THE LITTLE DIGGER

MOWA minnesota onsite wastewater association

August/September 2016 - Vol. 31, Issue 4

A bi-monthly publication

Tragic Reminder of Importance of Tank Lid Security

By Nick Haig, Minnesota Pollution Control Agency - Certification and Training Unit

In this Little Digger

A 22 month old toddler was recently rescued, lifeless, from the bottom of a septic tank near Two Harbors, Minnesota. He was airlifted to the hospital, but passed away hours later from what are believed to be complications from the fall. This tragedy has been difficult to process for those of us in the septic system industry. I have spoken with many professionals that have expressed shock, sadness, heartbreak, and grief. Perhaps it hits so close to home for many of us because we have families, children, nieces, nephews, and neighbors that we care for deeply and would be devastated to find fallen to a similar fate. We see septic tanks every day and have observed outdated, dilapidated, or otherwise insecure tank access. We also recognize that tank lids age, and a scuff does not warrant an expensive riser and maintenance hole replacement. Every day we face the challenges presented by running a business, meeting the code, and doing right by our customers and clients.

While certain situations are more obvious than others, every situation is different, and it can be difficult to judge the risk to public health when assessing the condition of a maintenance hole. Most of our onsite encounters are not in an official capacity to assess the system's compliance status – just to pump the tank or troubleshoot a problem or consult with a client. What is our responsibility to say something when we see a potentially dangerous situation? How insistent should we be that tank lids are secure when we leave a site? What does secure mean?

This article intends to identify the risks, responsibilities, and requirements when you see a potentially dangerous situation. Hopefully it will provoke some thought about how you can position your business to minimize risks and maybe prevent a tragedy like this from ever occurring again. I want to be clear that little is publicly known about the events that led to this tragedy, and it has been called "accidental in nature" by first responders. But, I also want us to acknowledge that we, as septic professionals, are more likely than the general public to observe a potential safety hazard, and we should be prepared to address this risk every day of our lives.

Tanklid Safety, *Continued on Page 8*

Safety Training - Friday, September 30th in St. Cloud - Open To All!

From MOWA's Executive Director

By Pat Martyn, MOWA Executive Director

Sign-Ups Still Available for Low-Cost Safety Training in St. Cloud

With this issue of the Little Digger, we are pleased to announce that the MPCA has awarded a total of 8.00 CEUs (2.00 Direct and 6.00 Related) for the upcoming Safety Training being held in St. Cloud on Friday, September 30th. There is still room to sign-up for this low-cost Septic Industry Specific Safety Training. This all-day event is oriented to Service Providers/Operators, Inspectors, Designers, Maintainers, Installers and Regulatory staff working in and around sewage and wastewater treatment systems. The program is open to all interested parties for a fee of $30.00. See pages 4-5 of this issue for details and registration.

Annual Tony Ruppert Scholarship - Awards

We are also pleased to announce that our Outreach Committee has awarded four scholarships to applicants for the 2016 Tony Ruppert Scholarship for a total award of $4,500. Each year, MOWA gives away up to $5,000 in scholarship money. These funds are raised at the auction held at our Convention each winter and are available to high school graduates who will be enrolled as full-time students in post-secondary undergraduate education. Winning essays are published in this and future editions of the Little Digger.

Annual MOWA Convention is being held in Duluth, January 30 - 31, 2017

We are back in Duluth for the 2017 Convention! The Convention location is in the heart of Duluth at the Duluth Entertainment Convention Center. This year, we will be staying at a brand new resort, Pier B, a short walk from Canal Park. Many of you will be glad to know that Pier B will be offering free shuttle service to/from the DECC and Canal Park from 7:00 am to 11:00 pm. The resort also features a restaurant, indoor pool, and free parking and wifi. Check it out at: http://www.pierbresort.com/

The Convention Committee has been hard at work for months planning this event, and has put together a stellar program, with a few fun surprises.

Office Changes

Finally, we'd like to let you know that Sue Martyn has retired. Many of you know Sue from her tireless work at MOWA events and her work behind the scenes working on the Association's bookkeeping duties. This transition has been in the works for a while, with Carla taking over Sue's duties, and we are sure you join us in wishing Sue the best. With this office change comes an address change. New contact information can be found on the bottom of this page.

We look forward to seeing you soon, in St. Cloud or in Duluth – or both!

There is still room to sign-up for this low-cost Septic Industry Specific Safety Training.

The is a bi-monthly publication of the Minnesota Onsite Wastewater Association.

Editor: Carla Tourin **E-mail:** MOWAcarla@aol.com

The articles printed in the publication do not necessarily reflect the opinion of this organization. Readers are encouraged to respond to the articles with their own points-of-view. We welcome industry-related comments or articles. Information or inquires should be sent to any of the following: MN Onsite Wastewater Association, MOWA, 5021 Vernon Ave, So., Suite 241, Edina, MN 55436 Phone: 612.801.5897 Fax: 952.487.4447 Website: www.mowa-mn.com

Minnesota Onsite Wastewater Association (MOWA), in association with the University of Minnesota OSTP, is pleased to announce

Septic Industry Specific Safety Training

Friday, September 30th, 2016

8:00 am – 5:00 pm

(Registration starts at 7:30 am)

◆ St. Cloud MnDOT Headquarters ◆

3725 – 12th Street, No. (Lower Level) ◆ St. Cloud, MN 56303

(http://www.dot.state.mn.us/d3/graphics2/tostcoffice-www.pdf)

The class is oriented to Service Providers/Operators, Inspectors, Designers, Maintainers, Installers and Regulatory staff working in and around sewage and wastewater treatment systems.

Construction Focus Four Training - 6 hour program

This program is a septic system industry specific training that is intended to raise worker awareness of the OSHA Construction Focus Four hazards in the Onsite Industry. The course also helps workers and employers develop and use root-cause analysis tools to identify and mitigate exposures to workers in the Focus Four categories:

- Opening session: 1.5 hours
- Falls – 1.5 Hours
- "Caught in" or "Between" – 1.0 Hours
- Struck-By – 1.0 Hours
- Electrocution – 1.0 Hours

Hazard Assessment, Mitigation and Training for Workers Exposed to Residential Sewage – 2 hour program (Pathogens)

This 2 hour program is designed to raise awareness to safe work practices, evaluation and selection of personal protective equipment and key exposures to industry workers and owners that have frequent exposure to untreated raw human waste in their workplace.

