



Yukon Water & Wastewater Operator Program

Wastewater Treatment Level 1 & 2

Course Outline

INSTRUCTOR: Graeme Farris
DATE: December 11 – 15, 2017 (Monday – Friday)
TIME: 8:30 am – 4:00 pm

Course Description

This 4.5 day course is designed to prepare the participants to write their Environmental Operators Certification Program (EOCP) exam for Wastewater Treatment Level 1 or 2 (required by Yukon Government Regulation).

The main objective of the course is to safeguard the public and environment by providing knowledge to operators regarding handling and treatment of wastewater influent for the purpose of discharging to the environment.

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 accepted with EOCP as core for WWT - SWWS - for 3.00 CEUs.

Course Duration

- 4.5 days
- 8:30 am to 4:00 pm each day, except last day from 8:30 am to 12:00 pm
- 1 hour lunch break
- morning and afternoon break (15 minutes each)

Course Topics and Learning Outcomes

This section should match the EOCP Training Registry's "Course Topics and Objectives" and vice-versa. Please notify YWWOP Coordinator of any significant discrepancy or need to update EOCP Training Registry.



<http://www.trainingregistry.eocp.ca/get/showCourseDetails.php?InstNum=50036&CourseNum=7556>

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

Introduction

- Housekeeping
- Instructor Introduction
- Operator Introductions
- EOCP Certification & Renewal

Legislation and Safety

- Legislation
- Negligence, Due Diligence, Operator Certification and Education
- Recordkeeping
- ERPs
- Asset & Maintenance Management Plans
- Electrical Safety
- Lifting, Falls, and Drowning
- WHIMIS & TDG
- Personal Protective Equipment (PPE)
- Confined Space Entry
- Excavations
- Underground Hazards

Septic Systems

- Purpose of Septic Systems and Tanks
- Viruses and Diseases
- Septic System Components
- Conventional Systems
- Septic Tank Pumping and Safety
- Septic System Maintenance
- Water Usage

Primary Wastewater Treatment

- Sewage, Grey Water, and Black Water
- Combined Sewers
- Problems with Infiltration



- Storm Sewers
- Diseases, Bacteria, Viruses, Protozoa, and Rotifiers
- Wastewater Pretreatment
- Types of Head Works
- Primary Clarifiers and Treatment
- Grease Removal

Wastewater Treatment Lagoons

- Types of Lagoons and Treatment
- Oxygen Transfer
- Temperature Effects on Lagoons
- Types of Surface Aeration Systems
- Nutrient Effects on Lagoons

Activated Sludge

- What is the Purpose and Function of Activated Sludge?
- Activated Sludge Process
- What is a Mixed Liquor?
- Return and Waste Activated Sludge
- Internal Mixed Liquor Recycle
- Extended Aeration
- How an Oxidation Ditch Functions
- How a Sequencing Batch Reactor (SBR) Functions and Their 5 Stages to Treatment

Biological Treatment

- How a Trickling Filter Operates
- How a Rotating Biological Contactor Operates

Nutrient Removal

- Biological Nutrient Removal
- Nitrification / Denitrification
- Phosphorous Removal
- Volatile Fatty Acids
- Westbank / Johannesburg WWT Process
- Secondary Clarification
- Types and Uses of Disinfection Process



Effluent and Solids Handling

- Uses for Wastewater Treated Effluent
- Natural Evaporation
- Groundwater Recharge
- Using Effluent for Spray Irrigation
- Other Uses for Wastewater Treated Effluent
- Discharging to Wetlands
- Handling Biosolids
- Handling Different Types of Sludge
- Sludge Thickening Processes
- Three Different Forms of Sludge Digestion
- Temperature Effects on Digestion
- The Different Stages of Anaerobic Digestion
- The Different Dewatering Methods Available
- The Purpose and Use of Dissolved Air Flotation
- What are The Purposes of Testing the Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) concentrations?
- The Importance of Dissolved Oxygen Concentrations

