

OPERATOR DIGEST

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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

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OPERATOR PROFILE

Scott Goosen

CWP CWWP, City of Mission



How did you become an Operator?

I began my career in 2008 at the end of a weed-whacker working for the City of Abbotsford Water Distribution Division. 8 months later I inadvertently challenged the WDI exam instead of the OIT test - I passed and the rest is history.

How long have you been an Operator?

This will be my 16th year as an operator.

What are your core functions?

- Upgrading, replacing, and maintaining water and sewer infrastructure
- Developing and administering a water quality program
- Writing standard procedures
- Administrating for Health and Safety
- Maintaining pressure reducing stations and a small water system
- Maintaining sewer lift stations and a small wastewater system
- Training other operators
- Aiding in the planning stage of a new water source
- Implementing a cross-connection control program

What is your typical day?

The City of Mission receives water from the Abbotsford/Mission Water and Sewer Commission. Our distribution network has various take-off points from the transmission mains that provide Mission's drinking water. My day largely deals with monitoring, maintaining, and adjusting of these take-off points. Mission also pushes wastewater towards the Joint Abbotsford Mission Environmental System WWTP. I

am responsible for the lift stations and sewer system that pushes Mission's wastewater to Abbotsford.

What do you most enjoy about the work?

Right now in my career I have a great blend of both administrative tasks and hands-on problem solving - I'm able to keep abreast of what's going on at the executive level, and keep in touch with what's going on in the field. I'm able to be a bridge between the needs of each party and provide information and resources in either direction. The team that I work with is exceptional and they really challenge me to be a better operator every day.

What are some challenges you face?

Aging infrastructure and dated SCADA system. Fortunately, the Mission team of operators isn't satisfied with limping things along - they're truly driven to improve their environment and make things better. I feel like with that attitude, no challenge is insurmountable.

Can you speak of any highlight in the past year?

In 2022, I left an organization that I'd been with for nearly 14 years. Leaving any job you care about requires courage, but my desire to challenge myself was greater than my apprehensiveness about leaving. My ability as an operator has benefited greatly by having worked in more than one system, and I look back at that decision to move on very positively. In 2023, I was part of creating a water quality

'Operator Profile' continued on page 9.

MESSAGE FROM THE DIRECTORS AND STAFF



Message from the Directors and Staff

It is Spring already, and the EOCP Staff team has been busy working on several initiatives:

1. One of our largest projects is our annual conference. We already have several organizations signed up as sponsors and/or exhibitors. Our conference has been rebranded, and the new name for this year is EOtec24. Registration is already open at <https://events.myconferencesuite.com/EOCP2024>. Make sure to register while the early-bird rate is in effect.



2. As indicated at our Annual General Meeting in September 2023, we have increased our focus related to facilities and certification, specifically with regard to ensuring that:
 - Facility classifications are valid
 - Facilities have Operators who are certified at the classification level of the facility
3. When we embarked on our updated classification models in 2017, population size was decoupled from the points structure as it was recognized that population size does not necessarily correlate with the complexity of a facility. However, in British Columbia, small systems, regardless of complexity, are designated as such if serving a population

of fewer than 500 people. Work is currently under way to realign the models to better reflect the complexity of small systems.

4. We continue our work with Operators, utilities, and various provincial ministries to establish a process for emergency response related to critical water and wastewater infrastructure. Updates have already been made to the EOCP's Customer Relationship Manager to allow certified Operators to volunteer for an Emergency Response Team, and the EOCP is collaborating with the Water Supply Association of BC on the development of an Action Plan related to Emergency Response for critical water and wastewater infrastructure.
5. For the first time in the EOCP's 58-year history, we will be sending a team to WEFTECH in New Orleans for Operations Challenge. A team selection and team training process is under development. In 2023, 55 teams from around the globe participated, but sadly, there was no team from BC. We want to change that!

We look forward to seeing you at EOtec24 in September – either online, or in-person in Vancouver. Make sure to not miss this event that is designed for Operators, by Operators!



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Simon Kirkland in the MCC Room

A GAME CHANGER: TOFINO'S NEW WASTEWATER TREATMENT FACILITY

By Chris Kerman CWWP ASCT PO and Kalpna Solanki CWP CPHI(C) BSc MBA

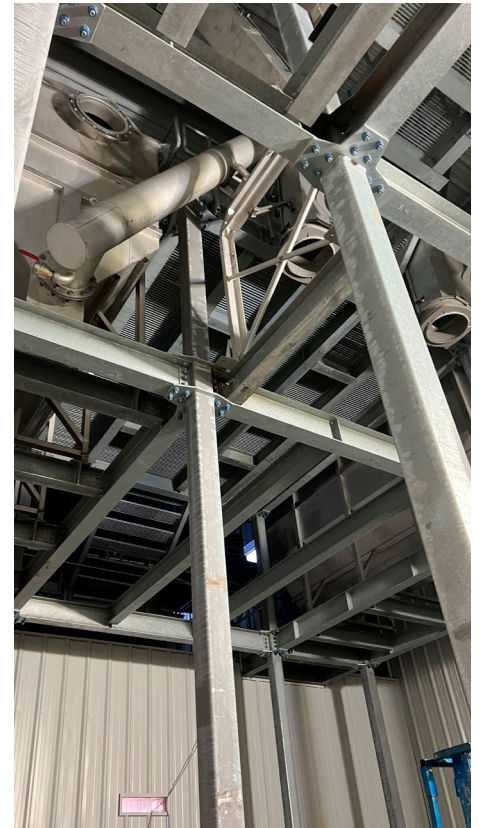
As part of a recent board meeting, some staff and directors of the EOCP had the opportunity to visit the still under construction wastewater treatment facility in Tofino.

Outside the facility, it becomes apparent that the site needed to be leveled to accommodate the buildings. For this, the property, which is owned by the District of Tofino, had to be drilled and blasted, and 12,000m³ of rock were removed. In addition, in preparation for the facility, the whole electrical grid needed to be upgraded to ensure 1,000 kW of power would be available solely for the plant as well as additional capacity for the future growth of the community.

