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______________________________
As I write this little missive, we are in the ‘dog days’ of summer; the heat and humidity are oppressive and everyone seems to be in vacation mode (a good thing). Thus far in my tenure, the responsibilities of office have not weighed too heavily on my shoulders. However, I have been assured by previous incumbents that, after the unofficial new year commences on Labour Day, the action will pick up and continue to accelerate, so that, by the time the 37th Annual Conference arrives near the end of May 2008, I will be screaming to be released from this imprisonment.

I believe that one should try to enjoy every situation they are in and take the most out of the moment, so I shall continue to enjoy the temporary lull in the action for as long as I can. Not that your executive has been idle over the past few months. On the contrary, much has been transpiring and I shall try to report on the significant issues.

Updating the Constitution and By-Laws
For several years, the association’s Constitution and By-Laws have been undergoing a complete review. This review and updating is nearing completion. We expect to bring forward the new Constitution and By-Laws for your acceptance at our next Annual General Meeting. We owe a debt of thanks to a small subcommittee, spearheaded by Ian McIlwham of the Regional Municipality of Durham, for seeing this task through.

W EAO Scholarship Program
A special subcommittee of the Board has been working diligently to implement our Scholarship Program. As announced at our last Annual General Meeting, we expect to award $2,000 in scholarships to students in environmental programs in Ontario colleges and universities this fall. Expect more on this in future issues. The subcommittee, headed by Tim Constantine of CH2M HILL Canada Limited, as well as the New Professionals Committee, is to be thanked for carrying this initiative forward.

W EAO Sponsorship Program
One of our key initiatives for this year is the development of a Sponsorship Program. For years, we have heard our sponsors and advertisers say that they would appreciate a coordinated program for sponsorships rather than being solicited at various times of the year by many different committees. A subcommittee of the Board, headed by Cordell Samuels of the Regional Municipality of Durham, has been toiling through the summer and expects to provide a draft program for Board review this fall (see article on page 45). We expect to be able to roll out the Sponsorship Program at the next Annual Conference. Stay tuned for news in future issues.

37th Annual Conference
Speaking of the Annual Conference, under the leadership of Janice Janiec of CH2M HILL Canada Limited, early work is ongoing on the 37th Annual Conference to be held at Blue Mountain in May 2008. She and her committee will be building on experiences and successes of recent conferences to stage an unparalleled event next spring. While we know that holding an event of this magnitude outside of the comfortable confines of our normal venues will pose some unique challenges, we are confident that Janice and her Conference Committee will take these challenges in stride. Best wishes, Janice.

25-Year Membership Luncheon
On May 31, 2007, I had the great honour of officiating at the 25-Year Member Luncheon, which was organized by the Member Services Committee, chaired by Graham Simpson of SEW-Eurodrive Company of Canada Ltd. Details of this event are provided on page 44 in this issue, however, I felt that I should share a comment on the impact that this luncheon had on me.

Those who know me well will know that I do not normally put much stock in ceremonies and awards of certificates, pins and plaques. But, this event has likely changed my views on this forever. When awarding the 25-Year Member pins and certificates, I had the honour of shaking each person’s hand. When I looked into their eyes, it became clear to me that this small token of recognition and appreciation was very important to the recipients. In fact, dare I say that I detected a great deal of emotion in the faces of some of the honourees?

All of this has taught me a valuable lesson. A small token gesture, even though it may seem insignificant to the donor, may mean so much to the receiv...
For several years, the association’s Constitution and By-Laws have been undergoing a complete review. This review and updating is nearing completion.

Additional notes
It is with deep regret that we bid a fond adieu to Tony Petrucci of CH2M HILL Canada Limited. Tony resigned from his position as Water Environment Federation delegate in July to devote himself to the duties of his Water for People Canada presidency. He has graciously offered to remain as WEF delegate until WEFTEC® 07.

Through his many years of service on committees and on the Board, Tony was a tireless worker on behalf of the WEAO. Tony’s dedication and good humour will be sorely missed. Thanks Tony, and best wishes for all your future endeavours.

Also, on behalf of the Board of Directors, I would like to take this opportunity to extend our thanks to Vanessa Chau of the Regional Municipality of York for her dedication and hard work as Chair of the New Professionals Committee. She has now relinquished her duties in favour of Edgardo Tovilla of Delcan, the incoming Chair and NP representative on the Board. He will be aided by Vice-Chair, Jeremy Kraemer of CH2M HILL Canada Limited.

One cannot say enough about the efforts and enthusiasm displayed by Vanessa during her tenure as NP Chair. She worked tirelessly to help organize many social and educational events for the NPs. She also spearheaded a concerted effort to establish Student Chapters at many Ontario colleges and universities. She has graciously volunteered to remain involved with the New Professionals Committee even as she moves into her new and all-important role as a mother. Thank you, Vanessa, and best wishes.

As always, I cannot close without offering my heartfelt thanks to all of the people who make my life easier as WEAO President: all the Board members and association representatives, Past President Vincent Nazareth, Vice-President George Lai, Executive Director Catherine Jefferson, and last, but certainly not least, Julie and Carrie Vincent, who keep the great machine turning over smoothly.

A big ‘thank you’ to Emil Cocirla of Can-Am Instruments Ltd., who works overtime, out of the spotlight, to keep our communications effort in gear by coordinating with Craig Kelman & Associates Ltd. to produce this magazine and by broadcasting our e-Zine and maintaining our web site.

Finally, thank you to each member of the association. Your support helps to make everything happen. Remember though, your silent support is great, but your direct support through volunteering on committees and writing articles for this magazine would be even better and go farther in strengthening our organization. I hope to see you all in the fall at the WEAO Golf Tournament and at WEFTEC® 07 in San Diego.

Peter Takaoka, P.Eng.
R.V. Anderson Associates Limited
Catherine Jefferson

E X E C U T I V E  D I R E C T O R ' S  C O R N E R

Much has happened since the last INFLUENTS issue. I have been getting my feet wet by attending the various committees WEAO has in place to run its business; attending Water Environment Federation (WEF) meetings and meeting my counterparts in the other Canadian WEF member associations; sharing activities of young professional groups with WEAO’s New Professionals; attending the IWA Specialty Conference and 4th Residuals and Biosolids Conference in Moncton, New Brunswick; and working with members on a variety of issues such as the Constitution and By-Laws, scholarships, presentations relevant to different audiences introducing WEAO and what it does, and many other issues too numerous to mention.

We have been reaching out the past few months, aligning ourselves with other associations such as the OWWA, OMWA, MEA, OPWA and OGRA in the form of the Ontario Coalition for Sustainable Infrastructure. The goal is to move forward as a common voice on issues of common interest. We took our booth to the Trenchless Roadshow held in Niagara Falls in late May, and found it a valuable experience. So much so, in fact, we are hoping to work with organizers of the No Dig Conference in Toronto in 2009.

In other efforts to reach out, we have been expanding our distribution lists for seminars to a variety of associations, interest groups, government departments and academia. These include the Federation of Canadian Municipalities, the Canadian Water and Wastewater Association, the Canadian Water Resources Association, conservation authorities, industrial groups, environmental groups, academia, etc. The development of provincial legislation governing source water protection will have an impact on our industry, as government looks to water budgets and alternative water sources due to the depletion of water resources. We have been building bridges with conservation authorities, the Ministry of Natural Resources, and the Ministry of the Environment. Similarly, legislation and requirements developed under the Safe Drinking Water Act for better training, reporting, monitoring, etc. will indirectly affect our membership.

But, as the pendulum swings, I suspect the focus will shift to wastewater management. We all understand how complex wastewater management can...
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be, and, as the interests shift, WEAO has to be ready to help its membership and encourage government departments to use us as a valuable resource in providing background for policy development.

I attended a workshop at the Walkerton Clean Water Centre (WCWC) in early June. It was geared to market WCWC activities as well as to offer displays from WEAO and a number of companies. There was interest in WEAO from the 130+ participants, and we initiated a dialogue about working together. There are as many similarities between small and remote wastewater treatment facilities as there are water facilities. Training is a major requirement that is particularly important for smaller municipalities without major human resources. Unfortunately, due to travel and costs, it also presents the biggest hurdle to actual implementation. This is an area we need to address jointly. The WCWC also has a marvelous mobile training centre that can be used across the province, providing some of the accessibility required to small and remote systems. I believe there are many other areas in which the WEAO and WCWC can cooperate.

Another event that I was fortunate to attend was the IWA Specialty Conference on Biosolids held in conjunction with the 4th Residuals and Biosolids Conference. The 5th Residuals and Biosolids Conference will be hosted by WEAO in 2009, so stay tuned for more information. The IWA Conference held in Moncton was special in many ways, one of which was to start the international community working together on the issue of biosolids, with Canada as a very important driver in the process. In fact, as an important player in promoting the beneficial uses of biosolids, WEAO has been asked to participate in putting together the second edition of a Global Atlas of wastewater sludge disposal and biosolids use. Our Residuals and Biosolids Committee will be heavily involved and will welcome other interested individuals to ensure that the best available information is presented.

Mark Rupke of the City of Toronto will be telling us more about this conference later in the magazine.

Another issue that is important to WEAO members is the plans the Ministry of the Environment has with respect to financial planning for drinking water, wastewater and storm water. A recent review of the proposed regulation (for drinking water systems) and, in particular, the Guidance Document meant to help municipalities with financial planning, includes wastewater and storm water. We have difficulties with the way the issues are being addressed without the consultation we feel might be appropriate. Stay tuned to the next steps and how we might become involved in an active way.

There will be a number of exciting seminars coming up over the next few months and we are trying to make them as accessible as possible for others outside the GTA. Any thoughts or suggestions you might have for holding such seminars in other parts of the province are welcome.

On a final note, WEAO is pleased to announce that there will be two scholarships of $1,000 available to eligible applicants. The awarding of the scholarships will take place in late November or early December of 2007, with plans for this to be an ongoing award. Please watch the WEAO website for details.

Catherine Jefferson, Executive Director, WEAO
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The Walkerton water tragedy of 2000 – in which seven people died and many others fell ill – starkly illustrated the importance of safe practices in the supply of drinking water. For another dramatic reminder of the importance of safety in wastewater systems, one does not have to go back any further in time than late June of this year, when two telecommunications workers lost consciousness and died while...
Recently, Monica has spoken about safety in confined work spaces, partly in response to concerns raised by the Oakville incident. Safety issues weigh heavy at wastewater sites, she says, “Because, when you are entering manholes or sewers, there are issues with air that is sometimes contaminated to levels that can kill.”

Other workplace health and safety matters near and dear to Monica’s heart include ergonomics, noise reduction, mould guidelines and violence reduction. That last area of concern includes reducing violence from customers and co-workers alike. Awareness of workplace violence has risen in recent years, partly due to some high-profile cases, she says.

One key to violence reduction, she explains, is people realizing “that they can just walk away from some things” and thus not escalate tensions. “Knowing how to de-escalate situations is something that we teach.”

Another objective of particular interest to her is the reduction of occupational diseases, including the lung ailments caused by airborne asbestos and silica particles.

She is impressed by the enthusiasm and interest the WEAO has shown for health and safety practices. “The WEAO is aware that health and safety is an important aspect of the way that they do their business,” she remarks. “The partnering of the WEAO with the MHSA, as a training organization and a health and safety organization, goes a long way in ensuring that health and safety is integrated into the way the WEAO operates. I think it really shows a concern for the safety of the people they represent.”

By Michael Stimpson

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NEW PROFESSIONALS LAKEVIEW WASTEWATER TREATMENT PLANT TOUR

Submitted by Erin Longworth and Charlie Chen, KMK Consultants Limited

On the sunny morning of May 5, 2007, the WEAO New Professionals (NP) Committee carried on its devotion to educate and attract new professionals by organizing its latest facility tour, this time of the Lakeview Wastewater Treatment Plant (WWTP).

Situated in South Mississauga, on the shore of Lake Ontario, the Lakeview WWTP is the largest wastewater treatment plant in the Region of Peel. The facility has recently undergone an expansion to accommodate the unprecedented growth in population and economy across the Region.

The tour received an overwhelming response from more than 30 participants, including new professionals in the industry and university students. Tour participants benefited from the knowledge of two speakers, Peter Marto from the Ontario Clean Water Agency (OCWA), and John Mills from the Region of Peel. The tour was planned to focus on two main aspects of the plant – wastewater treatment and solids handling. John guided participants through the wastewater treatment processes at the plant and explained the daily operations of the 448,000-cubic metre per day facility, including the new headworks building and the expanded primary and secondary treatment tanks. For the solids handling processes, participants gained valuable insight from Peter into the biosolids facility, including thickening and dewatering centrifuges and the state-of-the-art fluidized bed incineration facility. After the completion of four incinerators, this will make Lakeview WWTP the largest sludge incineration plant in North America.

The tour ended with a casual lunch provided by KMK Consultants Limited, and a presentation by Vanessa Chau, who presented gifts to the speakers on behalf of the committee.

The facility tours and technical seminars organized by the NP Committee provide excellent opportunities for new professionals to gain practical field experience and meet friends and colleagues in the industry. We welcome and encourage new and young professionals in the water and wastewater industry to participate in upcoming events.

“The WEAO NP Committee has been created to represent those WEAO members with 10 years or less of experience in the wastewater industry, or less than 35 years of age. Our primary goal is to aid in the technical and professional development of individuals entering the wastewater industry, as well as to encourage participation of new professionals in WEAO activities.”
The tours and technical seminars provide excellent opportunities to gain practical field experience...
the work of maintaining sewer systems is performed by a highly-trained group of professionals using equipment and methods designed to protect themselves and the public from the dangers of health hazards associated with these areas. Why then do we continue to read or hear all too frequently of the deaths of those who must work in and around confined spaces?

Consider these terms in the definition of a confined space: fully or partially enclosed space (a) that is not both designed and constructed for continuous human occupancy, and (b) in which atmospheric hazards may occur because of its construction, location or work that is done in the space. Now, consider the fact that there are two major factors that contribute to fatal injuries in confined spaces, namely, failure to have a program in place to recognize and control hazards associated with confined spaces, and inadequate or incorrect emergency response procedures and plans.

Relating to the definition of a confined space and the causes of fatal accidents in these areas, it would appear that proper training and education are ways of preventing these tragic occurrences. Normally, confined spaces may not appear to be hazardous and they may have been entered on prior occasions without incident or apparent sign of danger. At other times, there may be apparent indications of danger such as:

- the distinct odour of irritating or toxic atmospheres,
- the presence of arcing electrical equipment,
- continued mild electrical shocks, or
- flowing grain or sand.

