OPERATOR DIGEST

WINTER 2023 | NUMBER 155

EOCP

Quarterly Magazine of the Environmental Operators Certification Program – BC/Yukon

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OPERATOR DIGEST

The **Operator Digest** is the official magazine of the **Environmental Operators Certification Program**.

Submissions for publication in the Digest are welcome. Please email them to the EOCP office at eocp@eocp.ca

Changes of address, annual dues, Continuing Education Require-ments, exam applications, as well as general enquiries about the program should be addressed to:

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The Environmental Operators Certification Program is a charter member of Water Professionals Internationa and is a registered society with more than 4,500 active members.

OPERATOR OF THE YEAR

Kevin Vilac CWP, CWWP
City of Merritt

How did you become an Operator?
I was originally hired as a seasonal labourer for the City of Merritt. After a couple of seasons, I was able to secure a full-time position as an equipment Operator. Shortly after, one of the Operators in the wastewater treatment plant fell ill and they needed somebody to assist and fill the gap. When the crew was asked who would be willing to go into the plant, everyone balked at the idea because it was dealing with sewage. Due to my previous career as a garbage man, gross things did not bother me, so I volunteered. After spending that first day in the wastewater treatment plant, I knew this is what I wanted to do. It was nothing like I had expected and was amazed at all that was involved with the position.

How long have you been an Operator?
I have been an Operator for 14 years.

What are your core functions?
I ensure the safe and efficient operation and maintenance of the wastewater treatment plant, the water treatment facilities, and the water supply facilities.

What is your typical day?
A typical day begins with liaising with our crew to set the goals for the day. Then executing the work plan. This does not always go according to plan, as there is almost always some kind of monkey wrench which is tossed into the mix to make the day exciting. When these situations arise, I look at them as challenges not problems which require a solution.

What do you most enjoy about the work? I enjoy the variety of challenges which present themselves in a day. I enjoy the fact that everyday we make a difference in protecting the environment and serving our residents.

What are some challenges you face?
Due to our size, we do not have the luxury to just grab a replacement part off the shelf, so we must find a solution for the challenge with the resources we have available. The greatest challenge I have faced was the flood of 2021. The City of

'Operator of the year' continued on page 8

MESSAGE FROM THE DIRECTORS AND STAFF

Whilst 2022 had its series of upheavals, the changes and challenges also presented many opportunities, and we've been able to move forward, accomplishing a great deal

We have been working on our Constitution and Bylaws to ensure that they line up with our four Strategic Priorities. As a result, some changes:

1. Our conference was the biggest ever for the EOCP since the first conference in 2018. We had 200 delegates in person, and 400 joining us virtually. Work is already under way for EOCP2023, a hybrid conference with the theme 'Learn-Empower-Inspire', which we expect will be even bigger and better. Click **here** to add the conference dates into your calendar!
2. Something new planned for 2023 is a 'Women of Water' event that will be added on to the end of the 2023 conference. This will be a half day event accessible in person as well as virtually on the 14th of September 2023.
3. At our conference we also announced the Brian Thorburn Student Scholarship whereby every year, the EOCP will award three scholarships, worth $2,500 for one student each from BCIT, Okanagan College, and Thompson Rivers University.
4. We also set up for 2023, the launch of our new 'Stormwater Collections Operator' certification.
5. We celebrated the Water Supply Association's 100th anniversary by providing a $2,000 award to a student from one of the institutions that provides Operator training (BCIT, Okanagan College, or Thompson Rivers University).

Chris Kerman

Kalpna Solanki

6. Despite the pandemic, we had a competitive election and welcome to the board our new directors:
   - Natasha Cvenkel
   - Mike Firlotte
   - Chris Ford
7. The EOCP 'Operator on the Job' video series was completed with a set of five videos that can be seen at the EOCP's **YouTube** channel and **TikTok** channel.
8. The EOCP was also involved with the Canadian Water and Wastewater Association's Utility Development Committee. With the input of various others across Canada, a **Workforce Development Guidance Document** was created. This document is a resource for water, wastewater, and stormwater utility managers to offer guidance for addressing the challenges of recruiting, training, and retaining qualified staff to maintain a resilient and sustainable utility.
9. The EOCP has increasingly been involved with monitoring of facilities to ensure they are appropriately classified, and that facilities are operated by certified Environmental Operators. Along with this, there has been an added focus on promoting the valuable work of Environmental Operators to attract more entrants to the profession.

