Construction of the biological process upgrade of the Allenstown, NH wastewater treatment facility was officially kicked off with the groundbreaking ceremony held on Tuesday, April 27. This is a significant milestone for a project that has been in the works for a couple of years. After the voters failed to approve the bond article for the full-scale upgrade of the WWTF several years in a row Hoyle Tanner was asked by the Allenstown Sewer Commission to come up with a “Plan B” for a more modest upgrade of the WWTF to meet the Town’s needs and alleviate the moratorium on new sewer connections that has been in place for several years now in both Allenstown and Pembroke, both of which are served by the Allenstown WWTF.

The selection of this project for funding under the American Recovery and Reinvestment Act (ARRA) of 2009 gave the Town the opportunity to get significant (50%) funding and a better chance to win voter approval for the project. The voters responded in kind by voting overwhelmingly to approve the bond article at a Special Town Meeting held on June 13, 2009. The “Plan B” alternative selected for upgrading the WWTF is the “BioMag” process sold by Cambridge Water Technology in Cambridge, MA.

The Allenstown WWTF was constructed in 1977 and has been in operation for over 30 years. Hydraulically the plant is capable of treating 1,050,000 gpd of wastewater though wet weather flows can exceed this amount by several times. The biological treatment process was originally designed as a variation of the activated sludge process known as extended aeration, though it has not been operated in this fashion for a number of years due to operational problems that occur in this mode of operation. Existing process facilities at the plant include: headworks with screening, flow measurement and grit removal; aeration tanks with fine bubble diffused aeration; two secondary clarifiers; chlorine contact tanks; disinfection using sodium hypochlorite; aerated sludge holding; and sludge dewatering using a belt filter press. The facility is permitted to discharge up to 263 lbs/day of BOD$_5$ and TSS at a maximum average monthly concentration of 30 mg/l. The permit further stipulates that the facility must maintain 85% removal of both the influent BOD$_5$ and TSS consistent with conventional secondary treatment standards. The WWTF also receives and processes between 70,000 and 100,000 gallons per day of septage from many surrounding communities. The septage is not discharged directly into the secondary biological wastewater treatment process. It is combined with waste activated sludge, mixed and then decanted.
NHWPCA Board of Directors

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Upcoming Events

NHWPCA Summer Outing
Friday, June 25th at Ellacoya State Park

NHWPCA Golf Tournament
Thursday, August 5th at the Beaver Meadows Golf Course in Concord.

NHWPCA Fall Meeting
Thursday, September 23rd at the Jaffrey W.W.T.F.

Become a Sponsor of the NHWPCA Newsletter

Your company name, phone number and contact person will be placed in the collector each issue for only $100 per year. Contact the editor.

COLLECTOR Back Issues Wanted

We are looking for back issues of "THE COLLECTOR". If you have any that you are willing to share, please contact Todd at:
tgianotti@newmarketnh.gov
Please include the year and month of the issues.

Scholarship Award Recipient

On behalf of the NHWPCA board of directors and the scholarship committee I am pleased to announce Kristen Peterson as this year’s recipient of a $1,000 scholarship.

Kristen is a graduating senior of Somersworth High School planning to pursue an Engineering degree from Smith College. During her senior year she completed a project to bring clean irrigation water from the Salmon Falls River to a community garden in Rollinsford.

Because of her commitment to clean water issues, improving the environment, and clear vision of her direction within the environmental engineering field we are proud to award her this scholarship.

Michael Carle
Chair, NHWPCA Scholarship Committee

PLANT OF THE YEAR APPLICATIONS ARE DUE IN BY JUNE 30TH, 2010

Applications can be found at the NHWPCA Website
www.nhw pca.org

Newsletter Committee

Nancy Lesieur, Steve Clifton, Chris Hipkiss, Mary Jane Meier, Stephanie Rochefort, Dave Michelsen, Joseph Laliberte, and Todd Gianotti. We welcome additional members. Special thanks to this issues article writers - Michael Trainque, David Michelsen, Chris Hipkiss, Stephanie Rochefort, Joseph Laliberte, Mike Sullivan, and Michelle Beason.

We are looking for meaningful articles for the Wastewater Operator in a timely fashion.

Chairman & Editor - Steve Clifton, Publisher - Todd Gianotti
Send COLLECTOR articles to - Steve Clifton via email at wsclifton@underwoodeng.com, c/o Underwood Engineers Inc.