By their nature, confined spaces tend to concentrate hazards. Certain gases will displace breathable air in the confined space and will result in the accumulation of toxic, flammable or replacement gases. Physical hazards in a confined space are generally associated with restrictive movement or close proximity to a machine or substances. These include, but are not limited to, electrical components, moving mechanical components, and unstable or toxic chemicals. Recognition of the inherent capacity of these...
spaces to harbour hazardous agents is a significant element in a confined space hazard assessment. When confined spaces are recognized to be hazardous, provisions for minimizing the need for entry and for the use of appropriate work practices and equipment can be made.

Confined spaces may be classified into two categories:
- Open-topped enclosures with depths that restrict the natural movement of air (e.g., degreasers, pits, selected types of tanks and excavations).
- Enclosures with limited openings for entry and exit (e.g., sewers, tanks and silos).

The hazards found in any confined space are determined by the material being stored or used, or by the process taking place inside the space and by the effects of the external environment. Worker entry into confined spaces may occur during construction activities or during frequent necessary functions such as inspection, repair or maintenance.

**Atmospheric hazards**

Oxygen deficiency occurs from chemical or biological reactions which displace or consume oxygen in a confined space. The consumption of oxygen takes place during combustion of flammable substances, as in welding, cutting and brazing. A more subtle form of oxygen combustion occurs during bacterial action, as in the fermentation process. Oxygen deficiency can result from bacterial action in excavations and manholes located in garbage dumps, landfills or swampy areas. Oxygen may also be consumed during slow chemical reactions, as in the formation of rust on the exposed surface of metal tanks, vats or ship holds.

A mien air has an oxygen content of 21%. When the oxygen level drops below 17%, the first sign of hypoxia is a deterioration of night vision, which is usually not noticeable. Physiological effects include increased breathing volume, accelerated heartbeat, poor muscular coordination, rapid fatigue, and intermittent breathing. Between 6% and 10%, the effects are nausea, vomiting, inability to perform, and unconsciousness. At concentrations less than 6%, there is rapid loss of consciousness, and death within minutes.

**Oxygen displacement: inert gases and simple asphyxiants**

A simple asphyxiating atmosphere contains a gas or gases that are physiologically inert and which do not produce any ill effects on the body. However, in sufficient quantity, a simple asphyxiant will displace oxygen and may result in an atmosphere unable to support breathing. The ambient or normal atmosphere is composed of approximately 21% oxygen, 78% nitrogen and 1% argon, with small amounts of various other gases. For example, if 100% nitrogen (a non-toxic, colourless, odourless gas) is used to inert (displace) oxygen in a confined space, it will cause immediate collapse and death to the worker, if the confined space is not adequately ventilated before worker entry. Other examples of simple asphyxiants which have claimed lives in confined spaces include carbon dioxide, argon and helium.

**Flammable atmospheres**

A flammable atmosphere generally results from vaporization of flammable liquids, by-products of chemical reaction, enriched oxygen atmospheres, or concentrations of combustible dusts. Three components are necessary for an atmosphere to become flammable: fuel and oxygen (in the proper mixture), and a source of ignition. The proper mixture of fuel and oxygen will vary from gas to gas within a fixed range and is referred to as the lower flammability limit (LFL) and upper flammability limit (UFL). These terms are synonymous with the lower explosive limit (LEL) and upper explosive limit (UEL). For example, the explosive range for methane is between 5% and 15% in air. Concentrations below 5% methane are below the explosive range and concentrations above 15% are too rich to support combustion. If a confined space contains 27% methane and forced ventilation is started, the introduction of air into the confined space may dilute the methane in air, taking it into the explosive range.

**Toxic gases**

Toxic gases may be present in confined spaces because:
- The manufacturing process uses toxic gases. For example, in producing polyvinyl chloride, hydrogen chloride is used as well as vinyl chloride monomer.
- There are biological or chemical processes occurring in the product stored in the confined space. For example, decomposing organic material in a tank or sump can liberate hydrogen sulphide.
- The operation performed in the confined space can liberate a toxic gas. For example, welding can liberate oxides of nitrogen, ozone and carbon monoxide.
- Some toxic gases such as phosgene or carbon monoxide are particularly insidious because of their poor warning properties. Toxic gases which have been reported to cause death to workers in confined spaces include carbon monoxide, hydrogen cyanide, hydrogen sulphide, arsenic, chlorine, oxides of nitrogen and ammonia.

Toxic gases may be evolved when acids are used for cleaning the interior of a confined space. For example, hydrochloric acid can react chemically with iron sulphide to produce hydrogen sulphide. Hydrogen sulphide is heavier than air and will settle at the bottom of a confined space. Hydrogen sulphide is extremely toxic and exposure to it can cause paralysis of the olfactory system (making the victim unable to smell the gas), loss of reasoning, respiratory failure, unconsciousness and death.

**Solvents**

Hydrocarbon solvents are frequently used in industry as degreasers. These agents can cause unconsciousness by depressing the central nervous system. Some chlorinated hydrocarbon solvents, such as chloroform, have been used as aesthetic agents. In addition, certain chlorinated or fluorinated hydrocarbon solvents are toxic to the heart and have been associated with sudden death in confined spaces. The solvent methylene chloride can be toxic in confined spaces both because of its solvent properties and also because it is metabolized in the body to carbon monoxide.

**Physical hazards**

In addition to the atmospheric hazards in a confined space, physical hazards must also be addressed. Physical hazards cover the entire spectrum of hazardous energy and its control. These hazards include those associated with mechanical, electrical and hydraulic energy engulfment, communication problems, noise and the size of openings into the confined space.
Engulfment

Engulfment in loose materials is one of the leading causes of death from physical hazards in confined spaces. Engulfment and suffocation are hazards associated with storage bins, silos and hoppers where grain, sand and gravel or other loose materials are stored, handled or transferred. In some cases, material being drawn from the bottom of storage bins can cause the surface to act like quicksand. When a storage bin is emptied from the bottom, the flow rate can become so great that, once a worker is drawn into the flow path, escape is virtually impossible. A condition known as bridging can create additional hazardous situations. Bridging occurs when grain or loose material clings to the sides of a container or vessel that is being emptied from below, allowing a hollow space to be created. The bridge of material over the space may collapse without warning, entrapping workers who are standing below or on top of the bridge, and who are unaware that the surface is unstable. Bridging can occur in storage bins, silos and hoppers that contain ground grains, soybean meal or other meals, or other loose materials such as cement, limestone, coal or sawdust. The diameter of the storage vessel and moisture content of the stored materials are factors that contribute to bridging.

Other physical hazards

The nature of confined space work may make it difficult to separate the worker from hazardous forms of energy such as powered machinery, electrical energy and hydraulic or pneumatic lines. Examples of physical hazards often encountered in a confined space include the following:

• Activation of electrical or mechanical equipment can cause injury to workers in a confined space. Therefore, it is essential to de-energize and lock out all electrical circuits and physically disconnect mechanical equipment prior to any work in confined spaces.

• Release of material through connecting pipework or channels which are an integral part of the confined space pose a life-threatening hazard. All lines should be physically disconnected, blanked off, or use a double block and bleed system.

• Falling objects can pose a hazard in confined spaces, particularly in spaces which have topside openings for entry, through which tools and other objects may fall and strike a worker.

• Extremely hot or cold temperatures can make work inside a confined space hazardous. For example, if a confined space has been steam cleaned, it should be allowed to cool before any entry is made.

• Wet or slick surfaces can cause falls in confined spaces. In addition, wet surfaces can provide a grounding path and increase the hazard or chances of electrocution where electrical equipment, circuits and tools are used.

• Noise within confined spaces can be amplified because of the design and acoustic properties of the space. Excessive noise is not only harmful to the worker’s hearing, but can also affect communication causing shouted warnings to go unheard.

John Wraight is a former Safety Officer with the Ministry of the Environment and the Ontario Clean Water Agency. He is presently a Safety Officer and Trainer at Hetek Solutions Inc., London. He can be reached at john.wraight@hetek.com
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The Weather Outside is ... Frightful?
As we move into fall and look towards winter, it is a good time to review the experiences of the past year, winter and summer. Bone chilling storms and humid heat waves come to mind. If you care to reminisce about warm evenings at the cottage by water with a cool drink in hand – that’s good, some down time recharges the soul. But that experience may not help us analyze how to enhance our community and worker health and safety, and improve our policies and procedures in response to extreme weather conditions. Instead of dwelling on the best weather situations, let’s look at the occurrences of extreme weather related to community and worker health and safety.

As of the writing of this article in early August, Halton Region had issued six Smog Alerts covering 23 days to date in 2007. In 2005 and 2006, five and 15 alerts were issued covering 11 and 48 days, respectively. At this same time, Halton had its third Heat Alert covering a total of six days. In 2006, four Heat Alerts covered a period of 11 days, and, in 2005, eight Heat Alerts existed for 30 days. In 2007, Cold Weather Alerts occurred eight times for a period of 14 days. In 2006, two Cold Weather Alerts covered a period of three days and, in 2005, eight alerts existed over an 18-day period. Overall, Extreme Weather Alerts applied to between 15 to 70 days annually over the past three years in Halton. (Note: There is often an overlap in Smog Alert and Heat Alert conditions.)

Extreme weather conditions are occurring with a frequency that warrants prudent planning. For conditions that we know will occur, a process to inform the community, agencies and workers of potential adverse health effects and recommendations in a coordinated manner benefits all. This process can serve to inform staff about the necessary response to extreme weather conditions while at work. It also provides them with education to inform their actions and their family’s actions even while ‘off-duty,’ thereby increasing awareness of the community as a whole to the potential adverse health effects of extreme weather.

Extreme weather conditions are often thought to only compromise our vulnerable populations – seniors, young children and those who suffer from respiratory and cardiac conditions. In the water environment business, outdoor work can be an integral component of project work and general operations. Physical activity and exertion can be combined with extreme weather conditions, high temperatures and humidity, smog or extreme cold. Working under extreme hot weather conditions can lead to heat exhaustion and heat stroke while work in extreme cold weather can lead to frostbite and hypothermia. If left unchecked, these adverse health effects can become life threatening.

Community warning systems for smog and hot and cold weather exist, usually issued through established protocols by local health departments. These warning/notification systems usually are based on provincial and federal air quality or meteorological data related to the potential for adverse health effects. There are many excellent websites with information on extreme weather planning related to health impacts with recommendations. Some of these were referenced in the preparation of this article, but the main sources included the Region of Halton Health Department, the Town of Oakville, the Ontario Ministries of the Environment and Labour, Environment Canada and Health Canada.

It is prudent for municipalities, companies or agencies to periodically review and update their existing policies, procedures/protocols and operational practices. This will ensure their alignment with the maturing health watch/alert systems being developed by local health departments and the provincial and federal governments.

The goal is to reduce the health risks associated with extreme weather conditions through a coordinated, regionally consistent response.

Extreme weather condition planning

Extreme weather response plans usually develop at the local health department level involving a process such as:

- consultation between health department staff and meteorologists for area-specific weather forecasts;
- decision-making based on established trigger points (environmental/health/weather criteria);
- activation of notifications to local stakeholders including municipalities, school boards, utilities, agencies, among many others, e.g., those in contact with vulnerable populations (homes for seniors) or involved in extensive outdoor work;
- internal staff response plans for each contact is based on that agency’s existing policies/procedures or practices;
- termination of notification;
- public education component; and
- plan evaluation.

Some extreme weather response plans are profiled to provide information on the potential health impacts, those at risk, recommended actions and basis for decision-making.

Smog

Smoggy conditions can affect health by causing eye, nose and throat irritation, reduced lung capacity and tightness in the chest and can worsen conditions of people with asthma, chronic bronchitis, emphysema and heart trouble. Those most at risk to adverse health effects from smog include children, the elderly, and people who have respiratory or cardiac problems or who exercise outdoors.

Smog Alerts are issued by the Ontario Ministry of the Environment based on the Air Quality Index (AQI). A Smog Alert is called when smog conditions reach poor levels (i.e., Air Quality Index reaches or exceeds 50). A regional specific air quality information can be readily accessed at www.airqualityontario.com and one can subscribe to the Smog Alert Network notification service to receive alerts.
Many municipalities and agencies have smog response plans in place. These plans, such as the Town of Oakville’s, outline actions that staff and community can take in order to protect their health and decrease their impact on air quality during Smog Alerts. Plans advise employees to shift from work requiring small equipment such as lawnmowers, prohibit vehicle idling, suspend painting operations or work that involves the use of solvents or other volatile organic compounds, and restriction of vehicle refueling to early morning or evening. Some municipalities place restrictions on jobs such as paving and request that their contractors shift or stop work on Smog Alert days. In some cases, staff is reassigned to work such as litter pickup and landscaping, among other tasks. In many cases, Smog Alert notifications to staff provide advice on actions to be taken in the office, for facility management, and also include actions that can be taken at home, on the road and at play to protect health and reduce impacts on local air quality.

In some cases, smog response plans are evolving into clean air plans to reflect the fact that actions on smog days may be practiced on any day to realize health and air quality benefits year round. Locally, the Halton Partners for Clean Air, with the Halton Region Health Department as lead, provides a network for the development and maintenance of the Halton Clean Air Plan, endorsed by local municipalities and involving a broad range of stakeholders. The science of monitoring air quality and relating it to health is evolving and, recently, Toronto began a pilot of Canada’s Air Quality Health Index (AQHI). Information on AQHI can be found at www.weatheroffice.gc.ca.

In a recent press release, the index is promoted as “the world’s first index to communicate the health risks associated with the mixture of air pollutants we breathe and to provide protective health advice to reduce that risk.” The index does not represent the effects on health of odour, pollen, dust, heat or humidity. The AQHI will expand across Canada over the next four years, and will be accessible on a website. This health-based air quality index will be available as a reference to consult when deciding about work outdoors and will represent the level of health risk for the general population and the ‘at risk population,’ a feature not available through the current air quality monitoring system. The City of Toronto’s website provides details on this pilot program.

**Hot weather**

Adverse health effects related to hot weather arise from the relationship between physical activity level, heat and humidity, and the ability of the body’s natural cooling mechanisms to function. Symptoms of heat-induced illness may include rapid breathing, weakness or fainting, headache and/or confusion, nausea, dizziness, blurred vision, convulsions, and high body temperature.

