



WATER WELL DESIGN AND PUMP PERFORMANCE: THE ECONOMIC BASIS FOR WATER WELL OPERATION, REHABILITATION & MAINTENANCE DECISIONS

**A workshop on practical, cost-effective solutions
to extend asset value by maximizing well and pump performance**

**Anchorage, Alaska
Wednesday, October 9th and
Thursday October 10th, 2013**

Event venue: **University of Alaska Anchorage
Student Union
3211 Providence Drive, Anchorage, AK 99508**

PROGRAM PRESENTED BY AMERICAN GROUND WATER TRUST

Hear from experts about technologies and techniques to save money and reduce carbon footprint. It is all about maximizing efficiency and increasing performance. This program is for consultants, engineers & designers and for well operators, pump and well contractors, utility managers, owners and end-users. Just one tip on well design, pump selection, pump operation or problem-solving diagnosis could save you thousands of dollars in operation costs and reduce replacement expense by extending the asset value of your wells & pumps.

MORE WATER LESS COST - BACKGROUND

Inefficient wells cost millions of dollars in increased pumping costs and in unnecessary increments to the nation's carbon footprint. Well efficiency techniques and recent pump, and pump motor technology advances provide ways to reduce operation costs. This workshop program will show how major water users can save energy, manage resources efficiently and reduce infrastructure costs.

More than 2,000 utility managers, well contractors, water industry professionals, regulatory staff, well owners, water users and ground water specialists have attended this program in: AR, AZ, BC, CA, CO, FL, IA, IL, IN, MA, MD, MI, NC, NE, NH, NY, OH, OR, PA, TX, VA, and WA.

"Best program on well & pump performance!"

WORKSHOP PRESENTATION TEAM

Jim Bailey, National Well Services Director, Shannon & Wilson, Seattle WA

Mr. Bailey has a MS degree in hydrogeology and is a registered professional geologist. He has over 20 years of experience in ground water supply work and hydrogeological investigations. Mr. Bailey was previously President of a well services company in the Pacific Northwest and has conducted a scientific study in Europe of proprietary German well rehabilitation technology. He has managed numerous water well rehabilitation projects using this technology in the Pacific Northwest, Western Canada, and the Southeast and gives frequent workshop presentations on well maintenance and rehabilitation.

Thom Hanna, RPG, Johnson Screens, District Manager/ Hydrogeologist, Johnson Screens, Denver, CO

Thom Hanna is employed as District Manager for Johnson Screens, where he works in areas of well design, construction and development. He received his Bachelor of Science from Michigan State University and Master of Science from Western Michigan University. Before working for Johnson Screens he worked over 15 years as a hydrogeologist for several ground-water consulting firms including Hydrologic Consultants, Inc., Papadopoulos Associates, and Golder Associates. His experiences include hydrogeologic investigations, design and optimization of well efficiencies for mine dewatering and water supply investigations.

David Kill, P.E., Training Consultant, Xylem Goulds Water Technology, St. Paul MN

Mr. Kill is a Registered Professional Engineer and has a BS in Agricultural Engineering from the Univ. of Minnesota. He joined Johnson Screens in 1969 and became Regional Manager in 1974. In 1979 he joined the Fluid Systems Division UOP in the reverse osmosis water treatment business in San Diego, CA as 2002 Director of Marketing. He rejoined Johnson Screens in 1981 as Environmental Products Manager. In 1988, he founded Recovery Equipment Supply, a supplier of products for ground water monitoring and remediation. In 1996, he joined Goulds Pumps ITT and was promoted to Regional Commercial Business Manager in and Regional Market Development Manager in 2004. He was the 2005 NGWA McElhiney Distinguished Lecturer and presented "Well Efficiency Is Not a Myth" to over 20 water well contractor conventions.

Kevin McGinnis, President, Cotey Chemical Corporation, Lubbock TX

Mr. McGinnis graduated from Texas Tech Univ. in 1984 with a BA degree. He has worked in the water well remediation industry for 20 years. He has delivered technical papers to Saudi Arabia's Ministry of Agriculture and Water in Riyadh, and to the Philippine Water Works Assoc. In addition to his experiences in the U.S., Mr. McGinnis has supervised water well rehabilitation projects in several states of the Middle East, Far East and Latin America.

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

Andrew Stone has over thirty five years of ground water experience in Africa and the United States as a university professor, ground water consultant and ground water advocate & educator. He has first-hand experience of ground water exploration, well design and source protection in a wide variety of geologic environments. As the director of the AGWT's education programs he has convened and coordinated over one hundred and fifty conference programs related to ground source heating and cooling technology, well design, ground water management, aquifer storage recovery, conjunctive use, water banking, and asset management. From 1990 to 2002, as adjunct professor, he taught an annual course on Ground Water Protection Policy in the Masters Degree Program at Antioch New England Graduate School. He is the Director of the *International Association of Hydrogeologists' Commission on Groundwater for Decision Makers*.

