The Town of Hanover, NH owns and operates a 2.3 MGD activated sludge facility located at 121 South Main Street (entrance at Pine Knolls Cemetery), Hanover. The facility serves the Town of Hanover and a portion of the City of Lebanon.

Starting in 2003, the Town embarked on a series of upgrades at the WRF, including the addition of anaerobic selectors to both aeration trains, conversion of the disinfection system from UV to chlorination/dechlorination, construction of a new effluent outfall pipe, construction of a new third secondary clarifier, and replacement of the plant’s aeration diffusers and installation of new turbo-style aeration blowers. This work was completed over the course of eight years as six separate construction projects and the Town hosted the NHWPCA’s Winter Meeting in December 2010 to showcase those upgrades. At that time, design was underway for a major solids handling upgrade with the concept being that a second NHWPCA meeting would be held once those upgrades were completed.

As promised, the Town of Hanover has graciously offered to host the 2015 NHWPCA Fall Meeting on October 8 to showcase the WRF Improvements Project which was completed in 2013. The latest upgrades consist of a new Duperon mechanical fine screen and washpactor, new grit pump, new primary sludge pumps and grinders, new RAS/WAS/TWAS pumps, new plant water system, new polymer makeup and centrifuge dewatering, and a complete rehabilitation of the plant’s anaerobic sludge digestion system including new heat exchangers, new fixed and flexible membrane gas storage covers, new methane gas boiler, and new waste gas burner/flare.

Following these upgrades, Hanover has been able to fully heat the anaerobic digesters via burning of the methane gas produced as well as provide a portion of the Administration/Operations building heat during the shoulder seasons.

Underwood Engineers will be assisting the Town with tours of the facility and upgrades on the morning of October 8, as well as providing a presentation on the upgrades at the meeting to be held at the Fireside Inn in Lebanon, NH.
Editor’s Words

As is pretty typical in this field, I’m the sole female here at the Somersworth WWTP. This past weekend I went to an event with a totally different ratio. At my Girl Scout Service Team retreat there were 60+ ladies and 3 men. I felt a little bad for them because there were no flush toilets for the men. Yeah, there were plenty of latrines scattered around and they were clean but it was definitely worth the uphill walk to use the flush toilets! It’s camping in luxury when there’s flush toilets available. There wasn’t any hot water in the bathhouse, but you can’t have everything. So, I got to make lots of new friends over the weekend, including the three guys. We had lots in common as Girl Scout volunteers just like I have lots in common with all the other wastewater treatment professionals that I meet, male or female. As part of the weekend we learned some new skills about the best way to ask others to volunteer. The elevator speech that I wrote was on a Girl Scout volunteering topic, but I’m going to use what I learned to write one up on the topic of getting more volunteers for the newsletter. Be warned – Girl Scout skills are awesome and I’m going to be using them on YOU!

Stephanie, Somersworth WWTP

Special Thanks to this Issue’s Contributors
Dave Mercier, Laurie Perkins, Rick Cantu, Stephanie Rochefort, Sharon Rivard, Aaron Costa, Donna Hanscom, Gene Weeks and Charlie Tyler.

NEWSLETTER COMMITTEE
Stephanie Rochefort, Todd Gianotti, Mary Jane Meier, Steve Clifton, Gene Weeks, Kurt Robichaud, Ben Mosher & April Hyde. We welcome additional members. We are looking for meaningful articles for the Wastewater Operator in a timely fashion. Send submission articles for THE COLLECTOR to: Stephanie Rochefort via email at srochefort@somersworth.com.

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President’s Corner
By Peter Goodwin - 2015 NHWPCA President

2015 is certainly moving along at a rapid pace and there are many events occurring that are keeping my year as President exciting. Our Government Affairs Committee chairperson Shelagh Connolly put together another fantastic Washington DC Congressional Breakfast agenda which allowed us to spend time with all of our Washington Legislators and also attend several NACWA/WEF events that highlighted the “Value of Water”. Each of our Legislators were provided a “Water is Worth It” pint glass and most of them quickly put it to use. I have had the opportunity to travel to Washington for the NEWEA event for several years and each year I am reminded how important it is to continue to remind our Congressional delegation that the regulatory challenges and aging infrastructure need funding at increasing, not decreasing levels.

The Spring Trade Fair was successful again this year with a record number of vendors attending and several great technical sessions. I want to thank all of the vendors for their continued support at these events as they financially support our volunteer Association so that our membership costs can remain reasonable. We were also able to re-present the NEWEA Awards that were presented in January at the Annual Conference. If you remember “Snowmaggedon 2015” had a significant impact on New England in January and many attendees were not able to make the NEWEA Awards Banquet. We were also able to have NHDES Commissioner Tom Burack present the Poster Contest winners with their awards. I am a strong believer that this contest can be a catalyst for educating not only the children that participate, but also their families on the value and importance of Clean Water.

For those that were able to attend the Summer Meeting at El-lacoya State Park, there were certainly enough lobsters and steak for all of us to enjoy on an exceptionally sunny and warm day. Another sunny and warm day greeted a large contingent of NHWPCA golfers at Beaver Meadow Golf Course. Fred McNeill has been organizing this significantly successful fundraiser for many years and somehow always works with the golf gods to provide great weather, food and golf.

