Department of Environmental Protection
Bureau of Land & Water Quality   Mar. 2002

O&M Newsletter

A monthly newsletter for wastewater discharge licensees, treatment facility operators and associated persons

Energy Conservation in Wastewater Treatment Facilities

In the February issue of the *O&M News,* we began a series of articles on energy conservation. In this issue, we continue that series with some thoughts about pumps and pumping. This article is reprinted from a report titled "Saving Money and the Environment through Energy Savings". The report was the result of a joint effort between staff from the Region 1 EPA Office in Boston, several of the New England States, several New England Utilities, several consultants and vendors in doing business in the energy field and the New England Interstate Water Pollution Control Commission.

Pumps and Pumping Systems

Each component of a pumping system (pumps, motors, pipes, drives, valves) has its own efficiency rating. Together, these efficiency ratings make-up the overall system efficiency. Because pumping fluids at wastewater treatment plants accounts for a large fraction of a facility's energy costs, using pumps efficiently can help minimize those costs. Department of Energy studies indicate that using pumps more efficiently can save as much as 20% of the energy consumed in pumping.

Modern pumps can achieve as high as 90% efficiency when operating in the

optimum range. Pumps are designed for the highest efficiency at a specific flow rate and head (elevation) condition. When operated at flow rates that are quite different the efficiency will be reduced. In fact, many pumping systems are not operated at the best efficiency. Although pumps do lose efficiency as they age the flow requirements of a pumping system may have changed over time and it no longer operates in the best efficiency range.

For example, pump stations that are sized to handle high flows from a combined sewer system, or from groundwater infiltration, may operate inefficiently at normal wastewater flows. If a community has begun separating storm water or infiltration from its sewer system, thereby reducing the flow, the pump system may no longer operate within their optimum efficiency range. Energy and money are being wasted.

A pumping system has three key elements: flow, static head, and frictional head*.* Each of these elements must be challenged to find the opportunities for improvements within a pumping system. Below is a list of possible opportunities for savings.

* Reduce flow and total head requirements.
* Select the most efficient pump type and size (don't overemphasize the initial cost).
* If throttling flow evaluate the use of VFDs.
* Use two or more smaller pumps instead of one large pump.
* Maintain pumps and all system components to avoid efficiency loss.

In most applications, it costs much more to operate a pump for one year than it does to buy the pump. Considering the high energy costs in New England, a 20% reduction in operating costs can pay for the cost of a pump in about a year. Consider the following example.

A pump station operates 75% of the time at only 60% efficiency. A pumping assessment indicates a new 25 horsepower motor and pump would increase the efficiency to 80%.

New Pump and Motor Cost = $ 4,500
Annual Operating Cost at 60% = $ 20,422 (at $0.10/kWh)
Annual Operating Cost at 80% = $ 15,316
Savings = $ 5,106
Simple Payback = $ 4500 /$ 5,106 = 10.5 months

This example uses round numbers, and each situation needs to be evaluated, but the potential savings in energy and cost are considerable. Through a pumping system evaluation you may find opportunities to improve your system and begin saving on energy costs.

You can obtain a report containing further tips on improvements to each of these areas by contacting Dick Darling at the DEP.

Electronic Copies of the O&M news

We're up to about 75 operators or others who have signed up to get the O&M News via e-mail. You can find it on the DEP Web site at http://www.state.me.us/dep/blwq/newslet/omnews.pdf, but e-mail is a quicker way to get the news in your hands. (And we promise not to throw it in the bushes.)

If you have e-mail and would like to receive the O&M News electronically instead of in the mail, please send an e-mail to:

dick.darling@state.me.us

We will add your e-mail address to our e-mail group and start sending your O&M News electronically.

Dick Darling

DEP's Water Enforcement Program

It is the responsibility of the Maine DEP to, "…prevent, abate and control the pollution of the air, water and land and preserve, improve and prevent diminution of the natural environment of the State." DEP is charged with administering the Protection and Improvement of Waters Act. The Water Enforcement Section within the Bureau of Land & Water Quality administers the Act among both licensed and unlicensed dischargers of pollutants to Maine waters.

