

Northwest District News

Spring Study Session

The Northwest District held a study session on April 17, 2004 in Findlay with 39 students attending. Study sessions held and instructors were Class I Water, Rick Schantz; Class II & III Water, Charles Queen; and Class I & II Water Distribution, Larry Huber. The District is always looking for a volunteer to help out with the Study Sessions. Please contact Chair Mike Leis at 419-339-7427, if you or someone you know might be interested.

Spring District Meeting

The Northwest District spring meeting held on April 21st was hosted by the Village of Ottawa with 114 in attendance. Tours were provided of the newly upgraded Water Treatment Plant, Wastewater Treatment Plant and an industry tour at Silgan Plastics. Special thanks go out to the Village of Ottawa for their efforts in making the meeting a great success.

After the tours, a tasty lunch

was served followed by a brief business meeting. Committee chairs made their reports. Curtis Truss provided an OTCO update; Rick Schantz reported from the Governing Board; Greg Reinhart with Awards announced the results of the Science Fair in February and thanked the judges for volunteering and Stu Smith MAC Chair recognized past sponsors and solicited for 2004 sponsorships. In addition, Stu administered the 50/50 raffle and announced that \$153 was raised for Water for People. After a big boost from Curtis Truss donating his 50/50 winnings back, a record total of \$231 was raised for Water for People. Way to go 50/50 and thank you Curtis!

A total of 3.75 contact hours of technical sessions were provided on: Water Treatment Plant Tour & UV254 Lab Analyzer in the morning; and in the afternoon Tornado 2002, A Community Prepared by Rick McCoy of Van Wert County EMA; Plan Approval Update by

Kirk Leifheit of OEPA & Rick Schantz of Archbold; Stage 1 DDBP Rule Update by Richard Ciotola of OEPA and Ottawa Water Treatment Plant Improvements by Marvin Gnagy & Scott Lumbrezer of ARCADIS FPS. Following technical sessions it was off to social hour where many doors prizes and good conversation were to be had by everyone!

Upcoming Events

The Northwest District wants to remind you of the following upcoming events:

July 28th (changed from July 21st)
- Sidney - Lunch meeting

October 13th - Payne - Lunch meeting

A second Study Session is scheduled for October 16th. Mark these important dates in your calendar now. Look forward to seeing everyone at our upcoming meetings.



Chair Mike Leis & Mayor Maag



Hosts, Village of Ottawa



N. Ohio Exposition Wooster, Ohio • April 22, 2004

The Northern Ohio Water and Wastewater Exposition was held at the Wayne County Fairgrounds in Wooster on April 22. A session on Vulnerability Assessment followed by a session on Trenching and Excavating Safety were held in conjunction with the Expo. Three contact hours were earned by attendees.



NE District Meeting Massillon, Ohio • May 6, 2004

The Northeast District held their spring meeting in Massillon on May 6th. Aqua Ohio (formerly Consumers Ohio Water Company) offered tours of the water plant and Ohio Drilling showed off their new facility. The business meeting, lunch and technical sessions were held at Knights of Columbus Hall. Technical programs included an EPA Update, GIS and Construction Management, Grounding & Bonding, Commercial Diving Operations, and Principles and Concepts on Cellemetry. Attendees obtained 3 contact hours.



USING CHLORAMINES TODAY

By: Dr. Leland L. Harms, P.E. • Senior Water Treatment Engineer
Black & Veatch Corporation

Introduction

Several water utilities use chloramines for maintaining a disinfection residual within their distribution systems, with some utilities having applied chloramines for more than 50 years. Thus, chloramination is not a new technology, but it is one that is capturing increased attention in the water industry. Because of present and future needs to reduce the byproducts of chlorination received by consumers, chloramination is frequently considered or selected as a replacement for disinfection with free chlorine. However, chloramines have recently received some bad press. Thus, a fresh look at using chloramines is both timely and important.

Chloramines are formed when free chlorine is combined in water with ammonia. The ammonia can either be naturally present in the untreated water source or it can intentionally be added during treatment. Generally, insufficient ammonia is present in the raw water to form desired levels of chloramines, and ammonia is therefore added at the treatment plant in solid, liquid, or gaseous form. Ammonia in the gas form, anhydrous ammonia, is fed with equipment similar to that used to feed chlorine gas; liquid ammonia, aqua ammonia, is fed using metering pumps; and solid ammonia, such as ammonium sulfate, is fed with dry feed equipment with mixing in a solution tank prior to being metered into the treatment process.