I want to thank Kevin MacLean for stepping up and getting the ball rolling on planning for our 50th Anniversary in 2017. Many of our past Presidents have also agreed to assist in the planning for this significant event. If you have any ideas or suggestions, please reach out to Kevin or myself. I look forward to seeing you at the Fall Meeting in Hanover and the Winter Meeting in Merrimack. Thanks for letting me serve you as President of NHWPCA in 2015.

Respectfully,
Peter Goodwin

Retiree Q&A

Roger Leo Descoteaux


2. Where he is retiring from and how many years with that employer - Merrimack WWTF 31+years

3. What he will miss most - The people I have worked with for the past 30 years, the science, chemistry and problem solving pretreatment issues.

Thomas J. Croteau


2. Where he is retiring from and how many years with that employer - Retiring from DES WWEB after 14 years (the other 22 years w/WRBP).

3. What will he most miss? - That’s a hard question. Maybe seeing familiar faces on a daily basis and being interactive with the group and the public at large.

4. What his coworkers will most miss - Not sure maybe my willingness to work with my co-workers and problem solving.

5. How is the retiree most looking forward to spending his time? - To spend more time with family and friends, relax, have fun, travel, hike, keep fit, work around the house, play sports, canoe, maybe kayak, maybe volunteer, maybe a part time job. I will not miss the daily commute to work and maybe sleep in till 7AM. Try some new activities, learn and etc. Hopefully, I will continue to find new challenges that will keep me stimulated.

3. What will he most miss? - Not being able to go see and talk to the go-to-guy for help or even advice.

(continued on page 6)
Blurbs, Blurbs & More Blurbs

A Call for Help! – as you have heard (hopefully) and will continue to be reminded, the NHWPCA will be celebrating 50 years of service to its members in 2017. The Board is looking for volunteers to help ensure 2017 is a successful and memorable year. That said, a special committee is being formed to assist in the planning and implementation for a special 50th anniversary event. If you are interested in helping or have ideas for incorporation into the celebration, please reach out to any Board member or existing committees and offer your input or willingness to help.

Thanks in advance – First Director, Kevin MacLean

New Hampshire’s Newest Wastewater Operators

Hats off and Congratulations to the following NH Wastewater Operators for passing the June 2015 exams!
Grade 1- Phillip Boisvert, Reece Boisvert, Benjamin Crowder, Nicholas Curreri, Aaron Gaylord, Scott Harris, Matthew Heath, Barry Morel, and Kelli Morris
Grade 2- Charlie Damour, Scott Harris, Stephen Scotton, David Sheehan, and Lee Tasker, Jr.
Grade 4- Robert Robinson

Note- Scott Harris took both the grade 1 & 2 exams and passed both!

October 20 & 21, 2015 Advanced Activated Sludge Process Control and Optimization, New Hampshire Audubon Center, Concord, NH.

DES is pleased to once again host two days of Advanced Activated Sludge Process Control and Optimization training to be instructed by Eric Wahlberg, P.E. and Ph.D., through his Fountain Valley, CA. company, WasteWater Technology Trainers. Eric has been recognized numerous times by the Water Environment Federation for his research and contributions to wastewater operations, process control and troubleshooting, and methods for improving clarifier performance.

This class will provide operators and engineers with a more in-depth understanding of the activated sludge process with the goal of reducing effluent quality variability and process energy usage. Topics include wastewater characterization, biological nutrient removal, the importance of sludge quality and how to measure and control it, BOD conversion vs. removal, WAS flow control, RAS flow optimization, secondary clarifier performance diagnostic testing and state point analysis.

The class will be held at the Susan N. McLane Audubon Center in Concord, NH. The nearby Bow Hampton Inn is offering a group rate of $88 per night for those needing overnight accommodations. Registration costs $120 and includes lunch.

Registration deadline is September 28, 2015. Attendance is limited.

This class would not be possible without the generosity of these sponsors: Underwood Engineers, Utility Partners, David F. Sullivan and Associates, Environmental Operating Solutions, Inc., Hach, Evoqua, NHWPCA and NHDES.

For more information go to www.nhwPCA.org or contact Wes Ripple at Wesley.ripple@des.nh.gov or Mary Jane Meier at Maryjane.meier@des.nh.gov.

Fresh-Baked Cookies! - Chocolate chip! Double chocolate! Oatmeal raisin! White Chocolate Macadamia! The café at NHDES has AWESOME cookies, baked fresh every day. If you’ve been debating joining the newsletter committee, this might just be the deciding factor. We meet quarterly at the NHDES complex, on a weekday usually at 1 p.m. That’s a perfect time for a cookie or two. At our last meeting, the chocolate chips in the chocolate chip cookies were still warm and melty. Yum. Our meetings are pretty laid-back as we brain-storm ideas for the next edition of The Collector. It doesn’t matter if you don’t think you can write – there’s other tasks that go into publishing the newsletter. Please please please consider joining an awesome, rewarding committee – we need a few more members! Contact Stephanie – by email srochefort@somersworth.com or by phone 692-2418 or just talk to me when you see me – my picture’s in the front of this newsletter so you all know what I look like!