Those especially at risk during heat- and smog-related weather conditions include adults over 65, infants and young children, or people with chronic heart or lung disease, asthma, taking certain medications, exercising vigorously, or working outdoors, depending upon the length of time and exertion levels. Other risk factors include obesity, fever, dehydration, poor circulation and sunburn. These conditions can increase the risk of adverse health effects by altering the body’s ability to respond to hot weather conditions. Often, high temperature and humidity are accompanied by deteriorated air quality, which makes respiratory and cardiac conditions worse.

Hot weather plans address the extreme condition of high temperature and humidity, usually combined with smog. Recently, the GTA Clean Air

“Those most at risk to adverse health effects from smog include children, the elderly, and people who have respiratory or cardiac problems or who exercise outdoors.”
Partnership prepared A Scan of Municipal Heat/Health Watch Warning Systems and Hot Weather Response Plans (2007) for the GTA Clean Air Council. The report concluded that there is much work to be done to develop consistent plans with appropriate trigger criteria that are area specific, with effective intervention strategies applicable to the general community and, in particular, the vulnerable populations.

Heat or hot weather response plans usually address the situation when the combination of high heat, high humidity and other weather conditions is hazardous to health.

In Halton Region, a Heat Alert is issued when Environment Canada issues Humidex Advisories. This occurs when the maximum daily humidex is expected to exceed 40°C (104°F) and/or exceed 36°C for an extended period (three or more days).

Using the Halton Region Health Department’s Heat Alert information, recommendations provided to the community include:

- Stay out of the hot sun or heat.
- If you do go outside, stay in the shade and limit activity to morning/evening.
- Where possible, go to air conditioned sites (e.g., malls, community centres).

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types of outdoor exercise should be toned down or modified, depending on the age
and health of the individual, physical shape, the type of clothes worn, and other
weather conditions.

If working outdoors is an absolute necessity, drink plenty of liquids and take
frequent rest breaks. In hot, humid conditions, there is a considerable risk of heat
stroke and sun stroke.

The Town of Oakville has instituted
a community notification process with
front page access to information on Heat
Alert and hot weather advisory. A typical
message is posted as soon as notification
is received through the Region of Halton's
Heat Alert/Hot Weather Notification
Plan:

As a result of hot temperatures, a
humidex advisory was issued by Envi-
ronment Canada today. When a hu-
midex advisory is issued by Environment
Canada, Halton Region's Health Depart-
ment issues a Heat Alert. In response
to this summer's second Heat Alert, the
Town of Oakville is urging its residents
to take the necessary precautions to limit
outdoor activity and keep cool. During

If you do not have air conditioning,
keep shades drawn and blinds closed.
Fans keep you cool by evaporating
sweat. Use fans in or next to your
window. But, remember that fans alone
may not provide enough cooling.
Keep electric lights off or turned
down low.
Avoid heavy meals and using your
oven.
Take a cool bath or shower periodi-
cally or cool down with wet towels.
Avoid strenuous outdoor physical
activity.
Reschedule sports practices and jog-
ging times.
Plan ahead - ask for policies to
reschedule sports events during heat
alerts.
Exercise/workout indoors in an air
conditioned area.
Drink lots of water and natural fruit
juices (avoid alcohol, coffee, cola).
Wear loose-fitting clothing that allows
for evaporation of sweat.
Wear a hat and use sunscreen (of at
least SPF 15).
Spend some time near the lake or
waterfront where it is cooler.
Never leave children or pets unat-
tended in a car.
Control your pet's exposure to sun
- limit time and provide water and
shade.
Call or visit friends/neighbors who
are at risk, check on them 2-3 times
daily.
Take it easy and rest as much as pos-
sible.
Consult your doctor or pharmacist
about side effects of medications.
From Environment Canada, it is
noted that humidex advisories are issued
with the following information:

- Range of humidex: Degree of comfort
  - Less than 29: No discomfort
  - 30-39: Some discomfort
  - 40-45: Great discomfort; avoid exer-
tion
  - Above 45: Dangerous
  - Above 54: Heat stroke imminent

An extremely high humidex reading
can be defined as one that is over 40. In
such conditions, all unnecessary activity
should be curtailed. If the reading is
in the mid- to high-30s, then certain

continued on page 24
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Heat Alerts and warm weather, the following is recommended:
• Drink lots of water (avoid caffeinated and alcoholic beverages).
• Check regularly on children, neighbours, the elderly, persons with disabilities and chronic illnesses.
• Stay in an air-conditioned place (if possible) and only go outdoors during the coolest part of the day.
• Limit outdoor exercise.
• Avoid the sun by wearing loose-fitting clothing, hat and sunglasses and apply sunscreen 20 to 30 minutes before going outside.

The town publicizes the hours of air conditioned community centres, municipal offices, libraries and swimming pools. Summer camp programs are modified to involve participants in more passive games and water games with regular and frequent water/sunscreen breaks to ensure that staff and campers keep hydrated and cool.

Cold weather
Exposure to extreme cold weather can result in frostbite and hypothermia. Symptoms of frostbite, usually affecting the extremities, are pale grey, waxy-textured skin that is cold to the touch; numbness; and localized pain, swelling and blistering. This condition can lead to serious health complications with the worst being amputation. Hypothermia occurs when the body’s normal temperature becomes too low. Symptoms include shivering, confusion, weakness, mumbling, stumbling, and/or fumbling, and pale skin.

Anyone may be at risk from exposure to extreme cold weather conditions depending on the length of time and exertion levels. However, adults over 65, young children, outdoor workers, outdoor sports participants and those lacking proper shelter, clothing and food are at higher risk.

In the Region of Halton, the Health Department issues a Cold Alert when the following conditions are forecast for Halton:
• daily predicted low of -15°C without wind-chill; or
• the wind-chill reaches the level at which Environment Canada issues a warning for outdoor activity (-35°C); or
• extreme weather conditions, such as a blizzard or ice storm.

Recommendations for response to cold weather include:
• cover exposed skin (exposed skin can become frostbitten in 30 seconds);
• wear a hat (up to 40% of body heat loss can occur through the head);
• wear gloves or mittens and a scarf to protect the chin, lips and cheeks;
• drink warm fluids – but NO alcohol (alcohol can promote other injuries);
• if you start to sweat, cool off a little (wet clothes can freeze);
• wear clothes in layers: inner layer, middle layer, and outer layer;
• keep moving – limit time sitting – stand up and move around;
• take shelter from the wind – this can reduce wind chill exposure;
• keep your vehicle well-maintained and equip your car with an emergency kit;
• prepare a winter survival kit for your home, including food, water, and medicines;
• always be on the lookout for signs of frostbite and hypothermia; and
• plan ahead – listen to the weather forecast.

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“Anyone may be at risk from exposure to extreme cold weather conditions depending on the length of time and exertion levels.”
## Enviroquip MBR Systems... the clear advantage

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Municipal policy/procedures and practices

In the Town of Oakville, the Human Resources Department maintains the Health and Safety Policy and Procedure for Heat Stress Management and Cold Weather Work (No. HS 4.6, effective date 2004, reviewed March 2007) to provide employee awareness of the health risks and preventative measures that will control the hazards when working in extreme temperature environments. The policy recognizes that working in extreme temperature conditions places stress on the human body and provides definitions of heat stress and cold weather ‘signs and symptoms’ with treatment and prevention identified. This document addresses the requirements of the Ontario Ministry of Labour Occupational Health and Safety Act.

To address the notification to employees involved in outdoor work, there is a need for internal staff policy and procedures for hot weather response. This is identified as a legal requirement of the Ontario Ministry of Labour under the Occupational Health and Safety Act. From the Ministry’s website:

Employers have a duty under section 25(2)(h) of the Occupational Health and Safety Act to take every precaution reasonable in the circumstances for the protection of a worker. This includes developing hot environment policies and procedures to protect workers in hot environments due to hot processes or hot weather.

From the Ministry’s website, the following information is provided on managing heat stress induced by hot weather:

Most workplaces do not have ‘hot processes,’ but working in hot weather can pose health risks to their workers. For hot work environments due to hot weather, a hot weather plan is appropriate. A hot weather plan is a simplified heat stress control plan. A hot weather plan should establish the implementation criteria, or ‘triggers,’ to put the plan into effect.

“Be prepared, use the time available in advance of the likeliest ‘extreme’ weather seasons to enhance the protection of staff and the community.”

It is indicated that the criteria may include weather/environmental indicator triggers such as the humidex, Environment Canada’s Humidex Advisory, Environment Canada weather reports or the temperature forecast for three or more days of weather over 32°C.

Staff health and safety training to ensure understanding of policies and procedures includes the annual training of the casual and student workforce. Training topics include smog health issues and smog response, and health and safety policies/procedures such as the Heat Stress Management and Cold Weather Work Policy/Procedure and ‘sun sense’ practices. ‘Sun sense’ reminds staff that exposure to UV rays can cause sunburns and, in the long-term, has been associated with skin cancer and cataracts. The use of proper hats, sunglasses, sunscreen, and appropriate clothing to protect against the existing weather conditions and UV exposure is recommended. The need for attention to hydration is stressed, with specific recommendations to ensure adequate drinking water to avoid dehydration. Also noted is the need for the employee to discuss with his or her doctor and declare medical conditions or medications that may affect a worker’s ability to work in extreme weather environments.

Summary

To prepare for the coming winter and summer, it is a good time to give the Health and Safety Policy, and other corporate policies, procedures and practices a good hard look to see if they need revision and updating to align with the newest health warning systems related to extreme weather conditions. Take advice based on experience, be prepared, use the time available in advance of the likeliest ‘extreme’ weather seasons to enhance the protection of staff and the community.

It is prudent to have extreme weather plans in place, to ensure delivery of appropriate responses in a timely manner. Planning for response to extreme weather conditions is essential to enhance the protection against adverse health effects for staff and our communities.

References:

Canadian Centre for Occupational Health and Safety — http://www.ccohs.ca/oshanswers/phys_agents/humidex.html

City of Toronto — Air Quality Health Index http://www.toronto.ca/health/aqhi/


Region of Halton — Health Department http://www.halton.ca/health/services/air_quality/heat_alert.htm#Q7 http://www.halton.ca/health/services/air_quality/smog.htm#Q5

Town of Oakville — http://www.oakville.ca

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International background and origins

Water constitutes a worldwide challenge for the 21st century, both in terms of integrated resource management and the provision of access to drinking water and sanitation for the world’s population. Many international studies took place during the 1990s, culminating in the United Nations (UN) declaring in 2002 that access to water is an essential human right. Following the third World Water Forum in Kyoto in March 2003, the international community committed to improve governance of drinking water and wastewater services and, to this effect, made it a priority to build capacity with local governments.

While access to safe water and sanitation services remains a physical priority of the international community, improving governance of water services remains one of the first priorities. This sector (in the developing world) suffers from a lack of an applicable legal framework. In particular, any implementation of private/public partnerships should involve government oversight to ensure transparency, accountability and fair and effective provision of services.

Numerous proposals have been elaborated to that end, coming from professional organizations (e.g., Bonn Charter of IWA), UN agencies (WHO, Guide-line, and...
the Charter for Access to Basic Need by UN-Habitat/IGD) or regional groups (Guideline for Good Water Governance and Providing Access to Safe Water and Sanitation of the European Water initiative).

Relying on its experience with such national guidelines, and recognizing the need for a tool respecting the governance of water services, France proposed in 2001 that ISO set up a Technical Committee to provide International Standards giving guidelines for service activities relating to drinking water supply systems and wastewater systems. Forty countries, including Canada, agreed to join this proposal.

These ISO guidelines are designed to help public authorities and legally responsible bodies providing water services, together with their operators, achieve a level of quality that better meets the expectations of users and the principles of sustainable development.

The standards
Set to be in October 2007, there are three standards that set out a recommended methodology of assessing the water's services provided through a system of performance indicators. The standards are:

ISO 24510 Activities relating to drinking water and wastewater services - G guidelines for the assessment and improvement of service to users. This standard includes an inventory of typical users' needs and expectations and provides for each one a possible performance indicator or guidance for meeting the need or expectation.

Aspects considered include: access to water and sanitation services, quality of the service (price of service, continuity of water supply, etc.), contract management and billing (response to billing complaints, etc.), relationship with users (visits to the user, participation of the users, etc.), protection of the environment (efficiency in the use of resources, environmental impact, etc.), safety and emergency measures, and quality of water delivered to customers or discharged as effluents to the environment.

ISO 24511 Activities relating to drinking water and wastewater services - G guidelines for the management of wastewater utilities and for the assessment of wastewater services. This standard covers the services of collecting and treating sanitary and industrial wastewater allowed to be discharged into a sewer system outside buildings, as well as sanitary waste in undiluted form, sanitary wastewater combined with storm water, and storm water that does not include sanitary wastewater. It also addresses the issues of wastewater effluents and residuals.

The standard describes the physical components of a typical wastewater system and proposes six broad objectives for wastewater services: protection of public health, meeting users' needs and expectations, provision of services under normal and emergency situations, sustainability of the wastewater utility, promotion of the sustainable development of the community, and protection of the (built and natural) environment. It provides guidance for the management of a service, and, for each of the objectives, service assessment criteria are proposed along with a performance indicator.

ISO 24512 Activities relating to drinking water and wastewater services - G guidelines for the management of drinking water utilities and for the assessment of drinking water services. This draft deals with all aspects linked with the supply of drinking water, from the catchment of the resource (i.e., the source) to the point-of-delivery to the user (by direct pipe connection or other means such as trucks, bottles, etc.).

The standard describes the physical components of a typical drinking water system, and proposes the same six broad objectives for wastewater services: protection of public health, meeting users' needs and expectations, provision of services under normal and emergency situations, sustainability of the water utility, promotion of the sustainable development of the community, and protection of the environment. Like ISO 24510, the standard also provides guidance for the management of the service, service assessment criteria and performance indicators.

The Technical Committee recognizes that, for various reasons, the guidance and performance indicators may not be applicable in all circumstances nor may be applied or be applicable in some countries, in which case they have to be adapted to local conditions or they have to be considered as a goal for continuous improvement.

What are performance indicators?
Performance indicators are used to measure the efficiency and effectiveness of a utility in achieving its objectives. An example of a performance indicator respecting the protection of public health objective is the proportion of total effluent discharges to the environment that meet applicable effluent quality requirements. An example of a performance indicator respecting the sustainability of the wastewater utility is the proportion of total costs met by revenues. There are many examples available for performance indicators; each one linked through service assessment criteria to the objectives of the utility and its service. Some performance indicators can be used to demonstrate the achievement of more than one objective, e.g., effluent quality contributes to both the public health and the protection of the environment objectives.

