



# 2008 NEW ENGLAND GROUND WATER INSTITUTE PROGRAM

**MONDAY JULY 21, 2008 (CONTINUED)**

**12:15 PM – 1:00 PM**                      **Lunch (Provided on Site)**

**1:00 PM – 2:00 PM**                      **Class Session**

*Christine Fletcher, President, Secondwind Water Systems, Inc. Manchester, NH*

**Science in Action - How a Residential Water Treatment System Work**

- Microorganisms - How to keep them out of drinking water
- Arsenic, fluoride other natural culprits in ground water, – How to fix problems
- What is a water softener? How does it work?

**2:00 PM – 3:00 PM**                      **Class Session**

*John Warner, Ph.D., President, Warner Babcock Institute for Green Chemistry, Woburn, MA*

**The Chemistry of Ground Water – A Green Chemistry Perspective - PART 1**

- The basic chemistry of natural ground and surface water – Are they the same?
- Is a “polar molecule” only found at the North Pole?
- How and why do substances dissolve in water?
- How does water effect the processes of adsorption and absorption?

**3:00 PM - 3:15 PM**                      **Networking Break**

**3:15 PM – 4:30 PM**                      **Class Session**

*John Warner, Ph.D., President, Warner Babcock Institute for Green Chemistry, Woburn, MA*

*Amy Cannon, Ph.D., Exec Dir., Beyond Benign Foundation, Woburn, MA*

**The Chemistry of Ground Water – A Green Chemistry Perspective - PART 2**

- The basic chemistry of natural ground and surface water – Are they the same?
- Is a “polar molecule” only found at the North Pole?
- How and why do substances dissolve in water?
- How does water effect the processes of adsorption and absorption?

**TUESDAY JULY 22, 2008**

**8:30 AM – 8:45 AM**                      **Second Day Check-in**

**8:45 AM - 9:45 AM**                      **Class Session**

*Lise Marx, Sr. Program Mgr., Master Planning, Massachusetts Water Resources Authority, Boston, MA*

**A History of the Boston Water System – 19<sup>th</sup> Century to 21<sup>st</sup> Century**

- Why and how were the Quabbin and Wachusett Reservoirs constructed?
- What are the primary water sources for the MWRA?
- How significant was the availability of ground water in development of the MWRA system?
- What are the major historical and current environmental threats to the MWRA water supply?
- What are the primary methods and costs of protecting the MWRA water supplies from environmental threats?

# 2008 NEW ENGLAND GROUND WATER INSTITUTE PROGRAM

**TUESDAY JULY 22, 2008 (CONTINUED)**

**9:45 AM – 10:00 AM**

**Networking Break**

**10:00 AM – 12:00 PM**

**Class Session**

*Timothy LaVallee, Ph.D., Tsongas Industrial History Center, Lowell, MA*

**Water Sampling and In-situ Testing - Merrimack River**

- Water quality sampling and testing
- Commodification of water resources
- History of the built and natural environments surrounding Lowell's canals and the Merrimack river

**12:00 AM – 1:00 PM**

**Lunch – (Provided on site)**

**1:00 PM – 2:00 PM**

**Class Session**

*Timothy LaVallee, Ph.D., Tsongas Industrial History Center, Lowell, MA*

**The Lowell Typhoid Epidemic of 1890 - How and Why**

- Interactively explore the cause of the Lowell Typhoid epidemic of 1890-91
- Trace the scientific research that uncovered the epidemic's cause.
- Concept: unforeseen consequences of urbanization and industrialization on water resources
- Concept: water quality and human health

**2:00 PM – 3:00 PM**

**Class Session**

*Timothy LaVallee, Ph.D., Tsongas Industrial History Center, Lowell, MA*

**Ground Water Simulation Tank and USGS MODFlow Example**

- How groundwater flows and contaminant transport
- Interconnectedness of ground and surface water
- Computer modeling of water table contours and flow vectors using MODFlow
- Human impacts on water resources

**3:00 PM – 3:15 PM**

**Networking Break**

**3:15 PM – 4:15 PM**

**Class Session**

*Timothy LaVallee, Ph.D., Tsongas Industrial History Center, Lowell, MA*

**Ground Water Simulation Tank and USGS MODFlow Example (Continued)**

- How groundwater flows and contaminant transport
- Interconnectedness of ground and surface water
- Computer modeling of water table contours and flow vectors using MODFlow
- Human impacts on water resources

**4:15 PM – 4:30 PM**

**Wrap-up**

*Garret Graaskamp, American Ground Water Trust*

- Where to find additional education materials on ground water and hydrology

**Institute Adjourns**

American Ground Water Trust  
16 Center Street, Concord, NH 03301  
July 21-22, 2008