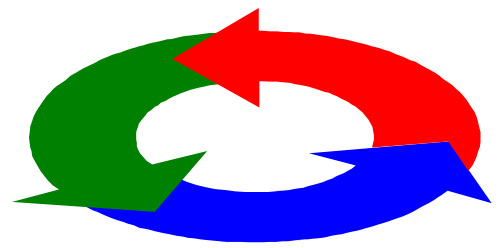


# Amendments



Improving Awareness & Advocacy of the Michigan Biosolids Program

Volume 17, First Quarter

January, 2013

## Biosolids Program Update

### By the Numbers...

The final biosolids land applied numbers are in and invoices have been sent out! The fee calculation breakdown is as follows:

Consumer Price Index: .40%

Total Biosolids Fund Amount: \$882,405.90

Carry Forward Amount (from FY11) - \$ 90,957.13

Adjusted Biosolids Fund (less carry forward):

\$791,448.77

179 land appliers at \$400 each: \$(71,600.00)

Amount to use to calculate dry tonnage:

\$719,848.77

Divide by 91,653 dry tons reported

\$719,848.77/91,653 = \$7.85

**Calculated dry ton fee for 2012: \$7.85**

This calculated to a \$5.07 decrease per dry ton from FY 2012. This is due to staff reduction (Jim Johnson's retirement), a carry forward amount of \$90,957.13, more dry tons from DWSD WWTP, and more facilities land applying biosolids.

### Biosolids Conference

The Conference Subcommittee of the MBT conducted a web meeting on November 28, 2012 and met at the Bavarian Inn in Frankenmuth on December 13, 2012, to continue plans for a two day conference. It will be held on **March 6 and 7, 2013**, at the Double Tree Hotel in Dearborn. The City of Detroit Water and Sewer District (DWSD) has agreed to provide a presentation of the facility and a tour of the WWTP. Our Theme for the conference is **Biosolids Management Trends and Marketing**. Topics include Pharmaceuticals, Management Trends, Co-Digestion, Land Application vs. Landfilling, among others. Feel free to contact Steve Mahoney at [mahoneys@michigan.gov](mailto:mahoneys@michigan.gov) or 517-241-2508 if you have any questions, comments, or suggestions.

### Michigan Township Association (MTA) Annual Conference

With cooperation from the Michigan Department of Agriculture and Rural Development (MDARD), The MBT will be displaying at the MTA Annual Conference in Detroit on January 22 and 23, 2013, to promote the beneficial use of biosolids.

### MSU Agricultural Exposition

For 2013, we will be growing wheat. Delta Township provided the biosolids. The Biosolids were applied on October 1 and the Plot was planted on October 2. The wheat is growing well, as of December 14, 2012, as pictured:



### New Michigan law widens uses for treated sewage product

By [Rina Miller](#)

The Environment Report for Tuesday, Jan. 8, 2012

To hear it: <http://www.michiganradio.org/post/new-michigan-law-widens-uses-treated-sewage-product>



*Credit City of Fayetteville*  
Biosolids drying in a greenhouse.

The Environment Report for Tuesday, Jan. 8, 2012

A new law in Michigan will make it easier for sewage treatment plants to sell or give away their leftovers.

All the water we use in our houses and businesses goes down a municipal drain and ends up in a wastewater treatment plant. It's processed and decontaminated and eventually becomes something called a biosolid.

Some of it then goes into landfills, and some is used as agricultural fertilizer.

A law signed last week will allow Michigan's sewage treatment plant to sell or give away what's called "exceptional quality," or EQ biosolids.

Mike Person with the Michigan Department of Environmental Quality says other states have allowed this for years. In fact, Michigan's been buying a product called Milorganite that's been generated and bagged by the city of Milwaukee.

"It's often used on golf courses and things of that nature. It's pelletized and what it does provide a nice, slow-release form of organic nitrogen," said Person.

The new Michigan regulations eliminate a layer of bureaucracy. It means these biosolids could be used in public parks, athletic fields, cemeteries, plant nurseries, and on your lawn and garden.

Person says that's an environmentally smart thing to do rather than putting biosolids in landfills or incinerating them.

In order for these biosolids to be given or sold to the public, they have to meet certain criteria.

Dawn Reinhold, an assistant professor in biosystems and agricultural engineering at Michigan State University, says pathogens like *E. coli*, salmonella, and viruses have to be eliminated, and so do harmful metals.

Reinhold says she's researching another aspect of biosolids: What happens to all those personal care products when they get into the water system?