Performance indicators are typically expressed as ratios between variables. These ratios may be commensurate (e.g., %) or non-commensurate (e.g., $/m³). In the case of non-commensurate ratios, the denominator should represent one dimension of the system (e.g., number of service connections; total sewer main length; annual costs). This allows for comparisons through time, or between systems.

What is also important are the characteristics of performance indicators. They should be unique and collectively appropriate for representing the relevant aspects of the service in a true and unbiased way. Each performance indicator should:

- be clearly defined, with a concise and unequivocal interpretation,
- be assessed from variables that are easily and reliably measured at a reasonable cost,
- contribute to the expression of the level of actual performance achieved in a certain area,
- be related to a specified geographical area (and in the case of comparison analysis, should be for the same geo-
be related to a specific time period, e.g., annual, quarterly, etc.,
allow for a clear comparison with targeted objectives and simplify an otherwise complex analysis,
be verifiable,
be simple and easy to understand, and
be objective and avoid any personal or subjective appraisal.

Applications
In deciding that Canada would participate in the work of the TC 224, the Canadian Advisory Committee determined that there could be four potential applications of the standards within the Canadian context:

1. as an internal utility mechanism for measuring utility performance over time, e.g., as a tool for measuring continuous improvement;
2. as a mechanism for the utility owner (e.g., the municipality) to receive reports on the management and performance of the utility and for setting goals for future performance;
3. as a means of specifying performance expectations for any management contract of a water utility being considered by the utility owner; and
4. as a means of overseeing utility performance by the public authority regulating water utilities.

These potential uses have been confirmed and, through the development process, which included experts from 24 countries who actively participated in the working groups, applications both current and future have been identified for all. British water companies use performance indicators internally (application 1). Japanese metropolitan governments use PIs (Performance Indicators) for water services in their jurisdictions (application 2). French municipalities use performance indicators as part of their management contracts with the French water companies (application 3). The UK Office of Water (OFWAT) uses PIs as a means of establishing new policy and compliance programs (application 4).

The future
The ISO TC 224 will have its last meeting in November following the publication of the standards. It may consider taking on new work initiatives related to the assessment of services and a call for suggestions will be made to the participating countries in September. Once the standards are published, the committee would normally meet again only in 2010 to consider what experience has been had over the interim period. One initiative that is taking place is the specific pilot testing of the standards in developing countries of Africa, Latin America and Asia, where operational data may be less available and reliable than in developed country utilities.

In Canada, one of the objectives of CWWA (Canadian Water and Wastewater Association – representing the corporate interests of municipal water and wastewater services in Canada) is to provide management tools for utilities. CWWA believes that a comprehensive guideline on the development and use of performance indicators will be beneficial to utilities in Canada and that the ISO standards can serve as a template for the development of this document. Accordingly, CWWA is working with CSA (Canadian Standards Association) to develop an expected national standard on the assessment of water services based on performance indicators. Work on this will commence in the fall. For more information or to participate in this activity, please contact T. D. Ellison at tdellison@cwwa.ca or by telephone at 613-747-0524.

End notes:
1 T. D. Ellison, Executive Director, Canadian Water and Wastewater Association, Chair of the Canadian Advisory Committee to ISO TC 224.
2 Where the context means both water and wastewater services, then the term “water” is used alone.
3 In 2001, an ISO technical committee was launched, ISO/TC 224, that has been developing standards providing guidelines for service activities relating to drinking water supply systems and wastewater sewerage systems.

T. Duncan Ellison Executive Director, Canadian Water and Wastewater Association
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Construacted in the 1930s, the RC Harris Water Treatment Plant is the largest of the four water treatment plants supplying the daily water needs for the City of Toronto and York Region. This plant alone supplies approximately 33% of those needs.

Located in the Beaches area of Toronto, this 950 M L/d conventional filtration plant was designed in the classical architectural Art Deco style. The facility was declared a national historic civil engineering site in 1992 and is registered under the Ontario Heritage Act. The plant has been the venue for numerous film and television shoots.

The original design of the plant had the residuals from the water treatment process backwashed directly into Lake Ontario. Subsequent changes in Ministry of Environment regulations and the City’s commitment to improve the Lake’s water quality along local beaches resulted in the city commissioning a Class Environmental Assessment (EA) for the plant. The outcome of this EA was a recommendation to construct a Residue Management Facility (RMF) on site to treat plant residues.

As the original treatment plant was designed by Gore and Storrie/H C Acres, it is perhaps fitting that CH2M HILL, Gore and Storrie’s successor, was awarded the contract to design the new RMF. The location of the RMF posed several significant design challenges for CH2M and construction challenges for Kenaidan Contracting (Kenaidan) as the constructor. These challenges started with the requirement that the facility be constructed entirely below grade, so as not to impact the heritage aspects of the RC Harris plant.

Additionally, the only available land for the RMF, with a footprint about the size of a CFL football field, lay on a steep 30-degree slope between the existing filter building, the service building and the 2100mm-diameter treated water conduits that carry water to the City of Toronto distribution system. (See Photo 1 – Schematic overlay of the new RMF. Due to the importance of this plant to the city, no disruption in production could be tolerated, unless planned and coordinated several months in advance and only for short durations during the low water use seasons.

The new facility’s location required shoring systems to be employed to support the adjacent structures during construction. These systems were a prime consideration in both the design and construction phases of the project. The primary shoring systems were a combination of conventional pile and lagging, conventional interlocking caisson walls and the relatively new system of continuous flight auger interlocking walls.

An example of the importance of the shoring systems employed is the support of the existing filter building and adjacent treated water conduits. Any significant movement of these facilities could have resulted in the complete shut down of the RC Harris plant. Therefore, the shoring in this location was subject to extremely stringent allowable movement criteria and continuous monitoring during construction. The continuous flight auger method minimizes soil loss during installation of the walls and, as a result, was used to shore the excavation adjacent to these structures.
The process design involves the diversion of backwash water from the existing plant drain into the RMF, where the backwash water is settled and decanted. The decant water is reintroduced into the plant drain outlet to Lake Ontario. Leakage water from the existing plant is also diverted through the RMF and can be retained for use in the landscaping irrigation system.

Residuals from the settling/decant process are clarified and thickened in four circular clarifier/thickener tanks, then dewatered to sludge cake with two centrifuges, before being disposed of at an acceptable landfill site.

At its highest elevation, the completed structure is approximately 23m above the deepest point in the RMF, the deepest point being approximately 7m below lake level. The structure is a complex system of multi-level tankage and process galleries, reflecting the difficulty of trying to fit a new treatment train into a relatively small footprint on a sloping site. (See Photo 2 – Partially completed concrete structure)

Kenaidan commenced construction of the RMF in October 2004 with the installation of shoring and excavation for the reinforced concrete structure and the temporary site access road east of the existing plant. Due to concerns over potential traffic congestion along Queen Street in the Beaches, the majority of excavated soil had to be loaded onto barges at the RC Harris seawall and towed to the disposal site at the Ashbridges Bay Waste Water Treatment Plant.

Once the structure was fully excavated, the magnitude and critical importance of the shoring system was quite apparent, with the existing filters building and water conduits supplying over 30% of Toronto’s water, perched some 20m above the base of the excavation. (See Photo 3 – Excavation and shoring adjacent to the existing filter building) It was a relief for the team members from the city, CH2M and Kenaidan when the new RMF structural concrete adjacent to the shoring system was completed and the security of Toronto’s largest water treatment plant was no longer reliant on a shoring system.

Construction of the RMF has continued through 2005, 2006 and 2007, with installation of the major mechanical process systems being carried out concurrently with construction of the concrete structure. With the entire structure being below grade, combined with its complex structural elements, access for much of the mechanical process installations after completion of the concrete work was impossible. (See Photo 4 – Process piping and thickener tanks in lower process gallery) This interaction of key mechanical work with structural concrete was an important element of the project schedule.

To add some additional fun to an already challenging project, it was necessary to construct a deep chamber to divert the backwash water into the RMF and an outfall chamber to reintroduce the decant water back into the existing plant drain. Connecting to both the diversion and outfall large diameter piping involved locating and then breaking into the existing 1350mm-diameter plant drain, which happened to be buried in mass concrete beneath two 2100mm-diameter treated water conduits.

In no small measure, the success of this challenging project has been due to the collaborative approach (and collective sense of humour) of the project team members from the City of Toronto, CH2M and Kenaidan.

The project is currently in the equipment start-up and commissioning stage, with full process operation expected to commence in October 2007.

David Kirkland, P. Eng. GSC
Vice President, Project Management
Kenaidan Contracting Ltd.

John Mills, P. Eng
Senior Project Manager
CH2M Hill Canada Limited
THE GROWING SHORTAGE

How demographics will inform strategy
A multitude of factors impact every organization’s strategic decisions, and managers are constantly challenged to find the right equilibrium to this dynamic. There is one key driver, however, that will dominate organizational strategy for the next generation. More than capital, resources, energy, competition, trade, pandemics, or terrorism, the labour force will become the pre-eminent strategic consideration. The way in which industries, sectors and organizations understand and respond to the projected demographic shrinkage will determine their ultimate success or failure.

**Birth, employment, retirement**

Since the 1960s, the developed world has experienced a significant decline in both:
- the fertility rate (percent of women having children) and
- the birth rate (number of children per woman).

When coupled with the aging and impending retirement of the Baby Boom generation, these factors are changing labour markets worldwide. (Boom, Bust and Echo) In understanding labour force projections, there are two critical elements – New Entrants and Exiters. New Entrants to the labour force are youth leaving school and new immigrants. Exiters are comprised of retirements, emigration and death.

Current demographic projections indicate that, in 2013, these two lines will intersect, meaning that there will be more Exiters than New Entrants. (Conference Board of Canada) As this pattern continues, the labour force will shrink, because there will be a shortfall of new workers to replace those who are retiring and dying. This will not be a sudden, cataclysmic event. Rather, it is a gradual process that will be uneven, both geographically and by sector.

If all other factors remain constant, this continuous shrinking of the labour force will result in reduced output, a deteriorating economy and a steady erosion of our standard of living, because the ability to produce goods and provide services will be constrained by the dearth of workers.

**A preview**

Alberta and British Columbia, where their booming economies are already experiencing labour shortages across many industries and sectors, provide an insight into how this situation might look. For example, some hotels in Calgary are posting No Vacancy signs, because they cannot hire enough staff to clean the rooms. Some businesses have even been forced to close down. The construction industry, hobbled by a lack of skilled tradespersons, cannot build homes, hospitals and schools fast enough to accommodate its burgeoning population. The development of the infrastructure is lagging demand. (Globe and Mail)

As the competition for labour becomes evermore acute, what are the various responses? Furthermore, are these responses of a tactical or strategic nature?

**Compensation**

One obvious alternative is to offer higher pay. In Alberta, a fast food chain has found it necessary to increase pay over time from $7 to $17 per hour in order to compete for labour. This short-term, tactical action may provide some limited relief, but it is not a long-term, strategic solution.

Ultimately, competing for labour on the basis of pay just creates a new pay floor, resulting in an unsustainable upward structural cost spiral. The cumulative effect can be seen most recently, where major expansion plans for oil production have been deferred, because spiraling wage costs have rendered them uneconomic.

**Recruitment, retention**

A number of sectors in Alberta have initiated recruitment efforts that extend across Canada and, in some instances, globally. An example is in construction of the energy infrastructure, its production and related support services, where companies are offering significant compensation enhancements (increased pay, rental relief, paid airfare) to encourage immigration that satisfies their skills requirements. Once recruited, their further challenge will be to retain those employees, which requires a culture that cements employee loyalty. Otherwise, these firms will experience costly turnover.

In British Columbia, the construction sector has initiated a two-day construction camp for young girls in order to interest them in the industry. This is a profound departure for this male-dominated sector.

Ironically, after years of government-mandated initiatives, employment equity finally will be achieved through the dynamics and needs of market forces. Strategically, organizations will need to broaden their recruitment universe to capture potential candidates from groups that they might not have engaged previously, such as aboriginals, women and minorities. Developing supportive and welcoming work environments also will require particular attention.

**Reorganizing work**

In order to attract and accommodate a workforce that will be expressing emergent needs, progressive organizations will reorganize the nature of work and the manner in which it is arranged to make it more interesting and desirable. For example, introducing flexible hours or project-based activities may help retain older employees who otherwise might retire. Younger workers, on the other hand, will gravitate to organizations that provide heightened personal fulfillment and developmental opportunities. This, in turn, will necessitate upgrading the underlying nature and organization of work so that it fulfills these aspirations.
Employer of choice

In a labour market characterized by chronic labour shortages, workers will recognize increased power in the relationship with their employers. How organizations respond will be telling and, to a large degree, will determine their success.

Some organizations will not be interested in adjusting their operations. They will likely employ workers with lesser skills and will continue to compete on pay, with the inherent churning of their labour force. Invariably, this will become part of their cost structure.

Other organizations will listen very closely to what their employees want and will invent creative responses to satisfy those needs. These will include:
- professional and personal development,
- job rotation and enrichment,
- training and developmental opportunities,
- engagement in solving problems and making decisions,
- enhanced responsibilities,
- profit sharing,
- work/life balance, and
- values-based enterprises that embrace ‘sustainability.’

Because younger workers will seek more than just remuneration in their work, the dual themes of social responsibility and sustainability will become significant priorities for them. These New Entrants will pursue organizations that embrace such values and embed them at their core.

A growing number of discerning organizations are recognizing that social responsibility and sustainability create fundamental value and differentiation. These serve as significant drivers for organizational innovation and excellence, as well as becoming essential strategies for employee recruitment and retention.

Changing the equilibrium

It was stated earlier that, if all factors other than the shrinking labour force remain static, a profound erosion of our standard of living will occur. In fact, many factors will undergo adjustments in response to these dynamics, thus mitigating the situation.

It already can be seen that work is being modified to delay retirements, thereby adding to the overall labour pool. In addition, recruitment is being extended to a larger potential universe. As competition for labour increases, values-based enterprises that incorporate innovative work arrangements and heightened employee engagement will experience more success in attracting and retaining skilled employees.

But, of necessity, the biggest adjustment will be a giant leap in productivity. This will be like going from Murray Westgate to self-serve gas stations or from bank tellers to ATMs and online banking. Because labour will cost more in this changed marketplace, organizations will find it cost-effective to invest in new technologies and efficiencies.

