EDUCATION SESSION ABSTRACTS

MONDAY

Small Water Systems Symposium

Moderator: TBD

Location: The Penticton Trade & Conference Centre

Room: 1

9:30 - 10:00
Successful Implementation of Membrane Treatment in a Park Setting - Ashcroft

Presenter: Travis Pahl, P.Eng., Urban Systems Ltd.

The Village of Ashcroft’s journey for safe drinking water began with the completion of a water master plan in 2013, which in turn facilitated obtaining grant funding for the project. The project underwent numerous contentious community meetings and public opposition, which climaxed in a referendum in 2016 aimed to stop project funding. Despite these challenges, the Village completed construction of the water treatment plant in 2019.

The treatment plant is situated in Legacy Park on the Thompson River, and in addition to providing clean water, it provides facilities for the adjacent campground. The Village staff advocated for renewable energy at the facility, which included 50 kW of rooftop solar. Village operators also championed standby power and a local radio system to alleviate challenges faced with power and communication outages during the 2017 Elephant Hill wildfire.

10:00 - 10:30
Why Are Over 500 SWS on a Permanent Boil Water Notice?

Presenter: Gary McDonnell, CPA, CA, McGillivray Falls Recreation Retreat Ltd.

Ever since the new Drinking Water Protection Act was introduced in 2003, there has been continuous reference to the challenges that small water systems would face in complying with the legislation. The 2019 Report of the Provincial Health Officer states “Several prominent reports over the past decades have voiced concerns about the challenges small water systems face and have called for action. Despite the efforts made to provide flexible options and support small water systems, many of the regulatory compliance challenges and drinking water quality concerns remain.” The 2019 Report of the Auditor General on the Protection of Drinking Water stated that “efforts to protect small water systems have been limited”. To date the focus has been on improving managerial and financial capacity for small water systems. This presentation will highlight some of the real world operating challenges faced by some of these very small, micro water systems that make compliance with the legislation very difficult.
MONDAY

Small Water Systems Symposium, continued

10:30 - 11:00
Death by O&M

Presenter: Robyn Sherstobitoff, P.Eng., Associated Engineering

Typically, potential options for community water and wastewater systems are evaluated based on a number of criteria; some of the most common being ability to meet regulations, site constraints and capital costs. Since money doesn’t grow on trees, many times the final design decisions are heavily weighted on capital cost. However, community water and wastewater systems are required to last many years, and cannot do so with proper operations and maintenance. The costs and implications of the operations and maintenance considerations often weigh heavy on a small communities who may not have the time or budget to complete all the tasks required to properly maintain a system after it is constructed. This can lead to additional costs and headaches for management and operations staff. This presentation will cover some of the operations and maintenance costs and considerations that should be considered in small system design, a list of most often forgotten considerations, the importance of operational input into design, standard operating procedures, and a few case studies. The presentation will also cover the importance of having Standard Operating Procedures, and how these simple tools can reduce operating costs and operator stress.

MONDAY

Wastewater Treatment

Moderator: Joel McAllister, P.Eng., Onsite Engineering

Location: The Penticton Trade & Conference Centre

Room: 2/3

9:30 - 10:00
MABR Pilot at Gold Bar WWTP: Nitrification Below Washout SRT

Presenter: Matt Reeve, P.Eng., SUEZ Water Technologies & Solutions

EPCOR, SUEZ, and the University of Alberta conducted a pilot study at Gold Bar WWTP in Edmonton, AB from June 2017 through April 2020. The pilot had two trains operating in parallel, one with a membrane aerated biofilm reactor (MABR) and the other as conventional biological nutrient removal. The MABR pilot demonstrated nitrification rates consistent with other published results, resilience to upset conditions, and enhanced TN removal. The MABR also demonstrated better nitrification performance than the conventional train at short SRTs and low temperatures and demonstrated nitrification below the washout SRT for nitrifiers. The results show the ability of MABR to increase WWTP capacity, improve performance, and save energy, while being an easy-to-implement solution.
MONDAY

Wastewater Treatment, continued

**10:00 - 10:30**

**An Investigation into the Biodegradation Mechanisms Involved with Sludge Accumulation in Septic Tanks**

**Presenter:** Kelsey Shaw, EIT, University of Victoria

Septic tanks (ST) are a form of decentralized sanitation. There is little evidence to support the biodegradation mechanisms that are assumed to take place. An analysis of these mechanisms, specifically related to anaerobic digestion, of sludge will be presented. Given their low cost and technical requirements, being able to optimize the treatment mechanisms will have beneficial consequences for resource constrained-contexts to improve access to adequate sanitation.

