Protecting Ohio's Drinking Water Sources

OhioEPA

Drinking Water Source Protection Update

September 2012

Ohio's Top Source Water Concerns

Leaking underground storage tanks (USTs) and failing septic systems have long been recognized as the most pervasive sources of ground water contamination. Recently, however, the ground water "contaminant" generating headlines is a substance so innocuous, a form of it can be found on every dinner table. Runoff from salt storage piles—especially large piles left uncovered—has caused serious problems over the last few years for several public water systems and also some domestic wells around Ohio.

For example, the Village of Camden in Preble County had to entirely abandon the wellfield for its public water system in 2010 due to salt contamination that was not a health risk but made the water undrinkable. Costs for relocating the wellfield and constructing a new treatment plant have already exceeded $1 million. In response to this and other salt storage pile issues, Ohio EPA led the development of a guidance in 2012 on how to prevent salty runoff from such facilities (see article on page 2).

For drinking water derived from lakes and streams, nitrates, phosphates and pesticides in runoff from agricultural fields have historically been the most worrisome contaminants. In addition, toxins from harmful algal blooms (HABs) have become a major concern. HABs made Ohio headlines in June 2010 when Grand Lake Saint Marys in Mercer County experienced a cyanobacteria bloom that decimated tourism and was responsible for human illnesses and dog deaths. Since then, Ohio EPA has monitored HABs on drinking water lakes and reservoirs throughout Ohio and has collected and analyzed water samples for toxins when a bloom is verified (for more on HABs, see article on page 3).

Ohio developed drinking water and recreational thresholds for cyanotoxins in 2011 and there is a secondary Maximum Contaminant Limit (MCL) of 250 mg/l for chloride, which is the component of salt that gives water an unpleasant taste. "Secondary MCLs" are unenforceable guidelines concerning acceptable levels of a nontoxic constituent in water based on its taste, odor or appearance. However, there are no federal health-based drinking water quality standards for either salt or cyanotoxins, and there is no requirement to monitor for them. These issues exemplify the primary argument for source water protection efforts: treatment alone cannot always guarantee safe drinking water.

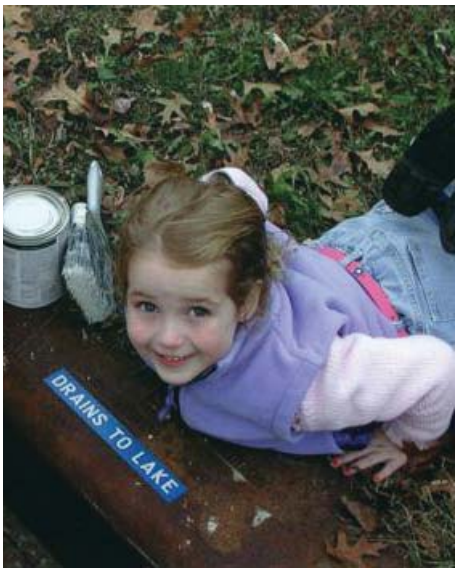
Inside This Issue

SWAP and Municipal Storm Water Plans

Communities that are preparing to develop source water protection plans should verify first whether they have—or will be required to have—a Storm Water Management Plan (SWMP).

SWMPs are required for most municipalities of 10,000 or more, as part of the general wastewater discharge permit (NPDES) required under the federal Clean Water Act. They are usually developed by city engineers responsible for drainage within the municipal boundaries. These staff may not work closely with public water system staff, and thus may not be aware of the source water protection planning efforts.

However, a source water protection plan and a SWMP have much in common, including requirements for public education and outreach, public participation and involvement, and pollution prevention strategies. Many of the activities pursued under the SWMP would apply equally to the source water protection plan. For example, 'runoff controls' required for a SWMP are also a source water protection strategy. Therefore, public water systems with one of these plans already in place require little effort to create the other.



Ohio Drafts Salt Storage Facility Guidance

In response to recent contamination due to salty runoff from salt storage facilities, the Ohio Water Resources Council commissioned a workgroup led by Ohio EPA to develop guidance for such storage facilities.

During 2012, the workgroup developed guidance concerning siting of new facilities, cover, runoff control and applicable permits. Among its draft recommendations:

- **Siting**—Salt storage facilities should be sited away from wells, surface water, floodplains and ditches. Outdoor storage piles also should not be sited in source water protection areas and hydrogeologically sensitive areas.
- **Cover**—Salt piles should be covered whenever possible, preferably within a roofed structure.
- **Runoff Control**—If salt is stored or handled outdoors, the facility should be designed for runoff control and collection. Whenever salt will be stored outdoors for more than seven days, a permit-to-install will be required.

The OWRC is expected to review this guidance for endorsement during Autumn, 2012.

Communities Complete Source Water Protection Plans

On August 13, 2012, Ohio EPA presented the Village of Coal Grove with a Certificate of Recognition for completion of a Source Water Protection Plan.

During 2012, the following communities completed source water protection plans endorsed by Ohio EPA.

- Village of Beaverdam
- Village of Bolivar
- Clark County-Park Layne
- Clermont County
- Village of Coal Grove
- Village of Cygnet
- City of Delphos
- City of Fremont
- City of Indian Hill
- Village of Mendon
- Village of Middlefield
- Village of Middlepoint
- Village of Millersburg
- Village of Minster
- City of New Carlisle
- Village of Newport
- Ohio and Lee Township Water Authority
- Village of Ottoville
- Village of Pemberville
- City of Piqua
- Village of Russia
- Scioto County Regional Water District

Detecting Cyanotoxins: When to Worry

One of the more important observations made by Ohio's HABs researchers over the last few monitoring seasons is that visual bloom severity is often not the best indication of toxin concentrations at the depth of public water supply intakes. When blooms are concentrated at the surface, toxin concentrations at the intake are often lower.