The COLLECTOR is the Official Newsletter of the NHWPCA
The decant is discharged to the biological process and the solids are conveyed to the belt filter press for dewatering. Filtrate is conveyed to the biological treatment process (aeration tanks) for processing.

One of the more significant limitations on the hydraulic capacity of the WWTF is the 7 foot side water depth in the existing secondary clarifier tanks. This was a significant factor in the selection of the BioMag process for the plant upgrade.

This project includes construction of a biological process modification at the Allenstown WWTF using the "BioMag" process to enhance solids settling and increase the hydraulic capacity. The BioMag process is a ballasted flocculation process whereby ballast is added to the biological solids to enhance solids settling and allow for operation at significantly higher mixed liquor concentrations. The effectiveness of the BioMag process is based on the ability to enhance secondary settling rates and thicken the sludge blanket. Not only does this increase the hydraulic capacity of the plant without adding new bioreactor or clarifier tankage but it also improves both phosphorus and nitrogen removal by producing a cleaner effluent and freeing up bioreactor tankage to create anoxic zones.

The BioMag process uses magnetite to significantly increase the specific gravity of the biological floc. Magnetite is an inert iron ore with a specific gravity of 5.2 and an affinity for biological solids. When the magnetite is added as a ballast material it significantly increases the settling rate of the biomass. By increasing the specific gravity and the settling rate of the biological floc, it then becomes possible to increase the mixed liquor concentration in the bioreactor while still maintaining adequate settling and thickening in the secondary clarifiers.

Raw magnetite and recovered magnetite are blended with return activated sludge in the ballast mix tank. The ballasted sludge is then conveyed to the aeration tanks and, subsequently, to the secondary clarifiers. Magnetite is recovered from the waste activated sludge (WAS). The settled solids in the WAS flow through an in-line shear mixer that shears the ballast (magnetite) from the sludge solids. The combined solids and ballast stream then flows over a magnetic drum that separates the ballast from the sludge solids. The sheared ballast is then returned to the ballast mix tank to be mixed with return activated sludge (RAS) and reused. The ballast is continuously recovered and recycled through the plant with the occasional addition of make-up ballast. The waste solids (waste-activated sludge) will be pumped to the existing sludge dewatering operation. A new screen is included to screen the return sludge ahead of the ballast mix tank.

The increase in capacity created by the BioMag system is the result of both the enhanced settling of solids in the clarifiers and the operation of the biological treatment process at a higher MLSS concentration in the aeration tanks. Presently, the WWTF is operated with an MLSS concentration of 2,000-2,500 mg/l. Implementation of the BioMag will allow for operation with a MLSS concentration in the range of 5,000-6,000 mg/l. The higher MLSS allows for additional wastewater flow and loading based on maintaining the food/microorganism (F/M) ratio. The increased MLSS concentration is not expected to result in any operational difficulties, especially with the enhanced settling characteristics of the sludge in the clarifiers.

A new building structure is currently being constructed next to the existing sludge pumping building to house the ballast storage and mix systems, the shear mills, the polymer storage and feed system, a new sludge screen, a new motor control center, and the equipment control panels. Implementation of this project is expected to increase the hydraulic capacity of the WWTF by approximately 300,000 gallons per day (GPD) or the equivalent of 1,200 residential sewer connections. This process will be fully compatible with plans for the future upgrade and expansion of the WWTF.

Significant cost savings will be realized as a result of much smaller footprint required, no significant (and costly) new process tankage required, and enhanced settling and thickening of sludge solids. The construction of this project is expected to take approximately 9 months to complete. This will be followed by a testing and start up period to optimize process operation. This will be the first full-scale municipal application of the BioMag process in New Hampshire and, depending upon the timing of other projects presently under construction, may be the first full-scale municipal application of the BioMag process in the U.S.
The Fields Point Wastewater Treatment Facility (FPWWTF) is owned and operated by the Narragansett Bay Commission and is located in Providence, Rhode Island. The facility, which has a design average flow of 65 million gallons per day (MGD), and a design peak flow of 200 MGD, treats wastewater from the City of Providence, the Town of North Providence, the Town of Johnston, and parts of the Town of Lincoln and the City of Cranston. The plant currently operates with a complete mix conventional activated sludge process and discharges to the Providence River in the upper reaches of the Narragansett Bay.

