

# Ewbank and associates

GEO SYSTEMS PROFESSIONALS

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## Thermal Conductivity Test Results Greenville Light and Water Board Administration Building Greenville, Tennessee

Earth Energy Engineering performed a thermal conductivity test at the Greenville Light and Water Board Administration Building in Greenville, Tennessee on November 19, 2000. Testing was done by Fred Allison with a Ewbank portable test unit.

The test borehole was 300 feet in depth and 5" in diameter. A 1" inch loop was installed and the borehole was backfilled with #8 stone. Static water level was not reported. The formations encountered were reported as primarily limestone.

The thermal conductivity (**k**) value for this borehole is **1.65 btu/degree F-hr-foot**. This is an average conductivity per foot for the borehole. This value represents the rate at which the borehole and rock will transfer heat.

To accurately measure the thermal conductivity of the formation a borehole should be drilled and grouted with a bentonite grout to prevent any flow of water through the borehole.

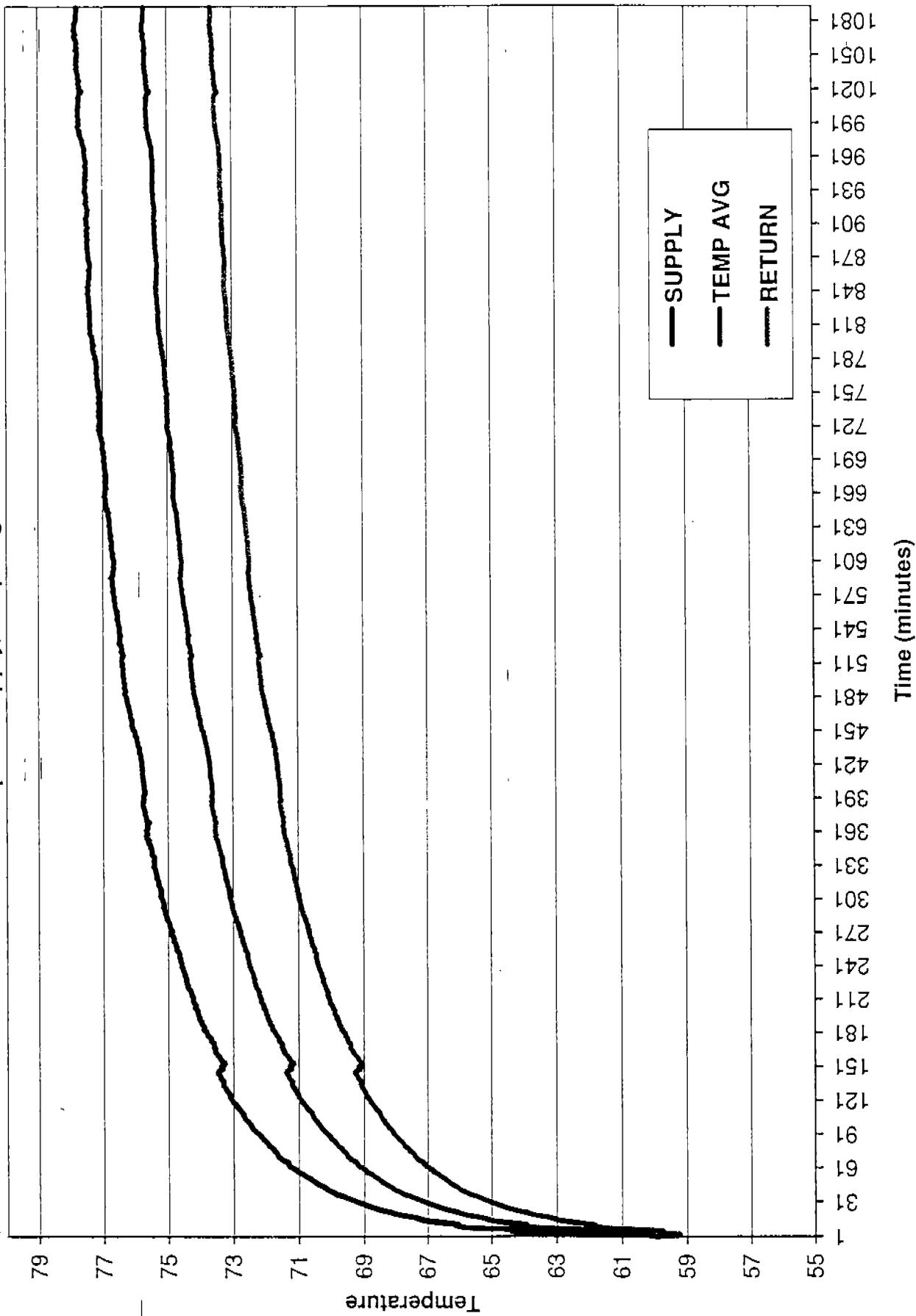
All test equipment, methods, procedures, calculations, and interpretation is done in accordance with the recommendations and guidelines of the International Ground Source Heat Pump Association.