Trivia Question

Where and when was the first municipal WWTP built in New Hampshire?

Perhaps you work there now, used to work there or maybe even live in that community. The newsletter committee is hoping to have somebody come forward with the answer to this question. There may or may not be a prize for the right answer but there certainly will be recognition for the right answer, unless you want to remain anonymous. Please get in touch with Stephanie at srochefort@somersworth.com.
Sustainable Collection Systems Management

Adopt a Plan

Laurie L. Perkins, PE, Senior Associate, Wright-Pierce

The wide range of collection system issues facing operators and facility owners is placing more demand on communities from a time and effort perspective, training perspective and budget perspective. As a result, many owners are recognizing the importance of and are focused on adopting a long-term approach to managing their collection system infrastructure to ensure consistency and secure adequate funding. Two examples of NHWPCA communities that are working toward a sustainable management approach include the DES Winnipesaukee River Basin Program (WRBP) and the Town of Durham, NH.

Some key components to developing a sustainable collection systems management plan include:

1. Gathering available system data – compile existing record drawings, maps, photos and reports into an electronic format using MS Access databases and a geographical information system (GIS).
2. Performing a gap analysis – determine what data is missing and develop a plan to obtain needed resources and field collect important character data (location, size, material, etc.).
3. Assigning unique identification numbers to pipes, manholes and other key collection system assets.
4. Documenting the condition and criticality of your collection system assets – using tools such as the National Association of Sewer Service Companies (NASSCO’s) Pipeline and Manhole Assessment and Certification Programs (P/MACP). These programs are an industry standard and offer a consistent approach to field inspections and evaluation of asset deterioration. The advantage to using this standard is that it removes some of the objectivity from determining what should get fixed now and what can wait until later.
5. Updating databases and a GIS to create comprehensive data storage, mapping and analytical tools.

It is common for owners to question where to even begin performing an assessment of their collection system. Developing and implementing an overall inspection or condition assessment program primarily depends on the size of the system (linear feet of pipe, number of manholes), its existing condition and available funding. One approach is to begin by inspecting known problem areas first, followed by a goal to inspect 10-20% of the system per year until the entire system has been assessed initially. Once the approach is established, owners can review existing resources (staffing, equipment and training) and evaluate the need for additional resources specific to their system and funding opportunities.

The importance of developing a collection systems management plan is that it positions owners and the communities they serve to be better prepared to:

- Reduce infiltration and inflow cost effectively
- Eliminate sewer system overflows
- Comply with Capacity Management Operation and Maintenance (CMOM) requirements
- Manage risk by understanding pipe condition, predicting deterioration rates and preventing failure
- Prioritize and maximize staff time and effort on demanding collection systems needs
- Provide consistency in evaluations from inspection to inspection
- Schedule appropriate follow-up inspections or cleaning, and
- Identify and implement appropriate repair, rehabilitation and replacement alternatives

Sustaining the plan may require assigned staff to be trained in performing condition assessments (PACP/MACP), using specialized field data collection equipment, and on design/installation standards for current repair, rehabilitation and replacement techniques. Equipment or software purchased by owners such as closed-circuit television (CCTV) inspection trucks or manhole pole cameras will likely require routine maintenance and should be included as part of the plan. Additionally, sustainable planning is most successful when work assignments, procedures, schedules and performance goals are clearly defined within the organization.

A sustainable collection system management approach benefits owners by providing timely allocation of resources and funding needed for system improvements – consider adopting a plan for your system too.

Laurie Perkins has over 20 years of experience in collection systems and is a certified NASSCO instructor. Please contact Laurie at Wright-Pierce (laurie.perkins@wright-pierce.com or 603.606.4430) if you have any collection system questions or are interested in the certification programs for condition assessments, inspection of pipe and manhole lining methods or would like to talk about a strategy for how your community could begin to develop a collection system management plan.
If you have been in this business long enough, you have most likely had at least one incident that was a safety near miss. These situations are normally not reported and the only value is that the operator will (hopefully) not make the same mistake again. The purpose of this article is to share with you a NEAR MISS in the hope that, by passing this story along, it will someday prevent readers from having an accident.

GLASSWARE GAFFS

Laboratory analyses are a necessity at every wastewater treatment plant. If you have any type of lab onsite, then you have glassware. BOD bottles, flasks, pipettes, desiccators, beakers, etc. are all part of the environmental arsenal used to quantify pollution. Who would think that a laboratory could be every bit as dangerous as a trench, a confined space, or even the top rung of a 20-foot ladder? Indeed, labs do have their fair share of accidents. Broken glass is just one of many lab hazards.

The Situation

The operator at a small plant chips the cover on the desiccator. Tightly strapped for cash, replacing the damaged desiccator at upwards of $500 was a large portion of the yearly maintenance budget of only a few thousand dollars. So, the operator spun the desiccator around and continued to open and close the cover from the good side of the unit. An unwary coworker didn’t know the break existed, and picked up the desiccator with the intention of putting it on another shelf. The broken edge cut deep into his hand. Blood gushed everywhere and a trip to the emergency room was required. Many stitches later, the employee had loss time to avoid infection because he worked at a treatment plant. The hand will most likely heal right and, luckily, no tendon was impacted. Future aggravation might come in the form of loss of use and pain similar to carpal tunnel syndrome.

