January 2008

WMT NEWS

Water Management Technologies, Inc. Volume 5, Issue 1

Special points of interest:

New Web Site

Please check out our new web site. We have a new format that we hope will be more informative and easier to navigate.

www.w-m-t.com

Watha Reuse System
Improves Shad Reproduction

"In previous production years, the NC Wildlife Resources Commission's Watha State Fish Hatchery has relied on a flow through well water supply for hormone induced tank spawning of American shad. For the 2007 production season, the Watha Hatchery was able to utilize water recirculation technology in its newly constructed Fish production building for tank spawning American shad. American shad egg and fry production yields were doubled utilizing the recirculation system! Previous yields utilizing the flow through system had averaged 33,000 eggs produced per shad female and 10,000 fry stocked per shad female. In 2007, utilizing the new recirculation system, yields of 61,000 eggs produced per female and 24,000 fry stocked per female were obtained. In past years, the Watha Hatchery struggled to meet its annual goal of producing and stocking 2 million American shad fry. In 2007, the Watha Hatchery nearly doubled its annual goal with the stocking of just over 3.8 million American shad fry. The recirculation system allowed the heating of spawning water to an optimum 20C and allowed recirculation of natural hormones produced by the American shad breeders."

Watha's new building and recirculation system was designed by Fish Pro / HDR in Springfield, IL.

"The recirculation system at Watha Hatchery includes: Drum microscreening and Packed column aeration provided by W-M-T, UV treatment by Trojan Technologies, and Flygt variable speed pumps.

For more information please contact Jeff Evans at jeff.evans@ncwildlife.org

Early Rearing Recirc Room

Jeff Evans with Hydrotech Drum Filter

WMT De-gass Columns

Watha Recirc Building 2007

OxyGuard CO2

The OxyGuard CO2 is a reliable and easy to use instrument that measures the free dissolved carbon dioxide concentration directly in the water. The dissolved carbon dioxide concentration is shown on the display, and there is an analogue output. Both fix-mount and portable versions are available. The portable version can be obtained with a data logger.

The OxyGuard CO2 gives simple, continuous and direct measurements of the amount of carbon dioxide in the water that will affect the fish—i.e. the free dissolved carbon dioxide. It is not affected by carbonates or other dissolved substances and therefore has considerable advantages over other methods used when attempting to measure carbon dioxide in water. This new instrument is in the process of redefining dissolved carbon dioxide measurement in aquaculture and other industries.

Oxyguard Atlantic

The new **OxyGuard Atlantic** is an accurate, reliable and easy to use single channel oxygen meter with features that make it suitable for a large number of tasks. It measures both oxygen—dissolved or in gas—and temperature—the user can choose the units.

The Atlantic has both relay outputs and a 4-20 mA analogue output. An analogue compensation input can be added. Atlantic has multiple alarm set points and timers that can be logically linked with inputs, outputs and each other to obtain a multitude of useful functions.

The OxyGuard Atlantic embodies the accuracy and reliability characteristic of OxyGuard instruments. Together with a reasonable purchase price and extremely low running and maintenance costs, this makes Atlantic the best value for money on the market today.

IMF Adaptability and Scalability

Historically, the market for recycle systems in the US has been centered on small to intermediate size recycle systems for universities and commercial farms. A small number of large commercial / industrial scale farms have been established as well. The global aquaculture industry is progressing towards implementation of large industrial scale fish farms to take advantage of the economies of scale associated with equipment procurement, construction and labor costs, thereby increase output and reducing production costs. Industrial scale "super sized" farms appear to be the main path towards successful implementation of aquaculture for food fish.

Mega IMF

Water Management Technologies developed the Integrated Modular Filtration (IMF) philosophy to provide a range of system design options that incorporate standard and scaleable filtration processes. You can review many of the advantages of the IMF system by logging into www.w-m-t.com and going to the complete systems section and downloading the IMF information brochure.

Micro IMF

WMT's first IMF system development was targeted to meet the needs of small to intermediate systems in the US market. The Micro and Standard IMF systems are complete FRP constructed systems providing a quick and easy installation and startup for small farmers and university based research projects.

In following the trend towards industrial scale systems, WMT subsequently began development of the Hybrid and Mega-IMF lines that allow for an almost infinite scale up ability. This is achievable since all of the filtration processes employed, micro-screening, CO2 stripping, protein skimming, moving bed biofiltration, oxygenation and bacterial load management have no scale up limitations. Scale up is achievable due to the limited amount of system plumbing that is required with IMF based systems. The Mega-IMF system can be arranged in many configurations to meet the site or project requirements. The Mega-IMF systems are gravity flow based systems from culture tank through the filtration processes. Gravity flow coupled with low head loss through the treatment system permits use of high efficiency low head return pumps, saving on system power and energy costs. These large scale IMF systems are primarily constructed in concrete with onsite and local labor, thus reducing the amount of "equipment" that needs to be shipped to the site and associated freight charges.

WMT has also developed other IMF system lines to meet non-recyle / reuse system needs within the industry such as the Combi-IMF system that packages micro-screening and UV within a single integrated housing for treatment systems up to 1,000 gpm, Custom integrated open channel UV systems for large flow applications and IMF intake / effluent treatment systems for government hatcheries. WMT is currently developing a vertical IMF system to fit into limited floor space applications with higher vertical clearances.

WMT's IMF system lines offers solutions to the small independent farmer, university research lab, government hatcheries or global aquaculture companies. Please contact WMT today to see if there is an IMF system that can meet your project requirements.

WaterTek MB^3 Moving Bed Media

The moving bed process is ideal for COD and BOD reduction as well as nitrification and denitrification in the following applications.

