

1050 Connecticut Avenue NW, Suite 1000  
Washington, DC 20036

April 18, 2008

GEOTHERMAL HEAT PUMP CONSORTIUM, INC.

Jerry Farrell, Jr.  
Commissioner, Department of Consumer Protection  
State Office Building, Room 103  
165 Capitol Avenue  
Hartford, Connecticut 06106

Dear Mr. Farrell:

In reference to the proposed amendment to the Connecticut Well Drilling Code, please accept the following information to assist you in your process.

We support your intention to address GeoExchange<sup>®</sup> bore holes, and to recognize the heating and cooling properties of the earth in the Connecticut Well Drilling Code. GeoExchange heating and cooling systems utilize geothermal (ground-source) heat pumps and associated earth and/or water heat exchangers to provide the most energy efficient and environmentally friendly heating and cooling systems available.

The proposed amendments address various facets of the installation of GeoExchange systems, including, piping materials, heat transfer fluids, and grouting materials, as well as the registration of drilling contractors and the construction, repair, development and abandonment of GeoExchange bore holes. The proposed amendments also allow for other methods and materials approved by the Department of Consumer Protection in consultation with the Department of Public Health and/or the Department of Environmental Protection.

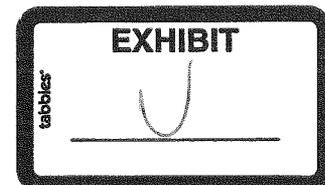
It is important to note that GeoExchange systems may employ either water-source geothermal heat pumps that circulate a water/antifreeze mixture through buried polyethylene piping, or "direct-exchange" geothermal heat pumps that circulate refrigerant through copper tubing buried in the earth. As a result, the proposed amendments should be written in a way that addresses both types of systems.

Please feel free to contact me if you would like additional information to assist you in your efforts: toll-free at (888) 255-4436 or via e-mail at [jkelly@GHPC.org](mailto:jkelly@GHPC.org).

Sincerely,

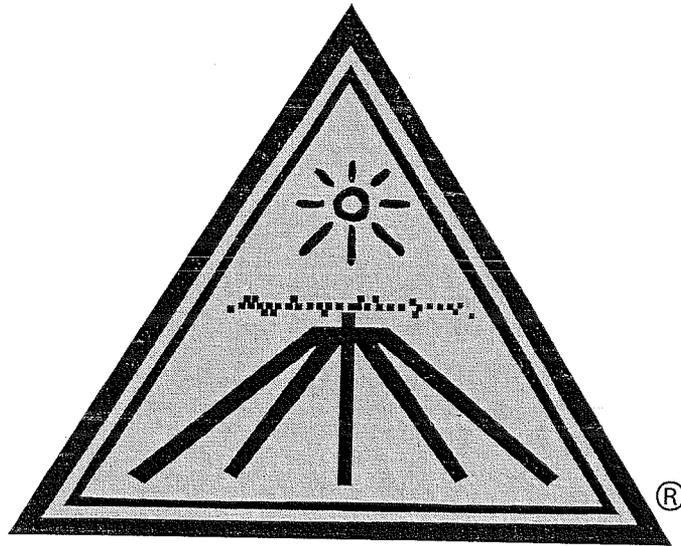


John Kelly  
Executive Director

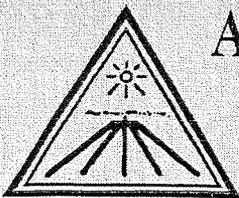


GEOEXCHANGE

# The Great Aire Comfort System™



**Breaking New Ground For Maximum  
Heating and Cooling Efficiency Through  
Advanced Geothermal Technology**



**ADVANCED GEOTHERMAL TECHNOLOGY**

*by ECR Industries, Inc. makers of  
The Great Aire Comfort System™*

P.O. BOX 6469, READING, PENNSYLVANIA 19610

610-796-1450 • 610-736-0570 • Fax 610-736-0571 • [www.advgeo.com](http://www.advgeo.com)