The tour within the facility started in the Headworks Room. Here, two elevated trains with 3mm Huber perforated plate screens are in place. Each train can screen and de-grit 120 L/s of incoming flow. Bagger systems will be used to contain the screened materials in a bin. Flow will then travel to the two Huber Gritwolf tanks for grit removal. Augers will be used to convey the grits to two more 'sausage' baggers that will also be collected in the bin. Both process trains are to be

run simultaneously. To limit the risk of corrosion, all the preliminary treatment equipment is manufactured from stainless steel. Also, within this building is an MCC for all the headworks equipment, NaOH dosing pumps, wash water pumps, and the EQ return flow pumps.

After preliminary treatment, the wastewater will flow to a splitter box. Here, flow will be evenly split to a maximum of 17.5 L/s per bioreactor. All flows above 35 L/s are diverted from the splitter box to a 950m³ EQ tank. During periods of low flow, the stored wastewater in the EQ tank will be pumped back at a maximum flow rate of 40 L/s to the splitter box to feed the bioreactors. Two submersible mixers will be used to keep the solids in suspension and to prevent septic conditions in the EQ tank. The secondary process is designed for a maximum flow rate of 75 L/s. This is the influent flow combined with flow pumped back from the EQ tank. If the EQ tank were to fill in a storm event, all flows would be directed to the secondary process. In general, the seasonal flow rates are fairly consistent, but the level of solids varies with a heavier load in the summer months. Although the community



Headworks Room with Huber Perforated Plate Screens and Huber Gritwolf Tanks



Chris, Christine, and Scott are part of the future Operations Team



EOCP staff and board on the tour

has separated storm and sanitary sewers, there is a significant problem related to I&I.

There are two Veolia Integrated Fixed Film Activated Sludge (IFAS) bioreactor tanks as well as two secondary clarifiers that each have a single arm scraper with a counterweight. The EQ tank, the IFAS tanks, and the secondary clarifiers are all premanufactured from steel and are glass lined. Air in the IFAS tanks will be supplied by coarse bubble diffusers – on two duty and one standby Atlas Copco blowers.

Return activated sludge will be pumped by two Borger rotary lobe pumps back to the IFAS tanks from the bottom of the secondary clarifiers. Waste sludge is diverted from the RAS line to the FRP thickened WAS storage tank. The waste flow is controlled by a modulating valve. Polymer will be used to help dewater the solids, and two GEA centrifuges are installed to perform the dewatering. The centrate will be returned to the headworks by two additional Borger rotary lobe pumps, while the dewatered solids will be trucked to the landfill for windrow composting.

Activated carbon odour control systems are in place to minimize odour complaints. The headworks has a dedicated system, as does the dewatering building.

Sodium hydroxide will be dosed in the splitter box to add alkalinity to assist the nitrification process for ammonia removal in the IFAS tanks.

The effluent from each secondary tank will be disinfected by passing through an inline Xylem UV system. The disinfected effluent will then pass to a holding tank to flow to the outfall by gravity. There are two KSB effluent disposal pumps that will send disinfected effluent to the influent screen

wash water tank under normal operation. This will reduce the demand on Tofino's precious potable water supply. During a high flow event, valves will actuate and the pumps will force effluent down the marine outfall instead of to the wash water tank.

In case of power outages, there is a 600-kW diesel generator on-site that has enough fuel for 72 hours of operation.

There is a lab next to the admin offices and control room. Federal regulatory samples will be shipped to an external accredited lab.

This will be a Level III wastewater treatment facility. The plant will be staffed by members of the current utility group with the District of Tofino. Bradley Evans is the Utility Foreperson and is currently certified as a Level III WT and as a Level II WD and WWC Operator. Chris Lyons is the Water Lead and is triple certified as a Level II Operator in WT, WD, and WWC. Christine Biegler is the Sanitary Lead and is currently certified as a Level II WWT Operator. She will be working towards her Level III WWT certification to take on the Chief Operator role. Scott Kolentsis, Utility Operator II, is also triple certified with Level II WT, WD, and WWC certifications. The final team member is Aaron Hemeon, who is working in the Utility Operator I position as an OIT. He is currently working towards his certification. There is lots to learn and the team is up for the challenge.

The team members have been busy getting education and training from vendors on their new equipment, all while running the water and collection systems. An RFP was posted for an external consultant to help with commissioning, mentoring, training, and to fulfil the certification coverage until Christine achieves Level II WWT certification.

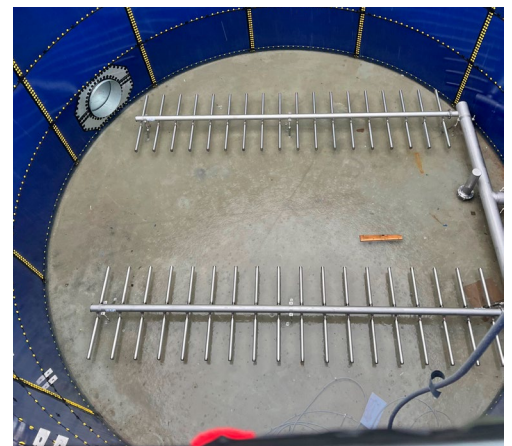
There have also been significant upgrades to the collection system. Four new lift stations are under construction of which two will replace old stations as water is being discharged via a new outfall. These new stations will also have increased capacity. Long sections of new HDPE forcemains needed to be installed to bring the wastewater up to the new facility for treatment. This is a big win for the community and the local marine environment.

It is expected that the final cost will come to \$80 million, of which \$52 million was grant money from the province.

The commissioning stage is scheduled to begin in June with the facility starting full operation in September 2024.

A special thank you to Simon Kirkland, ASCT Manger of Infrastructure and Capital Projects with the District of Tofino for providing the tour.

