

# WATER WELL PERFORMANCE: THE ECONOMIC BASIS FOR OPERATION, REHABILITATION & MAINTENANCE DECISIONS

A one-day workshop presented by:

## AMERICAN GROUND WATER TRUST

Monday, November 17th, 2008 • 8:15am - 5:00pm

Holiday Inn, Orlando Airport, 5750 T.G. Lee Blvd., Orlando, FL 32822

**Florida Engineers – Approved Provider**  
**Florida Well Contractors - Approved for 7hours CEU for (5 R/R, 2 S/B)**  
**Water Operators - Waiting for Approval**

### BACKGROUND – “More water at less cost”

More than sixteen hundred utility managers, water industry professionals, regulatory staff, well owners, agricultural and industrial water users and ground water specialists have attended past American Ground Water Trust workshop programs on water well operation, rehabilitation & maintenance in: Baltimore MD; Little Rock AR; Des Moines IA (2); Nashua NH; Houston TX; Lansing MI; Charlotte NC; Denver CO; Cincinnati OH; Wilsonville OR (2); Lakewood CA (2); Seattle WA (2); Richmond VA, Long Island NY, Bucks County PA, Phoenix AZ, Langley BC and Boynton Beach, FL.

### WHAT IS IT ALL ABOUT? - “More water at less cost”

The workshop will help improve asset management assessment skills, increase awareness of the economic importance of sustainable management of assets among engineers, utility operators, and water managers, and address core questions involved in assessing well performance to assist decisions related to, operation, maintenance, rehabilitation and replacement. The program includes fundamental aspects of well design, construction, operation, rehabilitation and maintenance.

This is a multi-disciplinary program that provides up-to-date information about water well rehabilitation technologies and well maintenance from real case study experiences. This program provides water engineers, water managers, well-field operators and well contractors with the latest information about cost-effective installation, operation and maintenance of water wells. The presentation team members are all experienced experts and their presentations will combine the practical aspects of well rehabilitation and maintenance with the economic principles of asset management so that well designers, owners, operators and managers can have a clear-cut basis to make decisions.

- ◆ What proportion of your water cost is related to well efficiency?
- ◆ Which asset management tools & concepts work best as a basis for decision-making?
- ◆ Do your well construction and design decisions include maintenance needs?
- ◆ What should be included in an RFP for well construction, maintenance or rehabilitation?
- ◆ What diagnostic indices can determine the most effective rehabilitation techniques?
- ◆ Do you know if your supply wells have the potential to provide higher yield?
- ◆ Is declining yield related to the aquifer, the pump or the well?
- ◆ How can you calculate the cost-benefit of maintaining well efficiency?
- ◆ What is the basis for assessing the success of maintenance or rehabilitation?
- ◆ How is the performance of deep Class 1 injection wells assessed and improved?

### PROGRAM - “More water at less cost”

7:30 – 8:15      **REGISTRATION, COFFEE, EXHIBITS AND SIGN-IN FOR CEUs**

8:15 – 8:30      **OVERVIEW OF THE WORKSHOP PROGRAM**

**Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH**

- *Ground water as a local, regional and national economic & environmental resource*
- *Water is free! What are the costs of accessing and delivering water?*
- *How to solve the conundrum of identifying well, pump or aquifer problems*
- *What's new in the well rehabilitation decision-making process?*

**8:30 – 9:15 ASSET MANAGEMENT PRINCIPLES AND IMPLEMENTATION STRATEGIES**

**Gordon Kennedy, Principal Geologist, MWH, Cape Coral, FL**

- *How to compile and interpret true costs*
- *Assessment of well field economics in the context of overall utility assets*
- *Value of an economic model template in rehabilitation/ replacement decisions*
- *Risk-based Approach for Asset Management Prioritization*

**9:15 – 10:00 FLORIDA GEOLOGY AND WELL DESIGN BASICS**

**Helen Hickman, Regional Groundwater Practice Leader, Brown & Caldwell, W. Palm Beach, FL**

- *Matching well design to geology*
- *Well construction for high capacity performance*
- *Well construction for on-site private wells*
- *Well design for ASR wells*
- *Regional & local well performance issues*

**10:00 – 10:30 BREAK** (networking and exhibits)

**10:30 - 11:15 DECLINE IN WELL PERFORMANCE**

**Neil Mansuy, Vice president, Subsurface Technologies, Kansas City, KS**

- *Chemical, microbiological and physical reasons for well problems*
- *Understanding typical “declining yield” problems*
- *Case studies of well yield declines attributable to encrustation*
- *Rehabilitation techniques for Class 1 injection wells*
- *Rehabilitation techniques for ASR wells*

**11:15 – 12:00 PRINCIPAL CHEMICAL METHODS FOR IMPROVING WELL PERFORMANCE**

**Kevin McGinnis, President, Cotey Chemicals, Lubbock, TX**

- *The arsenal of chemicals available to enhance/ restore well performance*
- *Matching the solution to the problem (How to decide on the “cocktail” to be used)*
- *The importance of a dual mechanical/ chemical approach*
- *Successful well-yield restoration case-studies*

**12:00 – 1:00 LUNCH** (provided)

**1:00 – 1:30 THE HYDROGEOLOGIST’S TOOL-KIT FOR IDENTIFYING WELL PROBLEMS**

**Jim Andersen, President, JLA Geosciences, Jupiter, FL**

- *Well data to assist in well rehabilitation decisions*
  - Geologic – formation characteristics*
  - Well completion specifications – screens, casing etc.*
  - Hydraulic data – yield, drawdown*
  - Water quality information*
- *How these data are obtained – driller’s logs, down-hole cameras, geophysics, performance records*