"When you use things like antimicrobial soaps, and you're washing your hands, that antimicrobial chemical is actually going down the drain, ending up in your wastewater treatment plant," said Reinhold. "A lot of that chemical actually ends up on the biosolids."

Reinhold's studies looked what would happen if you were to eat only fruits and vegetables grown in a garden amended with biosolids. She says the health risks would be a thousand to 10,000 times less than from using things like antimicrobial soap in the first place.

But there's one area that still needs work. Reinhold says all those pharmaceuticals Americans use also end up in those treatment plants.

"And so we're starting to understand what is occurring with these chemicals, but as far as being able to completely 100 percent answer that there's no risk from pharmaceuticals in these biosolids, we're not there yet," said Reinhold.

So Reinhold says using biosolids for landscaping limits your exposure to pharmaceuticals to just about nil.

And if you're not comfortable using biosolids in your veggie garden? Go organic.



## Biosolids storage: New facility positions city to utilize materials

November 16, 2012

By JACKIE STARK - Journal Staff Writer  
([jstark@miningjournal.net](mailto:jstark@miningjournal.net)), The Mining Journal

MARQUETTE - Construction is nearly finished on a new biosolids storage facility, located on the grounds of the Marquette Area Wastewater Treatment Facility that will help increase Marquette city's capacity to store and effectively use its biosolids.

"It will provide us with winter storage," said Curt Goodman, head of the city's water and wastewater department. "We'll be able to use it for agricultural purposes for fertilizer for area farmers, recycling is a beneficial use. It will reduce operations for wastewater by handling the material in a more cost effective way."

With all the walls up, crews worked this week to pour the concrete floor of the building, which Goodman said was about 75 percent complete.

### Article Photos



Workers pour cement as a part of construction of a new biosolids storage facility at the Marquette Area Wastewater Treatment Facility. (Journal photo by Matt Keiser)

Current regulations laid down by the Michigan Department of Environmental Quality do not allow for the use of biosolids on frozen ground, meaning much of the material processed by the wastewater facility is sent to landfills over the winter months.

The new 65 by 108 foot storage facility will allow for the storage of the biosolids for up to 180 days - an ability mandated by the MDEQ. Without the new facility - which has a storage capacity of 1,200 cubic yards - the city can only store the material for about 100 days.

"It allows for more sustainability, instead of putting it in the landfill," Goodman said. "If we had to take it to the landfill, it would be buried. With the nutrient value and the organic component of the biosolids, it provides a great fertilizer value."

Goodman said the material is a valuable resource that has many applications, including use in mine reclamation projects and on agricultural land. The addition of the new facility should also allow the department to branch out in its efforts to utilize the biosolids in other ways.

"It's a valuable material that can be used as a fertilizer supplement," Goodman said. "(The new facility) gives us a lot more flexibility for final disposal because of the way we handle the material. We'll be able to look at other application methods. It could be used for forest application, we'll continue mine reclamation, potential composting. We couldn't do that before due to a lack of on-site storage."

The Marquette City Commission approved construction of the new facility over the summer, at an amount not to exceed \$444,987. The bid was awarded to Premeau Construction.

The new facility is expected to save the city up to \$31,000 annually on hauling costs.

Goodman said he hopes to one day be able to sell the biosolids.

"That is the long-term strategy, to develop a market for this material," Goodman said.

Jackie Stark can be reached at 906-228-2500, ext. 242.

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### Great Lakes map shows the way to combat 'death by a thousand cuts'

January 1, 2013

| By [Charlsie Dewey](#) |

A new comprehensive map of the Great Lakes shows areas that have experienced the greatest cumulative impact from environmental stressors, such as pollution, invasive species and climate change, as well as areas with the greatest ecological benefit to humans.

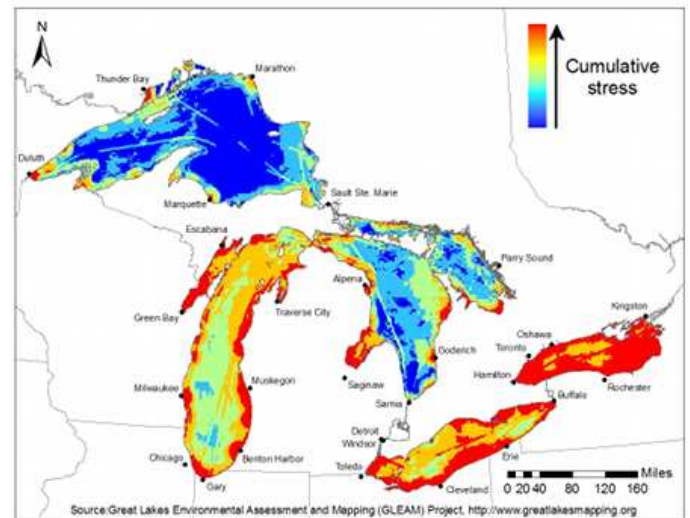
The map, developed during the past three years by the [Great Lakes Environmental Assessment and Mapping](#) project, was created to provide a tool to help determine how to invest resources in Great Lakes restoration and conservation projects.

