

VIII. Recommendations and Funding

A. Increasing Systems Thinking

Water Environment Research Foundation's (WERF) 2007 "Overcoming Barriers to Evaluation and Use of Decentralized Wastewater Technologies and Management" by Carl Etnier, Richard Pinkham, Ron Crites, D. Scott Johnston, Mary Clark, Amy Macrellis.

{See Attached Full Report on CD as 04-DEC-full2.PDF} or download at: <http://www.ndwrcdp.org/userfiles/04-DEC-2full.pdf>

Both centralized and decentralized wastewater treatment systems may adequately treat and disperse wastewater – as they are designed to do – and still cause environmental, public health, or economic problems. Potential problems may arise in unintended consequences elsewhere in the watershed or ecosystem.

Strategy: Require Wastewater Planning to Include Relationships to Other Water Sectors

Municipal or regional planning for wastewater usually begins with a needs assessment taking broader ecological systems, land use development, drinking water and stormwater management into account at the same time. Development projections are an integrative modeling imperative.

Action: Develop Guidelines for Linking Wastewater to Other Sectors

- Regulators can require that comprehensive water planning be a part of the scope of wastewater planning projects. This could be effective where regulators are educated about comprehensive water planning and are motivated to require it.
- Public sector engineers in funding agencies can require consulting engineers to consider relationship between each wastewater alternative and other water sectors, and make payment contingent on consulting engineers meeting criteria for including this consideration.
- Alternatively, funding could be provided preferentially for wastewater planning and construction where watershed/water resources approaches are incorporated into master planning.
- Engineering societies can promote a comprehensive planning approach.
- US Environmental Protection Agency can add the guidelines to their web page on "Technical Tools for Watershed Management".

Strategy: Utilities Encourage Integrated Water Resources Approaches

Action: Utilities Employ Integrated Resource Planning

A water resource utility can combine systems thinking with public involvement and the search for a least-cost method of achieving level-of-service goals. Integrated resource planning uses least-cost analysis of options for meeting utility functions. A promising way to introduce integrated resource planning into utility planning processes is through the asset management process. The five core questions for asset management are (Parsons/GHD Asset Management Center, 2003):

1. What is the current state of my assets?
2. What is my required sustained level of service?
3. Given my system, which assets are critical to sustained performance?
4. What are my best minimum life-cycle-cost capital improvement plan and operations and maintenance?
5. Given the above, what is my best long-term funding strategy?

Action: Utilities Investigate Offering Developers Incentives for Water Reuse
Utilities would investigate offering developers incentives for water reuse. Local reuse can make decentralized treatment more cost effective, and developers may be more likely to employ local reuse if they receive financial incentives for doing so. Reuse of treated wastewater offers an effective means of conserving high-quality freshwater supplies while helping to meet growing demands for water.

Action: Utilities Encourage LEED (Leadership in Energy and Environmental Design) Certification for New Construction and Renovation
Utilities and local governments would give incentives to build green buildings that give designers an incentive to become more creative in their systems thinking. LEED assigns points to many different aspects of building design and operations.

Onsite Wastewater is a collaborative partner of EPA WaterSense. <http://www.epa.gov/watersense/> To help American homes and business make more efficient use of their water, EPA has developed WaterSense, a public-private partnership program. By offering simple ways to reduce water use through water-efficient product choices—with no sacrifice to quality or product performance—WaterSense helps Americans save water and money.

If all U.S. households installed water-efficient appliances, the country would save more than 3 trillion gallons of water and more than \$18 billion dollars per year.

When we use water more efficiently, we reduce the need for costly water supply infrastructure investments and new wastewater treatment facilities, and new energy sources to power them.

The average household water & sewer bill is at least \$500-700 per year.

A few simple changes to use water more efficiently could save @ 25%

If one out of every 100 American homes retrofitted with water-efficient fixtures, we could save about 100 million electricity kWh per year — avoiding 80,000 tons of greenhouse gas emissions. Or the equivalent to removing nearly 15,000 automobiles from the road for one year! If 1 percent of American homes replaced their older, inefficient toilets with WaterSense labeled models, the country would save more than 8 million kWh of electricity—enough to supply more than 43,000 households electricity for one month.