For example, when Grand Lake St. Marys was covered by surface scums of cyanobacteria in 2010, the concentration of microcystin (one of the toxins produced) at the intake was only 0.49 ug/l (Ohio's drinking water threshold for microcystin is 1.0 ug/l).

On the other hand, when no scums were reported on Grand Lake St. Marys in 2012, the microcystin concentrations at the intake were much higher than in previous years (up to 57.6 ug/l). In 2011, the bloom at Maumee Bay State Park did not appear severe visually but microcystin concentrations exceeded 100 ug/l at the beach and exceeded 5.0 ug/l at nearby public water systems intakes. These observations support the working hypothesis that blooms may be just as severe and pose a greater risk to intakes at depth when the blooms are dispersed throughout the water column instead of concentrated in surface scums.

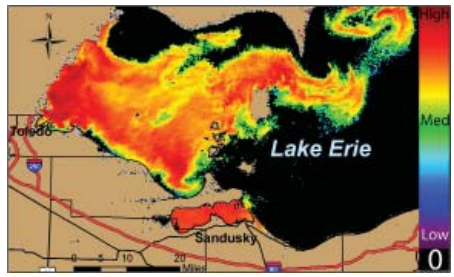
In 2011, Ohio EPA used EVISAT-MERIS satellite data (interpreted by the National Oceanic and Atmospheric Agency, NOAA) to remotely detect blooms and target sample locations. The image to the right—acquired at the time the photo above was taken—depicts a severe bloom, indicated by the red color.

Unfortunately, the EVISAT satellite stopped communicating with Earth in early 2012 and those data are no longer available for bloom interpretation. NOAA currently is using MODIS satellite data to help detect blooms on Lake Erie but the resolution is too poor to detect blooms on Ohio's inland lakes. In 2013, the Sentinel 3 satellite will be launched to replace the EVISAT satellite and remote bloom interpretation will resume.

Public water suppliers using surface water are encouraged to routinely monitor their source water year-round for cyanobacteria, whether visible or not. When cyanobacteria are detected early, more reservoir management tools are available to address the problem. Additional information about HABs is available on Ohio EPA's website: ***epa.ohio.gov/ddagw/HAB.aspx***. The site includes Ohio EPA's response protocol for HABs on public water supply lakes, a white paper on cyanotoxin treatment, a bloom characterization guide, fact sheets, and additional HAB information.

HABs: A Growing Concern

Microcystin, a toxin produced by some cyanobacteria, was detected in the majority of the Ohio surface water-based drinking water sources sampled in 2010-2012. Compared to 2010 levels, average microcystin concentrations in 2011 were four times higher at the City of Celina's intake on Grand Lake St. Marys, and more than 14 times higher at western Lake Erie water systems' intakes. 2012 levels at Celina were even higher than the 2011 levels. Fortunately, the affected public water systems have been able to remove microcystin through advanced treatment such as carbon filtration, but this treatment has placed a heavy burden on the systems, costing them as much as $200,000 more each month.



2011 SWAP Survey Shows Benefits of a Protection Plan

Ohio EPA recently analyzed more than 500 SWAP surveys returned last year. The surveys were 'scored' using a point system where each type of protective measure being implemented by the public water system was worth one point. The average 'score' for municipal public water systems without a source water protection plan was 9.4; by contrast, the average score for municipal public water systems with a source water protection plan was 16.1—nearly double the score of systems without a plan. These results indicate that communities with a written and endorsed source water protection plan tend to implement significantly more protective strategies.

SWAP Program Technical Assistance and Outreach in 2012

District source water protection (SWAP) staff continue to assist with assessing new systems as they come online. From July 2011 to June 2012, staff completed and issued 130 source water assessment reports. Other accomplishments during this period include:

Protection Planning Workshops

Multi-session workshops on source water protection planning were attended by representatives of 23 Ohio municipalities. Upon completion of an endorsable protection plan, Ohio EPA's operator certification program provides participants with one hour of continuing education credit for each session attended.

Individual Planning Meetings

Staff participated in one or more meetings with 32 public water system operators or local source water protection teams.

Technical Assistance Maps

The program responded to 261 requests for site-specific maps showing locations of source water protection areas and nearby regulated facilities.

SWAP Web Page

The program provided passwords to 129 new registrants for the Source Water Protection secure web page, bringing the total to 770. Registered users are primarily environmental consultants conducting research for site assessments. Other users include state, local and federal agencies, public water supply operators, schools, and nonprofit organizations. Also, SWAP staff were involved in the complete reformatting of Ohio EPA's website in 2012.

Checklists

The program received source water protection planning checklists from 84 nonmunicipal systems. The program sent certificates of recognition to each.

Permit Reviews

The program reviewed the following for proximity to source water protection areas: 84 applications for mining permits (coal or aggregate), 64 applications for 401/404 permits (for filling or dredging streams) and 11 applications for Underground Injection Control Class II wells (i.e., wells used to inject oil and gas industry wastes into rock units thousands of feet below ground surface).

SWAP staff also spoke at dozens of conferences, workshops, training events and school events across the state.

Looking Ahead

Nonpotable Wells

A summary of the rules that apply to installation of nonpotable wells should be available in 2013. This document is intended primarily for well drillers and well owners.

Upper Ohio River Joint Protection Plan

A joint source water protection plan is being developed by several neighboring Ohio River municipalities in a highly industrialized section of the river. The plan is expected to be completed before the end of this year.

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