Another operator broke off the tip of a pipette. Busy with his task, he set the broken pipette off to the side on his desk for eventual disposal, but paperwork partially covered the pipette and it was forgotten. It sat on the desk for a few weeks until the operator was sitting at the desk and reached over to open the filing cabinet drawer. His forearm brushed up against the pipette, forced the pipette to the back of the desk, where it lodged against the wall and cut his forearm. This all happened in a few seconds. Again, a trip to the emergency room was needed and the cut was deep enough to require six stitches!

Lesson Learned

Broken glass is inevitable, but the choice of whether or not to dispose of it properly and immediately is yours. We’ve all heard, “If you smoke, your chances of getting cancer increase significantly.” Remember - if you keep broken glassware, your chances of getting cut increase significantly.

Please be safe everyone!

To help get the word out about your NEAR MISS and keep others safe, please send your NEAR MISS stories to Patty Pasariello (passariellop@wseinc.com or 978-532-1900). All reports are confidential.
More and more treatment plants are now finding themselves having to analyze for total phosphorus. Recently a next-door neighbor treatment plant contacted me with a question about ortho vs. total phosphorus. New Hampshire is a small state. I consider any treatment plant in New Hampshire a next-door neighbor. And I live and work within walking distance to the Maine border so I consider Maine plants to be next-door neighbors too. What I’m getting at here is that since we’re all neighbors, don’t be shy about asking questions if there’s something in the lab that you’re unsure about. You can ask me. Or ask somebody else, I won’t be offended. Since this was such a good question, I figured that more of my next-door neighbor plants might be asking themselves the same thing. Or will be soon. You think?

Since I think it’s kind of fun to point fingers and blame others for my misery, I recently researched who discovered phosphorus in the first place. I found out that it was discovered because of GREED. Hennig Brand, a German, discovered phosphorus by accident in 1669. He had collected about sixty buckets of urine and was processing it to try to find a compound to turn ordinary metals (like lead) into gold. The first step in processing all that urine was to let it steep for about two weeks until it bred worms. The painter Joseph Wright created a painting in 1795 entitled “The Alchemist” that commemorates the discovery of phosphorus. He didn’t paint the step involving the worms. Looking back at what these early chemists did sure makes me happy to be working in a modern lab. Even a modern wastewater lab, as smelly as it may be, beats steeping urine to breed worms!

The question that was asked about ortho vs. total phosphorus was “Why is the total number smaller than the ortho number? Why was I told to divide the ortho result by 3 to get the total result? Shouldn’t total equate to more?” And my answer was “Yes, that doesn’t intuitively make sense, but you have to go back to Chemistry 101.” And by “Chemistry 101” I mean go back to basics. I never actually took a Chemistry 101 class. I don’t think that UNH numbers classes like that. A lot of the beginning classes are in the 400s. And my first chemistry class was Organic Chemistry 547.

It just so happens that phosphorus occurs in wastewater almost solely in the form of phosphate. There’s many classifications of phosphates. Orthophosphate is the simplest and has the molecular formula $\text{PO}_4^{3-}$. Just to confuse matters, orthophosphate is commonly referred to simply as phosphate. Orthophosphate is easily analyzed for with colorimetric methods. Notice that I wrote “almost solely”. There are other forms of phosphorus in wastewater, and some of these forms are organically bound. When a permit is asking for total phosphorus, we must analyze for phosphorus in all these forms. To do this, we need to beat on the sample a bit with acid, heat and persulfate to convert all the other forms of phosphorus into orthophosphate so that we can use that easy colorimetric method to quantify what’s there.

The colorimetric method gives a result as $\text{PO}_4^{3-}$. Going back to basics, the orthophosphate ion has a molecular weight of 94.97 because there’s one P and 4 Os. Phosphorus itself has a molecular weight of 30.974. Kind of easy to see where that divide by three comes from now! The orthophosphate that we converted everything to is a chunky molecule that weighs a lot more than just the phosphorus by itself. So, to put everything on an even playing field, we do the math and give a result as P for total phosphorus. And if you’re doing the math right now, you’ve probably already noticed that it’s not EXACTLY 3. More like divide by 3.07. Or multiply by 0.3261. I like the multiplication option. But then again, I was the captain of the math team in High School…
The question of why manhole covers are typically round (in some countries) was made famous by Microsoft when they began asking it as a job-interview question. Originally meant as a psychological assessment of how one approaches a question with more than one correct answer, the problem has produced a number of alternative explanations, from the tautological ("Manhole covers are round because manholes are round.") to the philosophical.

Reasons for the shape include:

- A round manhole cover cannot fall through its circular opening, whereas a square manhole cover may fall in if it were inserted diagonally in the hole. The existence of a "lip" holding up the lid means that the underlying hole is smaller than the cover, so that other shapes might suffice. (A Reuleaux triangle or other curve of constant width would also serve this purpose, but round covers are much easier to manufacture.)