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Air Diffuser inside the Veolia IFAS bioreactor tank

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ENHANCING SUSTAINABILITY AND SAFETY: A DEEP DIVE INTO COQUITLAM'S WATER TREATMENT PLANT

By Aron Engelhard BSc

Nestled amidst the scenic landscapes of British Columbia, Canada, lies the Coquitlam Water Treatment Plant - vital infrastructure ensuring the provision of safe and clean drinking water to the residents of Coquitlam and surrounding areas. In this article, I delve into the intricacies of this essential facility, exploring its history, technological advancements, environmental impact, and its role in fostering sustainability and public health.

A Brief History

The Coquitlam Water Treatment Plant has a rich history dating back to its establishment over 100 years ago, driven by the growing need for reliable water sources to support urban development. Initially designed to treat surface water from Coquitlam Lake, the plant has undergone expansions and upgrades over the years to meet the increasing demand and evolving water quality standards.

Technological Innovations

At the heart of the Coquitlam Water Treatment Plant lies a

sophisticated array of technologies designed to purify raw water into potable drinking water. The treatment process begins with the intake of raw water from Coquitlam Lake, followed by a series of steps including screening, disinfection, and pH adjustment.

In recent years, the plant has embraced cutting-edge technologies to enhance its efficiency and sustainability. Advanced systems, such as ozone and hypochlorite treatment, along with ultraviolet (UV) disinfection, have been integrated to achieve higher levels of water quality. Automated data collection and real-time monitoring systems have also been implemented to optimize operational processes and ensure compliance with stringent water quality regulations.

Environmental Impact and Sustainability

As a responsible steward of natural resources, the Coquitlam Water Treatment Plant is committed to minimizing its environmental footprint and promoting sustainability. Efforts have been made to reduce energy consumption, optimize chemical usage, and minimize waste generation throughout the

treatment process.

Furthermore, the plant actively engages in watershed management initiatives aimed at preserving the ecological integrity of the Coquitlam Lake protected watershed and its surrounding environment.

Collaborative efforts with local conservation groups, government agencies, and Indigenous communities are underway to protect water quality, enhance biodiversity, and promote the sustainable use of water resources for future generations.

Community Engagement and Public Health

Beyond its technical operations, the Coquitlam Water Treatment Plant plays a crucial role in engaging with the community and raising public awareness about water conservation. Educational programs, guided tours, and outreach events are organized to inform residents about the importance of water quality monitoring, source protection, and sustainable water use practices.

Moreover, the plant works closely with public health authorities to ensure the delivery of safe and reliable drinking water to homes, schools, and businesses across the region. Rigorous testing protocols, including microbiological analysis and chemical monitoring, are employed to detect and address any potential contaminants, safeguarding public health and well-being.

Challenges and Future Outlook

Despite its achievements, the Coquitlam Water Treatment Plant faces several challenges in its quest for continuous improvement and resilience. Climate change, population growth, and emerging contaminants present ongoing threats to water quality and availability, necessitating proactive measures and adaptive strategies.

Looking ahead, the plant is poised to embrace innovation and collaboration to address these challenges effectively. Investments in research and development, infrastructure upgrades, and stakeholder engagement will be crucial in ensuring the long-term sustainability and resilience of the water supply system.

In conclusion, the Coquitlam Water Treatment Plant stands as a beacon of excellence in water management, combining advanced technology,



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environmental stewardship, and community engagement to deliver safe, clean, and sustainably managed drinking water to the residents of Coquitlam and beyond.

As we navigate the complexities of the 21st century, the plant serves as a model for resilience and innovation, safeguarding public health and preserving precious natural resources for generations to come.



UV Room

'Operator Profile' continued from page 2.

monitoring program, I was involved in commissioning two sewer lift stations, and I played a role in implementing a confined space program.

What advice do you have on how to have a successful career as an Operator?

- Challenge yourself.
- Find a mentor.
- Be honest about who you are and what you're good at and lean into it.
- Ask questions, then find out for yourself.

What do you do when you aren't

working?

I'm a husband and father to three kids under six. I'm an amateur trail runner, back country skier, beer league baseball player, and slalom water skier, and I'm working towards a project management certificate through BCIT and emergency management certificate through JIBC.

Whom would you recognize as a mentor?

A fellow operator: Kaleb Leskiw with the Comox Valley Regional District. I put his name forward as a laborer for Abbotsford in 2014 and he has risen to the challenges of the industry, surpassing me in knowledge and

understanding. He's an amazing soundboard, resource, encourager, and friend.

Anything else you would like to add?

Work-life balance is something that I'm continuously checking in on and making adjustments to improve myself. My phone is always on, which comes with being an operator in a smaller city. As environmental operators we are constantly monitoring the health of our system. The past few years I have taken that approach to my personal health which has given me more energy and a healthy step towards better mental health.

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WHO'S ON THE MOVE

Dean Scovil, Engineering Project Coordinator



Dean Scovil on the West Coast Trail, August 2023

What was your first job?

My first career job was as an Environmental Health Officer with Health Canada where I worked in Fort St. John, Northeastern BC. I was responsible for public health issues on First Nations lands, as well as in work camps (along Alaska Hwy), federal buildings, and the Department of National Defence. I was responsible for safe drinking water, sewage disposal systems, food safety, indoor air quality, and emergency response.

What was your path to working in the water/wastewater sector?

I was initiated into working with the water and wastewater sector with Health Canada by reviewing drawings of new water treatment systems and wastewater systems, and also auditing their performance once in operation. From there I worked in Calgary Health Services as a risk assessment specialist and then returned to BC to work for Boundary Health Unit in Surrey as a Generalist. I eventually migrated to

Land Development in Onsite Sewage Disposal Systems and then specialized in Drinking Water Systems. For more than 13 years I was a Drinking Water Officer who was responsible for carrying out the Drinking Water Protection Act. This included managing 60 small water systems and 5 municipal systems which included Surrey, Township of Langley, City of Langley, Delta, and White Rock. From there I landed at the City of Surrey in the Water Operations section as an Engineering Project Coordinator.