Tanner Tryon, General Manager, Hose Solutions, Inc., Scottsdale AZ

Tanner Tryon received his bachelors in engineering at Arizona State University and his Masters in Business Administration from the University of Wisconsin. Tanner is the lead technical assistant for installations involving Flexible Drop Pipe. He frequently works on site to tackle specific problems and provide assistance at installations. He also shares his experiences at conferences all over the US with several organizations including the NGWA, AGWT, and several state organizations.

8:30 - 9:00

WELL & PUMP TECHNOLOGIES TO REDUCE COST AND MAXIMIZE GROUNDWATER POTENTIAL

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

- Groundwater industry technology
- One size does not fit all for well design, construction, operation or maintenance

Sponsors

9:00 – 10:00

WELL HYDRAULICS – THE BASICS

David Kill, P.E. Training Consultant, Xylem Goulds Water Technology, St. Paul, MN

- Definitions of the key hydraulic terms that are used in well efficiency calculations
- Explanations of the flow of water in aquifers towards wells
- Flow dynamics through rock fractures or screens into well bores and into pump intakes



10:00 -10 :45

ECONOMIC SIGNIFICANCE OF FLEXIBLE DROP PIPE FOR WATER WELLS

Tanner Tryon, General Manager, Hose Solutions, Inc., Scottsdale, AZ

- Physical properties of flexible hose (strength and durability of hose)
- Hydraulic performance capabilities (elasticity, pressure thresholds)
- Pump installation and removal methods (connectors, reels, etc.)
- Cost savings for rapid "pump-in, pump-out" during maintenance or rehabilitation
- Case studies of public water systems



10:45 – 11:00

BREAK

11:00 – 12:15

METHODS FOR IMPROVING WELL PERFORMANCE (Part 1)

Jim Bailey, National Well Services Director, Shannon & Wilson, Seattle, WA

- A practical approach to managing wells as an asset
- Why rehabilitate - Well inspection technology
- Key well performance indicators
- Prioritizing well condition factors
- How to decide on treatment options



12:15 -1:15

LUNCH

1:15 – 2:00

METHODS FOR IMPROVING WELL PERFORMANCE (Part 2)

- Theory behind particle movement during well development
- Simulations of well-aquifer / aquifer-well flow dynamics during rehabilitation



2:00 – 3:00

WELL PERFORMANCE SOLUTIONS

Kevin McGinnis, President, Cotey Chemical Corporation, Lubbock, TX

- Typical problems (mineral and biological blockage) that reduce well bore inflow
- 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



3:00 – 3:15

BREAK

3:15 – 4:15

WHY WELL CHLORINATION IS NOT WHAT YOU THINK

Kevin McGinnis, President, Cotey Chemical Corporation, Lubbock, TX

- Why chlorination fails
- When to chlorinate and when not to
- How to get the most out of your disinfection process
- Discussion of the different disinfection chemistries



4:15 – 5:00

SELECTION AND MAINTENANCE OF PUMPS

David Kill, P.E. Training Consultant, Xylem Goulds Water Technology, St. Paul, MN

- How pumps work – evolution of the US pump market
- Energy consumed by pumps
- Pump efficiency principles, horsepower and bowl assembly selection criteria
- Pump efficiency testing, identifying the weak link in your system
- Merits of submersible vs. line-shaft for high yield wells



Preferred Pump

5:00 – 6:00

NETWORKING RECEPTION



The American Ground Water Trust is a national, non-profit public education organization that has been providing groundwater information, awareness and education since 1986.

AGWT programs:

- Ⓢ Promote efficient and effective ground water management
- Ⓢ Communicate the environmental and economic value of ground water
- Ⓢ Showcase ground water science and technology solutions
- Ⓢ Increase citizen, community and decision-maker awareness
- Ⓢ Facilitate stakeholder participation in water resource decisions



8:30 – 10:00

ALASKA and ANCHORAGE - WELLS & GROUNDWATER

Presenters invited to participate include:

- Wayne Westerberg, M-W Drilling, Inc., Anchorage, AK – Well design and construction challenges in Alaska
- Melissa Hill, Alaska Department of Natural Resources, Anchorage, AK – Alaska Hydrological Survey groundwater projects
- Stafford Glashan, Shannon & Wilson, Anchorage, AK – Modeling of the Anchorage Regional Aquifer
- Presenter from Alaska Water & Wastewater Utility, Anchorage, AK – Importance of groundwater as a supply source

10:00 – 10:45

PUMP CONTROLS / WELL YIELD/ COST BENEFITS

David Kill, P.E. Training Consultant, Xylem Goulds Water Technology, St. Paul, MN

- VFD technology
- Case studies of installation and O & M costs for different types of pump
- Pump replacement criteria, \$ return on upgrading motor or bowls
- Information needed for deciding on pump specification for high-yield applications

10:45 – 11:00 BREAK

11:00 – 11:45

HYDROGEOLOGIC LOGGING OF CUTTINGS FOR WATER WELLS

Thom Hanna, Hydrogeologist, Johnson Screens, Denver, CO

- Sample Collection
- Sample description
- Using the hydrologic Classification System for Water Well Boreholes