Onsite Wastewater is a collaborative partner of Water Environment Federation. **Water Is Life, and Infrastructure Makes It Happen™** is a program designed to assist water and wastewater service providers in communicating the value of our nation's water and wastewater infrastructure. [The initiative is an on-going public education program of the Water Environment Federation \(WEF\)](#) with support from the National Association of Clean Water Agencies (NACWA). "We have about 2 million miles of pipe in this nation. If you look at what we're spending now and the investment requirements over the next twenty years, there's a \$540 billion difference." Steve Allbee, U.S. Environmental Protection Agency. *Liquid Assets*, <http://www.liquidassets.psu.edu> a ninety-minute PBS documentary, tells the story of essential infrastructure systems: water, wastewater, and stormwater. These systems — some in the ground for more than 100 years — provide a critical public health function and are essential for economic development and growth. Largely out of sight and out of mind, these aging systems have not been maintained, and some estimates suggest this is the single largest public works endeavor in our nation's history.



With the most massive overhaul of the nations water and wastewater infrastructure on the verge of necessity, this is the opportunity to radically rethink how design, construction, service and operation is provided.

NOWRA's new Chair Jerry Stonebridge in Onsite Magazine ([on CD as OSJ_Winter_2008_web_REV.pdf](#)) makes the same point OOWNM used in our MI Energy Fair presentation - that because so much of this nation's infrastructure now needs repairs and replacement, it presents an opportunity to rethink how we are plumbing and sewerage cities and neighborhoods. Case in point - Frankfurt Germany is retooling it's centralized municipal system to be more compartmentalized so as to prevent catastrophic failure.

Recommendations

Steps can be taken to meet the identified challenges. The following actions steps should be considered by decision makers at all levels of government.

1. **Establish collaborative, multi-discipline infrastructure planning.**
 - Provide a mechanism whereby wastewater service providers work together in identifying opportunities for reducing costs - both to the provider and client.
 - Look at incorporating water source protection, water reuse, wastewater provision and drinking water supply as a unified component of municipal master plans.
 - Consider all options for 'distributed' collection, treatment and distribution to ensure systems are cost effective, benefit based, and provide the level of treatment performance necessary by location not 'prescription'.
 - Factor in the cost/benefit of energy savings and infrastructure longevity from aggressively pursuing water conservation measures. i.e leak repairs, asset management scheduling, rebates to replace water inefficient appliances.
2. **Establish rate structures which provide incentives for sustainable growth and pollution prevention practices.**
 - Lower rates to communities engaging in pollution prevention activities that result in less demand and more efficient service.
 - **Advocate that wastewater service is a utility and that costs can be kept reasonable by paying for it from as wide a client base as possible.**
3. **Place emphasis on watershed management.**

A guiding principle as listed in USEPA's:
Decentralized Wastewater Treatment Systems: A Program Strategy: ([On CD as: epaseptic_management_handbook.pdf plus epa_septic_program_strategy.pdf](#))
{**Watershed-wide Integration.** Integrated wastewater facility planning and management of water resources on a watershed level promotes sound and sustainable communities. The role of properly sited, designed, installed and managed decentralized systems that provide for recycling and reuse of treated wastewater for groundwater recharge, replenishment of aquifers and protection of ground and surface water, should be considered in planning.}
4. **Implement pollution prevention.**
 - Communities can review their master plans and zoning ordinances to identify appropriate wastewater infrastructure needs. Asses planning and design before development occurs.
 - Ensure adequate reserve fund accounts, with ongoing payments in, are created to cover future repairs and replacement.

- Encourage consideration of Otter Tail, MN type Responsible Management Entities {On CD as [OtterTail20YearReview.PDF](#)}

5. **Engage citizens to become active participants through education.**

- Through such measures as water conservation, riparian property owner education, wastewater information, citizens can help reduce loading on and impacts of infrastructure.
- Advocate for funding of public education efforts.
- Utilize the expertise and collaborative resources of Onsite Wastewater of NW MI and our EPA WaterSense Partners to demonstrate the link between water infrastructure and energy consumption.

