

THE WATER SOURCE

NEWSLETTER

FROM THE Water Quality Management Dept at Red Rocks Community College

Welcome to another edition of the *Water Source*.

The Water Quality Management Technology program has been busy with some very significant development and growth plans. Last summer we began a unique partnership with the Colorado Department of Public Health and Environment – Water Quality Control Division to address a significant training need that exists within our industry. Water distribution system operations create the highest number of public health primary drinking water violations. For this reason,

an extensive development effort is underway to provide detailed higher education for distribution system technicians.

Another development that I wish to share is the merging of the Energy and Environmental Technology department with the Rocky Mountain Education Center – OSHA institute at Red Rocks Community College.

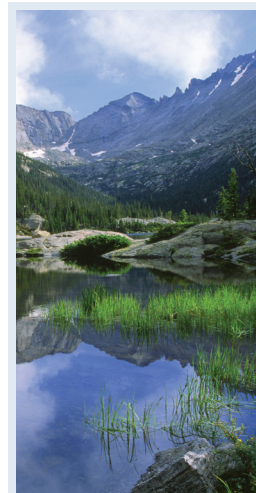
Joan Smith, the Dean of the department has taken over the management of the Center.

This merger creates many new

exiting pathways and educational opportunities for our students.

2009 was an incredible year for the Water Quality Management program as we saw double digit growth, digitized program instruction, and we established online training courses for our remote

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Merger Expands Curriculum at RRCC

It gives us great pleasure to present Joan Smith, the new Director of the Rocky Mountain Education Center (RMEC) – OSHA Training Institute and the Dean of the Energy and Environmental Technology (EET) Department at Red Rocks Community College.

Joan is an accomplished veteran at Red Rocks. Her roots began with the Funding and Grants Department, and her energy and experience has guided and developed the Industrial Science and Operations Department now known as Energy and Environmental Technology which includes Water Quality Management, Renewable Energy, Process Technology, Wind Technology and Construction Technology.



Joan Smith, Director/Dean of RMEC and EET

Joan was selected by the College President, Michele Haney, and has accepted her new responsibility under the condition that the EET program travel with her.

Joan's appointment demonstrates her developmental skills as these two departments form a very beneficial opportunity to not only the college and its students, but to general industry as well. Merging these two departments allows program coordinators to develop training that raises the level of education and allows for Short School training

programs to be used as Credit for Prior Learning into the existing degree programs. It also allows the RMEC-OSHA to expand by sharing the expertise from the existing departments into the World Wide curriculum offerings within RMEC-OSHA.

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industry partners. Beginning Spring 2010, WQM 100 – Introduction to Water Quality Management will be offered online thanks to our online program coordinator, Susan Nachtrieb, one of our newest adjunct faculty members. We are excited to introduce this technical expansion using the D2L training system.

Red Rocks is working with our area's public transportation system (RTD) as the college will become a stop for its new West Corridor Light Rail network. Because of all these developments, the Environmental Training Center is also in the engineering

and surveying stages for a facility expansion.

Finally, we have expanded our on-site training schedule and availability by employing Jerry Biberstine, the retired Director of the CDPHE-Water Quality Control Division. During the Fall semester, courses (both specialized and accredited) were provided at Denver Water, Arapahoe County Water and Wastewater Authority, and Centennial Water and Highlands Ranch Wastewater District. These courses were offered to provide Training Units (TUs) and education for higher level certification for the employees in these districts. With Jerry's

assistance, we now have the staff to expand our on-site program dedicated specifically to our employed industry operators and technicians.

As always, we are pleased to provide the training needs our industry requires to not only meet our regulatory requirements but to give you--the industry--quality trained operators. We will continue to strive for development keeping you, the public, and the environment in the forefront of our strategies.

Mike Smith

Water Quality Program Coordinator
Industrial Science and Operations
Red Rocks Community College

Research Corner

PROJECT BOLIVIA – Update

Since December 2009, The Water Quality Management Department and the Engineering Graphics Department at Red Rocks Community College has been working side by side for nearly a year with a student intern to aid with the development of CAD drawings for the manufacturing of the treatment equipment needed for Hardeman, Bolivia. Hardeman is the first of 24 communities to be provided with a unique treatment and communal assistance project.

