GeothermalXperts, Inc.

A DIVISION OF

INDOOR COMFORT specialists

Earth is our Element

Geothermal Packet

BBB℠
Awards for Excellence
Winner of Distinction
2009
2010
2011

GEOTHERMAL PACKET
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8 Reasons Why You'll Fall in Love with Geothermal

1. ***LOW OPERATING COSTS*** **- Energy savings up to 60% Vs. Gas, Electric, or Oil furnaces. Groundwater Heat Pumps reduce heating & cooling costs and provide domestic water heating essentially free or at substantial savings.**

2. **EFFICIENT - Systems are up to four times as efficient as the most efficient fossil fuel furnace. Instead of burning a combustible fuel to make heat, they simply move heat that already exists.**

3. **LOW MAINTENANCE – Groundwater heat pumps have fewer mechanical components making them more reliable, easier to service and less prone to failure. The loops have an expected life of over 55 years.**

4. **SAFETY – Small operating unit inside the building. Loops are buried. No dangerous outdoor equipment.**

5. **LOW NOISE – No noisy heat exchanger outdoors.**
   - **No Water Tower**
   - **No roof installation**

6. **ENERGY CONSERVATION - Groundwater Heat Pump systems work with the environment by absorbing renewable non-polluting solar thermal energy stored in the earth & ground water and using that energy to heat & cool your home or building.**

7. **SPACE SAVINGS – More rentable space or living space.**

8. **ENVIRONMENT – Reduced use of refrigerants, sealed system which does not harm the ozone layer, reduced emissions, no venting of fossil fuels.**

GEOTHERMAL SOLUTIONS

They champion an environment friendly approach to heating and cooling your office or home by tapping into the subterranean resources of Mother Earth's energy. — The initial cost of this system is more expensive, but the long-term savings on energy costs enable it to pay for itself within three to five years.

Buckminister Fuller said it best in his 1969 book, *Operating Manual for Spaceship Earth.* He insisted that we were all living on a spaceship, but one that came without an instruction manual. His book was an attempt to write that manual and to show that there was untold wealth and energy all around us, primarily because the universe itself was a perpetual motion machine. Life in our little corner of the universe, aboard Spaceship Earth, was the same as everywhere else—continuously renewing itself. From dawn until darkness and with each tide, Spaceship Earth was and is nurtured back to life each day by beneficent forces. Yet, to tap into this phenomenal bounty requires a comprehensive understanding of the universe and its secrets. Then you can "do more with less."

Bucky spoke of geothermal, solar, wind, and tidal pulsations as possible alternatives to fossil fuels. He likened our reliance on fossil fuels to a chick consuming its egg yolk before it hatches. Just as the chick must learn to find a new "fuel" supply or perish, we humans must learn to find other sources if we want to remain the top tool-making animal on the Spaceship. Not only are fossil fuels a yolk that will run out, the yolk will run out even faster if we continue to gobble it up at the same supercharged clip. Our culture has developed an appetite not only for gas guzzling SUV's, but for heating, ventilation, and air conditioning—HVAC for short—in that we need it to support our electronic "Information Age" infrastructure. Computers love air conditioning! And humans also prefer this dry, chilling environment. On days when temperatures outside are the hottest, climate-controlled environments that house computer systems rely on serious refrigeration tonnage to keep them "cool." Let's face it, unless our economy implodes—and we certainly don't want that now do we?—we're going to use MORE energy resources on HVAC in the future—not less.

That's how Geothermal X-perts, Inc. can help. They champion an environment friendly approach to heating and cooling your office or home by tapping into the subterranean resources of Mother Earth's energy. By installing a closed loop geothermal heat pump system using vertical ground loops—literally, pipes that go down into the earth and make a U-turn, then come back up—the temperature can be raised or lowered through the magic of heat pump technology. In summer, heat can be extracted from the air in your building, then transferred to the circulating water in the underground loop system where the heat is absorbed into the cooler earth. In winter, the water circulating through the loop absorbs heat from the earth and carries it to the heat pump, which extracts it, then compresses it to an even higher temperature. The resulting warm air is distributed through a conventional duct system into the building. The initial cost of this system is more expensive, but the long-term savings on energy costs enable it to pay for itself within three to five years. It's a way to deal with what we are really up against—rising utility costs as Chicken Little eats up his yoke. It's also a smarter, more "synergetic" way to implement what Uncle Bucky recommends: "Do more with less."

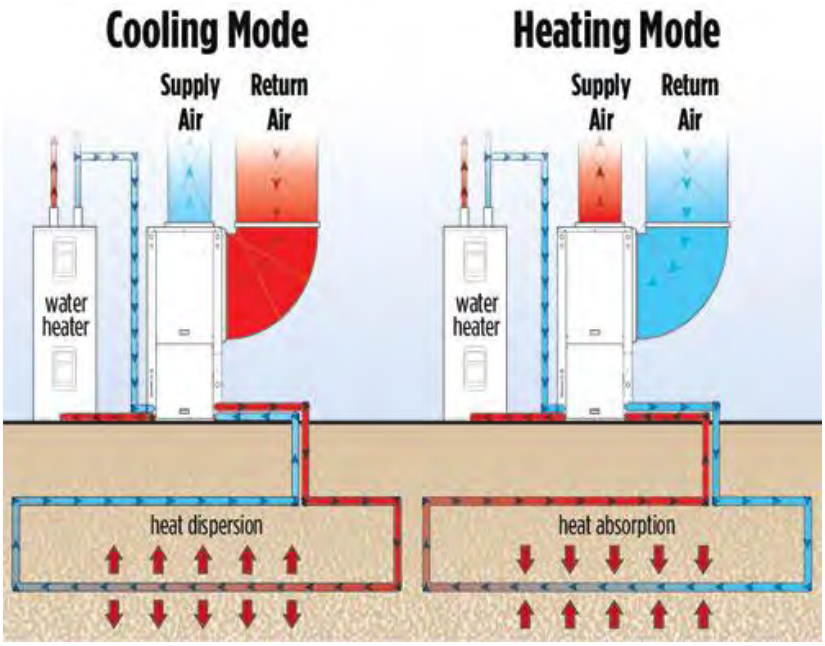
by Ray Ben Erskins

In the past three years, Geothermal X-perts, Inc.(a division of Egan & Hinson, Inc.) has installed over 300 tons of Geothermal Equipment. Currently over 150 tons are in various stages of installation. Egan & Hinson, Inc. can provide complete system design, installations, service, drilling, and loop piping. Austin, Houston, San Antonio, Dallas, and Fort Worth are all areas currently being serviced by Egan & Hinson, Inc.


What YOU should know about Geothermal!

Since the mid-1970s, tens of thousands of homes and businesses in the U.S., Canada and Europe have been heated and cooled by a system that bridges the gap between high technology and energy savings – the geothermal heat pump.
Consumers are searching for a better way to get more out of their energy dollar. And many have found their answer to be the geothermal heat pump.
This booklet was developed as an introduction to the geothermal heating and cooling technology. Using a question and answer format, we've tried to provide you with the information many consumers have sought about geothermal heat pumps.

Geothermal Heat Pumps: What are they and how do they work?



Q: What is a geothermal heat pump?
A: A geothermal heat pump is an electrically-powered device that uses the natural heat storage ability of the earth and/or the earth's groundwater to heat and cool your home or business.
Q: How does it work?
A: Like any type of heat pump, it simply moves heat energy from one place to another. Your refrigerator works using the same scientific principle.
By using the refrigeration process, geothermal heat pumps remove heat energy stored in the earth and/or the earth's groundwater and transfer it to the home.
Q: How is heat transferred between the earth and home?
A: The earth has the ability to absorb and store heat energy. To use that stored energy, heat is extracted from the earth through a liquid medium (groundwater or anti-freeze solution) and is pumped to the heat pump or heat exchanger. There, the heat is used to heat your home. In summer the process is reversed and indoor heat is extracted from your home and transferred to the earth through the liquid.

Q: You mentioned heating and cooling. Does it do both?
A: One of the things that makes a heat pump so versatile is its ability to be a heating and cooling system in one. You can change from one mode to another with a simple flick of a switch on your indoor thermostat. In the cooling mode, a geothermal heat pump takes heat from indoors and transfers it to the cooler earth through either groundwater or an underground loop system.

Q: Do I need separate ground loops for heating and cooling?
A: No. the same loop works for both. All that happens when changing from heating to cooling, or vice versa, is that the flow of heat is reversed.

Geothermal Heat Pumps: What are they and how do they work? (cont.)

Q: What types of loops are available?
A: There are two main types: open and closed.
Q: Does the underground pipe system really work?
A: The buried pipe, or "ground loop," is the most recent technical advancement in heat pump technology. The idea to bury pipe in the ground to gather heat energy began in the 1940s. But it's only been in the last few years that new heat pump designs and improved pipe materials have been combined to make geothermal heat pumps the most efficient heating and cooling systems available.

The Mechanics of the Heat Pump Process

Anyone who has a refrigerator or an air conditioner has witnessed the operation of a heat pump, even though the term heat pump may be unfamiliar. All of these machines, rather than making heat, take existing heat and move it from a lower temperature location to a higher temperature location. Refrigerators and air conditioners are heat pumps which remove heat from colder interior spaces to warmer exterior spaces for cooling purposes. Heat pumps also move heat from a low-temperature to a high-temperature space for heating.

