3225 MAIN STREET • P.O. BOX 226
BARNSTABLE, MASSACHUSETTS 02630

(508) 362-3828 • Fax (508) 362-3136 • www.capecodcommission.org

CAPE COD COMMISSION

MEMORANDUM

To: Kathy Baskin, EOEEA Water Policy Director

From: Tom Cambareri, Water Resources Program Manager

Date: April 3, 2012

RE: Comment on Appendix B Safe Yield Approach for the Plymouth Carver, Cape Cod and Islands methodology.

The Cape Cod Commission is the region's land use planning and regulatory agency that provides hydrogeologic technical services and assistance to the 15 municipalities and its water resources program recently provided critical input to DEP on the development of drought management triggers. The authors of the safe yield approach consisted of experts from EOEE, DEP and DCR who consulted with researchers from the USGS. Neither the Cape Cod Commission nor Cape water suppliers were contacted.

The simple application of the 1965 drought rainfall as a surrogate for the Q90 to the entire land mass of the Cape Cod Basin to determine safe yield is flawed. The method assumes that 100% of the groundwater system is available for public supply. The method makes an inappropriate analogy of groundwater in storage to the volume of the water stored in the Quabbin Reservoir. The Cape Cod Aquifer is not a constructed reservoir with a primary purpose of storing drinking water. The aquifer provides drinking water to wells, in addition to fresh water flow to ponds creeks and rivers, sustains fresh water wetlands and vernal pools (found at the watertable surface), and provides important fresh water discharge to the surrounding estuaries. The aquifer is bound by a delicate salt water transition zone.

During times of drought, the aquifer is at its lowest elevation. Pond shorelines expand, the flow of water in creeks decreases, wetlands and vernal pools are dry and substantial pond areas become dry. During times of extreme drought the aquifer requires critical recharge to sustain water dependent ecosystems and match the demand for summertime use. The use of the drought rainfall (approximately ½ of the average rainfall) solely for a safe yield drinking water purpose is generous for those extreme periods. The proposed allocation does not acknowledge that approximately 80 to 90% of the pumped water is not consumptive and is returned to the aquifer as wastewater.

In 1991 when the Water Resources Office of the then Department of Environmental Management was conducting an assessment of the Cape Cod Basin, it was mutually decided by DEM, DEP, USGS and CCC that an overall safe yield for the aquifer could not be determined and that water management act permits should use a site specific impact assessment and mitigation strategy. This has been the standing approach.

If the Commonwealth requires an overall safe yield to be determined for Cape Cod, it should be based on a thorough assessment and reasonable strategy. The following is an alternative approach to this problem. Because the Cape Cod groundwater system is not a sole purpose reservoir, we should consider just what portions of the land mass are available for water supply purposes. This is consistent with the definition of an aquifer as groundwater that can supply water to a well. The USGS conducted an assessment of potentially suitable areas for water supply development on Cape Cod, (Harris and Steeves, 1993). This was a reverse order overlay method to remove those areas not suitable for water supply. The study identified an area surrounding the margin of the Cape as a saltwater intrusion zone. This accounts for 26% of the land area that should be removed from consideration. In a similar fashion areas for wetlands, contaminated areas, business areas and restricted zones (NPS and DEM lands), should not be considered water supply areas. This accounts for 52% of the Cape land area. It is also reasonable that a portion, say 75%, of the residential areas should also be removed from the land area since it is unlikely that new supplies could be located within that type of area from a safe yield consideration. Applying EOEE's proposed drought rainfall amount to the remaining water supply areas (24% of the land area) results in 61 MGD.

Alternatively a safe yield of 70 MGD results if the EOEE's drought rate is applied to the combined Zone II areas, which make up 27% of the land mass.

In either case this revised method acknowledges the aquifer as a multi-purpose groundwater system and the results are more aligned to the presently permitted withdrawals of 51.6 MGD, which is approximate to the Cape-wide summer pumping demand.

The Commission just completed a Cape wide assessment that identified an actual annual 2008 water use of 28.8 MGD, including the use of private wells.

Finally, the safe yield determination for the Cape Cod Basin needs to acknowledge that the "basin" is comprised of six lenses that are distinct and hydrologically separate and abandon the characterization of the aquifer is a single basin. This concept needs further consideration given the possibility of interlens transfers for wastewater management.

I suggest that the approach to define a Cape Cod safe yield be revised and include input from the Cape water suppliers and the Cape Cod Commission.

Harris and Steeves, 1994. Identification of potential public water supply areas of the Cape Cod Aquifer, Ma, using a Geographic Information System, USGS, WRIR, 94-4156.