The FPWWTF received an NPDES permit with a requirement for nitrogen removal to 5 mg/L or less in the facility’s effluent on a monthly basis, from May through October. To meet this difficult nitrogen permit limit, the NBC selected the Integrated Fixed Film Activated Sludge (IFAS) suspended media biological nitrogen removal process after a thorough investigation of four alternative nitrogen removal technologies including step feed, modified Ludzack-Ettinger (MLE), fixed media and IFAS suspended carrier media. The IFAS process had the significant advantage of requiring no additional aeration tank volume to implement it. When complete, it will be the world’s largest IFAS plant.

The IFAS process consists of adding floating plastic or sponge media to the aeration tank. The suspended media provides significant surface area for the growth of attached (fixed) organisms. Fixed growth organisms are known nitrifiers. Further, the fixed growth organisms, coupled with the activated sludge, allows for a very high mass of microorganisms in the aeration tank to drive the nitrification and biodegradation in a short amount of time. Thus the IFAS process can fully nitrify in very small tanks and results in high concentrations of available microorganisms without additional mass loading to the clarifiers.

Key challenges associated with an IFAS plant include the need to prevent the media from migrating out of the aeration tank by adding retaining screens as well as providing sufficient mixing in the aeration tank to prevent the growth of excessively thick biofilms.

In the case of the FPWWTF, each of ten existing aeration tanks will be subdivided into a series of aerated and unaerated (anoxic) reactors with a serpentine flow path. Concrete walls are being added for the media screens and access walkways and in other locations FRP walls are being used to reduce cost. Suspended plastic carrier media will be added to the main aerated portion of each tank to boost nitrification performance, and an internal mixed liquor recirculation system will be added to achieve partial denitrification in the first anoxic zone. A second anoxic zone with external carbon addition (methanol or other carbon source) is being provided to achieve the level of denitrification needed for compliance with the seasonal TN limit. A schematic is provided in Figure 1 and the key process volumes and design parameters are summarized in the Tables 1 & 2.

Figure 1 – FPWWTF IFAS PROCESS SCHEMATIC
Other upgrades to the FPWWTF required to implement this process include additional aeration capacity (nine 300 hp turbo blowers), a carbon (methanol or other carbon source) feed facility, an intermediate screening facility with ¼” mesh screens to prevent fouling the plastic media, and extending the screw lift pumps six inches to overcome the additional head loss from the media retention screens.

The FPWWTF IFAS upgrade is currently under construction and is in year one of a four year, $60 million construction project. It is expected to be operational in 2013 to meet discharge permit requirements.
Most people have read or used the above phrase at sometime and the “Near Miss” I am going to describe below actually resulted in a lost time accident. I am referring to it as a “Near Miss” because it could have been a much more serious accident.

The Situation

Two mechanics were assigned to replace a non functioning methane gas metering devise with a meter of a newer design. The original installation consisted of two inch diameter flanged iron spools one being one foot long and the seconded being two feet long. The meter in-between was one foot long by one and half feet high with part of the meter appearing to be cast out of aluminum. The flanges on the meter were a six bolt pattern and the flanges going to the plant piping were a four bolt pattern. The meter installation was located six and a half feet above floor level and the replacement metering devise consisted of a four foot long two inch diameter spool made of stainless steel with the metering sensor installed in the spool.

The lead mechanic was on a ladder removing the four bolts on each end of the metering assembly while the second mechanic was positioned under the meter and was prepared to remove it after the bolts were removed. When the metering assembly, consisting of the meter and the two spools, was free, the second mechanic struggled with its weight and in doing so suffered neck, shoulder and back muscle strains which resulted in lost work time. Later it was determined that the total weight of the three components to be close to 120 pounds and even though I refer to this as a “Near Miss” if the second mechanic had lost his balance and fell with that amount of weight falling on his chest the accident would have been much more serious.

A better plan of action?

I am sure that those reading this article would have more than one suggestion on how they would have proceeded with this maintenance task. I am not going to prescribe a proper method but will put forth some suggestions on precautions to take when faced with a new task. Since this metering equipment had been in place for some time and was not functional the chances of having a readily available spec sheet giving the weight of the meter would be a long shot. Since they were swapping out the old meter with a new one with a completely different design you can’t compare apples to apples because the new meter is an orange. You could over design the project from the start by setting up scaffolding with appropriate lifting devises but since the space they were working in was two flights of stairs below grade this was not likely.