**10:30 - 11:00**

**Methanis Biogas Upgrading – Using Membranes for Biogas Conditioning / Valorization**

**Presenter:** Michael Theodoulou, P.Eng., SUEZ Water Technologies & Solutions

Methanis is a complete biogas purification system, enabling biogas from anaerobic digesters with around 40-60% methane to be upgraded to over >98% methane content and >99% methane capture. The system is comprised of a reliable and optimized biogas conditioning stage to remove gas contaminants and moisture, compression and finally a 3-stage membrane system for carbon dioxide removal. The unit reaches a methane yield of more than 99.5% over a wide operating range and is able to continuously maintain the methane quality and a low power consumption. The compliant biomethane can then be directed injected into the grid.

MONDAY

Underground Infrastructure

**Moderator:** Larry Sawchyn, McElhanney Ltd.

**Location:** The Penticton Trade & Conference Centre

**Room:** 6/7

**9:30 - 10:00**

**Tools and Techniques to Make Sewer Rehabilitation Programs More Effective**

**Presenter:** Sam Eichenberger, EIT, Kerr Wood Leidal

Cured-in-Place Pipe (CIPP) relining is a mainstream sewer rehabilitation method that has been used locally for over 20 years. During this time, sewer condition assessment and CIPP technologies have improved, as has the capability of the industry to implement successful projects. This presentation will focus on condition assessment, selection of appropriate rehabilitation measures and opportunities for municipalities to reduce their carbon footprint and save money through use of advanced tools such as GIS and the Carbon Calculator. Focusing on CIPP, common challenges for design, contract management, quality control and installation will be discussed. Different styles of CIPP and the benefits and drawbacks of each will also be covered.
MONDAY

Underground Infrastructure, continued

10:00-10:30
Life Cycle Cost Assessments of Pressure Sewer Systems

Presenter: Keith McHale, Environment One Corporation

This presentation provides an overview of life cycle cost analysis and cost advantages of pressure sewers. A life cycle cost analysis is an economic evaluation that utilizes engineering and financial inputs to compare wastewater infrastructure alternatives. It takes into account the total project costs, including initial capital cost as well as ongoing operations and maintenance costs, over the lifespan on the system. It is an invaluable process in assisting municipalities, wastewater utilities, consulting engineers, and others in the evaluation and selection of the appropriate solution to wastewater collection system challenges.

In evaluating wastewater collection alternatives, the true cost of long-term ownership has often been improperly considered. Evaluation tools, such as a Life Cycle Cost model, provides planning level assessments for the evaluation of long-term costs between a pressure sewers and a gravity sewers. This case study presentation will show how a life cycle cost analysis can demystify concerns with pressure sewers.

10:30-11:00
HDPE Pressure Testing: When is a Leak a Leak?

Presenters: Robin Parker, P.Eng. & Eamonn O’Riain, Kerr Wood Leidal Associates Ltd.

Hydrostatic pressure testing of High Density Polyethylene (HDPE) pipe is a key component in the quality assurance process for forcemain and pressure piping. Due to the viscoelastic nature of HDPE, referred to as “creep”, the Pressure Rebound Test procedure is recommended. This test procedure is foreign to many designers, contractors, and owners who are more familiar with conventional hydrostatic pressure test procedures. The Pressure Rebound Test procedure, detailed by the Plastic Pipes Institute (PPI) Technical Note 46 and by other authorities outside of North America, attempts to solve problems resulting from HDPE creep; the significant effects of creep, if not properly understood, can be interpreted as a leak in the system.

This presentation will focus on recent experience with hydrostatic pressure testing of 48” and 54” HDPE pipe. Specifically, it will cover the test procedure, the equipment requirements, and interpretation of the test results.
MONDAY

Drinking Water

Moderator: Nicolas Peleato, Ph.D., P.Eng. (ON), University of British Columbia

Location: The Penticton Trade & Conference Centre

Room: 8

9:30 - 10:00
Comparison of Various Backwash Procedures and the Effect on Filter Performance

Presenter: David Hambley, AWI

The presentation will begin with a discussion of the granular media filtration process and why it should be considered a ‘batch process’.

Following this, case studies will be presented that compare backwash procedures used in various types of water treatment plants. Case studies for both gravity and pressure filters will be included.