Except for those who qualify for an exemption under the law, it is illegal to discharge pollutants to the waters of the State without a license. It is everyone's responsibility, whether or not they possess a Maine waste discharge license, to comply with State laws that regulate the discharge of pollutants. Those who violate these laws are subject to possible enforcement action by the DEP.

DEP compliance and enforcement staff use the Division of Water Resource Regulation Compliance Policy as guidance to determine appropriate responses to violations. As a general rule, most violations are resolved voluntarily without formal enforcement action by the Department. Resolution without formal enforcement action and penalties is largely dependent upon the seriousness of the violations, their ongoing nature, and the willingness of the violator to promptly comply. While many formal enforcement actions are taken only after the DEP has attempted unsuccessfully to resolve the violations informally, occasionally the violations may be so serious or blatant that they warrant immediate formal enforcement action.

Once the decision has been made to take formal enforcement action, the assigned Water Enforcement staff person writes an Administrative Consent Agreement and Enforcement Order. If the violator and the Department reach an agreement with regard to penalties and corrective actions, the violator pays the penalties and signs the Consent Agreement. It is then submitted to the Board of Environmental Protection and the Department of Attorney General for approval. If the violator and the Department are unable to reach an agreement, the matter is referred to the Department of Attorney General for appropriate action, which may include prosecution in a court of law.

Maine law provides for significant monetary penalties for those who violate the laws administered by the DEP. Penalties for civil violations may range from \$100-\$10,000 for each day that the violation continues. For repeat violations, penalties may reach \$25,000 for each day that the violation continues. If the economic benefit is greater than the applicable penalties, the maximum civil penalties may be increased to an amount not greater than twice the economic benefit resulting from the violation. Violators who act intentionally, knowingly, recklessly or with criminal negligence are guilty of a Class E crime, the fine for which may not be less than \$2,500 nor more than \$25,000 for each day of the violation, except that the minimum amount for knowing violations is \$5,000 for each day of the violation. Finally, in accordance with Title 38 M.R.S.A., § 349.(3), "…any person who knowingly makes any false statement, representation or certification in any application, record, report, plan or other document filed or required to be maintained by any provision of law administered by the department, or by any order, rule, license, permit, approval or decision of the board or commissioner, or who tampers with or renders inaccurate any monitoring devices or method required by any provision of law, or any order, rule, license, permit, approval or decision of the board or commissioner…is, upon conviction, subject to a fine of not more than \$10,000, or by imprisonment for not more than 6 months, or both."

If you are a permitted discharger, it is extremely important that you read, understand, and fully comply with all aspects of your permit or license, including all special and standard conditions. If you have any questions about your permit or license, please contact your designated compliance inspector. It is important to note that now that Maine has been delegated to implement the National Pollutant Discharge Elimination System (NPDES) Program, all aspects of a NPDES permit issued by the DEP are fully enforceable by the DEP, EPA, and through citizen suits.

In closing, it's up to all of us to comply with Maine's Protection and Improvement of Waters Act because Maine's waters belong to all of us. Working together, we can clean up our waters and keep them clean.

John Glowa

Spring 2002 Exam

The Spring 2002 Wastewater Operator Certification Exam will be given Wednesday, May 15, 2002 in the usual locations, South Portland, Bangor and Presque Isle. Application *must* be postmarked on or before Saturday, March 30, 2002 or delivered to our offices by Monday, April 1, 2002. Applications can be obtained by contacting Leslie Rucker at 287-9031, by e-mail at leslie.a.rucker@state.me.us or by writing to Wastewater Operator Certification Program, Maine Department of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017.

For Practice

1. If the supernatant from an anaerobic digester has a high BOD content, how will it most likely affect the activated sludge aeration basin?
a. Increase the DO level.
b. Increase the MCRT.
c. Increase the F/M ratio.
d. Increase the removal efficiency.

