Operator Facts

TECHNICAL FACTS FOR WASTEWATER TREATMENT PLANT OPERATIONS

New York State Department of Environmental Conservation

Massena WWTP Maximizes Wet Weather Treatment

The Village of Massena WWTP is a 4.8 mgd design activated sludge plant with secondary limits. Due to its combined sewer system, the plant often receives flow much greater than its design limits (sound familiar?). A wet weather operating plan was in place and called for the following:

6.8 mgd through aeration
6.8 mgd to 10.4 mgd to the ORF (settling with chlorination)
Flows over 10.4 mgd out the emergency bypass

A permit condition for all combined sewer systems is to maximize flows to the treatment plant to reduce the number of raw sewage discharges. Chief operator Nick Zappia and the plant staff felt they could treat more flow but weren't sure how to push the system without possibly creating permit violations. After requesting assistance through their DEC Region 6 Office, the plant started a cooperative technical assistance program in February 2004. The goals were to:

1. Determine the maximum flow that can be reliably treated biologically through the secondary process.
2. Examine means to get most of the extra wastewater flow to the overflow retention facility (ORF) rather than discharging out the emergency raw bypass line.

Operator Jack Diagostino measures MLSS in the aeration tank

The operators had an excellent operation in place to maximize wet weather capacity. The plant routinely runs in the contact stabilization mode. This allows solids to be stored in the stabilization tank away from the influent flow and reduces the solids loading to the clarifier (a critical wet weather parameter). Target values were already set for MLSS concentrations. Enhancements to the program included:

- Increased process testing from weekly to daily to provide better control of the process and keep the solids inventory in the proper range and maintain proper sludge settling.
- Implemented constant return sludge flow control using the clarifier and stabilization tank to store solids during wet weather events.

A desktop evaluation was conducted to see if higher flow rates could be treated. Based on process calculations, the limiting factor was the clarifier solids loading. Under plug flow operation at 10 mgd, the solids loading was over 40 lbs/d/sq ft. This exceeded the recommended maximum of 35 lbs/d/sq ft. By staying in the contact stabilization mode, the solids loading to the clarifiers was only 20 lbs/d/sq ft. Using con-

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Future ABC Exam Dates

Applications for ABC exams must be postmarked by the filing deadline. This includes new applications and those retaking the exam. The cost is $35.00. Applicants who miss the deadline will be scheduled for the next exam.

Exam Date	Filing Deadline
August 30, 2006	July 19, 2006
February 28, 2007	January 17, 2007

Operator Facts

The purpose of this technical bulletin is to inform wastewater operators about various operational practices, problem-solving approaches, technical developments and certification and training issues.

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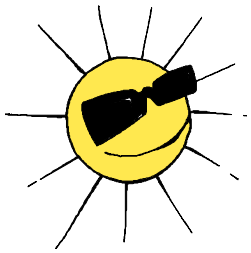
You are invited to submit technical articles or other information of interest to operators for publication in ***OperatorFacts***.

Be sure to notify us of a change of address if you wish to continue to receive ***Operator Facts*** and training notices. Please include your certificate number.

The mention of any product or listing of any company's seminar is not an endorsement by this department.

Send all correspondence to: ***Operator Facts***, NYSDEC, 625 Broadway, Albany, New York, 12233-3506, Phone (518) 402-8089 or Fax (518) 402-8082. Visit our website at: http://www.dec.state.ny.us/website/dow/bwcp/foas_main.html



Spring 2006

Wastewater Operator Faces Jail Time for "Clean Water Act" Violations

Wastewater plant operator David Van Dyke of Warsaw, Ind., was sentenced November 18, 2005 to serve 46 months in prison followed by one year of supervised release for his conviction on three counts of violating the Clean Water Act.

Van Dyke was the certified operator of the Warsaw, Ind., wastewater treatment plant, which discharges into Walnut Creek, a tributary of the Tippicanoe River. Van Dyke altered and falsified a lab report that was submitted to the Indiana Department of Environmental Management.