How did you pivot from your last position to your current one?

Given I worked in this profession for 32 years, it was time to retire from the City of Surrey and work part-time in pursuing my goal of sharing my knowledge and experience in water and wastewater Operator course development and instruction.

What advice would you give to someone who is currently an Operator or considering becoming one?

I am so glad to have seen both the regulatory side and operational side of the business. This work is well-suited for those who like to problem-solve. I would advise others to ask questions, network with others, and share successes, challenges, and learning experiences. We all recognize a healthy community requires safe drinking water and a proper sewage system. Thus, the role of the Operator is vital to the citizens of any community.

What are some of your goals in your new position?

My primary goal is to find new and innovative ways to develop and instruct courses. For the next few months after retirement, I plan to travel and visit as many places as I can in Canada.

What do you do in your spare time?

I enjoy finding new places to explore and to hike in the backcountry of the Rockies, Cascade Mountains, Vancouver Island, and the Grand Canyon.



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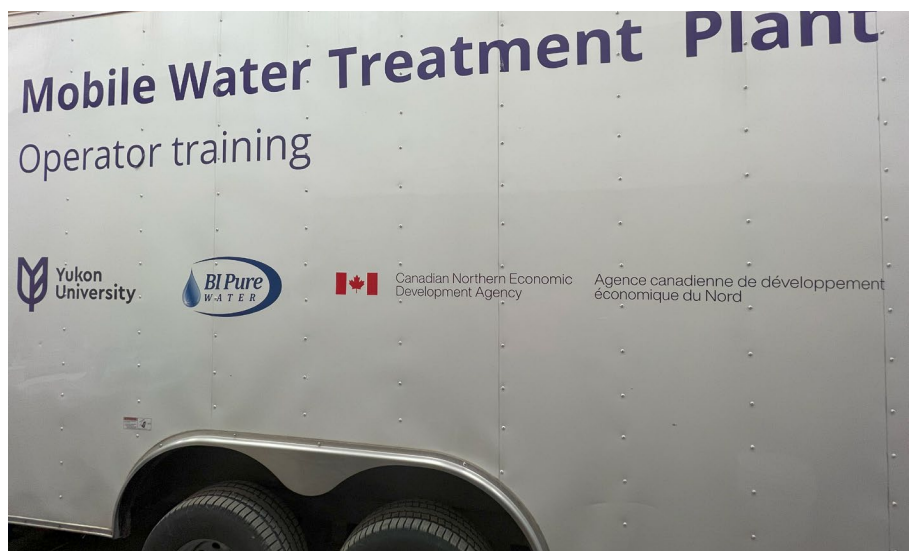
Mark (Operator) and Lydia (graduate Engineering student) doing daily checks

YUKON UNIVERSITY'S WATER AND WASTEWATER OPERATOR PROGRAM PARTNERS WITH ENGINEERING STUDENTS IN A NEW CO-TRAINING PROJECT

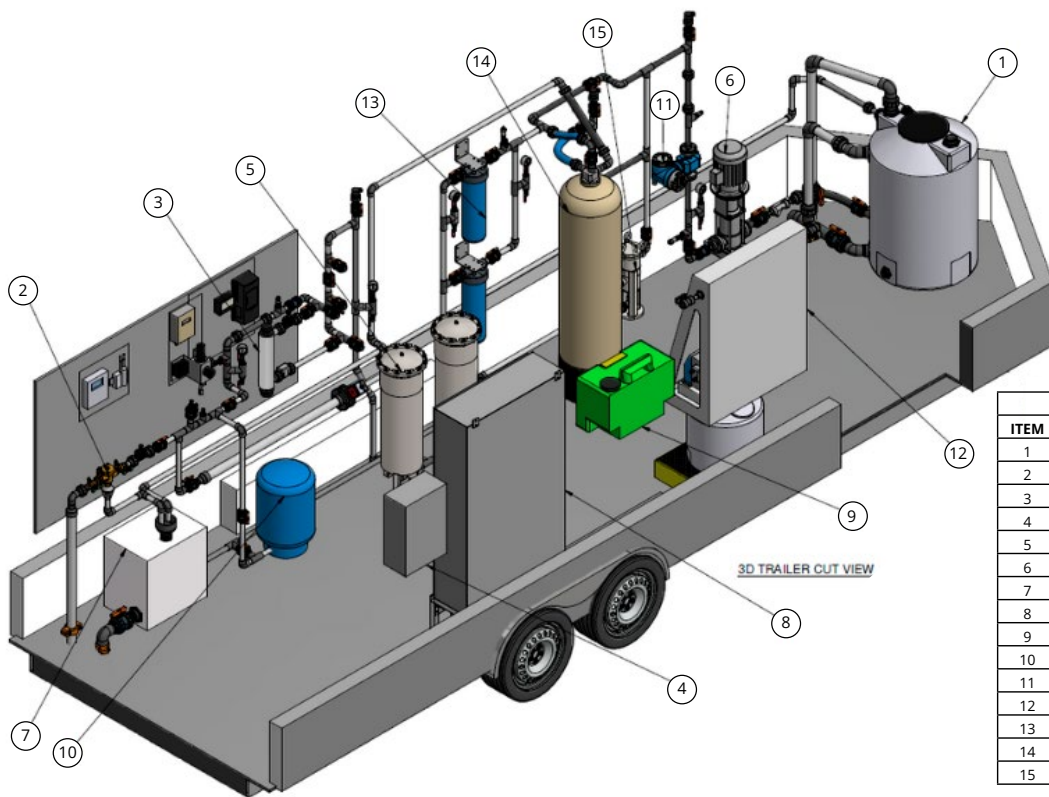
By Lydia M Hoffmann, Alison V Anderson, Onita D Basu

In a collaborative effort between Yukon University's Water and Wastewater Operator Program and Carleton University, a co-training program has been introduced, bringing together engineering students and water and wastewater operators. The goal of this co-training program is to encourage and facilitate engineering students and operators to learn from each other and work together on a variety of in-person physical tasks and in classroom-based lessons.