   To ensure this additional work can be completed and to safeguard the sustainability of the EOCP, membership dues will be changing as of January 2024.
10. Looking at EOCP by the numbers:
    - 225 facilities pre/re/classified
    - 456 exam sessions held
    - 894 exams written

We look forward to working together with you to protect public health and the environment for more than 5 million people in British Columbia and Yukon.

Chris Kerman, Board Chair
Kalpna Solanki, President and Chief Executive Officer

SAVE THE DATE
EOCP's Next Conference is 11-13 September 2023!

Mike Williams, Kalpna Solanki, and Byron Porter

BONAPARTE (STU'XWTEWS) FIRST NATION

By Rob Fleming (DTech) and Kalpna Solanki CPHI(C) BSc MBA

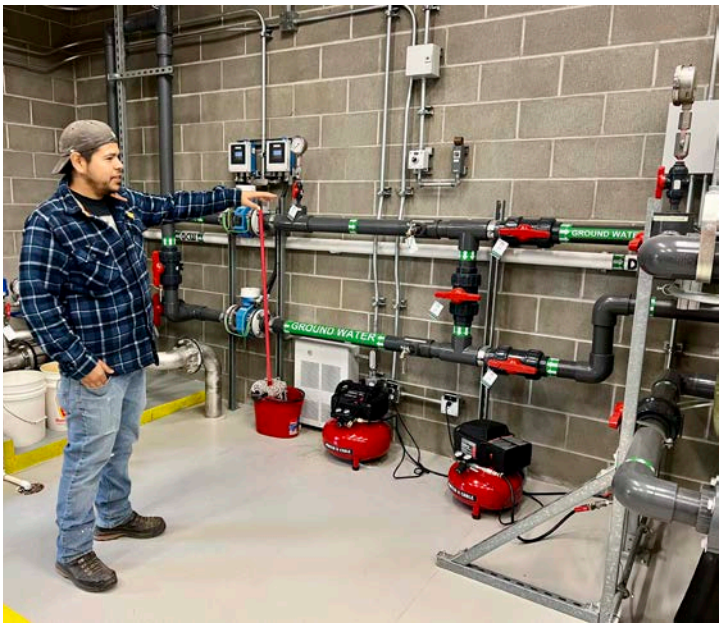
The main reservoir at Bonaparte First Nation

We recently had the pleasure of visiting Bonaparte First Nation (also known as the Stu'xwtews First Nation) a member band of the Shuswap Nation Tribal Council of the Secwépemc (Shuswap) people. The Community is located west of Cache Creek, with reserve lands of about 1,878 hectares.

EOCP certified Operators Byron Porter CWP and Mike Williams CWP took us on a tour of their community and its two water treatment plants: one brick and mortar, and the other in a Sea-Can. Bonaparte (Stu'xwtews) First Nation also has a multi-component drinking water capital project in progress that includes two more Sea-Can systems with advanced treatment to service two clusters of homes and 12 Point of Entry (PoE) systems for individual homes not within reach of the other clusters.

The bricks and mortar system, located on reserve Bonaparte 3, was commissioned in 2017 and utilizes groundwater from two 60 metre deep wells located 25 metres apart. The source water undergoes prechlorination with diaphragm pumps using 12% sodium hypochlorite, and then flows through three parallel Filox filters to remove iron and manganese. The filters undergo a daily automatic backwash, with the backwash water flowing through a settlement tank to a rock pit. Post Filox filtration, 12% chlorine is injected, the treated water achieves contact time in a wet well, and then is pumped to a 540,000 litre reservoir. The treated water from the reservoir flows through three parallel OneFlow filters prior to entering the distribution system. The distribution system currently consisted of 57 homes, the Band Administrative office and Health Centre, the Utilities and Lands Building, the HeadStart Program, and the Community Hall. The distribution system has 25 fire hydrants throughout the community, which are maintained, serviced, and flushed twice a year in the spring and fall. Byron and Mike perform all drinking water related duties with the support of the community EOCP Certified Circuit Rider, Gordon Anthony.

