TMDL Stage 2 Development of Septic System Map for a Targeted Subbasin

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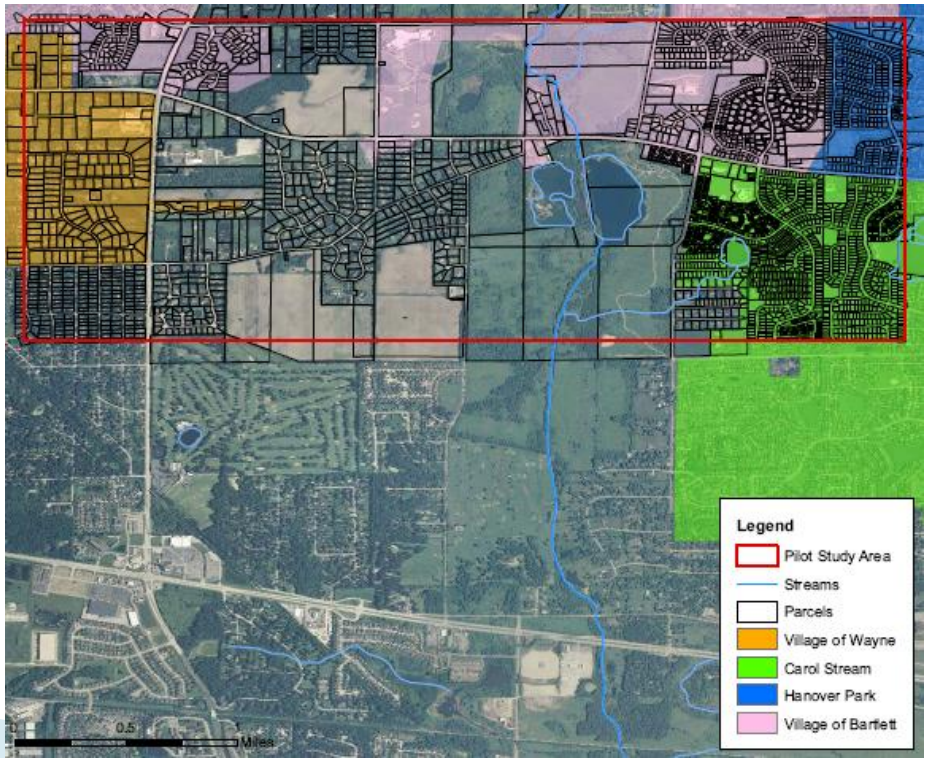
Project Goals

- Develop methodology required to create a comprehensive inventory of septic systems within a basin
- GIS shapefiles/maps of targeted subbasin
- Educational pamphlet for septic system owners

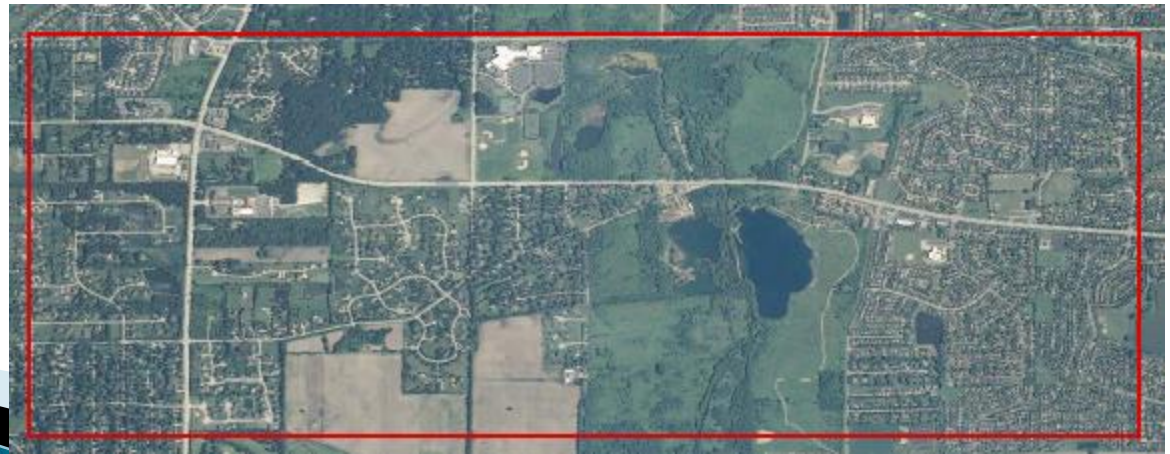
Pilot Study Area

- 2700 acres in West Branch DuPage watershed
- 3400 addresses
- Within Bartlett, Wayne, Hanover Park and Carol Stream
- 50% unincorporated area



