

ERCOL-WPIT Septic Subcommittee: Report on Year One

I. Introduction

In 2016, Tip of the Mitt Watershed Council published an Antrim County version of the Septic Question Report, found here: https://www.watershedcouncil.org/uploads/7/2/5/1/7251350/septic_question_report-antrimweb.pdf. It can also be accessed from the home page of the Watershed Council: www.watershedcouncil.org. That publication was followed by local presentations, which generated interest from several groups and individuals, including many partners in the Elk River Chain of Lakes Watershed Plan Implementation Team (ERCOL-WPIT). At an ERCOL-WPIT meeting, it was decided that we should create a subcommittee devoted to this important and complicated topic. This document is a report on what that subcommittee has done, so far, after seven meetings held during 2016-17, and much discussion and consideration.

Current subcommittee members include:

Dean Branson, Three Lakes Assn (TLA)
Christine Crissman, The Watershed Center Grand Traverse Bay (TWC)
Tina Fields, TLA
Scott Kendzierski, Health Department of Northwest Michigan (HD)
Bob Kingon, Elk-Skegemog Lakes Assn (ESLA)
Charlie MacDonald, local volunteer
Becky Norris, TLA
Grenetta Thomassey, Tip of the Mitt Watershed Council (TOMWC)

Steve Young, Intermediate Lake Assn (ILA), will join our committee in spring 2018, when he returns from Florida. Fred Sittle, Friends of Clam Lake (FoCL), has worked with us and remains interested, but cannot commit to every meeting. Dave Peterson, Helena Township Clerk, also contributed to a few meetings, but cannot commit to future meetings, either. Additionally, we had contributions to early discussions from Tom Clement, Antrim Conservation District (ACD) and Keith Termaat, of Township Neighbors Network (TNN), which were appreciated. Torch Lake Protection Alliance (TLPA) is included on the subcommittee email list and they are also following our work with interest.

SUBCOMMITTEE OBJECTIVES

- 1. Identify problems related to the meta-septic process, including technical and policy points, and prioritize them for environmental impact*
- 2. Identify causes of nutrient pollution from septic systems and examine potential solutions, including both mechanical and biological*
- 3. Develop an action plan to resolve priority problems, starting with a pilot project to obtain documentation of septic systems for each parcel in Milton Township without a record on file at the Health Department*

It is important to note that the committee must take parallel tracks into account, when thinking of effective treatment of wastewater, on site. The first track is mechanical, meaning the siting, design, construction, and installation of septic systems. The second track is maintenance of the septic system, once it is installed, to ensure it performs as expected and keep it in good repair, to ensure system longevity.

As noted in the Septic Question report, Michigan is the only state in the nation with no legal requirement for anyone to look at these systems, after they are installed. The Appendices to this report include research to examine what is being done in other states, to learn about what is possible and what might be a good policy approach for Michigan. Additionally, a conversation is beginning in Lansing to address both of the parallel tracks regarding septic systems. This subcommittee is also working to make sure our local voices are represented in that discussion about statewide changes to septic system oversight and regulation.

This report summarizes presentations to the subcommittee, key research considered, and the actions taken by the subcommittee, so far. It also outlines plans for upcoming work. Finally, there are four Appendices, which are referred to in the report:

- A. State Septic Code Examples – covers Connecticut, Iowa, Minnesota, Pennsylvania, and Wisconsin
- B. State Research: Follow Up – answers follow-up questions submitted by the ERCOL-WPIT Septic Subcommittee regarding the State Septic Code Examples document
- C. State Septic Code Funding Examples – covers the same five states, but digs deeper into the funding aspects of each example
- D. State Sanitary Code Tech Recommendations Letter #1 – submitted to the Governor/DEQ, Michigan League of Conservation Voters, and Michigan Environmental Council to contribute our subcommittee recommendations, as the conversation begins in Lansing about creating a statewide sanitary code, which would include required maintenance steps.

II. Presentations and Research

More extensive details about everything noted below are included in the subcommittee meeting notes. If you contact any subcommittee member, we can arrange for you to review past meeting notes, or receive future meeting notes, if you like.