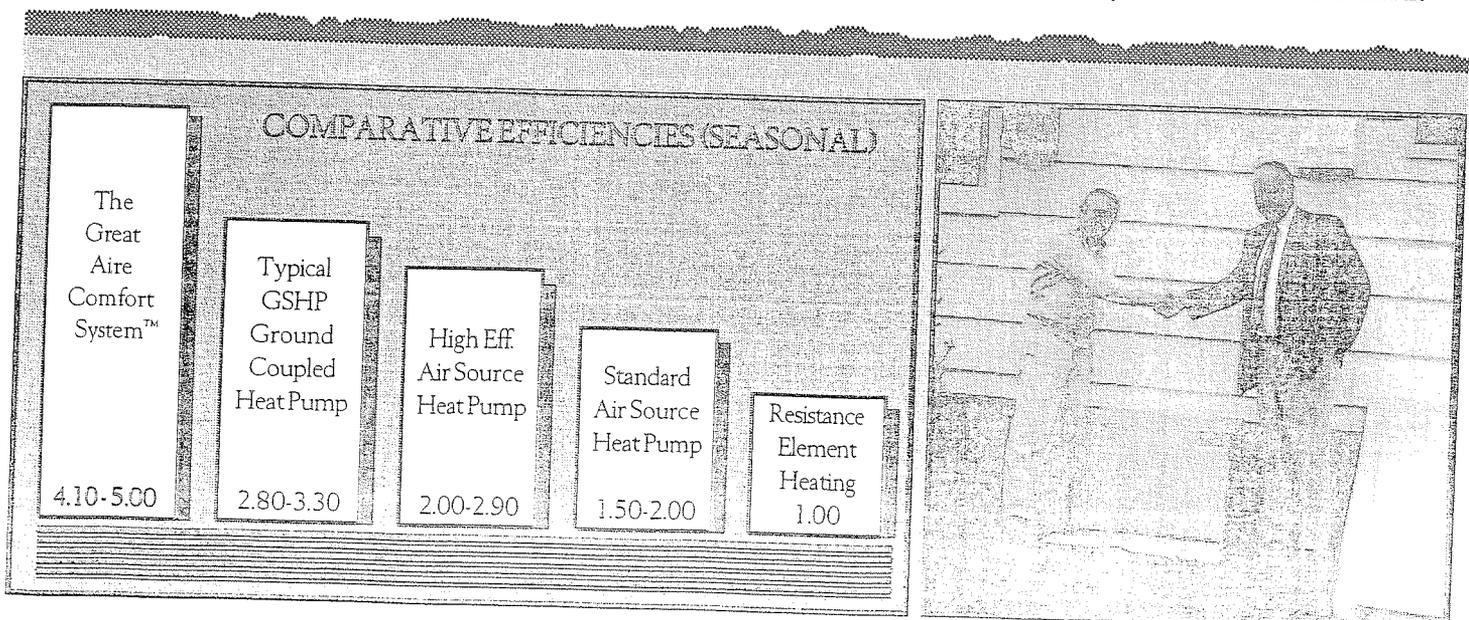
## THE COMPANY PROFILE

The company was founded in the mid 1980's as a company dedicated to developing better products for the emerging high efficiency heating and cooling market. After a considerable review of the available options, the company selected the direct exchange **ADVANCED GEOTHERMAL TECHNOLOGY** because of the potential for extremely high efficiencies over the life of the equipment, improved customer comfort, reduced impact on the environment and lower installed cost.