2. The concentration of dissolved oxygen that may be held in water
a. decreases as temperature increased
b. decreases as temperature decreases
c. is independent of temperature
d. increases as temperature increases

3. The type of solids that is the easiest to remove using a standard biological treatment process is.
a. Organic dissolved
b. Inorganic dissolved
c. Organic suspended
d. Inorganic colloidal

4. The best description of new activated sludge floc is
a. Young, poor settling, underoxidized
b. Young, good settling, clear effluent
c. Old, rapid settling, overoxidized
d. Old, poor settling, underoxidized

UPCOMING TRAINING COURSES

March 11, 2002 in Presque Isle, ME – Practical Chemistry for Operators - sponsored by MRWA, (207) 729-6569 - Approved for 4 hours.
*****
March 12, 2002 in Portland, ME - Hands-On Review of Pump Basics - sponsored by JETCC (207) 767-2649
*****
March 13, 2002 in Hallowell, ME – Excavation & Permit Required Confined Spaces - sponsored by MRWA, (207) 729-6569 - Approved for 5 hours.
*****
March 14,21,28 & April 4 in Scarborough, ME - Advanced Hydrology & Special Topics (4-week course) - sponsored by JETCC (207) 767-2649 - Approved for 16 hours.
*****
March 19, 2002 in Waterville, ME - Use of Polymers in the WWTP - sponsored by JETCC (207) 767-2649
*****
March 19, 2002 In Vassalboro, ME - Use of Coagulants & Flocculants in Water Applications - sponsored by JETCC (207) 767-2649 - Approved for 6 hours.
*****
March 20, 2002 in South Berwick, ME – Excavation & Permit Required Confined Spaces - sponsored by MRWA, (207) 729-6569 - Approved for 5 hours.
*****
March 21, 2002 in Rockland, ME - Pretreatment Septic System Installation - sponsored by JETCC (207) 767-2649 - Approved for 6 hours.
*****
March 26, 2002 in Brewer, ME - Basic On Site Septic System System Installation - sponsored by JETCC (207) 767-2649 6569 - Approved for 6 hours.
March 27, 2002 in Presque Isle, ME - Advanced On-Site Septic System Installation - sponsored by JETCC (207) 767-2649 - Approved for 6 hours.
*****
March 27, 2002 in Calais, ME – Excavation & Permit Required Confined Spaces - sponsored by MRWA, (207) 729-6569 - Approved for 5 hours.
*****
March 28, 2002 in Augusta, ME - Applying Process Control Tests to WWTP - sponsored by JETCC (207) 767-2649 - Approved for 6 hours.
*****
April 9, 2002 in Kennebunkport, ME - By-Pass Pumping WWTP - sponsored by JETCC (207) 767-2649 - Approved for 6 hours.
*****
April 9, 2002 in Thomaston, ME – Pump Station and Diesel Generator O&M - sponsored by MRWA, (207) 729-6569 - Approved for 6 hours.
*****
April 10, 2002 in Old Orchard Beach, ME – Pump Station and Diesel Generator O&M - sponsored by MRWA, (207) 729-6569 - Approved for 6 hours.
*****
April 10, 2002 in Skowhegan, ME – Respiratory Protection - sponsored by MRWA, (207) 729-6569 - Approved for 3.5 hours.
*****
April 10, 2002 in Scarborough, ME – HydroCad - sponsored by JETCC (207) 767-2649 - Approved for 6 hours.
*****
April 16, 2002 in Presque Isle, ME - Basic Microscopy for Wastewater Operators & Using ORP for Process Monitoring WWTP - sponsored by