Hindsight being what it is, taking out three of the four bolts and loosing the fourth bolt on each end flange would have allowed for the movement of the total assemble to judge the weight. Another approach, but taking more time, would have been to take out ten bolts leaving two loosened bolts in to judge the weight of the meter and remove that first and then taking out the two spools. Like I said earlier there are, I am sure, other approaches to this task.

In Conclusion

Before taking on a task that you have never done before do some research or be prepared for the unexpected and swapping out a meter with one that is completely different should be considered a new task. Remember “Things are not always what they appear to be”
Occasionally, I have to ship samples to a contract laboratory instead of doing them all in-house. The contract labor
atory always sends me nice, clean, new sample bottles for these samples. Awhile ago, I noticed that the
new bottles from the contract laboratory are something different than the dingy, stained, old sample bottles
that I use over and over again until they break. I wondered if this might have something to do with the occa-
sional QA/QC deviations that I’d been experiencing. You think?

So, I began experimenting with different ways to clean my sample bottles. My first thought was to use
bleach to return the bottles to their original whiteness. After all, we have a big, honking tank of bleach on-
site so that should be easy to do. I soaked the bottles in a strong bleach solution (ruining a good shirt in the
process) and rinsed them well. Or so I thought, after using my calibrated nose to tell if all the bleach was
rinsed out. No surprise that my calibrated nose was the wrong tool for the job and I had samples contami-
nated with bleach! Next I decided that I would need to test the bottles for chlorine after soaking them in
bleach. So, I soaked the bottles in a strong bleach solution (wearing the previously ruined shirt) and then
filled with DI water that I then measured for residual chlorine. And then I repeated the rinsing/testing proc-
ess until there was no residual chlorine. This was a lot of work. There had to be a better way.

I figured that acid-washing had to be the way to go. I’d had previous experience with acid, the scars had
faded and I was ready to clean my sample bottles. Of course, I couldn’t just soak a dirty sample bottle in
acid, so I first had to clean the bottle with soapy water and a scrub-brush and rinse well. Then I soaked the
bottle in a 50/50 HCl solution. I triple-rinsed with DI water, and then checked to make sure that all the acid
residual was gone. This was easily accomplished with pH paper. I really was happy with the results – no
more QA/QC deviations. However, yet again this was a lot of work. I decided to save this for the most im-
portant (NPDES) tests and come up with something else for my day-to-day samples.

For most samples, cleaning the sample bottles with soapy water and a scrub-brush, followed by triple-rinsing
is sufficient. Be sure not to skimp on the rinsing, because some detergents can leave a residue that inter-
ferses with some of the tests that we run. There’s a test to check for this – the inhibitory residue test. Very
easy – I’ve done this. You just need 18 autoclavable Petri dishes. Six plates marked Group A are washed in
your soapy water and rinsed like you normally do. Six plates marked Group B are washed, but then rinsed a
dozen times with DI water. Six plates marked Group C are washed but not rinsed. Autoclave all of the plates
and then set them all up for a pour-plate HPC with a 1 ml culture of Enterobacter aerogenes. At the end of
the incubation period, count all the plates. Differences in averaged counts on plates in Groups A - C should
be less than 15% if there are no toxic or inhibitory effects. Differences in averaged counts of less than 15%
between Groups A and B and greater than 15% between Groups A and C indicates that the cleaning deter-
gen is inhibitory properties that are eliminated during routine washing.

Okay, I lied. The inhibitory test is not easy – it’s a long, involved pain-in-the-behind. I bought a case of the
detergent that I ran the test on so that I wouldn’t have to run it again for at least a decade. Luckily, as we’re
nearing the end of that decade, the laboratory detergent manufacturers have caught on to this and they’re
spending the money to have the test run. Don’t buy a laboratory detergent unless the manufacturer will sup-
ply you with a copy of the inhibitory test result.