A considerable amount of time was spent developing a product called **The Great Aire Comfort System™**. The System is technically a direct exchange ground coupled system which has been developed as a very **Efficient, Comfortable, and Reliable** space heating, cooling and hot water heating system. As such, this System has eliminated practically all of the drawbacks associated with conventional heating systems. **The Great Aire Comfort System™** uses copper tubes placed deep in the ground to utilize the constant temperature of the earth to transfer heat directly to or from a refrigerant that is piped to an air handler located indoors. Thus, no intermediate fluids (eg. water or a water/antifreeze solution) are used, eliminating the need for additional heat exchangers, pumps and controls. The **ADVANCED GEOTHERMAL TECHNOLOGY** significantly enhances the transfer of heat from the earth. In addition, a new control technology for the refrigerant side of the System was developed which improves the performance by an additional 15% over current industry practices. The constant temperature of the earth allows for the design of a constant supply temperature during the heating season which feels warm and comfortable. During the air conditioning season, the heat is stored in the earth for subsequent use in heating water or use in the upcoming heating season. Excellent dehumidification is also attained.

The efficiency ratings of **The Great Aire Comfort System™** models are exceptionally high. In the heating mode, there are models available with a coefficient of performance up to 5.0. In the cooling mode, efficiencies range over 20 EER. In addition, the fully integrated hot water heating option, which provides hot water on demand, has a coefficient of performance up to 4.25, which significantly reduces the cost of heating water.

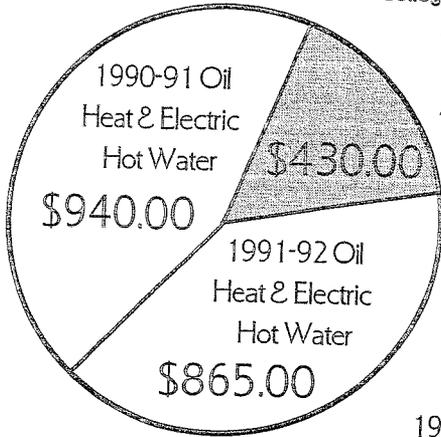
These efficiencies coupled with the installed cost of the System generally results in a return on the investment of 15 to 30 percent. Thus, making the selection of **The Great Aire Comfort System™** an easy choice for a retrofit, a new home, a commercial or an industrial space. As a consequence, owners have now installed our Systems from Maine to New Mexico. In addition, some electric utility companies have rebate programs available to offset part of the installation costs.



# ECONOMIC PROFILE

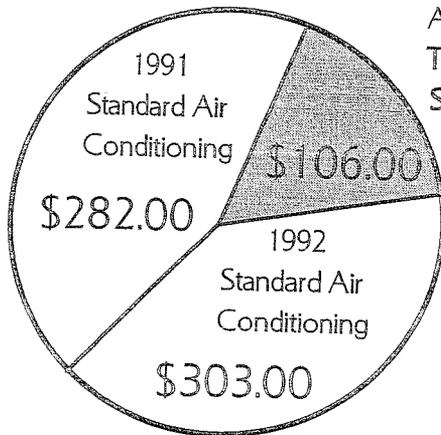
## Actual Comparison for Heating Season

Collegeville, PA 2300 Sq. Ft.



1992-93  
Heat & Hot Water with  
The Great Aire Comfort  
System™

This System was put into service in September 1992. The data was taken from actual electric and oil bills by the homeowner. October thru April of each year for the heating season and May thru September for the cooling season.



1993  
Air Conditioning with  
The Great Aire Comfort  
System™

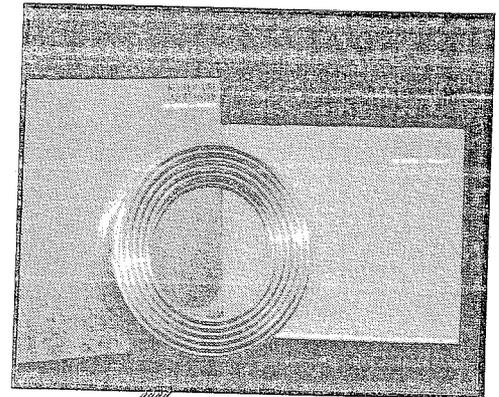
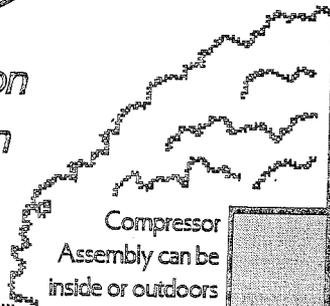
## Owner Benefits

Some folks have used the ground for heating, cooling and water heating for more than 15 years. Today The Great Aire Comfort System™ achieves better results because only one heat exchanger is required. We combine the advanced refrigerant technology with the almost limitless energy supply in the earth to produce a better approach to conditioning your home, office or industrial space.