- Round tubes are the strongest and most material-efficient shape against the compression of the earth around them, and so it is natural that the cover of a round tube assume a circular shape.

- A round manhole cover has a smaller surface than a square one, thus less material is needed to cast the manhole cover, meaning lower cost.

- The bearing surfaces of manhole frames and covers are machined to assure flatness and prevent them from becoming dislodged by traffic. Round castings are much easier to machine using a lathe.

- Circular covers do not need to be rotated to align with the manhole.

- A round manhole cover can be more easily moved by being rolled.

- A round manhole cover can be easily locked in place with a quarter turn (as is done in countries like France), which makes them hard to open without a special tool. Lockable covers do not have to be made as heavy, because traffic passing over them cannot lift them up by suction.

Other manhole shapes can be found, usually squares or rectangles. Nashua, New Hampshire, may be unique in the United States for having triangular manhole covers that point in the direction of the underlying flow. The city is phasing out the triangles, which were made by a local foundry, because they are not large enough to meet modern safety standards and a manufacturer for larger triangles cannot be found. Some manhole covers in Hamilton, Bermuda, are triangular, and hinged. Some triangular water-main covers also exist in San Francisco.


(continued from page 1)

Lewis Gregory Jr.

1. Where/when retiree began working in the WW environmental field - I started in Jaffrey, N.H. in 1973 has a truck driver and also helped the water & wastewater departments, eventually getting my grade 1 WW license in the early 80’s and became the Chief Operator of their facility. In between Jaffrey, I went to Franklin Pierce College in the late 80’s and was the Chief Operator of their Wastewater & Water Treatment Facilities. After Jaffrey I Started up Millipore Corporations SBR plant in 2002. From there I went to work for Woodard & Curran, Inc. and was chief operator of Greenville Wastewater Treatment Facility and then Peterborough.

2. Where he/she is retiring from and how many years with that employer - Currently at Peterborough, N.H. as there Chief Operator, and will be retiring in mid-December this year.

3. What will he/she most miss? - It’s been a great career and have met and worked with a lot of great people whom I’ll miss.

4. How is the retiree most looking forward to spending his/her time? - My wife and I plan to travel and see different parts of the US and Canada.
Plan, Do, Check, Act…It Works!
By Sharon L. Rivard, P.E., NHDES Wastewater Engineering Bureau,
Aaron Costa & Donna Hanscom, City of Keene WWTF

Did you know that drinking water and wastewater systems account for about 3-4% of the total energy used in the U.S.? For any municipality, energy costs for drinking water and wastewater facilities can be up to 30-40% of the total energy costs for the municipal facilities and buildings. The downside to this is that energy costs continue to rise. The upside to this is that energy costs can be controlled by getting more efficient. The cheapest and cleanest energy is the energy that isn’t used!

Rule Changes

The NH Department of Environmental Services (NHDES) Wastewater Engineering Bureau (WWEB) is working on helping wastewater facilities get more energy efficient. We revised our design standards (Env-Wq 700 available for review at: http://des.nh.gov/organization/commissioner/legal/rules/index.htm#waterq) to push new wastewater treatment facilities (WWTF) and pump station designs and upgrades toward energy efficiency, removing barriers such as no longer having to size blowers and pumps for estimated flows 20 years in the future.

Financial Incentives

NHDES Clean Water State Revolving Fund (CWSRF) is also offering principal forgiveness on loans for energy audits conducted meeting the minimum requirements described at http://des.nh.gov/organization/divisions/water/wweb/grants.htm. Additional training and assistance opportunities are in the planning stages.

Plan=>Do=>Check=>Act In Action!

New Hampshire wastewater treatment facilities are starting to take energy efficiency seriously and are seeing the benefits! The best way to approach energy efficiency is using a Plan=>Do=>Check=>Act approach. The first step (Plan) should be to conduct an energy audit. Due to the complex nature of WWTFs, a lighting/HVAC audit will not address the bulk of the energy used. Every WWTF should start with a complex level process audit conducted by an energy efficiency expert well-versed in WWTF operations. Both electric utilities and NHDES CWSRF have funding programs to potentially help with the audit costs. There are also some commercially available devices that a skilled operator or maintenance tech could use to initiate an energy measurement program.

For an example of a NH municipality using the Plan=>Do=>Check=>Act approach toward energy efficiency, we will highlight the work that the City of Keene is doing.

Plan

The City of Keene has a Climate Protection Plan that sets city-wide goals for 25% energy and greenhouse gas reduction by 2027. Because water and wastewater utilities are energy intensive, Keene’s water and wastewater utilities staff took this goal seriously and formed an energy management team.

For years, Keene’s utilities staff has been tracking kilowatt usage at the drinking water and WWTF and pump stations in a very low tech way by entering data from the facilities’ electric bills into Excel spreadsheets. This gave Keene a good baseline even before SCADA tracking or the formal energy audit. Staff focused on the kilowatt (kW) usage instead of dollars because usage data gives a cleaner way to compare annual consumption.

