I have no doubt that if development continues at the rate we have witnessed over the last five to ten years, we will be dealing with a serious pollution and public health problem.

Sincerely,
Gilbert Newton