*1093 minutes = 18.2 hours*

# Greenville Light and Water Board Administration Building

## Thermal Test

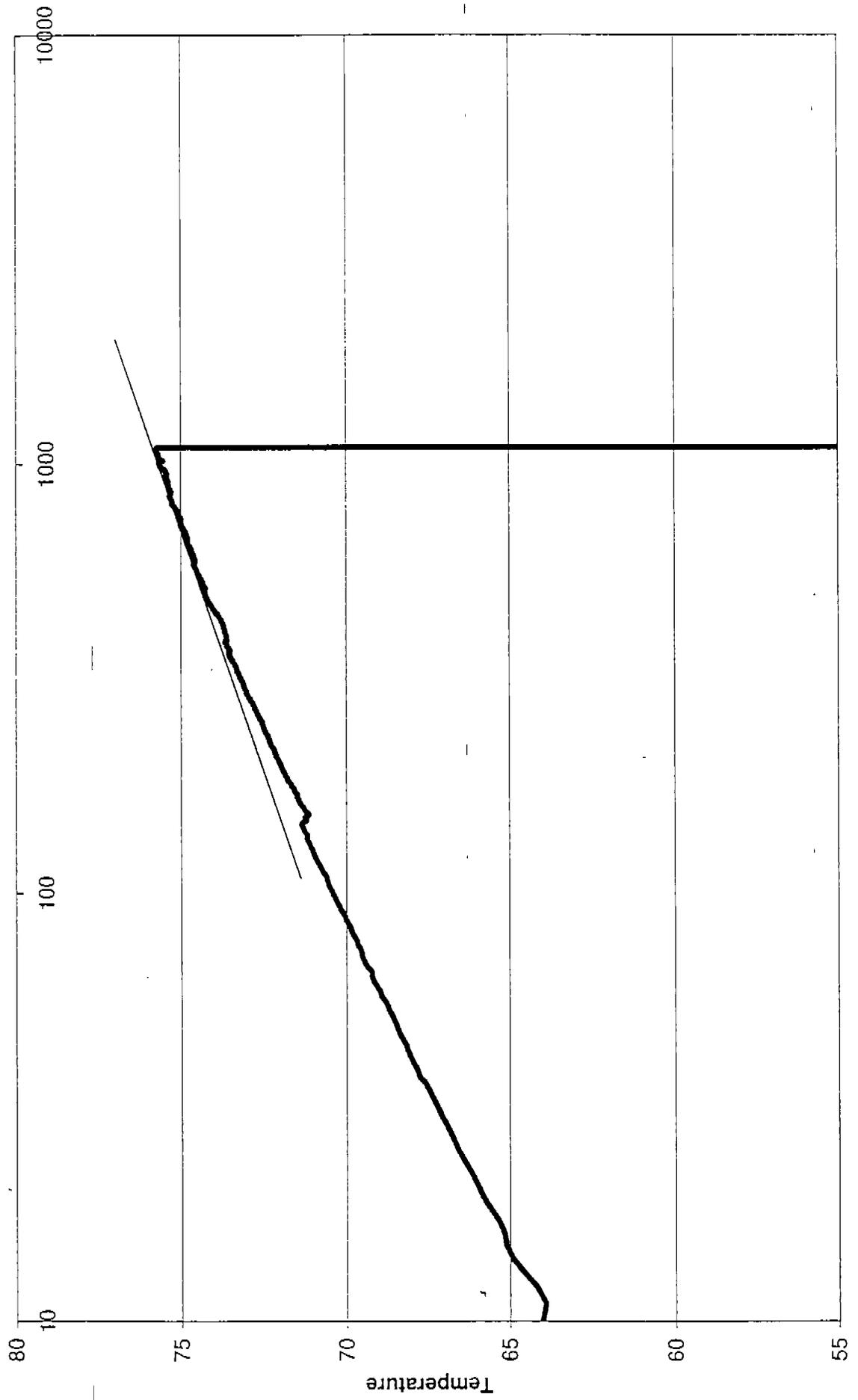
### Graph of Supply, Temp Avg, Return



Greenville Light and Water Board Administration Building

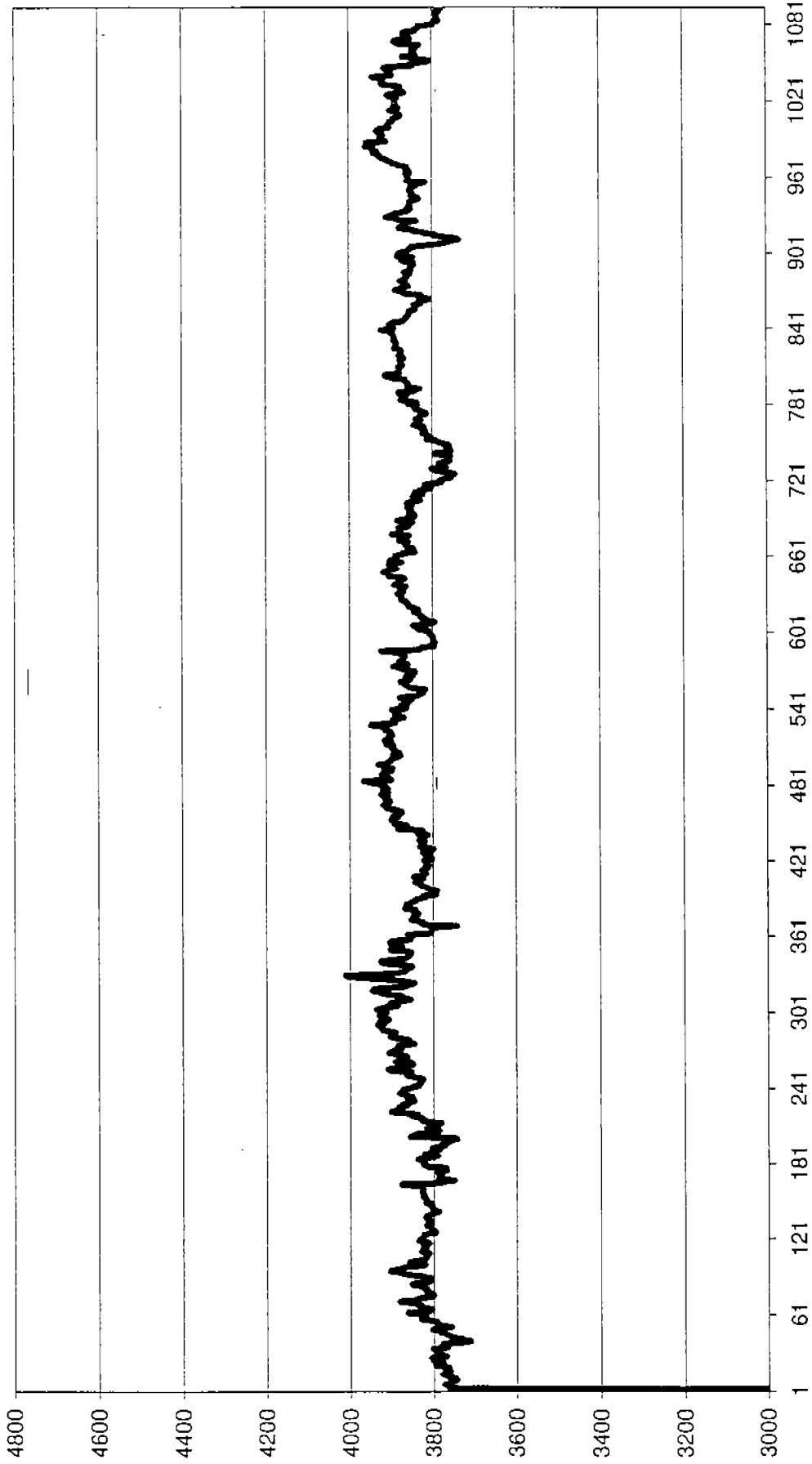
Thermal Test

Graph of Log Time of Temp Avg



Log Time (minutes)

Greenville Light and Water Board Administration Building  
Thermal Test  
Graph of Wattage



# Earth Energy Engineering, Inc.

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## Drilling Logs at Greeneville Light & Water Board. New Administrative Building

Driller: Denver Diggin' Services, Kevin Schischikowsky

### Hole No. 1      October 14, 2000

0 - 13 ft.      Clay  
13 - 300 ft.      Limestone

Set 13 ft. PVC casing.

Small quantity of water ( -2 gpm ) at 60 ft.

Lost circulation at 80 ft.

Set 1 in. x 300 ft. loop on 10-15-00, and backfilled with gravel and hole plug.

### Hole No. 2      October 15, 2000

0 - 5 ft.      Clay  
5 - 50 ft      Broken limestone  
50 - 60 ft      Limestone  
60 - 65 ft      Void  
65 - 95 ft      Broken limestone layers and clay beds  
95 - 96 ft      Void, lost circulation.  
96 - 97 ft      Limestone – drill rod broke at hammer

Set 5 ft. PVC casing.

Could not recover hammer.

Backfilled with gravel and hole plug on 10-16-00