“There’s never been a comprehensive map done in the Great Lakes of all the cumulative stressors that occur,” explained Alan Steinman, director of Grand Valley State University’s [Annis Water Resources Institute](#). “So having a map provides a very useful tool, a very visual tool, for people to look at the whole region, identify where the key areas of stress are, and then, using that, we can identify whether we are really focusing our restoration efforts in the right locations or not.”

The federal government originally planned to invest up to \$5 billion during a five to ten year period through the [Great Lakes Restoration Initiative](#), an amount Steinman said he isn’t sure will be reached, because the money has to be approved and appropriated on an annual basis by Congress.

Wanting to ensure that the money being spent on restoration of the Great Lakes by the GLRI and additional projects was being responsibly administered, GLEAM began, in 2009, to study 34 of the greatest environmental stressors on the Great Lakes. Seven categories were identified: aquatic habitat alterations, climate change, coastal development, fisheries management, invasive species, non-point source pollution and toxic chemical pollution.

Of the five lakes, Lake Michigan came out in the middle: in better shape than lakes Ontario and Erie, but not as healthy as Huron and Superior.



The map by the Great Lakes Environmental Assessment and Mapping project indicates the level of cumulative stress throughout the region. **Courtesy GLEAM**

Businesses that are directly tied to the Great Lakes might already be experiencing negative impacts from the deteriorated health of the water system, while for many not directly tied to the lakes, it might seem like a far off future concern.

“If your business is related to the Great Lakes at all, knowing where those stressors are and what the types of stressors are in your area, this can help you in terms of strategizing for the long term,” Steinman said.

“For example, if you own a marina or are involved in any sort of business chain dealing with recreational or commercial boating, the lower water levels associated with climate change are going to impact you in the long term, either directly or indirectly. Businesses need to start thinking about that — how will they adapt to this and can they adapt? Do they need to start looking at alternative business plans or scenarios to deal with the changes associated with altering climate, whether it’s warming temperatures, lowering water levels?”

“We are already seeing that take place in the agricultural sector, where these producers rely on the weather and the land and the climate for their product. Are they going to start changing the types of crops they grow? Will their

watering regimen change? These people who are really tied to the land in an intimate way recognize these stresses and what it means to them.”

Approximately 20 core members have participated in the GLEAM project, including Steinman and researchers from the University of Michigan; it involved surveying 161 researchers and natural resource managers from across the basin.

“What was interesting was that there is no one stressor that appears to be dominant throughout the entire Great Lakes,” Steinman said. “There seems to be a series of different stressors that influence the Great Lakes in different locations. What that means is that the Great Lakes are basically experiencing a death by a thousand cuts — little by little by little — and we can’t focus our attention on just one problem, like just one invasive species or too much nutrients. Depending on where you are in the Great Lakes, it’s a different combination of these stressors that are having an impact. I think that was a little surprising.

“What we also found, because we complemented the cumulative stress with the ecological benefits or the ecosystem services that are provided by nature that benefit humans, is that the areas with the greatest stress are also the areas where the greatest benefits are provided to society. That is a really interesting finding, because, one, it means if we can get rid of those stresses, we are going to get a lot more benefits to society, and that’s a good thing. But the challenge is much greater, because that’s where all the stressors occur.”

Steinman hopes federal and regional decision makers will use the map to help guide restoration efforts. The map can help determine which geographic areas to focus on and what stressors will be the most beneficial to allocate resources to combat.

“Often, when we do restoration, it is very site specific, and the reality is that these stressors don’t exist just in that small space,” Steinman said. “They are connected — they are hydrologically connected throughout the entire Great Lakes. So we have to recognize that a restoration in one very localized place may only have a very short-term benefit, because that stress may come from someplace else and replace the restoration that you’ve done. Hopefully, that kind of knowledge will help people in terms of thinking

about that restoration and how best to do it so it has a long lasting impact. By combining it with the ecosystem services, they could know what they can expect in return for those restoration activities.”