6. **Support innovative projects that demonstrate ways of reducing costs, while protecting water resources.**

- Remove unfounded bias and unreasonable barriers to 'best option' technology.
- Base system assessment decisions on science, performance testing and mandated remediation alternatives.
- See EPA "Protecting Water Resources with Smart Growth" (on CD as [waterresources_with_sg.pdf](#))

7. **Increase federal funding for wastewater and water infrastructure projects.**

Onsite Wastewater is committed to the "Liquid Assets" initiative. Water Environment Federation, in conjunction with NACWA, ASCE, and other sister organizations, seeks to promote public awareness of the crisis we face maintaining US water and wastewater infrastructure. The centerpiece of this national promotional effort is a major PBS documentary produced by Penn State University called "[Liquid Assets.](#)"

It is estimated that the repair costs for a national infrastructure that barely attained a "D" rating in 2006, now can anticipate a \$540B repair cost.

"Much of the U.S. water infrastructure -- the systems that treat, distribute, collect and clean water -- was built nearly a century ago. With quiet consistency, this infrastructure has provided the foundation for an economic prosperity and quality of life that has made the United States the envy of the world, until now. Water infrastructure suffering from age and exponential population growth demands our attention. Without reinvestment, we are headed for a crisis.

The 1.5 million miles of water and wastewater pipe that comprise our nation's infrastructure have a lifespan of 50 to 100 years. Many eastern cities have water and wastewater infrastructure close to 200 years old, Cincinnati, Portland, Baltimore, D.C., Atlanta, etc. The General Accounting Office (GAO) reports that 50% of the nation's large systems' pipe is near replacement age.¹ In some cases, the infrastructure is literally falling apart.

In addition to their age, these systems were originally designed for populations half their current size. Since 1950 the U.S. population has more than doubled. Most of the growth is in urban centers where it wears infrastructure down.





Population growth is anticipated to continue stretching water and wastewater systems significantly beyond capacity.

Adding insult to injury, a draft EPA report says cities should prepare for overflows to worsen as climate change is anticipated to increase intense rain and snow events in the Great Lakes region and Northeast. Even with newer facilities and innovative alternatives, upgrades are required to keep pace with growing needs and environmental challenges.

Sewer and water rates have never been reflective of the true cost of service. The United States has taken clean water for granted for many years. A GAO study showed that 29% of water and 41% of wastewater utilities were not generating enough revenue from user rates to cover the full cost of their service. As a result, maintenance is chronically on the back burner.

At the same time, investment in water infrastructure maintenance has declined dramatically. Competing needs for limited resources push those that are most quiet (water infrastructure) to the bottom of the list. With levees bursting, gas pipes busting, and bridges collapsing, it's difficult for the public to grasp the water infrastructure vulnerabilities taking place invisibly beneath us.

At this point, it's critical that we turn the situation around for sustainable water infrastructure across the United States. The Environmental Protection Agency reports that if we do not reinvest in our water and wastewater infrastructure by 2016, water pollution levels may deteriorate to those observed in the 1970s. We risk losing decades of progress in public health and environmental protection. We threaten our economic well-being and quality of life." ¹ GAO, *Water Infrastructure: Comprehensive Asset Management Has Potential to Help Utilities Better Identify Needs and Plan Future Investments* (March 2004).

9. **Current municipal sewer condition, and projected total repair costs, in this region, could not be identified due to lack of participation.** Until the total picture can be quantified, the true cost of routine and long term maintenance cannot be estimated. Municipal system information needs to be gathered. Onsite Wastewater will continue this as an ongoing commitment.
Sewer overflows, particularly wet weather events and combined sewer issues continue to impact discharge to surface waters. See Appendix folder 'ssos' for 2003-7 State reports. State Revolving Loan funded projects should prioritize repairs first.
For 2008 Regional Rate and System information see <http://www.goslingczubak.com/news.php?article=10>
10. **Many local communities lack paid staff to review funding or wastewater infrastructure needs.** Establishing an independent review agency, to assist with identifying needs, technology options, cost viability and proposal development will ensure the community receives unbiased assistance at a reasonable cost.
11. **Establish an independent rate review service** to determine the adequacy of revenue to properly operate and maintain local wastewater treatment systems. (Such as National Small Flows Community Training Institute for Small Community

Systems)

12. **Establish Continuing education credits** in wastewater planning, management and water resource protection - an academy for Elected Officials and Staff.