Co-training takes place in Yukon University's Mobile Water Treatment Plant where engineering students learn hands-on skills and practical insights alongside junior and experienced operators. Engineering students are eager to learn from operators' experiences and



Exterior view of Yukon University's Mobile Water Treatment Plant



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7	1	WASTE TANK T-25
8	1	CONTROL PANEL ENCLOSURE
9	1	EYEWASH STATION
10	1	HPT-740 MODEL WX-201-wp-100PSIG @ 200 F
11	1	W 400 FLOW METER PROMAG
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13	2	BIG BLUE FILTER 1-1/2" CONNECTION
14	1	FILTER VESSEL-CH30912 16" DIA PENTAIR
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Yukon Mobile Lab rendering from BI Pure

challenges. This collaboration helps to develop future environmental engineers who understand the perspectives of operators and the hands-on operation of water treatment plants.

For operators, the benefits of participating in co-training include exposure to the engineering thought process, knowledge of the bigger picture when it comes to water treatment, and the experience of collaborative problem solving and troubleshooting. These benefits were described by operators who participated in co-training through Yukon University. Feedback thus far from operators and engineering students involved in the co-training program has demonstrated its positive impact on operators' and engineering students' education.

Program Outcomes

Four courses have occurred as part of this co-training program and, in total, seventeen operator students and six engineering students have taken part. Each of these courses took place over a one-week time-period with both in-class training and time spent in the Mobile Water Treatment Plant.

During the in-class training time, engineering students helped the course instructor present various course modules including water treatment concepts and math. Co-



Alex (Engineering student) and Aaron (Operator) doing maintenance work on the sodium hypochlorite pump

training has provided the opportunity for engineering students to share their developing knowledge of water treatment with operators. For example, engineering students have shown how taking a mathematical approach to determining chlorine dosage can help operators in their role.

Many operators write EOCB certification exams after completing Yukon University Water and Wastewater Operator courses. Co-training with engineering students has been helpful for operators as they can complete practice questions together in preparation for exams and engineering students can assist with strategies to approach and solve the questions.

Within the Mobile Water Treatment Plant, engineering students and operators worked together on daily checks and maintenance tasks. In this setting, operators shared their knowledge of plant operation and tips and tricks they have collected over their careers.

Hands-on activities included starting and stopping the system, filter and UV maintenance, calibration of online analyzers (pH, turbidity, and free chlorine), calibration of chlorine dosage peristaltic pumps, and various handheld water quality measurements. To get practice, daily checks were conducted twice a day and throughout the co-training session the group followed a Maintenance Management Plan (MMP) and Standard Operating Procedures. By the end of the course, operator students and engineering students had completed each item on the MMP several times and were comfortable with the Standard Operating Procedures.

Co-training in Action

During the courses, the instructor would occasionally cause a system "issue" for operators and engineering students to troubleshoot together. Co-training has demonstrated the positive impacts of engineering students and operators problem solving together. As an example, the Mobile Water Treatment Plant typically runs in a recirculation mode to conserve water. This recirculation requires a carbon filter to remove chlorine so that the chlorine residual doesn't increase with each pass through the system.

During one co-training session, students observed that the chlorine residual was continuing to climb as the system was operated. Operators took several



Interior view of Yukon University's Mobile Water Treatment Plant

samples to determine that the chlorine residual was high in the water returning from the carbon filter, indicating that the carbon filter was not working properly to remove chlorine.

Engineering students were subsequently tasked with determining why the carbon filter stopped working, and after referring to the filter's

specifications sheet, they determined the plant was running at a flow rate that was higher than the carbon filter could treat. Operators reduced the system's flow rate and resampled the chlorine residual, revealing that these adjustments had fixed the problem. This example shows how problems can efficiently be solved when engineers



Kalpna (EOCP's President and CEO) pressure-washing a water tank. Kalpna attended the co-training program, wrote her certification exam, and is now an EOCP certified Operator!

