Barry-Eaton District Health Department
Time of Sale or Transfer Program (TOST)
The First Three Years 2007-2010

Caring for the Community Since the 1930’s
Overview

• What is TOST
• How it works
• Outcome of TOST
• Pictures ——worth 1000 words!
Regulations Governing
On-Site Sewage & On-site Water Supply System
Evaluation & Maintenance
Implemented 11-2007

- Section 3.2 Prior to sale or transfer of a parcel with well and/or sewage system
  - Transfer evaluation performed, and
  - BEDHD determination that system(s) not in a state of failure or necessary maintenance or remediation completed or assured, and
  - BEDHD issue transfer authorization
How TOST Works

• Certification & Registration of Private Evaluators
  – 15 small businesses
  – Observe conditions & follow BEDHD criteria
  – Report online http://tost.barryeatonhealth.org/tost/

• Evaluations Reviewed BEDHD
  – Accuracy, completeness, timeliness
  – Site visits & confirmation
  – Decision of failure or authorization by Health Department
  – Verify corrections
Chart 1 Identified Public Health Hazards
Reasons for Well Failure*

*Note: There may be more than one reason for failure on an individual site. Thus there are more total reasons for well failure (755) than the total number of sites with well failures (601)
TOST Results

Chart 2 Identified Public Health Hazards
Sewage Failure Reasons*

*Note: There may be more than one reason for failure on an individual site. Thus there are more total reasons for failure (731) than the total number of sites with sewage failures (602).
Before viewing the pictures, let's review the sicknesses caused by sewage...

- **Bacteria;** E. coli O157:H7 and other shiga toxin producing E. coli, Campylobacter, Clostridium difficile, Listeria, Salmonella, Shigella, Vibrio (cholera)

- **Viruses;** Poliovirus (oral vaccine derived-only reported in unvaccinated community in Minnesota), Hepatitis A, Rotavirus, Norovirus, Coxsackie virus A and B (causes encephalitis, myocarditis)

- **Protozoa;** Giardia, Entamoeba histolytica (amebiasis), Toxoplasmosis (fetal damage if pregnant woman infected), Cryptosporidium

- **Worms;** Pinworms, Roundworms (ascariasis), Tapeworms


Source: Dr. Robert Schirmer, MD, FACP, BEDHD Medical Director
### Septic System Pollutants of Concern

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Reason for Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathogens</td>
<td>Parasites, bacteria, and viruses can cause communicable diseases through direct/indirect body contact or ingestion of contaminated water or shellfish. Pathogens pose a particular threat when partially treated sewage pools on ground surfaces or migrates to recreational waters. Transport distances for some pathogens in surface or ground waters can be significant.</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>Nitrogen is an aquatic plant nutrient that can contribute to eutrophication and depletion of dissolved oxygen in surface waters, especially in estuaries, and coastal embayments. Excessive nitrate-nitrogen in drinking water can cause methemoglobinemia in infants and pregnancy complications for humans. Livestock can also suffer health impacts from drinking water high in nitrogen.</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>Phosphorus is an aquatic plant nutrient that can contribute to eutrophication of inland fresh waters and eventual depletion of dissolved oxygen.</td>
</tr>
</tbody>
</table>

*Slide source Rod Frederick, EPA*
Septic 101
Typical Sewage System

- A typical septic system has 4 main parts:
  - A PIPE from the home
  - A SEPTIC TANK
  - An absorption system (drainfield)
  - And the SOIL
    - Microbes digest or remove most contaminants before it eventually reaches our surface waters (lakes, rivers, wetlands) or our groundwater
Typical Septic Tank

- A watertight tank that separates solids from liquid & digests organic matter
- Septic tanks remain full of liquid between uses. When water is used the same quantity of water is displaced out of the tank and flows to the absorption system
After the sewage flows out of the septic tank it goes to an absorption system

- This is where the liquid portion of a home’s wastewater is dispersed
  - The typical drainfield contains perforated pipe placed in a layer of gravel/stone
  - Wastewater flows through the pipe and stone and into the soil.