FUNDING FOR ON-SITE WASTEWATER

State of Michigan:

The Michigan Department of Environmental Quality (DEQ) provides funding to local health departments to assist in the conduct of their on-site sewage program. All local health departments also support their programs with on-site system construction permit fees.

As a result all health departments in this region are underfunded and under staffed with insufficient funds or time to devote just to wastewater issues.

Each local health department's on-site sewage program is evaluated by the DEQ staff on a three-year revolving basis as part of the Michigan Local Public Health Accreditation Program.

The Michigan State Revolving Fund (SRF) is a potential source of loan funds to municipalities for construction and repair of municipal, publicly owned sewage treatment works. However, this allocation is determined by funds passed through from the federal budget - and as it is awarded by priority of need the process tends to favor major metropolitan areas not northern Michigan.

Michigan SRF does not specifically set aside funds to address correction of individual onsite wastewater systems as these are on private property.


“The SRF has witnessed the most dramatic change. From FY 2003 through FY 2006 Michigan’s Project Priority List averaged \$215 million in projects seeking assistance each year and in FY 2006 only \$96 million in loan assistance was tendered. In FY 2007, nearly \$600 million in projects anticipate completing the application process. We project this level of demand will persist, at least for the next 4 or 5 years.” Source: *The Loan Arranger Fall/Winter 2006 Revolving Loan and Operator Certification Section Environmental Science and Services Division Michigan Department of Environmental Quality*

Strategic Water Quality Initiatives Fund - SWQIF

Funded through the Clean Michigan Initiative Bond - this program was intended to assist communities provide badly needed funds to allow private property owners to replace or upgrade onsite/septic systems.

However the program purpose switched to primarily assist large municipal providers to address ‘clear water’ infiltration - i.e leaking lead lines form individual properties allowing water to infiltrate and thus adversely impact capacity and costs for municipal sewer systems.





“Although FY 2007 SWQIF demand remains low, with only two applicants seeking a total of about \$2.4 million, numerous communities with “wet sanitary systems” have embarked on project planning efforts, many of them through the S2 Grant Program. These efforts will identify the appropriate remedy for surcharged systems and sanitary sewer overflow problems, and many are likely to include efforts to reduce clearwater contributions from private property. These projects are likely to be eligible for SWQIF assistance, and it is anticipated that demand in future years will substantially increase. Our capacity to lend from the SWQIF was significantly reduced when \$40 million was transferred to the S2 grant program last year, leaving our ability to satisfy SWQIF loan demand in future years somewhat uncertain. Current lending capacity rests at @ \$12 million/year.” Source: *The Loan Arranger Fall/Winter 2006 Revolving Loan and Operator Certification Section Environmental Science and Services Division Michigan Department of Environmental Quality*

A Project Plan to create the first community-wide onsite system replacement project, including individual conventional, advanced and community cluster systems, through SWQIF, was developed by Onsite Wastewater for Benzonia and Lake Townships in Benzie County. (see www.michiganonsite.org) The project mandated each loan was conditional upon a legally binding maintenance contract, as specified by SWQIF.

The cluster portion was refused for funding by MDEQ. Subsequently the conventional portion also foundered due to a legal opinion by Bond Counsel that the SWQIF legislation did not contain authorizing language to legally allow public municipal entities to borrow against their funds for a private purpose - even though this was the original intent of the Bill.

Because, in addition to other legal and financial roadblocks, each individual application under the SWQIF award would also require Bonding - the project became economically unviable and cost prohibitive.

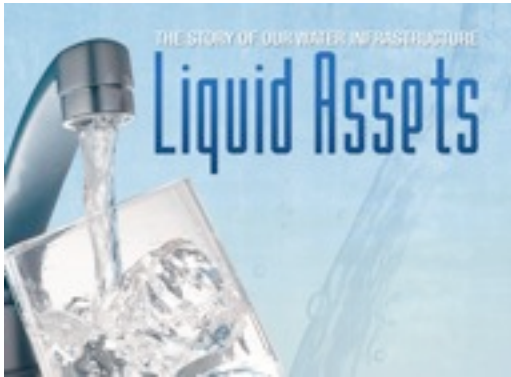
Several states have established simplified direct loan programs for homeowners to rehabilitate, improve, repair, or replace an existing on-site system. Utilizing a locally controlled septic revolving loan fund, administered by a nonprofit agency on behalf of municipalities and health departments, the process is income based. Again, loans are tied to a maintenance contract and pave the way to view all wastewater systems within a jurisdiction as part of an overall responsible, managed, wastewater service.

Onsite Wastewater has set creating such a *Septic Loan* program in our region as an organization priority and will be seeking funds for such in 2009.

Federal:

[Since the commencement of this project, the economy, and municipal system condition reports, have degraded conspicuously. Water Environment Federation members, including Onsite Wastewater, continue to draw attention to the D- Grade attached to water and wastewater infrastructure. By participating in WEF’s “Water is Life” and the “Liquid Assets” public awareness campaigns - the need for federal grant and loan assistance to address the \$540b price tag JUST for repairs and upgrades focuses our attention. But our focus has to be on the right system, in the right location, for the right reason, at the right price.

See <http://www.liquidassets.psu.edu>



And <http://www.waterislife.net>

In 2008, Onsite Wastewater hosted a public showing of “Liquid Assets” in Traverse City and underwrote its broadcast on Central Michigan University Public Television.

We will continue to make public education activities available. The Podcast of Valerie Nelson’s presentation from the “Liquid Assets” event is available from our web site.

NEW FEDERAL FINANCING DIRECTIONS: DECENTRALIZED WATER RESOURCE INFRASTRUCTURE by Valerie I. Nelson, Ph.D.

[Coalition for Alternative Wastewater Treatment 2008 \(On CD as o4DEC5WPFfinancing.pdf\)](#)

US Environmental Protection Agency (EPA)

Provides funding to small communities for the planning, design and construction of wastewater infrastructure and for water pollution control through the following programs located at: www.epa.gov/owm/mab/smcomm/grants.htm

Small Communities

Clean Water State Revolving Fund – provides grants to all 50 states and Puerto Rico to operate a revolving loan program that provides low-interest finances for wastewater and other water quality projects - but only for publicly owned projects.

An EPA Manual of how to properly assess and set rates is available [on the CD as final_ratesetting_guide.pdf](#) Though aimed at water system rate assessment, the principles apply equally to wastewater.

- [Nonpoint Source Program \(Section 319 Program\)](#) - Provides grants to States, territories, and Indian tribes to support a wide variety of activities (including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring) to encourage State and local efforts to reduce non-point source pollution. <http://www.epa.gov/owow/nps/funding.htm>
- [Small Communities Water Technical Assistance and Financial Resources](#) - A list of technical assistance and financial resources for small water and wastewater systems. <http://www.epa.gov/compliance/assistance/financing/water/water-smallcommunities.html>
- [Sustainable Infrastructure Initiative](#) - Information resources to help utilities implement better management practices, efficient water use, full-cost pricing of water and a watershed approach to protection. <http://www.epa.gov/waterinfrastructure/>



Other Federal Agencies

- [Department of Housing and Urban Development Community Development Block Grant Program \(CDBG\)](#)
- [USDA Rural Development Water and Environmental Programs](#)

As of the February 2009 publication of this document, additional funding to address water and wastewater infrastructure repairs is proposed by a one time 'stimulus' package which will be targeted to States SRF programs.

SRF does not address repair, replacement or consideration of onsite technology as part of an overall wastewater management plan. In a time of shrinking municipal and individual budgets, when research and technology offer viable alternatives, this report seeks to urge, strongly, consideration of our mission:

To increase awareness that water quality is directly linked to the use of appropriate wastewater systems and their management.

The information contained in, or referenced by this Report is subject to governing copyright as noted in relevant citations.

All data referenced from public or government funded entities is permitted for free use.

For further information please contact:

Dendra J. Best, Executive Director
Onsite Wastewater of Northwest Michigan 501(c)3
PO Box 792, Traverse City, MI 49685-0792
(231)233-1806 secretary@michigan-onsitewastewater.org www.onsitewastewater.info

Mathias McCauley Associate Director
Regional Planning & Community Development Northwest Michigan Council of Governments
2194 Dendrinis Drive, Traverse City MI 49684
231-929-5000 mccauley@nwm.cog.mi.us www.nwm.org and www.nwmcog.org