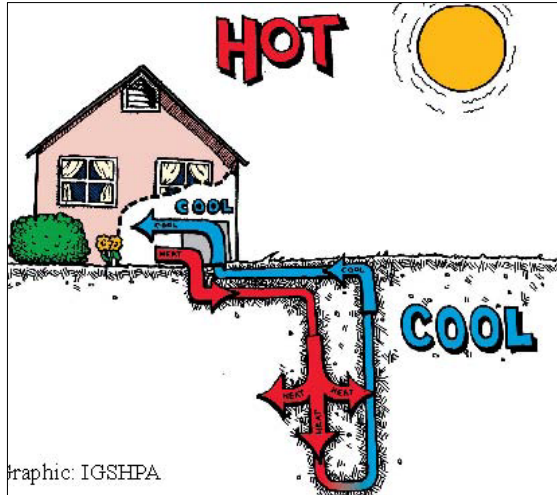


-Program-

# GEOHERMAL HEATING & COOLING FOR RESIDENTIAL AND COMMERCIAL PROPERTIES

Latest Technologies, Economic Advantages, Environmental Impacts and Regulations



Wednesday, September 12, 2007

8:15am - 4:30pm

at the

Four Points by Sheraton 99 Erdman Way,  
Leominster, MA 01453

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Presented by

**American Ground Water Trust**

*Ground Water Information, Awareness & Education Since 1986*

16 Centre Street, Concord, New Hampshire



**Please Visit our Workshop Exhibitors:**



## AMERICAN GROUND WATER TRUST WORKSHOP PROGRAM

- 8:15 – 8:20 **INTRODUCTION**  
Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH
- 8:20 – 8:50 **NATIONAL ENERGY POLICY - GEOTHERMAL OVERVIEW**  
Steven E. Chalk, Deputy Assistant Secretary of Renewable Energy, Office of Energy Efficiency and Renewable Energy, Washington, DC (Invited)  
- National economic perspective of reducing electrical energy demands and the need for infrastructure investment  
- Potential impact of geothermal on US energy independence  
- Geothermal heat pumps impact on national efforts to reduce CO2 emissions
- 8:50 – 9:30 **THE STATUS OF THE GEOTHERMAL INDUSTRY**  
Daniel Ellis, President, Climate Master, Oklahoma City, OK  
- The history of geothermal heat pump systems  
- What are geothermal heat pump systems?  
- Why should we use geothermal heat pump systems?  
- Market potential and market predictions for the geothermal heat pump industry
- 9:30 – 10:20 **GEOTHERMAL EARTH COUPLING DESIGN PRINCIPLES**  
Carl Orio, Owner, Water Energy Distributors Inc. Plaistow, NH  
- Explanation of the methods:  
    Open system – to surface, to diffusion Standing  
    Column well – Residential, Commercial  
    Closed loop – vertical, horizontal, slinky, pond  
- Weighing positives and negative aspects of each earth coupling method  
- Design considerations for geothermal wells in bedrock vs. shallow sand & gravel wells  
- What makes one well more efficient than another for thermal transfer?  
- Common misconceptions about the geothermal earth coupling
- 10:20 – 10:35 **NETWORKING BREAK**
- 10:35 – 11:25 **GROUND SOURCE HEAT PUMPS - THE FUNDAMENTALS**  
John Sima, III, P.E., Hydro Dynamic Engineering, LLC, Southington, CT  
- Understanding the basic physics of the heat transfer process  
- Explanation of terminology (geoexchange, geothermal, ground source, BTUs, tons etc.)  
- How the heat exchange process works for heating and cooling  
- What happens to the heat transferred underground – are there any risks?  
- How to measure the efficiency of geothermal heat pump systems  
- Primary differences between geothermal and traditional HVAC applications  
- What are the “vital-signs” of an efficiently operating geothermal heat pump system?  
- What should a home inspector, Realtor or prospective purchaser look for?
- 11:25 – 12:05 **GEOTHERMAL WELL CONSTRUCTION for EFFICIENCY and ENVIRONMENTAL PROTECTION**  
Moderator – Garret Graaskamp, P.G., American Ground Water Trust  
Panel Members:  
    Roger Skillings, President, Skillings & Sons Inc., Hollis, NH  
    David Quagliaroli, Dragin Geothermal Well Drilling Inc., Wareham, MA  
    Jack Porter, Owner, Smith Pump Inc., Hooksett, NH
- Q&A and Panel Discussion to include:**  
- Review of typical New England Installations  
- The basis for selecting installation materials (well casing, grout, propylene glycol, methyl alcohol. etc/)  
- Use of an existing well for a geothermal application  
- How does a ground source heat pump well differ from a drinking water well?  
- Common problems that can result from installation errors  
- What to do if a closed loop develops a problem, etc.
- 12:05 – 1:05 **LUNCH (Provided on site) / PRESENTATION**  
**Congressman Richard E. Neal, Second District, Massachusetts**, Member of the House Ways & Means Committee and a co-sponsor of legislation to increase energy efficiency (Invited)
- 1:05 – 1:50 **ECONOMIC SUCCESS STORIES – THE PAYBACK - Residential, Commercial and Industrial**  
Michael McQueeney, Program Administrator, Public Service of New Hampshire, Manchester, NH  
- How to do the short-term and long-term math on energy savings vs. installation costs  
- What is the typical Payback period and Return on Investment (ROI)?  
- How do geothermal heat pump installations add equity value to a property?  
- What are the typical servicing and maintenance needs and costs for geothermal heat pump systems.  
- What is the relationship among architect, system designer and installer? (Who is selling to whom?)  
- Case studies of installation and operation in MA, CT, NH, ME, RI, VT (homes, churches, schools, offices etc.)