**1:30 – 2:15 PRINCIPAL MECHANICAL METHODS FOR IMPROVING WELL PERFORMANCE**

**Jim Murray, President, Aquifer Maintenance & Performance Systems (AMPS), West Palm Beach, FL**

- *Surge and bail, wire brushing, hydrojetting, blasting etc.*
- *Methods that have been tried and proven in Florida*
- *Cost considerations for selection and combination of well improvement method(s)*

- *Techniques for down-hole well reconstruction*

- 2:15 – 2:45 THE COST BENEFITS OF MAINTAINING MAXIMUM WELL PUMP EFFICIENCY**  
**Charlie Diehl, Pump Services Division Manager, Diversified Drilling Corporation, Tampa, FL**
- *Pump selection/design considerations*
  - *Pump operating costs*
  - *Pump repair/replacement and upgrading*
- 2:45 – 3:00 ECONOMICICS OF FLEXIBLE DROP PIPE WHEN WELLS NEED REHABILITATION**  
**Rusty Shaw, Regional Sales Manager, Angus Flexible Pipelines, Purcellville, VA**
- *Physical properties of flexible hose (strength and durability of hose)*
  - *Hydraulic performance capabilities (elasticity, pressure thresholds)*
  - *Pump installation and removal logistics (time out and time in)*
- 3:00 – 3:15 BREAK** (networking and exhibits)
- 3:15– 3:45 CONTRACTOR WELL REHABILITATION PERSPECTIVES**  
**Stuart Anderson, President, Applied Drilling Engineering Inc. Tampa, FL**
- *Methods and procedures for improving the performance of class 1 injection wells*
  - *The potential of combining plugging and directional drilling to restore well yield and water quality*
- 3:45 – 4:30 PREVENTION IS MORE COST EFFECTIVE THAN CURE**  
**Neil Mansuy, Vice President, Subsurface Technologies, Kansas City, KS**
- *Cost / Benefit evaluation of well rehabilitation techniques*
  - *Case studies on effective well maintenance*
  - *Preventive maintenance procedures*
  - *Equipping the well for rehabilitation at the time of installation*
- 4:30 – 5:00 PANEL - REGULATORY AND ENVIRONMENTAL ISSUES**  
**Ann Marie Superchi, Water Well Regulations Division, SFWMD, West Palm Beach, FL**  
**Tony Gilboy, South West Florida Water Management District, Brooksville, FL**  
**Warren Zwanka, St Johns River Water Management District, Orlando, FL**
- *Who has given authority to whom to regulate what?*
  - *State, Water District, County and City authority over permits for wells*
  - *Licensing and inspection requirements related to well rehabilitation*
  - *Permits and reporting rules for new wells and for well improvement work*
  - *Reporting differences between drinking supply wells and wells for other water uses*
  - *Disposal of well rehabilitation chemicals - What are the environmental guidelines?*
- 5:00 ADJOURN**
- *Continuing Education Credit sign-out*

**REGISTRATION - “More water at less cost”**

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Registration and payment also available on-line at [www.agwt.org](http://www.agwt.org) (conferences & workshops)

- Registration includes lunch
- |                  |  |                                   |
|------------------|--|-----------------------------------|
| Pre-registration | (General)                                  | <input type="checkbox"/> \$230.00 |
| Pre-registration | (Employees of AGWT Members) (\$250+ Level) | <input type="checkbox"/> \$200.00 |

Pre-registration (Full-Time Student) (ID Required at Registration)  \$110.00  
Exhibit Table (Registration not included; You must also register.)  \$250.00  
Walk-in registration (General \$260, AGWT Member \$230, Student \$130)

PAYMENT TOTAL \$ \_\_\_\_\_  CHECK (Payable to: American Ground Water Trust)  
 VISA/MC  AMEX  PO # \_\_\_\_\_

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\* Mail to: American Ground Water Trust, 50 Pleasant Street, Concord, NH 03301 ~ Phone: (603) 228-5444 ~ Return by fax: (603) 228-6557

**CONTINUING EDUCATION**

**Contact Hours 7.00**

**The American ground Water Trust will provide a Certificate of Attendance to those attendees who sign-in and sign-out. Certificates will be mailed after the event.**

**Florida Engineers – Approved Provider  
Florida Well Contractors - Approved for 7 hours CEU for (5 R/R, 2 S/B)  
Water Operators - Approval Pending**

**HOTEL INFORMATION**

**Holiday Inn Select, Orlando International Airport, 5750 T.G.Lee Blvd..Orlando, FL 32822  
Telephone (407) 851-6400.**

**The AGWT has arranged for a block of rooms for workshop participants at the rate of \$89 per night. Mention “Water Well Program” at the time of making reservations. Advance reservation required.**

**SPONSORSHIP AND EXHIBITS**

**There are opportunities to show-case projects, products and services as exhibitors or event sponsors. Sponsors receive recognition for their financial assistance.**

**Details at [http://www.agwt.org/events/2008/08FLWD\\_SponsorForm.pdf](http://www.agwt.org/events/2008/08FLWD_SponsorForm.pdf)**

**Or Call (800) 423-7748 .**