

# Geothermal Heating and Cooling

## 68 South Street, Litchfield, CT



After Mary and Peter Tavino, Professional Engineer purchased an acre of land in the Litchfield Historic District in 2003, they constructed their house as a replica of the James Anderson blacksmith's home on Duke of Gloucester Street in Colonial Williamsburg, VA. To save money on fuel oil and reduce smoke out of their chimney, they decided in 2008 to change out their fossil fuel fired system to geothermal ground source heating and cooling.

The yellow track excavator dug a 750' long ditch 6' deep beneath their side lawn, in two days, and Peter installed a permanent plastic pipe that circulates water to and from their basement heat pump. For the past four winters, this water inside the pipe leaves the house at about 40 degrees and contacts the 50 degree heat six feet below the ground, which warms it to 45 degrees or so. Enough heat is moved from below ground this way to not need their fuel oil furnace any longer. A BTU raises one pound of water one degree Fahrenheit. By circulating 8 gallons per minute at 8 pounds per gallon, the 5 degree difference gives them 19,200 BTUs per hour.

One can use horizontal piping as Peter did here, if one has enough property with deep soils. An alternative is to drill a 400' deep borehole well or two, and install an 800' U bend pipe to the bottom. Both ways are equally efficient in heating and air conditioning if properly designed.



*The buried plastic pipes enter and leave through the basement concrete wall as shown to bring warm water to the Tavino ground source heat pump in winter, and cool water to it in summer.*

The properly insulated building uses this renewable ground energy to keep their 1900 sq. ft. first floor zone heated and air conditioned all year round. After the one week installation, the lawn was reseeded to its original landscape condition, showing no change to the historic look. Mary enjoys the less dry heated air and exceptional comfort inside, while Peter installs geothermal ground source systems for others at [www.LitchfieldGeothermal.com](http://www.LitchfieldGeothermal.com)