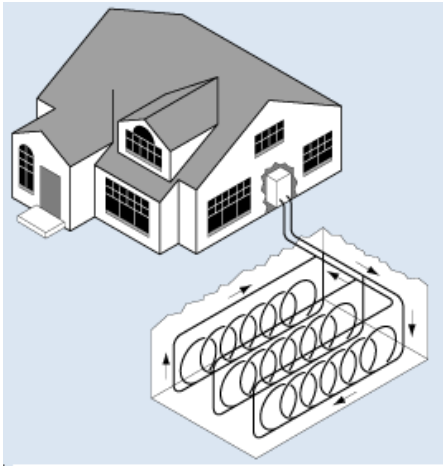
An air-source heat pump, for example, extracts heat from outdoor air and pumps it indoors. A geothermal heat pump works the same way, except that its heat source is the warmth of the earth.

The process of elevating low-temperature heat to over 100 degrees F and transferring it indoors involves a cycle of evaporation, compression, condensation and expansion. A refrigerant, like Freon, is used as the heat-transfer medium which circulates within the heat pump.

The cycle starts as the cold, liquid refrigerant passes through a heat exchanger (evaporator) and absorbs heat from the low-temperature source (liquid from the ground loop). The refrigerant evaporates into a gas as heat is absorbed. The gaseous refrigerant then passes through a compressor where the refrigerant is pressurized, raising its temperature to over 180 degrees F.

Heat Exchanger

The hot gas then circulates through a refrigerant-to-air heat exchanger where heat is removed and pumped into the home at about 100 degrees F. When it loses the heat, the refrigerant changes back to a liquid. The liquid is cooled as it passes through an expansion valve and begins the process again. To become an air conditioner, the flow is reversed.



Geothermal heat pumps: Closed-Loop Systems

Q: What is a closed-loop system?
A: The term “closed-loop” is used to describe a geothermal heat pump system that uses a continuous loop of special buried plastic pipe as a heat exchanger. The pipe is connected to the indoor heat pump to form a sealed, underground loop through which an antifreeze solution is circulated. Unlike an open-loop system that consumes water from a well, a closed-loop system recirculates its heat transferring solution in pressurized pipe.

Q: Where can this loop be located?
A: That depends on land availability and terrain. Most closed-loops are trenched horizontally in yards adjacent to the home. But any area near a home or business with appropriate soil conditions and adequate square footage will work.

Q: How deep and long will my trenches be?
A: Trenches are normally four to six feet deep and up to 400 feet long, depending on how many pipes are in a trench. One of the advantages of a horizontal loop system is being able to lay the trenches according to the shape of the land. As a rule of thumb, 500-600 feet of pipe is required per ton of system capacity. A well-insulated, 2,000-square-foot home would need about a three-ton system with 1,500-1,800 feet of pipe.

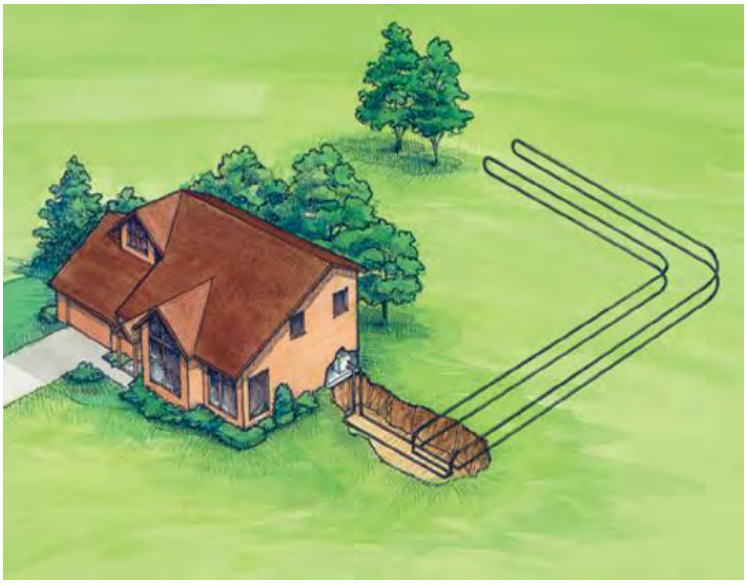
Q: How many pipes are in a trench?
A: Normally, a run of pipe is laid at five feet then looped back over itself at three feet once the bottom pipe is covered with soil. This allows more length of pipe to be put in one trench and has no adverse affect on system efficiency. Other loop designs use four or six pipes and allow for shorter trenches if land area is limited.

Q: What if I don’t have enough room for a horizontal loop?
A: Closed-loop systems can also be vertical. Holes are bored to about 125-150 feet per ton of heat pump capacity. U-shaped loops of pipe are inserted in the holes. The holes are then backfilled with a sealing solution.

Q: How long will the loop pipe last?
A: Closed-loop systems should only be installed using high-density polyethylene or polybutylene pipe. Properly installed, these pipes will last 25-75 years. They are inert to chemicals normally found in soil and have good heat conducting properties. PVC pipe should not be used under any circumstances.

Q: How are the pipe sections of the loop joined?
A: The **ONLY** acceptable method to connect pipe sections is by thermal fusion. Pipe connections are heated and fused together to form a joint stronger than the original pipe. Mechanical joining of pipe for an earth loop is **NEVER** an accepted practice. The use of barbed fittings, clamps and glued joints is certain to result in loop failure due to leaks.

Geothermal heat pumps: Closed-Loop Systems (continued)

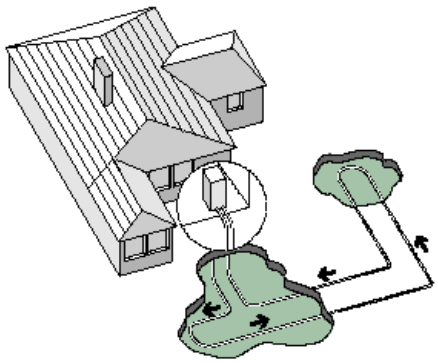


Q: Will an earth loop affect my lawn or landscape?
A: No. Research has proven that loops have no adverse effect on grass, trees or shrubs. Most horizontal loop installations use trenches about six inches wide. This, of course, will leave temporary bare areas that can be restored with grass seed or sod. Vertical loops require little space and result in minimal lawn damage.

Q: Can I reclaim heat from my septic system disposal field?
A: No. An earth loop will reach temperatures below freezing during extreme conditions and may freeze your septic system. Such usage is banned in many areas.

Q: If the loop falls below freezing, will it hurt the system?
A: No. The antifreeze solution in the loop will keep it from freezing down to about 10 degrees F. Three types of antifreeze solution are acceptable: propylene glycol, calcium chloride and methyl alcohol.

Q: Can I install an earth loop myself?
A: It's not recommended. In addition to thermal fusion of the pipe, good earth-to-coil contact is very important for successful loop operation. Nonprofessional installations may result in less than optimum system performance.

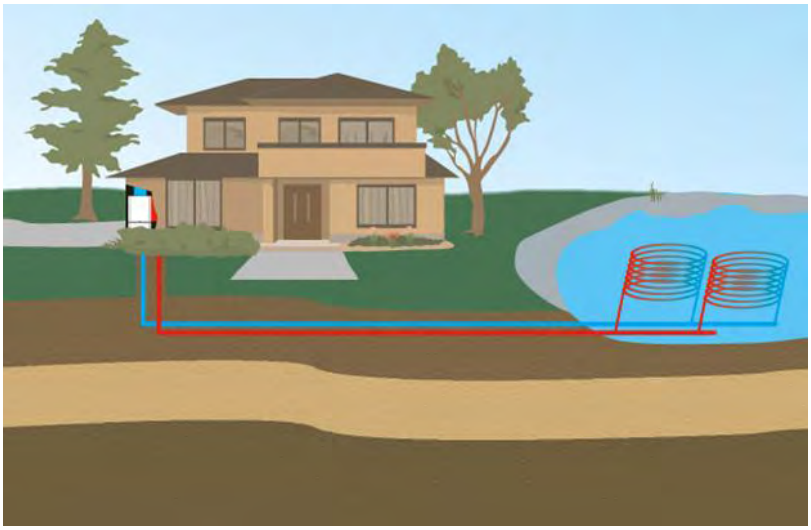


Most closed-loop systems use trenched-in pipe as a heat source.

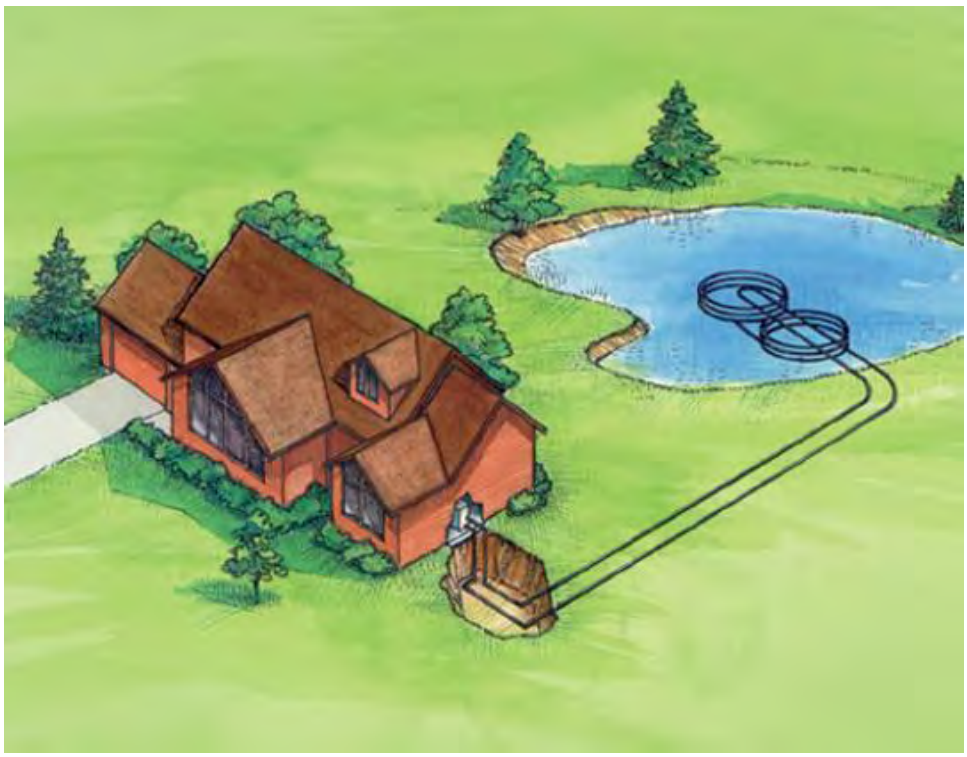
Geothermal heat pumps: Closed-Loop Systems (continued)

Q: I have a pond near my home. Can I put a loop in it?

