

OSS Owner Education Project

Final Report

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Thurston County Environmental Health

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Table of Contents

Project Description	1
Pilot Project	2
Background	2
Process	3
OSS certified owners	3
Certified pumpers	4
Puget Sound Counties	5
Environmental Health Staff. . . .	6
Test Model Design	8
Methods	9
Results	10
Recommendations	13
Summary	14

Appendices

- A Thurston County On-Site Sewage Operation & Maintenance Program – Current Status, December 2013
- B Puget Sound County O&M Programs Spreadsheet
- C Summary of Puget Sound County Septic System O&M Programs
- D Henderson Certified Homeowner Survey
- E Certified Pumpers Survey
- F Survey of Five Puget Sound Counties Online Training
- G Letters of Invitation to Participate in the Pilot Study
- H Test Sample
- I Comments from Henderson Pilot Project Participants

Project Description

Develop curriculum and pilot test an advanced program that will train Thurston County residents how to properly monitor and maintain their on-site sewage systems.

The project was grant funded by Washington State Department of Health and consisted of seven tasks. Tasks 1 and 2 were completed in December 2013. The findings and reports were used by the advisory committee who updated the Thurston County On-Site Sewage Management Plan. The third task, to develop a budget and proposal to implement an educational model, was included as part of the funding recommendation that the advisory committee made in their final *Draft* document that was forwarded to the Thurston County Board of Health. Tasks 1 through 3 are described below.

1. Evaluate the effectiveness of current OSS education programs used by the County and Puget Sound local health jurisdictions.

This task was completed December 2013. Thurston County On-Site Sewage Operation & Maintenance Program – Current Status, December 2013 included a section that documented Thurston County’s current education and outreach efforts to educate and train on-site sewage systems owners. (Appendix A)

2. Identify and evaluate homeowner training programs offered by local health jurisdictions to on-site sewage system owners within the Puget Sound area.

This task was completed December 2013: Summary of Puget Sound O&M Programs. The matrix of the twelve Puget Sound counties was reviewed by the respective counties and finalized Summer 2014. (Appendix B & C)

3. Develop a budget and proposal to sustain the desired education and outreach program.

The advisory committee who updated the OSS Management Plan recommended a funding mechanism that would in part implement such a model. Thurston County On-Site Sewage Management Plan Update 2014, Final Draft, July 2014. This draft will be presented to the Board of Health for consideration.

The remaining four tasks, listed below, concern the development and testing of a curriculum pilot project for training septic system owners on how to properly operate, maintain and inspect their own septic system. The following report describes and documents the process of developing and testing the model. The results of the pilot project are included, as well as recommendations for implementation of using a video to train OSS owners on proper maintenance and inspection procedures.

4. Identify key components and outcomes needed for a successful homeowner education program.
5. Develop an advanced curriculum model for OSS owners that are outside of designated Marine Recovery Areas.
6. Pilot test and evaluate the curriculum.
7. Prepare a final recommendation and report for consideration by the Thurston County Board of Health, the Department of Health and interested stakeholders.

Pilot Project

Background

An inequity exists for owners of on-site sewage systems (OSS) in Thurston County. Training opportunities are available to certain OSS owners, but not to all.

Thurston County has approximately 70,000 on-site sewage systems. Ten thousand (10,000) of these systems are within the county's designated Marine Recovery Areas (MRAs) – Henderson and Nisqually Reach Watershed Protection Areas (WPA). A portion of the annual MRA program charge is designated for OSS owner training education. Within the MRAs, owners of the approximately 9,000 standard gravity, pressure distribution, mound and Glendon biofilter™ systems are eligible for enhanced education opportunities that enable them to receive training qualifying them to conduct and submit their own inspection reports and to meet the requirements for the renewable operational certificate. The remaining 1,000 OSS are sand filters, aerobic treatment units (ATU) or other systems that require a certified inspector to conduct inspections, do routine maintenance as needed and submit reports to the health department. Therefore, 90% (9,000) of the OSS owners within a Watershed Protection Area can get training and do their own inspection.

Outside these two MRAs, an additional 3,348 OSS have an operational certificate and inspection requirement due to OSS use or system type. The required inspections of all these systems must be conducted by a certified professional inspector. Resources are not available for an OSS owner training and certification program. If an owner of a mound or Glendon biofilter™ system resides within an MRA, training options are available to become certified to conduct their own inspections to meet the requirement of the operational certificate. However, if the owners of a mound or Glendon biofilter™ system live outside the MRA, they must hire a professional to conduct the inspections and submit the reports. There are 1,479 OSS (44% of the 3,348 OSS) outside the MRAs that are either mounds or Glendon biofilters™.