The backwash steps discussed will include:

- Filter drain-down
- Air scour, including rates and duration
- Low-rate and high-rate backwash, including flowrate and duration
- Filter media restratification

The workshop will provide Operators with answers to the following questions:

- What is the relationship between poor filter performance and backwash?
- How long does it take to see the effect of a poor backwash program on filter performance?
- How long does it take to see the effect of changes made to the backwash program on filter performance?
- How can the backwash procedure contribute to filter media loss?
- Which backwash procedure is the best?
- Which backwash parameters and data should the Operator be monitoring, trending and collecting?

The workshop will also discuss:

- Stand-alone air scour and backwash vs. concurrent air-water wash: Which is better?
- Backwash turbidity profile: What does it tell us? What doesn’t it tell us?
- Monitoring and trending of backwash pressure: Why is it a critical part of filter operation?
MONDAY

Drinking Water, continued

10:00-10:30
Stand-Alone Biological Filtration Technology for Removing Iron, Manganese and Ammonia from Groundwater

Presenter: Babak Roshani, P.Eng., Ph.D., Delco Water Division of Delco Automation

Biofiltration technology is considered an economical, alternative membrane pre-treatment technology to treat iron, manganese, and ammonia from water sources. Based on our knowledge and experience, biofiltration technology as a ‘stand-alone’ process for a given water source to meet desired drinking water quality was less understood. This presentation overviews the process feasibility and design and evaluates the performance of ‘stand-alone’ biofilters, in a small community, targeting simultaneous removal of iron (Fe), manganese (Mn), and ammonia (NH4+) from low-temperature groundwater.

10:30-11:00
Groundwater Manganese Removal by Bio-Filtration

Presenter: Bojun Xu, SUEZ Water Technologies & Solutions

Biological manganese removal (Mangazur) is a process for removing dissolved manganese from groundwater for drinking water treatment. It has been proven a successful technology over a few decades and has had installations across North America and Europe. Bio-filtration has advantages such as less backwash frequency, savings in chemicals, easy operation and maintenance. In this presentation, the design of a bio-filtration technology is introduced and the performance of two recent installations in British Columbia is discussed.
MONDAY

Small Water Systems Symposium

Moderator: TBD

Location: The Penticton Lakeside Resort

Room: Salon A

1:45-2:15
Building a Sustainable Infrastructure to Support Small Water Systems

Presenter: Marian Hands, BCWWA

Abstract TBD

2:15-3:15
Improving Drinking Water Source Protection in Small Water Systems – Interactive Session

Presenters: Rebecca Mersereau, RPBio, M.Sc., MPA, Econics, and Natasha Overduin, M.A., Compass Resource Management

Protecting the quality of drinking water sources is a complicated web of responsibility. Water service providers, regional health authorities, and several provincial ministries all have important and sometimes conflicting roles to play. Another significant challenge is regulating activities on private lands that impact drinking water sources, such as forestry, land development, and agriculture. These challenges can be especially difficult for operators of small water systems due to their limited revenues and capacity for source water protection, yet they often incur high treatment costs and public safety risks as a result of them.

There have rarely been opportunities to address these drinking water source protection challenges in BC. However, the Ministry of Health recently launched a project to do just that, and is gathering ideas from drinking water providers and other key regulators. The consulting team behind the project will share what they’ve learned by reviewing provincial policies to identify opportunities to improve drinking water quality protection, and by talking to provincial and local stakeholders about the specific challenges they’re facing on the ground. During the second half of the session, the team will lead small group discussions with participants to encourage feedback on the approaches being considered, and to gather new ideas for improving drinking water source protection in BC.
MONDAY

Wastewater Treatment

**Moderator:** Matthew Voell, J.D., Lidstone & Company

**Location:** The Penticton Lakeside Resort

**Room:** Salon B

1:45-2:15

Aeration Blowers and Choosing the Right Technology

**Presenter:** Lane Hallick, Aerzen Canada

Given numerous variables when selecting an aeration blower system for wastewater applications, and equally numerous claims by technology providers, there is no surprise that confusion exists. Worse than confusion is the disappointment that results when a blower technology fails to perform as anticipated, with operating costs and efficiency benefits going unrealized.

Energy consumption and cost have been the key drivers behind the development of more efficient aeration blower systems. These systems account for as much as 60% of the total energy consumption of a wastewater treatment plant. Technological advancements in aeration blowers are providing new options for reducing energy consumption; however, this does require a greater understanding.

This paper explains three blower technologies describing the most effective technology for particular applications, and why. In doing so, this will raise the right questions and drive the importance surrounding the technology evaluation process.