Additionally, areas that currently have low environmental impact with high human benefits might be a focus for preservation.

The project is being funded by a \$500,000 grant from Bloomfield Hills based Fred A. and Barbara M. Erb Family Foundation. Additional data will continue to be collected, and a second phase is planned for 2013 that will focus on the Great Lakes Restoration Initiative.

For more information, visit [greatlakesmapping.org](http://greatlakesmapping.org)



## Fiscal cliff could dump sewage into Great Lakes

Dec 11 2012 [Kari Lydersen](#)

### Nearshore water quality threatened

Duluth was deluged with record rainfall last June — more than seven inches in two days — that caused [massive flooding](#) and sent cascades of debris, contaminants, sediment, and [raw sewage](#) into Lake Superior.

The flow of sewage into the lake would have been worse if it weren’t for three decades of expensive and labor-intensive [efforts](#) to repair and overhaul the sewer systems of Duluth and neighboring Superior, Wis.

Now such crucial sewer system improvements across the Great Lakes are at risk because of the federal budget crisis. It’s happening right when climate change is expected to mean more of such heavy rains.

In older cities and towns across the Great Lakes, untreated sewage is regularly released into rivers and lakes when pipes that handle both sewage and storm water are overwhelmed by rain. Duluth reduced such combined sewer overflows — known as CSOs — by 91 percent by separating sanitary and storm sewer pipes and building catchment basins.

## Loan program at risk

The most important funding source for improving sewers and preventing overflows is a federal program that provides low-interest loans. Over the past three years this Clean Water State Revolving Loan Fund – the SRF – facilitated \$1.8 billion worth of CSO-related projects across the Great Lakes region.

If Congress fails to avoid budgetary sequestration scheduled in January, the SRF is in line for the 8.2 percent across-the-board budget cuts mandated by 2011 negotiations over the national debt.

That means a loss of \$44 million in sewer improvement funds to Great Lakes states from 2012 levels – a drop from \$533 million to \$489 million.

What’s more, the federal budget commitments also cap discretionary spending through 2021, which would likely mean additional cuts to Great Lakes programs. That includes the sewer loan program and the Great Lakes Restoration Initiative, which funds some green infrastructure projects that help reduce sewer overflows.

Even if Congress strikes a deal to avoid sequestration, significant – perhaps even greater – cuts to the loan fund are likely. Great Lakes advocates say such cuts could be devastating for cities and towns trying to stop CSOs – halting some projects in their tracks, preventing other projects from ever getting started and setting the stage for declining funding levels in future federal budgets.

The biggest risk for sewer improvement funds is that people start viewing them as add-ons instead of essentials, said Joel Brammeier, executive director of the Alliance for the Great Lakes.

## Sewage is not fat

“The question on everybody’s mind at the federal level is, ‘Is there any fat we can cut?’” Brammeier said. “That’s simply not what these programs are – they’re investments in solving problems that have been festering for decades.”

Slashing funds for sewer improvements will mean greater costs in the future, Brammeier noted. Letting sewers deteriorate makes them more costly to fix later,

not to mention the costs of dealing with near-shore contamination and beach closures.

He warned that 2013 cuts could spiral: “Those cuts will be sustained for many years to come and will set back the projects in the pipeline...less and less money becomes available and the perceived ability of communities to fix their problems becomes lower and lower, so you end up with a race to the bottom and increases in combined sewage going into the lakes.”

The Alliance for the Great Lakes, the National Wildlife Federation and other groups are striving to make sure legislators understand the [importance](#) of the sewer loan fund and the Great Lakes Restoration Initiative. In November they released a fact sheet warning about the potential impact of cuts, proving the economic importance of the Great Lakes and citing polls showing a strong majority of Great Lakes residents support funding of Great Lakes restoration and protection, even during a budget crisis.

“These are programs that generate economic growth – they create jobs, fuel local economies, in our minds this is the kind of program that cannot be cut and should remain fully funded,” said Jeff Skelding, the National Wildlife Federation’s campaign director for the Healing Our Waters-Great Lakes Coalition. “This has a positive effect on the economy. The whole goal here as far as I can tell is to rejuvenate the national economy and those two programs are doing this for the Great Lakes region.”

## Big target

Skelding is afraid that when the U.S. EPA decides how to slash its budget that the loan program will be targeted because of its significant size.