Speaker Biography: *John Thomas has served as the Executive Director for the Washington Onsite Sewage Association for the last 15 years. He manages the NWOTC training center and the WOSSA online distance learning center that provides education to over 600 industry service providers. He is the lead instructor for safety related classes on Pathogen Exposure to Service Providers, Safety Management Principles for Small Business owners and also teaches Confined Space Entry and program development for the association to industry service providers. He holds a B.S. degree in Environmental Earth Sciences from Northern Michigan University.*

OPEN TO ALL INTERESTED PARTIES

8.00 Continuing Education Credits (2.00 Direct and 6.00 Related)

$30.00 per person (includes instruction, CEUs, lunch, and breaks)

Please visit our website for updated information: www.mowa-mn.com or call 1-612-801-5897

Minnesota Onsite Wastewater Association & The University of Minnesota OSTP

2016 Safety Training–St. Cloud, MN

Mail: MOWA
5021 Vernon Ave, So.
Suite 241
Edina, MN 55436
Phone: 612.801.5897
Fax: 952.487.4447

(visit our Web site updates @ www.mowa-mn.com)

REGISTRATION FORM

One form per person. Please copy for additional registrants

Name:_____ Organization: _____

Address: _____

Phone:_____ Fax:_____ E-mail:_____

Friday, September 30, 2016

8:00 AM – 5:00 PM (registration starts at 7:30 AM)

St. Cloud MnDOT Headquarters

3725 – 12th Street, No. (Lower Level) ◆ St. Cloud, MN 56303

(http://www.dot.state.mn.us/d3/graphics2/tostcoffice-www.pdf)

Open to All Interested Parties!

This program is a septic system industry specific training that is intended to raise worker awareness of the OSHA Construction Focus Four hazards in the Onsite Industry. The course also helps workers and employers develop and use root-cause analysis tools to identify and mitigate exposures to workers in the Focus Four categories. This 6-hourprogram is followed by a Hazard Assessment, Mitigation and Training for Workers Exposed to Residential Sewage – 2 hour program (Pathogens).

8.00 Continuing Education Credits (2.00 Direct and 6.00 Related)

PAYMENT: TOTAL COST $30.00

Cost includes instruction, lunch, and breaks

A. A check payable to MOWA is enclosed in the amount of $_____

B. Please charge the amount of $_____ to: ____ VISA ____ MasterCard ____ American Express

Name on card _____ **Signature** _____

Account number _____ **Exp. Date** _____

I agree to indemnify and hold harmless Minnesota Onsite Wastewater Association (MOWA) and MnDOT from any and all liability, loss, damage or expense from any incident that may arise while attending any portion of the 2016 Safety Training. I authorize any photos taken of me at this event to be published in MOWA's Little Digger and/or other MOWA-related promotional materials.

Signature: _____ Date: _____

For updated information, including how to become a MOWA member, please visit our website: www.mowa-mn.com

MARK YOUR CALENDAR!!

THE MINNESOTA ONSITE WASTEWATER ASSOCIATION

MOWA

PROUDLY ANNOUNCES ITS

2017 ANNUAL CONVENTION AND EXHIBITOR SHOWCASE

JANUARY 30TH–31ST, 2017

DULUTH ENTERTAINMENT CONVENTION CENTER (DECC)

350 Harbor Drive, Duluth, MN 55802
http://www.decc.org/

Contact MOWA for details:

MOWA
5021 Vernon Ave, So.
Suite 241
Edina, MN 55436
612.801.5897

mowacarla@aol.com / www.mowa-mn.com

Tank Lid Safety, *Continued from Page 1*

Risks

Tank access covers come in a variety of materials and styles – each of which has a designed method for preventing unwanted access. Some lids need to be locked, bolted, or screwed. The sheer weight and configuration of concrete lids is usually enough of a deterrent to prevent accidental or casual entry. It isn't only weak or damaged maintenance hole covers at the surface, like the ones seen below, that present a safety hazard. Entire tanks and tank lids have collapsed under pressure in the past, which is one major reason old tanks must be properly abandoned.

Note the crack on the plastic tank cover on Page 1. Even if it is properly screwed in place—the crack introduces a structural deficiency that no longer makes it safe.

Look at the picture of the concrete lid on Page 1. You can see where the edges of the tank and riser lid have corroded to create a sloped edge. This lid can quickly become a "teeter-totter" or game for curious children with disastrous consequences.

The most important question you can ask yourself when assessing the safety or security of a lid is, "Would you let a child play on or near it?" If the answer is no, do something about it.

Responsibilities

Your responsibility to the owner, to the site, and to the local governmental unit depends on what you are doing on the site and what you discover when you are there. You can play it safe by answering the question, "Would I let a child play on and around this system?" There are three levels of responsibilities:

1. **Notification** - professionals have an obligation to report their observations to their customers. Never underestimate the impact of the information you share. Educating your customers about the critical importance of tank lid safety may prevent a tragedy. Maintainers must communicate the status of maintenance hole access in their report to the owner.
2. **Declaration** – inspectors must identify non-secure tanks as an imminent threat to public health and safety and report their findings to the system owner and local unit of government.
3. **Repairs** – the code requires that tank maintenance hole covers be sound, durable, and "secured" after maintenance. What constitutes secure and who is responsible for doing it is largely left to the professional, owners, and local requirements.

Tank Lid Safety, *Continued on Page 9*

Tank Lid Safety, *Continued from Page 8*

If you come across a septic tank cover that is not sound or durable, you should insist something be done about it. You can outfit your trucks with supplies and prepare your employees to address the most concerning situations before they even leave the site. DANGER or CAUTION stickers can double as a smart marketing tool when your phone number and website are printed alongside the notice. If an owner absolutely refuses additional measures, you can refuse to pump the tank and still charge a flat service fee. If you do perform the maintenance service, you must leave the tank cover in a durable and sound condition, which may mean replacing the cover. You should make your recommendations and any owner refusal very clear on your report to the system owner. You should also consider notifying the local unit of government when unsafe conditions exist.