An example of this is the Canadian primary steel industry, where 55% of the workforce is over 45 years of age. By introducing new technologies, the sector anticipates needing to replace only 50% of these imminent retirees. Even at that, however, an estimated 2,300 new operations and trades workers will be required over the next five years – three times the recent rate of recruitment. (Canadian Steel Trade and Employment Congress) The adoption of new technologies, streamlined processes and value-added breakthroughs will help maintain and even enhance our standard of living.

Managing strategically

Demographics will influence the re-shaping of organizational strategy, including:
- reorganized work arrangements,
- employee engagement and management responsiveness,
- recruitment, selection, retention, and post-retirement strategies,
- values-based organizations that embed ‘sustainability,’ and
- productivity improvement.

Astute organizations are embracing the changing economy by ensuring their culture is ready for these unique challenges.

“In a labour market characterized by chronic labour shortages, workers will recognize increased power in the relationship with their employers.”

Bill Fields, President
bfields@diamondmanagementinstitute.com
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18. UNDERGROUND SOLUTIONS INC.
    Fusible C900/905 PVC Water & Sewer Pipe, HDD, River and Road Crossings, Sliping, Pipebursting, Duraliner PVC structural rehab

19. SIEMENS WATER TECHNOLOGIES
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    Package Water Plants
    Centrifugal Filters, Sludge Sucker
    Envirex Circular and Rectangular Clarifiers, Thickeners, DAF units
    RBC, SBC Units and SBR’S Clarification
    Oxidation Ditches
    IFAS Media
    Jet-Tech Aeration, Jet Mixing
    Continuous Backwash, Traveling Bridge & Disc Filters
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SPARE PARTS FOR ALL PRODUCTS
t. George’s Golf and Country Club was the site of the annual luncheon and induction ceremony of the Ontario Chapter of the Select Society of Sanitary Sludge Shovellers. On June 5, 2007, 39 SS members, reportedly a record attendance, gathered at St. George’s under the kind auspices of Erv McIntyre to meet and reminisce with fellow members and formally induct the new Shovellers for 2007. This year, the inductees were Dave Spiller of the Regional Municipality of Durham, George V. Crawford of CH2M Hill Canada Limited, and Michael Albanese of H2Flow Equipment Inc.

As usual, the three inductees were received into the Society with due honours and perquisites as their temporary shovels, received at the WEAO Annual Conference Awards Luncheon in April 2007, were surrendered in favour of the well-recognized gold tie clip/apel pin with the white trillium symbol. The honourable pH7, Geoff Scott, was in attendance to see that all traditions were strictly adhered to.

It was with sadness that the passing of several members was noted. The esteemed Shovellers fondly remembered were George B. Crawford, Mae Grove and Brian Leclair.

Following the luncheon and induction ceremony, long-time member Charles Ferguson spoke about his career in the wastewater industry from his perspective as an environmental professional working for Inco Limited. He recounted that he was the son of an Inco mining engineer who had short stints at James F. McAlar Laine Limited and Dorr-Oliver-Long Limited, prior to his long career at Inco from 1965 to 2003. Currently, he is an environmental advisor to FNX Mining in Sudbury.

Charles noted that Inco, which began as a copper mining company over 100 years ago, had recently been purchased by a Brazilian company called CVRD. He expressed concerns over the fact that Canada’s natural resource companies were not protected from foreign ownership. Charles also provided some insight into recent developments in Inco/CVRD’s activities at Voisey Bay and in New Caledonia. He noted that the company’s future activities would be in the area of uranium mining. Charles’ speech was well received and spurred several questions and comments.

It was with great anticipation of next year’s luncheon that the Shovellers departed St. George’s.

Peter Nicol (far left) and WEAO President Peter Takaoka (far right) flank the new SS inductees (L-R) Michael Albanese, David Spiller and George Crawford at the Annual Conference Awards Luncheon back in April.
During the recent Annual Conference held in London, ON and at WEFMAX in Chicago, IL, it has been recognized by WEAO and WEF that there is a shortage of qualified operators, technicians and technologists in the water and wastewater industry. This shortage is not limited to our industry only, but also across the municipal public works sector.

In February of 2007, the Ontario Good Roads Association conducted an informal survey of municipal public works organizations to try and find out if there was a shortage of qualified technicians and technologists. This survey included the water and wastewater system facilities and services.

The online survey was distributed to senior public works staff across Ontario. There were 80 responses to the survey, which, accounting for 17.9% of Ontario’s municipalities, can be interpreted as a statistically significant representation of this sector.

Based on the indications of this survey, municipalities are having difficulty attracting and retaining qualified technical staff. Those in rural and northern Ontario appear to be facing the greatest challenges in finding good candidates.

Reasons for these difficulties can primarily be attributed to a shortage of qualified, experienced candidates combined in many cases with lower compensation levels and location of the position. Municipalities may wish to consider:

1. Beginning to bring local compensation rates up to competitive market rates.
2. Creating trainee positions to foster experience through a variety of appropriate operations paths.

Indications from the survey suggest that, although there are employment opportunities within municipalities across Ontario, the larger shortage of qualified technicians and technologists are within the smaller communities, where new job seekers may find more opportunities to gain work experience.

Vincent Shiu, B. Ed (AdEd), B.A. (Ed)
WEAO New Professionals Committee, Committee Member

Vincent is currently employed by Ontario Good Roads Association, in the role of Curriculum Coordinator within the Department of Professional Development and Training covering education programs for the municipal transportation and public works sector.
William M. Butler, who was with the City of Saint John, New Brunswick for 25 years, received an award named in his honour for Outstanding Canadian Service at a dinner held during the American Water Works Association (AWWA) annual convention held in Toronto.

Water For People is an international, non-profit organization based in Denver, Colorado. Its mission is to assist people in developing nations gain access to safe drinking water and proper sanitation. Water For People was formed in 1991 by the American Water Works Association and it is the charity of choice for the North American water industry.

In 1995, Bill Butler and other Canadian volunteers formed Water For People – Canada (WFPC), which was originally created so that Canadian WFP donors, primarily through AWWA, had a Canadian non-profit organization to which they could send their donations. An agency agreement between Water For People and Water For People – Canada outlined that the Canadian organization would have the same mission, vision and goals of WFP, but that some WFP activities would be adapted for our Canadian culture and legal system. Mr. Butler served as the first president of WFPC until 2003, when he retired from the City of Saint John. He still sits on the Board and is chair of the International Programs Committee.

Master of Ceremonies, Tony Petrucci, of CH2M HILL Ltd. and President of Water For People Canada, said “thanks to Bill Butler’s vision, countless thousands around the world now enjoy the benefits of safe water and improved sanitation.” He told the audience that WFP’s vision is a world where all people have access to safe drinking water and sanitation; a world where no one suffers or dies from a water- or sanitation-related disease. Mr. Petrucci went on to cite these most startling statistics:

- 1.8 million people die every year from diarrhoeal diseases (including cholera); 90% are children under five years of age, mostly in developing countries.
- 88% of diarrhoeal disease is attributed to unsafe water supply, inadequate sanitation and hygiene.
- Improved water supply reduces diarrhoea morbidity as much as 25%.
- Improved sanitation reduces diarrhoea morbidity by 32%.
- Hygiene interventions including hygiene education and promotion of hand washing can reduce diarrhoea cases by as much as 45%.
- Improvements in drinking water quality though household treatment can lead to a reduction in diarrhoea episodes by between 35% and 39%.
- 1.3 million people die from malaria each year, 90% of whom are children under five years of age.
- There are 1.5 million cases of hepatitis A every year.
- 146 million are threatened by blindness related to a lack of face washing due to absence of nearby sources of safe water.

Mr. Petrucci quoted Dr. Lee Jongwook of the World Health Organization, who said, “Once we secure access to clean water and adequate sanitation facilities for all people, irrespective of their living conditions, a huge battle against all kinds of diseases will be won.” Each WFP project addresses the three areas of water supply, adequate sanitation and hygiene education, to help win this battle.

The UN has included water supply, sanitation and hygiene in its Millennium Development Goals (MDG). The world community has acknowledged...
the importance of their promotion as development interventions and has set a series of goals and targets, some of which are:

- By 2015, cut in half the proportion of people without sustainable access to safe drinking water and basic sanitation.
- By 2020, achieve a significant improvement in the lives of at least 100 million slum dwellers.
- Between 1990 and 2015, reduce by two-thirds the under-five mortality rate.
- By 2015, have halted and begun to reverse the incidence of malaria and other major diseases.

The UN has declared 2005-2015 Water For Life as the International Decade for Action and set the world agenda on a greater focus on water-related issues.

Companies or individuals wanting to get involved with Water For People – Canada can contact Penny Davey with Environmental Science and Engineering magazine at penny@esemag.com.

By Penny Davey

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Moving Forward in Moncton

The International Water Association (IWA) Biosolids Conference/Fourth Canadian Residuals and Biosolids Conference was a resounding success. Ronald LeBlanc and the folks at the Greater Moncton Sewerage Commission did a fabulous job of planning and hosting the events.

The conference, which occurred June 23 to 27 in Moncton, New Brunswick, provided an excellent opportunity to examine biosolids practices and research from around the world. With over 450 delegates from 44 different countries, this was indeed a global conference. While biosolids processing can differ widely around the globe, from hand-digging pit toilets in Africa to advanced nutrient reclamation from centrate, it is clear that the need for sustainable biosolids management is a constant challenge in all corners of the earth.

As one presenter put it, “Building the plant is the easy part, operating it and managing the resultant biosolids is the real challenge.”

The theme of the conference was Moving Forward, with an emphasis on trying to move the global environmental agenda forward. This was evident in the highlighting of presentations on sustainability and taking a long-term big picture approach to biosolids management. One such topic which was mentioned several times is the impending phosphorus crisis. The world’s supply of clean, cheap rock phosphates will only last for another 50 years or so. As phosphorus becomes scarcer and more expensive, the need for the phosphorus contained in biosolids will continue to increase. Within our lifetime, biosolids could become one of the largest sources of available phosphorus, and may be a key to sustaining the planet’s agricultural production in the future. We need to work hard now, to create a society that does not just tolerate, but rather welcomes, the use of biosolids.

One of the outstanding elements of the conference was the exceptional social events. The Greater Moncton Sewerage Commission went all out to show visitors from around the world true maritime hospitality. From the mouthwatering lobster dinner at the wastewater treatment plant, to being piped down the main street of Moncton prior to enjoying a variety night of Canadian talent at the Capital Theater, the Commission provided everyone a truly enjoyable and memorable time in beautiful Moncton.

Following on the success in Moncton, planning for the Fifth Canadian Residuals and Biosolids Conference is already underway. Catherine Jefferson of the WEAO was pleased to announce that the Biannual Canadian Biosolids Conference will be returning to Ontario in 2009.

Canadian Biosolids Partnerships takes another step forward

Following the conference, there was a meeting of the interim Canadian Biosolids Partnership (CBP), which examined the next steps in the ongoing creation of the CBP. The idea of a Canadian biosolids group has been bandied about since before the first Canadian National Residuals and Biosolids Conference in 2000 in Toronto. It has existed for several years as an informal information-sharing network administered by the Canadian Water and Wastewater Association (CWWA). It was revitalized as the Canadian Biosolids Partnership in 2004, and has been growing towards reality since, under the championship of Ronald LeBlanc, Commissioner of the Greater Moncton Sewerage Commission.

The Partnership is still wrestling with the issue of its purpose and mandate and to what extent involvement of federal and provincial regulators is needed. On the topic of provincial involvement in biosolids, it was disappointing to note that, apparently, only one Ontario Ministry of the Environment (MOE) staff was present at the conference in Moncton.

Even though not yet fully formed, the Canadian Biosolids Partnership has already begun to develop biosolids resources, such as a website summarizing biosolids regulations across the country. Work is also underway trying to garner support for the Partnership from federal and provincial regulators, as well as municipalities. Letters requesting commitment to help with the founding of the Partnership have been sent out to a wide variety of stakeholders. If you have not seen one and would like to help out, check out the Partnership pages at the CWWA website (www.cwwa.ca).

The creation of the Partnership would help in moving biosolids forward in Canada. It is also a very timely enterprise, as the Canadian Food Inspection Agency (CFIA) is currently holding consultations to revise the regulation of fertilizers in Canada, including a working group on biosolids. Also, as the Canadian Council of Ministers of the Environment (CCME) is now finalizing its work on setting national standards for Municipal Waste Water Effluent (MWW E), it is likely that it will soon be turning its attention to biosolids. If nothing else, its proposed national secondary treatment standard will result in the generation of considerably more biosolids. We need to ensure that there is a strong national voice for biosolids, such as the Partnership, to help educate the regulators and the public, so that future regulations will promote sustainable biosolids management.

The next meeting of stakeholders interested in the Partnership will take place November 14, 2007 at the CWWA annual Window on Ottawa.

Submitted by Mark Rupke, City of Toronto
A New Level of Thinking

A new energy is flowing at DELCAN Water. We have always been at the forefront of providing government and corporate clients in Canada and around the world with the highest level of engineering expertise and services.

Now, DELCAN Water offers even broader capabilities with the establishment of DELCAN IWS (Intelligent Water Systems), which offers leading edge design and implementation of automation, network and information management systems; expertise that complements DELCAN Water’s established reputation for engineering services. DELCAN Water also benefits from even greater global resources with our new alliance to DELCAN Water (DHV Netherlands). DHV is an international leader in water technologies having provided integrated solutions to over 1,000 plants worldwide.

Contact us today and learn more about how you can benefit from the new ideas that are flowing at DELCAN Water.
In recognition of long-term service, a special luncheon was held to honour WEAO members with 25 or more years of service. At the May 31, 2007 25-year service luncheon, 16 honourees were acknowledged for their life-long commitment to WEAO and the environment.

A special welcome was provided by WEAO President Peter Takaoka, who spoke passionately about how vital it is to have members with such great service life to the association. He reviewed the history of WEAO since its initial formation as the Canadian Institute of Sewage and Sanitation in 1932, through its various transitions, to its current association as WEAO. He stressed the positive impact that the honourees have had in the development and support of WEAO’s vision and mission, as well as in the progress of the water industry as a whole.

Peter Takaoka presented the honourees with a special pin and certificate to commemorate the occasion. WEAO has designated a special blue pin to honour those members who have achieved a quarter century in continuous service. This badge will distinguish them at all WEAO functions, indicating the place of honour that the WEAO organization places on the time, efforts, and support that they have provided over the past 25-plus years.