11:45 – 12:45

WATER WELL DESIGN FOR EXTENDED WELL LIFE AND REDUCED MAINTENANCE

Thom Hanna, Hydrogeologist, Johnson Screens, Denver, CO

- Design basics for water wells
- Selection of casing type and depth of installation
- Selection of filter Pack
- Selection of Screen materials and Slot Size
- The need for, and the methods of well development

12:45 – 1:45 LUNCH

1:45 – 2:15

CONFLUENCE LAKE WELL DESIGN AND EFFICIENCY EVALUATION – PUTTING IT ALL TOGETHER

Thom Hanna, Hydrogeologist, Johnson Screens, Denver, CO

- Data Collection
- Well Design
- Evaluation of Well Efficiency

2:15 - 2:45

DESIGN OF INFILTRATION GALLERY – GREENS CREEK MINE ALASKA

Thom Hanna, Hydrogeologist, Johnson Screens, Denver, CO

- Site Geology
- Design of infiltration Gallery
- Construction of Infiltration Gallery

2:45 – 3:00 BREAK

3:00 – 4:00

PROPERLY CONDUCTING PUMPING TESTS ON WATER WELLS

David Kill, P.E. Training Consultant, Xylem Goulds Water Technology, St. Paul, MN

- What can controlled tests show about the aquifer?
- How to decide on test pumping rates and test duration
- What should be measured?
- Instruments and equipment for cost-effective data collection
- Tests with pumping well data only
- Interpreting yield, drawdown and water level recovery data
- Making use of test results for water well operation

4:00

WRAP-UP, COMPLETE EVALUATIONS AND ADJOURN

CONTINUING EDUCATION

Alaska Water Operators

Core CEUs

Day 1 – 0.7

Day 2 – 0.6

Both days – 1.3

Approved by Alaska Department of Environmental Conservation, Operator Training and Certification Program

Certificate of Attendance will be provided by AGWT (post event) to those attendees who sign-in and sign-out. These certificates may be used by attendees to obtain continuing education credit from professional organizations or licensing agencies.

"Best workshop program I have been to in years"

"It is great how you organize the program to flow so smoothly"

"Thank you for a well balanced discussion of the issues"

"This must be the best value event on this topic"

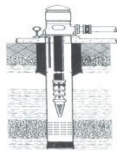
"I had more good contacts at my exhibit table than I usually get at a trade show!"



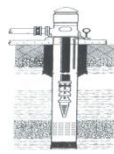
"Content Great! Networking Awesome!"

**To register: call 800 423 7748 (between 9 and 5 (eastern time))
or mail or e-mail or fax or pay on-line registration at www.agwt.org/events**

Technical program for water end-users and professionals involved with water issues, groundwater, water wells and water supply



Education Program from:
American Ground Water Trust
 50 Pleasant Street (Suite 2)
 Concord, NH 03301



GROUNDWATER WATER WELLS & PUMPS

“More Water – Less Cost” [October 9-10 – Anchorage]

Recognize the value of groundwater and water well services in Alaska

Workshop on design, construction, operation, rehabilitation & maintenance

University of Alaska Anchorage Student Union

3211 Providence Drive, Anchorage, AK 99508

~~ WELLS & PUMPS ~ THE VITAL LINKS THAT CONNECT RESOURCE AND CUSTOMER ~~

\$ Increase well yields ~ it is all about design & maintenance and operation

\$ Save on operation costs ~ how your pump impacts well performance

\$ Reduce energy costs ~ it is all about well & pump efficiency

\$ Time to fix your well? ~ how to decide what to do and when

\$ Technology ~ are you up to speed with VFD for pumps?

REGISTRATION – WELL & PUMP WORKSHOP – ANCHORAGE 2013

Registration includes: access to exhibits, reception, handouts, breaks and lunch(s)

Call us if your company/ organization wants to be an event sponsor (800 423 7748)

YOU MUST CHECK ONE: →

General Workshop Registration

American Ground Water Trust Member

Government Employee (Municipal, County, State, Federal)

Official Representatives of 501(c)(3) non-profit organizations

Full-Time Student (ID required at Registration)

CD - (Presentation information from speakers mailed post-event)

Exhibit Table (You must also register to attend.)

Check [payable to: American Ground Water Trust]

AMEX Visa MasterCard PO

Credit Card or PO No. _____ Expiration _____

Cardholder Name _____

Registration Name _____

Title/Position _____

Company/ Organization _____

Address _____

City _____ State _____ Zip _____

Phone _____ E-Mail _____

Two Day

One Day

Oct 9 & Oct 10

Oct 9 or Oct 10

or

\$320

\$190

\$270

\$160

\$270

\$160

\$270

\$160

\$140

\$80

\$20

\$300

Total for all checked boxes \$

Mail: AGWT, 50 Pleasant Street,
Concord, NH 03301

Fax: (603) 228-6557

Call : (800) 423-7748

On line: <http://www.agwt.org/events>

SPONSORSHIP & EXHIBITS

Showcase *company achievements, expertise,*
projects, products & services
 Call 800 423-7748 or visit web-site

CANCELLATION POLICY

See website
 (<http://www.agwt.org/events>)