In addition, approximately 56,500 gravity and pressure distribution systems outside the MRAs do not have an operational certificate requirement. Thurston County does not actively oversee the operation and maintenance of these systems. Nonetheless, state law requires that the owners of these gravity and pressure distribution systems are required to inspect their OSS on a three year and annual basis, respectively, in order to protect public health, water quality and the homeowner's investment. Thurston County does have a variety of educational opportunities available to all OSS owners – brochures, on-line information, 2-hour SepticSense workshops and a SepticHelp Line to answer questions. However, there currently is no program to train these OSS owners on how to correctly do an inspection.

An enhanced education curriculum for county-wide training could provide an OSS owner of a gravity or pressure distribution system with the skills to conduct their own inspections. Such a program could provide training opportunities to all OSS owners and make it possible for homeowners to correctly inspect and maintain their systems, forego costs of hiring a professional to conduct the inspections, and promote understanding of how OSS function and how they should be operated and maintained.

Process

The goal of this pilot project was to determine if an efficient and electronic training method could enable county-wide septic system owners to become knowledgeable and skilled at properly inspecting and maintaining their septic system. The process to achieve this goal was to

- Get feedback from those Henderson OSS owners who had taken the county 5 ½ hour training course
- Interview septic system pumpers to get their perspective about OSS owners' knowledge and skill level
- Identify what other Puget Sound counties offered for owner training – specifically online training options
- Gather information from Thurston County Environmental Health O&M program staff and discuss a vision for an enhanced OSS owner education program
- Draft a model to test
- Test the model
- Report findings
- Make recommendations

OSS Certified Owners

The first step of the pilot project was to survey OSS owners in the Henderson MRA who had been certified to do their own septic system inspections. They each had taken a 5 ½ hour class taught by an environmental health specialist that included classroom lecture with question-and-answer and a visit to a septic demonstration park. To be included in the survey, their OSS had to be in full compliance with county operation and maintenance requirements, i.e. their operational certificate (OPC) had to be up-to-date, and their inspection certification had to be in good standing. These owners who were surveyed were chosen at random from a list of 2007-2009 class participants. A questionnaire was developed and sent in September 2013 to 150 class attendees. The purpose of the questionnaire was to learn if class participants thought the class was helpful, if they were able to successfully do their own inspection after the training and again three years later and whether they thought the county should keep such a program. Seventy (70) of the 150 questionnaires were returned completed. [The full report is in Appendix D.]

The overall response was very positive. Inspections are being done and are being repeated by the certified owners at time of operational certificate renewal. Participants believe that they have the skills to conduct their own septic system inspections. Training information is recalled or handouts and personal notes are utilized as reminders on how to conduct their inspections. More web-based inspection information was suggested. With the exception of two respondents who didn't answer – 97% indicated that the county should continue to offer the training program.

Conclusions from certified OSS owners:

- The county's current conventional training course is effective.
- Most certified owners are confident to do their own septic system inspections initially and for subsequent renewals.
- Owners saw value in the training for OSS owners and appreciated it.
- A refresher, preferably online, is needed.

Certified Pumpers

Next was to get feedback from Thurston County certified professional septic system pumpers regarding OSS owner inspection training. Though pumpers' primary job is to pump septic tanks and make minor repairs, they also conduct system inspections and file inspection and pump reports electronically. Within the MRAs, many of the tanks that they pump were initially inspected by a certified owner. Therefore, pumpers have first-hand knowledge of how well the certified owners are doing at inspecting their own systems. Pumpers also have many, many years of experience with homeowners. They know how knowledgeable owners are, how willing they are to learn and how well they are doing their inspections. [Full report in Appendix E]

The goal of the pumper survey was to learn from the septic pumpers what their professional in-field experience is regarding OSS homeowner inspections.

- What system types can homeowners adequately inspect?
- What system types should homeowners not be inspecting?
- What type of training would ensure proper homeowner inspections?
- Are certified homeowners doing their inspections correctly?
- Would homeowners of gravity systems 'out in the county' be interested in training to self-inspect?

A questionnaire was sent via e-mail to twenty-six (26) septic tank pumpers who are certified in Thurston County. No responses were received. Phone calls were made to ten pumpers located in Thurston County, and each was interviewed.

In summary ...