“With the marching order of mandatory cuts it will be likely they would look at the big programs first, but we would hope when they do that they would factor in other considerations,” he said. “It would be ludicrous to just look at the size of each program and say that gets the biggest percentage cut. You have to look at the jobs that are created and the contribution to recovering the economy.”



Sewer overflows like this one in Milwaukee contribute to billions of gallons of polluted water dumped into the Great Lakes. Photo: Wisconsin DNR

Ever since the 1972 Clean Water Act sparked governmental and public attention of water quality, federal funding has been crucial to building modern treatment systems and addressing CSOs across the Great Lakes. Most municipalities, especially smaller ones, lack the capital or ability to launch expensive, long-term infrastructure projects on their own. Sewer overhauls are often the most expensive projects they undertake.

An early federal grant program was replaced with the state revolving loan fund, which allows municipalities to finance projects and repay the federal government through sewer rate payments and savings generated by the overhauls.

The U.S. EPA in 2002 predicted that without increased funding for water infrastructure, by 2019 there would be a \$122 billion gap between funding needed for necessary updates to wastewater and clean water infrastructure and the funding available.

“We built tremendous infrastructure 40 years ago, and now it’s all wearing out at once,” said environmental engineer Jim Ridgway, who was assistant director of wastewater operations for Detroit’s water treatment plant and worked with numerous public and private efforts addressing CSOs. “If we have virtually no repair and replacement budget, it’s all going to fall apart. We either start investing now or we will have catastrophic failures later.”

### **Struggling communities hurt most**

CSOs disproportionately affect communities struggling with many other serious financial and structural challenges, Ridgway said. “In these older cities, the sewers began as creeks, were ‘improved’ to prevent

urban flooding, were enclosed and incorporated sewage transport directly to larger rivers and lakes and then, very late in the process, sewage treatment was added.

“Now, as the profession understands the importance of restoring the hydrology to improve water quality and lower operating costs, funding is less available to the most vulnerable communities. But the sewage that escapes their boundaries impacts us all.”

### **Rouge rebound**

Ridgway has seen firsthand what a dramatic effect federally-funded wastewater programs can have on Great Lakes ecosystems and communities.

When he was a child growing up in Detroit, the [Rouge River](#), which runs through the city and surrounding towns, was a stinky eyesore that residents avoided. It emptied industrial pollution, contaminated storm water and raw sewage into Lake Erie via the Detroit River.

But thanks to a watershed-wide program carried out with \$300 million in federal grants, the Rouge today is much healthier, and by extension so are the near-shore areas of Lake Erie where the river water flows.

Over 20 years, the cooperative efforts of state, local and federal agencies and local communities meant that most CSOs were eliminated along 89 of the Rouge’s 127 miles. The project separated previously combined sewers, added CSO treatment facilities and made other improvements to greatly reduce storm water run-off, untreated sanitary sewer releases and CSOs. Rouge River water quality improved remarkably: e. coli levels dropped and dissolved oxygen levels rose, the river and near-shore lake waters became cleaner, fish populations increased and local residents did not have to worry about as many beach closures or the risk of getting sick from taking a swim in Lake Erie.

“Most folks believe that the government has a role in removing sewage from our waterways,” said Ridgway, who helped oversee the Rouge improvements as executive director of the Alliance of Rouge Communities. “We believe that means funding regulation, monitoring, and yes, construction of controlling works.

“Let’s hope that Congress can find a way to make sure that the progress we have made to date can continue.”

## Ohio

### OWEA Residuals Management Committee Update – January 2013

Welcome to 2013! Recent news and our upcoming activities include the following:

- ◆ **Biosolids Workshop** –The 2012 workshop was held on December 6, 2012 at NorthPointe Conference Center. We had a great turnout, including 110 registered participants. We sincerely thank our speakers and members of the committee that volunteered to help. A special thanks to Steven Reese for serving as moderator for the event and for his coordination of the agenda. Also a big thank you to Judi and her staff for coordinating the venue and registration for this event. As always, things went extremely smoothly for the event.