The CAD drawings were then approved and forwarded to the College's 3D printer which manufactured a display model for fundraising and student interest. The model was built to a 1/10 scale for detail demonstration and thus only 1/3 of the actual system was constructed. This model is currently on display in the library at Red Rocks along with a detailed system description of it's

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Display Model of Bolivia Project



Project Timeline of Bolivia Project



Partnership Provides Future Training Opportunities

During the Fall 2009 semester, Arapahoe County Water And Wastewater Authority (ACWWA) and Red Rocks Community College began a journey together. Under the direction of Barbara Townsley, Human Resources Manager of ACWWA, the Water Quality Management Technology (WQM) Department began an in-house teaching program in both accredited and non-accredited format directly to its staff members. This has also been done with other districts such as Denver Water, Centennial Water, and Highlands Ranch Reclamation District. ACWWA, however, took this program to a new level by providing its staff members with training to prepare them for the future.

ACWWA's system should be watched as a developmental model. Last year, the Authority along with Inverness Water and Sanitation District, built a state-of-the art wastewater treatment plant—Lone Tree Creek Water Reuse Facility, which utilizes microbiology to reduce the need for chemicals and energy hungry mechanical equipment. The water provided by this plant is some of the purest in the industry.

Through a joint venture with Cottonwood Water and Sanitation District and ACWWA, a reverse osmosis plant is being constructed, and is scheduled to begin use this spring/summer. The new plant increases the use of surface water

from Cherry Creek by treating reused water with reverse osmosis—the same purification process commonly used for bottled water, filtering out even the smallest contaminants.

Lastly and most recently, ACWWA just announced the ACWWA Flow project. The Authority closed on \$153 million in bonds in December 2009, resulting in an annual average delivery of 4,400 acre-feet of fully consumable water rights from the South Platte River upon completion in 2012. Due to ACWWA Flow, the Authority will have enough renewable water to meet the needs of current and future residents through build-out.

Due to this internal development, additional training was needed for ACWWA staff and Red Rocks was the facility of choice. Planning for the future is the rule in the Authority's daily operations and ACWWA aims to have the best trained operators available to sustain growth and development.

Additional training programs are scheduled for the next semester as well as providing internship opportunities for existing students within the WQM program. It is our pleasure to share this model with our industry and to present this partnership to you. Red Rocks has enjoyed working with ACWWA, and we look forward to a long, prosperous developmental journey together.

Distribution Training Program

Acting on the results from a detailed Cause and Affect report related to Primary Drinking Water Regulation violations, the Colorado Department of Public Health and Environment—Water

Quality Control Division contacted Red Rocks Community College to form a joint training partnership to aid and correct this concern.

A research trip was scheduled to Des Moines, Iowa where an existing training system was evaluated. Once reviewed, several modifications were developed to improve the training facility concept. After months of planning, we are now extremely pleased to announce our plans.



Water Treatment Plant Distribution Pumping System

Beginning Spring 2010, our existing WQM 109 Water Distribution Class has been modified and will be scheduled every Fall and Spring semesters. The class is very specific and focuses on the operational areas that create public health concerns. Because of the severity of these concerns, the WQM program and the Environmental Training Center

(ETC) will need to see an expansion. This will be a phased development, but for now, our efforts will be focused on the training program itself.

The students scheduled for the Spring 2010 class will actually participate with the class's development by assisting with instructional equipment assembly. This will be a very unique opportunity for these students and many

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Training Units, Certificates and Degrees

Did you know that every Water Quality Management accredited course is automatically Training Unit approved?

We have worked hard with the Colorado Plant Operators Certification Board to establish a strong educational relationship.

Each course is approved by "10 hour" increments for Training Units with material in all categories. Look for this announcement on the OCPO Web site.

What are Certificates?

The Water Quality Management Program has developed 8 different Certificate programs in addition to our existing AAS degree. These certificates, when completed, represent specific areas of interest/study to help an operator build his/her portfolio. Certificates are offered for the following categories:

- Introduction to Water Treatment
- Introduction to Wastewater Treatment
- Water Distribution and Collection
- Water Quality Analysis
- Treatment Mathematics
- Experience and Education
- Wastewater Treatment Operator Certification (D-A)
- Water Treatment Operator Certification (D-A)

Did you forget something?

We have many files of past students who did not complete their degree. Amazingly, many of these students already have enough courses and experience to earn the degree and don't know it. If you have been a past student who never completed the degree program, give us a call; you may be a lot closer than you think.

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educational benefits will be enjoyed by these students. Per the report, specific areas of study need to be stressed, hence visual teaching tools will prove to be the most effective means of successful education. Along with a digitized curriculum, the following will also be assembled that will become permanent fixtures at the ETC:

- A township model will be used for instruction in proper sampling protocol and flushing and tank cleaning techniques.
- An above ground vault that provides egress and regress instruction that includes a full meter, check and by-pass assembly with an air release valve.
- An above ground pipe display that will be fully charged for tapping and assembly demonstrations.
- A leak field that students can practice using new leak detection equipment.