The disinfection capabilities of chloramines are not as efficient against most microbial organisms as free chlorine, and for this reason chloramines are normally used as secondary disinfectants within the distribution system rather than for primary disinfection. However, the gap between disinfection with chloramines and free chlorine is not as wide as most professionals are led to believe, because many drinking water systems operate at a pH of 7.5

or higher. In this pH range, the majority of free chlorine has dissociated to hypochlorite ion, OCl^- , and this form of free chlorine has disinfection characteristics much closer to monochloramine than the more effective form of free chlorine, hypochlorous acid.

A key driving force for using or switching to chloramines in today's regulatory environment is the need to reduce chlorinated disinfection byproducts such as trihalomethanes (THMs) and haloacetic acids (HAAs). Both of these byproducts have regulatory limits set by USEPA and these limits will soon become more stringent and more difficult to meet. As each water system evaluates its current situation and the

quick review of the water chemistry for forming chloramines is in order. Figure 1 shows a breakpoint chlorination curve similar to curves found in most water treatment texts. It can be used to illustrate some important aspects of chloramination.

When ammonia and chlorine are added together, monochloramine (NH_2Cl) is formed at chlorine to ammonia ratios less than 5:1. Chlorine to ammonia ratios are calculated on a weight basis, i.e., 5 mg/L of chlorine with 1 mg/L of ammonia-nitrogen would be a 5:1 chlorine to ammonia ratio. Monochloramine is the desired form of chloramines for use by drinking water systems, as higher ratios favor the formation of dichloramines,

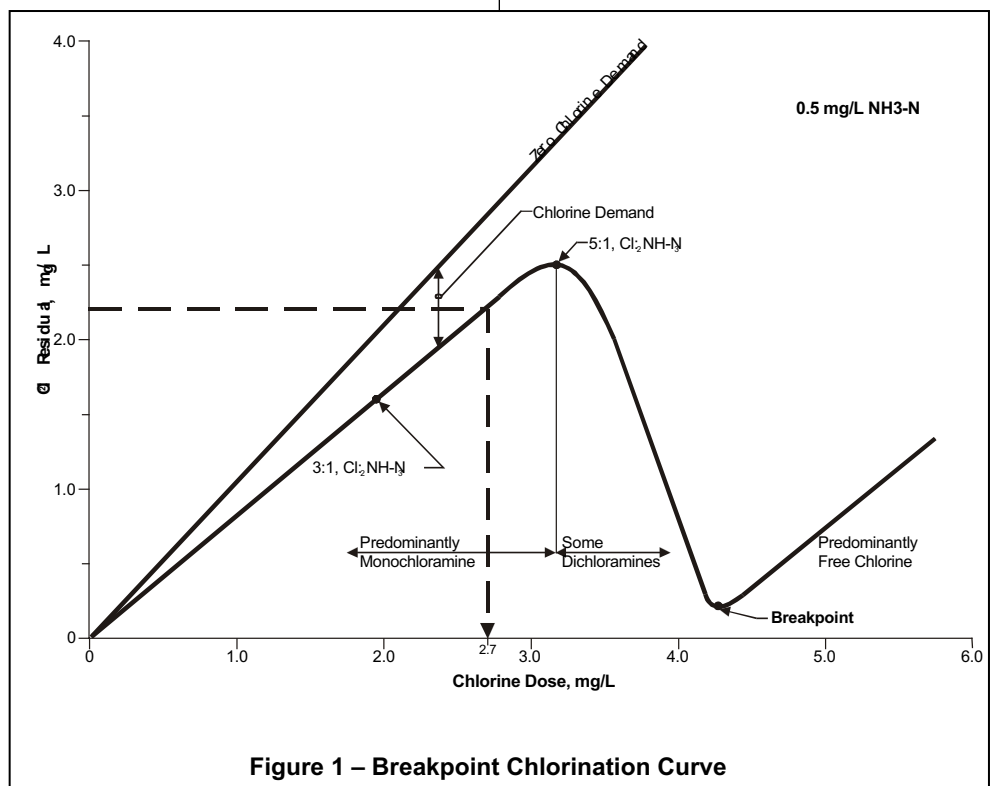


Figure 1 – Breakpoint Chlorination Curve

available options, should change be necessary, chloramines will often enter into the evaluation process as they are normally one of the more economical alternatives available.