- All agreed that a gravity septic system could be inspected by a trained owner.
- Most pumpers were concerned about owners inspecting pumps. Owners should 'keep their fingers off the panel'.
- Most agreed that any alternative system should be inspected by a professional. The systems are either too complex or the functioning nuances are not understood without adequate training and experience.
- Most agreed that the current intensive 5 ½ hour training for owners is good. The 'hands on' demonstration park is most helpful to owners.
- Owners do mention that they have taken the class; most are 'pretty good' at doing their inspection.
- Some owners simply do not want to do their own inspections even after taking the class.
- If an inspection requirement were to be enforced for all OSS county-wide, then training options for OSS owners are needed in order for the public to accept the requirement. Responsible owners would take the class; for others no amount of incentives will work.

Additional comments included:

- For many pumpers, time of (property) transfer program hasn't really increased their business; they had already been doing tank pumping for real estate sales.
- The MRA programs have increased business.
- People are surprised / alarmed that their tank is full. The fact that a septic system functions with a full septic tank is not understood by many clients.
- Owners are having trouble measuring the sludge. They need something better than a sock to do so.
- Wipes are becoming a serious problem. They are not flushable as it says on the package.

Observations;

- Pumpers differ on what their 'service role' is – strictly business vs. educator.
- Some pumpers encourage their customers who live in an MRA to take the training.
- Some pumpers are proactive in finding record drawings.
- Most pumpers have an 'inspection only' option.
- Some pumpers focus on time of transfer service.

Conclusions from Certified Pumpers:

- With adequate training, OSS owners could inspect gravity systems.
- Additional training is needed to inspect a system with a pump.
- County's current intensive training format is working and certified owners are doing a good job.
- If the county requires all OSS to be inspected, OSS owners need to have training options available.

Puget Sound Counties

Before designing a pilot education project for Thurston County, it was important to learn what type of training options other Puget Sound counties offer to their OSS owners and explore the possibility of using already developed products.

All twelve Puget Sound counties have On-Site Sewage Management Plans as required by state law. Education is an important element in these plans. The table in Appendix C lists the counties and their respective Operation & Maintenance (O&M) program requirements. The column headed 'OSS Education / Training' highlights the varied approaches to education and training, whether OSS owners are allowed to do their own inspections and what, if any, fees are required.

Because the goal of the pilot project was to test *an efficient and electronic method*, program detail was gathered from only those counties where there were **online** training options for OSS owners: Clallam, Island, Jefferson, Skagit and Whatcom. [Full report in Appendix F]

Following are findings from the review of Clallam, Island, Jefferson, Skagit and Whatcom County programs:

- All offer basic OSS education.
- To qualify to self-inspect, additional online (Septic 201) or in-class training is required.
- Most have different standards / requirements than Thurston County.
- All counties, except Island County, allow mounds and sandfilters to be inspected.
- Online format varies from professional video to PowerPoint with no audio.
- All have an exam requirement to become certified.
- All require submittal of an inspection report.
- OSS owner inspection is not allowed for real estate transfer.
- OSS owner inspection is not allowed for community, commercial, food establishment, ATU OSS.
- Limitations include:
 - Must have an existing record drawing / as-built.
 - First inspection must be done by a professional.
 - Must have a professional inspection every 9 years.
 - OSS owner inspection is not allowed for MRA, sensitive areas or shorelines.

- Additional training is required if a system has a pump.
- OSS owner inspection is not allowed if the site was non-conforming at time of repair issuance.

Conclusions from Puget Sound Programs

- Clallam County's professional video could be used 'as is'.
- It would be helpful to insert some 'exceptions/differences' for Thurston County.
- Exams are already developed and need only editing to use.
- Consider adopting some of the 'limitations' implemented by other counties.

Thurston County Environmental Health Staff

The next step in the process was to review with Thurston County staff all the information that had been gathered and discuss a vision for a comprehensive OSS owner education program. In addition, a document summarizing Thurston County's current O&M program had been prepared for the On-Site Sewage Management Plan Advisory Committee and was available for staff review. Staff gathered for a 4-hour meeting in January 2014 and began the discussion by reviewing these results / responses from the certified OSS owners in Henderson, the certified professional pumpers in Thurston County and other Puget Sound county programs, as well as the analysis of Thurston County's current O&M program.

Staff summarized how they saw the strengths and weaknesses of Thurston County's O&M program.

