



## Yukon Water & Wastewater Operator Program

# Managing for Climate Change Impacts on Water and Wastewater Systems

## Course Outline

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| <b>INSTRUCTOR:</b> | Kevin Rumsey M.Sc., Virginia Sarrazin P. Eng. |
| <b>DATE:</b>       | December 10-11, 2019 (Tuesday – Wednesday)    |
| <b>TIME:</b>       | 8:30 am – 4:00 pm                             |
| <b>LOCATION:</b>   | Ayamdigut                                     |

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### **Course Description**

Canada's climate has changed from historical conditions, namely a global increase in temperature over the last century. This temperature increase is occurring twice as fast in the circumpolar region. Impacts of this warming are already affecting many aspects of daily life. Buildings and public infrastructures, such as bridges, roads, water and wastewater systems, energy transmission and transit, were built and regulated by codes and standards that were largely developed based on historical data from relatively predictable long-term trends. Today, with increasing severity and more frequent weather events, infrastructure built in the past are already or will in the near future, become less operational and require increased maintenance. The urgent need to adapt and build resilience is evident. There is ever increasing risk to buildings and public infrastructure, from interruptions and even failure from a changing climate. By association, there is also increasing risk and hazards to private property and the well-being of people. Investments in long-standing infrastructure, including retrofits and upgrades, as well as capitalizing in green infrastructure as solutions can help communities build resilience, reduce disaster risks, and save costs over the long term.

This two-day course provides students with an overview of climate change and its impacts that specifically threaten their water and wastewater infrastructure. The course will support students in identifying the vulnerabilities they are facing and present proactive tools and solutions.

### **Course Pre-requisites**

There are no specific pre-requisites for this course. However, Grade 12 (or equivalent) math skills are an asset. Math upgrades are available –contact us.

### **Continuing Education Units (CEUs)**

This course is recognized by EOCP for 1.2 CEUs (related for SWS, WT, WD, WWT, WWC and SWWS certifications).



### **Course Duration**

- 2 days
- 8:30 am to 4:00 pm each day
- morning and afternoon break (15 minutes each)

### **Course Topics and Learning Outcomes**

Upon successful completion of the course, the students will be able to:

- Describe and differentiate the basic concepts and accepted science around the climate crisis.
- Categorize and discuss the current climate change impacts occurring in Yukon and circumpolar.
- Identify and assess threats and vulnerabilities they may encounter due to climate change as owners/operators of a water system and of a wastewater system.
- Examine and apply different tools and information sources available to help owners/operators of infrastructure to perform a consistent and reliable climate change impact risk assessment on their infrastructure.
- Discuss the assessment of Green House Gas emissions for an infrastructure project and mitigation measures which can be adapted to reduce these emissions.
- Prioritize and implement corrective actions to reduce the risk of climate change impacts on their water and wastewater infrastructure.
- Describe and compare two planning and preparedness management tools: Asset Management, and Emergency Response Plan as they relate to addressing climate change impacts.
- Recognize the principles and function of an emerging 'green' urban water management approach, called 'Low Impact Development (LID).'
- Undertake a water management capacity assessment to evaluate and close gaps in capacity.
- Describe the principles and process of creating comprehensive Drinking Water Safety Plans.

### **Delivery Method/Format**

| <b>Instructional Method</b> | <b>Percentage of Class Time</b> |
|-----------------------------|---------------------------------|
| Hands-on/Q & A              | 10%                             |
| Examples/Case Study         | 30%                             |
| Slides                      | 55%                             |
| Video/DVD                   | 5%                              |



### **Material/Handouts (supplied)**

- Student Binder: Yukon College, 2019. Managing for Climate Change Impacts on Water and Wastewater Systems; an elective – Technical Development – course. Whitehorse, Yukon.
- EOCP Course Completion and Evaluation Form.
  - every student needs to complete and return this form for any CEU allocation
- Calculators are provided but students are welcome to use their own.
  - please return

### **Course Requirements**

Attendance and participation in class are required. It is the student's responsibility to attend all classes.

CEUs will be allocated based on attendance and course completion; Yukon College records will show a pass or fail result. If the participant doesn't attend the class, Yukon College records will show a "no show" result and no CEUs will be allocated.

### **Evaluation**

There will be a quantifiable evaluation at the end of this course with a passing mark of 70%. Please note that this evaluation is for self-assessment purpose only.

**The final evaluation for this course is NOT an EOCP certification exam. To challenge a certification exam, register separately with EOCP at least 3 weeks in advance: 1-866-552-3627 or [crm.eocp.ca](http://crm.eocp.ca).**

### **Appropriate Language**

In all areas of the college environment, students are responsible for showing respect for others. Swearing, or language that is discriminatory or derogatory in relation to race, sex, ethnic background, religious beliefs, age, and physical condition is not appropriate.

### **Electronic Devices**

In order to be successful in classes and minimize distractions for others, cell phones, iPods, and other electronic devices must be turned off while students are in class. In an emergency situation, the instructor may give a student permission to use a cell phone or pager.

### **Academic and Student Conduct**

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/Admissions & Registrations web page.

### **Plagiarism**

Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken



material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

### **Academic Accommodation**

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or [lassist@yukoncollege.yk.ca](mailto:lassist@yukoncollege.yk.ca).

### **Class Outline**

#### Day 1

- Section 1: Opening notes and introduction (15 min)
- Section 2: Understanding Climate Literacy (1.75 hrs)
- Break – 15 min
- Section 3: Environmental Changes in Yukon and Circumpolar (1 hrs)
- Lunch (1 hr)
- Section 4: Vulnerabilities of Water/Wastewater Infrastructure (2 hrs)
- Break – 15 min
- Section 5: Adaptation Tools to Support Climate Resilience and Mitigation Measures (1 hr)

#### Day 2

- Section 6: Review of Day 1 (15 min)
- Section 7: Assessing your Vulnerabilities, Prioritising and Taking Action (30 min)
- Section 8: Developing Management Planning (45 min)
- Break – 15 min
- Section 9: Green Infrastructure (30 min)
- Section 10: Undertaking Capacity Assessment (20 min)
- Section 11: Drinking Water Safety Plans (30 min)
- Lunch (1 hr)
- Section 12: Break-out Activity and Discussion (3.0 hrs)
- Break – 15 min
- Section 13: Wrap-up, Summary and Course Evaluation (10 min)