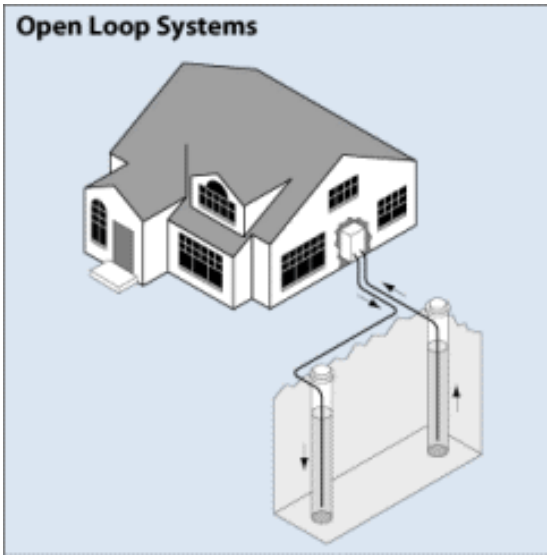
A: Yes, if it's deep enough and large enough. A minimum of six feet in depth at its lowest level during the year is needed for a pond to be considered. In pond loops, copper, polyethylene or polybutylene pipe can be used.



A pond can be used as a heat source if it has adequate depth.



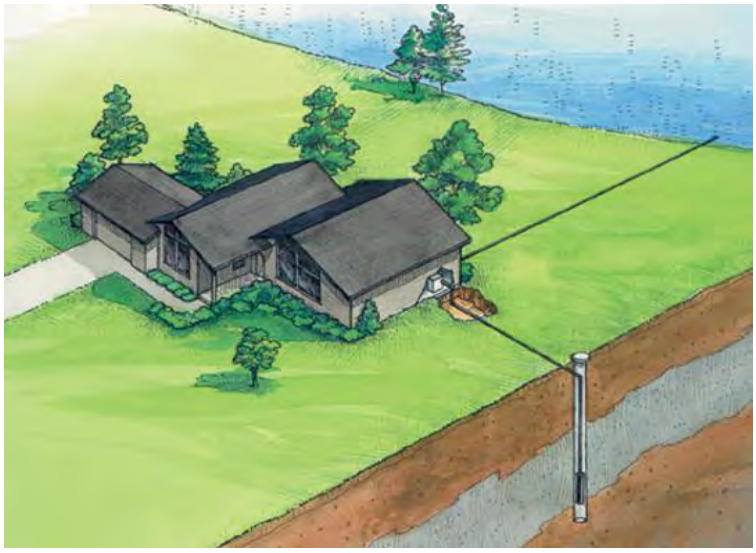
Geothermal Heat Pumps: Open-loop Systems



Q: What is an open-loop system?
A: The term "open-loop" is commonly used to describe a geothermal heat pump system that uses groundwater from a conventional well as a heat source. The groundwater is pumped into the heat pump unit where heat is extracted, and then the water is disposed of in an appropriate manner. Since groundwater is a relatively constant temperature year-round, it is an excellent heat source.

Q: What do I do with the discharge water?
A: There are a number of ways to dispose of water after it has passed through the heat pump. The open discharge method is the easiest and least expensive. Open discharge simply involves releasing the water into a stream, river, lake, pond, ditch, or drainage tile. Obviously, one of these alternatives must be readily available and must possess the capacity to accept the amount of water used by the heat pump before open discharge is feasible.

A second means of water discharge is the return well. A return well is a second well bore that returns the water to the ground aquifer. A return well must have enough capacity to dispose of the water passed through the heat pump. A new return well should be installed by a qualified well driller. Likewise, a professional should test the capacity of an existing well before it is used as a return.



Open-loop systems use groundwater from a well as a heat source.

Geothermal Heat Pumps: Open-loop Systems (continued)

Q: How much groundwater does an open-loop system need?
A: Geothermal heat pumps used in open-loop systems need differing amounts of water depending on the size of the unit and the manufacturer's specifications. The water requirement of a specific model is usually expressed in gallons per minute (g.p.m.) and is listed in the specifications for that unit. Your heating contractor should be able to provide this information. Generally, the average system will use 6-10 g.p.m. while operating.
Your well and pump combination should be large enough to supply the water needed by the heat pump in addition to your domestic water requirements. You will probably need to enlarge your pressure tank or modify your plumbing to supply adequate water to the heat pump.

Q: What problems can be caused by poor water quality?
A: Poor water quality can cause serious problems in open-loop systems. Your water should be tested for hardness, acidity and iron content before a heat pump is installed. Your contractor or equipment manufacturer can tell you what level of water quality is acceptable. Mineral deposits can build up inside the heat pump's heat exchanger. Sometimes a periodic cleaning with a mild acid solution is all that's needed to remove build-up. Impurities, particularly iron, can eventually clog a return well. If your water has high iron content you should be sure that the discharge water is not aerated before it's injected into a return well.

Finally, you should opt against using water from a spring, pond, lake, or river as a source for your heat pump system unless it's proven to be free of excessive particles and organic matter. They can clog a heat pump and make it inoperable in a short time.

Q: Does an open-loop system cause environmental damage?

A: No. They are pollution free. The heat pump merely removes heat from or adds heat to the water. No pollutants are added whatsoever. The only change in the water returned to the environment is a slight increase or decrease in temperature.

Some people are concerned that open-loop systems contribute to the depletion of our ground water resources. This issue is not critical in some parts of North America because of abundant supplies of groundwater.

Q: Are there any laws that apply to open-loop installations?
A: In some localities, all or parts of the installation may be subject to local ordinances, codes, covenants or licensing requirements. Check with local authorities to determine if any restrictions apply in your area.

Geothermal Heat Pumps: Parts of the System

What are the components of a geothermal heat-pump system?
A: The three main parts are the heat-pump unit, the liquid heat-exchange medium (open or closed loop), and the air-delivery system (ductwork).

Q: Are all geothermal heat pumps alike?
A: No. There are different kinds of geothermal heat pumps designed for specific applications. Many geothermal heat pumps, for example are intended for use only with higher temperature ground water encountered in open-loop systems. Others will operate at entering water temperatures as low as 25 degrees F which is possible in closed-loop systems.

Most geothermal heat pumps provide summer air conditioning, but a few brands are designed only for winter heating. Sometimes these heating-only systems incorporate a groundwater-cooled coil that can provide cooling in moderate climates.

Geothermal heat pumps can also differ in the way they are designed. Self-contained units combine the blower, compressor, heat exchanger, and coil in a single cabinet. Split systems allow the coil to be added to a forced-air furnace and utilize the existing blower.

Q: Will I have to add insulation to my home if I install one of these systems?
A: Geothermal heat pumps will reduce your heating and cooling costs regardless of how well your home is insulated. However, insulating and weatherizing are key factors in realizing the most savings from any type of heating and cooling system.

Q: Can a geothermal heat pump also heat water for my home?
A: Yes. Using what's called a desuperheater, some types of geothermal heat pumps can save you up to 50% on your water-heating bill by pre-heating tank water. Desuperheaters are standard on some units, optional on others. Some geothermal models can provide all of your hot water needs on demand at the same high efficiencies as the heating/cooling cycles.

Q: Is a geothermal heat pump difficult to install?
A: Most units are easy to install, especially when they are replacing another forced-air system. They can be installed in areas unsuitable for fossil fuel furnaces because there is no combustion, thus, no need to vent exhaust gases.

Ductwork must be installed in homes that don't have an existing air distribution system. The difficulty of installing ductwork will vary and should be assessed by a contractor.

Geothermal Heat Pumps: Parts of the System

Q: Can a geothermal heat pump be added to my fossil fuel furnace?

A: Split systems can easily be added to existing furnaces for those wishing to have a dual-fuel heating system. Dual-fuel systems use the heat pump as the main heating source and a fossil fuel furnace as a supplement in extremely cold weather if additional heat is needed.

Q: I have ductwork, but will it work with this system?

A: In all probability, yes. Your installing contractor should be able to determine ductwork requirements and any minor modifications, if needed.

Q: Do I need to increase the size of my electric service?

A: Geothermal heat pumps don't use large amounts of resistance heat, so your existing service may be adequate. Generally, a 200-amp service will have enough capacity, and smaller amp services may be large enough in some cases. Your electric utility or contractor can determine your service needs.

Q: Should I buy a heat pump large enough to heat my home with no supplemental heat?

A: Your contractor should provide a heating and cooling load calculation (heat loss, heat gain) to guide your equipment selection. Geothermal heat pumps are sized to meet your cooling requirements. Depending on your heating needs, a geothermal heat pump will supply 80-100 percent of your design heating load. Sizing the heat pump to handle your entire heating needs may result in slightly lower heating costs, but the savings may not offset the added cost of the larger heat-pump unit. Also, an oversized unit can cause dehumidification problems in the cooling mode, resulting in a loss of summer comfort.