For calendar year 2013, the Residuals Committee will be working on the following initiatives:

- **Development of New Promotional Materials for Biosolids** – We are going to modify our display at the Farm Science Review and hopefully use the modified display at other conferences / events. The materials will be developed to specifically highlight the benefits of beneficial use of biosolids. We will also highlight the potential cost advantage of using biosolids for agricultural use.
- **Continue Our Working Relationship with Neighbor Associations in IN and MI** – During the past year, Rob Smith and Steven Reese have led our efforts in reaching out to Residuals Committees in Indiana and Michigan. We have had several conference calls and have exchanged a large amount of information. A representative from the Michigan Residuals Committee, Stephen Mahoney, presented an overview of Michigan biosolids regulations and upcoming issues with P management in land application. We plan to attend conferences in IN and MI this year and share information from Ohio in a similar manner.
- **Alternate locations for our Residuals Committee Meetings** – Our first meeting this year was held at the Olentangy Environmental Control Center on January 15, 2013. We will be holding our other three meetings at various

locations in central Ohio and will hold tours at those facilities. In the future we will be offering one contact hour for each facility tour. If you have any ideas for possible venues for future meetings or would like to help coordinate these locations, please let me know.

- **Review / discussion of P management requirements under revised land application regulations** – As a committee, we are exploring ways to constructively evaluate and review the requirements for management of phosphorus in land applied biosolids. The revised regulations will go into effect in July 2013 will reduce the amount of land application possible in some areas. As a committee, we will strive to objectively review, discuss, and continue to inform you, the OWEA membership, on the latest issues.
- **Verify member list / update contacts** – If you haven't received any correspondence from me and you would like to receive the correspondence related to committee activities, please send me an email (see contact information below). Please also drop me an email if your contact information has recently changed so that we can include you in upcoming activities.

We would love to have you as part of our committee. The Residuals Management Committee is focused on serving the OWEA membership through education, promotion of effective biosolids management, technical information on biosolids, and interface with OEPA on regulatory issues. We always welcome new membership and we would love to see you at our next meeting. If you are interested in getting involved or if you have any questions about the committee, please contact me.

Jamie Gellner (jgellner@hazenandsawyer.com).





# Ohio State Researcher to Re-write Ohio's Phosphorus Index to Improve Water Quality

Nov 06, 2012



*P Risk Index tile drainage*

**COLUMBUS, Ohio** -- Grand Lake St. Marys has lost an estimated \$60-80 million in tourism due to harmful algae blooms. And in 2011, algae blooms covered 990 square miles of Lake Erie's surface area, the largest in the lake's history. Phosphorus is the pollutant most often implicated in the degradation of Ohio's fresh surface water, with use of phosphorus fertilizer on farmland as a contributing factor.

To help mitigate these water quality issues, an Ohio State University researcher has launched a \$2 million project to evaluate and, as necessary, revise the U.S. Department of Agriculture-Natural Resources Conservation Service Ohio Phosphorus (P) Risk Index to better predict the risk of phosphorus moving off farm fields.

Elizabeth Dayton, a soil scientist in Ohio State's School of Environment and Natural Resources, garnered a \$1 million USDA Conservation Innovation Grant and \$1 million in matching donations from Ohio agribusinesses to complete the project.

Her goals are to make the Ohio P Risk Index accurate, add more best management practice options for farmers, create an interactive web-based tool so farmers can calculate their P Risk Index scores, and evaluate management options and make informed decisions to better manage phosphorus.

Because the Ohio P Risk Index is used by farmers statewide in developing nutrient management plans for

both manure and commercial fertilizer application, it is important that the P Risk Index be as accurate an indicator as possible.

"With increased degradation of surface water in Ohio, agriculture has increasingly been cast in the role of the villain," Dayton said. "A robust, functioning Ohio P Risk Index will give farmers a better tool to manage field scale phosphorus transport, while sustaining agricultural productivity and protecting surface water quality."

The research will focus on, but is not limited to, Grand Lake St. Marys and the Western Lake Erie Basin, two of Ohio's most problematic watersheds.

Ohio's agricultural industry is showing its concern about the phosphorus problem in Ohio by providing matching contributions to the project, including those from the Ohio Soybean Council, Ohio Small Grains, and The Andersons, Inc.

"The tremendous support we have received from Ohio agribusinesses demonstrates their commitment to good stewardship and to being part of the solution," she said.

Tom Fontana, director of New Use Development for the Ohio Soybean Council, agrees.

"Water quality is a top concern in Ohio, and farmers want to be part of the solution," he said. "Ohio State's research to validate and update the Phosphorus Risk Index will help us determine what the next best management practices are when it comes to phosphorus use on the farm.

"It will also help farmers statewide to reduce the risk of phosphorus runoff, which in turn, better protects Ohio surface water quality."

Ohio State's School of Environment and Natural Resources is part of the College of Food, Agricultural, and Environmental Sciences.