1:50 – 2:30

**GEOHERMAL INSTALLATIONS: BUILDING INDUSTRY PERSPECTIVE**

Moderator: Andrew Stone, Executive Director, American Ground Water Trust

Panel Members: Geoff Rendall/ Michael Meurant, Pulte Homes, Westborough, MA  
Thomas Rosswag, Native Construction Inc., Milford, NH  
Quincy Vale, PowerHouse Inc - Energy Efficient Buildings, Lawrence, MA

**Q&A and Panel Discussion to include:**

- What sells? Initial cost of geothermal installation vs. homeowner operating costs
- Costs of retrofit vs. installation in new construction – More definitive TRUE costs as compared to traditional methods/systems
- Who decides whether to install a geothermal heat pump installation? (Developer, architect, homeowner)
- How to manage the contracting- sub-contracting installation responsibilities
- Regulatory roadblocks to installing geothermal heat pump systems (state and local permits and code requirements)
- Service and maintenance requirements/ liabilities for geothermal installations

2:30 – 2:45

**NETWORKING BREAK**

2:45 – 3:35

**LARGE-SCALE GEOHERMAL INSTALLATIONS: PROSPECTS FOR GROWTH**

Phil Rawlings, CGD, TRC Energy Services, Greenfield, TX

Applications and experiences with implementing ground source heating and cooling systems on numerous military bases nation-wide from 1994 to present

- Ground source options
- Regulatory and permitting issues
- Design criteria for large heating and/or cooling demands
- How ground/site conditions impact ground heat exchanger design and application
- Ground source heat pump system economics
- Environmental considerations: Installation and Operation
- Performance record of projects that have been operating for many years

3:35 – 4:20

**GEOHERMAL INSTALLATIONS: STATE and LOCAL RULES and REGULATIONS**

Moderator – Neil Chayet, J.D., President, Chayet Communications Group, Boston, MA and  
Host of CBS/WBZ radio feature “Looking at the Law”

Panel Members:

Steve Roy, Supervising Hydrogeologist, NH Department of Environmental Services, Concord, NH  
Ken Pelletier, UIC Program Manager, Department of Environmental Protection, Boston, MA  
Jeffrey Curran, Supervising Environmental Laboratory Consultant, Environmental Health Section, Connecticut  
Department of Public Health, Hartford, CT  
Erich Kluck, UIC Coordinator, Maine Department of Environmental Protection, Augusta, ME

**Q&A and Panel Discussion to include:**

- Health concerns from installation and/ or operation of geothermal systems
- Environmental & water resources concerns from drilling, heat exchange or well failure
- Current regulatory requirements by State (New England)
- “Paperwork” burden for installation of a geothermal heat pump system
- Perception of “risks” to the integrity of ground water or aquatic environments
- In what instances do drinking water regulations apply to geothermal wells?
- Federal regulations related to below ground geothermal heat pump installation design and materials
- Licensing requirements for geothermal well and heat-exchange equipment installers.
- The role of state plumbing boards

4:20 – 4:30

**WRAP UP AND ADJOURN**

-Questions and CEU sign-out