

# **Environmental & Science & Engineering** MAGAZINE

APRIL 2021  
WWW.ESEMAG.COM  
@ESEMAG



Protecting water plants from cyberattacks  
Controlling sewage lift station odours  
Multi-barrier approach for complex contaminants  
Cambridge WWTP adopts MABR technology

PMA0065446

Editor and Publisher **STEVE DAVEY**  
steve@esemag.com

Managing Editor **PETER DAVEY**  
peter@esemag.com

Sales Director **PENNY DAVEY**  
penny@esemag.com

Sales Representative **DENISE SIMPSON**  
denise@esemag.com

Accounting **SANDRA DAVEY**  
sandra@esemag.com

Design & Production **MIGUEL AGAWIN**  
miguel@esemag.com

Circulation **BRIAN GILLET**  
ese@mysubscription.ca

**TECHNICAL ADVISORY BOARD**

**Archis Ambulkar** OCT Water Quality Academy

**Gary Burrows** City of London

**Patrick Coleman** Stantec

**Bill De Angelis** Metrolinx

**Mohammed Elenany** Urban Systems

**William Fernandes** City of Toronto

**Marie Meunier** John Meunier Inc., Québec

**Tony Petrucci** TMIG The Municipal Infrastructure Group

Environmental Science & Engineering is a bi-monthly business publication of Environmental Science & Engineering Publications Inc. An all Canadian publication, ES&E provides authoritative editorial coverage of Canada's municipal and industrial environmental control systems and drinking water treatment and distribution.

Readers include consulting engineers, industrial plant managers and engineers, key municipal, provincial and federal environmental officials, water and wastewater plant operators and contractors.

Information contained in ES&E has been compiled from sources believed to be correct. ES&E cannot be responsible for the accuracy of articles or other editorial matter. Articles in this magazine are intended to provide information rather than give legal or other professional advice.

Canadian Publications Mail Sales  
Second Class Mail  
Product Agreement No. 40065446  
Registration No. 7750

**Subscription Changes?**  
Please email reader subscription changes to  
ese@mysubscription.ca, or call 705-502-0024.

Environmental Science & Engineering  
220 Industrial Pkwy. S., Unit 30  
Aurora, Ontario L4G 3V6  
Tel: (905)727-4666  
Website: www.esemag.com

A Supporting Publication of



**20**



**26**

**FEATURES**

- 6** Dinner with Prince Philip's private detective in 1967 changed my career
- 8** ECO Canada releases report on the financial compensation of environmental workers
- 10** Stormwater funding gap increasingly in the spotlight
- 14** Advanced biological filtration provides a multi-barrier approach to complex contaminant removal
- 19** Selkirk's new WWTP equipped to serve double current population
- 20** Florida cyberattack raises public awareness of threats to water plants
- 24** Saskatchewan city links recent sewer clogs to flushed masks
- 25** Filtration milestone reached for Northwest Territories water treatment plants
- 26** Pipeline design provides stormwater runoff control to protect West Vancouver neighbourhood
- 30** Testing an oxygenation system at a sewage lift station for odour control
- 32** Automated wastewater treatment systems help with compliance and reduce costs
- 34** Cambridge's Hespeler WWTP adopts membrane aerated biofilm reactor technology
- 38** B.C. cities get funding for wastewater heat recovery systems
- 39** Optimizing Kelowna's water system improves coverage and multi-use
- 40** Understanding the testing requirements under Ontario's new excess soil regulation
- 42** Accelerating digital transformation in the water industry to improve efficiency
- 44** \$90M in funding could jumpstart water work for 37 Ontario First Nation communities
- 46** Digital twins equip utilities to proactively manage and improve water systems

**DEPARTMENTS**

- 48** Product Showcase
- 51** Environmental News
- 51** Professional Cards
- 54** Ad Index



Cover photo by  
**De Nora**

[www.esemag.com](http://www.esemag.com)  
[@ESEMag](https://twitter.com/ESEMag)



**Environmental Science and Engineering Magazine**



The new pipe system will enable storm level flows to be managed within the Five Creeks area of West Vancouver and will reduce the impact of intense storms in Westmount and West Bay. Credit: ADS

## PIPELINE DESIGN PROVIDES STORMWATER RUNOFF CONTROL FOR WEST VANCOUVER NEIGHBOURHOOD

By **Steve Cooper**

The first consideration for preventing flooding and erosion from stormwater runoff in an upscale and sustainability-minded community of West Vancouver, British Columbia, was how to protect the environment, especially the five creeks in the area.