Q: Do geothermal heat pumps have outdoor units?

A: No. The equipment goes inside your home, usually in the basement, garage or crawl space. Because it's indoors, the lifespan of the compressor and major components are greatly extended, most having a lifespan of 20 years or more.

Geothermal heat pumps: What are the major benefits?

Q: How efficient is a geothermal heat pump?
A: They are more than three times as efficient as the most efficient fossil fuel furnace. Instead of burning a combustible fuel to make heat, they simply move heat that already exists. By doing that, they provide three units of energy for every one unit used to power the heat-pump system.

Q: What does a system like this cost?

A: A system for the typical home will cost more than if you bought a separate furnace and central air-conditioning system. But you wouldn't really be comparing apples to apples. To get an accurate comparison of costs you need to consider the following:

- ✓Payback, or how long it takes to recover the difference in costs between the two systems using energy savings. Payback for most geothermal heat-pump systems runs two to six years.
- ✓Energy efficiency of the two systems. To get an accurate picture, make sure efficiency claims are substantiated. Your lifestyle and how well your home is insulated affect how economical a system will be.
- ✓Total operating savings from heating, cooling and domestic hot water must be combined to get an accurate picture of total energy savings.
- ✓Energy costs and availability, both present and future.
- ✓Maintenance costs and system reliability.
- ✓System lifespan.

Q: What about comfort?
A: A geothermal heat pump system moves warm air (90 degrees – 105 degrees) throughout your home via a standard duct network. Typically, a very even comfort level is found throughout the home. This is because the warm air is moved in slightly higher volumes and, therefore, saturates the home with warmth more evenly. This helps even out hot or cold spots and eliminates the cold air blast common with fossil fuel furnaces.

Q: Can I get a tax credit for installing this system?
A: It depends on where you live. Some states and provinces do have tax credits for installing geothermal system. Check with your electric utility, Department of Commerce or Ministry of Revenue for further details.

Q: Which system is best, open- or closed-loop?
A: The net results in operating cost and efficiency are virtually the same. Which system to choose depends mainly on whether you have an adequate groundwater supply and means of disposal. If you do, an open loop can be used very effectively. If not, either a horizontal or vertical closed-loop system is your best choice.

Over a period of years, a closed-loop system will require less maintenance because it's sealed and pressurized, eliminating the possible build-up of minerals or iron deposits.

Geothermal heat pumps: Questions you should ask about a new heating system

Regardless of the type of heating system you may be considering for your home or business, there are specific questions you should ask the dealer/installer. These questions deal with finding out the actual efficiency of the system, any operating limitations it may have, and the bottom line of operating costs. The answers here are meant as a guide for what you should try to find out with your questions.

Q: What is the Btu size of the furnace that's being proposed?
A: Furnaces are designed to provide specific amounts of heat energy per hour. The term "Btuh" refers to how much heat can be produced by the unit in an hour. Before you can know what size furnace you'll need, you must have a heat loss/heat gain calculation done on your home. From that, an accurate determination can be made on the size of the heating system you'll need. Most fossil fuel furnaces are substantially oversized for home heating requirements, resulting in increased operating costs.

Q: Is the efficiency rating actual or just a manufacturer's average?
A: All types of heating and cooling systems have a rated efficiency. Fossil fuel furnaces have a percentage efficiency rating. Natural gas, propane and fuel oil furnaces have efficiency ratings based on laboratory conditions. To get an accurate installed efficiency rating, factors such as flue gas heat losses, cycling losses caused by oversizing, blower fan electrical usage, etc., must be included.

Geothermal heat pumps, as well as all other types of heat pumps, have efficiencies rated according to their coefficient of performance or COP. It's a scientific way of determining how much energy the system produces versus how much it uses.
Most geothermal heat pump systems have COPs of 2.5-3.5. That means for every one unit of energy used to power the system, two and one-half to three and one-half units are supplied as heat.

Where a fossil fuel furnace may be 50-90 percent efficient, a geothermal heat pump is about 300 percent efficient. Some geothermal heat pump manufacturers and electric utilities use computers to accurately determine the operating efficiency of a system for your home.

Q: Will the minimum entering water temperature have an effect on which heat pump I buy?
A: Yes. If you have an open-loop system, your entering water temperatures (EWTs) may range from the 70s in the southern United States to the 40s in Canada. All heat pumps can handle temperatures in the moderate to warm ranges. A closed-loop system, on the other hand, will encounter EWTs below freezing. Not all geothermal heat pumps will operate efficiently at those temperatures. It's important for you to know what EWTs your heat pump will handle.

Q: Are the dealer and loop installers qualified?
A: Don't be afraid to ask for references from dealers. A reputable dealer won't hesitate to give you the names and numbers to call to confirm his capabilities. The same with the loop installer.

Geothermal heat pumps: Questions you should ask about a new heating system

Q: Will open- or closed-loop be best for you?
A: That depends on several factors, as stated earlier. A dealer should be willing to install what's best for you, not for him.

Q: Will the loop joints be heat fused?
A: The **only** acceptable method for joining sections of the special pipe used for closed-loop systems is heat fusion. Any other method will eventually result in failure of the loop.

Q: How long is the payback period for your geothermal heat pump system?
A: To figure this accurately, you must know how much per year you'll save in energy costs with a geothermal system and the difference in costs between it and a conventional heating system and central air conditioner. As an example: If you'll save $700 per year with a geothermal system and the cost difference is $2,000, your payback will be less than three years.

Q: If a home has ceiling cable heat or baseboard heat, do air ducts need to be installed?
A: Not always. It may be desirable to install geothermal heat pump room units. For some small homes, one room unit would provide most of the heating and cooling needs. Ceiling cable or baseboard units could then be used for supplemental heat.

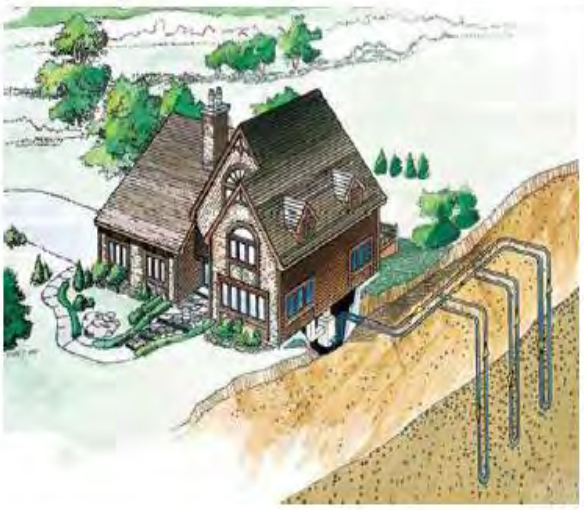
Q: If I want to know more about geothermal heat pump systems, whom should I contact?
A: YOUR ELECTRIC UTILITY. Most electric utilities have information about these systems. If you have a question they can't answer, they will put you in contact with someone who can.

REMEMBER! YOUR ELECTRIC UTILITY WANTS YOU TO BE AN INFORMED, EFFICIENT USER OF ELECTRICITY. CONTACT THEM ANY TIME YOU HAVE A QUESTION ABOUT HEATING AND COOLING SYSTEMS.

Did You Know?

Green Facts About Geothermal Heat Pumps

- There are ~85,000 geothermal heat pumps (GHPs) installed annually across the United States, at an average 3 tons capacity each, for a total of 255,000 tons of new GHP capacity every year.
- Average efficiency of new GHP systems is 400% (COP4). 75% of GHP thermal production is renewable energy from the Earth.
- Annual GHP capacity installed in the United States is equivalent to 897 megawatts (MW_{TH}). 75% of that—672 MW_{TH}— is renewable energy from the Earth. That's equivalent to displacing 3 average coal-fired power plants every decade.
- GHP installations displace the equivalent of 1,242,528 tons of CO_2 emissions every year. That's the same as taking nearly 220,000 passenger cars off the nation's highways annually.
- Average residential GHP system installation cost is currently $20,000, depending on building size, heating and cooling load, drilling costs and other factors.



- At the current installation rate of 85,000 units annually and an average cost of $20,000, GHPs are a $1.7 billion/year industry in the United States.
- GEO estimates that there are a total of 1.5 million GHP units installed across the United States.
- Total U.S. GHP installations offer energy equivalent to 15,750 MW_{TH}. 75% of that—11,810 MW_{TH}—is renewable energy from the Earth.
- GHP installations in the United States have doubled in the past decade.
- GEO believes that GHP demand is poised to explode when construction and the economy rebound.

Glossary

Btu (British Thermal Unit): The amount of heat needed to raise the temperature of one pound of water one degree Fahrenheit. Btu is used to signify the heating and cooling capacity of system and the heat losses and gains of buildings and homes.

Btuh: The number of Btus produced in one hour.

Closed-loop heat pump system: A heat pump system that uses a loop of buried plastic pipe as a heat exchanger. Loops can be horizontal or vertical.

COP (Coefficient of Performance): The ratio of heating or cooling provided by a heat pump (or other refrigeration machine) to the energy consumed by the system under designated operating conditions. The higher the COP, the more efficient the system.

Compressor: The central part of a heat system. The compressor increases the pressure and temperature of the refrigerant and simultaneously reduces its volume while causing the refrigerant to move through the system.

Condenser: A heat exchanger in which hot, pressurized (gaseous) refrigerant is condensed by transferring heat to cooler surrounding air, water or earth.

Cycling losses: The actual efficiency of a heating or cooling system is reduced due to start-up and shut-down losses. Oversizing a heating or cooling system increases cycling losses.