Chemistry of Chloramines

Before addressing the challenges surrounding chloramination, a

which are often the source of obnoxious tastes and odors that will generate customer complaints.

Note that beyond the 5:1 ratio, the measured chlorine residual will go down when additional chlorine is added. This relationship between dose and residual is fundamental, but one is frequently overlooked by

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operators when the chlorine monitor starts to show a drop in residual. The normal tendency for an operator when the chlorine residual drops below the desired level in the plant discharge is to increase the chlorine dose. If the plant is then operating beyond the 5:1 level, increasing the chlorine dose will result in an even lower chlorine residual; it will not resolve the low residual problem.

Challenges

As mentioned previously, training operators of treatment works to recognize the fundamental principles of chloramine chemistry is very important. In addition, educating the public, controlling nitrification, blending of disinfectants, and limiting the formation of other harmful DBPs are other challenges facing a utility using chloramines. Of these challenges, controlling nitrification and blending chlorinated water with chloraminated water are the two issues most frequently discussed by water works professionals, and will be discussed in more detail later.

Educating or informing the public regarding the use of chloramines is an important, but often overlooked aspect of using chloramines. Some homeowners will recognize that their household cleaning products carry warnings against mixing ammonia with chlorine, exactly what their water utility intends to do. Those who receive phone calls from the general public must be prepared to answer questions such as this. Also, it is important to notify pet stores and other customers regarding the need to remove chloramines prior to using water for fish tanks. Although chloraminated water is not known to be harmful for pets to drink or for watering plants, these questions will be asked and users do have the option of removing chloramines prior to use with chemicals available at local stores. It will also be prudent to notify kidney dialysis centers of any change in disinfection practice, although the standard procedure during dialysis is to remove any chlorine or chloramine prior to use. Any disinfection process that

uses an oxidant will form byproducts as a result of the disinfection reaction. This statement is true for all oxidants including chlorine, chloramines, ozone, and chlorine dioxide. Byproducts of chloramination that may be of concern are N-nitrosodimethylamine (NDMA) and cyanogen chloride. Presently neither of these compounds is regulated in drinking water, partially due to a lack of reliable information regarding their health risks and what concentrations of these chemicals may be cause for concern. Data to date indicate that their presence in chloraminated water is at very low concentrations. However, just knowing that NDMA or cyanogen chloride could be present in drinking water has launched an initiative in California to require the State to discontinue the use of chloramines.

Controlling Nitrification

Nitrification is the biological oxidation process by which ammonia is converted to nitrate. It is a two-step process with nitrite as the intermediate contaminant. Two primary groups of organisms responsible for this biological oxidation are loosely categorized as Ammonia Oxidizing Bacteria (AOB) and Nitrite Oxidizing Bacteria (NOB). Neither AOB or NOB are pathogenic, but they can be responsible for a loss of disinfectant residual, a drop in pH or alkalinity, and/or an increase in HPC concentrations.

A key step in controlling nitrification is to know your distribution system and what changes may be occurring. It is essential to monitor within the system periodically for ammonia, nitrite, nitrate, chloramine residual, pH, alkalinity, and HPC concentrations. It is important to establish a baseline for these constituents so that if nitrification does begin to occur, it is detected at an early stage. Nitrification can usually be kept under control by ensuring an adequate chloramine residual (2.0 to 2.5 mg/L) throughout the system, reducing water age as much as possible by avoiding excessive storage time, and using a chlorine to ammonia-nitrogen ratio of about

4.5:1. Systems that operate part of the year with cold water can usually avoid nitrification using these procedures. Systems that have warm water within their distribution system for the entire year will experience more difficulty avoiding nitrification episodes.

Introducing free chlorine into the system periodically has been another technique used for controlling nitrification. This method of control often produces taste and odor complaints during the change to the new disinfectant, but it does generally restore disinfectant residuals to an acceptable level. The future use of this technique is not assured pending interpretation of the final Stage 2 DBPR which may require sampling for DBPs during the period that chloraminated systems switch to free chlorine.