This section of the report will cover presentations and research considered by the subcommittee, which we scheduled to further objectives 1 and 2:

1. *Identify problems related to the meta-septic process, including technical and policy points, and prioritize them for environmental impact*
2. *Identify causes of nutrient pollution from septic systems and examine potential solutions, including both mechanical and biological*

- Presentation and follow up email discussions: Fred Sittle

At our second meeting in January, Fred Sittle presented the following technical points to consider:

- The first focus should be on design and performance of new systems, followed by homeowner education and inspection of existing systems.
 - o In Milton Township in 2016, there were more permits for new systems than there were Time of Transfer (TOT) inspections. Addressing problems with design and performance of new systems will make a greater immediate impact than inspecting old systems.
- Some problems we face are: failures are impossible to predict; active failure can persist for long periods of time; and there is very little chance of quantifying how many nutrients are actually getting into lakes. So, instead, we should establish a way to measure system performance.
- The health code considers soil permeability, which implies the design intent of a system is uniform effluent application. However, some current designs make uniform distribution impossible. Gravity and pump back systems have no design execution of design intent when it comes to uniform distribution. A low pressure system is engineered specifically for even distribution. Low pressure systems are easy to check for failure because there is a specific pressure to test for.
 - o An ordinance that called for systems to maintain uniform distribution at all times on sites within 500 feet of a lake would require homeowners to use low pressure systems. This would result in aligning system performance with home values and environmental sensitivity.
- As far as inspection of current systems, we should promote inspection on the basis that it has the ability to prevent failure. The focus should be on preventing ponding and runoff into the lake, and inspections can function as a preventative measure.

- In general, systems do not fail or cause homeowners problems. This means homeowners don't perceive a problem and are not receptive to policy change. If homeowners recognize the issues with their system they may be more receptive to bigger change, and we should advocate for larger code changes as opposed to incremental steps.

Subcommittee Comments:

- o Clogs in systems preventing uniform distribution, or causing ponding, could be clogs in the aggregate and not necessarily in the pipes or the system. Also, observation points in the field give a way to see the progression of an eventual failure.
- o Legacy systems are an issue that needs to be dealt with, so any code that deals with new systems will also need a way to address problems with legacy systems.
- o Currently any sensitive site (high water table, etc.) that requires a mound system also requires a low pressure system.
- o Can we see some science that backs up the assertion that gravity and pump back systems make uniform distribution impossible?
- o The committee could use a known local neighborhood group inspection experience as an example to advocate for inspections. Scott also knows of another neighborhood with a similar voluntary inspection system.

After this interesting and relevant discussion, we decided to continue along these lines. We created a Discussion Guide for the next meeting, held March 3. The subcommittee asked Fred:

- What does requiring increased isolation distances for new and replacement system installations actually look like?
- How do we require advanced system technology, while phasing out distributed systems?
- Who are the potential winners and losers, with such a change?
- And what exact action compels this to happen, in a township or the county?

Below are answers from both email and discussion.

BACKGROUND

Septic code provides for three types of permitted systems:

1. Conventional (gravity)
2. Mound with pressure distribution
3. Advanced Treatment

Each system has an increasing level of function. The code stipulates the system and function level based on the **vertical** separation distance between the natural ground surface and the seasonal high water table, ordinary high water mark or limiting soil condition.

- All system types are designed to be open systems, which release effluent and nutrients directly into the environment by applying it to an area of soil.
- Systems rely on the local soils and site conditions to retard movement of nutrients toward nearby waterways.

HORIZONTAL DISTANCE TO WATERWAYS

- Dependency on site conditions makes it is difficult to justify a further general increase of isolation distance.
- Important precedent can be established by requiring increased system function when locations are close to waterways.
- Required level of function should be based on **horizontal** separation from a waterway, in addition to the vertical separation to seasonal high water table or limiting soil condition.

PRESSURE DISTRIBUTION

- Can be used independently of mound systems
- Condemnable failures are due to loss of function to uniformly apply effluent.
- Only distribution method required to be designed to apply effluent uniformly.
- Can be inspected for uniform application to prevent surface ponding and nutrient runoff to nearby waterways.
- Minimum function to protect waterways from failing systems.

COST OF PRESSURE DISTRIBUTION NEAR WATERWAYS

- Requiring increasing function over time narrows gap to municipal systems.
- Low cost of conventional systems provides opportunity for modest increase.
- Aligns cost with real estate valuation.
- Added cost limited when distribution is higher than outlet baffle.
- Cost of design review can be eliminated if health department designs system.
- Standardization provides additional cost efficiencies.