The Sea-Can system, known as the Morgan Treatment Facility, is a Filterco treatment plant that was commissioned in 2020.



Byron Porter in the process room of the Treatment Facility at IR#3

Gordon Anthony (Circuit Rider), Byron Porter, and Mike Williams

The source water is from two GUDI wells that are 15 metres deep, which is then prechlorinated. The water needs filtration to control iron and taste, so it goes through two iron filters in parallel, two activated carbon filters in parallel, two 5µ cartridge filters in parallel, and then finally through UV treatment. Post-UV, the water is chlorinated again using 3% sodium hypochlorite with peristaltic pumps, and stored in two reservoirs totaling 14,000 litres. This smaller system provides potable water to five homes, and has no hydrants for firefighting. The Morgan system is located approximately 25km from the main Bonaparte Community Water System, creating some logistical challenges for the Operators to maintain each system, especially during winter when road conditions can be difficult.

Bonaparte First Nation has several homes geographically disconnected from these two systems, which means that providing a centralized water system for the entire community is not feasible. The Community has a plan for two additional Sea-Can systems, built by Clearflo Systems on Vancouver Island, to serve clusters of homes that will be commissioned in 2023. These two new systems, along with the existing two Community Water Systems and the 12 POE systems, will mean that all residents of Bonaparte First Nation have access to clean, safe, reliable tap water.

Byron and Mike are dedicated and conscientious Operators working to provide clean, safe, reliable tap water to all community members and visitors to Bonaparte (Stu'xwtews) First Nation. Kudos to Byron and Mike who have this critical role within their community and to Band Administrator Sean Bennett, and the Bonaparte (Stu'xwtews) First Nation Kukpi7 Chief and Council for their ongoing commitment to safe drinking water for their community. The community has prioritized drinking water, and has worked with partners to find innovative solutions to challenging topography, geography, source waters, and operations.

Mike Williams and Byron Porter at the Morgan Treatment Facility

WATER AND WASTEWATER OPERATIONS PROGRAM.

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Full funding is provided for accepted Indigenous students thanks to the generosity of the Dennis & Phyllis Washington Foundation.

Register now at **bcit.ca/water** or contact **Andrea_Dusanj@bcit.ca** for more information.

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WHEN THE GOING GETS TOUGH, THE TOUGH GET GOING

By Mike Firlotte CWP, Mike McLachlan CWP CWWP, Byron Wagner CWP CWWP, Kalpna Solanki CPHI(C), BSc MBA

Living in northern Canada has its challenges, challenges that are rarely experienced in most other parts of Canada. Even when the temperatures drop to below - 50°C, water and wastewater infrastructure needs to be maintained. So, how is this accomplished?

The City of Whitehorse has Level I Water Treatment, Level II Wastewater Treatment facilities, and Level III Water Distribution and Wastewater Collection systems. The current water source is ground water from the Selkirk well field.

While the WT system is fairly standard, something unique to the WD system is the use of thermostatically controlled 'bleeders' that essentially 'drip' at a rate of 1.1 to 2.2 Litres per minute to keep the water moving, preventing freezing. In addition, many lines also have a heat trace on them to prevent freezing.

Water from the bleeders discharge to the sanitary sewer, and also serve to keep the sanitary lines from freezing. But even then, in around 14 locations, the sewer line is steamed twice weekly to make sure it does not freeze.

Hydrant lines can be up to 3 to 5 metres below the surface. Plumbing antifreeze (Food Grade) is used to keep the hydrants from freezing, the pressure is kept at 20 psi to prevent any back flow issues as

'Whitehorse" continued on page 9

Above: EOCP Directors and Staff Finding Out About Steamers

Below: Willy Benn, Kalpna Solanki, and Real Stoker Outside a Steamer Truck

Bleeder runs from the dead-end hydrant. This keeps the hydrant running and also keeps the sewer flowing

'Operator of the year' continued from page 2

Merritt was inundated with an unprecedented volume of water forcing us to think on our feet to protect our infrastructure. Once the water rescinded, we then had to assess the damage and determine how to get our critical infrastructure back online. Our main goal was to bring our residents home in the fastest and most efficient way possible, yet still protecting the environment and providing safe, clean drinking water.