- Strengths
 - The 5 ½ hour OSS training classes are successfully training thousands of OSS owners.
 - Tons of septic system information is available on the web and in print.
 - Environmental Health's SepticHelp line is available to anyone in the county.
 - The department has good financial incentives, i.e. riser rebates, low income assistance, low interest loans, that are used by hundreds of OSS owners.
- Weaknesses
 - Program costs a lot.
 - People get lost on website – it can be difficult to navigate.
 - Brochures can be seen as junk mail and are often thrown out.
 - Lack of funding for a comprehensive county-wide program.
 - Class attendees need a refresher – preferably online.
 - Training options and financial assistance/ incentives depend on where you live.

The discussion moved to 'When does an OSS owner want to learn about their septic system?' The number of certified OSS owners in the MRAs - 2,574 and counting - is evidence that septic system owners are willing to attend a 5 ½ hour class on a Friday or Saturday and learn about their septic system. However, the 'real' reason for the excellent attendance is likely that septic system inspections are required within the MRAs and being certified is a way to save money. There is no charge to attend because these classes are funded by the MRA annual program charge. This classroom / demonstration park format is labor intensive and costly and can only be available when funded through an established program.

Staff listed the following as reasons why an OSS owner would want to learn about their system:

- Inspections are required.
- Know someone who spent \$\$\$\$ on a repair and want to avoid the cost of an expensive repair.
- Some change in life / first time on a septic.
- System is failing.
- Do the right thing.

The general consensus was that OSS owners aren't particularly receptive to training options unless there is a compelling reason that the information is important. Though some owners may have good intentions to 'do the right thing', other priorities in their lives can take precedence.

What followed was a brainstorming session of ideas that could meet the public health challenges whereby septic systems within the county would be adequately operated and maintained and regularly inspected. How can the current O&M program be improved? With an estimated 56,000 OSS in the county that do not have any inspection oversight, what might be possible?

The following list of ideas was the outcome:

- Create an equal opportunity for education – equity issue.
- An inspection requirement for all OSS in the county.
- At 'time of transfer' or permitting, etc. – get O&M information to the new OSS user (not the realtor/seller/contractor).
- First inspection should be done by a professional.
- OSS owners of the following system types could be certified to self-inspect:
 - OSS owners of pressure, mound, Glendon and high-risk gravity must attend a class.
 - OSS owners of low-risk gravity can take on-line instruction.
- All OPC rates / charges would be on the property tax statement – more efficient and cost-saving.
- OSS professional inspection required every 3 – 4 cycles.
- General education classes / workshops held regularly.
- Use adaptive management to evaluate and adjust program.

Feedback from public included:

- Reorganize website / make the site easier to use.
- Offer a refresher for certified homeowners.
- Chart the OSS replacement costs to inform owners of what neglect might cost.

Conclusions from Environmental Health Staff

- OSS owners need a compelling reason to be educated about their septic systems.
- County should find options for expanded training opportunities - explore online instruction.
- Inspections by professionals should be required at prescribed intervals.
- Update website.
- Develop a refresher option.

Test Model Design

The goal of this project was to *determine if an efficient and electronic method* could enable county-wide septic system owners to become skilled at properly inspecting and maintaining their own system. The objective was to design an educational model that could be tested.

Given that for Thurston County:

- MRA OSS owner certification 5 ½ hour class is already established, successful and well attended.
- 2-hour SepticSense workshop curriculum is established and workshops are held when funding is available.
- OSS education information is distributed at public venues, i.e. fairs.
- Expanding OSS owner certification outside the MRAs is not a current directive.
- Updating the EH website 'education' segment is not in the current work plan.

And ...

- Two-thirds of Henderson certified OSS owners responding to a September 2013 questionnaire about their class attendance experience indicated that a '**refresher**' for conducting subsequent inspections would be helpful. The majority of respondents preferred an online format.

And ...

- An outcome from the staff discussion was questioning whether OSS owners of low-risk gravity systems could become proficient in **inspecting** through online instruction.

Therefore, the proposed model was to 'test' an existing OSS inspection online video with OSS owners. Two groups would be targeted: One group, Henderson OSS owners who are already trained and certified to inspect their own systems, would view the video as a **refresher**. The second group, Nisqually MRA OSS owners who have never inspected their OSS, would watch the video as a **training tool for self-inspection certification**.

If the video could successfully refresh certified OSS owners and/or train 'new' OSS owners on how to operate, maintain and inspect an OSS, it would meet the criteria of the project. It would be equitable – equally available to all on the internet. It would be electronic – done using a home computer. It would be an efficient refresher – less labor intensive than a classroom format. Whether it would be an efficient training tool for self-inspection certification would depend on what percentage of OSS owner inspections would need staff 'supervision'.

