



# Nutrient Removal

May 13, 2016  
NORTHGLENN

**TU APPROVED**  
**Class Size Limited**  
**to 25 Attendees**



INDIGO  
WATER GROUP

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Indigo Water Group  
626 West Davies Way  
Littleton, Colorado 80120

*Pair this class with  
Advanced Activated Sludge  
Process Control  
on May 11 & 12, 2016  
in the same location.*



To Register: Call 303.489.9226, mail in the enclosed registration form, FAX to 303.484.3304, or register on-line at [www.indigowatergroup.com](http://www.indigowatergroup.com) Mail payment by check or pay on-line by credit card.



## About the Trainer

Sidney Innerebner, PhD, PE is the principal and Owner of Indigo Water Group, a local engineering firm based in Littleton, Colorado.



Sidney has over 22 years of experience in the environmental arena. She is a Colorado certified A wastewater and A industrial operator. Sidney has been a long time instructor at the Boulder and Leadville Operator Schools. She provides training on water and wastewater treatment throughout the United States. Customized on-site training packages are available.



## Indigo Water Group

Indigo Water Group is a small, woman-owned business in Littleton, Colorado that specializes in water and wastewater treatment. We offer a wide range of services from utility plans to specialized on-site training to assistance with laboratory and water/wastewater operations to collection system and process modeling.

Visit our website to download our **FREE** math workbooks and **FREE** sample study questions for the certification exams.

**New! FREE On-Line math training videos.**



## NUTRIENT REMOVAL

Please join us for our One-Day Nutrient Removal course. The day begins with an overview of the new Colorado nutrient criteria regulations followed by an exploration of nutrient concentrations and ratios in domestic wastewater. Learn how to apply knowledge of those ratios to mass balances for process control and troubleshooting. Attendees will use data from real wastewater plants to troubleshoot nitrification, denitrification, and bio-P failure. Please visit our website at <http://www.indigowatergroup.com/register.htm> for more information or call 303-489-9226.

**Classes are limited to 25 attendees each.**

TRAINING UNITS					
	W	WW	I	C	D
Total		0.7	0.7		

## LOCATIONS

City of Northglenn	May 13, 2015
Maintenance and Operations Building 12301 Claude Court Northglenn, CO 80241	Pair this class with Advanced Activated Sludge Process Control on May 11 – 12, 2015 at the same location.

## WHO SHOULD ATTEND?

This course is geared toward A and B level operators. The objective is to give front-line supervisors and operators a more in-depth understanding of the activated process and nutrient removal. With improved understanding, effluent quality variability and energy use can be reduced.

## COURSE AGENDA

8:30 - 9:00	<b>Colorado Nutrient Criteria</b>
9:30 - 10:15	<b>Nutrients in Wastewater</b>
10:15 - 10:30	<b>Morning Break</b>
10:30 - 12:00	<b>Introduction to Nitrogen Removal</b> Microorganisms Nitrification kinetics and stoichiometry Denitrification kinetics and stoichiometry Process variables Suspended growth nit-denit systems Fixed film nit-denit systems Hybrid systems
12:00 - 12:45	<b>Lunch</b>
12:45 - 2:30	<b>Introduction to P Removal</b> Basic Bio-P theory Phosphate Accumulating Organisms Bio-P Kinetics Process variables Chemical phosphorus removal
2:30 - 2:45	<b>Afternoon Break</b>
2:45 - 3:30	<b>Combined Nutrient Removal Systems</b> Flow Sheets for Total Nutrient Removal General remarks on various process configurations
3:30 - 4:00	<b>Process Control Considerations for Combined Systems</b> Interaction of Nitrates and Phosphates Sufficient DO in the aeration zone COD to TKN ratio
4:00 - 5:15	<b>Troubleshooting BNR Plants</b> Interpreting lab data Plant designed for nit but not denit Plant designed for nit and denit Complete BNR designs Attendees will break into small groups and troubleshoot case studies. Application of learned concepts.
5:15	<b>Distribute training unit certificates</b>

## HOW TO REGISTER

Registration may be done by mailing in the attached form, faxing, by telephone, or through our website at [www.indigowatergroup.com](http://www.indigowatergroup.com). We accept major credit cards through our website or checks by mail.

Registration fee is **\$150 per person**. A light breakfast, lunch, and afternoon snack break, are included. Registration and coffee from 8:00 to 8:30 am. Seminars starts at 8:30 am and run until 5:15 or 5:30 pm for 0.70 training units approved by the State of Colorado. The seminar schedule includes 45 minutes for lunch and two 15 minutes breaks.

\$150 per attendee for Nutrient Removal

Attendee 1: \_\_\_\_\_

Attendee 2: \_\_\_\_\_

Attendee 3: \_\_\_\_\_

Attendee 4: \_\_\_\_\_

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

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_

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

\*\* An e-mail address is necessary for invoicing and to send a courtesy reminder to attendees a day or two prior to the course.

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