GIS Layers

- Arial Photography- National Agricultural Imagery Program (NAIP)
- Municipal Boundaries- Illinois National Resources Geospatial Data Clearinghouse
- Land Parcel Data- DuPage County Information Technology Department
- Surface Water- USGS NHD
- Roads Base Map- MS Bing Maps

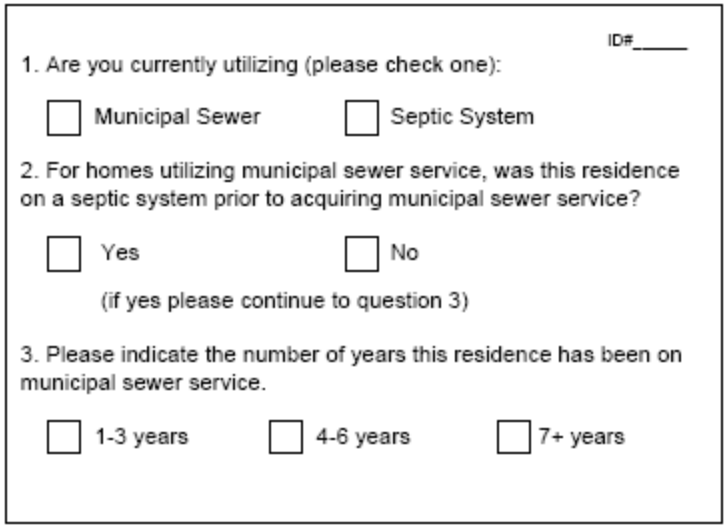


Sewer System Coverage

- Wayne and unincorporated areas- no coverage
- Hanover Park- address search- no coverage in study area
- Bartlett- hardcopy sewer line map- no coverage
- Carol Stream- GIS coverage

Surveys

- 30% of addresses got survey- 1000
- Questions-
  - Do you utilize municipal sewers or a septic system?
  - Did the property have septic before?
  - How long has the property had sewer service?



ID#_____

1. Are you currently utilizing (please check one):

☐ Municipal Sewer ☐ Septic System

2. For homes utilizing municipal sewer service, was this residence on a septic system prior to acquiring municipal sewer service?

☐ Yes ☐ No

(if yes please continue to question 3)

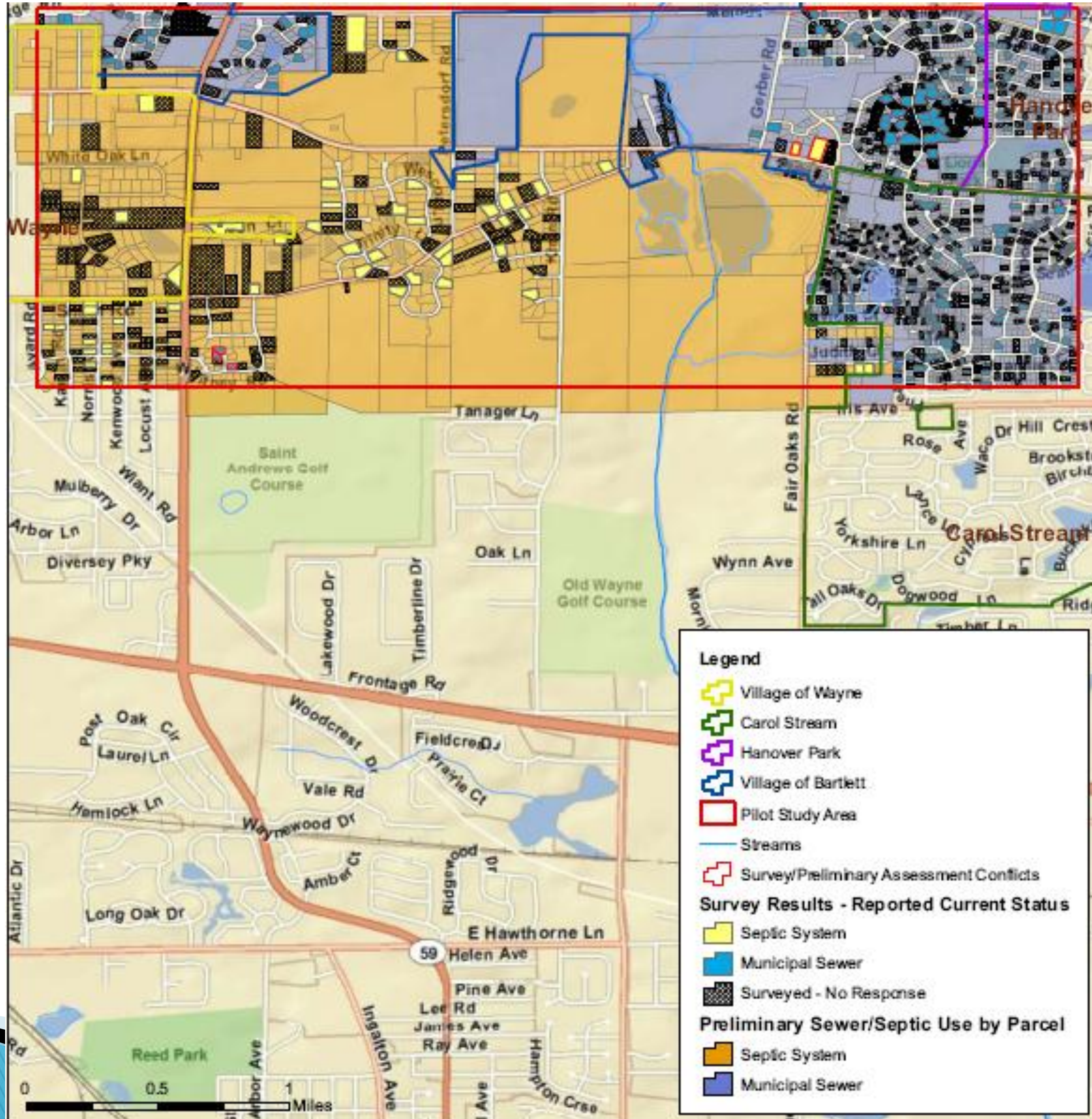
3. Please indicate the number of years this residence has been on municipal sewer service.