The defendant also falsified records of the sewage plant's weekly limit for carbonaceious biological oxygen demand, ammonia, total suspended solids and E-coli bacteria.

In addition, Van Dyke ordered employees at the facility to use diesel fuel at the plant to reduce foaming, without reporting that practice to the Indiana Department of Environmental Management.

Rather than pay for sludge disposal, the defendent ordered that sludge be recirculated within the plant. This killed the plant's biological treatment system, leading to the release of untreated sewage into the creek.

Testimony at trial indicated that thousands of fish were killed in Walnut Creek in 2002 as a result of these activities. Wildlife also disappeared from the creek area during the discharges, and local residents complained of the stench.

Approximately 22,000 cubic yards of sewage sludge remains in Walnut Creek as a result of the improper operation of the facility.

The case was investigated by EPA's Criminal Investigation Division (Chicago) and the Indian Department of Natural Resouces. The case was prosecuted by the U.S. Attorney's Office in South Bend.

Stormwater Manual Available

A comprehensive manual for municipalities that focuses on the development and implementation of programs to find and correct illicit discharges to storm sewers is available from USEPA. The new manual is entitled *Stormwater Illicit Discharge Detection and Elimination Manual*. It includes detailed information on creating and managing a program, types of testing used, costs and time lines for implementation.

The manual and supporting materials can be downloaded at www.cwp.org/idde_verify.htm

Mercury in the Treatment Plant

Mercury is a metal that occurs naturally in the environment in several forms. The most common form, metallic or elemental, is a silvery, odorless liquid, that can evaporate at room temperature to form a vapor. Elemental mercury is the most common form of mercury found in mercury-added devices. Some examples of mercury-added devices in treatment plants and collection systems include:

- Fluorescent Lamps: 10 mg - 50 mg per tube
- High Intensity Discharge Lamps: 20 mg - 250 mg per lamp
- Float Switches: 3.5 g -3500 g
- Flow Meters: 5 kg or more
- Manometers/Barometers: 100g - 500 g
- Laboratory Thermometers: up to 3g

A more extensive list of mercury-added devices can be found at http://pasture.ecn.purdue.edu/~epadocs/mercbuild/src/devicepage.htm and information on some specific mercury-added products can be found at http://www.newmoa.org/newmoa/htdocs/prevention/mercury/imerc/notification/index.cfm

Spills (leaks) of mercury from these devices can rapidly enter the work and natural environment. NYSDEC has responded to two spill events in the last two years that show the hazards associated with these devices. In both cases, the operators were unaware the devices contained mercury.

The first event involved the release of approximately three pounds of mercury from an old unused piece of equipment. This equipment was being stored at the facility and none of the current operators was aware of the equipment's use.

The operator, who discovered the spill, attempted to vacuum up the mercury. This action vioatilized the mercury and discharged the mercury vapor through the vacuum exhaust. Room airborne mercury levels rose above the exposure limits, and an environmental contractor had to wipe down all room surfaces. A final cleanup resulted in the disposal of more than 3,700 pounds of contaminated debris and the facility being designated as a large-quantity generator of hazardous waste.

The second case involved a leak of mercury from an old differential pressure-type flow meter. The meter was still in use, pending its final failure before a new meter was installed. Mercury leaked from the meter and entered a metal cabinet where it was discovered. The pool of mercury (4"-6") was isolated from the rest of the room because of ongoing construction activities. A clean-up contractor was hired to remove the spill. To date, approximately 215 pounds of material have been removed for off-site disposal.

To limit your potential exposure to mercury, identify mercury-added devices in use or stored at your treatment plant or collection system.