Requirements

Chapter 7080 has always explicitly referred to "unsecured, damaged, or weak maintenance hole covers" as an imminent threat to public health and safety. It has also always required that the maintenance hole covers be left in a sound and durable condition, in addition to being "secured" after a tank is pumped. In the 2008 rule revision, the MPCA clarified what "secure" means for systems that were installed or have had tank access brought to grade after 2008:

Minnesota Rules Chapter 7080.1970, item D reads,
Covers for maintenance holes must:

1) *be secured by being locked, being bolted or screwed, having a weight of at least 95 pounds, or other methods approved by the local unit of government. Covers shall also be leak resistant; and be designed so the cover cannot be slid or flipped, which could allow unauthorized access to the tank;*
2) *have a written and graphic label warning of the hazardous conditions inside the tank;*
3) *be capable of withstanding a load that the cover is anticipated to receive; and*
4) *be made of a material suitable for outdoor use and resistant to ultraviolet degradation.*

The definition of "secure" depends on three primary factors:

1. The local SSTS program's definition of "secure"—different local standards apply to these requirements.
2. The date of system installation – the vast majority of systems in the state were installed before 2008, and are not required to meet the prescriptive standards above unless the access is raised to grade or other local requirements apply. **This never means it is acceptable to simply allow unsafe conditions to continue.**
3. The depth of cover – tanks installed prior to 2008 may continue to have below grade access, but these systems must never present a risk of collapse under pressure.

Minnesota Rules Chapter 7080.2450, Subp. 3, items C and D read,

C. After removal of solids and liquids from a system installed after the adoption of a local ordinance adopted after February 4, 2008, the maintenance hole cover must be secured as described in part 7080.1970, item D. Covers secured by screws must be refastened in all screw openings.

D. After removal of solids and liquids from a system installed before the adoption of a local ordinance adopted after February 4, 2008, maintenance hole covers must be sound, durable, and of adequate strength as specified in part 7080.1970, item D, subitem (3), and:

1) *be buried with a minimum of 12 inches of soil cover or, if the cover is currently at or above the ground surface or within 12 inches from final grade, be secured by a method that was deemed secure by the local ordinance that was in effect before February 4, 2008; or*
2) *meet the requirements of part 7080.1970, item D, if the cover is to be raised to be at or above the ground surface or within 12 inches from final grade.*

Tips

- Educate your customers about the critical importance of lid safety
- Be prepared – load supplies and prepare employees to address these situations
- Ensure primary restraint – do not leave a site with a maintenance hole that is not sound or durable
- Consider secondary restraint – if you aren't sure if it really needs to be replaced, consider some of the secondary restraints on the market.
- Be partners, and not adversaries, with your local program – work together to identify and address problems that pose real threats to people's safety.

Who ya gonna call? MPCA's Ombudsman program

Small Business Ombudsman program offers help with environmental issues

The Small Business Ombudsman is an independent entity responsible for reviewing environmental regulatory activities to ensure that they are fair, reasonable and appropriate for Minnesota's "small businesses" that have to comply with environmental regulations—independently owned and operated businesses with less than 100 employees.

This is accomplished by receiving and investigating complaints, mediating disputes, and representing small-business interests during rulemaking. The ombudsman also works with the Small Business Environmental Assistance Program to provide technical and educational assistance, and acts as a contact for small businesses looking for financial resources.

Assistance and resources

- Complaint handling
- 24 hr. Environmental Emergency Hot-line
- Small Business Environmental Assistance Program
- Small Business Environmental Improvement Loan Program and other financial assistance resources
- Annual report - Status of state and territory Small Business Compliance Assistance Programs (U.S. EPA)

Program priorities

- Assist small businesses with environmental concerns.
- Outreach and education for regulated small businesses.
- Simplify and reduce the complexity of the regulatory process for small businesses.
- Build partnerships with trade associations, business groups, economic development programs, and other small business assistance providers.
- Ensure environmental assistance is available to Minnesota small businesses that includes strong pollution prevention components.
- Help small businesses locate government and private financial assistance opportunities to protect the environment.

For more information, contact Mike Nelson, Small Business Ombudsman: 651-757-2121 or 800-985-4247

We've Moved!

Calendar of Events

MOWA Events

September 30, 2016— Safety Training – MnDot Headquarters – St. Cloud, MN (visit www.mowa-mn.com for details)

January 30 – 31, 2017—Annual Convention & Tradeshow – Duluth Entertainment Convention Center (DECC) (visit www.mowa-mn.com for details)

Industry Events

October 26-29, 2016—NOWRA 2016 Conference at The Nugget Hotel and Casino, Reno, NV (see www.nowra.org)

February 22 – 25, 2017–Water & Wastewater Equipment, Treatment & Transport (WWETT) Show – at the Indiana Convention Center (visit https://wwettshow.com/ for details)

2016 Tony Ruppert Scholarship 2nd Place Essay

Chlorides in Ground and Surface Waters

by Jenna Miller, Maple Grove, Minnesota, Tony Ruppert Scholarship 1st Place Winner

In Minnesota, an increasingly prevalent environmental problem is the presence of an excess of chlorides in ground water and surface waters. This excess causes a significant ecological imbalance, which is detrimental to the environment. There are two major sources of the chlorides. The first: the salt sprinkled on the roads during the winter to melt the ice. When the ice melts and turns to water, it takes the salt with it and it percolates into groundwater and surface waters. The second major source: water softeners used in households to reduce the hardness of groundwater used for household tasks and drinking. For many years, environmentalists and scientists have been trying to figure ways to resolve the unending cycle, but in order to craft a solution, the problem must first be understood.

Winters in Minnesota can be brutal, especially when it comes to road conditions. In the Twin Cities alone, approximately 54 inches of snow fall during the winter on average (Minnesota Pollution Control Agency, 2016). As a result of this, thousands of miles of roadways and highways must be maintained throughout the winter to provide safe driving conditions. To make the roads drive-able, road salt, primarily sodium chloride (NaCl), is used to melt the icy layer which forms on the road. While this process is effective, when the ice melts, the sodium chloride saturated water intermixes into water resources. The salt applied to roads in the winter is a major source of chloride in Minnesota's surface water and groundwater (Minnesota Pollution Control Agency 2016). The presence of chlorides in the surface water and groundwater produces a significant ecological imbalance, which is where the problem emerges.

In addition to road salt, water softeners are used in households to provide de-hardened water to use for drinking, cleaning, and other household necessities. The softened water is produced by a process called ion exchange within a water softener. Sodium chloride saturated polystyrene beads remove the magnesium and calcium ions from the water molecules, which are the elements that "harden" the water, and replace them with sodium chloride, which softens the water, making it useable (Klenck, 1998). This water is then used in households, and the waste is either pumped into a septic tank (for rural homes) or a municipal system (for city homes). In both cases, the sodium chloride saturated water from the homes travels into the environment, and the chloride is not removed from the water using conventional treatment methods, which is how the excess of chlorides ends up in surface and ground water (Minnesota Pollution Control Agency, 2016).