The Member Services Committee carried out the 25-year service luncheon. Special thanks to Julie Vincent and Carrie Vincent for their hard work in the organization of the event.

Susan Hansler, M.A.Sc., P.Eng., City of Toronto

(L-R) Steve Black, Bob Kuzyk, Dr. Nihar Biswas, Dr. Earl Shannon, Gerry Sigal, Tom Alkema, Don Cane, Geoff Scott (seated), Bill Gray, Hershel Guttman, Mike Loudon, Peter Takaoka, Bob Wilicocks, Peter Laughton, Don Hoekstra and Steve Nutt.
The Water Environment Association of Ontario (WEAO) has a membership of almost 1,300 environmental professionals in Ontario. There are also several hundred other environmental professionals who can access the services offered by the WEAO through other member organizations such as the Ontario Pollution Control Equipment Association (OPCEA) and the Professional Wastewater Operators (PWO).

The many activities of the WEAO and the other groups have traditionally been sponsored by member companies of OPCEA. Sponsorship assists WEAO in putting on these activities at a reasonable cost, and also provides greater exposure of the participating companies to a targeted audience.

Over the years, companies have been approached multiple times by people organizing events for sponsorship dollars. They have been very gracious to provide the funds asked for, or they decline with courtesy. The WEAO recognizes that this is not an efficient way to perform this function, and appreciates that this could be an irritant to our suppliers as well. A task force was struck by the Board to investigate and recommend changes to this process. This task force includes representatives from the Conference Committee and the Long-Range Planning Committee as well as OPCEA and the Executive Director.

The committee reviewed other sponsorship programs including the one used by the Water Environment Federation (WEF), and has decided to pursue a new strategy for sponsorship. This strategy should be approved by the Board and be ready for implementation by early 2009 at the latest.

All events conducted by the WEAO will be offered for sponsorship to suppliers and consultant organizations. It is expected that there will be different levels of sponsorship opportunity depending on the audience to be reached. All activities at the annual conference will also be offered for sponsorship.

The overall objective will be to offer a package to sponsors, which gives companies an integrated marketing and promotional opportunity that positions their organization to the widest audience for their products or services. They will only be required to contribute once in a calendar year at the level or levels they choose. This will allow companies to budget for this activity annually.

When fully implemented, this will bring WEAO in line with other groups who use this avenue to raise funds both in Canada and the US.

Your comments and feedback on this initiative is greatly appreciated. Please send your comments to Julie Vincent or Catherine Jefferson at the WEAO office.

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Stantec recently announced it is donating $50,000 to Water For People, a US and Canadian charity organization that provides water, sanitation and hygiene education support to developing countries. Stantec made this donation in commemoration of National Drinking Water Week, being celebrated all over North America.

“We are proud to support an organization like Water For People that understands the importance drinking water has to global health,” said Tino DiManno, leader of Stantec’s Canada region. “Much of Stantec’s work involves providing safe public infrastructure and this donation further supports that objective.”

In 2003, Stantec supervised the construction of a water supply infrastructure project in Malawi, Africa, one of Water For People’s targeted countries. Since then, several of the company’s offices have been active in the organization, volunteering for fundraising events, contributing in-kind services, and providing employees as committee and board members.

This $50,000 donation allows Stantec to provide direct support to targeted projects, including continued work in Malawi.

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Terratec Environmental Ltd.
EAO was recently one of the sponsors of the Trenchless Technology Roadshow held in Niagara Falls, from May 28 to June 1. The roadshow is a seminar and tradeshow dedicated to educating municipal and contractor personnel on the benefits of trenchless methods for sewer and water pipeline rehabilitation. The event was hosted by the Centre for Advancements in Trenchless Technologies (CATT), in association with the Municipal Engineers Association (ME A), the North American Society for Trenchless Technologies (NAST T), the Ontario Public Works Association (OPWA) and the WEAO. The event was a resounding success and included over 40 exhibitors.

This was a unique opportunity to introduce WEAO to professionals in the area of trenchless technologies, as the vast majority of people attending the roadshow were not WEAO members. Our participation in the roadshow also represents an opportunity to develop stronger linkages with groups such as CATT and NASTT, who share many of our interests and goals. NASTT and CATT will be key sponsors of the 2009 NO DIG! Conference that will be held in Toronto.

Thanks to all the members of the Collections Committee who organized the booth. Special thanks go to those who volunteered to represent the WEAO at our booth, including Catherine Jefferson and Harold Chard.

Christine Hill, M. Eng., P. Eng.
XCG Consultants Ltd.
Chair of Wastewater Collection Systems Committee
THE PROBLEM-SOLVING WORKSHOP IS HEADING NORTH

The WEAO’s popular Problem-Solving Workshop will be presented at the Holiday Inn in Sudbury on Wednesday, October 10, 2007. The one-day training session will once again be facilitated by Hany Jadaa of LEXICON Environmental Consulting Services Inc. The primary objective of the workshop is to provide participants with a framework for solving problems, while stressing the importance of a team approach. The workshop uses innovative knowledge-transfer skills to create a highly interactive and motivating atmosphere – ideal for learning. While working through case studies that focus upon the activated sludge process, attendees are expected to utilize the problem-solving techniques taught during the day. Although the workshop reviews aspects of process knowledge, it is not intended to provide comprehensive instruction on the activated sludge process.

The course curriculum, which has recently been upgraded and enhanced by Hany Jadaa of LEXICON Environmental, received high praise from the operators who attended the Problem-Solving Workshop recently held in London. Participants will receive a copy of the revised Student Workbook, a certificate of attendance, and are eligible to receive 0.65 CEUs.

For more information, check the WEAO website or contact John Thompson at john.thompson@region.durham.on.ca.

PROFESSIONAL WASTEWATER OPERATORS (PWO) THE YEAR IN REVIEW

PWO was actively involved in a number of initiatives during the past year:

Regional conferences
Regional conferences consist of technical presentations on topics of interest to wastewater operators, accompanied by table-top equipment supplier displays, showcasing the latest developments in wastewater technology. Conferences were held at the following locations:
- Southeast PWO Conference – Kingston, Ontario (September 25, 2006)
- Southeast PWO Conference – Chatham, Ontario (November 8, 2006)

Problem-Solving Workshop
Designed for senior operators, the Problem-Solving Workshop provides participants with a framework for solving problems at wastewater treatment facilities, while stressing the importance of a team approach. Workshops were held at the following locations:
- Brockville, Ontario – September 20, 2006
- London, Ontario – April 18, 2007

MOE Operator Certification and Training Working Group
The Operator Certification and Training Working Group was established by the MOE to ensure that, as certification program decisions are considered, there is a forum for discussion with stakeholders. To date, the Working Group has convened at the Ministry’s offices in Toronto on four occasions: September 12, 2006; November 18, 2006; February 15, 2007; and June 14, 2007. The PWO/WEAO representatives on the Working Group are:

- John Thompson, Regional Municipality of Durham
- Stephen King, Utilities Kingston
- Dave Dutchak, City of Thunder Bay
- Robin Dudley, Chatham-Kent Public Utilities Commission

Operator-In-Training (OIT) Certification Examination Review Committee
A PWO representative participated on the MOE’s OIT Examination Review Committee.

John Thompson
Committee, which convened in Toronto on December 13 and 14, 2006.

William D. Hatfield Award
The William D. Hatfield Award is presented by the Water Environment Federation (WEF) to operators of wastewater treatment plants for outstanding performance and professionalism. The 2007 Award recipient, Jack MacRae of the City of Windsor, was recognized at the WEAO Awards Luncheon on April 16 in London, Ontario.

Operator’s Corner
Operator’s Corner is a regular component of WEAO’s quarterly magazine, INFLUENTS, and includes articles of interest to wastewater operators. Popular features include: Plant Profiles, Success Stories, and Certification News.

Operations Challenge Competition
PWO continues to provide financial support for the Ontario teams competing at the annual WEF Operations Challenge Competition. The Southeast and Southwest PWO Regions contributed $1,900.00 toward the registration costs of the teams that will be representing Ontario in October 2007 in San Diego, California.

What’s new with PWO?
PWO continues to provide financial support for the Ontario teams competing at the annual WEF Operations Challenge Competition. The Southeast and Southwest PWO Regions contributed $1,900.00 toward the registration costs of the teams that will be representing Ontario in October 2007 in San Diego, California.

Upcoming PWO Events
- Southeast PWO Conference – September 25, 2007 (Kingston, Ontario)
- Northern Ontario PWO Conference – October 11, 2007 (Sudbury, Ontario)
- Southwest PWO Conference – November 7, 2007 (Chatham, Ontario)
- Problem Solving Workshop – October 10, 2007 (Sudbury, Ontario)

For more information about PWO, contact john.thompson@region.durham.on.ca

Submitted by John Thompson, Regional Municipality of Durham
On June 6, 2007, the 16th annual OPCEA Golf Tournament was held at the Kleinburg Golf Club. This year, 248 members and their guests golfed in excellent weather and enjoyed an outstanding dinner. A total of 45 OPCEA member companies participated in this event. Special thanks to Heinz Held, Mark Reeves, Rob Anderson, Wayne Harrison and Greg Jackson, who manned the registration desk and organized the prize tables.

Water For People Canada raised over $1,540 in OPCEA’s name selling raffle tickets and wristbands.

The Vissers Sales Corp. foursome of Greg Vissers, John Low, Sean Partington and Grant Stanley won the scramble format tournament with a low score of 11 under par.

HOLE IN ONE CANADA INC. sponsored three closest to the pin holes and awarded prizes for landing on the green, closest to the pin, within 4ft-square, within SAAB 4ft x 8ft, and hole in one.

The OPCEA Golf Committee would like to thank the companies who sponsored gifts on each of the 27 holes.

### Sponsored hole winners

<table>
<thead>
<tr>
<th>SPONSOR</th>
<th>WINNER</th>
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<tbody>
<tr>
<td>John Muenier Inc.</td>
<td>Andy Schell</td>
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<tr>
<td>ACG Technology Ltd.</td>
<td>Dean Rudd</td>
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<tr>
<td>Env Treatment Systems Inc.</td>
<td>Alex M C Cecern</td>
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<tr>
<td>Pro Aqua + Shadrack Inc.</td>
<td>Ken Smith</td>
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<tr>
<td>Summa Engineering Limited</td>
<td>Irwin O singa</td>
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<tr>
<td>Indachem Inc.</td>
<td>Ken Raymond</td>
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<tr>
<td>H2Flow Equipment Inc.</td>
<td>Chuck H unsonroder</td>
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<tr>
<td>Troy - Ontor Inc.</td>
<td>Mark Seymour</td>
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<tr>
<td>Envirocön Wastewater Treatment Equipment Company Ltd.</td>
<td>Martin Gravel</td>
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<tr>
<td>N-Viro Systems Canada Inc.</td>
<td>Fernando Chua</td>
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<td>Neo Valves</td>
<td>Martin Doyle</td>
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<tr>
<td>Environmental Science &amp; Engineering M magazine</td>
<td>Jane Gowing</td>
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<tr>
<td>Cancoptas Limited</td>
<td>Craig H Hutchinson</td>
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<td>ClearTech Industries</td>
<td>Brian H artwick</td>
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<td>Flowserve Canada Corp.</td>
<td>Don Bauerlein</td>
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<td>M etcon Sales &amp; Engineering Limited</td>
<td>Jane Gowing</td>
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<tr>
<td>Rotork Controls (Canada) Limited</td>
<td>Steve Reeves</td>
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<tr>
<td>Performance Fluid Equipment Inc.</td>
<td>Jamie H odd</td>
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<td>SPD Sales Limited</td>
<td>David O hashi</td>
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<tr>
<td>Aqua Technical Sales Inc.</td>
<td>Jason Boomhour</td>
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<td>KSB Pumps Inc.</td>
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<td>Eimco Water Technologies</td>
<td>Gary Lamb</td>
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<tr>
<td>Sew-Eurodrive Company Of Canada Inc.</td>
<td>Carmen Cosentino</td>
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<tr>
<td>Vissers Sales Corp.</td>
<td>Tony Petrucci</td>
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<td>B.N.W. Valve Manufacturing Limited</td>
<td>Jim Brooker</td>
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<td>Greatario Engineered Storage Systems Ltd.</td>
<td>Barry West</td>
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<tr>
<td>Ciba Speciality Chemicals Canada Inc.</td>
<td>Eric Kudlik</td>
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<tr>
<td>Westfalia Separator Canada, Inc.</td>
<td>Eldon Wallis</td>
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<tr>
<td>C &amp; M Environmental Technologies Inc.</td>
<td>Amin M ohammed</td>
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<tr>
<td>Sterling Power Systems</td>
<td>Eric Kudlik</td>
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<td>Westech Industrial Ltd.</td>
<td>Scott Burn</td>
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<tr>
<td>Flowal Equipment Ltd.</td>
<td>Claudio Cinapri</td>
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### Hole In One Canada Inc.

- Closest To The Pin Winners – Eric Kudlik, Ken Smith & Jamie H odd
- 4 Ft. Square Winners – Carmen Cosentino & Jim Stanley
- Saab 4 Ft. X 8 Ft. Winner – Karen Faguy
- Water For People – Canada: 50/50 Raffle Winner – Andy Schell

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**CHECK YOUR WEB LISTING**

OPCEA members are reminded to visit the website and review your listings to ensure that your information is current. Now would also be a good time for you to refresh your keywords list, to ensure that your potential customers can find your listing on the site when they search for information. Please submit your updates to Kelly Madden and help the OPCEA website work for your firm.
We had been having a clogging issue at one of our plants and decided to replace them with two new ABS contrablock pumps. As the old saying goes, “When it rains it pours.” We were installing one of the ABS pumps and were about to install the second when our “pre pump” influent channel grinder failed. Since it would take some time to repair, we decided to hold up on installing the second ABS pump as we were concerned this pump would see aggressive water (grit, rags, etc.) due to the channel grinder being down. This set the stage for a real true life comparison. I am pleased to report that for the entire period our grinder was down, the ABS pump outperformed the original pump by not clogging once. However, the original pump lasted less than an hour before it clogged, something we had grown to expect. Fortunately our new ABS pump picked up the slack and kept the place running.”