Blending of Disinfectants

Many systems have multiple water sources with different disinfectants; for instance, chlorinated ground water may be pumped directly into a distribution system that also receives chloraminated water from a surface water treatment facility. As evident from Figure 1, if water disinfected with free chlorine is blended with chloraminated water, the additional chlorine in the blended water will change the chlorine to ammonia-nitrogen ratio. If the additional chlorine places this ratio beyond the 5:1 location on the breakpoint chlorination curve, the promotion of dichloramines with subsequent tastes and odors may result.

Some systems avoid this blending problem by isolating portions of the distribution system so that waters with different disinfectant residuals are not blended in the same pressure zone. Elsewhere, attempts are made to limit the blending so the chlorine to ammonia-nitrogen ratio never exceeds 5:1. One large water system has developed a sophisticated computer program to track blending to ensure that all portions of the system receive water with only mono-chloramine.

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Summary

Although not a new technology, there is renewed interest in using chloramines for secondary disinfection to limit concentrations of DBPs. Regulatory limits have become more stringent for DBPs in recent years, and they will continue to receive critical attention from future regulations. It is important for operators of water systems using chloramines to have a basic understanding of the chemistry involved as well as an awareness of the challenges for successful implementation. Important activities to successfully implement chloramines include monitoring of water quality changes in the system, operating with suitable residuals, maintaining proper chlorine to ammonia ratios, and controlling nitrification.

Dr. Harms is a Senior Water Treatment Engineer in the Kansas City, Missouri office of Black & Veatch. He specializes in the evaluation, optimization, and selection of water treatment processes. He was one of the primary authors for the EPA Guidance Manual for the Lead and Copper Rule and has conducted training seminars on the Lead and Copper Rule for AWWA and EPA. In addition to his consulting experience, Dr. Harms has served on the faculties of South Dakota State University, the South Dakota School of Mines and Technology, and Virginia Polytechnic Institute and State University. He has published over 30 articles on water quality, stormwater management, water treatment, and water reuse. Please direct questions to Dr. Harms at (913) 458-3232 or by email at: harm-sll@bv.com.



Youth Education Committee

by Phil Van Atta

The City of Dayton Water Department hosted the eighth annual Children's Water Festival on May 5, 2004. The festival took place at the University of Dayton and provided Miami Valley youngsters with fun for a day and information for a lifetime. This year's festival "roped in" 2,033 fourth graders and 100 teachers from 44 schools.

Boring lectures are not part of the program at the Water Festival. Instead, children were treated to a variety of activities from plays to laboratory experiments, all dealing with the common theme of water. They learned the importance of water to life; how to conserve and use water wisely; and the need to protect our water resources.

A wide variety of presentations were given in university classrooms. Indoor and outdoor games, activities, and crafts allowed children to have a hands-on experience. Many of this year's outdoor activities had to be shifted to new areas because of extensive building and renovation projects on the UD campus. At the end of the day a teacher's resource bag was given to teachers so that water instruction could continue in their classrooms.

Many Ohio AWWA members were presenters at the festival, including Karen Hawkins, Assistant Sec. – Treasurer for our section. Karen used AWWA Water

System posters that her husband Roy had cut into puzzles. Students received a piece of puzzle when they correctly answered a water-related question.

The following cities and agencies were involved in this year's festival; City of Dayton, Miami Valley Earth Central, Ohio EPA, City of Miamisburg, Montgomery County Combined Health District, Greene County Sanitary Engineering, YSI Inc, City of Fairborn, Cargill Inc., Miami Conservancy District, City of Xenia, Montgomery County Extension, Montgomery Solid Waste District and U.S. Filter Operating Services.

Other News:

The Youth Education Committee **NEEDS YOU** to serve as a county liaison to help promote water education to teachers and students in Ohio. Please contact a committee member to volunteer. Committee members are: Gary Dursch (Committee Chair garyd@ci.middletown.oh.us), Bob Gardner, Danella Pettenski, Jeremy Gaston, Greg Reinhart, Don Freisthler, Harold Dungan, Phil Van Atta (phil.vanatta@cityofdayton.org), Karen Hawk, Mike Frommer, Andrea Kroma, Brandon Vatter, Tim Ray, Tim Truman, Bic Boyles and Steve Heimlich.



Children passed the earth around at the Water Festival.