1. Search all plant buildings and pump stations to create a mercury-device inventory. See http:/www.health.state.ny.us/nysdoh/environ/hsees/mercury/index.htm for an example.
2. Determine whether the device can be replaced with a non-mercury device. See NYSDEC's website at: http://www.dec.state.ny.us/wesite/dshm/redrecy/mercury.htm for information on disposal of mercury-added devices.
3. Develop a mercury spill response plan for mercury-added devices remaining in service. Consider purchasing a mercury spill kit as a precaution.
4. Set up a fluorescent lamp recycle program. The website http://www.nema.org/lamprecycle/ has information on setting up a recycle program.

In case of a mercury spill:

1. Do not use a vacuum cleaner, mop or broom to clean up a mercury spill. This will spread the contamination to other areas.

2. Report the spill to the NYSDEC Spill Hotline (800-457-7362). Reporting is required for a mercury release of one pound (approximately two tablespoons) but is recommended for any release.
3. Contain the area to prevent spreading the mercury.
4. Evacuate the room or affected area. Open exterior windows to ventilate the room. Do not use fans to move air over the spill area.

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Renewal and Certification Training & Upcoming Meetings

Looking for Some Training?

Biological Treatment or Water Quality Modeling
Date: June 12-16, 2006
Location: Manhattan College, Riverdale, NY
Cost: $1,300 each
Contact: Theresa Hage, Manhattan College @ (718) 862-7276

Belt Press Optimization Workshop
Date: April 19, 2006-Mt. Morris, NY
April 27, 2006 - Maybrook, NY
May 3, 2006 - Little Falls, NY
Cost: $45 NYWEA Members
$105 for Non-Members
Contact: Maggie Hoose, NYWEA @ (315) 422-7811

Security for WWTPs
Date: April 19, 2006
Location: Saratoga Co. Fire Training Facility, Ballston Spa, NY
Cost: $50
Contact: NEIWPCC @ (978) 323-7929 or visit: www.neiwpcc.org

Solids Handling Processes Overview
Dates: May 9, 2006
Location: Delhi Volunteer Firehouse, Delhi, NY
Cost: $35
Contact: Mark Gander, NYSDEC @ (518) 402-8182 or mxgander@gw.dec.state.ny.us

Nitrogen Removal Workshop
Date: June 14, 2006
Location: Yorktown Heights Volunteer Firehouse, Yorktown Heights, NY
Cost: $35
Contact: Mark Gander, NYSDEC @ (518) 402-8182 or mxgander@gw.dec.state.ny.us

NYWEA

NYWEA, Inc.
525 Plum Street, Suite 102
Syracuse, NY 13204
(315) 422-7811
e-mail: mail@nywea.org
http://www.nywea.org

National Events
WEFTEC
October 21-25, 2006
Dallas, Texas

Legislative Forum
May 16, 2006
Albany, NY

State Events
Voluntary Collection System Operator Certification Exam
April 26, 2006
Several Locations Throughout New York State
For more information call:
Maggie Hoose (315) 422-7811

NYWEA/NEWEA Spring Technical Conference & Exhibition
June 4-7, 2006
Groton, CT

2006 New York City Watershed Science & Technial Conference
September 20-21, 2006
Fishkill Holiday Inn & Conference Ctr.
Fishkill, NY

Visit our Website at: www.dec.state.ny.us/website/bwcp/foas_main.html

Certification Courses

Basic Operations
May 1-12, 2006
SUNY at Morrisville
(315) 684-6082

September 11-22, 2006
Great Lakes Laboratory - Buffalo
(716) 878-5422

Basic Laboratory
June 26-30, 2006
SUNY at Morrisville
(315) 684-6082

August 28 - September 1, 2006
Great Lakes Laboratory - Buffalo
(716) 878-5422

Activated Sludge
April 27-May 25, 2006
Ulster Community College
(Tuesday and Thursday Evenings)
(845) 687-5173

