



What are Septic System Failure Rates, and how are They Used in Thurston County?

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Some community members have expressed concerns about how county staff and the *Thurston County On-site Sewage System Management Plan Update* describe and discuss septic system failures and failure rates. Thurston County wants to be responsive to our community's concerns, and drafted this document to help address this issue.

Septic System Failure:

Septic "failure" is defined in state law, and our county sanitary code. A septic system has "failed" when the system, or a component of the system threatens the public health by inadequately treating sewage, or by creating a potential for direct or indirect contact between sewage and the public. Most common failures cause sewage to rise to the surface of the ground, back up into the residence it serves, or be discharged to surface water. For the surveys summarized below, most failures were identified by surfacing sewage confirmed by bacteriological testing. Surfacing sewage was often found by dye testing: dye is flushed down the sink or toilet, then recovered from seeps and surface discharges. A system is "failing" if a water quality test confirms fecal coliform bacteria are present in the seep or discharge at concentrations of 200 organisms per 100 milliliters or more.

What's a failure rate?

The *Thurston County On-site Sewage System Management Plan Update* and other documents include failure rates from sanitary surveys and other inspection programs. These rates show how many septic systems within a defined group or area were found to be failing during inspections. Inspections occur during shoreline surveys or when systems are inspected by certified septic system monitoring specialists. Failure rates from 14 – 29% were found during shoreline surveys in Eld Inlet, Henderson Inlet, Nisqually Reach and Summit Lake. The results are summarized below.

Table 1: Failure Rates Found During Sanitary Surveys in Thurston County

| Survey Area and (Year) | Number of Systems Evaluated | Number of Failing Systems | Failure Rate |
|----------------------------|-----------------------------|---------------------------|--------------|
| Eld Inlet (1990-96) | 564 | 93 | 16% |
| Eld Inlet (2012–14) | 102 | 17 | 17% |
| Henderson Inlet (1996-99) | 58 | 8 | 14% |
| Nisqually Reach (1994-96) | 123 | 32 | 26% |
| Nisqually Reach (1996 -99) | 42 | 12 | 29% |
| Summit Lake (1992-97) | 330 | 57 | 17% |

A failure rate refers to the percentage of systems found failing. It is calculated by dividing the number of systems found failing in the study or survey area by the total number of systems evaluated.

When a septic system is failing it must be repaired in order to protect public health. There are two types of septic repair:

- **Permitted Repair.** Permits are required to replace or perform substantial work to repair a failed system. Examples include replacing a failed septic tank or drainfield.
- **Minor Repair.** Minor repairs include the repair or replacement of system components like a cracked or broken pipe between a structure and a sewage tank; sewage pumps; pump control floats; effluent filters; small cracks in septic tanks, cracked or broken septic tank baffles and other items listed in the sanitary code. Minor repairs **DO NOT** require a permit, although they must be stated in reports submitted by septic tank pumpers and certified monitoring specialists. About 50% of system failures found during shoreline surveys were small problems like broken pipes or cracks, and were repaired

How many repairs take place each year?

Table 2: Septic System Repairs in Thurston County

| | Year | Year |
|--------------------------|------|------|
| | 2015 | 2016 |
| Permitted Repairs | 205 | 206 |
| Minor Repairs | 342 | 257 |
| Total | 547 | 463 |

How many septic systems are in Thurston County?

We believe there are 52,968 septic systems in Thurston County as of December 31, 2016. We recently developed a process with Thurston County GeoData that identifies all lots served by septic systems and periodically updates the inventory.

Septic Failure Rates: Comparing Shoreline Surveys and Repair Rates

Some concerned community members indicate that the plan states the septic system failure rate for Thurston County is 14%, when the actual failure rate is less than 1%. To understand this difference, it is important to understand that failure rates based on surveys will look different from failure rates based on repairs. Repair rates capture those systems that a) are known, and b) have been fixed. This rate does not include systems that are broken but unfixed. Shoreline surveys offer a broader picture, and because living on banks can impact septic function, it makes sense that shoreline surveys suggest a higher failure rate than is indicated by the repair rate data.

It may also be helpful to understand how sanitary surveys are conducted when considering this issue. During surveys each system is evaluated by a trained inspector. Dye testing and water quality sampling are used to find and confirm most failing systems. Surveys focus on shoreline areas because failing systems there pose the greatest public health risk. More failures are found in these areas because sewage seeps from banks and cuts, and systems are evaluated during the wet season when they are most prone to have problems. Often the property owner is not aware their system is failing.

Again, repair permit data only indicate failing systems that were repaired under permit. It does not cover minor repairs or failures that have not entered the permit process.

The *Thurston County On-site Sewage System Management Plan Update* includes a section called Failing Systems. It describes how failing systems are identified (page 16). It compares historic failure rates from sanitary surveys and dye testing to more recent data. This section of the report focuses on a small subset of the total septic systems in Thurston County (those in the Henderson Marine Recovery Area (MRA)). The plan states the following about the dye tests conducted in the Henderson MRA:

- Approximately fifty dye tests are due every wet season in Henderson.
- From 2007–2012, fifteen (15) septic systems failed the dye test in the Henderson Marine Recovery Area (MRA)
- **The overall percent of shoreline systems found failing through dye testing has been 13 – 14%**
- The percentage of systems failing dye tests in Henderson from 2007 -2008 was similar
- The dye trace failure rate in Henderson dropped to 2 – 4% per year from 2009 - 2012
- The reason for lower failure rate is unknown

The Repairs section on page 17 compares repair rates in the Henderson MRA to the rest of the county. It states that from 2007-2012:

- A total of 602 repair permits were issued in Thurston County
- 132 repair permits were issued in Henderson, about 2% of the total of 6,510 systems in the MRA
- 470 repair permits were issued for the rest of the county – about 1% of the septic systems
- It suggests the higher number of repairs in Henderson is because systems there are required to have regular inspections

The Plan correctly states that 13-14% of high risk shoreline systems were found failing when dye trace methods were used. The Plan further indicates that septic system repair permit rates in the Henderson Inlet area are twice as high as the rest of the county, but that only 2% of the systems required permitted repairs from 2007-2012. The Plan does not state the overall failure rate in the county is 14%. We do not survey most areas of the county, and so cannot provide a failure rate county-wide with certainty.