Trench type system above. There are many types of absorption systems
Not a septic system...

- Illicit connections to the storm drain or to the river
- Bleeder lines or overflow lines from a sewage system to the storm drain, ditch or to the river
- A field tile is NOT a septic system
Pictures are worth a 1000 words...

The following information and pictures, including aerial photographs, are all from sites where an evaluation of the water supply and/or sewage system was performed in Barry and Eaton Counties as part of the TOST program.
This is what the plumbing can look like when sewage backs up from a failed sewage system....
Failed drainfield connected to the creek
A closer look at the sewage connection to the creek from previous picture
This house had no sewage system--just a pipe discharging the sewage to the ground surface.
Sewage overflow pipe called a “Bleeder line” discharging to the road ditch

Health Department flushed tracer dye down the toilet. The dye showed up in the road ditch. See bright green dye below.
This failed drainfield had a “bleeder line” too. Where did that line go?....
The bleeder line went to the county drain
But there’s more... the neighboring site also
had a failed drainfield found through TOST.
Leaking Septic Tank
Causes scum & solids to enter the drainfield when sewage rises high enough to overflow
These steel tanks were full of sewage and inverted on top of two failed seepage pits.

Contractor said: “I haven’t ever seen anything like this in 47 years.”
Sluggish Drains?
The sewage leaving this leaking septic tank discharged to the surface of the ground
Hopefully the home-run ball didn’t make it to the sewage....

Failed system with sewage flowing on the ground surface.
The black staining on the rim of this septic tank manhole shows evidence of sewage backup into the tank....
....and the area over the drainfield showed evidence of sewage surfacing to the ground....
...digging into the failed drainfield revealed sludged stone
Sewage discharging to the county drain, which then drains to the river
Inside a leaking septic tank where the pre-cast concrete baffle was completely corroded off and the tank outlet plugged.
Inside....
...Outside...
...and the septic tank lid was collapsing too!

Pictures showing the open hole from the collapsing septic tank.
All in the neighborhood...

Four TOST Sites with

- Three failed sewage systems
- Unplugged wells
- E-coli bacteria detected in the open, broken well system located in this flood prone area
This site had a damaged well and....
...a failed drainfield and bleeder line discharging sewage next to the lake!
TOST Site: No sewage system & Contaminated Well

County Drain connected to river

Septic Tank (no drainfield found)

Well with high nitrates
No septic tank found and no drainfield found

County Drain connected to river

Nitrate Well
TOST Site: No sewage system - sewage drained to the river

Septic Tank & then piped into the drain

County Drain then to river

Slide 3 of 5
TOST Site: Failed drainfield

- Drain Tile from slide 1 & 2
- Open Drain shown in slide 3
- Failed Drainfield

Slide 4 of 5
And they are all neighboring homes!

Sewage piped to the drainage creek which then connects to the river.
Septic tank with unsafe cover
Three TOST sites in a row with not one drainfield...

1. Open drain discharging to the lake
2. Sewage collection tile
3. Unplugged, open well
TOST Results

First 3 years

• Found 136 illicit connections (including sites with no sewage system)
  – Stopping the illegal discharge of sewage from these sites alone equates* to a reduction of **26.7 million gallons** of sewage -- sewage that is no longer flowing improperly into our lakes, streams, rivers and wetlands.

*136 sites x 2.56 persons per site x 70 gallons/day x 365 days x 3 years=26.7 million
TOST Results

• Found over 117 unused, abandoned wells---once plugged these old wells can no longer serve as a conduit to contaminate our groundwater aquifers

• And much more...
  – For more information on the TOST findings go to www.barryeatonhealth.org to read the full report to the community – TOST, The First Three Years
Contact Information

Regina Young, R.S.
Water Protection Team Supervisor
(269) 798-4103
ryoung@bedhd.org