Applications include:

- Aquaculture - Fish Farming
- Industrial wastewater
- Municipal wastewater

WMT's WaterTek MB3 polyethylene media is robust, durable and bacteria friendly. With a specific density slightly below 1.0, the media fluidizes easily with air. MB3 delivers a self cleaning outer surface with plenty of protected inner surface area.

WMT also offers complete moving bed reactors (MBR) inclusive of rectangular or round tanks, media screens, air blower with air distribution manifold and MB3 media.

MB3 is made in the USA.

Moving Bed Media

Technical Specifications	BKPE	NAPE
Material	Polyethylene	Polyethylene
Specific Surface Area	184 ft^2/ft^3 (604 m^2/m^3)	184 ft^2/ft^3 (604 m^2/m^3)
Weight	8.25 lb/ft^3 (132 kg/m^3)	7.86 lb/ft^3 (126 kg/m^3)
Number of Units	3740 units/ft^3 (132,155 units/m^3)	3740 units/ft^3 (132,155 units/m^3)
Surface per Unit	8 in 2 (51.6 m^2)	8 in 2 (51.6 m^2)
% Hollow Space	85 %	85 %
Color	Black	White

Hydrolox Engineered Polymer Screens Revolutionize Traveling Water Screens

Hydrolox traveling water screen components are constructed with a non-corrosive engineered polymer material that provides extreme resistance to wear, impact, and fatigue in abrasive screening environments. Hydrolox engineered polymer screens have proven to outlast the life of traditional steel screen components by two or more times in a variety of water-screening applications.

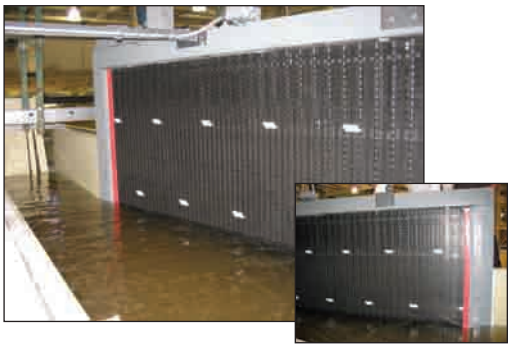
Each screen is made to order in virtually any width and length. Hydrolox screens are assembled in an interlocked, bricklayed pattern with full length hinge rods—an inherently strong design. The modular components allow for fast, easy on-site maintenance.

Hydrolox water screens also feature unique frame design characteristics. Where traditional screens are edge-driven, Hydrolox screens employ a positive drive system. Sprockets are installed along the entire head shaft to distribute the load across the width of the screen, eliminating uneven wear. Additionally, the Hydrolox screen design features no submerged moving parts, completely eliminating the maintenance required for submerged drive chains and foot-shaft sprockets of traditional screening technology.

This innovative screening solution solves many of the problems associated with competing traveling water screen technologies.

- Sprocket-driven positive drive system eliminates uneven wear and mistracking
- Smooth, polymer screen surface allows debris to be easily washed away
- Elimination of submerged foot sprockets reduces maintenance
- Lightweight material is capable of solar-powered operation
- Compliance with the NOAA National Marine Fisheries Service water screening criteria for fry-size anadromous fish species

Hydrolox engineered polymer screens have proven to outlast steel screen components in a variety of water-screening applications. Hydrolox screens at the Burbank Pumping Station in Washington.



For wide and shallow river applications, with a sweeping flow, Hydrolox screens can be built horizontally.

Hydrolox engineered polymer screens are lightweight enabling the solar power operation. The Hydrolox traveling screen pictured here is located in a remote location and is rotated using solar power.

Plasma Block Overview

The key to producing ozone efficiently lies within the micro channel™ design of the Plasma Block® reactor cell. This combined with 93% oxygen feed gas verses using only dry air creates from 5 to 10 times more ozone than glass tube dielectrics and other methods.

In order to get the maximum efficiencies and control, the frequency is maintained at 23,000 hertz at about 3200 volts. Older designs run less than 1000 hertz and above 15,000 volts. If you are not above 20,000 hertz you are using older technology. Plasma Block® up to 10 times more efficient.

Since the Plasma Block® reactor cell (micro channel™) is small, heat removal efficiencies increase allowing for air cooling up to 120 grams/hour per Plasma Block cell configuration. Liquid cooling may also be used creating additional increase in grams/hour ozone gas.

The Plasma Block® power supply is truly state of the art technology. All of the reactor cell control logic is within the power supply. Using a PDM (Pulse Density Modulating) function which converts analog to digital signal and combined with an equally state of the art transformer, allows a symphony of electrons to convert oxygen into ozone. Power can be adjusted on a scale of 100:1 from ORP or DO sensors which provides the customer precise control over their process.

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WMT's Dual Drain System for Fish Culture Tanks

In collaboration with an industry partner, WMT now offers a dual drain culture tank system. The dual drain configuration incorporates a conical bottom center drain with tangential outlet as well as a center top drain. The top drain acts as an active skimmer for the removal of suspended solid particles at, or near the surface. In conjunction with the bottom drain, the operator can trim the culture tank to successfully and quickly remove solids from the entire water column. WMT's dual drain system is fully adjustable; top and bottom.

WMT recommends both tank effluents; top and bottom, be treated through the primary solids treatment device; preferably Hydrotech Drum or Disc Filter. WMT's dual drain system differs from the Cornell drain design which is primarily used for passive removal of "clean" tank water and generally not treated through the primary solids removal device.

WMT's dual drain system is designed for applications where the operator requires active skimming of the surface water across the tank. The dual drain system is ideal for applications requiring constant removal of any material causing surface tension, such as the removal of oils from juvenile and larval tanks, those operations using floating feeds, or the culture of species having light, watery fecal composition.

Tank Drain Cross Section