Future displays will include a full scale pipe and bedding assembly that includes a service tap and fire hydrant assembly along with proper thrust



New Water Main Installation

blocks, trenching and shoring equipment, and a flow study program that is being developed with the Colorado State University.

We are very proud to be a part of this tremendous training opportunity that is very specific to the distribution system operators and technicians that will significantly aid the CDPHE-WQCD with reduced public health violations. In addition, this class will be the next class to be developed into our online program to aid our remote or distant communities with this training opportunity.

Many utilities have already aided us by donating piping, appurtances and equipment needed to provide the industry with a unique program. A very good example of how our industry works as a family and those in need of help can rely on help from those who have.

We are still very interested in receiving more supplies; if you have equipment, both old and new that we can use to demonstrate existing operational problems and today's techniques please email mike.smith@rrcc.edu.

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typical operation as well as a display of the project's timeline explaining the research that was necessary for it's development, including the health study, environmental impact study, chemical investigation and the sustainability study.

During the Summer of 2009, following word of the projects development, the people of Hardeman changed their hygiene practices thinking that the development alone improved the water quality and thus stopped visiting the dentist and doctor's office with

related health effects from the Fluoride contaminated water supply. Red Rocks and the local Center De Salud created a system where free toothpaste was given to patients who visited the office along with training on its use. This was a quick fix to a serious research problem and data ceased but the problem remained. Following this incentive, the people responded by returning to the Dentist's office and data was again flowing back to RRCC.

The next phase of this project is the manufacturing

followed by the shipment and installation of the first of 24 treatment systems. This will be scheduled through study abroad internships for approved and qualified Water Quality Management students. We will keep our readers current with our development and schedule.

If you have an assessment or research project that you would like our program to assist you with, please share that information with us as we would be happy to help. For more information, email us at mike.smith@rrcc.edu.

Hirundo Porphyrionota...

...that is, Cliff Swallows in English. These small, fearless birds measure about 5 or 6 inches long. To watch these amazing little aero dynamic creatures in flight is like watching streamlined mini jets gracefully darting up and down at high speeds. Just when you're sure one is going to nail you square in the forehead it swoops up and over with amazing precision.

I recently ended an internship with the Englewood/ Littleton Wastewater Facility. I spent two years in the classroom learning all about water quality management, and I heard many stories about the midges. My classmates, the operators and supervisors who work in the industry, tell about the massive clouds and swarms of midge flies that funnel to the sky. On my "field trips" to various waste water facilities I saw them with my own eyes. Yuck! When I got to the Englewood facility to do my internship, however, I noticed that there weren't any. This summer has been particularly wet so I thought that the bugs would be phenomenal.



Photos courtesy of Littleton/Englewood Wastewater facility

With the rain comes standing water and with that comes mud. Together, mud, bugs, and with the altitude of the Nitrifying Trickling Filters form a perfect recipe for cliff swallows.

Cliff Swallows, continued on page 7



Important RRCC Dates

Spring Semester begins.....	January 19, 2010
Spring Break.....	March 29–April 4, 2010
Registration begins for Summer 2010 Semester	April 5, 2010
Registration begins for Fall 2010 Semester	April 5, 2010
Spring Semester ends	May 11, 2010
Spring 2010 Graduation Ceremony	May 15, 2010
Summer (8 week) Semester begins	June 1, 2010
Summer 2010 Semester ends	August 2, 2010
Fall 2010 Semester begins	August 23, 2010

Cliff Swallows, continued from page 6

The cliff swallows make their little mud homes high above the ground. They live in colonies of about 100 pairs or more. The swallows gobble the pesky bugs by the masses. Both mom and dad incubate the eggs, which takes about 12 to 16 days. A pair of swallows can find its own young in the creche by voice recognition. The chicks are then taken care of for about 25 days, after that they leave the colony; they winter in South America.

Cliff swallows are protected too. In the U.S. the swallows are classified as migratory insectivorous birds under the Migratory Bird Treaty Act of 1918. Destroying nests or disturbing them in any way requires a permit through US Fish and Wildlife Service.