May 8-11, 2006
Great Lakes Laboratory - Buffalo
(716) 878-5422

June 5-8, 2006
SUNY at Morrisville
(315) 684-6082

Supervision & Technical Operations
May 22-26, 2006
Great Lakes Laboratory - Buffalo
(716) 878-5422

June 12-16, 2006
SUNY at Morrisville
(315) 684-6082

Management Course
June 5-7, 2006
Great Lakes Laboratory - Buffalo
(716) 878-5422

Security

The National Small Flows Clearinghouse (NSFC) has developed a poster titled "Ten Steps to Maintain Critical Wastewater Services and Protect Public Health in an Emergency." NSFC developed this tool with assistance of national experts for use by local officials and wastewater treatment plant operators to improve security and emergency preparedness. The poster includes ten pocket cards for use as an emergency contact list. This poster is available from NSFC by calling 1-800-624-8301. NSFC's website (www.nesc.wvu.edu/snfc/nsfc_index.htm) has downloadable versions of the poster in booklet format or in its actual size.

Long Term Power Outage Tips

Ideas/tips for dealing with the loss of power.

- Put all available preliminary treatment units online to maximize capture of inorganic materials. Increase cleaning frequency and go to manual cleaning if necessary.
- Put all available primary settling tanks on line to maximize BOD_5 and TSS removal. Hand skim scum from surface to prevent loss to effluent.
- Use all empty storage tankage such as equalization basins or final lagoons.
- Use existing settling aids, chemicals and polymers to increase solids and BOD_5 capture. Feed points may include primary or secondary settling tanks.
- Stop wasting sludge from activated sludge plants.
- Put all available disinfection units online, including chlorine contact tanks, UV channels and ozonation basins. Increase effluent disinfection monitoring to ensure adequate pathogen reduction.
- Rent portable gas/diesel powered generators for small system pump stations and package plants to keep the waste stream moving and prevent wastewater backup.
- Depending on the power outage duration, odors may be generated. Purchase odor oxidizing chemicals and self-powered feed systems. Relocate existing odor control systems from (inside) solids handling areas to outside areas; eg. move potassium permanganate misting systems from belt filter press room to primary clarifier deck.

Additional case study information on long-term power outages is available from the Association of Metropolitan Water Agencies (AMWA). AMWA worked with the Water Information Sharing and Analysis Center (WaterISAC) to survey those directly affected by the August 2003 power failure. They summarized the lessons learned from that event into a single report. The report ("Water and Wastewater System Interdependencies with the Power Sector, Lessons Learned from the 2003 Power Outage") is available at www.amwa.net/security/Water-Power-LessonsLearned.pdf or by contacting AMWA at 202-331-2820.

Mercury in the Plant
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5. Shut down any ventilation system that would spread mercury vapor to other areas.
6. Keep anyone who may have been contaminated in a separate room until they can change their clothing and shoes and remove other articles such as watches or jewelry. Shower or wash throughly before changing into fresh clothing.
7. Contact a reputable environmental contractor (see Yellow Pages) to remediate and test the spill area.

More information and links regarding mercury management can be found on the NYSDEC website at: http://www.dec.state.ny.us/website/dshm/redrecy/mercury.htm

Employment

The Village of Dolgeville is seeking candidates for Chief Wastewater Treatment Plant Operator. Required qualifications are eligibility by April 1, 2006 or possession of a valid NYS Grade 3A Operator's License. Job experience necessary.

Salary based on experience with a competitive benefit package available.

Qualified candidates can submit their resumes to Tammy L. Chmielewski, Village Clerk, 41 North Main Street, Dolgeville, NY 13329.

Congratulations

To Our New Certified Operators!