Desuperheater: A device for recovering superheat from the compressor discharge gas of a heat pump or central air conditioner for use in heating or preheating water.

Fossil fuel: Any of several types of combustible fuels formed from the decomposition of organic matter. Examples are natural gas, propane, fuel oil, oil, and coal.

Geothermal heat pump: A heat pump that uses the earth as a heat source and heat sink.

Heat exchanger: A device designed to transfer heat between two physically separated fluids or mediums of different temperatures.

Heat pump: A mechanical device used for heating and cooling which operates by pumping heat from a cooler to a warmer location. Heat pumps can extract heat from air, water, or the earth. They are classified as either air-source or geothermal units.

Heat sink: The medium – air, water or earth – which receives heat rejected from a heat pump.

Heat source: The medium – air, water, or earth – from which heat is extracted by a heat pump.

Glossary (continued)

Open-loop heat pump system: A heat pump system that uses groundwater from a well or surface water from a lake, pond, or river as a heat source. The water is returned to the environment.

Payback: A method of calculating how long it will take to recover the difference in costs of two different heating and cooling systems by using the energy and maintenance cost savings from the more efficient system.

Supplemental heating: A heating system used during extremely cold weather when additional heat is needed to moderate indoor temperatures. May be in the form of fossil fuel or electric resistance.


UNDERSTANDING THE
FEDERAL TAX INCENTIVES
for RESIDENTIAL GEOTHERMAL HEAT PUMPS
WaterFurnace

The Energy Credit

In October 2008, geothermal heat pumps were added to section 25D of the Internal Revenue Code. This created a 30% tax credit for costs associated with qualified geothermal equipment "placed in service" through the end of 2016. Property is usually considered to be placed in service when installation is complete and equipment is ready for use. However, if the system is part of the construction or renovation of a house, it's considered placed in service when the taxpayer takes residence in the house.

- **30% of total system cost**
- **No limit to credit amount for 2009 and beyond**
- **Can be used to offset AMT tax**
- **Can be used in more than one year**
- **Can be combined with solar and wind tax credits**
- **Can be combined with energy efficiency upgrade credits**

What's Eligible

Geothermal equipment that uses the stored solar energy from the ground for heating and cooling, ***and*** that meets Energy Star requirements at the time of installation is eligible for the tax credit. Covered expenditures include labor for onsite preparation, assembly, or original system installation and for piping or wiring to connect a system to the home. The structure must be located in the United States and used as a residence by the taxpayer, although primary residency isn't required. In fact, if geothermal is installed in more than one home, there's no limitation on the number of times the credit can be claimed.

What's Not

The credit can't be claimed for spending on equipment used solely for hot tub or pool conditioning, nor on previously used equipment.

How to claim the Credit

Use IRS Form 5695 (2008) to claim the Residential Energy Efficient Property Credit for 2008. Form 5695 for 2009 has not been published yet. For systems completed in 2008, the maximum tax credit is capped at $2,000. For property placed in service after the start 2009, there's no limit on the credit amount. The tax credit can be used to offset both regular income taxes and alternative minimum taxes (AMT). If the federal tax credit exceeds tax liability, the excess amount may be carried forward into future years. Spending on geothermal heat pump property adds to your home's cost basis, but also must be reduced by the amount of the tax credit received.

Non-Business Energy Property Credit

The Non-Business Energy Property Credit is a 30% tax credit (up to $1,500) for spending on qualified energy efficiency improvements made to an existing home between 2009 and 2010. This credit is for improvements on insulation, windows, doors, and solar reflective roofing materials and can be claimed in addition to the Energy Efficiency credit for geothermal property. The improvements must be for a dwelling in the United States that's owned by the taxpayer and used as the principal residence. IRS Form 5695 (2009) is used to claim the credit. Form 5695 for 2009 has not been published yet.

New Energy Efficient Home Credit

Section 45L of the Internal Revenue Code provides building contractors a $2,000 tax credit for the construction or substantial renovation of a new home that achieves a 50% heating and cooling energy cost saving relative to a comparable dwelling that meets the minimum requirements of 2004IECC energy code. The home must be sold prior to the end of 2009 for the builder to receive the credit. The energy consumption reduction must be verified by an independent accredited certifier, such as a RESNET home energy rater. IRS Form 8908 is used to claim the credit. IRS Notice2008-35 provides detailed guidance.

Home businesses

If a structure serves as both a residence and place of business, spending may need to be allocated between residential and business use. If residential spending is at least 80%, then all spending qualifies for the residential credit. For commercial spending, there's a 10% tax credit available, and 5-year MACRS accelerated depreciation.

FTIB 03/09

INDOOR COMFORT SPECIALISTS, INC.

Houston's Only GeothermalXperts

5303 GLENMONT SUITE F
HOUSTON, TEXAS 77081-2049
TACL-A-000606C
PHONE: 713-666-1101 FAX: 713-666-2476

Why Should You Choose Us?

At Indoor Comfort Specialists, we believe there is only one way to do a job – the correct way. We will provide you with all of the engineering data including a manual J load on your home, as well as the correlating engineered loop design. The loop load is more important than the Manual J or Manual D. There are no other dealers/contractors in Houston that will provide you with a copy of the loop load design. Other contractors will often times tell you that they can calculate the loop load but they are really using a simple 1-page Excel form which is provided by the manufacturer for free. The form even states that it is an estimate. In addition many contractors will also use a "rule of thumb" of installing one loop per ton. For your review, following this letter is a sample calculated loop load from a previous job we installed. It clearly depicts the proper loop length needed now, as well as the engineered loop design that is required in 10 years. This design feature is crucial because in the Houston area we operate our air conditioners approximately 2,500 hours per year and our heaters only 200 hours per year. Since we are cooling dominate, we deposit in excess of 10 times more heat into the earth through our loop system as we take out for the heating system. This results in ground overheating over the years. When a loop system overheats it does not occur overnight. It takes 3-5 years to happen and once it starts it is all downhill from there. The system will end up almost useless and this is what gives geothermal a bad name.

With geothermal pricing, it can almost become a hocus-pocus situation. We can reduce the price of your job by $2,000, but this will require eliminating one loop. Of course this action will cause your loop temperatures to run hotter, thereby costing more money to operate your system each month. We invite you to check with the local WaterFurnace factory representative where you will find that we have been doing this for a long time. In fact we often times have to clean up problems caused by other contractors. There are no other contractors that are **Certified Geothermal Designers** in or around Houston. Most contractors in this area have attended an 8-hour training class whereby they receive a certificate on "How To Install A Geothermal Unit", but not how to engineer a properly-sized earth loop. Some systems work and some do not. We repair about 5-10 systems each year that have been designed and installed incorrectly. One customer in Pearland paid another company $40,000 to install two 4-ton systems because our price was $6,000 higher than theirs. After numerous complaints the installing contractor would not even call the homeowner back. The customer then paid our company $12,000 to fix his system. Unfortunately there are many more examples like this.

If you would like to compare any of these other companies to our company I ask you to:

- Dial the other contractor's phone number in the middle of the night and see if you get an answering machine or talk a live person.
- Compare the certifications, training and education of the other contractors you are considering for your installation. We continuously update our training by attending classes to further our geothermal knowledge. Other companies do not.
- Ask each company if they will provide you with all the related engineering data, including the loop design depicting a 10-year projection of the proper loop length.
- Check with the Better Business Bureau on each company.
- Check references of each company.
- Inquire as to the average loop-length per ton they normally see on their jobs which is usually 250 foot – ours is 330 foot of loop per ton on average.

We have successfully installed over 5000 tons of geothermal since 1993. Since 2009, we have installed geothermal systems in the homes of three astronauts in the Clear Lake area. Two of them are M.I.T. graduates and each received engineering data that satisfied them as to proper loop length design. We believe this is an accomplishment that no other geothermal contractor in Houston has. Those customers have referred us to yet another astronaut, where we are currently designing his geothermal system. His home is in League City.

I hope this provides you with some insight into our company. We guarantee you will have a properly designed and installed geothermal system that will give you many years of dependable and efficient performance.

Should you have any other questions please feel free to contact me.

Best personal regards,

Jerry Egan

Houston's Only Full Service **Green** Contractor
IGSHPA Certified **Geothermal** Installer
IGSHPA Certified **Geothermal** Piping Installer
IGSHPA Certified **Geothermal** Piping Designer
IGSHPA Certified **Geothermal** Designer
Certified By The Association of Energy Engineers
Member of the American Society of Civil Engineers
Member of the **Geo-Institute**
Member of the U.S. **Green** Building Council-Greater Houston Area Chapter
State of Texas Class A Contractors License # TACL-A-606C
State of Texas Registered A/C & Refrigeration License # 190
State of Texas Certified A/C & Refrigeration Technician License # 190

Vertical Bore 1

Earth Temperature Data Location

Deep earth (below 20ft) temperature is a function of the average annual air temperature in your region and remains relatively constant regardless of season.

Deep Earth Temp (T_G) **70.0 °F**

Formation Details

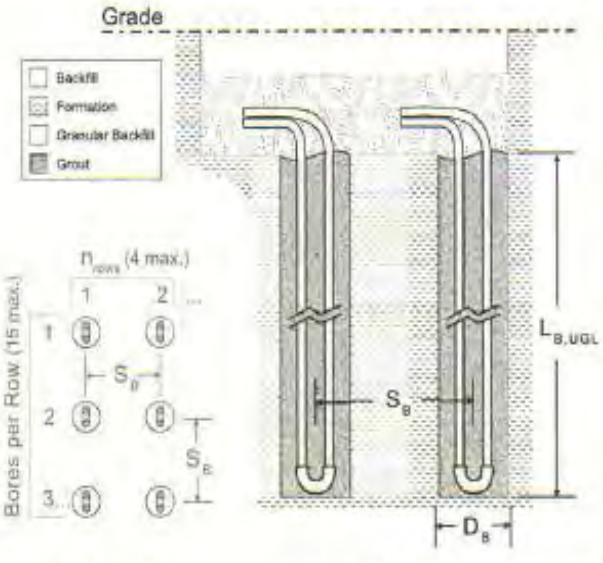
The thermal properties of your formation are based on the formation's composition and have a direct impact on the scale of your loopfield.