Knowing the two sources of the excess of chlorides in surface water and groundwater is only a small fraction of a step toward a solution. The real problem persists in bodies of water throughout the Twin Cities. Every city is held to a certain water quality standard. This standard evaluates waters which are polluted or impaired, sets limits on what can be discharged to surface water, and protects the water for overall health of the ecosystem which exists in and about the water (Minnesota Pollution Control Agency, 2009). The current standard for long term chloride concentration is 230 mg/L. Any body of water which exceeds this is considered a health concern to humans and animals alike. Samples from across the urban areas of Minnesota showed an increased level of chlorides

Chlorides *Continued on Page 13*

Chlorides *Continued from Page 12*

in lakes, wetlands, streams, and groundwater, and the high concentration projected an immediate call for attention to the issue (Minnesota Pollution Control Agency, 2016).

Too much chloride prohibits osmosis, which moves water molecules through cell membranes, which is essential to aquatic life. This stresses the plants, fish, and other organisms living in the water, and they eventually die. Although water quality is one of the major concerns of too much chloride, it also impacts multiple other aspects of the surrounding environment. Groundwater, one of the main sources of drinking water as relied on by 75% of Minnesotans, is also affected (Minnesota Pollution Control Agency, 2016). A recent study shows 30% of wells tested in shallow sand or gravel aquifers exceeded the standard of 230 mg/L. This is both dangerous and costly to fix. Plants alongside roads which are directly affected by deicing efforts take up salt through their roots and can be harmful as well. Another major concern which is often overlooked is salt's effect on infrastructure. Chlorides corrode road surfaces, bridges, reinforcing rods, concrete pavement, and more, which is extremely costly as well (Minnesota Pollution Control Agency, 2016). Overall, while chlorides are essential to human life and aquatic life in small amounts, accelerated amounts are both harmful and costly.

While the problem of an excess of chlorides in the environment still persists, action is being taken to try and provide a solution for the problem. One of the major sources of chlorides is road salt. As of 2014, 175 municipal agencies, mostly in the Midwest, are now using a mixture of a sugar-beet molasses based pre-treatment product which increases the road salt's capacity to melt the ice on the roads (Rhodan and Sanburn, 2014). This allows for less salt to be used, due to the fact that the molasses also makes the salt stick to the road and not bounce, which increases the efficiency of the road salt. This method has proven to be more environmentally friendly and cost effective (Rhodan and Sanburn, 2014).

Another solution that could be considered is evaluating the elimination of individual water softeners in urban areas, and instead have the city provide softened water to home. This would eliminate the use of water softeners in homes and decrease the amount of chlorides to a more controlled level in the waste water being expelled from the homes. Cities would need to upgrade drinking water treatment facilities to accommodate the softening of water and removal of excess chlorides created from that process. There still would be a significant cost for this treatment, however it would be better controlled and spread out over time through municipal financing.

Chlorides occur naturally in the environment, and are necessary to human and natural life, but in excess, they can be dangerous and detrimental to ecosystems and costly to remove. While the use of chlorides in homes and on roads is practical and useful, it is causing a major problem in its ability to imbalance entire ecosystems, damage concrete structures, and much more. In searching for solutions to the problem with chlorides, the answer is clear. The less we use, the more we save.

Works Cited

Klenck, Thomas. "How It Works: Water Softener." Popular Mechanics. N.p., 01 Aug. 1998. Web. 08 Aug. 2016. <http://www.popularmechanics.com/home/interior-projects/how-to/a150/1275126/>.

Minnesota Pollution Control Agency. "Twin Cities Metropolitan Area Chloride Management Plan." PCA MN, Feb. 2016. Web.

Minnesota Pollution Control Agency. "Water Quality Standards." Minnesota Pollution Control Agency. N.p., 16 Nov. 2009. Web. 08 Aug. 2016. <https://www.pca.state.mn.us/water/water-quality-standards>.

Rhodan, Maya, and Josh Sunburn. "How Beet Juice Is Helping Keep Roads Safe This Winter." Time. 10 Feb. 2014. Web. 08 Aug. 2016. <http://time.com/5761/salt-shortage-triggers-beet-juice-cheese-brine-alternatives/>.

2016 Tony Ruppert Scholarship 2nd Place Essay

Rising Sea Levels

By Zackary D. Boos, Annandale, Minnesota, Tony Ruppert Scholarship 2nd Place Winner

Today's world is faced with the ticking time bomb presented by rising sea levels. For decades , the Earth's oceans have been taking on water from its melting ice caps, and it is leading to some potentially fatal results. Ocean levels have been increasing at a rapid rate since the early to mid-1900's. If this continues, the global community could be faced with floods, the destruction of habitats, extinctions of certain species, and much more. The change in the climate is being ignored. This is a problem that is effectively being swept under the rug, and handed to future generations. However, the time left to take action is short and dwindling away.

While the Environmental Protection Agency and other green friendly organizations have made attempts to pull the human race together against this monumental world affair, they lack the following and passion to make real change happen. At the core of the irreversible damage being done to the great waters, is that the masses don't want to make a lifestyle change if it is inconvenient. It's been common knowledge for quite some time now that there are simple things that can be done to help the environment. Most have been taught the concept of, reduce, reuse and recycle.

People know that if they adjust their air conditioning to be less cool in the summer and dial down their thermostat in the winter, it would make an impact. Using public transit would make an impact. Still these changes are not being made by most simply for their own accommodation and comfort. The road blocks for the salvation of planet Earth, including the imperfections of human nature, as well as the root of the issue, are going to be identified in the next few paragraphs.