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## Valparaiso could turn sludge savings to earnings

December 02, 2012 8:15 pm • [Phil Wieland](#)  
[phil.wieland@nwi.com](mailto:phil.wieland@nwi.com), (219) 548-4352

VALPARAISO | Applying the city's annual 4 million gallons of treated sewage on area farm fields has been a good thing for the farmers and the city, but turning the sludge into compost could prove to be an even bigger boom for the city.

Valparaiso sewer department Pretreatment Coordinator Ed Pilarski on Tuesday gave the Utilities Board a lesson on the land application program the department has had since 1994. At the board's next meeting, he will explain the planned composting program and how that could affect the land application program.

Pilarski said the waste is a good fertilizer for a variety of crops but is used mainly for corn and soy beans. This year the city saved farmers almost \$44,000 in fertilizer costs while spending nearly \$186,000 to have it hauled to the fields and applied. Utility Director Steve Poulos said it is improper to say it is "disposed" because it's not just being dumped, as in a landfill.

The city would be spending two or three times as much to "dispose" of the sludge at a landfill or other storage facility. The city also would have to remove most of the water from the sludge, which would add to the costs.

The sludge is spread on the fields in the spring and fall. The city has a permit through 2019 that allows it to use 18,000 acres on farms that agree to take the sludge.

This year's 4 million gallons was spread on only 322 acres, and Pilarski said the city rotates the applications to different farmers or different fields each year.

The utility budgets \$200,000 a year for the land application program, but this year's \$186,000 was the most it has ever spent. The cost per gallon has risen about 10 cents in the last 10 years because the price of gasoline increased.

Board member Mike Sur asked if the utility should be selling the sludge to farmers rather than giving it away since it saves the farmers so much money. Pilarski said the farmers have a pretty good network and know how the program is

being operated in other areas. Besides, it's worth it for the money the city saves.

If the Utilities Board decides to pursue a compost program in the future, sludge could become a moneymaker. Pilarski has spent the last four years experimenting with the precise formula for mixing sludge with other materials to create a compost suitable for offering to the public for landscaping and gardens.

If the material is approved by the Indiana Department of Environmental Management and the board agrees to pursue it, the utility could begin marketing it in the near future. Pilarski will discuss the details on that program with the board in December.

## Minnesota

**Princeton Union-Eagle**  
IT'S ALL ABOUT YOU.

## Reed plants are key part of wastewater plant

By [Jeff Hage](#) on December 12, 2012 at 7:26 pm



Sludge falls from a pipe into one of the new reed bed enclosures at the city's recently-expanded wastewater treatment plant on Dec. 5. The pieces of material seen in the liquid at the bottom are reed roots that will be dormant until spring when shoots should form from them to grow reeds.

The plant roots lying immersed in sludge inside concrete enclosures at the city of Princeton's newly-expanded and modified wastewater plant this fall haven't looked like much – long tuberous things that might make you think of giant ginger roots.

But these roots that lay there inert as wastewater sludge has been pumped into the enclosures from the city's wastewater processing stream, are expected to turn into something dramatically different this coming spring. That is, tall green plants that reduce sludge by consuming the

sludge's nutrients, a key link in the wastewater processing at the newly-expanded wastewater facility.

The city of Princeton is at or close to the finish line in its project of not just tripling the city's wastewater plant's processing capacity, but also in making some significant modifications in the plant's design. Another significant design change is in the handling of the wastewater sludge, or biosolids, that are left at the end of processing the wastewater.

In the approximately 16 years since the original mechanical wastewater plant opened, the city has had to remove the sludge from collection tanks and haul it to farm fields about twice a year to spread or inject into the soil.

The wastewater plant's new design incorporates the use of enclosures called reed beds that can hold biosolids and liquid, and hold a gravel and sand base for reeds to grow in to consume the sludge. The hollow stems of the reeds allow oxygen to come down through the plants to make the process work, says John Fisher, senior design leader at the engineering firm, SEH. SEH is the engineering firm for the city's wastewater project.

The reed method of breaking down the sludge works so well that no sludge residue should have to be cleaned from the reed beds, likely for 10 years, Fisher said last week.

Fisher notes that reeds have been used for this kind of work throughout Europe, Asia and Australia, as well as in more than 50 locations in the United States. Among its advantages are low construction costs and minimal daily operation and maintenance costs, he points out.

One main advantage is only having to remove sludge residue once every 8-10 years from the plant, versus the old system of twice per year, Fisher said.