(Continued on page 10)
Grades - 1 - 3

All three winners are from the Greenland Central School
Grades - 4 - 5

All three winners are from the Bicentennial School
NEW HAMPSHIRE LEGISLATIVE BREAKFAST
MARCH 31, 2010

By Mike Sullivan, NHWPCA Legislative Affairs Committee

The NHWPCA, NEWEA, and NEBRA organizations jointly hosted the third annual legislative breakfast event on March 31, 2010 for representatives and senators from the State’s legislative body. Attendance was excellent and the legislators that joined us for this event were quite spirited and vocal and it made for a very productive exchange of information.

After opening remarks from Sean Greig, NHWPCA President, and Adam Yanulis, NEWEA Government Affairs Committee, the attendees were greeted by Senator Martha Fuller Clark, who served as the senate sponsor for the legislative breakfast. Senator Clark spoke about the work being conducted by the SB61 Commission, which she chairs, and which focuses on sustainability for water and wastewater infrastructure. The event was co-sponsored in the House of Representatives by Burt Williams and Susan Wiley and Representative Wiley also provided some opening remarks, including her recent encounter with a fourth grade class debating whether the state drink should be milk or cider, and one of the kids suggesting that the state drink should really be water – clean water. It is nice to know that even 4th graders understand the importance of clean water.

Paul Heirtzler from New Hampshire DES gave an overview of the state ARRA funding projects that have been kicked off over the past year and summarized the large discrepancy between the available funding mechanisms and the current and future needs for the wastewater industry in our state.

Paul’s comments were followed by a panel of speakers representing a broad spectrum of issues and communities. Speakers from across New Hampshire and New England presented issues facing their communities and sparked a lively discourse from the attendees. Donna Hanscom, Assistant Public Works Director from Keene, NH, spoke about the problems facing their 30+ year old wastewater treatment plant especially with regard to very stringent nutrient limits with their new permit. Her talk was followed by Phil Bilodeau, Deputy Director of General Services for Concord, NH, who spoke about the issues facing Concord’s two wastewater treatment plants and the need to set priorities for funding facility improvements.

Jason Turgeon, EPA New England Region I, discussed the potential options for improving energy efficiencies at existing water and wastewater treatment facilities. This talk was complimented by John Adie, the fourth panelist, Operations Supervisor for the City of Nashua, NH, who presented the various energy initiatives that his plant is conducting.

Sean Greig closed out the session thanking all of the attendees and inviting them back for our next legislative breakfast event, and reminded legislators that the NHWPCA is a resource for information about wastewater treatment and the tough issues facing municipalities as they continue to ensure the highest environmental standards. Several of the legislators in attendance asked probing questions and even followed up with additional input which hopefully will foster additional interest by their colleagues for future events that we intend to host.

The Legislative Affairs Committee for NHWPCA and NEWEA and representatives from NEBRA all worked incredibly hard to put together a informative and interactive program for this year and we hope for the continued support of these associations and especially the NHWPCA membership in general for coming events.
Municipalities across the state continue to struggle to address their aging sewer infrastructure. In many cases, high flows from these collection systems result in combined sewer overflows (CSOs), sanitary sewer overflows (SSOs), and increased cost of wastewater conveyance and treatment. Some municipalities are addressing high flows through mandates and Capacity, Management, Operations, and Maintenance (CMOM) programs.

Steps taken usually start with projects for the public sewer system and may include sewer separation, trenchless rehabilitation or replacement of sewer mains and manholes, increased pipeline conveyance with relief sewers, installing offsite storage or treatment facilities, and increasing the treatment capacity at the wastewater treatment plant. However, in taking these logical and cost-effective steps, there is another infiltration and inflow (I/I) source that is often overlooked and that is from service laterals.

**Sewer Service Laterals and Potential I/I Sources**

Sewer service laterals connect the sewered building to the sewer main, including the tap (typically a wye or tee branch) at the main. The service laterals often have limited or no prior condition inspection and may in fact be in poor/failing condition. Service laterals can represent a large portion of the infiltration that enters the collection system.

Groundwater infiltration into the service lateral through cracked joints, broken pipes, and root intrusions, may not be the only source of extraneous water that enters the collection system. House laterals may also have external inflow connections (i.e., yard drains foundation drains, and roof leaders) as well as internal inflow connections (i.e., floor drains and sump pumps). Collectively, the I/I sources from the sewer service laterals may approach or even exceed the total I/I in the publically owned portion of the collection system.