Somewhat dazed (but never confused) Youth Ed. Committee Member PhilMAN gives presentation, "Water-We Treat It Right".

Science Fair 2004



Sara K. Sullivan

For over 50 years, and now with more than 45,000 alumni, State Science Day is the *pinnacle of student originated inquiry-based science education* for Ohio's students. The academic equivalent of a State athletic championship, this year's event is one of the largest of its kind in the nation. Drawing upon a base of over 35,000 students at more than 1,000 local school science fairs, nearly 1000 students in the grades 7-12 from more than 200 schools were evaluated this year on their scientific research and communication skills.

Among those 1000 students was a group who presented projects dedicated to the water industry, in one form or another. AWWA participated again this year as a Special Sponsor in the 56th Annual State Science Day held on Saturday, May 8, 2004.

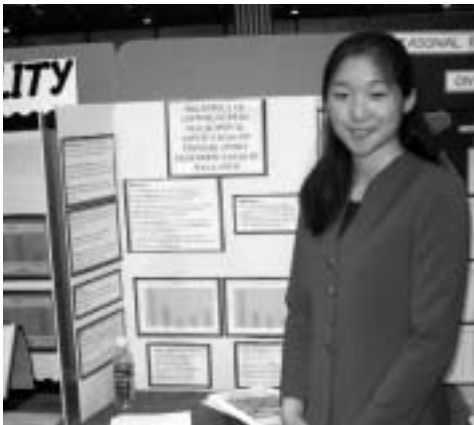


Eden G. Engel-Rebitzer

Kristen Atha from Tetra Tech, Brian Bisson from Aqua Ohio, Rick Douglas from Lake County Utilities, Steve Heimlich from the City of Galion Division of Sewer & Water, Ronald Schwarzwaldner from Fairfield County Utilities, Cliff Shrive from ARCADIS FPS, and Jill E. Taptich from the City of Columbus Division of Water, represented AWWA as judges for the 17 students chosen for their water related projects.

The first place winner, receiving a \$400.00 cash award, was Sara K. Sullivan, a 10th grader from Unioto High School in Chillicothe, for her project "*Does Betsch Fen Improve the Water Quality of Blackwater Creek?*"

Two second place winners were chosen, Eden G. Engel-Rebitzer, an 8th grader from Shaker Heights Middle School in Shaker Heights, for her project "*Methods of Neutralizing and Removing Coliforms*", and Winifred M. Lo, a 10th grader from Upper Arlington High School in Upper Arlington, for "*The Effects of Differences in Macrophyte Application on Dissimilative Denitrification in Wetlands*", who each will receive a \$200.00 cash award.



Winifred M. Lo

An Honorable Mention award for \$100.00 was presented to Dava G. Spurlock, a 7th grader from Fairland Middle School in Proctorville, for her project entitled "*Ingestion Exposure Radon Contaminated Drinking Water*".

AWWA Congratulates and encourages all four winners for their current and continuing efforts in research within the water industry.