Hoyle, Tanner and Associates (HTA) worked with Keene for the WWTF’s recent phosphorous removal upgrade. From the beginning of this project, HTA understood the City’s goal to integrate energy efficiency into every aspect of the upgrade design. Throughout the design process, energy efficiency was a central theme, and solutions were implemented wherever deemed cost effective based on life cycle costs. During design, Keene staff and HTA continually revisited their “green” goals to make sure they kept energy efficiency in mind. Prior to its upgrade, Keene conducted an energy use baseline audit so it could measure success and target its future efforts.

HTA and Keene’s management group involved all staff members during the upgrade planning stages to identify low-hanging fruit for energy reduction and to improve buy-in which, in turn, helps make implementation more effective.

After the upgrade, Keene’s WWTF staff started monitoring the WWTF’s energy use through the SCADA system. This data will allow staff to quantify the value of the recent energy saving upgrades and will provide solid measurements of future improvements.

Do

For Keene, many of the energy saving outcomes were expected, but others were side benefits of changes made either for process control or for resiliency to flooding. The energy savings measures implemented by Keene include:

- Chemically enhanced primary treatment was initially installed to address very low copper limits (6 ppb) and aid in phosphorus removal. However, a side benefit is that chemically enhanced primary treatment typically reduces the aeration demand in secondary treatment by enhancing BOD removal. In a new plant, this change can result, not only in smaller blowers, but also in smaller aeration tankage. These types of savings can be seen in initial capital costs as well as long term operating costs and should be considered on every new WWTF or upgrade project.
- Solar tubes for lighting during the day in the new chemical buildings
· Effluent heat recovery unit to heat UV and Septage buildings;
· Solar wall for heating air exchanges in UV building and primary chemical feed building;
· Elevating UV out of flood zone resulted in eliminating need for post aeration because the new cascading steps are much steeper than the old design, they allow more air entrainment;
· Process modifications resulted in the reduction of aerated tank volume from 1.6 million gallons to 800,000 gallons. Mechanical mixers were added to the anoxic and anaerobic zone to prevent solids settling;
· Optimized pump sizes wherever possible. They found that many of the facility’s original pumps were oversized for the current process and flow and could be replaced with smaller, more efficient pumps;
· A jockey pump, new energy efficient pumps and VFDs were installed at Martell Court pump station to replace the museum-quality liquid rheostat technology; and
· Lighting and HVAC improvements.

Check
Keene is now at a point they need to evaluate the impact of all the changes made to date so they can report out about those results to City management and stakeholders. As part of the Check, Keene staff:
· Revived the in-house energy team and invited representatives from EPA and DES to share experiences from other facilities;
· Continues spreadsheet review and tracking;
· Uses power monitoring through SCADA to identify and track energy use;
· Is planning an end-of-year wrap up with staff to report and celebrate the reductions and keep the employees involved and on track with energy use awareness; and
· Is reporting out by speaking to the City Council and the community through social media and bill stuffer information.

Act
Following the evaluation, Keene’s Energy Team will review audit results, SCADA power monitoring, and operational experience to develop its next list of potential energy saving projects. Then Keene will Plan, Do, Check and Act again.

In the absence of a formal energy audit, a community could identify ways to either use its equipment more efficiently through operations modifications or evaluate the cost/benefit of equipment replacement. To improve efficiency, WWTF staff must think outside the box because not all improvements require equipment replacement, sometimes energy efficiency is as simple as re-thinking operations.

Some of Keene’s upcoming planned work includes:

· Continued evaluation of Inflow and Infiltration to reduce pumping costs;
· Replacement of two 30-year old 30 hp mixers with two 3 hp mixers; and
· Replacing a plant service water pump once the replacement of the old water-intensive belt filter presses with FKC screw presses is complete. With the decreased demand for plant water, a smaller plant water pump will likely meet the facility’s needs, provide reliability, and save energy at the same time.

Stayed tuned for future updates from Keene as they measure their savings over the long term and are better able to quantify these savings.

If you haven’t started monitoring your facility’s energy use, don’t panic and don’t quit! You can start developing a baseline today. You don’t need a SCADA system and you don’t have to have an audit to get started. However an audit that reports the energy usage of your major equipment is eye-opening and is an important planning document for prioritizing energy projects. If you are serious about long-term energy reduction, you will want to invest in a detailed process level energy audit.

Your energy provider can give you historic usage data if you haven’t been tracking the data yourself. This data will also be used in the “check” step, so start tracking your usage as soon as you can. Then, get your operations and maintenance staff together and start a discussion about how to save energy. No one knows your WWTF and its equipment better than your own staff. Be creative, think outside the box, and give everyone a voice. Then, pick a couple small projects that can make a big difference, and be sure to celebrate your success!