**Legal Issues, Private I/I Removal Options, and Lateral Rehabilitation**

The largest deterrent to removing private inflow connections and rehabilitating deteriorating service laterals is nearly always ownership and the associated legal issues. While some municipalities will own and maintain the service lateral to the property line or even up to the building, more often than not ownership and maintenance is limited to the main line sewer only. While the existence of private I/I sources connected to the service lateral is generally prohibited by the municipality’s bylaws, removal of sources by the property owner is rarely enforced. Removal by the municipality is also rarely undertaken due to the inherent risk associated with working on private property. Legal issues are the primary reason why private laterals have been largely ignored by many municipalities until recently.

Removal options of private inflow sources are fairly straightforward and typically include either redirecting the source to the lawn, a local waterway, the drainage system, or allowing the water to infiltrate (i.e., to a dry well).

Recent increased awareness and technical advances in available products have also opened doors for the reduction in infiltration from service laterals. In addition to lateral replacement with open excavation, there are numerous service pipe rehabilitation techniques that are now available:

- Rehabilitation of lateral connections with top hats or chemical grout;
- Rehabilitation from inside the building towards the main with cured in place pipe liner (CIPPL); and
- Rehabilitation from the main towards the building by pipe bursting or CIPPL (typically performed from within the sewer main to a cleanout although new technology is being developed that does not require a cleanout).

**Pilot Program**

To ensure that moneys spent on I/I reduction projects are cost-effective and achieve intended goals, there has been a recent increase in municipalities across the country performing pilot programs. These programs quantify the failures and successes of various service lateral I/I removal techniques. The results of the studies are then being used to guide future I/I reduction projects. There are applicable papers discussing the results of these pilot programs, and although the results vary, the general theme is that a larger than expected I/I reduction has been achieved through the implementation of a private lateral rehabilitation and private inflow source removal programs.
You still do want to make sure that you’re rinsing well enough. This is easily accomplished (really!) with a solution of bromthymol blue that you can purchase pre-mixed from your favorite laboratory supply company. Even though the word blue is in the name, bromthymol blue is green at a neutral pH. Most detergents are alkaline, so if the solution turns blue, you need to rinse better. If the solution turns yellow, you have an acid residue. I recommend playing with the bromthymol blue solution by adding a few drops to containers that you’ve purposely left a detergent residue and an acid residue in to see the color changes.

Luckily for me, as part of my treatment plant laboratory upgrade, I received a laboratory dishwasher. I love my dishwasher. I wash all my sample bottles and BOD bottles with a certified inhibitory-free detergent in my dishwasher. BOD blank problems are a thing of the past and I have to look harder for reasons for any QA/QC deviations. I will still do a quick check with bromthymol blue, but the dishwasher does a fine job of rinsing.

Editor’s Note: We are hoping that Stephanie makes her laboratory musings a routine column in the Collector. Good Job Stephanie!

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DON'T FORGET!

THE NHWPCA'S 2010 SUMMER OUTING

THE NHWPCA’S SUMMER OUTING 2010 at ELLACOYA STATE PARK

SOUTH OF THE BORDER MUNCHIES

SPEEDY GONZALEZ CHILE, SENIOR PEPE CORN BREAD, MAYAN CHICKEN, JOHN WAYNE BEEF TIPS, SOMBRERO POTATO SALAD, ALAMO SALAD, LONE RANGER DESSERTS, CANTINA SODAS & SPIRITS.

Note: NHWPCA is not responsible for any actions by any individuals that may cause personal injury or physical damage to any participants at the event. It is the responsibility of all participants to maintain a professional demeanor during the event. We strongly recommend that individuals limit alcohol intake to sensible levels and that designated drivers are utilized. Thank you!

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10
Answers on page inside of back cover.

1. Eagle Scout Troop Leader.
2. Ham Radio Operator
3. Rip-saw Tank Co-creator
4. Makes own bio-diesel
5. Is a true artist and likes to paint

A. ____________  
   Steve Clifton
B. ____________  
   Geoff Howe
C. ____________  
   Ed Rushbrook
D. ____________  
   Chris Hipkiss
E. ____________  
   Mario Leclerc

6. Thou shalt endeavor by hydraulics, politics, electronics, soft-soap, bulldozing, profanity, and chemistry to keep thy efficiencies high, yea, 100 percent is acceptable.

7. Thou shalt not covet new equipment, or assistant, or helpers, for all these things are abomination in the sights of the Municipality.