JETCC (207) 767-2649 - Approved for 6 hours.
*****
April 17, 2002 in Brewer, ME - Basic Microscopy for Wastewater Operators & Using ORP for Process Monitoring WWTP - sponsored by JETCC (207) 767-2649 - Approved for 6 hours.
*****
April 17, 2002 in Portsmouth, NH – Optimizing SBR Operation - sponsored by NEIETC (978) 323-7929 - Approved for 6 hours.
April 17, 2002 in South Berwick, ME – Respiratory Protection - sponsored by MRWA, (207) 729-6569 - Approved for 3.5 hours.
*****
April 18, 2002 in Brunswick, ME - Basic Microscopy for Wastewater Operators & Using ORP for Process Monitoring WWTP - sponsored by JETCC (207) 767-2649 - Approved for 6 hours.
*****
April 24, 2002 in Bangor, ME – Respiratory Protection - sponsored by MRWA, (207) 729-6569 - Approved for 3.5 hours.
*****
April 31 & May 1, 2002 in Waterville, ME – Wastewater Microbiology and Filament Staining & Identification - sponsored by MRWA, (207) 729-6569 - Approved for 8 hours.
*****
May 1, 2002 in Livermore Falls, ME - Advanced Computer Spreadsheets for Wastewater Operators - sponsored by JETCC (207) 767-2649 - Approved for 6 hours.
*****
May 7, 2002 in Thomaston, ME - Mechanical Packing & Mechanical Seals - sponsored by JETCC (207) 767-2649 - Approved for 6 hours.

Answers to *For Practice:*

1. c – Increasing the BOD increases the food available to the microorganisms. Thus, the F:M (Food:Microorganism) ratio will increase
2. a – The ability of water to hold dissolved oxygen decreases as the temperature increases. Warm water holds less oxygen then cold water.
3. d – Dissolved organic solids are absorbed quickly by the microorganisms. Organic suspended solids are adsorbed to the microorganisms but must be broken down by enzymes before they can be absorbed. Inorganic dissolved solids are not removed by settling but are not, usually, taken up by the microorganisms. Colloidal inorganic solids are very difficult to remove because they do not settle and are not readily adsorbed by the microorganisms.
4. a – New activated sludge floc is made up a young cells that settle poorly and are underoxidized.

Biological Nutrient Removal Workshop

New Hampshire Water Pollution Control Association in cooperation with New Hampshire Department of Environmental Services present *Biological Nutrient Removal* Featuring Dr Clifford Randall, The Charles P. Lunsford, Professor of Environmental Engineering, Virginia Tech at the NHDES Auditorium, 6 Hazen Drive, Concord, NH on May 16, 2002 from 9:00am to 4:00pm. This workshop has been approved by the Maine DEP for 6.0 training contact hours for operator renewal.

Workshop Content

This seminar features nationally renowned nutrient removal expert Dr Clifford W Randall, who has authored text books on the subject and brings decades of both theoretical and hands-on experience to this class.

Many industries and municipalities will be facing more stringent NPDES Permit limits in the not so distant future. Many of these permits will contain nutrient limitations, specifically ammonia, total nitrogen and phosphorous. This seminar will discuss the principles of how to efficiently remove these pollutants using biological processes and will discuss how these may apply to your wastewater treatment situation.
This seminar will discuss a variety of nutrient removal topics, including:

Biological Nutrient Removal Processes

- Importance of Wastewater Characteristics
- Principles of Biological Nitrogen Removal
- Principles of Biological Phosphorus Removal

Modification of Conventional Activated Sludge Plants for Biological Nutrient Removal: Case Histories

- Modification for Biological Phosphorus Removal
- Modification for Biological Nitrogen Removal
- Modifications for Combined Biological Nutrient Removal

Modifications for Improved BNR Performance

- Design and Operation of Prefermentation Systems
- Secondary Clarifier Design and Operation
- Integrated Fixed-Film Activated Sludge (IAFS) Systems: Case Histories
- Step-Feed BNR Design

BNR Sludge Handling and Processing

- Recycle Streams
- Anaerobic Digestion

Who Should Attend

Wastewater professionals dealing with more stringent future discharge limits including operators, design engineers, municipal officials, regulatory personnel and those interested in gaining a better understanding about the principals and applications of biological nutrient removal.