Dava G. Spurlock

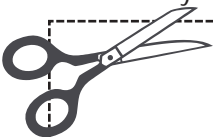


2004 AWWA Committee Chairs

Awards and Recognition	Curtis Truss 614-268-6826	leeotco@ohiowater.org
By-Laws Review and Update	Robert Stevenson 419-245-1235	Robert.Stevenson@ci.toledo.oh.us
Computer Applications	Donald Houchins 513-591-7969	don.houchins@gcww.cincinnati-oh.gov
Conference Management 2003	Robert Stevenson 419-245-1235	Robert.Stevenson@ci.toledo.oh.us
Conference Management 2003	Marvin Gnagy 419-473-1121	mgnagy@arcadis-us.com
Conference Management 2003	Rick Schantz 419-445-2506	verrick@rteceexpress.net
Continuing Education	Larry Valentine 330-328-2137	lvalentine@neo.rr.com
Customer Service Activities	Linda Nelson 419-245-1847	Linda.Nelson@ci.toledo.oh.us
Distributon	Pat Tierney 513-591-6820	Pat.Tierney@gcww@cincinnati-oh.gov
Diversity	Lynne Moton 419-245-1839	Lynne.Moton@ci.toledo.oh.us
Education	Dave Bornino 740-687-6631	bornino@lwtp.com
Executive	Jerry Swanton 937-525-5880	jswanton@ci.springfield.oh.us
Exhibits	Tony Angelotti 419-345-0062	
Finance and Audit	Tony Kohler 614-645-8441	awkohler@columbus.gov
Fuller Award	Tim Wolfe 216-623-5999	Timothy.A.Wolfe@us.mwhglobal.com
Membership	Bob Davis 330-841-2572	bdavis@warren.org
Newsletter	Larry Valentine 330-328-2137	lvalentine@neo.rr.com
Nominating	Rick Schantz 419-445-2506	verrick@rteceexpress.net
Operator Meritorious Service Award	Thomas Mills 740-622-1577	
Public Communications	Karen Hawk 937-562-5925	khawk@co.greene.oh.us
Research	Mike Herdlick 800-783-5991	mherdlick@atellabs.com
Richard F. Melick Award	Larry Short 419-445-0289	
Safety	Lorrie Brown 937-333-6135	lorrie.brown@cityofdayton.org
Section History	Richard Lorenz 614-901-6772	rclorenz@ci.westerville.oh.us
Small Systems	Mark Verbsky 937-285-6417	Mark.Verbsky@EPA.state.oh.us
Strategic Planning	Debbie Metz 513-624-5658	Debbie.Metz@gcww.cincinnati-oh.gov
Tapping Contest	Mike Spriggs 614-645-7677	MASpriggs@Columbus.gov
Technical Program	Marvin Gnagy 419-473-1121	mgnagy@arcadis-us.com
Technology	Jack DeMarco 513-624-5660	Jack.DeMarco@gcww.cincinnati-oh.gov
Top-Ops	Verna Arnette 513-624-5624	verna.arnette@gcww.cincinnati-oh.gov
Water for People	Connie Roesch 513-591-7745	Connie.Roesch@gcww.cincinnati-oh.gov
Young Professionals	Leslie Ostrozny 937-781-2628	Ostroznyl@mcoho.com
Youth Education	Gary Dursch 513-425-7864	GaryD@ci.middleton.oh.us

Council Chairs

Manufacturers/Associates Council	Chris Jarrett 412-851-1230	cjarrett@cipro.com
Water Utility Council	Craig Charleston 614-645-7626	cwcharleston@columbus.gov



Volunteers Make a Difference We cannot do it without you!

The active participation of the Ohio Section members has been a key ingredient in our organization's success. Each member can make a significant contribution. Interested in getting involved? Committees and corresponding chairs are listed above. Please call the chair listed, or circle the areas in which you are willing to contribute your time, skills, and experience to benefit the entire membership.

Name: _____
 Phone: _____
 Title: _____
 Employer: _____
 Address: _____
 City, State, Zip _____

Please send the Willingness to Serve form to:
Steve Heimlich/Ohio Section Secretary-Treasurer
 Ottawa County Regional Water
 1405 West Fremont Road
 Port Clinton, Ohio 43452
 (419) 734-7312

HOW FAR WOULD YOU GO TO HELP WATER FOR PEOPLE!

By: Connie Roesch, WFP Committee Chair



Well, apparently in Ohio, we're willing to do pretty much anything to support Water for People! Steve Harsch, Purchasing Agent from the Butler County Department of Environmental Services (BCDES) suggested to Shannon Gillespie, BCDES Public Relations Coordinator, that he would be willing to eat one of the five billion 17-year cicadas that are terrorizing large parts of Ohio, as a fundraiser for Water for People (WFP). Shannon, an active member of our OAWWA WFP Committee was all "abuzz" about the idea and before Steve could change his mind, she had organized a fundraiser for WFP whereby Steve agreed to drink a "cicada shake", a concoction that would include one cicada for every \$30.00 raised. The media in the Greater Cincinnati area picked up on the story and ran three segments the week of May 14 culminating in live coverage of Steve drinking his "cicadarita" complete with 9 pureed cicadas. \$285.00 was raised for Water for People; the media coverage was priceless!

Congratulations and thanks to both Steve Harsch and Shannon Gillespie from the Butler County Environmental Services. We continue to develop new, fun, and creative ways across the entire State to get folks involved and excited about Water for People. It's a tribute to our committee members and membership, and indicative of the leadership that Ohio has shown in the WFP effort, the charity of choice for AWWA.