8. Thou shalt never, no never, assign anyone, of thy day-laborers to any menial task which he might consider beneath his dignity, or in any manner discriminatory.

9. Thou shalt maintain continuously, and at all times, a BOD reduction of 99.44 percent, for the Water Pollution Control Authority, knows best.

10. Thou shalt not covet great rewards. Thou shalt accept, gratefully and without question, the pittance meted out to thee. May thy troubles be many, thy financial and spiritual rewards small, and may thy days be long with thy antique, over-loaded treatment plant.
The Importance of Effective Collection System Inspections and Management

By Michelle Beason, P.E.

The sinkhole in the middle of the intersection had already swallowed three vehicles. Sanitary District employees scrambled to bypass the tremendous flows and stop the sinkhole from expanding, while worried homeowners watched helplessly.

This is the nightmare for any Sanitary District (District) providing wastewater service to customers. Deferred maintenance, and lack of periodic inspections, have resulted in catastrophic damage and loss of life. Increasing regulatory requirements mandate inspection and rehabilitation programs for collection systems in an effort to reduce overflows and failures.

Traditional wastewater inspections involve cleaning the pipelines, and then use of a CCTV truck and cameras to inspect. The data captured is dependent on the operator controlling the camera remotely, is subject to many reporting errors and missed defects, and footage results rarely exceed 2000 feet per day. Once complete, the CCTV results have historically been presented on a DVD or hard drive. This data was not easy to retrieve or organize, nor was it clearly linked to any particular pipeline segment.

RedZone Robotics has broken ranks from traditional inspection services by developing advanced robotic inspection technologies, along with GIS based Program Management Software called ICOM3. With highly advanced and specialized robots capturing complete and precise data, and the ICOM3 software to view and organize the data, RedZone Robotics provides a complete and cost effective solution for the inspection, prioritization, and maintenance management of any collection system.

RedZone has two types of robots: the Solo robots which inspect small diameter pipelines, and the Responder robots for large pipelines. Both robots have independent track systems, so they can crawl through sediment and debris in the pipe, alleviating the need to clean a pipe before inspecting.

The Solo robot is the first autonomous robot developed for wastewater pipeline inspection. The Solo robots provide superior results due to the unique 360 degree lens that takes a video of the entire pipe interior, and is not dependent on an operator to record the defects. The results are presented in the Solo Viewer, a sophisticated computer program that allows a user to pan, tilt, and zoom the video footage. Also, becauseSolo is autonomous, there is no need for an expensive CCTV truck. An employee can carry the 22 pound battery-operated robot into hard to access areas, open the manhole, lower the robot inside the manhole, close the lid, and go on to the next manhole while the robot automatically inspects the pipe and returns to the starting manhole. This process alleviates the need for extensive and disruptive traffic control, prevents wasted fuel and emissions, and increases employee productivity. It also enables a significant amount of video footage (5000 to 8000 feet) to be captured each day.

The Responder Robot is even more advanced, and simultaneously takes sonar, 3D laser, and H2S gas readings, along with CCTV. The 750 pound robot can complete inspections of up to 8000 linear feet from a single entry point, and can be fully submerged. The results of the Responder inspections, using the Multi-Sensor Viewer software, provides a complete picture of the sediment levels in the pipeline, any ovality or deflection issues, and lining defects.

Once the data from the Solo and Responder robots is analyzed and coded, the results are loaded into the ICOM3 Program Management GIS Software customized for each client. This software allows a user to click on a pipe segment on the GIS Map, and see not only the pipe characteristics (size, length, etc), but also the inspection results of the pipe, work orders, and criticality ratings. ICOM3 can be used to plan inspections, generate work orders, and perform other asset management functions like criticality and risk analysis. In addition to organizing all current and future data, the user can load all historical CCTV inspections, as well as all previous work orders, and other system information.

RedZone Robotics provides a complete Wastewater Program Management solution: revolutionizing inspections, inspection management, work management, and asset management. By importing the results of advanced robotic inspections into the powerful ICOM3 GIS-based software, Districts have an ally in the management of their wastewater assets, helping ensure public safety, and meeting regulatory requirements.
Publisher’s note: Companies with large logos are current 2010 sponsors of the NHWPCA’s newsletter: THE COLLECTOR

Answers to page 11 “WHO’S HOBBY IS THAT?”

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