InterCAD Services Ltd. found a way to maintain low level flows in the creeks. This would ensure the environmental benefits of the creeks, while diverting only the excess flows that would occur during heavy rain storms.

“As the downstream neighbourhoods have developed, various pinch points were created,” explained Iain Lowe,

InterCAD’s project manager. “So, there was a realization that there was a need to divert water away from the creeks to protect the downstream lands. We devised a system to take about 30,000 litres of water per second out of the creeks and divert it directly to the ocean.”

Once completed, the new system will serve the Pipe, Westmount, Cave, Godman and Turner watersheds by directing creek flow, which would potentially overflow the banks of the creeks and flood the area, into the new pipe. The Five Creeks Stormwater Flood Projection Project was initiated and substantially funded by developer British Pacific Properties

(BPP) in a partnership with West Vancouver as a way to protect the area.

In 2013, the District of West Vancouver prepared an Integrated Stormwater Management Plan (ISMP) to address concerns of overland flooding within the Five Creeks watershed area. The plan would benefit both existing and future neighbourhoods below and above the Upper Levels Highway.

It called for a stormwater pipe to run through the Westmount and West Bay neighbourhoods from the Upper Levels Highway down to the Burrard Inlet at the foot of 31st Street. Intake structures installed within the creeks would divert

stormwater from larger, infrequent rain events into the pipe, while retaining base flows within the creeks.

Now, some 2,000 metres of the buried stormwater pipe runs under the roads through the Westmount and West Bay neighbourhoods from north of the Upper Levels Highway down to the Burrard Inlet at the foot of 31st Street. The Main Leg of the storm sewer used 800 metres of 1,500 mm diameter ADS SaniTite® HP pipe with fabricated bends, tees and manholes, and 400 metres of 1,800 mm diameter concrete pipe.

Being implemented in stages, the second phase – the East Leg – is scheduled to be completed by early 2022 and will use 1,200 metres of 900 mm to 1,500 mm diameter SaniTite HP pipe. The final phase, the West Leg, will extend the pipe to the northwest to pick up flows from Turner and Godman Creeks.

“While BPP is developing the lands north of the highway, the ISMP recognizes that the construction of the developments will result in negligible increases



*SaniTite HP pipe made it possible to have five-degree bends prefabricated at the ADS plant to accommodate the terrain and to follow the road. Credit: ADS*

in runoff in the post-development condition,” Lowe said. “The way it works is that all the flows up to a two-year event remain in the creeks, so we don’t touch any of that water. Any water flowing above that two-year level is progressively

split off, so we essentially end up with a 50/50 split between the creek and the diversion pipe. The pipeline is designed to function up to a 200-year storm.”

“We obviously didn’t want to dry out  
*continued overleaf...*”

# GRAF EcoBloc Inspect smart

- » Fully inspectable
- » Up to 7.5m burial depth
- » Minimal assembly required
- » Load rating HS-25 or above with approval
- » Expert technical service & support from our team



celebrating 50 years

Canadian Supplier  
1.800.665.4499 | barrplastics.com



ENVIRONMENTAL TECHNOLOGIES INC.

Ontario Distributor  
1.866.625.3929 | makeway.ca

these creeks, and it was important to maintain the environmental benefits of those creeks. Essentially, we removed the large rain events from the creek, which provides protection to the downstream properties and an area of around 500 acres containing numerous homes,” added Lowe.

Maximizing the hydraulic efficiency of the pipe conveying the diverted water was a key in selecting the type of pipe that would be used. Lowe’s plan called for pipe in diameters from 1,500 mm to 1,800 mm to accommodate the volume of runoff. He first considered using all reinforced concrete pipe (RCP). In order to meet the hydraulic design consideration, however, there was a desire for it to be lined, in order to provide protection against abrasion which would add to the cost.

