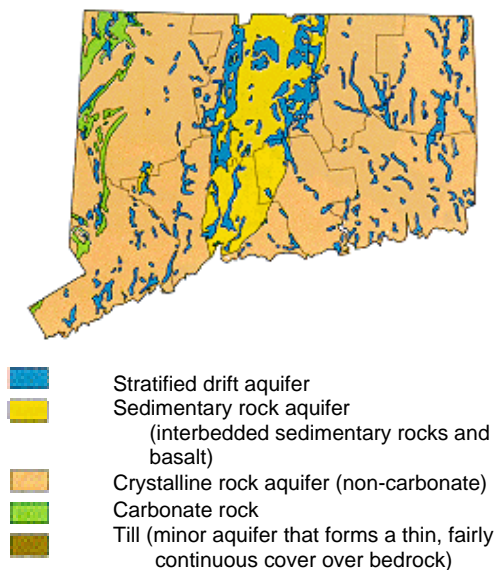


CONNECTICUT GROUND WATER CONDITIONS

Ground Water Importance: Connecticut's ground water resources are the source of drinking water for approximately one million people, about one-third of the State's population. Ground water is withdrawn through 600 community water systems (public supply), more than 2,600 non-community wells (restaurants, hospitals, schools, etc.), and roughly 250,000 individual private home wells. It is anticipated that future potable water demands related to growth will be satisfied predominantly by ground water. In addition, ground water provides baseflow for most of the State's rivers, streams and wetlands, and therefore the quality and quantity of ground water is inextricably linked to that of surface water resources.

Where is It? Connecticut has two major types of aquifers, stratified drift aquifers composed of unconsolidated sand and gravel of glacial origin, and bedrock aquifers that are differentiated into sedimentary, crystalline (non-carbonate), and carbonate-rock aquifers (see Figure below). Stratified drift aquifers, which line the larger river valleys, are the most productive aquifers and the primary source of ground water for water utilities which serve populations of greater than 1,000 people.



Bedrock aquifers underlie the entire State and are the source of supply for most non-community water systems and private homeowner wells.

Connecticut's aquifer systems are shallow, typically less than 300 feet deep and the water table is within 50 feet of the land surface. Most wells tap the upper part of the saturated zone, producing water that has been in the aquifer only a few months to a few decades. These shallow aquifers are susceptible to contamination from land use activities on the surface.

How good is the Water? The quality of Connecticut's ground water is generally very good. The Connecticut Department of Environmental Protection (DEP) estimates that more than 90% of the State is underlain by ground water suitable for drinking without treatment. However, incidents of ground water contamination have occurred in every municipality due to many thousands of sources, including historic industrial activities, underground storage tanks, landfills, salt storage facilities and road salt application, application of pesticides and fertilizers and countless accidental spills of chemicals at industrial, commercial and residential properties.

There are currently more than 5,500 contaminated sites identified on the State's data base, 672 sites on the State's inventory of hazardous waste disposal sites, and more than 3,000 underground storage tanks known to have leaked. As a result, more than 2,200 contaminated drinking water supply wells (providing water for at least 300,000 people) have been identified since the 1970's. On the average, 50 to 70 contaminated drinking water supply wells are identified every year.

The most commonly identified contaminants are petroleum-based compounds from gasoline (including MTBE), and fuel oil. Halogenated solvents, used for cleaning purposes in many industrial and commercial activities, are the second most common class of ground water contaminants.

Just as in other areas of the country, the costs of remediation are very significant. While costs incurred by property owners and businesses at hundreds of sites are not reported, expenditures of State and Federal funds to

remediate contaminated sites are in the range of tens of millions of dollars per year.

Connecticut does not make use of an ambient ground water monitoring program. Instead, DEP relies upon monitoring performed for numerous other purposes including, but not limited to Safe Drinking Water Act compliance monitoring at more than 3,200 community and non-community water supply wells; monitoring performed at known or suspected sources of contamination by DEP, EPA and responsible parties; ground water discharge compliance monitoring; hydrogeologic investigations by USGS; and monitoring of homeowner wells as typically occurs upon sale of a property, by local health department investigations or simply performed by a concerned homeowner. Due to the multiple data sources and many thousands of monitoring results each year, improved data management is a DEP priority.

Efforts to Protect Ground Water: The sheer number of sources of contamination, most of which affect a very localized area of ground water, presents many challenges to achieving the State's goal of protecting and restoring ground water resources. DEP has used four approaches to develop ground water quality programs:

(1) Quality goals and designated uses for all ground water resources were articulated in a manner similar to that done for surface water resources (Water Quality Standards and Classification System). A complementary clean-up standards regulation was then developed consistent with the water quality goals and designated uses to guide remediation.

(2) A potable water program was developed to address the most critical human health risk caused by ground water contamination - the contamination of drinking water wells.

(3) DEP developed a number of programs, in addition to federal programs, that encourage or require the clean-up of contaminated sites. Such programs include the State Superfund and remediation programs which address sites that are high environmental priorities, and the property transfer and urban site remediation

programs which address sites of economic importance.

(4) DEP implements preventive action programs including: the federal Source Water Assessment Program (in cooperation with the CT Department of Public Health) and Wellhead Protection Program; and State programs for Aquifer Protection Areas, Pollution Prevention, and contaminant source control such as the Underground Storage Tank and Ground Water Discharge Permitting Programs.

DEP addresses pollution prevention on a statewide basis, with focused attention on public drinking water supplies. The Aquifer Protection Program recognizes that the most effective way to prevent contamination of the State's most prolific drinking water resources is to control land uses in areas which contribute recharge to the stratified drift aquifers. The permitting requirements for discharges to ground water, such as those generated by landfills, protect ground water resources by prohibiting discharges in a setting that is or could be used for potable water supply, and by requiring best available technology, such as liners, to minimize ground water impacts even in hydrologically suitable settings. Another recent initiative was enactment of legislation requiring phase-out of the gasoline additive MTBE.

What else is Needed? More resources are needed to address ground water pollution affecting drinking water supply wells and associated sources of contamination that the public expects government agencies to address expeditiously. Continuing the Safe Drinking Water Act emphasis on ground water source area protection (a.k.a. "SWAP") especially as it enables States to strengthen and implement their respective Wellhead Protection Programs (the Aquifer Protection Program in Connecticut) is important. Finally, additional research to enable establishment of more precise wellhead protection areas for public wells in bedrock for Connecticut and the Northeast is needed.

(Figure taken from U.S. Geological Survey Open-File Report 87-0717, Connecticut Ground water Quality, R. L. Melvin et al.)