For more information contact Sharon Rivard at Sharon.rivard@des.nh.gov or (603) 271-2508, Aaron Costa at acosta@ci.keene.nh.us or Donna Hanscom at dhanscom@ci.keene.nh.us
New England was represented by seven students at the 2015 National Stockholm Junior Water Prize (SJWP) competition, which took place from June 19-20 in Herndon, Va. All seven of the students who competed at the national level were winners of their respective state SJWP awards: Nick Knudsen, of Burlington, VT, with the project “The Levels and Sources of Escherichia coli in Lake Champlain and the Surrounding Watershed”; Nihar and Harshal Sheth, of Westford, MA, with the project “Developing a Water Efficient Irrigation Controller Using a Multivariate Logistic Regression Algorithm”; Paige Brown, of Bangor, ME, with the project “Identifying and Remediating the Sources of Pollution in Impaired Bangor Streams”; Erica Doucet, of Allenstown, NH, with the project “The Effect of Coastal Restoration Techniques on Erosion”; Morgan Kane, of Bristol, RI, with the project “Can the Use of Natural Aquifers...”; and Julia Ennis, of Fairfield, CT, with the project “The Analysis of Clay Flocculation’s Effect on the Benthic Zone Used as a Mitigation Technique for Harmful Algal Blooms (HABs)”.

Perry Alagappan, of Clear Lake High School in Houston, Texas, was named the first-place winner of this year’s SJWP. The SJWP, established in 1997 to mirror the adult Stockholm Water Prize, rewards outstanding research conducted by students grades 9-12. In his winning project, Alagappan combined both research and experimentation to demonstrate how Multi-Walled Carbon Nanotubes form effective, renewable filters that can be utilized to remove heavy metals such as Cadmium, Nickel, and Mercury — waste products from electronic components — from the water environment.

Alagappan received $10,000 and an all-expenses-paid trip to Stockholm, Sweden, where he will compete for the International Stockholm Junior Water Prize during World Water Week, August 22-28, 2015. He will also have the opportunity to present his research at the 2015 WEFTEC Conference, which takes place from September 23-28 in Chicago, Ill.

Two U.S. runners up, Jack Andraka of Maryland and Bluye DeMessie of Ohio, each received a $1000 award.

While none of our students from New England placed at the national competition this year, we recognize and congratulate them for winning the SJWP at the state level, and are proud of their research and talent. We hope that they all had a great time at the national conference, learned a lot, made connections, and increased their interest in pursuing a career in water.

**NEWEA’s mission is to promote education and collaboration while advancing knowledge, innovation, and sound public policy for the protection of the water environment and our quality of life.**

Water quality professionals from all across New England competed in the Annual Operations Challenge Competition on June 9, 2015 during the New England Water Environment Association (NEWEA) Annual Spring Meeting & Exhibit at the Omni Mount Washington Resort in Bretton Woods, N.H. Teams of four raced against the clock as they completed tasks in the fields of process control, maintenance, laboratory, safety, and collection systems, vying for first place and a chance to compete in the national Operations Challenge Competition at the Water Environment Federation (WEF) Annual Conference in September.

This year, the Rhode Island “Ocean State Alliance” team was victorious, tallying 425.56 points thanks in part to their strong showings in Process Control and Laboratory events. New Hampshire “Seacoast Sewer Snakes”, whose team also had two wins, came in second with 367.79 points followed by the Maine “Force Maine” team who earned 306.98 points. The Massachusetts “Resource Revolution” team, who competed for the first time, earned 25 points on each challenge, finishing with 125 points total and fourth place overall.

The Rhode Island, New Hampshire and Maine teams will compete against teams representing WEF affiliates from across the country in the national Operations Challenge Competition at this year’s Annual WEFTEC Conference in Chicago, IL. The convention, which takes place September 23-27 at the McCormick Place Convention Center, is the largest water quality event in North America, and is expected to draw over 22,000 professionals from all water quality professionals. For more information about WEFTEC, visit www.weftec.org.

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Here Comes a Salesperson
What is it like to be the salesperson coming in your door to meet with you?

By Gene Weeks - BAU/Hopkins

I sell water treatment and wastewater treatment equipment. As part of my job, I need to go to as many of the treatment plants as I can. Why am I coming to your treatment plant? Is it to bother you when you are trying to work? No, it is not. I believe that I (and many of my colleagues and competitors) have something positive to offer you that can benefit both of us. If I can get a few minutes of your time, I will let you know what it is that I sell. It is possible that I sell something that you are looking for at the time. If I don’t, I do have something to offer that will need in the future. I may be able to add to your knowledge of new products or technologies. My feeling is that I am a knowledgeable person who sells products that work. You need to have a list of “go to” people that you can contact when you need something. I think that I should be on that list and if I am, it will benefit both of us.

What do I want to get out of our meeting? First, I want to get on your “go to” list if possible. I also want to know who else I should talk to in your plant or in your town. I will ask you about your plans for what you would like to change, or fix, or upgrade. If you are working with an engineer, I will ask you which firm and who is the Project Engineer. Again I am working on the assumption that I have something to offer to anyone whose name you give me.

My company sells products in two main ways. First we will quote our equipment to contractors on large bid projects like treatment plant upgrades. Second we will sell our products to treatment plants directly. These direct sales can be small items like calibration columns or larger items even as big as sludge presses. We are happy to quote anything we can regardless of size.

Am I frustrated if I see that you are buying through the “Book” people? Frankly, yes I am. You may have assumed that my prices are higher than the “Book”. In fact my prices are lower than the “Book” in most cases, and so are many of my competitor’s prices. I also am available to answer questions and solve problems. How did I get all this information to help you with your problems? Every day, I spend my time visiting other treatment plants in my territory. You can bet that if I don’t have an answer to your problem for you, I will know someone else who does. I have a long list of “go to guys”.

