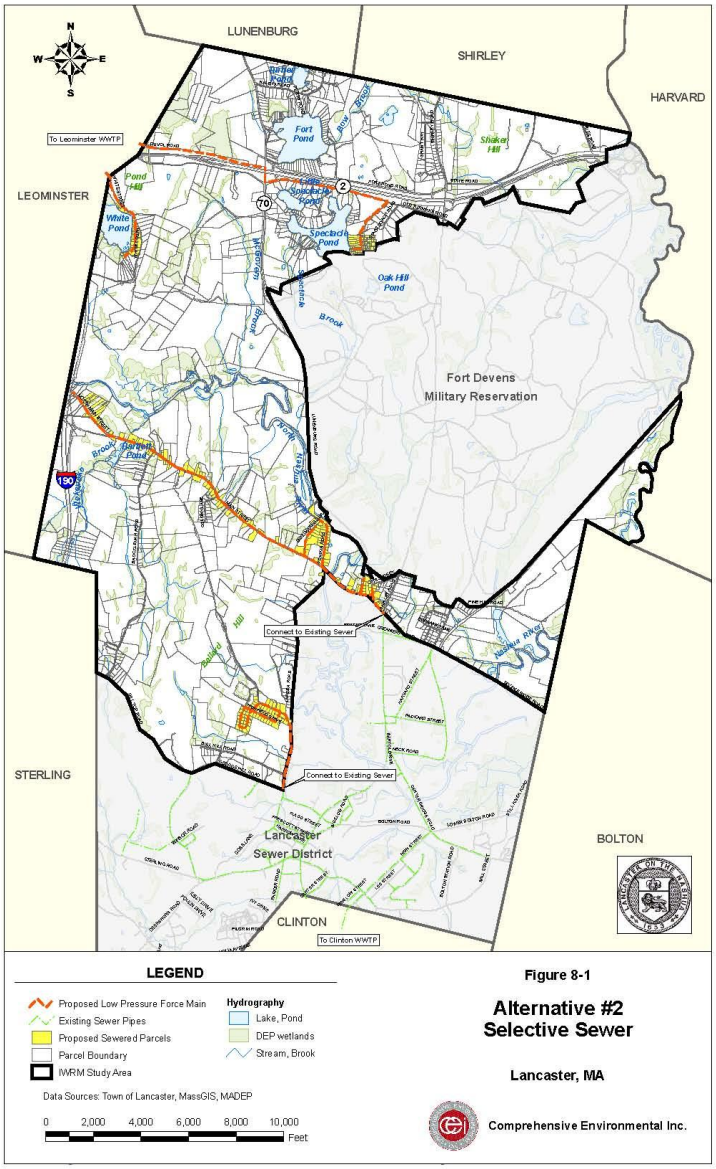
Water Resources Innovations

Integrated Water Resources Management (IWRM) Plan, Lancaster, Massachusetts

Development can have significant impacts on water resources. Increased impervious surfaces limit the amount of water that recharges and replenishes streams. Higher populations mean more water withdrawn for drinking water, bathing and irrigation. New homes and businesses create more wastewater that is either discharged through subsurface septic systems or collected and treated through municipal sewage systems. The availability of sewers to collect wastewater discharges often allows for greater development densities, more people, higher water demands and more stormwater runoff. Each facet of development affects the other, and all affect water resources, yet they are most often planned independent of each other. An Integrated Water Resources Management (IWRM) Plan considers all of these components together to promote balanced development of water resources for economic growth and environmental sustainability.



CEI worked with the Town of Lancaster, Massachusetts to develop an IWRM Plan for a largely undeveloped northern section of town. Although Lancaster desires to increase its tax base and local jobs through growth, there are concerns that sewering the area for attracting commercial and industrial development may also attract significant and more dense residential development and the impacts of this growth on the tax base, streamflows, drinking water supplies, environmental resources, flooding and the Town's rural nature. The focus of Lancaster's IWRM was to evaluate the impacts of various alternative growth scenarios and develop a plan for sustainable growth that considered drinking water supply needs, stormwater management needs, wastewater management needs and their overall impact on economic growth and the water balance.

Click on the following links to see how CEI integrated these components into the IWRM.

Water Supply (Chapter 5.0) – Growth increases water demands. Both public and private water systems withdraw water from the basin and impact water resources and the water balance. Water supply demands, the availability of sources and their impact on water resources are all considerations in an IWRM. The goal is to balance water demands, its cost and impacts of water withdrawals on groundwater and streamflows.

Stormwater Management (Chapter 6.0) – How stormwater is managed greatly impacts the quantity and quality of stormwater runoff that reaches water resources. Local performance standards were developed for stormwater and wastewater to increase recharge, decrease stormwater runoff and improve water quality.

Wastewater Management (Chapter 8.0) – Wastewater management can greatly influence growth and affect water resources by allowing development where it may otherwise be infeasible. In light of these influences, sewering should focus on areas with existing subsurface disposal problems and areas where economic growth is beneficial to the community. This differs from typical sewer management plans, which often promote widespread sewering of a community. Several options for managing wastewater were evaluated in the Lancaster IWRM, including the use of grinder pumps and pressurized sewer lines to deal with limited treatment capacities of the surrounding wastewater treatment facilities.

Water Balance (Chapter 3.0) – The water balance defined the amount of water available to streams as groundwater by accounting for contributions such as stormwater recharge, septic system discharges, and losses to groundwater such as stormwater runoff, evapotranspiration, water supply withdrawals and wastewater sewer exports. Results for varying development scenarios showed stormwater has the greatest impact on the overall water balance. The addition of performance criteria (Chapter 6.0) for future development was also evaluated and showed a water savings of almost 750 million gallons per year through its implementation.