2:15-2:45

Primary Sludge Screening and Grit Removal System Leads to Sustainable Digester Operations

**Presenter:** Patrick Herrick, B.Sc., Hydro International

Iona Island Wastewater Treatment Plant’s anaerobic digesters have experienced significant capacity reduction due to grit and screenings accumulation despite having a headworks screenings and grit removal system in operation. Canadian federal regulation changes mandated future upgrades to secondary treatment. A new screening and grit removal process was required to increase the solids handling capacity of digesters to enable the existing plant to operate through 2030.

After assessment of various options, the preferred options were to remove screenings and grit from the primary sludge and add a new gravity thickener. Implementation of the new sludge pre-treatment facility resulted in screenings and grit removal quantities increasing by over 7 times, which are expected to help extend the life of the digesters and overall plant operations through 2030.
MONDAY

Wastewater Treatment, continued

2:45-3:15
Granular and Flocculant Biomass: Learnings Flow Both Ways

Presenter: Dean Shiskowski, Ph.D., P.Eng., Associated Engineering

With dense, compact granules reaching particle diameters in excess of 1 mm and discreet granule settling velocities in the order of tens-of-metres per hour, aerobic granular biomass (AGB) is a topic that has attracted significant industry interest in recent years. A key element of granule development success is minimizing the carry-over of readily degradable carbon from un-aerated “feast” bioreactor environments to aerated “famine” environments, which can induce filamentous or zoogloeal flocculant biomass growth. Such conditions can cause outgrowths on individual granules, which impedes their settling velocity, or poor-settling flocculant growth within the biomass matrix that slows its overall setting velocity. In this context, select data from two laboratory-scale AGB experimental systems fed real primary effluent are presented to illustrate the correlation of carbon carry-over on measured sludge volume index and show how improvements were achieved concurrent with system modifications. Implications for conventional, flocculant biomass systems are also discussed.

MONDAY

Drinking Water


Location: The Penticton Lakeside Resort

Room: Salon C

1:45 - 2:15
Lead – Where Do We Draw the Line?

Presenter: Siobhan Robinson, M.A.Sc., P.Eng., Kerr Wood Leidal

The challenge with lead in drinking water is that while there may be no lead in the water throughout the distribution system, leaded components of domestic plumbing systems can leach lead into the water before it is measured at the tap. With lead in the news, the central question is ‘where do we draw the line?’ It is now more important than ever to understand the regulatory framework and the changes to the Health Canada Guidelines and learn more about how other water suppliers are approaching this issue. This session will provide details about what has changed and what this means for water utilities.
MONDAY

Drinking Water, continued

2:15-2:45
Do you know if you have a Corrosion Issue with Lead? Practical Tips to Understand your Risk

Presenter: Quirien Luywlyk, M.A.Sc., P.Eng., AECOM

Most water systems have poor records of lead and galvanized materials. Several jurisdictions mandate that lead inventories be publicly posted and require full lead service replacements and replacing only the public side is not allowed (Wisconsin, Ohio, Michigan). Further, controlling lead exposure at the tap has become increasingly complex as regulators identify lower limits for lead in tap water, including in British Columbia at 5 ppb.
To help utilities understand the practical implications of finding and managing lead in their water system, case studies from Michigan, Ohio and Pennsylvania will demonstrate:

• How to find lead and build a lead inventory using desk-top and field methods
• How to sample for lead
• How to interpret results to understand and manage the risk from lead in drinking water

This paper will be of interest to systems that want – or need – to reduce the risk from lead in tap water.

2:45-3:15
Lead Taskforce Update

Presenter: Marian Hands, BCWWA

Abstract TBD
MONDAY

Municipal Utility Management

Moderator: Michael Nordquist, M.Eng., P.Eng., PMP, LEED AP BD+C, WSP Canada

Location: The Penticton Lakeside Resort

Room: Merlot

1:45-2:15
Boom, Bust & Echo – How Main Break Data Guides Capital Planning

Presenter: Ron Weismiller, P.Eng., City of Burnaby

The latest Canadian Infrastructure Report Card reports that about 30% of Canadian drinking water infrastructure is in fair, poor or very poor condition; that long-term investments in renewal are essential, even as we envision new water projects to build in response to local growth and re-development. Should long-term funding fall short of replacement needs, an infrastructure funding gap is created (now greater than $30B, nationally). The failure of water infrastructure is not only costly, but it puts the safe provision of water in jeopardy. To achieve water system reliability and ensure we are using the correct dollars and efforts towards system renewal, the City of Burnaby has learned to look at main break and damage report data as a key tool in water capital planning. This presentation offers a perspective on how the City of Burnaby has grown in confidence in its water asset capital planning, using even the simplest of best practices and break history data analysis available.