Earth's pardon from climate change induced devastation is being barred by the rapidly melting ice caps. These humongous chunks of frozen , yet defrosting, water contribute to rising sea levels and is caused by an overall increase in the global temperature (Bradford, 2014). Most scientists point toward carbon emissions as the cause for the warming. With the heating atmosphere, hotter water is produced, which causes a phenomenon called thermal expansion. Thermal expansion is the concept that when water gets warmer, it expands (National Geographic, 2016). There is more water, and it is bloating. This is where the rapid increase, which is causing the issue, is coming from. Estimates show fatal ends for many coastal cities in the world. This is where most of the populations sit. Many of them are predicted to be engulfed by the seas. China, India , and Bangladesh are among the most endangered. However, this is not only an issue for humans, it also has a devastating effect on wildlife. In the United States alone, hundreds of species, including seventeen percent of endangered species are threatened by rising sea levels (Doyle, 2013). Time will not be on our side if quick action as a united world does not occur. By the year 2100, New York City will have sea levels 2.3 feet higher. It will be 2.9 feet higher in Hampton Roads, Virginia, and over a meter in Galveston, Texas. The overall increase to our oceans will be as much as 3 feet (Wordland, 2016). The world as we know it will never be the same if monumental change does not happen.

Various efforts have been made to halt the issue of the sea levels. The United States government in 2014 introduced legislation that would require no more than 70 percent of its energy resources to be non-renewable (Phillips, 2014). The use of fossil fuels is massively destructive to the biosphere, and this attempt to curb the usage of it on such a massive scale would be very effective. The transition to clean energy is one of the most crucial aspects of saving the planet. The United States Government's Environmental Protection Agency (EPA) as well as less bureaucratic organizations actively do work to ease the issue. Regulations have been placed on factories and mills and similar workshops to reduce and clean their emissions. The EPA also regulates the pollution from automobiles (EPA, 2016). In 2015 , the United

Rising Sea Levels, *Continued on Page 15*

Rising Sea Levels, *Continued from Page 14*

Nations formed an accord called the Paris Agreement. This bill called for all countries involved to reduce their emissions to the point resulting in safer levels of a 2°c atmospheric increase with aspirations of reaching 1.5°C. Scientists agree that any more would lead to catastrophic floods, heat waves and droughts (The Guardian, 2015). This treaty, however, is not perfect. Although it is legally binding,there is no penalty for those who fail to meet its standards. Experts also claim that the limitations are too loose. With that being said, the Paris Agreement is still a historic milestone in saving the planet and may be what civilization needed to unite its people. The only answer to the global crisis is to band together to combat it.

In a world that is facing a potentially catastrophic future, it would only make sense that the citizens of that world would largely take precautions to stop or halt that catastrophe. However, in this reality, humanity is not doing much to help out its home. The reasons for ignoring monumental quandaries regarding the environment can be summed up into six categories. Uncertainty, mistrust, denial, under evaluating risks, lack of control, and habit. Scientific evidence shows that lack of belief in climate change results in far less environmentally friendly behavior. Research also has shown that people often do not acknowledge the warnings of risk from government officials or researchers. Perhaps the most dangerous of the list is the belief that one's actions are too small or will not make an impact (Main, 2009). These misconceptions regarding the state of the global environment are at the root of the problem. The disastrous change in the global condition, such as the rise in sea levels, is being swept under the rug by the human mentality of keeping everything the way it is, and pretending that everything is okay.

Rising sea levels is an issue that needs to be presented to the public in a much more urgent tone. The procedure for solving this problem is creating global unity. Time is running out. The citizens of Earth must first accept and acknowledge the issue at hand. With that milestone achieved, then work to reduce all kinds of pollution and as a result, cool the atmosphere, and stop the ice caps from melting incredibly fast. Public transit must be adopted and replace personal automobile usage. Cleaner forms of energy need to become the norm, worldwide. Not only are coastal lives and specific animals threatened, the world as we know it is threatened. More inaction will only lead to cities flooded , and lives torn apart. This plague caused by mankind, can only be stopped by mankind.

Works Cited

Bradford, Nick. National Environmental Education Foundation. Rising Sea Levels. https://www .neefusa.org/nature/water/sea-level-rise

EPA, 2016.Vehicle Standards and Regulations. https://www3 .epa.gov/otaq/standards .htm

Goldenberg , Suzanne 2016. Guardian. Paris climate deal: countries with about half of global emissions to join this year.https://www .theguard ian.com/environment/2016 /apr/25/paris-climate-agreement environment-climate-change-un

Main, Emily, 2010. Climate Access . 6 Reasons You're Ignoring Global Warming. http://www .climateaccess .org/sites/default/files/Main_6 %20Reasons%20Youre%20Igno ring%20Global%20Warming .pdf

National Geographic. 2016. Sea Level Rise. Oceans Levels Are Getting Higher Can We Do Anything About It? http://ocean .nationalgeographic .com/ocean/critical issues-sea-level-rise/

Phillips, Ari. May 14, 2015. Climate Progress. New Bill Would Ensure The U.S. Gets No More Than 70 Percent Of Its Energy From Non-Renewable Sources http://thinkprogress .org/climate/2015/05/14/3658190/senators -introduce-national renewable-energy-standard/

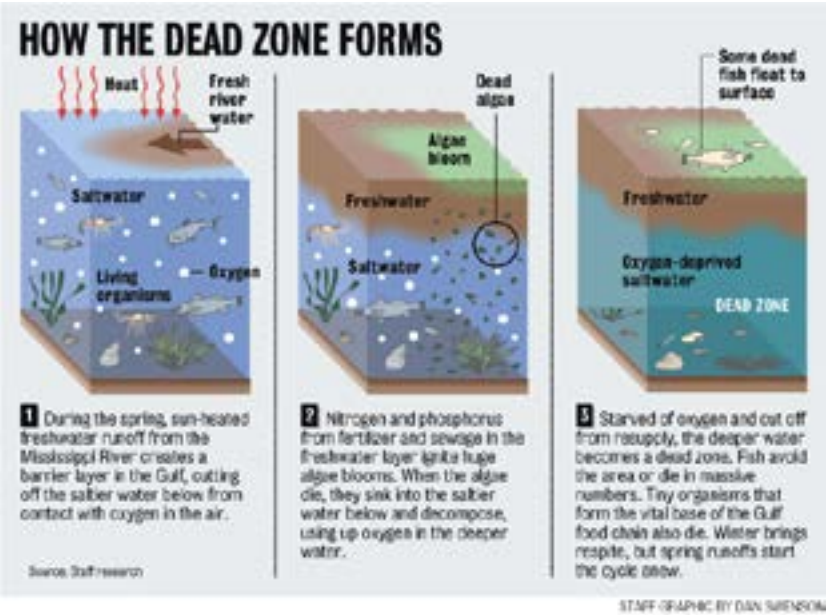
Rice, Doyle, Sea-level rise threatens hundreds of U.S. animal species USAtoday, Dec 11,2013 http://www.usatoday.com/story/weather/2013/12/11 /sea-level rise-threatened-endangered-species/3963339/