Registration Information

There is a $60.00 per person charge for NHWPCA Members, and $75.00 per person charge for non-members for this workshop to cover training materials and refreshments at breaks. Lunch is NOT included.

There will be no refunds, but substitutions are welcome. Registration until May 9, 2002 or when full.

To Register, please use the form otinter on the right. Please make checks payable to:

New Hampshire WPCA

No telephone registrations will be accepted.

Please contact George Neill at (603) 271-3325 if you have any questions regarding the workshop.

Registration Slip - Attn: George Neill

Biological Nutrient Removal May 16, 2002

____
(Name)

____
(Home Street Address)

____
(City, State and Zip Code)

____
(Home Telephone)

____
(Employer / Facility Name)

____
(Work Telephone)

____
(Certification #)

____
(Check #) (Total Amount)

Make checks or vouchers payable to:

New Hampshire WPCA

$75 per person

$60 for NHWPCA Members

Return to:

George Neill
NHDES Wastewater Engineering Bureau
6 Hazen Drive
Concord, NH 03302

No telephone registrations please.

Registration until May 9, 2002, or when full.

You will be notified only if your registration cannot be accepted.

Gulf of Maine

March 4, 2002

Dear Sir or Madam:

RE: Gulf of Maine Sewage Management Workshop

The Gulf of Maine Council on the Marine Environment is sponsoring a regional Sewage Management Workshop to be held on April 11 & 12, 2002 at the Bedford Institute of Oceanography in Dartmouth, Nova Scotia, Canada. The Nova Scotia Department of Environment and Labour will host the workshop.

The objective of the workshop is to share and evaluate sewage management information among the jurisdictions that border the Gulf of Maine, to clarify the current status of sewage management in each jurisdiction, and to challenge jurisdictions to develop sewage management action plans.

The keynote speakers will be Garth Bangay, Regional Director General of Environment Canada and Robert Varney, Regional Administrator for the Environmental Protection Agency Region 1 (to be confirmed). These will be followed by jurisdictional overviews from Massachusetts, New Hampshire, Maine, New Brunswick and Nova Scotia.

The first day will focus on breakout sessions to address such topics as economic impacts/costs, innovative approaches, funding mechanisms, public education, regulation & enforcement, and ecosystem health. The second day will involve urban and rural case studies to initiate discussion and assist in developing management models.

We hope that you will find this an interesting and beneficial workshop to improve the understanding of sewage management in the Gulf of Maine region.

Should you have any questions or require further information, please contact the workshop organizers.

Sincerely,

Patricia Hinch
Workshop Steering Committee Chair
Sadie Bryan Patricia Hinch
Sewage Workshop Coordinator Nova Scotia Dept. of Environment & Labour
(902) 489-9818 (902) 424-6345
sadiebryan@hotmail.com hinchpr@gov.ns.ca

The mission of the GOMC is to maintain and enhance environmental quality in the Gulf of Maine and to allow for sustainable resource use by existing and future generations.

New Brunswick Department of Environment and Local Government • 2001-2002 Secretariat

GOMC • c/o NHDES • PO Box 95 • Concord, NH, US • 03302-0095 • Phone (603) 225-5544

Sponsored by: Gulf of Maine Council on the Marine Environment
Hosted by: Nova Scotia Department of Environment and Labour

Sewage Management Workshop

April 11-12, 2002
Main Auditorium - Bedford Institute of Oceanography
Dartmouth, Nova Scotia

Objective: To share and evaluate sewage management information among GOM jurisdictions, to clarify the current status of sewage management in each jurisdiction, and to challenge jurisdictions to develop sewage management action plans.