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We have several interesting topics to discuss in this month’s report. As well as the upcoming WEFTEC Conference in San Diego, we have news on the recent WEF Board Resolution on Climate Change; the WEF Position on Sustainability; WEF Governance changes within the House of Delegates; and feedback from the recent WEFMAX meeting in Banff, Alberta.

This year’s WEFTEC will run from October 13 to 17 in San Diego, California. This is the leading annual technical symposium for the wastewater industry in the world, attracting 15,000 registrants who will attend 119 Technical Sessions having four to six papers per session, 29 full-day technical workshops, and an exhibition floor having products from 900 companies on display. See you there!

The WEF Board recently implemented a Resolution on Climate Change. WEF recognizes that there is a scientific consensus that the build-up of greenhouse gases in the atmosphere from human sources is causing global temperatures to increase and threaten the stability of our planet’s climate; that the impacts of global climate change will disrupt the hydrological cycle causing greater extremes of wet weather, flooding and drought; and that these changes will affect water quality and availability. WEF therefore resolved that WEF and its Committees should identify processes, designs and operations that reduce greenhouse gas emissions and manage the hydrological impacts of global climate change. The full WEF Resolution can be found within the WEF website www.wef.org, or by contacting George Crawford.

An earlier (2005) WEF position on Sustainability can also be found on the WEF website, having primary emphasis on effective utility management and funding of our collection, treatment and distribution systems; continuing federal funding for infrastructure; and an increased role for the public and industry to ensure that local utilities effectively serve their communities. As a more recent activity, WEF is exploring various ways to address the broader principles of sustainability within WEF, its Committee structure, and within its technical programs and educational materials. According to Matt Reis, WEF’s Managing Director of Technical and Educational Services, WEF is looking to create a Community of Practice for Sustainability in the Water Sector. Typically, a CoP includes representatives from all related WEF Technical Committees, as well as other interested members. The IWA has employed a similar approach for several years, referring to their group as a Global Steering Committee with a mandate to provide consistency in terminology, criteria, strategic direction and peer review. Those interested can contact George Crawford or WEF for additional information.

What is ‘WEFMAX’? The acronym stands for WEF Member Association Exchange meetings, and five or six are held annually. The Banff WEFMAX meeting in May was attended by all five Canadian WEF Member Associations, as well as representatives from Chesapeake, Ohio, Pacific Northwest, and Texas. Through a three-day exchange of ideas, we learned about several new initiatives and ideas that have worked well for other MAs, and several that did not. A sampling of some of the ideas that have worked well within other MAs: donating money to Water for People instead of providing speakers’ gifts at the annual conference; a ‘Silent Hero’ award to recognize our dedicated operators; an annual membership book that also includes listings of all WPCPs’ capacities, treatment configurations and contact information; and how MAs can ‘Just say No’ to restore or maintain their financial responsibilities to their membership. For more information, contact any of the WEAO leaders who attended, including George Crawford, Tony Petrucci, Peter Takaoka, George Lai, and Catherine Jefferson.

I will conclude this month’s report with a short note on some changes being made to the WEF House of Delegates governance structure. Our Tony Petrucci has dedicated countless hours towards supporting WEF with this initiative, and the WEF Board has accepted the recommendations made by the Governance Team. Much of the governance discussions, including those at the WEFMAX meetings, revolved around the difficulties of creating a leadership team having some continuity when the term of a House Delegate is only 3 years. To address these types of issues, the Leader of the House of Delegates will now be called the Speaker, and the Speaker can serve during either their 3rd or 4th year. A Steering Committee is proposed, but not yet finalized, to assist the Speaker in reviewing the Board’s Strategic Plan, and reviewing the proposed budget for consistency with the Plan – two key responsibilities of the House of Delegates.

Take a look at the WEF website for more information about what WEF is doing for you, for our industry, and for the water environment! www.wef.org

Submitted by George Crawford – WEAO Director and WEF Delegate
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- membrane filtration systems
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For further information regarding ACG Technology’s services, check out our new website @ www.acgtechnology.com.
The Ministry of Environment now requires a host of information to be reported to the Spills Action Centre when a spill occurs. Failure to report, failure to report on time, or inadequate reporting can result in charges and fines. New legal obligations apply to the persons who must report, including a continuing duty to provide and to correct information.

With a little preparation, municipalities can avoid running afoul of reporting requirements.

The Reporting Requirement
The Environmental Protection Act defines a ‘spill’ as a discharge of a pollutant from a structure, vehicle or other container into the natural environment that is abnormal in quality or quantity. A pollutant is any solid, liquid, gas or odour that causes or may cause an adverse effect. Adverse effects include impairment of the quality of the natural environment, injury or damage to property or to plant or animal life, harm or material discomfort to any person, and loss of enjoyment of property.

The EPA requires that every person who owns, every person who controls a pollutant that is spilled and every person who spills or causes or permits a spill of a pollutant, must “forthwith” notify the Ministry of the spill, unless someone else has already done so. Once a spill has occurred, the owner and controller of the pollutant must do everything practicable to prevent, eliminate and ameliorate the adverse effect and to restore the natural environment.

New Spill Reporting Obligations
Until recently, there were only limited regulated spill reporting procedures stipulated in the EPA. Since August 1, 2007, the Classification and Exemption of Spills and Reporting of Discharges Regulation prescribes an extensive list of information that persons reporting spills must provide to the Ministry of the Environment.

The sidebar lists the information that must be provided. (Police officers, municipal employees and other employees of public authorities who are informed of or are investigating a spill are only required to report the first four bullet points.)

The regulation now requires that all spills must be reported to the Spills Action Centre (SAC) at 1-800-268-6060 or 416-325-3000. Reporting to SAC satisfies the requirement to notify the Technical Standards and Safety Authority. However, owners and controllers must also report spills to the local municipality, and to other owners or controllers, so that they can also respond.

There is now a continuing duty to find out and provide information. If any of the information was not provided to SAC at the time of notice, the persons required to report must take all reasonable steps to ensure that the information is “ascertained and provided forthwith” to the Ministry. There is a limited exception for some of the items, where the person can demonstrate that the information is not relevant in the circumstances.

There is also a duty to correct any inaccurate information. If the reporting person becomes aware that any information provided to the Ministry is inaccurate, the person must notify the Ministry forthwith of the inaccuracy and must provide the correct information.

How to Prepare for Proper Spill Reporting
Municipalities should immediately review their spill reporting procedures and documents in light of the new spill reporting requirements. Front line staff who may be the first to learn of a spill should be trained to ensure they are aware of their obligations. Similarly, municipal employees who are likely to be informed of, or investigate spills, should be made aware of the special obligation upon them to call SAC.

Anyone who may have a duty to call SAC should have ready access to the telephone number and needs to understand that the duty is immediate upon spill occurrence.

When is a spill reportable? A reportable spill is not only an event that is out of the ordinary and unplanned, but must also be one that may cause an adverse effect. The use of the word “may” suggests that a spill is reportable even if the potential for an adverse effect is uncertain.

Municipalities should consider anticipating potential spills and preparing some of the information that potential reporters will need. This may include:

- corporate/municipal contact information
- standard descriptions of areas from where spills are likely to emanate
- identity and characteristics of materials that may be spilled, including potential adverse effects and hazards
- an awareness of how the surroundings might have an impact on potential adverse effects
- contact information for neighbouring property owners who may be affected by a spill
- planned response action
Potential first reporters should be trained on the requirements of the municipality’s emergency response plans. They should also be prepared to document their actions in order to show that proper procedures were followed.

These amendments will soon be supplemented by new rules for exempting spills from reporting, and new regulatory requirements for the preparation of Spill Prevention and Contingency Plans for certain facilities.

**End notes:**
2. EPA, s. 91(1).
3. EPA, s. 92(1). There is a similar duty on any person who “discharges a contaminant or causes or permits the discharge of a contaminant into the natural environment” to forthwith notify the Ministry if the discharge is out of the normal course of events, the discharge causes or is likely to cause an adverse effect and the person is not otherwise required to notify the Ministry under section 92”; s. 15(1).
4. EPA, s. 91(4).
5. EPA, s. 93(1).
6. O. Reg. 675/98.
7. O. Reg. 675/98, s. 13(7). ♦

By Juli Abouchar and Raj Bharati of Willms & Shier Environmental Lawyers LLP

**W hat Must be Reported**

The following is a simplified list of the information that must be provided to the Spills Action Centre:

- the name and telephone number of the person obligated to notify the Ministry, and, for corporations and municipalities, the name, telephone number and position of the individual calling
- police officers and municipal employees (and other employees of public authorities) investigating a spill must provide (if known) the name and telephone number of the person(s) who spilled or caused or permitted the spill
- a description of the location of the discharge, and the address (if known)
- the date and time that the discharge was discovered and occurred (if known)
- names and telephone numbers of everyone who was contacted to respond to the discharge, including any fire department, police department or other public authority
- the duration of the discharge and whether it is continuing
- the identity and quantity of the pollutants discharged and, if the pollutants contain any substances associated with known hazards, the name of each such substance the associated hazard
- if the person is subject to the Environmental Penalties regulation, an indication of whether the pollutant contains a toxic substance (as defined in that regulation)
- the location of the source of the contaminant
- any relevant information regarding the cause of the discharge (if known) and the circumstances surrounding the discharge
- if the cause is not known, the person’s assessment of the most likely cause based on the best information available and an explanation of steps that have been taken or will be taken to determine the cause
- a description of any adverse effects that occurred or may occur
- a description of any conditions that have or may aggravate or mitigate the adverse effects (such as weather conditions, surface or ground water flow rates, etc.)
- where other properties are affected by the discharge, whether the owners or occupants of the affected properties will provide access to persons required to take steps to prevent, eliminate or ameliorate adverse effects
- a description of any other pollutants that were or may be discharged into the natural environment as a result of the spill that is being reported, and any adverse effects that resulted or may result from those pollutants
- actions taken or that will be taken to prevent, eliminate or ameliorate any adverse effects, and the name and telephone number of those responsible for carrying out those actions
- circumstances that may interfere with the actions referred to above (such as weather or traffic).
On May 13, I began the long voyage to Whitehorse, NWT for my first official CWWA Board Meeting. I have to admit that, when Whitehorse was suggested for the May Board meeting, I remember thinking, “Why would anyone want to travel to the opposite end of the country for a meeting?” As it turned out, it was one the best experiences of my life, both professionally and personally. I flew to Whitehorse, with a connection through Vancouver. Anyone who has ever flown north from Vancouver has had the pleasure of experiencing the view of the beautiful Rocky Mountains. Fortunately, the weather was clear and I was able to experience the mountains all the way to Whitehorse. I had always thought that the mountains in BC were the best there were but as I soon found out, this is not so. As we were making our decent into Whitehorse, I was in awe. The view of the mountains was none other than spectacular.

After landing, as I was waiting for my luggage to come off what looked like the only carousel, I noticed that a couple of my colleagues were on the same flight. We started joking that maybe our luggage did not make it. Of course, it was my luggage that did not make it. At that point, I had been traveling all day and wanted to get to the hotel and change into some clean clothes to prepare for our group dinner at the hotel. Air Canada informed me that I probably would not get my luggage for three days. Some of the group members who had arrived the previous Friday still did not have their luggage on the day I arrived. Luckily, when I got to the hotel, Brian Crist, the NWT CWWA representative, took me to a small shop that was still open in Whitehorse at 9 pm to get a few toiletry items to last until my luggage arrived. Thank you Brian. Luck was on my side and, when I awoke, my luggage had been delivered to the hotel.

So began the first day of meetings. The group got down to work right away doing much the same things we do at the WEAO Board meetings. The agenda was reviewed and approved and the previous meeting’s minutes were reviewed and amended as required. The main goal of the meeting was to review both the association’s and the Board’s policies. This review can be considered a huge undertaking. Some of the outcomes of the policy reviews included: changes were needed to the By-Laws, a continuing role for the CWWA in public information and education was confirmed, and support was required for a national operator certification process. It was identified that a policy related to public education and information was required. As well, the date was set for the 2007 AGM at the Windows on Ottawa Conference that will be held on November 15 and 16. One other bit of information that might interest you is that the National Drinking Water Conference in Quebec City, October 1-4 is being hosted by the
CWWA. Information on these and other events can be found on the association’s website cwwa.ca.

During our meeting, we were also lucky to have an official welcome by the mayor of Whitehorse. Mayor Bev Buckway thanked us for choosing Whitehorse as our meeting venue. She also discussed the City’s strategic plan and pointed out the various opportunities Whitehorse has to offer. She told us to tell our colleagues what a great place Whitehorse is to conduct business or to visit as a tourist. I have to agree. Every morning on my two block walk from the hotel to Tim Horton’s for my morning jolt, I witnessed the downtown streets being cleaned. That is something I used to see growing up in Ottawa, but not since I moved to the suburbs of the GTA. The pace is much more relaxed in Whitehorse. One day when my Blackberry froze and I could not get an internet connection at the hotel, I inquired at the front desk. I was politely told, “Well, some days it works and other days it doesn’t.” What a concept! I hope folks back at the office were not too upset when I responded to their requests some days and not others.

For more information on Whitehorse, you can visit the city’s official website at www.city.whitehorse.yk.ca.

Whitehorse is a typical northern town, but it seems to have more gourmet restaurants than one might expect. This made for great group dinners in the evenings. I had the best fish and chips at this little spot called Klondike Rib and Salmon. The group was huddled on the back deck of the restaurant that they had enclosed with tarps and equipped with propane heaters especially for us. It got a little cool when the propane ran out. Perhaps it was the restaurant owner’s way of getting us to leave so they could close for the evening. It was awesome! There was not one night that it was dark when I fell asleep. To take advantage of this, Brian organized a 9-hole golf game for us late on our last day of meetings with some of the personnel of Yukon Water and Wastewater. The grass was not green yet and there was still snow on the ground, but it was 15 degrees when we teed off at 3:30 pm in the afternoon. Later, the non-golfers joined us for dinner at the Meadow Lakes Golf and Country Club. It was all home cooking and the salmon was fabulous.

The most memorable part of the visit was the extra day I took to travel to Skagway, Alaska. About a two-hour drive through the mountains, it took more like three and a half. It was so beautiful that I had to stop and take pictures every half hour. I also had to reduce speed when an elk was making its way up the yellow line on the highway for a kilometer or so. I spent the day in Skagway shopping with the cruise ship travelers and took the famous train trip to the White Pass Summit. This rail route was built between 1898 and 1900, costing about $10 million to construct. Locals call this the “Railway Built of Gold,” as a tribute to the men and women who created the first fully-integrated transportation system, opening the Yukon for settlement and commerce following the 1898 Klondike Gold Rush.

I would like to thank Brian Crist, NWT CWWA representative, for his hard work arranging the meeting and extracurricular activities making this a most memorable experience for me professionally and personally. I would also like to thank Duncan Ellison, Executive Director of the CWWA, for planning a rewarding meeting that balanced both business and pleasure.

I would like to close by quoting something I read in the tourism materials provided by the City of Whitehorse - “Half the size of Ontario, with 30,000 people, the Yukon is home to the world’s smallest desert, Canada’s highest mountain, the world’s largest non-polar ice field, more than 2,000 glacier lakes, the midnight sun and the northern lights.”

Rosanna DiLabio, P.Eng.
CWWA Representative
Praxair Canada Inc.
DO MICROBIAL INDICATOR ORGANISMS IN STORM WATER PUT THE PUBLIC AT RISK?

The concentration of conventional microbial indicator organisms in storm water is high at times, posing the question, “Is there a risk to the public?” The few studies to date have not clearly established the relationships between these indicator organisms and pathogens (and thus illness) in storm water. The debate around how to assess this risk to the public and how to appropriate funds to mitigate this risk has highlighted the gap in our understanding. Where is this gap? Is there enough data? Are there requirements for new methods for tracking pathogens? Is there a lack of epidemiologic studies?

To help establish what this gap is and to provide a way forward to close it, the Water Environment Research Foundation (WERF) funded a study to look at this issue. The final report entitled Development of a Protocol for Risk Assessment of Microorganisms in Separate Storm Water Systems (WERF 0S-SW-2) was released this year.

The study reviewed both the available literature and other data to establish what pathogens pose the greatest risk, which pathogens are present in storm water, and whether there is a correlation between indicator organisms and pathogens of public health concern in storm water. Generally, the study concluded that the data reviewed does not support such a relationship. The researchers concluded that the few studies that supported such a correlation could not be extrapolated to other sites.

The fate of microorganisms in storm water is unclear. Once in the water column, they may be preyed upon, become inactivated, absorb/desorb from particles, or be deposited within sediments at the bottom of the water column. According to the study, herein lies the greatest risk. Because microorganisms have a higher chance of survival in sediments, there is risk that they will be re-suspended into the water column during high flows. For this reason, the researchers recommended that work be done to investigate the movement between the water column and the sediment layer. They also recommended that storm water sampling should include sediments when assessing microbial risk.

The report reviewed methods for tracking microorganisms in storm water. At issue is that conventional enumerating indicator organisms of fecal contamination do not distinguish between those originating from animals and those from humans. The report concluded that a system that was based both on microbial and chemical source tracking as well as general watershed assessment methods held the greatest promise. This implies that regulations based on conventional indicators alone may not be the best way to protect public health.

Various studies have assessed the ability of structural treatment controls (e.g., detention ponds, retention ponds, bioretention, infiltration basins, storm water wetlands) to reduce the pollutant load on receiving waters. The removal levels are listed in the report. The researchers stressed the importance of understanding the level of treatment required given the storm water catchment and the risk to public health before deciding the type of treatment to provide.

The two methods used to characterize the risk to human health with exposure to water borne pathogens are human health effects (epidemiologic) studies and risk assessments. The researchers identified four relevant epidemiologic studies: one addresses risks in freshwater and three in marine waters. All four concluded that current bacterial indicators are ineffectual for predicting health effects associated with water contaminated by non-point sources of fecal pollution (e.g., storm water). The researchers concluded that, with more data on pathogens in storm water, the use of risk assessments to assess public health concerns associated with storm water would be a valuable alternative to conducting epidemiologic studies.

The last objective of the study was to identify what data are needed to fill the gap in our understanding and how best to obtain it. The study recommended a three-phase approach. A method to characterize infections/viable pathogens in storm water would be developed in the first phase. A pilot monitoring program would be conducted on an urban watershed (Phase 2), which would lead to a national study in Phase 3. At the end of this work, a risk assessment model would be developed that could be used to assess the risk to public health posed by storm water. The model would account for storm water types, land use, climate, antecedent dry weather period and rainfall intensity. This would allow investment to focus on areas where the model predicts there is the highest risk.

Pat Coleman, Ph.D., P.Eng.
Associated Engineering Limited
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The Ontario Coalition for Sustainable Infrastructure (OCSI) brings together the combined resources of six well-established organizations to work toward sustainable infrastructure in Ontario. The Coalition comprises:

- Water Environment Association of Ontario (WEAO)
- Ontario Public Works Association (OPWA)
- Ontario Water Works Association (OWWA)
- Ontario Municipal Water Association (OMWA)
- Municipal Engineers Association (MEA)
- Ontario Good Roads Association (OGRA)

The mission of the Coalition is promotion of “Safe and Sustainable Infrastructure.”

As noted in my last column, OCSI is intended to be an ‘issue-focused’ organization. Accordingly, one of the first activities of OCSI has been to identify those issues which require our immediate attention. Through meetings of the representatives of each of the constituent organizations, issues of current interest were agreed to be:

- The impact of tangible capital asset accounting (PSAB 3150) on the finances and operations of municipalities, and asset management/financing in general.
- The requirement for Financial Plans to be prepared by municipalities under the Safe Drinking Water Act, 2002 (SDWA).
- Mandatory testing for potential contamination of drinking water by lead due to old service lines.

It has been decided that, on some of the issues, one of the constituent organizations will take the lead on behalf of OCSI and report back through OCSI to the other organizations (e.g., OPWA will take the lead on issues related to PSAB 3150 implementation). For others, some organizations have already made submissions to the provincial government, in which case OCSI will endorse that position and add the support of the five other professional organizations to that position. These are examples of how OCSI will promote the need for ‘Safe and Sustainable Infrastructure’ with the combined voice of six respected professional organizations.

The issue which has the potential to have the greatest impact on the wastewater industry is the requirements for Financial Plans under Part V of the SDWA and the associated draft Regulation and Guideline. Many of us were under the impression that this legislation and policy was solely concerned with drinking water systems. However, through discussion with the other OCSI organizations, it has become apparent that the provincial government intends that the approach and requirements contained in these documents will eventually apply to wastewater and storm water systems also. In fact, the Guideline notes the need for an integrated approach to water, wastewater and storm water systems through “Integrated Planning.” Therefore, it is important that the wastewater industry, through WEAO and OCSI, be involved in the finalization of this legislation. Unfortunately, the WEAO has not been consulted at all by the province to date on this matter, although OWWA, OMWA, OPWA and MEA were. WEAO will, in fact, be submitting comments on this important legislation and OCSI will be supporting this, along with OWWA/OMWA’s prior submission. For further details on this subject, please see Catherine Jefferson’s column in this issue of INFLUENTS.

The key challenge for OCSI in these early days is to make the members of the constituent organizations, government, and other decision makers and stakeholders, aware of its formation and purpose. It is intended that this will be achieved in a number of ways:

- By announcing participation in OCSI at constituent organizations’ annual conferences and other functions. To this end, Paul Smeltzer, the present OCSI Chair,
The mission of the Coalition is promotion of “Safe and Sustainable Infrastructure.”

attended recent OWWA/OMWA, WEAO and AWWA ACE conferences.

• Distribution of informational materials; a pamphlet on OCSI is presently in preparation.

• Advertisements in trade magazines.

• Regular columns such as this.

• Direct contact with government officials. The initial reaction from provincial ministries to the formation of OCSI has been overwhelmingly positive, as they see it as a means of coordinating with all the OCSI organizations any consultation on infrastructure matters. The various contacts that all six organizations presently have with provincial ministries are being compiled and a unified strategy will be developed.

In addition, OCSI is developing a list of questions for the provincial political parties to ascertain their positions on infrastructure issues in the lead-up to this October’s provincial election.

In summary, a good start has been made and OCSI shows a lot of promise. However, much needs to be done and it is our challenge to maintain this early momentum.

I will endeavor to keep you informed of developments through WEAO’s Government Affairs Committee and this column. However, if you have any questions about OCSI activities, or have any suggestions as to issues that we should examine, and would like to contact me directly, please email me at carl.bodimeade@hatchmott.com.

Submitted by Carl Bodimeade, P.Eng.
Vice-Chair, OCSI,
Hatch Mott MacDonald
Call for Articles

Readers are invited to submit articles for inclusion in future issues of INFLUENTS, the official publication of the Water Environment Association of Ontario (WEAO). The articles should be approximately 500-2,000 words in length and should not be 'advertorial' in nature.

The topics must be of general interest to the WEAO membership and may cover such things as operation and maintenance tips, industry projects, proper application/selection of equipment or processes, industry news, innovative technology and so on.

The articles should be forwarded to Emil Cocirla, WEAO Communications Committee Chair for consideration. The selection of the articles for inclusion in INFLUENTS is at the sole discretion of the WEAO Communications Committee. The Committee also reserves the right to edit the article as necessary, for clarity, brevity or unseemly commercialism.

Notwithstanding the foregoing, getting your article published in INFLUENTS is a very good way to gain credibility in the Ontario marketplace and stand-out among your peers.

To submit an article, please include the following info:
- Your Name • Organization
- Article Topic and Synopsis

Please include a title and brief description (50-100 words) of the proposed topic.

You may also write in with suggestions of topics for future articles as well. You may also write in to request that we seek an article on a particular subject of interest to you or your organization. All suggestions should be sent to Emil Cocirla, WEAO Communications Committee Chair at: emil@can-am.net.

By submitting an article, photo or a combination thereof, you are giving permission for the submitted materials to be printed in whole or in part.

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## SEPTEMBER

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<tr>
<td>Sept. 6</td>
<td>Professional Development Committee New Professionals Student Chapter Presentation, U of T Galbraith Building, Durham College</td>
<td>4:30 p.m.</td>
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<td>Sept. 7</td>
<td>INFLUENTS Release Date</td>
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<tr>
<td>Sept. 11</td>
<td>Residuals &amp; Biosolids Committee, WEAO Office, Milton</td>
<td>9:30 a.m.</td>
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<td>Sept. 14</td>
<td>Public Education Committee, WEAO Office, Milton</td>
<td>10:00 a.m.</td>
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<td>Sept. 18</td>
<td>Board Meeting, R.V. Anderson Offices, Toronto</td>
<td>9:30 a.m.</td>
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<td>Sept. 19</td>
<td>Source Water Protection and the Clean Water Act Seminar, Ramada Inn, Milton</td>
<td>8:30 a.m.</td>
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<tr>
<td>Sept. 20</td>
<td>WEAO Annual Golf Tournament, Shawneeki Golf Club, Milton</td>
<td>Noon</td>
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<tr>
<td>Sept. 25</td>
<td>PWO Southeast Region Conference, Legion Hall, Kingston, ON</td>
<td>8:00 a.m.</td>
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<tr>
<td>Sept. 27</td>
<td>Water For People Canada Committee, U of T, Galbraith Bldg., Room 117</td>
<td>6:00 p.m.</td>
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## OCTOBER

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<td>Oct. 1-2</td>
<td>Residuals &amp; Biosolids 2-day Conference, CCIW Facility, Burlington</td>
<td>8:15 a.m.</td>
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<td>Oct. 4</td>
<td>Communications Committee WEAO Office, Milton</td>
<td>10:00 a.m.</td>
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<td>Oct. 9</td>
<td>Residuals &amp; Biosolids Committee, WEAO Office, Milton</td>
<td>9:30 a.m.</td>
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<td>Oct. 10-11</td>
<td>PWO Northern Ontario Conference, Sudbury</td>
<td>8:00 a.m.</td>
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<td>Oct. 10</td>
<td>Problem Solving Workshop, Sudbury</td>
<td>8:00 a.m.</td>
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<tr>
<td>Oct. 11</td>
<td>New Professionals, Ryerson University</td>
<td>4:30 p.m.</td>
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<td>Oct. 13</td>
<td>Great Canadian Icebreaker, San Diego</td>
<td>7:00 p.m.</td>
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## NOVEMBER

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<td>Nov. 2</td>
<td>Submission Deadline for INFLUENTS</td>
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<td>Nov. 7</td>
<td>PWO Southwest Region Conference, Chatham</td>
<td>8:00 a.m.</td>
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<tr>
<td>Nov. 13</td>
<td>Residuals &amp; Biosolids Committee, WEAO Office, Milton</td>
<td>9:30 a.m.</td>
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<td>Nov. 15</td>
<td>New Professionals, TBD</td>
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<td>Nov. 20</td>
<td>Board Meeting, R.V. Anderson Offices, Toronto</td>
<td>9:30 a.m.</td>
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<td>Nov. 22</td>
<td>Water For People Canada Committee, U of T, Galbraith Bldg., Room 117</td>
<td>9:00 a.m.</td>
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<tr>
<td>Nov. 27</td>
<td>WEAO Strategic Planning Session, Ramada Inn, Milton</td>
<td>6:00 p.m.</td>
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<td>Nov. 30</td>
<td>NYP Holiday Bash, TBD</td>
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## DECEMBER

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<td>Dec. 7</td>
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<td>Dec. 11</td>
<td>Board Meeting, TBA</td>
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<td>Dec. 13</td>
<td>New Professionals Conference Call, TBA</td>
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<td>Dec. 14</td>
<td>Public Education Committee Followed by Christmas Luncheon, WEAO Office</td>
<td>10:00 a.m., Noon</td>
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<td>Dec. 20</td>
<td>Water For People Canada Committee, TBA</td>
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<td>800-500-8855</td>
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<td>Degremont Technologies Suez</td>
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<td>DELCAN Water</td>
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<td>EarthTech</td>
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<td>EIM CO Water Technologies</td>
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<td>ENV Treatment Systems Inc.</td>
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<td>Enviroharvest Inc.</td>
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<td><a href="http://www.enviroharvest.ca">www.enviroharvest.ca</a></td>
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<td>EPIC</td>
<td>888-374-2338</td>
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<td>GENIVAR Ontario Inc.</td>
<td>905-475-7270</td>
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<td>Giffels Associates Ltd.</td>
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<td>Hydro-Logic Environmental Inc.</td>
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<td>414-365-2200</td>
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<td>RV Anderson Associates Ltd.</td>
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<td>SEW Eurodrive Company of Canada Ltd.</td>
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<td>905-332-7669</td>
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<td>Stantec Consulting</td>
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<td>The Thompson Rosemount Group</td>
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<td>Watts Industries (Canada) Inc.</td>
<td>888-208-8927</td>
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