Thermal Conductivity **1.24 Btu/hr ft °F**

GHEX Summary

Cooling is dominant

Grout is used inside of all bores in order to protect the deep earth environment from surface contaminants and to provide a more effective contact surface with GHEX piping that optimizes heat transfer between the fluid pumped through your GSHP and the earth.



Grout T.C.	0.88 Btu/hr ft °F
EWT_{MIN}	45.0 °F
EWT_{MAX}	90.4 °F
Bore Diameter (D_B)	5.00 in
Pipe Diameter (D_o)	1.00 in
Bores in Series ($N_{B/S}$)	1
Layout Rows (n_{rows})	2
Bores per Row	14
Number of Bores	28
Bore Spacing (S_B)	20.0 ft
Bore Depth (L_B)	317 ft
Adj. Bore Depth* ($L_{B,UGL}$)	399 ft
System Run Fraction	0.426

Need Now

10 years from now

*Adj. Bore Depth is the adjusted bore depth. This is the depth of bore that should be used to accommodate unbalanced ground loads over time.

AIR CONDITIONING AND REFRIGERATION CONTRACTOR

GERALD HENRY EGAN

TACLA000606C

CLASS	ENDORSEMENTS
A	Environmental Air Conditioning
	Commercial Refrigeration and Process Cooling and Heating

ISSUED BY THE
TEXAS DEPARTMENT OF LICENSING AND REGULATION
P.O. BOX 12157
AUSTIN, TEXAS 78711

This certificate is for display purposes only. It should not be considered a valid license to perform Air Conditioning and Refrigeration contracting.

William H. Kuntz, Jr., Executive Director

№ 1913

STATE OF TEXAS
GERALD HENRY EGAN

AIR CONDITIONING &
REFRIGERATION CONTRACTOR

EGAN & HINSON INC AND ASSUMED

LIC.# TACLA606C
EXPIRES 08/30/2012

TEXAS DEPARTMENT OF LICENSING AND REGULATION

ASCE American Society of Civil Engineers

By action of the Board of Direction

Gerald Egan, Aff.M.ASCE

has been elected

AFFILIATE MEMBER

who is entitled to all the privileges granted by the Constitution of the Society, an organization for the advancement of professional knowledge and the improvement of civil engineering.

Patrick J. Natale

Patrick J. Natale, P.E., F. ASCE
Executive Director

April, 2009

AMERICAN SOCIETY OF CIVIL ENGINEERS 1852

D. Wayne Klotz

D. Wayne Klotz, P.E., D.WRE, F.ASCE
President

Gerald Egan, Aff.M.ASCE

Grade: AFFILIATE MEMBER

Member #: 939393

Patrick J. Natale

Patrick J. Natale, P.E., F.ASCE
Executive Director

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

University of Wisconsin-Madison
College of Engineering

The Department of Engineering Professional Development

proudly presents this award for
educational achievement to

JERRY EGAN

for participation in

GEOTHERMAL HEAT PUMP SYSTEMS DESIGN

September 10 - 12, 2001

UNIVERSITAS WISCONSINENSIS SIGILLUM

Harold L Olsen
PROGRAM DIRECTOR

Philip R. O'Leary
CHAIRMAN OF THE DEPARTMENT

30th ANNIVERSARY
Established 1977
aee
Three Decades of Achievement

July 2, 2007

Gerald Egan
Indoor Comfort Specialists, Inc./Geothermal Xperts
5303 Glenmont, Ste. F
Houston, TX 77081

ID #: 44699

Dear Mr. Egan:

Congratulations! We are pleased to inform you that your application for Certified GeoExchange Designer (CGD) has been approved by the Certification Board. Your certificate is enclosed.

The continuing education of a geoexchange designer is essential in order to cope with rapidly changing conditions. Therefore, to remain certified you must accumulate eight (8) professional credits every three (3) years. A renewal form will be mailed when your recertification is due. Enclosed is information on areas where credits may be obtained.

Your interest in certification reflects your pursuit of professionalism, and achieving CGD recognition demonstrates your knowledge and ethical fitness for geoexchange design. On behalf of the Association of Energy Engineers, I would like to offer our congratulations once again. Welcome to the CGD program!

Cordially,

Jennifer Ngo
Certification Director

ASSOCIATION OF ENERGY ENGINEERS®
4025 PLEASANTDALE ROAD, SUITE 420 ATLANTA, GEORGIA 30340

Name: Gerald Egan
Grade: Member
Membership #: 44699

MEMBER'S SIGNATURE

12/31/2011
VALID THROUGH

CERTIFIED GEOEXCHANGE DESIGNER

CGD

The Association of Energy Engineers

CERTIFIES THAT

Gerald H. Egan CGD

has completed the prescribed standards for certification, has demonstrated a high level of competence and ethical fitness for geoexchange design and is hereby granted the title of

CERTIFIED GEOEXCHANGE DESIGNER

CGD Board Chairman

CGD Director

December 31, 2013
Certification Expiration Date

172

IN CONJUNCTION WITH:

IGSHPA
International Ground Source Heat Pump Association

GEOEXCHANGE
The Geothermal Heat Pump Consortium

AWARDED BY:

aee
The Association of Energy Engineers

ASSOCIATION OF ENERGY ENGINEERS CORPORATE SEAL GEORGIA

GEOEXCHANGE®

GEOEXCHANGE®

The GEO Board of Directors Honors

GeothermalXperts

Indoor Comfort Specialists Inc.

A Valued ***Business Partner*** of the

GEOTHERMAL HEAT PUMP CONSORTIUM, INC.

Dedicated to *Saving From the Ground Up* Through Application of Geothermal Heat Pump Technology

September 19, 2010

John Kelly, Chief Operating Officer

Geothermal Heat Pump Consortium

GEOEXCHANGE

Certificate of Membership

This certifies the acceptance of

Egan & Hinson, Inc.

to the level of

Bronze Member

in the Geothermal Heat Pump Consortium, Inc.

Executive Director

Home advice®

Healthy air starts here.™

Certified HomeAdvice™ Specialist

Certificate of Completion

Egan & Hinson/Indoor Comfort Specialists

Has met all of the requirements of the HomeAdvice™ Certification Program

Dated: October 31, 2007

HomeAdvice Certified Specialist

Jim Crowder
AirAdvice President and CEO

David Olver
Business Advisor

WaterFurnace
Smarter from the Ground Up™


WaterFurnace
Smarter from the Ground Up™

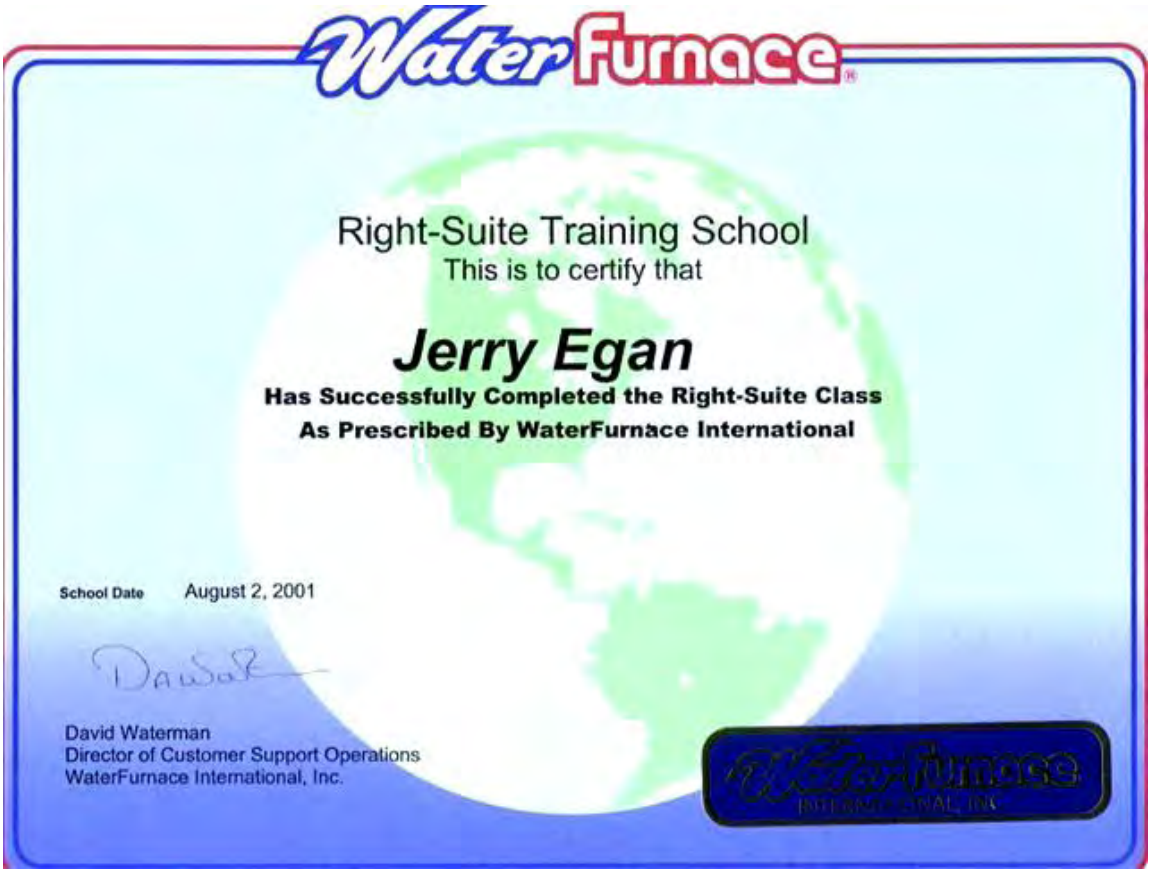
FACTORY TRAINED FUSION TECHNICIAN

Jerry Egan

Has successfully completed all of the requirements to perform heat fusion of WaterFurnace geothermal pipe

☑ Socket PE Butt PE

Sonny Hampton	6771	11/15/2010
Instructor	ID Number	Expires


WaterFurnace

Right-Suite Training School

This is to certify that

Jerry Egan

Has Successfully Completed the Right-Suite Class

As Prescribed By WaterFurnace International

School Date August 2, 2001

David Waterman
Director of Customer Support Operations
WaterFurnace International, Inc.