Did I have an appointment? Maybe! I try to make 1-3 appointments per day. This is not always possible. Let me give you a hypothetical example from a salesman’s point of view. Let’s say that I have an appointment with Treatment Plant A at 10 am. You are at Treatment Plant B 10 miles away. I call you and ask if you can see me either before or after my 10 am appointment. If you say “Yes” that’s great, and we will pick a time. However, chances are good that you are already booked at these times that are convenient for me. Therefore you tell me that you are sorry, you can’t see me. Now I can’t go to your plant. If I don’t call you, I can go to your plant. When I get there, you may be right there and have a few minutes to talk. If you are not there, maybe I can talk to someone else in your plant. At the very least, if I don’t know you, I can probably get your contact information. My chance of a positive outcome is at least fairly good if I make a “cold call”, maybe better than if I call first. It is almost impossible to make a full day of appointments that does not leave me with a lot of waiting between appointment times. Therefore most days I am making some “cold calls”. If you can’t see me – that’s fine just tell me so. If you only have 5 minutes, say so and I will make it quick.

Some of you have a sign that says something like “Salesmen by Appointment Only”. Do I pay any attention to the sign? Sometimes! If I know you, and I know you are serious about the sign, I have already made an appointment. If I don’t know you, what I do know is that at least half of the operators that have such a sign don’t pay attention to it. So there is a good chance that I will go past the sign and see what happens. If you are sticking to the words on the sign, just tell me so. I would ask that you not be upset with me if I go past the sign. My job is to go past the sign. Just give me your card and make an appointment when I call or e-mail you another day.

If I have quoted you something, I will need to follow up. I will try to do this in person if I can. If you are going to place an order with me, I want to expedite that if I can. If you have ordered from someone else, I want to find out what you ordered and from whom so I can do a better job the next time.

I believe that I am part of the team of people who work every day to improve and sustain our environment.

Gene Weeks is a Sales Engineer for BAU/Hopkins selling water and wastewater treatment equipment. Gene has been involved in the industry for over 20 years. He lives in Buxton, ME.

November 1, 2015 at 2 AM
2015 NHWPCA Summer Meeting
Photos by Charles Tyler

A Big Thank You to all of the Summer Meeting Sponsors
Portsmouth Chowder Company - Resource Management, Inc. - Ted Berry Company, Inc. - Tighe & Bond
Underwood Engineers - Weston & Sampson - The Wise Company, Inc. - Wright-Pierce
10 Questions to get to Know Our NHWPCA Board of Directors

John C. Adie
Position on Board: Past President
1. Nobody wants to grow up and work in a WWTP. How did you find yourself in this field? Always wanted to help our environment. Cleaned up the water on the industrial side, was asked if I would come over to the municipal and never looked back.
2. What is your current employer? The fine City of Nashua.
3. How long have you been in the wastewater field? About 5 years.
4. What kind of cell phone is in your pocket – Apple or Android? Android…..always!
5. What’s your favorite social media – Facebook or Twitter? Facebook.
6. What kind of computer is on your desk – Apple or Microsoft? Only Microsoft….they own the world.
7. What’s the last movie you watched in a theater? Guardians of the Galaxy.
9. When you’re not working, what are your hobbies? Computers, gaming.
10. What is one thing about our association that you’d like to accomplish/change? I would like sustainability, so that future generation members can have and enjoy what I have.

Ken Conaty
Position on Board: Director at Large
1. Nobody wants to grow up and work in a WWTP. How did you find yourself in this field? I supervised site, utility and road construction crews for 20 years. I was tired of the crazy hours and took the opportunity to apply to Merrimack when it opened up. Seven years later I’m still here.
2. What is your current employer? Town of Merrimac WWTF
3. How long have you been in the wastewater field? Seven years
4. What kind of cell phone is in your pocket – Apple or Android? Apple
5. What’s your favorite social media – Facebook or Twitter? Facebook
6. What kind of computer is on your desk – Apple or Microsoft? Microsoft
7. What’s the last movie you watched in a theater? Gravity
8. What’s your favorite book of all time? The Art of Racing in the Rain by Garth Stein
9. When you’re not working, what are your hobbies? Walking, Reading and Decorative Painting
10. What is one thing about our association that you’d like to accomplish/change? Increase membership.

Elizabeth Harrington
Position on Board: Administrative Assistant
1. Nobody wants to grow up and work in a WWTP. How did you find yourself in this field? A mutual acquaintance of Linda Gaudette told me about the job opening and applied.
2. What is your current employer? Focusing Safety
3. How long have you been in the wastewater field? Since September 2014
4. What kind of cell phone is in your pocket – Apple or Android? Android
5. What’s your favorite social media – Facebook or Twitter? Facebook
6. What kind of computer is on your desk – Apple or Microsoft? Microsoft
7. What’s the last movie you watched in a theater? The Judge
8. What’s your favorite book of all time? The Great Gatsby
9. When you’re not working, what are your hobbies? Working around the house and vacationing away.
10. What is one thing about our association that you’d like to accomplish/change? I’d like to see a better line of communication between the board and the members to assist them in what they need.