What advice do you have on how to have a successful career as an Operator? Knowledge is your greatest ally to succeeding as an Operator. This includes schooling and knowing your systems in and out so when something happens you can find a solution to the challenge. Also, listening to everyone you work with or who works for you. It is the team who will make you successful.

What do you do when you aren't working? When I am not working, I enjoy my time with my family. You will find us either on a lake fishing or out in the bush hunting.

What else can you tell us about working as an Environmental Operator? Working as an Environmental Operator has been the most rewarding career I have ever done. You are part of a great team who at a drop of hat, will lend a hand to help you. I have met a lot of great people who share the same passion to protect the environment and the communities in which we live.

Whom would you recognize as a mentor? I would recognize Darrell Finnigan as a mentor. He was the Chief Operator that I first worked under and showed me the light so to speak. He supported and inspired me to pursue my career as an Operator.

Board Director Allison O'Neill is in her element at the Whistlebend Recirculation Pump House

Mike McLachlan CWP CWWP, gives EOCP Directors and staff a tour of the Recirculation Facility

'Whitehorse" continued from page 7

hydrants are only charged when used for fire suppression needed in the winter.

What is also unique to the WD system in Whitehorse is that it uses a recirculation system so that lines do not freeze. Water goes into a residential property and then leaves through the house and goes through a recirculation pump house.

This system circulates water at a rate of 35 litres per second. Back up boilers could be used if needed to help keep the circulating water at a temperature of 2.5°C to 3°C. With the growing population of Whitehorse, the recirculation systems, although originally set up for rechlorination, now have an important purpose of keeping the water from freezing as well as preventing stagnation .

The Steamer Truck is equipment quite unique to northern climates. Whitehorse has two of these. In addition to the aforementioned purpose of steaming the sewers, the Steamer Truck is also used for thawing the ground when emergency work is needed. Most utilities are between 3 to 5 metres below the surface and just using a backhoe will not suffice. The Steamer Trucks thaw the area before the digging equipment can work. This is an involved process that may take a full day to thaw an area large enough to put in a cage that is 2m by 4m and will need an area of 4m by 5m to be thawed in preparation.

Despite the challenges of the climate, the Environmental Operators' Certification Program's Operators keep the water and wastewater systems running impeccably.

Typical Building Recirculation System

Steamer Truck in Operation

Operator training, close to home

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WHO'S ON THE MOVE

Anna Agnew CWP, CWWP. Water and Wastewater Technician, Jameson Water

What is your new position? I am a Water and Wastewater Technician with Jameson Water. I work as a Circuit Rider and a sometime instructor for the Jameson water and wastewater courses.

What was your first job?
My first job was a chambermaid at Johnny's Motel in Grand Forks BC.

What was your path to becoming an Operator? I was looking for an active career that didn't require a four-year degree. I was researching options in the Okanagan College course calendar (as we did in the 90s) and discovered the Water Quality Technology program with a co-op option! I had the required prerequisites, entered the program in 1996, and have never looked back!

How did you pivot from your last position to your current one?
Relationships, experience, and connections! The Operator world is small! I was looking for a hands-on Operator position which included teaching and mentoring Operators, with travel. I had been working on contract teaching courses with Jameson Water since 2019, but I'm new to being a Circuit Rider.

What advice would you give to someone who is currently an Operator or considering becoming one? I tell them how passionate I am about being an Environmental Operator – whether I'm working to protect the community's drinking water, receiving environment from wastewater, or training fellow Operators, I get a lot of job satisfaction! The benefits of being an Operator are the demand for our skills, the ability to travel around and work in new locations, as well as always learning because you need to keep up your education credentials. There are always new technologies on the horizon!