WaterFurnace INTERNATIONAL INC

WaterFurnace International, Inc.
9000 Conservation Way
Fort Wayne, IN 46809
219-478-LOOP (5667)
FAX 219-478-3029

July 24, 2000

Jerry Egan
Egan & Hinson
5303 Glenmont
Houston, TX 77081

Dear Jerry Egan,

Thank you for your recent participation in the Service/Installation Technician School. The extra effort and costs incurred to attend the training school demonstrates your commitment to learning more about the service/installation aspects of WaterFurnace Geothermal Systems.

You have successfully completed the Service/Installation Training course and passed the required tests. I have enclosed the certificate which you may proudly display where you work.

If you ever have a service question to ask, give us a call at our Technical Services Department, or contact your local Region center staff.

Thank you again for your commitment to WaterFurnace and we wish you great prosperity and happiness in the future!

Sincerely,

David Waterman
Director of Customer Support
WaterFurnace International, Inc.

Enclosure

WaterFurnace

Certified Heat PumpTechnician
Service/Installation Technician Training School

This is to certify that

Jerry Egan

has successfully completed the Service/Installation Technician Training School as prescribed by WaterFurnace International, Inc.

Date: 17 December, 1998

Signed: Garry Sexton
Garry Sexton, Training Manager

WaterFurnace International, Inc
9000 Conservation Way
Fort Wayne, IN 46809
219-478-LOOP (5667)
FAX 219-478-3029

January 25, 2001

Jerry Egan
Egan & Hinson
530 3 Glenmont
Houston TX 77081

Dear Jerry Egan :

Thank you for your recent participation in the Geothermal Piping Design Seminar. The extra effort and costs incurred to attend the training school demonstrates your commitment to learning more about the service/installation aspects of WaterFurnace Geothermal Systems.

You have successfully completed the Piping Design Training course and I have enclosed the certificate which you may proudly display where you work.

If you ever have a design or service question to ask, give us a call at our Technical Services Department, or contact your local Region Center staff.

Thank you again for your commitment to WaterFurnace and we wish you great prosperity and happiness in the future!

Sincerely

David Waterman
Director Customer Support Operations
WaterFurnace International, Inc.

WaterFurnace

Certificate of Completion
Geothermal Piping Design Seminar

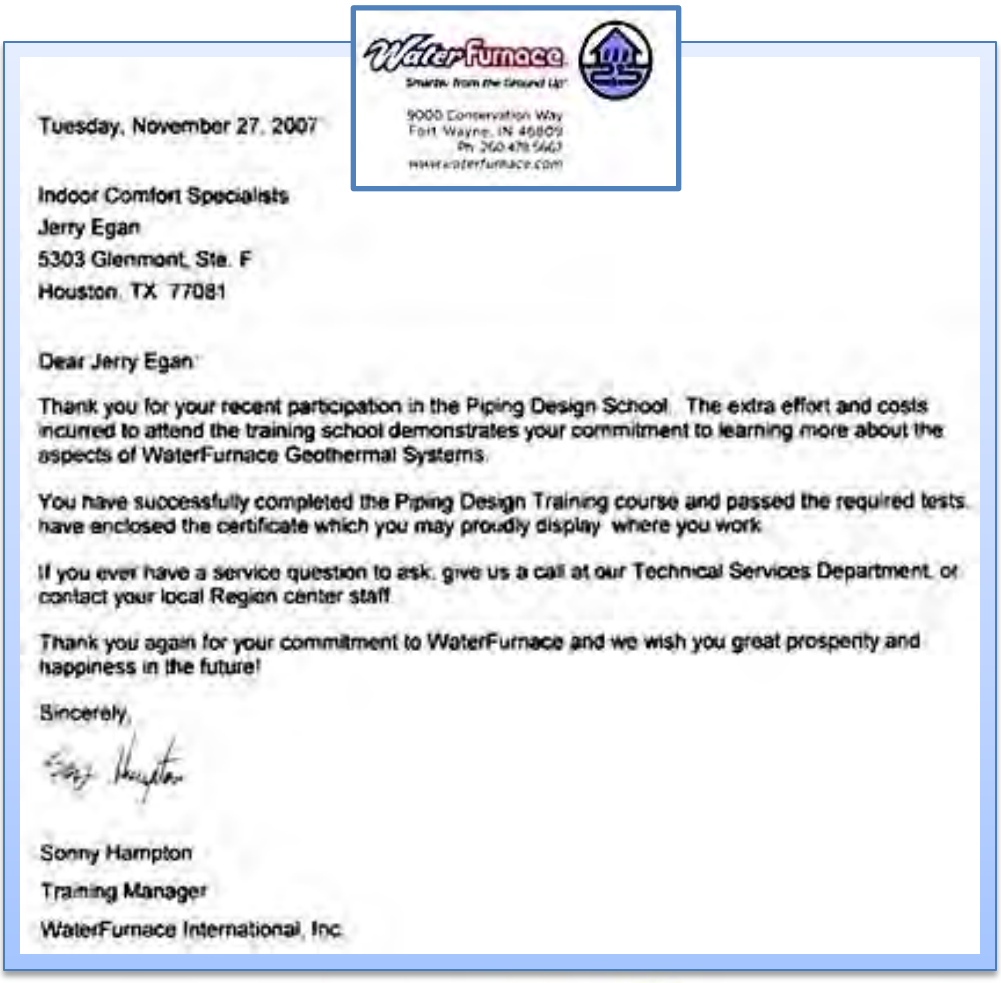
This is to certify that

Jerry Egan

has completed the Geothermal Piping Design Seminar,
a School of advanced instruction and testing, as prescribed by
WaterFurnace International, Inc.

Date: ***16 December, 2000***

David Waterman
Director Customer Support Operations



WaterFurnace
Smarter from the Ground Up

9000 Conservation Way
Fort Wayne, IN 46809
Ph: 260.478.5663
www.waterfurnace.com

Tuesday, November 27, 2007

Indoor Comfort Specialists
Jerry Egan
5303 Glenmont, Ste. F
Houston, TX 77081

Dear Jerry Egan:

Thank you for your recent participation in the Piping Design School. The extra effort and costs incurred to attend the training school demonstrates your commitment to learning more about the aspects of WaterFurnace Geothermal Systems.

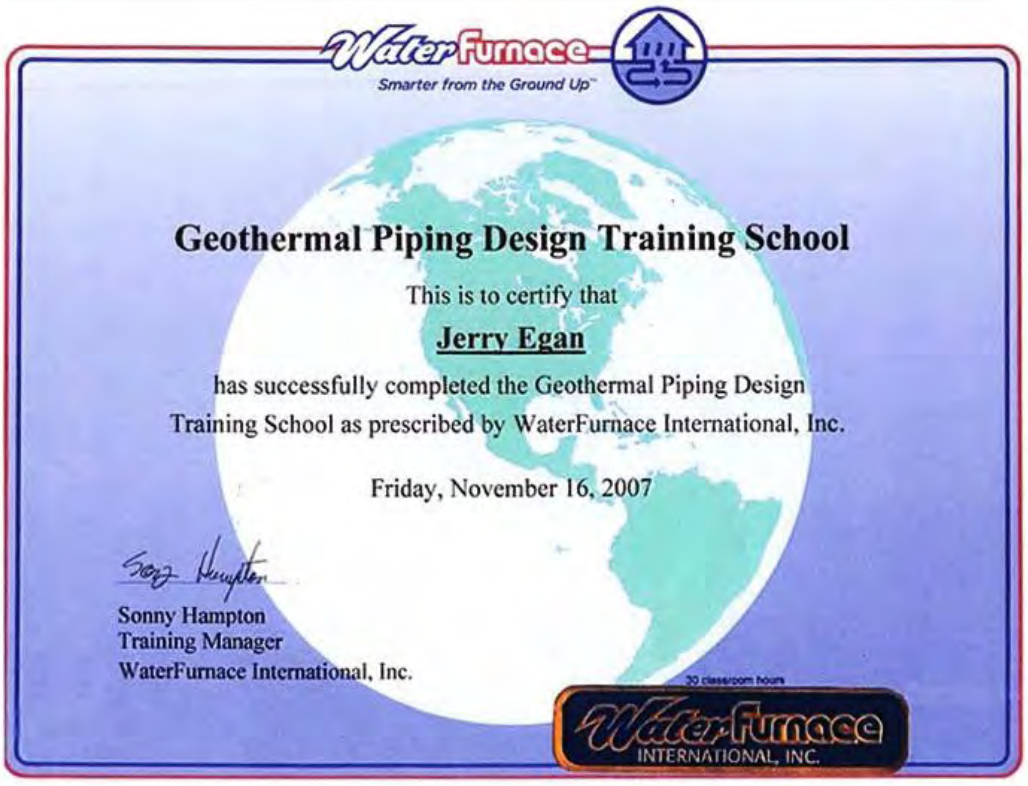
You have successfully completed the Piping Design Training course and passed the required tests. I have enclosed the certificate which you may proudly display where you work.