Grade 1

Mark C. Atkins	Westchester
John Bolembach	New York City
Steven T. Cartwright	New York City
Frantz F. Cham	New York City
John R. Evangelista	Westchester
Carl Fasano	New York City
Elia Garcia	New York City
Richard J. Hagen, Sr.	Westchester
William V. Higgins	New York City
Constante L. Ignacio	New York City
James Jeffers	Cayuga
Rawle A. Jordan	New York City
Steven J. Marxhausen	New York City
Alvaro Mora	New York City
Kurt T. Plank	Greene
Luckner Poitevien	New York City
Lionel V. Robinson	New York City
William E. Sedutto	New York City
Brian Theordor	New York City

Grade 1A

Edward G. Davis	Greene
Brian S. McCall	Cortland
Brian P. Paige	St. Lawrence
Benjamin D. Parson	Essex

Grade 2

Keith W. Brown	Seneca
Stephen L. Castner	Yates
Scott D. Cummings	Chautauqua
Samuel J. Hindley	Orange
Daniel C. Merrils	Rensselaer
Ralph J. Millen	Wyoming

Grade 2A

Christopher F. Abele	Montgomery
Ernest B. Bates	Dutchess
George P. Bonham	Cortland
John L. Childs	Ulster
Edward E. Cordis	Essex
Michael Dembski, Jr.	Erie
Paul A. Dibble	Delaware
Christopher Falcon	New York City
Robert Gerasia	Saratoga
Michael D. Jaeger	Erie
Martin Jagsaran	New York City
Sean M. Kelly	Delaware
John Lewyta	Orange
Thomas Macomber	St. Lawrence
Thomas E. Mahady	St. Lawrence
Richard J. McHugh	Delaware
Thomas M. Niciu	Westchester
Robert D. Peck	Hamilton
Edward Poole	Cortland
Frank M. Price, Jr.	Chenango
Kristine M. Rathbun	Allegany
Robert L. Scharf	Cattaraugus
Malak Shafik	New York City
Michael S. Silvestri	Dutchess
Thomas A. Stamas, Jr.	Albany
David P. Tavernier	Putnam
Cory D. Vaillancourt	Erie
Joseph G. Wahlgren	Erie
Matthew J. Weaver	Erie
Duane Wormuth	Delaware

Grade 3

Thomas J. Lee	Broome
Earl W. Wentz	Delaware

Grade 3A

Aric K. Albright	Orleans
Jeffrey J. Bryant	Out Of State
Brad F. Camp	Cattaraugus
Tomas Fernandez	New York City
Joseph Franco	New York City
Glenn Goodfriend	Jefferson
Robert Haimson	New York City
Donald R. Hardic	Out of State
Rafael Ignacio	New York City
Paul A. Kwiatek	Erie
Martin J. Lauer	Niagara
Frederick Levison	St. Lawrence
Edward S. Mahlstadt	New York City
John A. Mitchell	Monroe
Michael H. Pratt	Onondaga
Anthony Ruggiero	New York City
Abel E. Sanchez	New York City
William L. Troost	Delaware

Grade 4

Donald K. Phillips, Jr.	Niagara

Grade 4A

Robert M. Crandall	Jefferson
John McCabe	New York City
Jeremy A. Meerdink	Cattaraugus

ABC Exam Statistics

for
February 22, 2006
Exam

Grade	% Pass	# of Exams	Average Score
1	75	24	75
1A	100	4	85
2	100	6	81
2A	70	40	76
3	17	12	64
3A	33	46	66
4	25	4	67
4A	29	7	64

Massena Wet Weater Treatment

(continued from Page 1)

tact stabilization, it seemed the process was capable of treating 9-10 mgd reliably.

However, a desktop evaluation is not real life.

A stress test protocol was developed to evaluate the plant under controlled conditions at flows greater than 6.8 mgd. The testing included a minimum of hourly monitoring of contact and stabilization MLSS, clarifier solids profiles and effluent turbidity. If the plant demonstrated any instability (sludge blankets greater than 10 feet), the test could be stopped before any effluent violations occurred. Four stress tests were run during normal flows by taking clarifiers off line. For flow rates of 7.3 - 10.8 mgd, the effluent TSS remained below 20 mg/l (permit limit is 30 mg/l), and the sludge blanket never exceeded 8 feet (the clarifier depth is 15 feet).