Anna Agnew with Carlson Charlie Sr. CWP, in Pacheedaht. This photo is from when we cleaned and replaced broken parts from the sodium hypochlorite injection system.

What are some of your goals in your new position? Establishing relationships with the First Nations Operators I'm working with and learning about their operations and many responsibilities to their communities. First Nations Operators are dedicated and wear a lot of hats. They have critical positions in their communities, often looking after roads, snow removal, taking care of their Elders, providing firewood, keeping storm drains clear, and helping with housing. My goal is to be a resource and help where I can with their water and wastewater operations, by helping hands on while sharing knowledge and best practices.

What do you do in your spare time? I have a dog, Zuma, who travels around with me and motivates me to explore new trails and parks daily. I have recently moved to Ladysmith and I'm exploring all the island hotspots in my campervan VANANNA!


MATH FOR OPERATORS

Loading Rate kg/day

By Chris Kerman, AScT, PO, CWWP In Collaboration with Natasha Cvenkel, P.Eng.

You have been asked to assist with planned upgrades to your treatment plant. The upgrades include the installation of a pump to dose a chemical into the primary influent channel to help with settling. Your plant processes 10 MLD. After jar testing the recommend dose of active chemical to wastewater is 18 mg/L. The product to be supplied is a 35% solution.

a) To ensure that the plant will have sufficient storage space for the new chemical, in an existing 10,000 L tank, you have been asked to provide the volume of the chemical used per day based on the MLD.

We have this formula for **Loading Rate** from Page 3 of the ABC/WPI Wastewater Formula Table

$$\textbf{Loading Rate}\,\frac{\text{kg}}{\text{day}} = \frac{(\text{Volume}\,\frac{\text{m}^3}{\text{day}})(\text{Concentration}\,\frac{\text{mg}}{\text{L}})}{1{,}000}$$

In the question above you have been asked for a volume. In the Loading Rate formula, volume is a variable that you would have on hand and would be able to input to calculate the loading rate. From the information we have been provided we do not have the volume and need to manipulate the formula to calculate the daily volume to be used to ensure adequate chemical storage.

What we know:

- We have a 35% chemical solution
- We have 10,000,000 L per day of wastewater to treat
- We need to dose 18 mg/L of active chemical
- We have a 10,000 L storage tank

With the known dose of 18 mg/L and the volume of 10,000,000 L/day we can quickly calculate the total mg/day of active chemical needed. Then convert the mg/day to kg/day.

Conversion Factors Page 7 ABC/WPI Wastewater Formula Table

1 g = 1,000 mg 1 kg = 1,000 g therefore

$$18\,\frac{\text{mg}}{\text{L}}\ \text{x}\ 10{,}000{,}000\,\frac{\text{L}}{\text{day}} = 180{,}000{,}000\,\frac{\text{mg}}{\text{day}}$$

$$180{,}000{,}000\,\frac{\text{mg}}{\text{day}}\ \text{x}\ \frac{1\ \text{g}}{1{,}000\ \text{mg}}\ \text{x}\ \frac{1\ \text{kg}}{1{,}000\ \text{g}} = 180\,\frac{\text{kg}}{\text{day}}$$

We have determined we need **180 kg/day** of **active** chemical to get the prescribed dose. Using the known concentration of the solution (35%) we can calculate the total volume of solution per day we need to deliver the 180 kg/day of active chemical. Before we manipulate our **Loading Rate** formula, we must convert our 35% chemical solution into mg/L.

Conversion Factors Page 7 ABC/WPI Wastewater Formula Table

1% = 10,000 mg/L therefore 35% = 35 x 10,000 mg/L = 350,000 mg/L

Now we are ready to import our Daily Loading Rate and Concentration back into our original formula to solve for the Volume.

$$180\,\frac{\text{kg}}{\text{day}} = \frac{\text{Volume}\,\frac{\text{m}^3}{\text{day}}\ \text{x}\ 350{,}000\,\frac{\text{mg}}{\text{L}}}{1{,}000}$$

