Database Development

Earth Tech developed the Water Assets database to integrate data from three separate Department of Environmental Protection (DEP) databases:

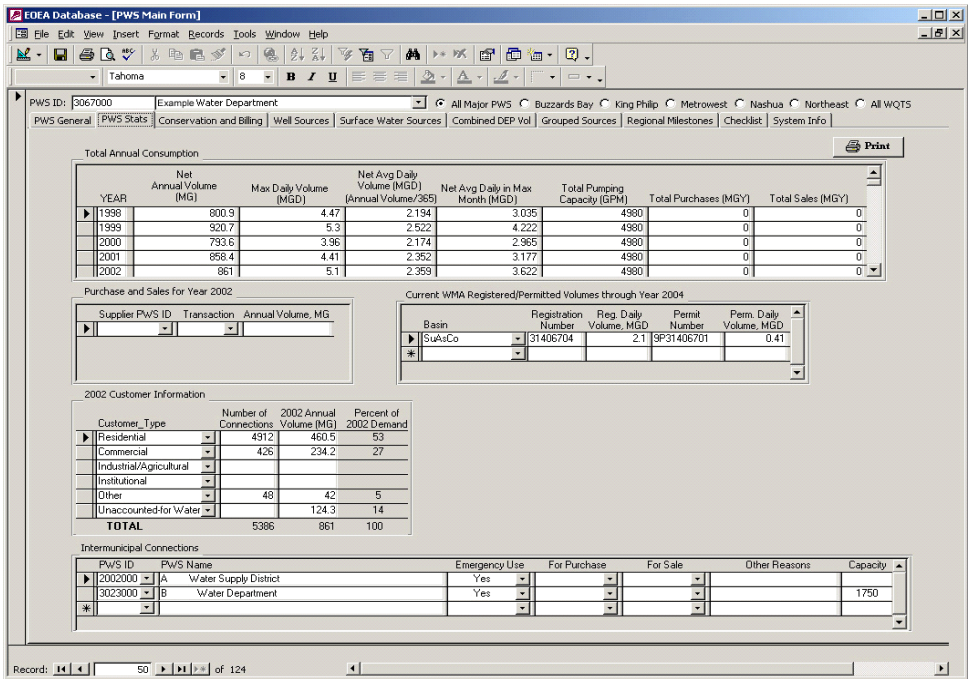
- Water Quality Testing System (WQTS),
- Water Management Act (WMA),
- Zone II

During interviews with public water suppliers, Earth Tech staff verified and corrected the Public Water Supplier Annual Statistical Report data from MA DEP records. New information was gathered on water-conservation programs, water-system limitations, planned improvements and water system components.

To update, reconcile and query the information, a relational Access database with a graphical user interface was developed. Examples of water system information for each supplier included:

- amount of water consumed annually
- water withdrawn from individual sources
- consumption by customer class (residential, industrial, commercial)

Interview forms were pre-populated by the database to assist with the review process and provide the communities an opportunity to verify the information.



Benefits of Report Automation:

- Community reports generated through a link from Access to Microsoft Word.
- DEP data, community water supply data and GIS analysis compiled in report template by customized Word Merge.
- Report template contained queries to perform the analysis, create the report text, tables and bar charts.
- Rapid and accurate report generation by managing hundreds of fields and calculations electronically.
- Template changes and revisions to the analysis was possible at a much later stage in the project than if the reports been prepared manually.

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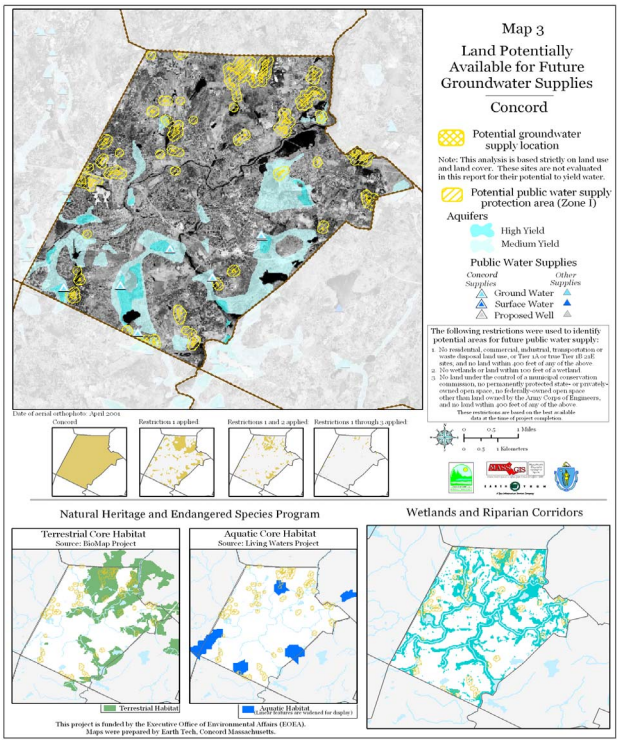
GIS Analysis and Maps



Using GIS data provided by MassGIS, Earth Tech performed a series of analyses to identify land that may be available for future water supply development. Hydrogeologic conditions were not considered. However, the land use analysis is often the first step that a public water supplier needs to take before undertaking a groundwater exploration program. Many public water suppliers do not have the GIS capabilities needed to do this type of analysis.

Earth Tech created a series of five Water Assets Study maps for each of the communities. These maps displayed:

- Existing groundwater and surface water supply protection areas (Zone II and B).
- Land potentially available for groundwater supply development after removing:
  1) Developed land uses (plus a 400-ft buffer)
  2) Wetlands (plus a 100-ft buffer)
  3) Permanently protected open space (plus a 400-ft buffer)
- Land use and zoning within existing and potential water supply protection areas.

Benefits of Map Automation:

- Map creation and plotting was standardized by customizing the ESRI developer's sample, Map Book.
- Earth Tech modified Map Book to handle multiple data frames and text updates from the data layer attributes.
- Map Book utilizes templates, thus only 5 map documents were needed to create the 650 maps required for the project. Using map templates meant that map modifications only had to be made once in the master template.
- The large quantity and size of GIS data was managed using ESRI's Spatial Database Engine (ArcSDE) with Microsoft SQL server database software.