☐ 1-3 years ☐ 4-6 years ☐ 7+ years

	Count
Total Number of Parcels in Pilot Study Area	3,435
Number of Surveys Mailed	1,000
Number of Surveys Returned	253
Question 1	
Are you Currently Utilizing:	
Municipal Sewer	205
Septic System	48

Survey Results

- 253 responses
- 81% used municipal sewers
- 19% have septic system
- 5 responses were in conflict with preliminary evaluation
  - 3 in southwest portion of area/ assessed as unsewered unincorporated area
    - Municipal data layer did not show West Chicago in area, but new boundaries have 175 acres (undeveloped ag land)
  - 2 others in Bartlett (greater than 100 feet from lines)


Legend
Village of Wayne
Carol Stream
Hanover Park
Village of Bartlett
Pilot Study Area
Streams
Survey/Preliminary Assessment Conflicts
Survey Results - Reported Current Status
Septic System
Municipal Sewer
Surveyed - No Response
Preliminary Sewer/Septic Use by Parcel
Septic System
Municipal Sewer
0
0.5
1
Miles
Wayne
Carol Stream
White Oak Ln
Gerber Rd
Tanager Ln
Fair Oaks Rd
Saint Andrews Golf Course
Old Wayne Golf Course
Mulberry Dr
Wiant Rd
Arbor Ln
Diversey Pky
Oak Ln
Wynn Ave
Lakewood Dr
Timberline Dr
Frontage Rd
Woodcrest Dr
Post Oak Cir
Laurel Ln
Vale Rd
Prairie Ct
Hemlock Ln
Waynewood Dr
Amber Ct
Ridgewood Dr
Atlantic Dr
Long Oak Dr
E Hawthorne Ln
59
Helen Ave
Pine Ave
Lee Rd
James Ave
Ray Ave
Ingalton Ave
Reed Park
Yorkshire Ln
Dogwood Ln
Hill Crest
Rose Ave
Waco Dr
Kenwood
Locust

End Products

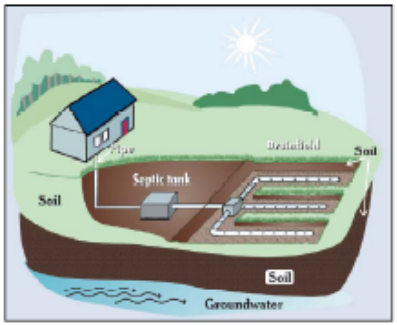
- GIS shapefile with parcel/ lat/longs based on centroid of parcel shape/other attribute information
- Documents steps taken for project applicable to any watershed
- Educational pamphlet

LIMITING YOUR SEPTIC SYSTEM'S IMPACTS ON ENVIRONMENTAL QUALITY

Properly designed, constructed and maintained septic systems can provide effective long-term treatment of household wastewater. If a septic system isn't maintained, it might begin to malfunction and eventually need to be replaced, potentially costing thousands of dollars. A malfunctioning system can contaminate groundwater that might be a source of drinking water. Septic systems are required to be in good working order prior to the sale of a property. This guide will outline how system works and what steps a homeowner can take to properly maintain a system to ensure the system will work properly, minimizing the potential for environmental contamination potentially caused by a septic system.

