



**Developer and Owner – WWOTC**

**Online Course – Instructor Led**

## **Nitrogen Removal Systems**

**March 12-13, 2024 (1:00-5:00 AST)**

### **Course Objective / Description**

This one day course is designed for operational staff to gain a good understanding of phosphorus and nitrogen removal systems. This course will assist operators in recognizing operational issues related to nutrients associated with wastewater, and the various ways to troubleshoot and correct these issues.

What will be covered:

- Nitrogen in the environment
- Sources and microbiological principles
- Nitrification and de-nitrification
- Physical/chemical processes
- Breakpoint chlorination and ion exchange
- Phosphorus removal methods-biological/chemical
- Process layouts, advantages and disadvantages
- Biological removal equipment
- Abnormal and emergency operating conditions

| <b>Lesson</b> | <b>Description</b>                     | <b>Contact Hours</b> |
|---------------|--|----------------------|
| Day 1         |  |                      |
| Lesson 1      | Introduction and Overview              | 0.5                  |
| Lesson 2      | Nitrogen Sources and Effects           | 1.5                  |
|               | Break                                  | 0.25                 |
| Lesson 3      | BNR Configurations                     | 1.5                  |
| Day 2         |  |                      |
| Lesson 5      | Biological Phosphorous Removal         | 1.25                 |
| Lesson 6      | Suspended and Fixed Growth Systems     | 1.0                  |
|               | Breaks                                 | 0.25                 |
| Lesson 7      | Nutrient Problems                      | 1.0                  |
|               | Exam                                   | 0.5                  |
|               | <b>Total Instruction/Contact Time:</b> | <b>7.0</b>           |

**CEU: 0.7**

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Name: \_\_\_\_\_

Company: \_\_\_\_\_

Company Mailing Address \_\_\_\_\_

City, Province: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

ACWWA Membership #: \_\_\_\_\_ WEF Membership #: \_\_\_\_\_

If no membership number is listed, you will be invoiced as a non-member. See pricing below.

**Fee for ACWWA or WEF Members & Employees of UTILITY Members**

Course: \$355.00 + \$53.25 HST (15%) = \$408.25

**Fee for Non – Members**

Course: \$380.00 + \$57.00 HST (15%) = \$437.00

**Invoices will be sent to the address listed above.**

**PO number to be included on the invoice** \_\_\_\_\_

**Payment can be made by Visa, Master Card or cheque.**

Card Holder's Name \_\_\_\_\_

Credit Card Number \_\_\_\_\_ Expiry \_\_\_\_\_

Signature \_\_\_\_\_

Email address for credit card receipt \_\_\_\_\_

Cheques should be made payable to:

**ACWWA**

PO Box 28141 · Dartmouth, NS · B2W 6E2

Phone 902-434-6002 Fax 902-435-7796