Methods

OSS owners were solicited from the MRA lists. Names chosen at random became the 'invitation list'. Three hundred (300) invitations were sent via regular mail – 150 to Henderson, 150 to Nisqually – requesting volunteers. Those owners who agreed to participate had to respond by email in order to obtain their email address as all subsequent correspondence was electronic. The survey tool chosen was Constant Contact™. All participants were sent an electronic pre-test to determine current knowledge. After receiving the completed test, a link to the instructional video was sent. After the participants watched the video, they

requested and took a post-test. The Henderson ‘refresher’ group answered a few additional questions and then were done with the survey. Those in Nisqually set up an appointment to do their inspection with a county staff member present to evaluate how well the inspection was done and then provide the owner with additional information or instruction as needed.

Participants were chosen at random from the MRA program roll. Invitations to participate were sent to 150 OSS owners in Henderson MRA and 150 OSS owners in Nisqually MRA. [Correspondence to participants is in Appendix G.]

The Henderson participants had to have

- taken the intensive training class and been certified,
- conducted their initial and renewal inspections,
- have their operational certificate current, and
- have a gravity, pressure distribution, Glendon™ or mound OSS.

The Nisqually participants were chosen at random from the Year 3 renewal cycle list of OSS owners whose first inspection would be due in 2015 and who have a gravity or pressure distribution OSS.

Schedule

When a list of participants was confirmed, the pilot training began by sending the pre-test with an initial memo outlining the sequence of e-mails that would be forthcoming. As the participants completed each step, the next ‘action’ e-mail would be sent. The goal was to complete the survey by the end of September – including the completion of all the owner inspections in Nisqually.

Video

Based on staff review of what the other Puget Sound counties were using for online training, the Clallam County video, which was produced professionally, was chosen as the best fit. The content was accurate and the presentation kept the viewers’ interest. The video content can be used by most anyone and has few details that are specific to Clallam County. The link to YouTube to view the video on a home computer was easy and free to use. <http://www.youtube.com/watch?v=udBaGyzJyU8>

Survey Tool

Constant Contact™ was the survey tool used to communicate with project participants. Staff were using this tool for other projects and were familiar with it. All correspondence, including both pre- and post-tests were sent, and returned, using Constant Contact™ as well as links to the videos and other online resources.

Tests

In order to evaluate whether the video was a good refresher or training tool, it was necessary to find out how much the OSS owner knew before they watched the video – and then again afterwards. Clallam, Island and Skagit counties have all developed a series of questions to test the OSS owners’ knowledge about how septic systems function. With their permission, these test questions were incorporated into a test of 38 questions. [Test sample in Appendix H] This test was used as both the pre-test and the post-test. This was done in order to compare how the participants answered the questions before viewing the videos and then after viewing the videos, as well as to find out which questions were consistently answered incorrectly. Incorrect answers pointed out common misunderstandings and could be used to adapt future training to clarify certain aspects of how septic systems function.

Inspections

The final step for the Nisqually project participants was to do an inspection of their septic system while being observed by department O&M program staff who would evaluate how well the owner performed the inspection. The OSS owner had to schedule an appointment with the department, uncover the tank, have their inspection tools ready and be prepared to do the inspection.

Results

Participants

Three hundred (300) invitations were mailed out in June 2014 – 150 to Henderson OSS certified owners and 150 to Nisqually OSS owners of gravity systems whose first inspection would be due in 2015. Approximately 20% responded that they would be willing to participate in the pilot project – 32 in Henderson and 34 in Nisqually. Of the volunteers who began the project, 78% in Henderson (25 participants) completed the project. In Nisqually 66% (19 of 29) completed the post-test; 38% completed their inspection and were certified (11 of 29).

Henderson: 32 initial volunteers
 5 dropped out
 27 took pre-test
 25 finished the post-test

Nisqually: 34 initial volunteers
 5 dropped out
 29 took pre-test
 19 finished post-test
 11 did their inspection and are certified

The pre-tests were emailed in early July 2014. From this point forward to the end of the project, responses trickled in. This often necessitated an individual response to each participant. After the pre-test was taken and sent back to the department, the links to the videos were sent out. After watching the videos the participants had to request a post-test, which was then emailed. Sending the completed post-test back to the department was the end of the project for Henderson participants. For those from the Nisqually MRA, an appointment had to be made with a department sanitarian who would observe the owner doing their septic system inspection.

