

A New Way to Look at Sewer System Buildout Analysis by Steve Clifton, Underwood Engineers, Portsmouth, NH

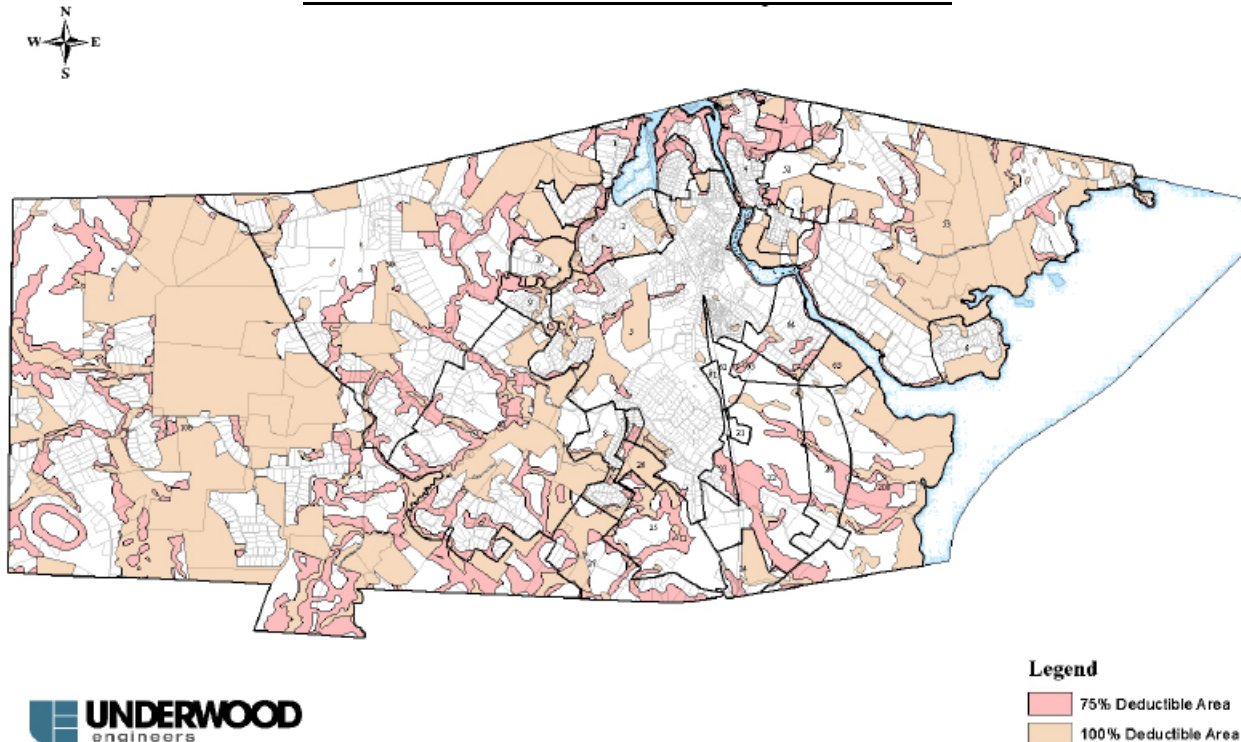
Graphic Information Systems offer municipalities a new way to look at the buildout of their sewer systems. Information that was once difficult to estimate is now in graphical formats that can be used to provide intersections of layers for easy analysis of sewer areas.

The Town of Newmarket recently re-evaluated their sewer system buildout and found that by using their GIS system to identify truly buildable areas, their future sewer capacity needs were significantly reduced.

Accurate estimates for land that is non-buildable can be easily identified and a buildable area can be created based on zoning district maps and individual parcels, existing and future sewer buildout areas and limitations imposed on the land due to wetlands, conservation lands, various buffer zones, poor soils and steep slopes.

The Town of Newmarket has a gross land area of 8,062 acres. Estimating the buildable area after taking out the non-buildable land reduced this to 3,963 acres! Figure 1 shows the extent of the land restrictions by highlighting the non-buildable areas in light grey color and the areas discounted 75% non-buildable in darker grey.

FIGURE 1 – NON-BUILDABLE LAND AREA



Other significant information that can be extracted from the GIS system using the intersecting layers and are listed as follows:

- Land area can be separated by sewer sub-basin and zoning district so that the amount of buildable area within each sub-basin that is residential, commercial and industrial is easily listed for estimating sewer flows, population and density.
- Conservation land is becoming a significant portion of the total land area. Achieving the recommended set asides for conservation practices can be easily documented using actual land parcels. Newmarket currently has approximately 2,200 acres or 27% of their land in conservation.
- Existing sewer area information can also be separated by zoning district and sub-basin, allowing historical water consumption records to be utilized to estimate water consumption and sewer discharge. This information can then be used to provide future projections.
- The ultimate sewer buildout based on current zoning districts can also be estimated to provide the community with the information needed to purchase enough land to build out all their wastewater facility's needs.

New uses for utilizing Graphical Information Systems are finally branching out into the water and sewer areas, providing accurate information for municipal leaders to make informed decisions. Text book answers may be appropriate for some situations, but if you have an existing GIS map of your sewer system and zoning density layers, take advantage of these tools during your next sewer buildout analysis.

You may be surprised by the results.