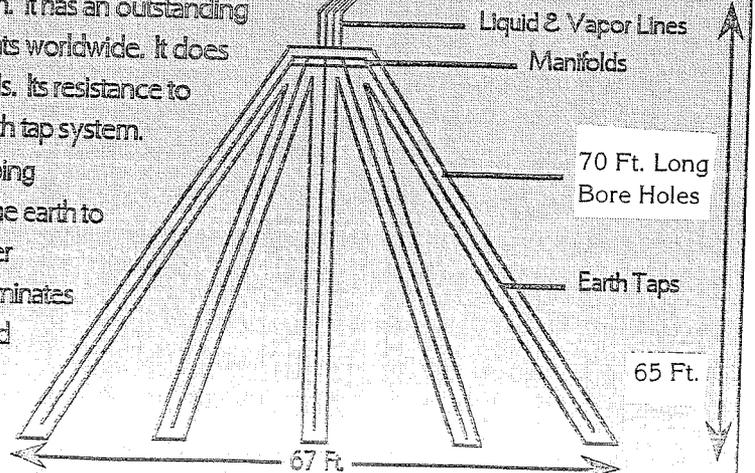
- Heating costs are reduced by 30% to 60%
- Air Conditioning costs are reduced by 20% to 70%
- Water heating cost are cut by 70%
- Higher supply air temp. is typically 100 degrees
- Supply air temperature is constant during the winter
- Better humidity control is achieved during summer

## Actual Comparison for Cooling Season

Collegeville, PA 2300 Sq. Ft.

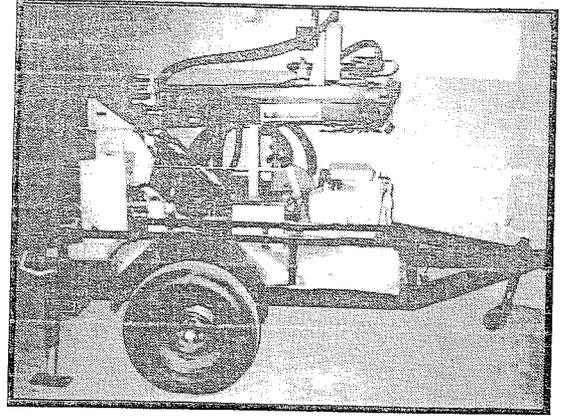


Copper is a noble metal that occurs naturally in its elemental form. It has an outstanding history of corrosion resistance in most underground environments worldwide. It does not naturally corrode in most days, chalks, loams, sands or gravels. Its resistance to corrosion enables us to give a limited lifetime warranty on the earth tap system. The Great Aire Comfort System™ uses heavy walled copper tubing placed deep in the ground to utilize the constant temperature of the earth to transfer heat directly to or from the refrigerant which provides higher efficiencies therefore lower costs. The copper earth tap system eliminates the need for a water source, costly deep wells, an intermediate fluid loop, its heat exchanger, and all of the pumping power equipment, cutting your energy consumption considerably.



## SOME INFORMATION ABOUT OUR EARTH COUPLING SYSTEM

We use either a rock or a mud rotary drill (shown below and at right) depending upon the ground conditions. It is a much less obtrusive installation method than the extensive trenching that is required for most geothermal systems. We bore 3 to 10 holes, depending on system size. They are 65 Ft. long, 2 1/2" to 3" in diameter and normally positioned at 30 degrees off vertical. Each hole has an earth tap inserted, which consists of two heavy walled copper tubes. One is for liquid, the other for vapor and they are each attached to either the liquid or the vapor manifold. The manifolds are buried at a depth of 3 ft.