How a Septic System Works

A septic system treats and discharges wastewater through a variety of physical and biological processes. The system has four main components: a pipe from the home or business, a septic tank, a drainfield, and the soil.



Graphic adapted from USEPA's Homeowner's guide to Septic Systems *publication.*

The pipe goes from the home or business to the septic tank. A septic tank is typically a large, watertight fiberglass or concrete tank which serves a number of purposes. The septic tank receives the wastewater, separates the solid waste from liquid waste, stores the solid waste, and passes the liquid waste out to the drainfield. The drainfield allows the liquid waste to slowly seep out into the soil while providing emergency outlets to prevent sewage back-up in to the residence. The liquid waste then percolates through the soil which provides final treatment by removing bacteria and nutrients from the wastewater.

Septic Systems and Environmental Pollution

A malfunctioning or poorly maintained septic system can lead to the release of improperly treated wastewater, which can cause a number of environmental contamination issues. The most common pollutants in residential wastewater are nutrients such as nitrogen and phosphorus, and pathogens such as bacteria and viruses. High levels of nutrients in wastewater can eventually make their way into nearby lakes and streams causing excessive growth of algae and other water quality issues. Pathogens and certain types of nitrogen found in wastewater can cause human health problems if drinking water sources become contaminated by poorly treated wastewater.

Septic System Maintenance

In order to minimize the risk of septic system malfunction and possible environmental contamination, it is important to properly maintain your system. The solid waste captured in the septic tank must be inspected by a professional and should be pumped out as frequently as recommended by the inspector. The pumping frequency for a given septic tank will depend on the size of the tank and the number of

Contact Information

- Please provide comments/ changes for methodology and educational pamphlet
- Jennifer Clarke- 217/782-3362

users in a household but is typically on the order of once every 3-5 years for an average residential septic system.

Efficient water use can greatly increase the effectiveness of a septic system since less water used means less wastewater for the system to manage. It is estimated that a dripping faucet can waste up to 2,000 gallons per year and a leaky toilet can waste as much as 200 gallons each day! The way people use water in the home can also greatly impact the amount of water entering the system. Some ways you can reduce personal water usage include:

- Install water-conserving fixtures such as low-flow toilets, showerheads, faucets and high efficiency dishwashers and washing machines
- Limit the length of showers and other large water uses.
- Wash only full loads of laundry or dishes
- Maintain plumbing to help find and eliminate leaks
- Make sure all faucets are turned off completely when not in use.

Being careful to limit what items get flushed down the toilet is another easy way to help maintain a well functioning septic system. Items such as dental floss, diapers, cigarette butts, cat litter, coffee grounds, paper towels and feminine hygiene products can clog and potentially damage septic systems. Chemicals such as gasoline, oil, pesticides, antifreeze, and paint should never be poured down the drain because they can disrupt the biological treatment processes in the septic system and might contaminate the soil or groundwater in the drainfield. Care should also be taken to limit what food items are sent to the system by way of your kitchen's garbage disposal. Cooking oils and fats can solidify in the drain and cause backups and large amounts of food waste entering the system through a garbage disposal cannot be treated and lead to greater amounts of solid waste in the septic tank which must eventually be pumped out.

Managing Your Drainfield

The soil beneath the drainfield is where the final treatment of wastewater occurs and it is very important to keep this system working naturally and effectively. The beneficial bacteria in the soil need air to live and to ensure adequate treatment of the effluent. Therefore, the soil must remain un-compacted, unsaturated and undisturbed.

The soil treatment system can become clogged by overloading with water and solids. The same water conservation and careful flushing measures that keep your septic tank running properly will also help maintain your drainfield. Likewise, a properly maintained septic tank will help to ensure that adequately treated and mostly liquid wastewater is reaching the drainfield which will aid in the percolation of the water through the soil.

Directing drainage from gutters, driveways and other impermeable surfaces away from the drainfield will help to keep the soil from becoming over saturated with water and will allow for maximum treatment and percolation rates of the wastewater coming from the septic tank. Also, one should be careful to avoid driving heavy vehicles over the drainfield which can cause damage and excessive soil compaction.

Additional Resources

There are a number of resources available for obtaining additional information on septic systems and how you can properly use and maintain your system to increase the lifespan and effectiveness of your system while reducing the risk of your septic system releasing harmful contaminants into the environment.

The Illinois Environmental Protection Agency (IEPA) has a list of useful resources available on their website at: http://www.epa.state.il.us