2:15-2:45
Streamlining the Approval Process: Assessing Developments with Hydraulic Models

Presenters: Werner de Schaetzen, Ph.D, P.Eng. & Andrea d’Andrade, EIT, GeoAdvice Engineering

The City of Langley, like many municipalities in BC, is experiencing significant growth. As development occurs, it is important for the City to know whether the existing water distribution and sanitary sewer collection systems have the required capacities to handle the additional water demands and sanitary sewer loads. GeoAdvice and the City are working together to assess each development application using the City’s hydraulic models. Hydraulic modeling, when done properly, is a powerful tool for assessing proposed development applications and informing significant water distribution and sanitary sewer collection system infrastructure decisions. Using hydraulic modeling, site servicing reviews are completed in order to establish the impact of proposed developments on the City’s water and sanitary sewer systems as well as provide recommendations for upgrades where needed. By working in consultation with the City, recommendations are provided to achieve the City’s Official Community Plan objectives to provide sustainable water and sanitary sewer servicing to growth. Recommendations are made that enable the City to efficiently plan and effectively manage proposed developments.
Municipal Utility Management, continued

2:45-3:15
Building Information Modeling for Design and Construction of a WWTP

Presenters: Aaron Buckley, B.ES. & Sushma Rani, B.Arch., M.Eng., PMP, Jacobs

The Northwest Langley WWTP is being upgraded to provide tertiary treatment for 230,000 people. Building Information Modeling (BIM) is being used to develop the detailed design and will be used for construction management. A record BIM model for O&M activities will also be produced. There has been minimal application of BIM to the design, construction and operation of large municipal WWTPs in BC. There has also been limited development of Canadian BIM standards for water and wastewater infrastructure. This presentation will discuss critical success factors and lessons learned for implementing BIM on large design and construction projects in the municipal water and wastewater industry. The presentation will include strategies for robust project planning, collaborative design development, efficient design coordination and streamlined design reviews using BIM. The use of BIM on mobile devices in the field will also be discussed as a strategy for reducing costs and schedule delays during construction.
MONDAY

Operational Technologies

Moderator: Stacy Bell, Neptune Terminals

Location: The Penticton Lakeside Resort

Room: Zinfandel

1:45-2:15

Solving SCADA Challenges with Design Considerations

Presenter: Zane Spencer, Eng.L., MPE Engineering Ltd.

SCADA systems are utilized by Water and Wastewater Utilities to drive operational efficiency and gain intelligence related to their Critical Infrastructure. Many challenges related to SCADA system operation can be addressed during the design phase of a new system installation or existing system upgrade.

Challenges and solutions discussed will include:

- Communication systems – Prevent or Plan for failures?
- Level of Automation – Wants vs. Needs
- System Life Cycles – Plan for replacements
- SCADA Best Practices & Standards
- SCADA System Security
- Programming Specifications
- Data Management – How will data collected by the system be utilized?

Attendees will gain knowledge related to some of the challenges that face designers, operators and managers who interact with SCADA systems. Understanding these challenges and some of the options to overcome them will allow stakeholders to better discuss and determine the requirements for their systems as they work to design, implement and operate their SCADA systems.
MONDAY

Operational Technologies, continued

2:15-2:45
Benefits of High Performance Graphics for Municipal SCADA

Presenter: Steven Gillan, PBX Engineering

This presentation will provide an overview of High Performance Graphics as they pertain to municipal SCADA HMIs. An overview will be provided outlining some of the pitfalls seen in many SCADA systems and will subsequently provide comment on best practices for achieving maximal operator effectiveness. The best practices outlined will be guided largely by topics covered in the High Performance HMI handbook. Topics will include:

- The optimal use of colour
- Depiction of Alarms
- Implementation of Trends
- Level Indication means
- Use of charts, tables and checklists
- Optimal display hierarchy

This presentation will include a hands-on component: A high performance graphic SCADA system developed by PBX Engineering will be demonstrated via the main presentation screen, and also via six hand-held tablets that will be passed through the audience. Presentation attendees will be able to monitor and control the demonstration SCADA system in real time.

2:45-3:15
A Case Study in Legacy SCADA Migration: The City of Langley

Presenter: Max McLean, P.Eng., PBX Engineering

This case study will examine the processes followed, and features gained, during the upgrade of an existing SCADA system. The presentation will use the City of Langley as an example: in 2019 and early 2020, PBX Engineering was involved in the upgrade of the existing SCADA systems for the City, which involved the replacement of a legacy head-end system with a modern contemporary version. The presentation will examine the steps taken to perform the upgrade, and will highlight the benefits of using a template-based design. In addition, an overview will be provided of the upgraded features and efficiencies realized when migrating from an old system with rudimentary features to a modern implementation.