We need to get the daily volume (unknown) on its own. We must multiply both sides of the equation by 1,000. This will eliminate the 1000 from the denominator location on the right side of the equation. We then have

$$180{,}000\,\frac{\text{kg}}{\text{day}} = \text{Volume}\,\frac{\text{m}^3}{\text{day}}\ \text{x}\ 350{,}000\,\frac{\text{mg}}{\text{L}}$$

If we then divide both sides of the equation by our concentration, we will have a volume in m³ of chemical solution to dose per day.

$$\frac{180{,}000\,\frac{\text{kg}}{\text{day}}}{350{,}000\,\frac{\text{mg}}{\text{L}}} = \text{Volume}\,\frac{\text{m}^3}{\text{day}}$$

$$0.514\,\frac{\text{m}^3}{\text{day}}$$

Conversion Factors Page 7 ABC/WPI Wastewater Formula Table

1 m³ = 1,000 L therefore

$$0.514\,\frac{\text{m}^3}{\text{day}}\ \text{x}\frac{1{,}000\ \text{L}}{1\ \text{m}^3} = \text{Volume}\,\frac{\text{L}}{\text{day}}$$

$$= 514\ \text{L/day}$$

If we then divide the tank volume by our daily usage, we can calculate the number of days of storage.

$$\frac{10{,}000\ L}{514\,\frac{L}{\text{day}}} = 19.4\ \text{day}$$

It was agreed that more than 2 weeks of chemical storage would be sufficient.

b) You have been asked to size a pump to dose a chemical into the primary influent channel to help with settling. The chemical dosing pump will be controlled by a feedback loop from a flow meter to help dose the recommended concentration at any given flow rate. Reviewing your plant's onsite historic wastewater flow rates, you note that 250 L/s is at the upper end of your plant's range of flows.

Begin by selecting a period of time to compare the influent flow rate with the necessary chemical flow rate, let's use 10 minutes.

We first need to calculate the total volume of wastewater with that flow rate for 10 minutes.

$$10\ \text{min x}\ 60\,\frac{s}{\text{min}}\ \text{x}\frac{250\ \text{L}}{s} = 150{,}000\ \text{L}$$

Conversion Factors Page 7 ABC/WPI Wastewater Formula Table

1,000 L = 1 m³ therefore

$$150,000\ \text{L}\ \text{x}\frac{1\ \text{m}^3}{1,000\ \text{L}} = 150\ \text{m}^3$$

We can use our solution from Part A to come up with a ratio of chemical dose in L to volume of wastewater to be treated in m³.

$$\frac{514\ \frac{\text{L}}{\text{day}}}{10,000\ \frac{m^3}{day}} = 0.0514\ \text{L/m}^3$$

$0.0514\ \text{L/m}^3$ can be multiplied by any wastewater volume in m³ to find out the volume in L of 35% chemical solution to dose. It can also be used to help program the control logic for the pump PID.

150 m³ x 0.0514 $\frac{\text{L}}{\text{m3}}$ = 7.71 L

7.71 L / 10 min = 0.771 L/min

That works out to a little more than 0.75 L of chemical solution per minute.

A pump should be selected that will operate in the middle of its output range. This way you have room on both the bottom and upper range to dose the correct amount during lower or higher flow events.

You have decided to select a pump with an output range of 0 - 1.0 L/min.

If there is a formula on the ABC/WPI sheets that you would like to see worked through in a future edition of The Operator Digest, please email ckerman@watersolutionsbc.com

The formula sheet is found here www.eocp.ca click on the Menu tab (upper right corner) then click on Operator and finally Exam Preparation. Under the title Other Important Documents, you will find the links for the ABC Canadian Formula/Conversion tables.

Until next time, Happy Operating!

BCWWA
BC WATER & WASTE ASSOCIATION

BCWWA Annual Conference & Trade Show

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STATISTICS

1st October to 31st December 2022

EOCP
Environmental Operators Certification Program

EXAM STATISTICS

387 exams taken

109 exam sessions

FACILITIES

72 facilities re/classified

CONTINUING EDUCATION UNITS (CEUs)

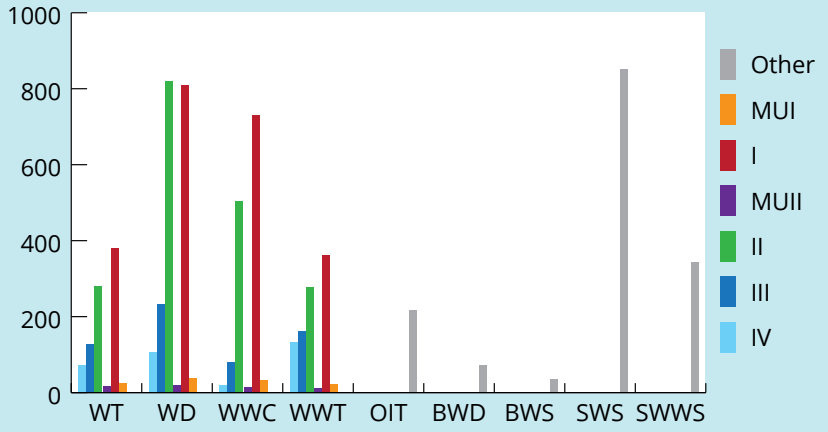
1,186 Operators submitted CEUs

2,085 CEUs were earned

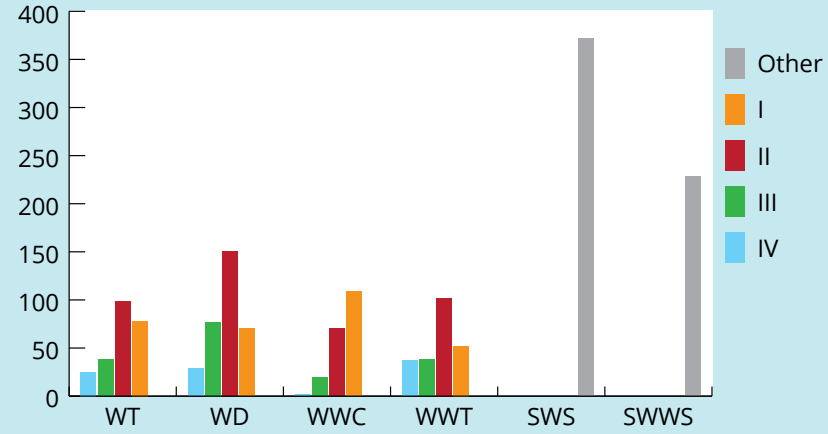
DEFINITIONS

WT	Water Treatment
WD	Water Distribution
WWC	Wastewater Collection
WWT	Wastewater Treatment
OIT	Operator In Training
BWD	Bulk Water Delivery
BWS	Building Water System
SWS	Small Water System
SWWS	Small Wastewater System
MU	Multi Utility

Operator Certification



Facility Classification



CEUs can be added to your profile by choosing Action > Add Course Taken under the learning column. Or you can email your certificates to eocp@eocp.ca.

Check your Operator status by logging into your profile at https://crm.eocp.ca/ and clicking on **ACCOUNT** to see if your 2023 dues have been paid, and **CEU** under the **LEARNING STATUS** tab to see if your CEUs have been met.

If your CEUs have not been met for the 2020 - 2021 reporting period, and/or your dues haven't been paid for 2023, your status will be red flagged and you will be listed as not certified.

SAVE THE DATE

11TH-13TH SEPTEMBER 2023

EOCP HYBRID CONFERENCE

Designed for Operators, by Operators

LEARN. EMPOWER. INSPIRE.

The 2023 EOCP Hybrid Conference program will be jam-packed with two full days of training worth up to 1.2 CEUs.

Attend in person (in Vancouver) or online! Registration Opens on the 1st of May 2023.

What #EOCP2022 attendees said:

"Thank you, I enjoyed the event very much. There were diverse topics, interesting conversations, and the food was excellent."

"Very great, more than I thought it was going to be."

"I was very impressed with it all, I've already got the go ahead to attend in person next year. See you next year!"

"Great Tradeshow - much needed Information."

For more information and to register, check out eocp.ca/eocp-conference/

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