Wastewater Collection Systems

- Pressure and Vacuum Systems
- Collection System Designs
- Different Types of Pumping Facilities
- Manholes Provide Access for Operations and Maintenance

Math for Wastewater Operators

- Calculator Functions
- Order of Operations
- The Metric Systems and Common Units
- Dimensional Analysis
- Basic Algebra
- Ratios and Proportions
- Calculating Averages and Percentages
- Calculating Perimeters and Circumferences
- Area and Volume Calculations
- Organic Loading



- Mixed Liquor Volatile Suspended Solids
- F/M Ratios
- Sludge Volume Index
- Wastewater Hydraulic Math

Delivery Method/Format

This section should match the EOCP Training Registry.

Indicate the percentage of course time you will spend using the following teaching methods:

Instructional Method	Percentage of Class Time
Hands-on/Q & A	
Examples/Case Study	
Presentation/Lecture	
Slides	
Demonstration	
Video/DVD	
Tutoring	

** it is a requirement of EOCP to have instructional information appear in this format*

Material/Handouts (supplied)

- Student Binder: Yukon College, 2017. Wastewater Treatment Level 1 & 2; a core –EOCP Exam Preparation– course. Whitehorse, Yukon.
- Reference Manual: Office of Water Programs, 2008. Operation of Wastewater Treatment Plants, Volume I; a field study training program. 7th Edition. Sacramento, California. **+ Volume II?**
- 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. 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%. If anyone fails this evaluation, arrangements can be made for a re-assessment. 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 directly with EOCP at least 3 weeks in advance: crm.eocp.ca or 1-866-552-3627.

Class Outline

This section should match EOCP Training Registry's "Course Agenda"

Day One:

8:00 am to 8:30 am: Introduction
8:30 am to 10:00 am: Legislation and Safety
10:00 am to 10:15 am: *Health Break*
10:15 am to 12:00 pm: Legislation and Safety (cont.....)
12:00 pm to 1:00 pm: *Lunch*
1:00 pm to 2:30 pm: Septic Systems
2:30 pm to 2:45: *Health Break*
2:45 pm to 3:30 pm: Septic Systems (cont.....)
3:30 pm to 4:30 pm: Primary Wastewater Treatment

Day Two:

8:00 am to 8:30 am: Review
8:30 am to 10:00 am: Primary Wastewater Treatment
10:00 am to 10:15 am: *Health Break*
10:15 to 12:00 pm: Primary Wastewater Treatment (cont.....)
12:00 pm to 1:00 pm: *Lunch*
1:00 pm to 2:30 pm: Wastewater Treatment Lagoons
2:30 pm to 2:45: *Health Break*
2:45 pm to 3:45 pm: Wastewater Treatment Lagoons (cont.....)
3:45 pm to 4:30 pm: Activated Sludge



Day Three:

8:00 am to 8:30 am: Review
8:30 am to 10:00 am: Activated Sludge
10:00 am to 10:15 am: *Health Break*
10:15 to 12:00 pm: Biological Treatment
12:00 pm to 1:00 pm: *Lunch*
1:00 pm to 2:30 pm: Nutrient Removal
2:30 pm to 2:45: *Health Break*
2:45 pm to 4:30 pm: Effluent and Solids Handling

Day Four:

8:00 am to 8:30 am: Review
8:30 am to 10:00 am: Wastewater Collection Systems
10:00 am to 10:15 am: *Health Break*
10:15 am to 11:15 am: Wastewater Collection Systems (cont.....)
11:15 am to 12:00 pm: Math for Wastewater Operators
12:00 pm to 1:00 pm: *Lunch*
1:00 pm to 2:30 pm: Math for Wastewater Operators (cont.....)
2:30 pm to 2:45: *Health Break*
2:45 pm to 4:30 pm: Math for Wastewater Operators (cont.....)

Day Five:

8:00 am to 10:00 am: Review and Exam Practice
10:00 am to 10:15 am: *Health Break*
10:15 am to 10:30 am: Review and Exam Practice (cont.....)
10:30 am to 11:30 am: Course Completion Exam