Many companies lately claim to be "green" or going green. This however is the perfect scenario of man coexisting with nature. At the

de-chlorination basins, the wastewater facility is plagued with midge flies that swarm into the mouth, buzzing in the ears, flying up the nose (in fact, I swallowed one while I was there). Then the swallows move in, build nests, and wipe out the problem. The colony of nests is high up under the NTFs, not in anybody's way. The bird droppings are generally not visible and, when the swallows are gone, can be washed away with one of the facility's fire hoses.

Having cliff swallows take care of the midge problem is a good idea for any wastewater facility. There is no pesticide involved, nothing to contaminate the water, just old fashioned nature at work. Perhaps more companies can look to coexisting with nature for their operational needs.

Diana Navarro
WQM Graduate

Test Your Skills

Take a crack at these questions to test your knowledge and skills.

(Answers will be published in our Fall 2010 edition)

Water

1. What compound is typically found lining distribution piping?
2. What can be used to remove Arsenic?
3. How many gallons of water is needed to backwash a filter that is 20 ft X 20 ft with a rise of 1.5 ft/min for 8 minutes?
4. What backflow prevention device is best used for a fire line within a commercial facility?
5. What is the repeat sampling protocol for a TC positive result?

Wastewater

1. How often should solids be removed from a wastewater lagoon?
2. What is the best way to control high Ammonia levels in an A/S system?
3. What is F/M?
4. What is the state's desired Nitrate concentration of a discharge into receiving waters?
5. Why is backup power so important with a A/S system?

Answers from previous edition:

Water

1. Slip and Fall protection
2. Advanced Warning Zone
3. 5 ft/sec
4. Oil and water mixed within a motor
5. 97 WWHP

Wastewater

1. Illegal connections
2. 200-450 mg/l
3. Rotifers
4. 83%
5. Ultra Violet Light

WQM Schedule at A Glance

Spring 2010 Schedule

WQM 100 Introduction to Water Quality Management	M	6:00PM-8:45PM
WQM 100 Introduction to Water Quality Management	T	6:00PM-8:45PM
WQM 100 Introduction to Water Quality Management	ONLINE	
WQM 109 Water Distribution Systems	M	6:00 PM-8:45PM
WQM 121 Environmental Sampling and Volume Measurement	W	6:00PM-8:45PM
WQM 122 Instrumentation and Electrical Control Systems	T	6:00PM-8:45PM
WQM 124 C and D Review for Water Treatment	W	6:00PM - 8:45PM
WQM 124 C and D Review for Water Treatment	R	6:00PM - 8:45PM
WQM 126 Safety and Security Systems	R	6:00PM - 8:45PM
WQM 175 (160) Source Water Management	R	6:00PM - 8:45PM
WQM 177 (169) International Development Systems	M	6:00PM - 8:45PM
WQM 200 Hydraulics	W	6:00PM - 9:20PM
WQM 200 Hydraulics	F	6:00PM - 9:20PM
WQM 206 Design Interpretations	T	6:00PM - 9:20PM
WQM 216 Biological and Bacteriological Water Analysis	T/R	6:00PM - 7:45PM
WQM 217 Disinfection Systems	M	6:00PM - 9:20PM

Summer 2010 Schedule

- WQM 280 Internships
- WQM 285 Independent Study

Fall 2010 Schedule

WQM 100 Introduction to Water Quality	M	6:00PM-8:45PM
WQM 100 Introduction to Water Quality	T	6:00PM-8:45PM
WQM 100 Introduction to Water Quality	ONLINE	
WQM 105 Specific Calculations	M	6:00PM-9:20PM
WQM 105 Specific Calculations	R	6:00PM-9:20PM
WQM 109 Water Distribution Systems	R	6:00PM-8:45PM
WQM 109 Water Distribution Systems	ONLINE	
WQM 118 Wastewater Collection Systems	F	6:00PM-8:45PM
WQM 119 Basic Water Quality Analyses	T/R	6:00PM-7:45PM
WQM 120 Water Quality Equipment Maintenance	M	6:00PM-9:20PM
WQM 125 Wastewater Cert Review for C&D	W	6:00PM-8:45PM
WQM 150 Troubleshooting in Water Quality	W	6:00PM-8:45PM
WQM 175 Water Reuse Systems	R	6:00PM-8:45PM
WQM 176 Water Law	W	6:00PM-8:45PM
WQM 177 International Development	R	6:00PM-8:45PM
WQM 212 Drinking Water Regulations	W	6:00PM-9:20PM
WQM 216 Bio/Bact Water Analysis	T/R	6:00PM-7:45PM
WQM 217 Disinfection Systems	M	6:00PM-9:20PM
WQM 280 Internships		
WQM 285 Independent Study		