Periodically, phone calls were made encouraging participants to complete a test or watch the videos. These calls offered an opportunity to find out if there were any problems with using Constant Contact™ or viewing the videos. Often e-mails had to be resent in order to get the participant back on track. Five people from Henderson and five from Nisqually stopped participating and could not be reached after repeated phone calls where messages were left. The September goal was not met. As of mid-November post-tests are still coming in and appointments for inspections are being made.

Tests

The pre-test and the post-test for both test groups contained the same 38 questions – and in the same order. This made it easy to compare ‘pre’ and ‘post’ test results. The Henderson owners scored well on the pre-test (92% correct answers) – likely from their classroom knowledge as well as doing their own inspections. Based on the fact that their post-test scores improved after watching the video, it may be concluded that either they learned something new or their memories were ‘refreshed’.

The Nisqually OSS owners had not previously attended any septic training course, so their pre-test answers would have reflected a baseline of knowledge. After watching the video their test scores improved from 84% to 94% correct answers - and ended on par with their Henderson neighbors.

Test Results (38 questions)

Pre-test average:	Henderson 34.8 (92% correct)	Nisqually 32.1 (84% correct)
Post test average:	Henderson 36.4 (96% correct)	Nisqually 35.7 (94% correct)

Test Questions

An interesting caveat to discuss are the questions most frequently answered incorrectly. The questions are as follows in the order of frequency missed:

Question 37. The alarm for the pump is tested by

- *assuring the alarm float is attached to the discharge pipe.*
- *pressing the ‘test’ button on the alarm.*
- *lifting the alarm float by hand or with a tool.*
- *turning off the power to the pump and waiting for 2 days.*

Question #37 was the question most frequently answered incorrectly. On the pre-test, over half answered in error – 14 of 27 people in Henderson and 18 of 29 in Nisqually. When taking the post-test 10 of 25 people in Henderson and 5 of 19 in Nisqually still answered it incorrectly.

Conclusion: Even after watching the video, OSS owners are confused about how to test a pump.

Question 38. You open the septic tank and see the tank is half full. This is because ...

- *the tank has not refilled since the last pumping.*
- *the tank leaks and must be repaired or replaced.*
- *the microorganisms in the tank are working properly.*
- *this is normal and what one expects to see.*

Question #38 also had a large number of incorrect answers – 11 of 27 Henderson pre-test takers and 17 of 29 in Nisqually. After watching the video, 5 of 25 (20%) Henderson participants still answered the question incorrectly. Eight of 19 people (42%) in Nisqually gave the wrong answer on the post-test. The certified pumpers had commented on this lack of understanding of how a septic tank functions. Their clients are surprised / alarmed that their tank is full. The fact that a septic system functions with a full septic tank is not understood by many.

Conclusion: How a septic tank functions is misunderstood.

Question 20. You can determine the scum and sludge levels in your septic tank by

- using PVC tools you make yourself to measure levels.
- using just a tape measure.
- visually inspecting your tank.
- none of the above

Question 20 was also about the septic tank. There were 11 of 27 Henderson and 11 of 29 Nisqually who answered incorrectly on the pretest. After watching the video, everyone taking the post-test answered the question correctly.

Conclusion: The video provided the information on how to measure scum and sludge levels.

Questions 24 and 32 were about septic tanks – their primary purpose and where the liquid level in the tank should be. Prior to watching the video, the Nisqually OSS owners often answered these questions incorrectly. They did improve after seeing the video. On the pre-test many Nisqually participants incorrectly answered the question about a *reserve area*. With only a single incorrect answer on the post-test, most now know that they have an area for a replacement drainfield.

Conclusion: The number of incorrect answers to these five questions suggests that training should include more emphasis on septic tanks and how they function, as well as what is normal and what is a deficiency.

Test Comments

Feedback was solicited from Henderson participants as part of the post-test.

- Twenty-three (23) of the 24 said they have been doing their own OSS inspections since attending the class.
- All 24 said they remembered how to do the inspection.
- Nineteen (19) thought the video was a ‘very helpful’ refresher, 4 said it was ‘somewhat helpful’ and 1 said he ‘knew everything before’.

The written suggestions / comments by the Henderson participants for improving the training are listed in Appendix I. Most confirmed that the videos were helpful and well done. Suggestions included putting the link on the county website, providing information on landscaping a drainfield and having ