



# Evaluation of Soils and Hydrology for Subsurface Sewage Disposal

## Gloucester, Cape Ann, Massachusetts

Cape Ann, Massachusetts is a peninsula of granitic rock overlain with thin glacial soils. Siting individual wastewater disposal systems for single family homes can be challenging, and siting leaching facilities for a wastewater treatment plant is even more challenging.

Horsley Witten Group (HW) worked with a Cape Ann developer to evaluate the feasibility of a wastewater treatment plant for a residential community on 70 acres of land in southern Gloucester. Numerous deep hole observation tests and percolation tests showed that an area of approximately one acre was potentially suitable for the proposed treatment plant leaching facility.

To prove this area for wastewater leaching, groundwater monitoring wells were installed to determine thickness of glacial sediments, groundwater flow direction, and hydraulic conductivity. Hydraulic conductivity was measured by conducting in-situ “slug” and mini-pumping tests at each monitoring well.

A three-dimensional groundwater model of the site was created using the USGS’s modeling program MODFLOW. The model showed that, due to the relatively thin soils and their low hydraulic conductivity, only a limited amount of wastewater could be leached. Considerable amounts of imported fill would be needed to prevent mounding of wastewater effluent.

The client is currently reconsidering options for the property.

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