Worland, Justin. Time Magazine. 2016. See How Your City May Be Affected by Rising Sea Levels. http://time.com/4257194/sea-level-r ise-climate-change-miami/

2016 Tony Ruppert Scholarship 2nd Place Essay

Dead Zones

By Nicole Renier, Chanhassen, Minnesota, 2nd Place Tony Ruppert Scholarship Winner



Minnesota is the land of ten thousand plus lakes, countless ponds and a number of rivers, but something that is shocking is how little we seem to care about some of these water sources. Home owners feel the need to fertilizer their lawns to keep it green and looking healthy, but as they do it, they forget about keeping our water ways healthy. Farmers use fertilizers because it contains plant nutrients such as nitrogen, phosphorous, and potassium that keep their crops healthy and strong. But these things, when they reach bodies of water don't have the same positive effects. When we fertilize our lawns and when farmers fertilize their crops, all the fertilizer is not absorbed into the grass or crop, a large percentage of it is washed away by rain or soaked into the ground.

When fertilizer is washed away it goes into our surrounding water ways. In my neighborhood, we have three drainage ponds that in the spring and summer months (when people fertilize here) become coated with algae. This is known as an algae bloom, caused by pesticides, fertilizers and other agricultural chemicals, these make up a significant amount of our water pollution.

This is a concern because when algae blooms occur, it depletes the oxygen levels in the water. Aquatic animals need this oxygen to live and without it, the animals can no longer live there, when this occurs it is called a "dead zone". When large amounts of algae are produced, sunlight cannot reach the underwater plants that need this sunlight. If the plants aren't getting the sun light they need, they start to die off and the animals that depend on these plants as a source of food or, habitat, starve or are killed. When these things occur it negatively impacts the ecosystem greatly, making it hard to get rid of the dead zones and the large amount of algae. Dead zones are what this paper will be exploring; and how to limit and avoid the spread and start of them.

Some people may not see this as a large problem currently, because they use fertilizers with no phosphorus, but it is a problem. Even if fertilizer is put down at the appropriate time and the right amount is applied, a certain amount will reach water sources. The only way to really limit the amount of fertilizer reaching water ways is in "Reductions in fertilizer rates to decrease the amount getting off site."(McCarty) With the majority of people knowing that fertilizer has negative impacts on water resources, it still doesn't seem to make a difference. According to "The University of California Davis, reports that cropland is responsible for 96 percent of nitrates found in rural California water supplies. " (Palmer) Something needs to be done to lower the amount of nitrates in water supplies, "Excessive concentrations of nitrate-nitrogen or nitrite-nitrogen in drinking water can be hazardous to health, especially for infants and pregnant women. " (Oram) There are three methods to removing nitrates from drinking water: distillation, reverse osmosis, and ion exchange. But these methods are a lot harder to do on a pond or lake, than on a controlled water source like a city's drinking water.

Algae blooms aren't harmful to people the majority of the time, except for an occasional rash after swimming, or if you drink the water, but for fish and other animals the effects can be deadly. Dead zones occur because of less oxygen dissolving in the water. "One of the largest dead zones forms in the Gulf of Mexico every spring. Each spring as farmers fertilize their lands preparing for crop season, rain washes fertilizer off the land and into streams and rivers."(National Ocean Service) making these once teeming habitats biological deserts. No water source is immune, the places where they occur the most in the United States is the East Coast, the Gulf of Mexico, and the Great Lakes.

There are many practices that can reduce water pollution and slow the growth of dead zones. Fertilizer should be used sparingly and not near water's edge. Ten feet of buffer space should be left around all water sources. " Know application factors, such as grass species and soil type and permeability. Know exactly how much area (square feet) of your lawn the

Dead Zones, *Continued on Page 17*

Dead Zones, *Continued from Page 16*

bag of fertilizer is intended to cover." (St. Johns River Water Management District) Another way is to only use fertilizers with low amounts or no phosphates, organic fertilizers are highly recomended. Many cities are making it mandatory to use these kinds of fertilizers. When applying fertilizer read the directions on the bag "Using the correct amount of fertilizer can reduce the amount of pollutants reaching waterways, save water and money, and result in a healthier landscape. Over fertilizing can aggravate pest problems, stimulate excessive plant growth, and demand frequent irrigation." (St. Johns River Water Management District) By doing this you aren't just saving money but you are also reducing the amount of nitrite and phosphates that reach our water ways that flow into the Gulf.

Even though things are being done to limit the amount of pollutions entering our water ways, dead zones still continue to pop up every year. "Every summer a dead zone emerges in the waters along the Gulf Coast. Where oxygen is low, fish and others animals cannot survive. Currently the world has more than 400 identified dead zones, up dramatically from the 49 dead zones identified in the 1960's." (Carol Hand). "According to the University of Michigan and Louisiana State University, with support from the U.S. National Oceanic and Atmospheric Administration, estimate a Gulf dead zone of between 7,286 and 8,561 square miles."(*Dell'Amore)* They used computer models which are based on U.S. Geological Survey data of nutrients runoff in U.S. rivers and streams. The largest ever reported in the Gulf, 8,481 square miles, occurred in 2002. *This means the dead zone is nearly the size of New Jersey.*

Some may not care about the effects on the Gulf because it doesn't effect them or because they think they have nothing to do with it. People everywhere need to realize their actions truly are effecting these ecosystems from where they live all the way into the Gulf of Mexico "It's important to remember that everybody is downstream of someone else. What we do to our water and land will impact those around us." (The Nature Conservancy)With this dead zone and others growing, it is going to not just effect the animals living in the water, but humans as well. Fisherman are having a hard time catching the fish they use to catch so easily, this impacts their income. Some business have had to close because they are catching so little. If companies continue to go out of business, the ones that stay open will be able to charge a lot more for their catches, putting the prices though the roof and making these fish more valuable. The loss of these fish will also affect animals such as bears, alligators, other fish etc. that depend on these fish as part of their diet.

Water quality effects all of us from the water we drink and bathe in, to the water we pollute, with fertilizers and other human waste products. We humans need to realize how dramatic our impacts are on this world and everything that is living on this planet. If we start to watch our ecological footprints, our children and grandchildren can see the same beautiful earth we were lucky enough to live on. But if we don't take a look at our ecological footprint and we continue to use, and over use some of these products, our children may never get to see some of the wildlife we enjoy. Our lakes will no longer be swimmable or fishable. People won't want to own lake houses, or go boating if our water resources have excessive amounts of algae. Another thing we need to look at is with our oceans becoming landfills, and with dead zones growing, we don't know what kind of animals, fish and corals we are going to end up losing.

When analyzing sources, I couldn't find one that agreed that fertilizers aren't effecting our water ways. Some said the effects were less dramatic because of the effort to cut nutrient pollution, and that dead zones are decreasing. According to the John Hopkins study of the Chesapeake Bay "The team found that the size of mid- to late-summer oxygen-starved "dead zones," where plants and water animals cannot live, leveled off in deep channels of the bay during the 1980s and has been declining ever since. " (John Hopkins University) But knowing this information doesn't change the fact that fertilizers are playing a role in polluting ponds, lakes, rivers and the ocean.

Many colleges currently have programs that are studying this field to see what can be done to restore these areas that have been effected by high levels of nitrates and phosphorus." Researchers investigating the causes and consequences of dead zones include scientists, technicians, and students trained in a range of relevant disciplines." (Teach Ocean Science) But the biggest thing that needs to be done is education to lessen pollution. Even with scientists looking into these problems, there isn't much they can do to fix the problem. We are the ones that need to change our ways of life. Scientists are coming up with different ways to combat some of the negative effects of fertilizer such as creating organic fertilizers that give lawns the same nutrients they need to grow, that contain less pollutants. Scientists are also looking for ways to re-add oxygen to areas of the ocean that have little oxygen reaching the bottom. Other scientists are studying size of these dead zones and trying to help countries find the source of the pollution.

In conclusion, to minimize dead zones in our water supplies we need to take a number of steps. First we need to mandate using organic fertilizers to reduce the effects of the pollutants in water ways. Continue to fund research working on finding solutions to the current dead zone problem. Lastly we need to educate others on the effects of pollutants in our water ways and what they can do to watch their ecological footprint. With the studies being done and the current state of our water these dead zones can either slowly be eliminated or they can

Dead Zones, *Continued on Page 18*

2016 OSTP Certification Course Descriptions and Offerings

Introduction to Onsite Systems (15 Direct Credits)
Fee: $360 Exam: Yes
This 15-hour workshop is the foundation for all SSTS certifi cation courses and is best completed prior to the other workshops. It prepares participants for the Basic exam and provides an overview of onsite treatment options and concepts. Enrollment in this workshop includes a copy of the Manual for SSTS Professionals in Minnesota.

Topics include:
- Treatment of wastewater
- Site evaluation
- Wastewater characterisitcs
- Soil treatment systems

10-3 St. Cloud - Moose Lodge 11/14-16/16 Deadline: 11/7/16

Installing Onsite Systems (12 Direct Credits)
Fee: $265 Exam: Yes
This 12-hour workshop prepares attendees for the Installer exam and provides information about proper installation practices.

PREREQUISITE: Introduction to Onsite Systems

Topics include:
- Construction planning
- Tools for installing
- Construction practices
- Pipelayer certification

112-3 St. Cloud - Moose Lodge 11/17-18/16 Deadline: 11/10/16

Installer Continuing Education (12 Direct Credits)
Fee: $265 Exam: No
This 12-hour workshop will meet the continuing education requirements for any certification but is specifically tailored for Installers. All information will be provided from the perspective of a system installer.

Topics Include:
- Construction safety
- Keys to proper installation
- Pumps and dosing
- Rule change implications

69-3 Grand Rapids - Sawmill Inn 11/29-30/16 Deadline: 11/21/16

Pipelayer Certification (2 Direct Credits, 1 Related Credit)
Course begins at 1:00PM Exam: Yes
Fee: $75 or $50 as add-on to enrollment in Installer CE
This 3-hour workshop is once again offered this year to accommodate a change in the Minnesota Plumbing Code that requires all septic system installers be either certified pipelayers, licensed plumbers, or registered apprentices in order to install sewer or water service pipes outside of a building in Minnesota.

Topics include:
- MN Plumbing Code
- Pipelaying
- Code compliance bond packet instruction

92-3 Grand Rapids - Sawmill Inn 11/30/16 Deadline: 11/22/16

General Continuing Education (12 Direct Credits)
Fee: $265 Exam: No
This 12-hour workshop is designed to meet the continuing education requirement for SSTS professional registration. The topics will be varied to give a wide range of information for SSTS professionals.

Topics include:
- Rule change implications
- Pressure distribution
- Working on difficult sites
- MPCA update

60-3 N. Mankato - Best Western 11/2-3/16 Deadline:10/26/16
60-4 Cloquet Forestry Center 12/7-8/16 Deadline: 11/30/16

Soils Continuing Education (6 Soils-Specific Direct Credits)
Fee: $240 or $405 with Munsell Color Guide Exam: No
This 6-hour course couples classroom and field training to meet soils-specific MPCA continuing educational requirements for designers and inspectors. Munsell Color Guides are available for $165 and Sand Cards for $10.

Topics include:
- Regional geology and soils
- Local soil hydrology information
- Soils observations
- System siting and design

55-7 Rochester South - Clarion Inn 9/20/16 Deadline: 9/13/16

Enroll online at: septic.umn.edu
Classes are filled on a first-come, first-served basis.

OSTP, 173 McNeal Hall, 1985 Buford Ave., St Paul, MN 55108
Fax: 612-624-6434 **Phone: 800-322-8642**

Dead Zones, *Continued from Page 17*

continue to grow and kill more wild life. Water effects every living thing on this earth so we need to take good care of it. Water is life.

Works Cited

"Dead Zones - Investigate Current Research - Teach Ocean Science." *Dead Zones - Investigate Current Research - Teach Ocean Science*. Teach Ocean Science, n.d. Web. 12 Aug. 2016.

"Decline in Dead Zones: Efforts to Heal Chesapeake Bay Are Working." *Decline in Dead Zones: Efforts to Heal Chesapeake Bay Are Working*. Phys Org, 3 Nov. 2011. Web. 12 Aug. 2016.

Dell'Amore, Christine. "Biggest Dead Zone Ever Forecast in Gulf of Mexico." *National Geographic*. National Geographic Society, 25 June 2013. Web. 12 Aug. 2016.

"Fixing the World's Dead Zones." *Fixing the World's Dead Zones*. National Biodiversity Teach-in, n.d. Web. 12 Aug. 2016.

Hand, Carol. *Dead Zones: Why Earth's Waters Are Losing Oxygen*. N.p.: Twenty-First Century, n.d. Print.

McCarty, Thomas. "Pond Ecology (Water Quality)." *Water Quality (Penn State Extension)*. PennState Extension, n.d. Web. 12 Aug. 2016.

Oram, Brian, Mr. "Many People Have Questions about the Impact of Nitrate in Their Drinking Water." *Nitrate Nitrite Nitrogen in Surfacewater and Drinking Water*. Water Research Center, n.d. Web. 12 Aug. 2016.

Palmer, G. D. "Pesticides & Fertilizers in Ponds." *Home Guides*. SFGate, n.d. Web. 12 Aug. 2016.

Schleifstein, NOLA.com | The Times-Picayune, Mark. "Gulf's Low-oxygen 'dead Zone' Covers 5,052 Square Miles along Louisiana's Coast." *NOLA.com*. Nola, 04 Aug. 2014. Web. 12 Aug. 2016.

"The Nature Conservancy." *What We Can Do About Gulf Hypoxia*. The Nature Conservancy), n.d. Web. 12 Aug. 2016.

"What Is a Dead Zone?" *What Is a Dead Zone?* National Ocean Service, n.d. Web. 12 Aug. 2016.

"What You Can Do To Reduce Water Pollution." *News Releases*. St. Johns River Water Management District, 18 Nov. 2011. Web. 12 Aug. 2016.

2016 MOWA MEMBERSHIP APPLICATION

MOWA minnesota onsite wastewater association

Membership: ❑ **Renewal** ❑ **New Member**

❑ Individual Member $240 (1 person)
❑ Business Group /Government Unit $340 (up to 5 people; $100 /person after 5)
❑ Student $140 (1 person)
❑ Life-time
❑ Honorary

Note: Your MOWA Membership includes one NOWRA membership

Memberships are based on calendar year - After July 1st, new members pay $140-individual / $190-business or gov't groups for remainder of 2016

Individual/Group Contact: **This person will be listed as the NOWRA member on the Septic Locator website. They will be listed first in all MOWA publications. Please print clearly.**

• **1st Member** _____ **Company Name** _____

Address _____ City/State/Zip _____

Title _____ Phone _____ Mobile/800# _____ Fax _____

Email _____ Website _____ County _____

Circle the counties you work in: *Needed for Directory and Website.*

Statewide 88

Aitkin	1	Clay	14	Hubbard	29	Marshall	44	Pipestone	59	Steele	74
Anoka	2	Clearwater	15	Isanti	30	Martin	45	Polk	60	Stevens	75
Becker	3	Cook	16	Itasca	31	McLeod	46	Pope	61	Swift	76
Beltrami	4	Cottonwood	17	Jackson	32	Meeker	47	Ramsey	62	Todd	77
Benton	5	Crow Wing	18	Kanabec	33	Mille Lacs	48	Red Lake	63	Traverse	78
Big Stone	6	Dakota	19	Kandiyohi	34	Morrison	49	Redwood	64	Wabasha	79
Blue Earth	7	Dodge	20	Kittson	35	Mower	50	Renville	65	Wadena	80
Brown	8	Douglas	21	Koochiching	36	Murray	51	Rice	66	Waseca	81
Carlton	9	Faribault	22	Lac qui Parle Lake	37	Nicollet	52	Rock	67	Washington	82
Carver	10	Fillmore	23	Lake	38	Nobles	53	Roseau	68	Watonwan	83
Cass	11	Freeborn	24	Lake of the Woods	39	Norman	54	Scott	69	Wilkin	84
Chippewa	12	Goodhue	25	Le Sueur	40	Olmsted	55	Sherburne	70	Winona	85
Chisago	13	Grant	26	Lincoln	41	Otter Tail	56	Sibley	71	Wright	86
		Hennepin	27	Lyon	42	Pennington	57	St. Louis	72	Yellow Medicine	87
		Houston	28	Mahnomen	43	Pine	58	Stearns	73		

Information: **(Check all that apply)**

❑ Installer ❑ Pumper ❑ Designer ❑ Inspector ❑ Gov't Regulator ❑ Educator ❑ Service Provider ❑ Student
❑ Soil Scientist ❑ Professional Engineer ❑ Manufacturer ❑ Operator/Maintenance ❑ Supplier ❑ Other: _____

Additional Business/Government Members:

• **2nd Member** _____ Title _____ County _____

Address _____ City/State/Zip _____

Phone _____ Mobile/800# _____ Fax _____ Email _____

• **3rd Member** _____ Title _____ County _____

Address _____ City/State/Zip _____

Phone _____ Mobile/800# _____ Fax _____ Email _____

(Please list additional business/government group members on separate sheet with complete contact information.)

Publications: Would you prefer receiving 'Little Digger' newsletters via ... ❑ Regular Mail ❑ Electronically

We currently send one publication per address to business/government groups. Contact the MOWA office if you'd like additional copies.

Additional NOWRA Memberships: **MOWA membership fees include one NOWRA membership per company/organization. List names of members who want additional NOWRA memberships here: Cost - $40 per person.**

2)_____ 3)_____ 4)_____ 5)_____

Payment: *(Please print)*

MOWA Membership $_____ + Add'l NOWRA Memberships = **Amount: $ _____**

❑ Check enclosed (Payable to MOWA) ❑ VISA ❑ MasterCard

Card Number: _____ Expiration Date: _____ Cardholder Name: _____

Signature: _____ Date_____

MOWA, 5021 Vernon Ave. So., #241 • Edina, MN 55436 • Phone: 612.801.5897 • Fax: 952.487.4447

Note: Dues payable to MOWA are not deductible as a charitable contribution but may be deductible as an ordinary and necessary business expense.

MOWA
minnesota onsite wastewater association

Presorted
Standard
U.S. Postage
PAID
Rochester, MN
Permit No. 289

RETURN SERVICE REQUESTED

MOWA
5021 Vernon Ave, So., Suite 241
Edina, MN 55436
Phone: 612.801.5897
Fax: 952.487.4447

www.mowa-mn.com