The stress tests confirmed that the activated sludge process and ultraviolet units could treat flows up to 10 mgd for at least an 8-hour period. Based on this, plant staff was able to gradually adjust the gate in the influent distribution box, allowing wet weather flows up to 10 mgd to the biological process.

Influent channel with very little storm flow storage before bypass

Influent channel after plant staff added an additional 16 inches of storage

Another concern was activation of the emergency bypass outfall during intense rain situations because of limited influent channel capacity (see photos above). A bypass could occur even when secondary process and/or ORF unit capacity was still available. To address this problem, plant staff fabricated a new bar screen for the emergency bypass and included a channel in front of the screen. The channel allowed plant staff to add three 2 x 6 stop boards in the channel, increasing channel storage capacity by 16.5 inches.

An additional problem was plugging of the influent pumps. The plugging reduced the pumping capacity. Plant staff developed a weekly cleaning program to assure the 12.4 mgd maximum flow can be delivered to the treatment plant.

Thanks to the efforts of Nick Zappia, Tim Dumas and Steve Mailhot (and the rest of the staff) the Massena plant can now reliably treat more flow through the treatment plant and, as a result, have reduced raw and partially treated bypasses to the receiving waters.

Change in Wet Weather Flow Capacity

Unit	Capacity Before	Capacity After
Biological Treatment	6.8 mgd	10.0 mgd
Overflow Retention Tank	3.6 mgd	2.4 mgd
Emergency Bypass Flow	All flows over 10.4 mgd	All flows exceeding maximum pumping capacity(12.4 mgd)

Reduction in ORF and Bypass Flows

Parameter	Before (Jan 03 - Apr 04)	After (May 04 - Feb 06)
Total ORF Flow	13.56 mgd	0.619 mgd
Total ORF Events	23	4
Raw Bypass Events	5	5
Raw Bypass Duration	17+ hours	2 hours

Wastewater Operator Certification

In the Winter 2005-2006 issue of *Aquafacts* (the official publication of the New York Rural Water Association), there was a discussion of the need for new wastewater treatment plant operators. The article outlines the importance of developing new staff to replace experienced operations staff as they retire. It is important for you, the operator, to make your community understand that the wastewater operator workforce is aging and there is a strong need for new operators.

The article provides an example of the requirements and time involved in obtaining a Grade 2 certification. However, some of the information in the article requires clarification. First, the certification regulations have not changed.

Second, certification schools do not require any prior experience to enroll in a certification course. Prior experience is helpful but not a prerequisite to attending a course.

Third, the work experience requirement to take the Grade 2 certification exam is one (1) year at a Grade 2 or higher wastewater treatment plant. Finally, certification renewal requirements (continuing education) vary with the certification grade. Grade 1 & 1A - 20 approved contact hours; Grade 2 & 2A - 40 approved contact hours; Grade 3 & 3A - 60 approved contact hours; and Grade 4 & 4A - 80 approved contact hours.

Details on the certification program can be obtained from our website(www.dec.state.ny.us/website/dow/bwcp/foas_main.html, click on operator certification) or contact us:

Region 1- Rich Malaczynski
(518)402-8087
Region 2 -Tim Miller
(518) 402-8106
Region 3 - G. Michael Coley
(518) 402-8086
Region 4 - Alan Cherubin
(518) 402-8155
Region 5 - Gregg Gendron
(518) 402-8096
Region 6 - Alan Cherubin
(518) 402-8155
Region 7- Rich Malaczynski
(518)402-8087
Region 8 - Gregg Gendron
(518) 402-8096
Region 9 - Bob Wither
(518) 402-8097

Visit FOAS' Website:
http://www.dec.state.ny.us.website/dow/bwcp/foas_main.html

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Facility Operations Assistance Section
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Albany, New York 12233-3506