“As we designed the alignment and calculated the hydraulic need for conveying gravity flow runoff down the steep grade from the base of Cypress Mountain all the way to the Pacific, that



It was possible for the contractor to slip the large diameter stormwater pipe under existing utilities. Credit: InterCAD

led us to thinking about thermoplastic types of pipe,” Lowe explained. “SaniTite only goes up to 1,500 mm diameter. At some points we needed 1,800 mm diameter pipe. So, we couldn’t use it for all the run, but we reached a compromise.”

He added that “the reason we went

with it was because the pipe provides excellent hydraulics, being so smooth on the inside, plus it’s also very durable as well, so it is resistant to operational damage from any sediment that enters the pipe. Our materials selection was acceptable to the District of West Vancouver.”



Looking to learn from some of the industry’s best experts?

Check out the continuing Stantec Water Webinar Series

New year, new topics. This year we are covering everything from integrating affordability into capital planning and using customer insights to improve asset performance to selenium management and dam safety. Visit [stantec.com/water](http://stantec.com/water) to learn more and view past recordings.



Design with community in mind

**Proven Efficient Solutions to Water Quality Challenges**



- Available for Immediate Shipping!
- 3.6 Log Cyst Reduction
- Pre-Filtration
- 1-Micron Absolute
- THREE Filters in ONE: Cyclonic Separator, Cartridge Filter, Upflow Filter
- Up to 20% Less Energy Costs
- Flow Rates <1.9 - 151.4L/s per Housing
- Proven Installations Across All Canadian Provinces, North America & Worldwide!



**HARMSCO® MUNICIPAL**

(800) 327-3248 • (561) 848-9628 • [sales@harmSCO.com](mailto:sales@harmSCO.com) • [HarmSCO.com](http://HarmSCO.com)

Previous to the Five Creeks project, ADS submitted its SaniTite HP polypropylene pipe to the Master Municipal Construction Documents Association, Civil Committee, which unanimously approved it and material, and added the pipe to the Master Municipal Construction Documents (MMCD) list of approved products for use in highway, culvert and other infrastructure projects in British Columbia.

Installation of the new pipeline was done by Complete Utility Contractors Ltd. (Pitt Meadows, B.C.) with a crew of four to seven. "To get through the bedrock, we had two excavators with large hoe ram attachments, but we did have to blast in some areas," said Adam Matheos, project manager for Complete Utility Contractors. "We laid in the pipe sections concurrently. We excavated and didn't get too far ahead so the pipe would line up. And because the ADS pipe is lighter than the concrete and comes in longer sections, it definitely made for a quicker installation."

Matheos added: "There were fewer joints and it was easier to put into the ground and push together. This made it much easier going through residential areas at a pretty significant grade and we were anywhere from three to four metres deep. Naturally, the bedrock was more challenging but even though this was our first time using the ADS pipe in such large diameters, it was easy to work with and very durable."

The pipe came from the ADS plant with special five-degree mitres for some sections. "Those five-degree bends were needed for constructing the pipe around and within the existing roads, and for running between existing underground utilities and services," stated Lowe. "We tried to create smooth circular radius curves or bends, which we achieved using the SaniTite."

Specific sections of the pipe were fabricated at the ADS plant to include a riser with a ladder inside to act as a manhole.

In addition to the new stormwater management system, the project will also include the relocation of watermains, complete reconstruction of roads and resurfacing, and the addition of sidewalks.

When completed, the project will increase the level of flood protection for homes below the Upper Levels Highway. Rerouting the excess stormwater will also reduce erosion, help to safeguard residents and property while accomplishing its original goal of protecting the watershed health of the Five Creeks drainage areas. ■

*Steve Cooper works with Advanced Drainage Systems Inc. For more information, visit: [www.adspipe.com](http://www.adspipe.com)*

# A Bigger and Better One-Stop-Shop



IS NOW



We are excited to announce that Metcon has been rebranded as **SCG Process**. Unified as SCG Process, we can help you implement more solutions to support your municipal and industrial facility's process performance and aging infrastructure needs.

Chemical Feed

Measurement and Control

Disinfection

Filtration

Packaged Treatment Systems

Rebuild Services for Large Pumps and Blowers

Process Equipment Part Rebuilds to Extend the Life of Old Assets

Material Component Upgrades

[SCGprocess.com](http://SCGprocess.com)