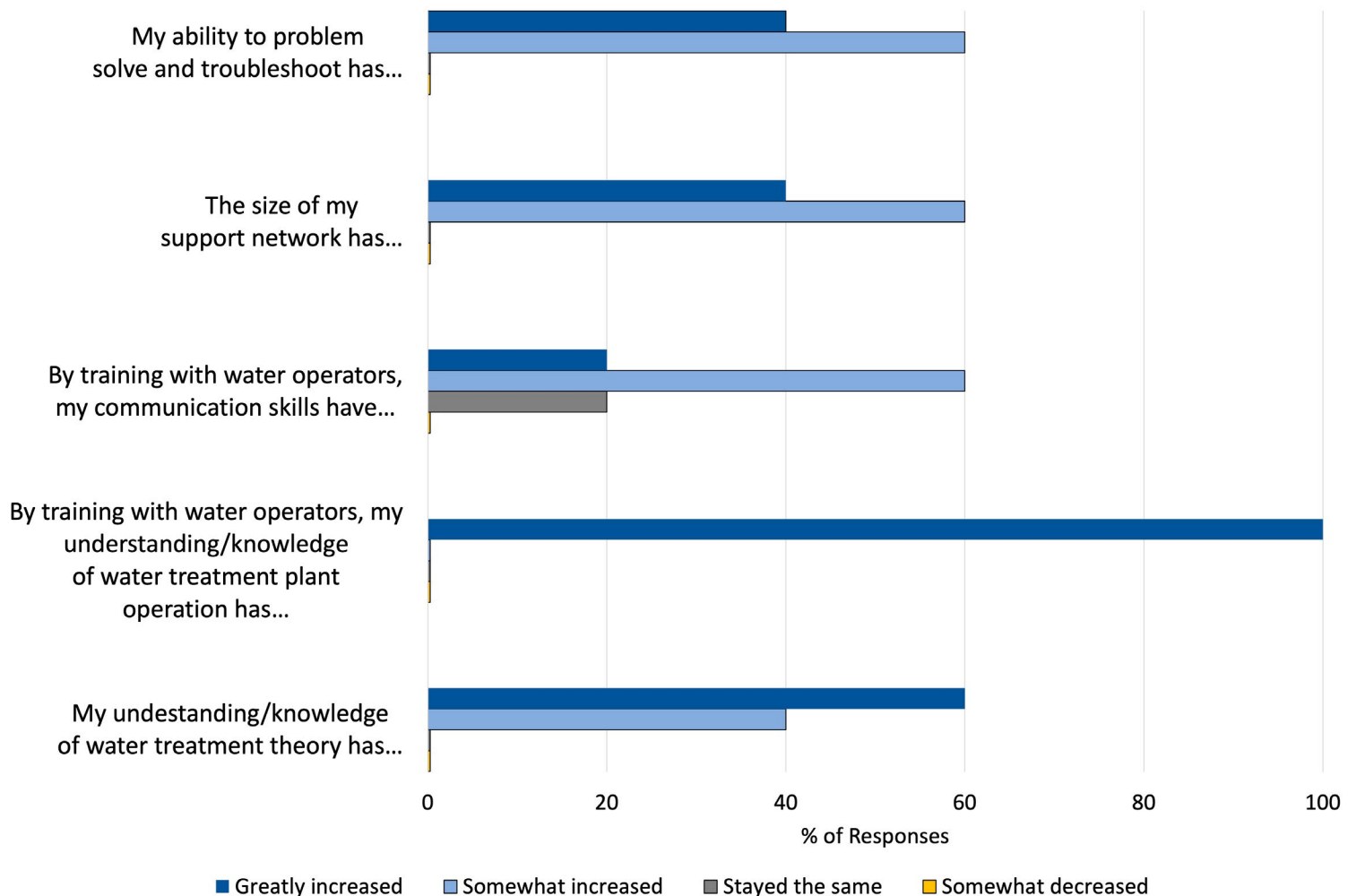
and operators work together to troubleshoot. Operator students were exposed to engineering design specifications and engineering students were exposed to a real-life application of these specifications, resulting in valuable learning for all the students.

Survey Results

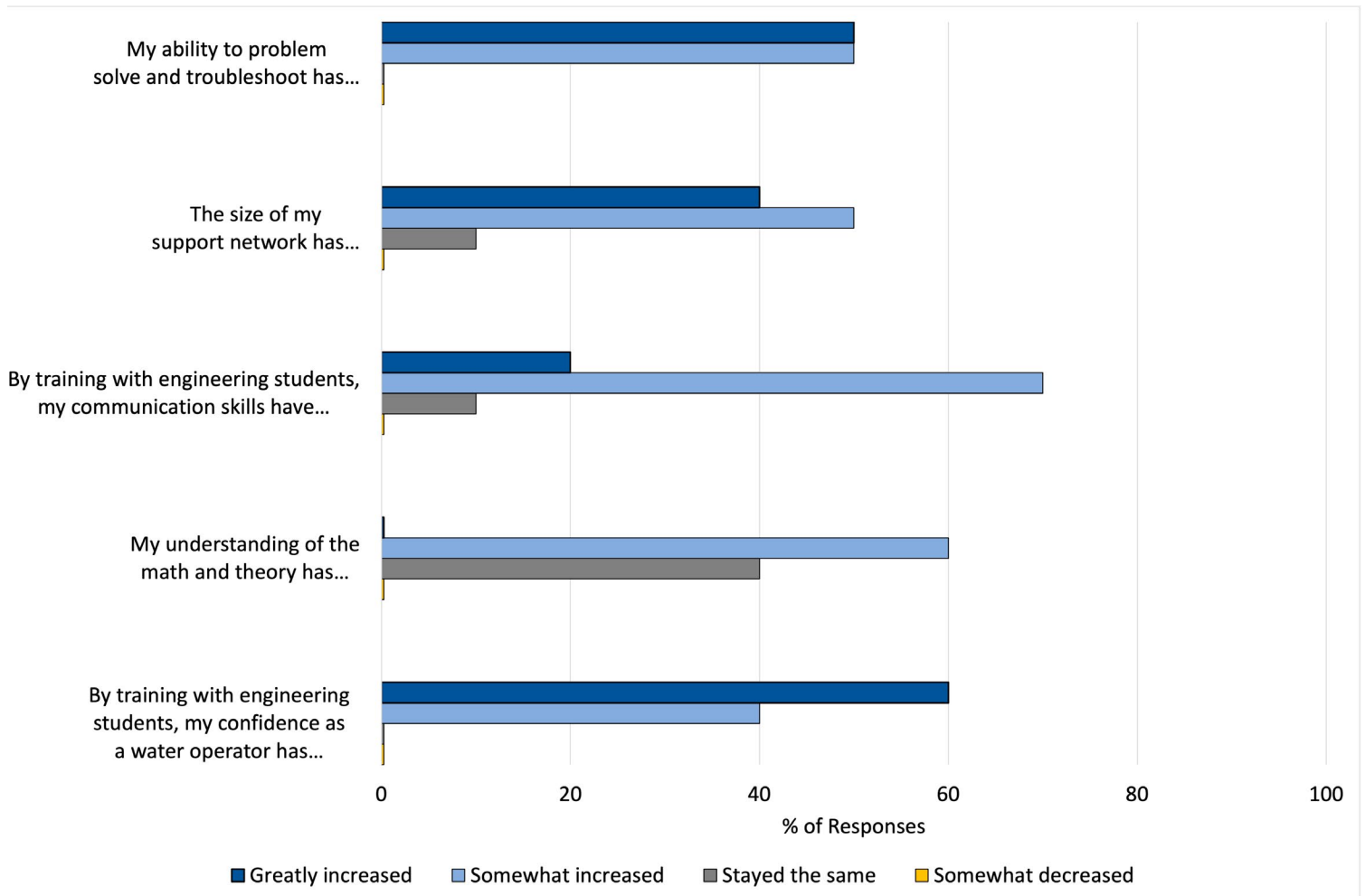
Following completion of each co-training course, operators and engineering students were invited to participate in an anonymous survey on their experiences. Survey results, as shown in the tables below, highlight the benefits of the co-training program for both operators and engineering students.

For instance, all operators surveyed reported an increased ability to problem solve and troubleshoot, as well as increased confidence levels through training with engineering students; meanwhile all engineering students surveyed reported that working alongside operators greatly increased their understanding of how water treatment plants operate.

Overall, the pilot program was a resounding success, with both operators and engineering students viewing co-training in a favorable light, and the pilot program was considered to enhance learning, training, and knowledge sharing outcomes.



Operator survey results



Engineering student survey results

What's Next?

At the forefront of this project is the goal of increasing capacity among water and wastewater operators. Yukon University, in partnership with Carleton University, will continue to explore how co-training and other innovative approaches can be used to enhance educational experiences for students.

For information on Yukon University Water and Wastewater Operator courses, and to sign up for a newsletter to be informed of future co-training opportunities and research, visit yukonu.ca/ywwop.

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As of 31st March 2024



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FACILITIES



173 facilities (re)classified

CONTINUING EDUCATION UNITS (CEUs)

890 Operators submitted CEUs

2,355 CEUs earned

DEFINITIONS

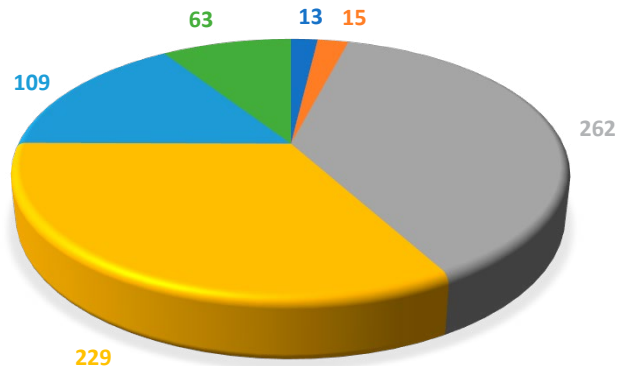
WT	Water Treatment
WD	Water Distribution
WWC	Wastewater Collection
WWT	Wastewater Treatment
OIT	Operator In Training
BWD	Bulk Water Delivery
BWS	Building Water System
SWS	Small Water System
SWWS	Small Wastewater System
MU	Multi Utility

OPERATOR CERTIFICATIONS

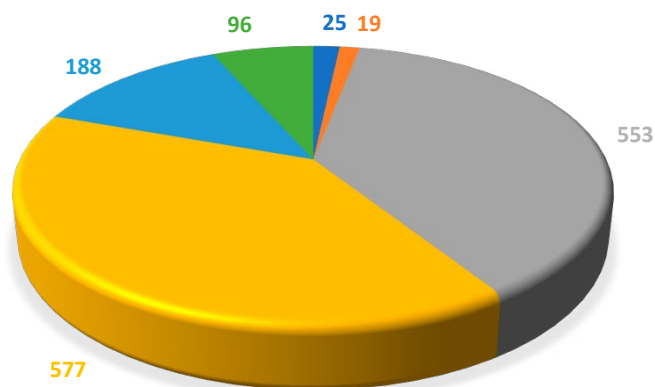
■	MU II
■	MU I
■	IV
■	III
■	II
■	I

OPERATOR CERTIFICATIONS

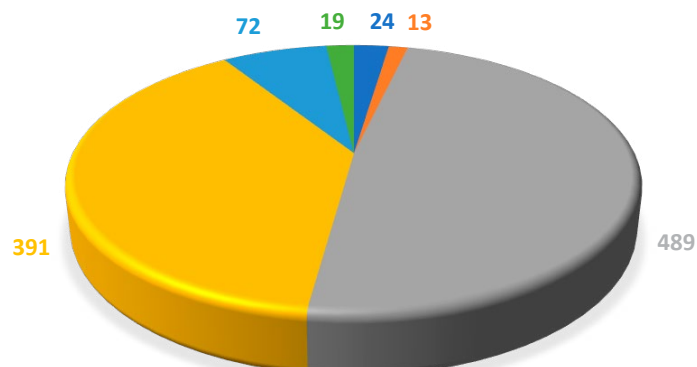
WT OPERATOR CERTIFICATIONS



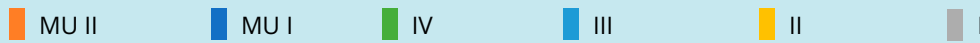
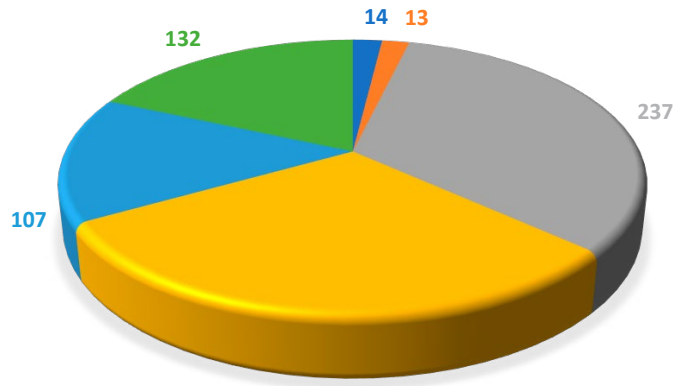
WD OPERATOR CERTIFICATIONS



