

## Case Studies in Nitrification and Denitrification in the Activated Sludge Process and Using Redox (ORP) as an Operational Tool

### Who Should Attend?

This workshop will benefit anyone responsible for developing or complying with effluent nitrogen requirements, including municipal and industrial wastewater operators and managers, state regulators and environmental consultants.

**Cost:** \$50.00 for MA licensed wastewater operators. \$75.00 for all others. Lunch will be provided. There will be a \$15.00 late fee if registration is not received by November 28, 2006. There is a \$10.00 discount for MWPCA members.

Michael Gerardi's book **Nitrification and Denitrification in the Activated Sludge Process** is available (and recommended) for an additional \$45.00.

**Credits:** 6 Training Contact Hours

**Attendance:** Seven days notice is required in writing (mailed or faxed) for you to cancel at no cost. Cancellations received after this time will be charged \$25.00. Registrants who do not cancel and fail to show are responsible for full payment.

**Date:** December 5, 2006  
Publick House  
Sturbridge, MA  
8:30 a.m. to 3:30 p.m. (sign-in at 8:00 a.m.)  
Course Code: ETC0743

**Directions will be mailed with confirmations.**

**Questions?:** Contact NEIWPCC at 978-323-7929 or training@neiwpcc.org.



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NEIWPCC  
Boott Mills South  
116 John Street  
Lowell, MA 01852-1124

www.neiwpcc.org



New England Interstate Water Pollution Control Commission

and Massachusetts

Department of

Environmental Protection



## Case Studies in Nitrification and Denitrification in the Activated Sludge Process and Using Redox (ORP) as an Operational Tool with Michael Gerardi

Co-sponsored by the  
Massachusetts Water Pollution  
Control Association



December 5, 2006  
Publick House  
Sturbridge, MA

## Case Studies in Nitrification/Denitrification in the Activated Sludge Process and Using Redox (ORP) as an Operational Tool with Michael Gerardi, Wastewater Biologist, Water Pollution Biology

High concentrations of nutrients such as nitrogen and phosphorus produce algae that deplete a receiving stream's dissolved oxygen and create unsightly algal blooms. They also produce bacteria leading to fish kills, and the increased oxygen demand on the receiving stream causes septic waters with anaerobic bacteria that produce foul odors.

In March 2006 NEIWPCC and Massachusetts DEP co-sponsored workshops on nutrient removal at publicly owned treatment works (POTWs). Michael Gerardi, a leading authority on wastewater biology and instructor at Penn State University presented a workshop on *Nitrification and Denitrification in the Activated Sludge Process*.

Mr. Gerardi returns to New England for a second workshop on *Case Studies in Nitrification/Denitrification in the Activated Sludge Process and Using Redox (ORP) as an Operational Tool*.

This workshop will feature a brief review of the nitrification/denitrification information presented in the first class and case studies of wastewater plants achieving successful nutrient removal. The course will also feature the use of Redox (ORP), a laboratory analysis that measures the oxidative state of compounds and elements.

Attendance at the first workshop is not a prerequisite for this class

### Topics include:

#### **Nitrification**

- Review of the biology and chemistry of nitrifying bacteria.
- Why do wastewater treatment plants nitrify?
- Types of nitrogenous compounds including TKN.
- Fate of nitrogenous compounds in aerobic and anaerobic digesters.
- Operational conditions and troubleshooting key for nitrification.
- Using Redox (ORP) as an operational tool to identify nitrification.
- Alkalinity conditions and industrial discharges.
- Case studies and operational controls at wastewater plants that nitrify.

#### **Denitrification**

- Review of the biology and chemistry of denitrification.
- Why do wastewater treatment plants denitrify?
- Operational troubleshooting and process modifications controlling denitrification.
- Using Redox (ORP) as an operational tool to identify denitrification.
- Identifying/correcting denitrification in secondary clarifiers.
- Case studies and operational controls at wastewater treatment plants that denitrify.

#### **Redox (ORP)**

- Definition of ORP.
- The ORP millivolt (mV) scale.
- Using direct immersion ORP probes in wastewater treatment plants and sewers.
- Using ORP to measure phosphorus removal.

Please complete this form and return with payment **by November 28, 2006**. Please use one form per attendee.

**Registration Fee:** \$50.00 for MA licensed wastewater operators. \$75.00 for all others. \$10.00 discount for MWPCA members. Fee includes lunch and course materials. (Registration costs partially subsidized for Massachusetts Licensed Wastewater Operators by Massachusetts DEP).

**Optional Manual:** Additional \$45.00 (purchase of the manual is strongly recommended).

#### **Mail registration form and fee to:**

NEIWPCC  
Attn: Case Studies Workshop  
116 John St.  
Lowell, MA 01852-1124

### Registration

Name \_\_\_\_\_

Manual (optional) \$45.00

MWPCA Member  Member ID #: \_\_\_\_\_

Amount Enclosed \$ \_\_\_\_\_ Check No. \_\_\_\_\_

### Or Use Your Credit Card

Card Type \_\_\_\_\_ 3-digit code (Visa Only) \_\_\_\_\_  
(indicate Visa, MC or Discover) (located on back of card)

Card No.: \_\_\_\_\_

Name on card \_\_\_\_\_ Expiration: \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Affiliation \_\_\_\_\_

Address \_\_\_\_\_

City/Town \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone \_\_\_\_\_ Fax \_\_\_\_\_

E-mail \_\_\_\_\_

MA WW License # \_\_\_\_\_

**Credits: 6 Training Contact Hours**