The reed system reduces water content, minimizes solids and provides sufficient storage time to stabilize biosolids prior to disposal.

"They're quite efficient and could grow 8-10 feet tall," Fisher said of the reeds. "Sometimes it takes one to two years for them to really mature."

You could compare the reed beds at the city's wastewater this time of year to that of a marsh that is freezing over for the winter, Fisher added.

Fisher supplied a text on the reeds that describes them as common reed plants with the scientific name, *phragmites communis*, and a second cousin to the common marsh plant.

The text continues: "It is a tough, adaptable plant, which can grow in polluted waters and find sustenance in sludge. This reed has a voracious appetite for water. The plant is tolerant to low oxygen levels and to waterlogged conditions. The reeds hold themselves in the soil through roots and rhizomes, an intricate network of underground stems.

"New plants in turn will sprout from these stems. These rapidly growing roots provide air passages through the sludge, which in turn provide a host area for many biological communities to develop and continue to mineralize the sludge."

The Princeton wastewater project resulted in the construction of 12 reed beds, each being in a 50' x 120' concrete enclosure. Reeds have only been placed in eight of the reed beds for now because that is all that is considered necessary for now, for processing the amount of wastewater coming through the plant.

The extra reed beds are part of the extra capacity built into the facility to accommodate the potential for future growth.

Fisher noted that the reed beds contain three layers of sand – a pea rock bottom layer, a medium-coarse middle layer and a fine-sand top layer. As Princeton wastewater plant operator Chris Klinghagen looked over some of the reed beds on Dec. 5, he explained that reeds thrive by taking nutrients out of the sludge. He noted that liquid sludge in the reed beds goes into a perforated pipe and the liquid runs to a lift station that pumps it through the wastewater plant again. When the liquid is processed enough through the reed beds, it should exit "crystal clear," Klinghagen said. "For me, it's amazing what technology will do."

Fisher noted that in about 10 years from now, the remaining sludge that will be cleaned out the reed beds will be "pretty inert." At that point, it can be mixed with compost and applied on land anywhere, according to Fisher, who said it is "quite safe" environmentally.

"It's nature's way," Fisher said about having reeds to reduce biosolids.

### Journal Article

## Factors affecting the degradation of pharmaceuticals in agricultural soils.

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*Environmental Toxicology and Chemistry* (impact factor: 2.81).  
08/2009; 28(12):2546-54. DOI:10.1897/08-657.1

### ABSTRACT

Pharmaceuticals may be released to the soil environment through the application of biosolids to land. To understand those factors affecting the persistence of pharmaceuticals in the soil environment, the present study was performed to assess the effects of soil type, the presence of biosolids, and the impact of chemical mixture interactions on the degradation of three pharmaceuticals: naproxen, carbamazepine, and fluoxetine. Single-compound studies showed that naproxen degraded in a range of soils with half-lives ranging from 3.1 to 6.9 d and in biosolids with a half-life of 10.2 d. No relationships were observed between degradation rate and soil physicochemical properties and soil bioactivity. For naproxen, addition of biosolids to soils reduced the degradation rate observed in the soil-only studies, with half-lives in the soil-biosolid systems ranging from 3.9 to 15.1 d. Carbamazepine and fluoxetine were found to be persistent in soils, biosolids, and soil-biosolid mixtures. When degradation was assessed using a mixture of the three study compounds and the sulfonamide antibiotic sulfamethazine, the degradation behavior of fluoxetine and carbamazepine was similar to that observed in the single compound studies (i.e., no degradation). However, the degradation rate of naproxen in soils, biosolids, and soil-biosolid systems spiked with the mixture was significantly slower than in the single-compound studies. As degradation studies for risk assessment purposes are performed using single substances in soil-only studies, it is possible that

current risk assessment procedures will underestimate environmental impacts. Further work is therefore warranted on a larger range of substances, soils, biosolid types, and chemical mixtures to better understand the fate of pharmaceuticals in terrestrial systems.

Source: [PubMed](#)

[Self Archiving Restrictions](#)

## Calendar of Events

### MBT Meetings

January 17, 2013

Delta Township WWTP, Lansing

May 16, 2013,

Grandville Clean Water Plant, Grandville

July 18, 2013,

MSU Ag Expo, East Lansing

September 19, 2013

Johnson Wildlife Center, Cadillac

December 12, 2013

Bavarian Inn, Frankenmuth (Holiday Party)

### Annual Conference

March 6-7, 2013

Double Tree Hotel, Dearborn