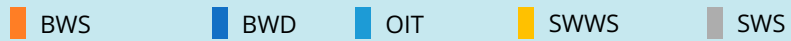
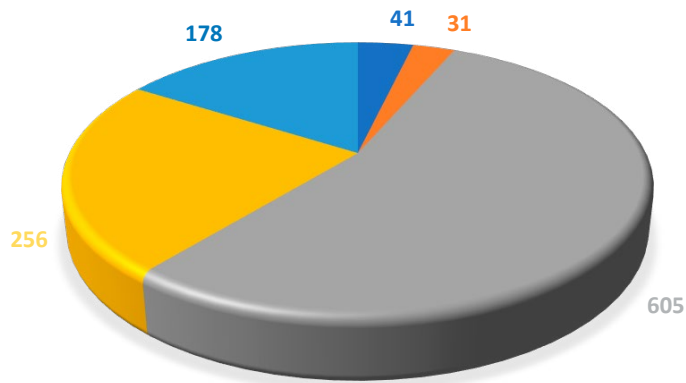
WWC OPERATOR CERTIFICATIONS



WWT OPERATOR CERTIFICATIONS

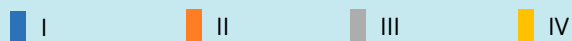
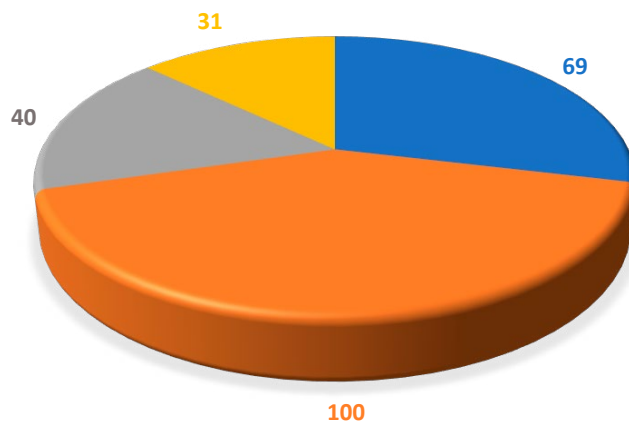


OTHER OPERATOR CERTIFICATIONS

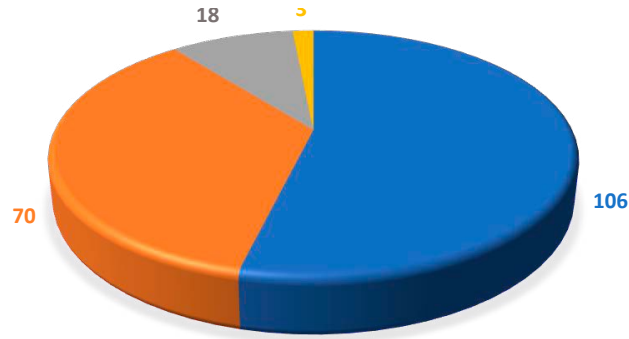


FACILITY CLASSIFICATION

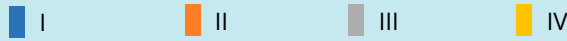
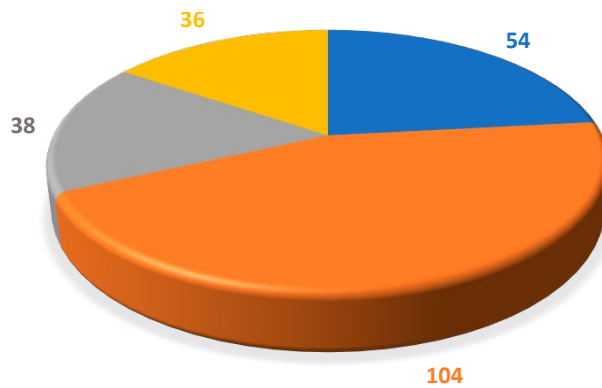
WT FACILITY CERTIFICATIONS



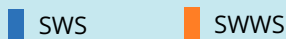
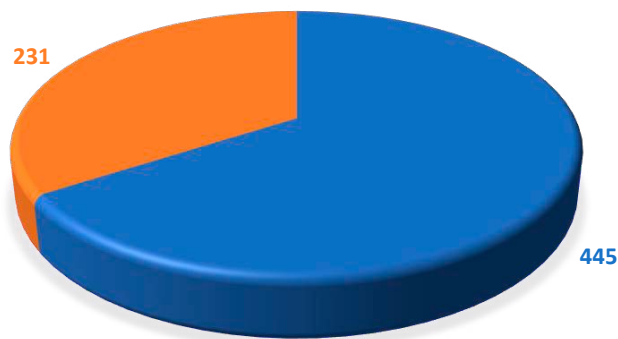
WWC FACILITY CERTIFICATIONS



WWT FACILITY CERTIFICATIONS




SMALL WATER FACILITIES



CEUs can be added to your profile by choosing Action > Add Course Taken under the learning column.

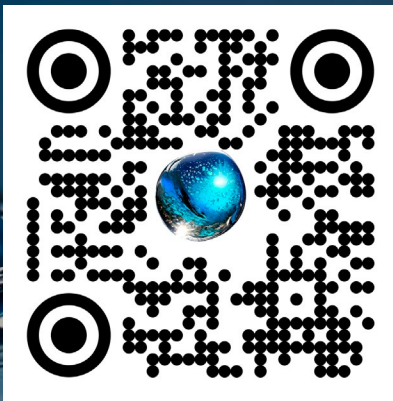
Or you can email your certificates to eocp@eocp.ca.

Check your Operator status by logging into your profile at <https://crm.eocp.ca/> and clicking on **ACCOUNT** to see if your 2024 dues have been paid, and **CEU** under the **LEARNING STATUS** tab to see if your CEUs have been met for the 2022-2023 reporting period.

If you show as not certified , this means you haven't paid your dues and/or submitted CEUs.

A new CEU reporting period started on January 1, 2024.

REGISTER HERE



BUILDING BETTER FUTURES

THIS YEAR'S KEYNOTE SPEAKER IS...

COREY HIRSCH

The Keynote Speaker for E0tec24 is Corey Hirsch, Public Speaker and NHL Broadcaster, Olympic Silver Medalist, NHL Goaltender, and NHL Coach Advocate for Mental Health and Wellness.

Purchase 'The Save of My Life: My Journey Out of the Dark' and have it signed by Corey Hirsch!