AGENDA

Thursday, April 11th, 2002:

9:00 am	Welcome/Introduction/Format	
9:10 am	US/New England Overview	
	Canadian/Maritimes Overview	
9:30 am	Jurisdictional Status and Standards Review	
	(MA, NH) - 15 min. each plus questions	
10:10 am	Nutrition Break	
10:20 am	Jurisdictional Status and Standards Review	
	(ME, NB, NS) - 15 min. each plus questions	
11:20 am	Panel Discussion – Jurisdictional Presenters (40 min)	
12:00 Noon	Lunch (on your own)	
1:30 pm	Break-Out Session Goals/Assignments/Directions	
1:40 pm	Concurrent Break-Out Session – 1 (1hr30min):	
	(1A)	Socio-economic Impacts/Costs
	(1B)	Innovative Approaches
	(1C)	Public Education
3: 10 pm	Nutrition Break	
3: 20 pm	Concurrent Break-Out Session – 2 (1hr30min):	
	(2D)	Funding Mechanisms
	(2E)	Regulation & Enforcement
	(2F)	Ecosystem Health
4:50 pm	Adjourn for the day	

6:00 pm Meet for Dinner/Social

Friday, April 12th, 2002:

9:00 am — Plenary Reports from Day 1 Breakout Sessions: - 10 min. each
- (A) Economic Impacts/Costs
- (B) Innovative Approaches
- (C) Public Education
- (D) Funding Mechanisms
- (E) Regulation & Enforcement
- (F) Ecosystem Health

10:00 am — Case Study Break-Out Session Goals/Assignments/Directions

10:10 am — Nutrition Break

10:20 am — Case Studies & Management Model Development Sessions (1hr40min):
- (A) Rural Case Study #1
- (B) Rural Case Study #2
- (C) Rural Case Study #3
- (D) Urban Case Study #1
- (E) Urban Case Study #2
- (F) Urban Case Study #3

12:00 Noon — Lunch (on your own)

1:30 pm — Plenary Reports from Management Model Development (15 min each)

3:00 pm — Nutrition Break

3:15 pm — Open Discussion/Recommendations/Next Steps

4:30 pm — GOM Council Role

4:45 pm — Adjournment

Gulf of Maine Sewage Management Workshop

" To share and evaluate sewage management information among Gulf of Maine jurisdictions, to clarify the current status of sewage management in each jurisdiction, and to challenge jurisdictions to develop their own action plans."

Sponsored by: Gulf of Maine Council on the Marine Environment
Hosted by: Nova Scotia Department of Environment & Labour

Contact Information

Name:
Position:
Association:
Mailing
Address:
Phone #:
Fax:
Email:

Identification as you would like it to appear on your workshop name card:

Sewage Management Workshop

Accommodations *You are responsible for booking and covering all costs of your accommodation, meals & travel relating to the workshop. There have been blocks of rooms reserved until March 15th at two Inns that are within walking distance of BIO (workshop location). Phone the Inn directly, and tell them you are with the "Gulf of Maine Sewage Management Workshop" to receive the group rate.*

COUNTRY INN & SUITES COASTAL INN
(902) 465-4000 (902) 465-7777
Room: $80 Room: $72-$82
Suite: $90 Suite: $89
All prices in Canadian funds, 15% tax not included

If you are unable to cover travel and accommodation expenses, please contact the workshop coordinator to explore options. We don't want you to miss out!
If you have extra space in your room, or an extra seat in your car that you wouldn't mind sharing, please let the workshop coordinator know. There may be organizations that cannot cover expenses.

***Estimated arrival time & date:* ________________________**

? Questions *? Ask the Workshop Coordinator:*
Sadie Bryan
Phone: (902) 489-9818
Fax: (902) 624-9818
Email: sadiebryan@hotmail.com
Please indicate which breakout session you are most interested in:
__ Economic Impacts / Costs
__ Innovative Approaches
__ Funding Mechanisms
__ Public Education
__ Regulation & Enforcement
__ Ecosystem Health
These sessions will be the focus of the first day of the workshop, with case study options for the second day.

April 11-12, 2002
Main Auditorium
Bedford Institute of Oceanography
Dartmouth, Nova Scotia
Registration is FREE. Please fax this sheet to Sadie @ (902) 624-9818 preferably by March 26th .