If you ever have a service question to ask, give us a call at our Technical Services Department, or contact your local Region center staff.

Thank you again for your commitment to WaterFurnace and we wish you great prosperity and happiness in the future!

Sincerely,

Sonny Hampton
Training Manager
WaterFurnace International, Inc.



WaterFurnace
Smarter from the Ground Up™

Geothermal Piping Design Training School

This is to certify that

Jerry Egan

has successfully completed the Geothermal Piping Design Training School as prescribed by WaterFurnace International, Inc.

Friday, November 16, 2007

Sonny Hampton
Training Manager
WaterFurnace International, Inc.

20 classroom hours

WaterFurnace INTERNATIONAL, INC.

IGSHPA
International Ground Source Heat Pump Association

This is to certify that

Jerry Egan

has successfully passed the

Certified GeoExchange Designer Course and Exam

And in recognition thereof,

is hereby awarded this Certificate

given August 21, 2002.

James E. Bose, Executive Director

IGSHPA
International Ground Source Heat Pump Association

Jerry Egan
Egan & Hinson, Inc.
5303 Glenmont # F
Houston, TX 77081

Dear Jerry,

Congratulations! You have passed the Certified GeoExchange Designer Exam given at the recent CGD course hosted by Water Furnace International, Inc. in Fort Wayne, Indiana. The International Ground Source Heat Pump Association, IGSHPA, is happy to have been a part of your educational experience and growth with geothermal heat pumps.

As you know, the CGD course is a result of the combined efforts of IGSHPA, Association of Energy Engineers, AEE, and the Geothermal Heat Pump Consortium, GHPC. **To follow through with becoming certified, you must take the following steps:**

1. Attend the IGSHPA CGD course and pass the CGD exam. You have already done this.
2. Determine eligibility; see the eligibility requirements below.
3. Complete a separate application with an additional fee to Association of Energy Engineers, initiating the certification process.
4. After evaluation of your qualifications, as stated on the application, CGD board approval, and successful completion of the IGSHPA CGD exam, certification will be determined and awarded through AEE.

Eligibility Requirements; Each candidate must meet one of the following four sets of criteria:

- Be an engineering graduate and/or Professional Engineer or Registered Architect with three years of verified, combined experience in geothermal heat pump design, heating, ventilation and air-conditioning.
- Have a four-year, non-technical degree with five years combined experience in geothermal heat pump design, heating, ventilation, and air-conditioning.
- Have a two-year technical degree with eight years of verified, combined experience in geothermal heat pump design, heating, ventilation, and air-conditioning.
- Have ten years or more verified, combined experience in geothermal heat pump design, heating, ventilation, and air conditioning.

Oklahoma State University
490 Cordell South
Stillwater, OK 74078-8018
(405) 744-5175 tel • (405) 744-5283 fax

Down to Earth Energy

IGSHPA
International Ground Source Heat Pump Association

January 31, 2002

Gerald Egan
GeoThermal Xperts, Inc. A Div. Of Egan & Hinson, Inc.
5303 Glenmont, Ste. F
Houston, TX 77081

Dear Gerald:

Welcome back as a member of the leading GeoExchange industry association, the International Ground Source Heat Pump Association, (IGSHPA). Your membership renewal is an investment in the GeoExchange industry that will strengthen your business tomorrow.

We hope you are enjoying your copy of IGSHPA's newsletter, *The Source*. This newsletter is created for our members to exchange information and promote the industry as a whole. We encourage input or any article submissions from our members. If you would like to share with your colleagues a story about an interesting and challenging project, please call about publication in *The Source*.

As a service organization, we continually strive to serve our membership. Many services are on our website, http://igshpa.okstate.edu. Again, we welcome input from our members on how we can improve our services. Member participation and input is vital in order for IGSHPA to maintain its industry leadership role.

Your new membership card, which guarantees you special member discounts on publications, conferences and seminars, is enclosed. Keep your card handy, and be sure to include your personal ID number whenever you correspond with the association office.

Thank you again for renewing your IGSHPA membership.

Sincerely,

James E. Bose, Ph.D., P.E.
Executive Director

IGSHPA

IGSHPA

International Ground Source Heat Pump Association

This is to certify that

Gerald Egan

is a member in good standing of the

International Ground Source Heat Pump Association

and in recognition thereof,

is hereby awarded this Certificate

given 4/3/00.

James E. Bose, Executive Director

The International Ground Source Heat Pump Association hereby confirms

Gerald H. Egan

as an Accredited Installer

Membership ID	Accreditation ID
17015-400	13050-400

Expires 12/31/2013

"Down to Earth Energy" Established 1984

The International Ground Source Heat Pump Association hereby confirms

Gerald H. Egan

as a/an Dealer/Contractor Member

Membership ID	Expires
17015-400	12/31/2011

Member Since 4/3/2000

"Down to Earth Energy" Established 1984

INTERNATIONAL GROUND SOURCE HEAT PUMP ASSOCIATION

IGSHPA

"Down to Earth Energy"

An IGSHPA-Accredited Geothermal Heat Pump Installer in Your Community

For Immediate Release

The International Ground Source Heat Pump Association (IGSHPA) is pleased to announce that Gerald Egan of Egan & Hinson, Inc. in Houston, Texas, has successfully completed the geothermal heat pump installation workshop and is now an IGSHPA-accredited installer.

Geothermal heat pump (GHP) systems use modern technologies to tap the stored energy of the greatest solar collector in existence: the earth. They take advantage of the earth's relatively constant ground temperature to provide structures including homes, commercial buildings, apartment complexes, and schools.

Installation trainees learn everything involved in the design and installation of the plastic pipe configurations (called ground heat exchangers) that are the basis of a system. The pipes are buried beneath the earth's surface, and water or an antifreeze solution is circulated through them. During the winter, the fluid collects heat from the earth and carries it into the building. In the summer the system reverses itself and cools the building by pulling heat from the building and depositing it in the earth. The process creates free hot water in the summer and delivers substantial hot water savings in the winter.

Because GHP systems offer consumers a durable, low-maintenance, economical, and environmentally-friendly alternative to conventional heating and air conditioning systems, an IGSHPA-accredited installer is a benefit to any community. Utilities can also benefit because the efficiency and reliability of GHP systems helps stabilize their demand loads.

For more information on GHP systems, contact the International Ground Source Heat Pump Association at 1-800-626-4747, or contact your local IGSHPA-accredited installer.

This is to certify that

Gerald H. Egan

is an IGSHPA Accredited Installer

ID#: 13050-400

ACCREDITED IGSHPA INSTALLER

IGSHPA Executive Director

International Ground Sourc
Heat Pump Association

Valid only with current membership car

IGSHPA
International Ground Source Heat Pump Association

As Of August 18, 2011

There Is Only One Geothermal Contractor Who Is An Accredited Geothermal Installer, A Certified Geothermal Designer, And A Full Service Geothermal Contractor In The Houston Area

IGSHPA

Certified GeoExchange Designer

State/ Province: **TX**

Country: **United States**

Membership must be current to be listed in the directory

Note: Associate = A; Architect/Engineer = A/E; Accredited Installer = AI; Association = AS; Certified GeoExchange Designer = CGD; Dealer/Contractor = D/C; Ex-Officio = Ex-Officio; Foundation = F; Individual = I; Manufacturer = M; Product Distributor = PD; Student = S; Trainer = T; Utility = U; Accredited Vertical Loop Installer = VI .

Name	Company	Address	City	State/ Province	Zip	Country	Phone	Email	Web	Membership Type
Richard Long		12933 Chittamwood Trail	**Euless**	**TX**	76040		817-878-4242	rll@summitmep.com		I, CGD
David W. Donnelly, PE		10674 FM 1641	**Forney**	**TX**	75126		502-468-0511	david.donnelly@prodigy.net		AI, T, CGD
Michael Beebe		3008 Wichita Ct.	**Fort Worth**	**TX**	76140		817-293-3803	mbeebe@centurymech.com		I, CGD
Don Penn	Don Penn Consulting Engineer/IEG Ltd.	635 Westport Pkwy., Ste. 300	**Grapevine**	**TX**	76051		817-410-2858	donpenn@donpenn.com	www.iegltd.com	A/E, CGD
Robert Frick		635 Westport Pkwy., Ste. 300	**Grapevine**	**TX**	76051		817-410-2858	rfrick@iegltd.com		I, CGD
Phil Rawlings		PO Box 1044	**Greenville**	**TX**	75403		903-454-8952	geoman@geusnet.com		AI, T, CGD
Gerald H. Egan	Geothermal Xperts/Indoor Comfort Specialists, Inc.	5303 Glenmont, Ste. F	**Houston**	**TX**	77081		713-666-1101	jerry@indoorac.com	www.geothermalxperts.com	D/C, AI, CGD
Keith Douglas		1425 Greenway Drive, Suite 640	**Irving**	**TX**	75038		972-812-1270	kdouglas@kmc-inc.com		I, CGD
Cameron Symes		3608 West Way	**Tyler**	**TX**	75703		903-581-2677	csymes@estesmcclure.com		I, CGD

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