## SYSTEM SPECIFICATIONS

SIZE	MODEL #	TAPS	RATING (BTU/HR)	SQUARE FT.
1.5 TON	GC-18-1ZK8	3	18,000	1,200
2.0 TON	GC-24-2ZK4	4	24,500	1,600
2.5 TON	GC-30-3ZK0	5	30,500	2,000
3.0 TON	GC-36-3ZK6	6	36,500	2,400
3.5 TON	GC-42-4ZK2	7	42,000	2,800
4.0 TON	GC-47-4ZK7	8	47,500	3,200
4.5 TON	GC-54-5ZK4	9	54,000	3,600
5.0 TON	GC-61-6ZK1	10	61,200	4,000

SYSTEM PHYSICAL MEASUREMENTS ARE THE SAME FOR ALL UNITS 27"X 20"X 19"

HOT WATER HEATER OPTIONAL WITH ALL SIZES

\* BUILDING MUST BE DESIGNED TO 15 BTU'S PER SQ. FT. OR BETTER

## BENEFITS FOR BUILDERS

### EFFICIENT

- LONG LOOPS OF PLASTIC PIPE ARE ELIMINATED
- HIGH VOLUME WATER WELLS ARE NOT NEEDED
- HEAT EXCHANGER FIELD CAN BE INSTALLED IN CONFINED SPACES
- SMALLER CAPACITY SYSTEMS HAVE COMPARABLE OUTPUT
- ENERGY EFFICIENT MORTGAGES ARE AVAILABLE
- CUSTOMERS APPRECIATE SMALLER ENERGY BILLS

### COMFORTABLE

- COLD DRAFTS ARE ELIMINATED DURING THE WINTER OPERATION
- HOT WATER CAPACITY IS SIGNIFICANTLY INCREASED
- THE COMPRESSOR ASSEMBLY CAN BE PLACED INSIDE OR OUTSIDE
- NOISE LEVELS ARE REDUCED
- CUSTOMERS ARE HAPPIER WITH WARM AIR

### RELIABLE

- TROUBLESOME SERVICE PARTS ARE ELIMINATED
- WATER QUALITY AND HEAT EXCHANGER PROBLEMS ARE NO LONGER A CONCERN
- THE SYSTEM COMBINES WITH PREFERRED INDOOR EQUIPMENT
- CUSTOMERS HAVE FEWER COMPLAINTS
- THE COMPRESSOR ASSEMBLY HAS LESS COMPONENTS

## BENEFITS FOR UTILITY COMPANIES

### EFFICIENT

- OPERATING COSTS ARE LESS THAN FOSSIL FUEL ALTERNATIVES
- ENERGY COSTS ARE REDUCED LEADING TO FEWER CUSTOMER COMPLAINTS
- AIR CONDITIONING PEAK LOADS ARE REDUCED 20% TO 40%
- 10 TO 15 KW OF RESISTANCE PEAK LOAD DEMAND IS ELIMINATED
- 4 TO 5 KW OF WATER HEATING DEMAND IS ELIMINATED

### COMFORTABLE

- HIGHER SUPPLY AIR TEMPERATURES PRODUCES GREATER CUSTOMER SATISFACTION
- SUPPLY AIR TEMPERATURE IS CONSTANT DURING THE WINTER
- SUMMER HUMIDITY CONTROL HELPS REDUCE PEAK POWER CONSUMPTION
- HOT WATER CAPACITY IS SIGNIFICANTLY INCREASED
- HOT WATER IS PRODUCED WITHOUT SACRIFICING HEATING PERFORMANCE

### RELIABLE

- SYSTEM KW'S REDUCED
- POWER SPIKES CAUSED BY DEFROST CYCLE ARE ELIMINATED
- DEMAND CAUSED BY BACKUP HEAT IS SIGNIFICANTLY REDUCED
- CONSUMER SERVICE COMPLAINTS ARE REDUCED