As part of the presentation, PBX Engineering will provide a demonstration of the upgraded City of Langley system.
MONDAY

Young Professionals Symposium

Location: The Penticton Lakeside Resort

Room: Chardonnay

1:45-2:15
Maximizing Your Potential – Advice from BCWWA’s Current Water Leaders

Presenters: TBD

Moderator: Jessica LeNoble, EIT, Kerr Wood Leidal

The water sector will require direction and leadership as new innovations and technologies change the way we operate systems and process information. This session will provide content on how some of BCWWA’s current leaders got involved in the water industry, found their passion, started volunteering with the BCWWA, and were nominated and elected to a leadership position. Current leaders in the BCWWA will discuss overcoming hurdles/obstacles, the process for getting involved (such as how the nominations process worked for them), and career/volunteer highlights. Advice on what our current water leaders would have done the same or differently will also be shared. The focus of this session will be on how new and existing professionals can maximize their potential in the water industry, develop their passion for water, and help lead the industry as it continues to grow and evolve.

2:15-3:15
Showcase: Young Professionals PechaKucha Series

Presenters: TBD

Moderator: Shona Robinson, EIT, Ph.D., Kerr Wood Leidal

In this dynamic session, YP presenters will share some of their favorite lessons, challenges and experiences, and non-YPs will impart share their wisdom from past experiences. Each Pecha Kucha presentation consists of 20 slides with 20 seconds of commentary (6 minutes and 40 seconds total), encouraging presenters to talk less, show more and have fun.
Underground Infrastructure

Moderator: Colin Kristiansen, P.Eng., MBA, Kerr Wood Leidal

Location: The Penticton Lakeside Resort

Room: Salon B

3:30-4:00
Ductile Iron Pipe for a Resilient, Sustainable Infrastructure

Presenter: Sam Ghosn, B.Eng., M.Sc., Ductile Iron Pipe Research Association (DIPRA)

Century ago, dedicated American engineers installed iron pipe to create the country’s water systems. This strong, safe, and reliable product has stood the test of time. Modern ductile iron pipe has the inherent strength to withstand the kind of incredible stress that natural disasters, such as earthquakes, can place on an infrastructure. Much of the storied success of Ductile iron pipelines was achieved using standard designs. Today, with awareness of the potential for seismic loadings growing and the need to keep pipelines in service during those events, additional features such as restrained joints, expansion couplings, and polyethylene encasement become a part of a properly designed Ductile iron pipeline.

In this presentation, we will discuss the environmental and economical benefits of using ductile Iron pipe. In addition, we will present the available seismic mitigation appurtenances that ductile iron pipe can provide to maintain a resilient and sustainable infrastructure, making it the best choice for pipeline material.

4:00-4:30
New Tools for Asbestos Cement Pipes Condition Assessment

Presenter: Nicholas Goertz, SewerVUE Technology

Pipe Penetrating Radar (PPR) is the underground, in-pipe application of GPR, a non-destructive testing method that can detect defects and cavities within and outside non-ferrous pipes.

The Asbestos Cement Pipe Scanner is a newly developed, remotely operated vehicle designed to inspect small diameter pipes with particular emphasis on AC and other non-ferrous pipes with diameters as small as 200 mm. The ACPS runs on tethered tracks, has high frequency antennae and features a CCTV camera, for visual correlation with the PPR results.

PPR data gathered from an asbestos cement pipe in Surrey, BC, demonstrated that PPR is effective in the assessment of small-diameter AC pipes. 2D line data were collected on the invert of the pipe. The high antenna frequency provided good quality data and signal penetration to allow analysis to a depth of 300 mm from the inside pipe wall. Wall thickness was interpreted to be in the 45 mm range with little variation over the inspected length. Interpreted results suggested no significant structural issues on the inspected sections of the pipe.

PPR has already been shown to be effective at gathering quantitative data from large diameter pipes, and this survey demonstrated that the technology could be adapted for smaller pipes, which represent a significant portion of the decaying AC pipe infrastructure.
MONDAY

Underground Infrastructure, continued

4:30-5:00
Pipeline Design Considerations to Increase Seismic & Subsidence Resilience

Presenter: John Johnson, ENVISIO SP, NACE CT, Canada Pipe / McWane

Designing for Seismic Resilience can play a major role in preventing buried pipe lines from damage due to seismic hazards. Seismic hazards can include: Ground Displacement, Liquefaction, Ground Deformation, Surface Crack(s), Ground Subsidence as well as in areas with potential earthquake activity.