INSPECTION OF EXISTING SYSTEMS

- Factors that determine nutrient plume migration are soil type, vertical separation to water table, groundwater flows, and proximity.
- Oversight is focused on permitting new and replacement systems because once a system is installed, site conditions cannot be changed.
- Inspection requirement must be aligned with risk to health and environment.
- Inspection must include pass or fail elements which occur frequently enough to justify public burden.
- Sludge level inspection meets risk, pass or fail and frequency requirements.
- Sludge level determination adds value by extending service life and eliminates cost of over-pumping and excessive sludge disposal.
- Additional inspection can be performed at time of sludge determination.

OTHER IDEAS

- Improve formal documentation of water table determinations. Resolve unrealistic differences between adjacent systems.
- Intentionally circumventing septic code creates public risk so fines and punishment should be involved.
- Local zoning should discourage overuse of existing systems.
- Advocacy directed at County commissioners sitting on the septic board.
- Partner on pilot projects to evaluate alternate system technology in actual field installations; possible cost share on high risk systems found during TOT.
- Assist health department transfer paper permit records to compute system.

- [Presentation: Keith Termaat, Pres. TNN – Township Neighbors Network](#)

Keith sent a paper to the subcommittee to read before the second meeting. The goal of the paper was to use scientific data to determine where failures are taking place in the meta-septic system.

In Keith's neighborhood there was land application causing high E. coli counts, and when the local land application stopped, E. coli counts slowly came down. The reports referenced in Keith's paper cite a .3-1% failure rate for the 10 counties in Health Department #10. Since the TOT ordinance, Milton Township has had a .67% failure rate. In 2010, the EPA estimated a 10% failure rate nationwide and other government agencies have estimated it at 20%. Keith asserts that rates are greatly overestimated and moving forward the committee should refer to the studies cited in the report and accept the failure rate of .3-1%.

Another study cited shows that nutrients move very slowly towards the lake, and wave action along the shore might even cause nutrients to never reach the lake. The point is that nutrients from septic systems move slowly, and we need to look at a larger area including critical dunes and lakeshore properties requiring large setbacks to figure out if nutrients are even making it to the lake.

The main points and suggestions moving forward are:

- stipulate to the .3-1% failure rate
- initiate 3 to 5 septic maintenance projects involving a knowledgeable pumper to coach homeowners
- identify areas in Antrim County with a high water table causing hydraulic system overload, and
- assess the benefits of a county wide ban on land application of septage

Subcommittee Comments:

- E. coli can occur well above the full body submersion standard, even in remote areas where no septic systems or land application occurs.
- There is a state report that combines all health department actions with regard to failed septic systems. The state has not given proper guidance as to exactly

how to determine the reason for a failure, so these reports may not be the best source for septic tank failure.

- The committee needs to agree on a definition for failure. Not to say that the health code definition is wrong, but the committee should acknowledge problems with septic tanks that may not count as failures reported by the health department.

- Follow up research: Charlie MacDonald

Charlie MacDonald did some follow-up research regarding Keith's recommendations. In this section, "health department" refers to the Health Department #10 report that Keith cited.

The health department report only considers sewage found on the surface of the ground, and/or backups into homes as "failures." This overlooks many other ways a septic system can fail to work properly in order to protect water quality. From our conversations with septic installers, brand new tanks that have holes and cracks, and installers failing to patch weep holes, are both issues that will cause a brand new system to now work properly, but will not cause a backup in the home and depending on the soil, will never cause sewage on the ground surface. The narrow scope of what the health department considers a "failure" may be one reason why the reported failure rate is so much lower than the estimated national average.

The health department report found that most failures were occurring in tanks of 1000 gallons or less. This finding is consistent with the assertion that malfunctioning systems are going undiscovered, unreported, or both. A system with a large tank, particularly one used by seasonal residents, will have a larger margin of error for failures like backups and spillage onto the ground surface. A large tank with a slow leak, or failure between the tank and the drainage field, will be much more difficult to detect and may take years to cause a backup or surface spillage.

The health department report attributes the low failure rate to the large amount of seasonal residents, and proper soil conditions for septic systems throughout the area. The fact that the report fails to consider that the low failure rate is due to lack of reporting or availability of adequate data should be a red flag. The large amount of seasonal residents may mean systems are less likely to be overloaded, but it may also mean failures like leaks in tanks become more difficult to detect. Also, Michigan is the only state without a statewide code. It is entirely possible that the EPA estimated failure rate is more accurate than the .3-1% rate found in this report, due to the fact that other states require greater oversight and therefore find, report, and fix more failed systems.

The health department report breaks down the main reasons for failure as 22% design/installations, 48% maintenance, and 27% usage concerns. In conversations with septic professionals, they have expressed concerns over septic systems being

installed that will not work properly, as installed. The health department report identifies 3 main areas of concern for failures, and by far the largest percentage of failures occur due to maintenance issues, and the smallest percentage is due to design/installation issues. These numbers may be misleading for several reasons. One, no follow up is required when a system is installed. If a failed system does not have noticeable problems for several years, then it may be misdiagnosed as a maintenance issue instead of an installation issue. Also, tanks in well-draining soils, with seasonal usage and a slow leak may never have visible symptoms of failure, and a design/installation issue will never be reported or discovered. Therefore, design/installation issues may have a lower probability of being discovered or diagnosed properly, and not necessarily represent a lower occurrence of failure.

The health department report identifies a lack of quality reports with respect to causes of septic system failures. Although the health department report draws conclusions as to what types of failures, and how many failures occur in the district, the report also concludes that many of the reports of failed systems were lacking in quality as to the reason for failure. The report states that the section for causes of the failure were often "casually and poorly completed" and in more than one county, every single report listed the same reason for failure despite conditions that were "very different". Without proper information it is highly probable that causes of failure exist that are not identified properly by the health department report.

Conclusion: Keith suggests that moving forward the committee stipulate to a .3-1% failure rate of septic systems in Antrim County. Based on the previous comments I do not think that stipulating to this failure rate is either accurate, or helpful to the goals of the committee. Keith's other suggestions are good, and a ban on land application may be the low hanging fruit in this situation, but stipulating to such a low failure rate could hinder the ability for this committee to advocate for local government action regarding on-site septic systems.

- *Research: Land Application, Charlie MacDonald*

To further educate the committee on this item, Charlie did additional legal research into the topic and presented a PowerPoint on the specifics. If you want to see this PowerPoint presentation, just let us know and we can forward it to you. Land Application is intensely regulated, but there are causes for concern. In 2018, we will also contact MSU researchers working on this issue because they expected to do additional research over summer 2017 regarding Land Application.

One of the key suggestions from Keith was to assess the benefits of a county wide ban on land application of septage. Here is a summary of the presentation on the ban in Grand Traverse County:

- Presentation covers the law and some political history in the area regarding septage land application

- Two types of products applied to land are biosolids and septage, each with their own legal definitions and rules.
- Federal part 503 rules cover all disposal including land application, incineration, and landfill disposal. A 2002 review found that “there is no documented scientific evidence that the Part 503 rules have failed to protect public health. However, additional scientific work is needed to reduce persistent uncertainty about the potential for adverse human health effects from exposure to biosolids”.
- Part 117 is the state rules for septage, and are more restrictive in certain situations, such as calling for septage to be incorporated into the land after surface application under certain conditions.
- In the 1990’s, concern over land application in GT county lead to the construction of a septage receiving facility and a ban on land application
- After several lawsuits, and revisions to state law, the law now requires that a local unit of government may only ban land application within the service area of a septage receiving facility
- Pumpers will usually be able to choose which receiving facility they use; however, the state law allows for local governmental units to require the use of a certain facility if it meets certain debt requirements
- Exemptions also exist for pumpers with storage facilities and land application permits outside of the banned area
- Antrim County is within the service area of the Bullseye receiving facility located in Mancelona
- Several other counties around the state have banned land application in response to environmental concerns, and have provided examples of both innovative receiving facilities, and beneficial use through natural gas sourced electricity at an on-site plant paired with a landfill.

- *Research: what is happening in other states?*

Before creating the Septic Question reports, Grenetta Thomassey looked into septic system regulations to see what is done in other Great Lakes states and elsewhere, and whether other examples could be useful for Michigan. She reviewed over 25 different states and noticed a pattern of inspection and mandatory pumping regulations. Only a few states were included in the Septic Question reports, but Thomassey found additional basic information about several other areas.

Most state sanitary regulations that allow for on-site wastewater treatment systems also require some kind of maintenance, once systems are installed. As the conversations continued in our subcommittee, Thomassey’s summer intern, Jay Dutcher, assembled

more detailed information about a few more states. That report can be found in Appendix A, *State Septic Code Examples*.

Once that information was provided to the Septic Subcommittee, members had some follow-up questions. Dutcher provided answers, and the *State Research: Follow Up* document can be found in Appendix B. Additional discussions led to Dutcher and Thomassey delving further into the same five states, with a focus on relevant funding solutions. The *State Septic Code Funding Examples* document is in Appendix C.

III. Actions Taken

This section is devoted to Actions taken, to further subcommittee objective #3:

3. Develop an action plan to resolve priority problems, starting with a pilot project to obtain documentation of septic systems for each parcel in Milton Township without a record on file at the Health Department

- Action: Milton Township Pilot Project

The single biggest finding from the Milton Township Time of Transfer septic inspection ordinance, adopted in 2012, was that 23% of the inspected systems had no record on file at the Health Department. Additional research found that of the 3080 parcels in the Township, 1870 did not have information on file. After much discussion, the subcommittee asked the Watershed Council to produce a map showing the parcels in the Township with missing documents, for the purpose of deciding if we should attempt to get documentation from property owners, on a voluntary basis using a Pilot Project mailing effort.

The Health Department felt that any additional information we could find would be very helpful. Additional points made included: having complete information about septic systems is beneficial when evaluating and managing regional water quality and wastewater issues. Also, having records and information on file could expedite health department services, and/or assist property owners in planning for future development activities. It was decided to proceed with the project.

This Project had no regulatory or enforcement actions connected to it. Participation was completely voluntary. The Watershed Council worked with the county to get a list of addresses for the parcels with missing documentation. Once obtained, we excluded the parcels with information on file at the health department, and then excluded all federal, state, or locally-owned public lands. We also eliminated duplicates for farms and businesses so that they would only get one piece of mail from us. Any home or business with missing information should have gotten a copy of a mailing from our Subcommittee Pilot Project.

We put together a letter from the Health Department of Northwest Michigan and local partners on the project: The Watershed Center Grand Traverse Bay, Tip of the Mitt Watershed Council, Elk-Skegemog Lakes Association, Three Lakes Association, and the

Torch Conservation Center. From early August through October, property owners in Milton Township responded to letters in the mail, asking for their help with septic system information.

We mailed out 1101 letters and hoped for a return rate of at least 10%, which would be good for a raw survey such as this, with nothing more than a single communication to the target audience. We had 102 letters returned, 9%. As promised in the letters, a drawing was held for the names of citizens who participated and the winners are Robert and Sally Epskamp. The Epskamps were sent prizes donated from Short's Brewery: two pint glasses, a bottle opener, and a \$75 gift card for the Short's Pub.

- Action: *Recommendation Letters to the State*

Because conversations are now happening in Lansing to discuss the need for a statewide sanitary code, the subcommittee put together the first in what we expect will be a series of letters to the state; specifically, to the DEQ and the Governor. That letter can be found in Appendix 4.

IV. Upcoming Work

This subcommittee seeks to ensure that septic system performance provides the public health and water resource protection required for our communities. We have good water quality Up North, but we are also under development pressure that is expected to increase, over time. That expected growth should be accompanied by common sense protections, taking effective local steps to ensure septic systems are working properly and protecting local water resources.

For our next steps, the subcommittee is forming a Technical work group to do a demonstration project locally that will help us better understand local impacts. This will take all of the presentations we heard, and all of the discussions we had, and attempt to fulfill Subcommittee Objectives 1 and 2. To further Subcommittee Objective 3, we are also creating a Frequently Asked Questions (FAQ) document for the general public. We will also send additional recommendation letters to the state, as the Lansing conversation unfolds. Finally, we will take additional actions, based upon upcoming work and discussions.

V. Appendices

The appendices are being provided in separate attachments:

- A. State Septic Code Examples – covers Connecticut, Iowa, Minnesota, Pennsylvania, and Wisconsin
- B. State Research: Follow Up – answers follow-up questions submitted by the ERCOL-WPIT Septic Subcommittee regarding the State Septic Code Examples document

- C. State Septic Code Funding Examples – covers the same five states, but digs deeper into the funding aspects of each example
- D. State Sanitary Code Tech Recommendations Letter #1 – submitted to the Governor/DEQ, Michigan League of Conservation Voters, and Michigan Environmental Council to contribute our subcommittee recommendations, as the conversation begins in Lansing about creating a statewide sanitary code, which would include required maintenance steps.