Seismic Design Standard ISO 16134 provides a framework for resilient pipeline design internationally. This presentation introduces attendees to the standard as well as the performance ratings for: Expansion/Contraction, Slip-Out Resistance and Joint Deflection. The Standard Ductile Iron pipe is documented to be resistant to damage in seismically active areas due to its inherent strength to resistance to external loads along with joint deflection capacity. Similarly, this inherent ability can be augmented with the installation of a Seismic Coupling which further improves the lines ability to withstand significant ground displacements. Examples of areas that would benefit from additional protection are: Soft or disturbed earth, Reclaimed ground, Slopping grounds and near revetments and Areas prone to seismic events.

Attendees will be introduced to the following terminology: Seismic Strain, Axial compression/expansion and Deflection. How areas could benefit from additional protection will also be discussed including: Areas prone to Seismic events as well as Soft or Disturbed Earth, Reclaimed Ground, Slopping Grounds and near Revetments.
MONDAY

Drinking Water

Moderator: Ineke Kalwij, Ph.D., P.Eng., Kalwij Water Dynamics Inc.

Location: The Penticton Lakeside Resort

Room: Salon C

3:30-4:00
City of Chilliwack Well Pumping Test and Pilot Investigation

Presenters: Rachel Trower, EIT & Marta Green, Associated Engineering

Due to increasing potable water demands, the City of Chilliwack is investigating whether the East Chilliwack Aquifer, known to have elevated iron and manganese, could be used to supplement their primary source, the Sardis Aquifer.

To gain a better understanding of the aquifer’s water quality and the treatment requirements, the City retained Associated Engineering to design and oversee a year-long pumping test, and a month-long pilot study. This was conducted at Well No. 5, a production well developed in the 1990s but taken offline due to challenges with water quality.

After two months of pumping, iron and manganese in the water increased to levels exceeding aesthetic objectives. These levels continued to increase for 9 months and then appeared to stabilize. The pilot study was then completed using pre-oxidation followed by filtration-adsorption. The findings of the pilot study were used to develop a conceptual design for a full-scale water treatment plant.

4:00-4:30
Cross Connection Control Incidents and Emergency Response

Presenter: Trevor Hoff, Maintenance Training Systems Inc.

This discussion includes a review of past backflow incidents and a general emergency response action plan for a backflow incident. Topics include:

- Common causes of hydraulic conditions that cause backflow;
- Common indicators of a backflow incident;
- Sampling methods and emergency sample collection kit;
- Incident documentation and data collection;
- Remediation of contaminated piping;
- Restoring water service and user confidence.
Drinking Water, continued

4:30-5:00
Yukon Gold – Treating and Heating Water in Dawson City, Yukon

Presenters: Matthew Lozie, P.Eng., Associated Engineering & Rick Kent, Yukon Government

Dawson City, home of the Yukon Gold rush, provides residents with drinking water through groundwater wells situated nearby the confluence of the Yukon and Klondike rivers.

The Yukon Government, through the federal small communities fund, assists small communities who lack the capacity to fund or manage infrastructure projects. Associated Engineering provided design and construction services for a new water treatment plant which treats water with cartridge filters followed by UV and chlorine gas disinfection. Together with a local architectural firm, Associated Engineering provided a heritage-themed design for the plant to be situated along the prominent 5th Ave.

Unique challenges included:
- Climate change affects on construction flood elevation and mitigative design efforts,
- Working alongside the City’s Heritage Advisory Committee and stakeholders to ensure the building reserved an authentic gold rush era theme,
- Multiple energy forms provide building heat and power and seasonal heating to the treated water.
MONDAY

Biosolids

Moderator: Mary Boulanger, M.A.Sc., P.Eng., Urban Systems Ltd.

Location: The Penticton Lakeside Resort

Room: Zinfandel

3:30-4:00
Why Doesn’t Anybody Want My Biosolids?

Presenter: David Lycon, Ph.D., P.Eng., AECOM

The City of Penticton commissioned a Wastewater Solids Management Review to identify a sustainable solution to the growing production of waste solids from its Advanced WWTP. The City is not unique in the Okanagan Valley; other municipalities and regional districts are facing similar challenges associated with the ultimate end use/disposal of biosolids. Penticton’s challenges are compounded by an aging compost facility and a declining local demand for the finished composted biosolids product.

The project examined a long list of technologies primarily focused on biological stabilization and thermal/drying technologies. From the long list of technologies, a short list was developed and then analyzed using a multiple bottom line approach. This analysis provided three viable management options, which were then determined to be beyond the City’s financial capability. The project concluded with a “back to the drawing board” approach, which would satisfy all stakeholders.

4:00-4:30
Monitoring the Solids and Volumetric Flow Consolidation and Nutrient Compliance at the Kenosha Water Utility

Presenters: Zachary Mazur & Jerod Swanson, Centrisys-CNP

As space for landfills becomes limiting and more stringent organic waste diversion requirements are applied to sewage sludge, wastewater treatment plants need to reduce the amount of sludge to be disposed. At the same time, the effort to regulate the nutrient discharge by concentrating nutrients in the sewage sludge and the reduction of sludge volume results in further increasing the nutrient content of biosolids. To evaluate the degree of sludge volume reduction and nutrient concentration, a mass and nutrient balance of Kenosha Wastewater Treatment Plant was conducted.
Biosolids, continued

4:30-5:00
Biosolids Dewatering and Handling Trends – Moving Toward More Sustainable Solutions

Presenter: Dan Harmon, P.Eng., P.E., HDR

Planning and design of solids management facilities for communities in the Pacific Northwest are trending toward the design of systems that have a reduced impact on the liquid stream process, while providing more sustainable final biosolids management opportunities as existing composting facilities are reaching capacity. To manage these issues, two considerations are critical, namely dewatering and liquid stream management. Understanding dewaterability of the biosolids and understanding the operations requirements of the equipment is helping to facilitate good decision making on final equipment selection. This presentation will share what communities in the Pacific Northwest have implemented to assure more sustainable and reliable solids management solutions, and will show how the equipment selection, facility location, options for incorporation into other community management systems, and availability of amendments materials and chemicals fits into broader solids management solution.

MONDAY

Young Professionals Symposium

Location: The Penticton Lakeside Resort

Room: Chardonnay

3:30-4:00
Student Chapters, Design Competitions, and World Water Day: Youth and Student Engagement in the Water Industry

Presenters: TBD

Moderator: Jessica LeNoble, EIT, Kerr Wood Leidal

The water industry is experiencing growth and renewal as a large cohort of existing employees begin to retire, which will open up a wide range of opportunities for young and emerging professionals to join the sector. This session will provide an overview of BCWWA activities that will be relevant for student and YP members as they consider career options in the water industry. Topics will include an update from members of BCWWA’s active student chapters, a presentation from the winning 2020 BCWWA Student Design Competition Team, and a discussion of networking events led by the BCWWA YP Committee with details on how students and YPs can get more involved.
MONDAY

Young Professionals Symposium, continued

4:00-5:00
Positioning Yourself for Positions that Don’t Exist (Yet) – Panel Session

Panelists: TBD

Moderators: Negin Tousi, B.A.Sc., WSP and Sylvia Woolley, M.A.Sc., EIT, Associated Engineering

The world is changing quickly, and so is the way we work, solve problems, and evaluate risks. We are seeing new positions being created and the focus and priorities of project work changing. This panel will address some of the changes our industry is experiencing and discuss how Young Professionals can be leaders in addressing these changes. Panelists will draw from their own past experiences with change and discuss how these experiences could be relevant to what we are seeing now, and what is anticipated in the future. The panelists will also discuss emerging trends, the shift in regulatory focus, and technological advancements that could result in significant change to the water industry. The intent is to provide Young Professionals with insights on how to be prepared for change, and how to position oneself to lead that change. This will be an interactive panel with opportunities for questions from the audience.

TUESDAY

Municipal Utility Management

Moderator: Gaurav Ahuja, M.Eng., WSP

Location: The Penticton Lakeside Resort

Room: Salon A

8:00-8:30
Infrastructure Funding: Climate Lens Integration

Presenter: Lee Johnson, MRM, Ministry of Municipal Affairs and Housing

This presentation will provide an opportunity to hear how the Provincial government is integrating climate considerations, both mitigation and adaptation, into capital infrastructure funding programs. The session offers local governments a chance to better understand how to incorporate climate change considerations into infrastructure projects while discussing the Federal Climate Lens and Provincial climate objectives. It is hoped that the exploration of these topics and emerging best practices will help provide insight into design and construction approaches for low carbon and resilient infrastructure systems. This session will help build capacity by discussing the expected climate risks to drinking water, wastewater, and stormwater systems and the threats to our communities’ ability to deliver sustainable services. The impact of climate change on natural assets, which communities rely upon in service delivery, and their ability to provide opportunities to increase community resiliency will also be explored.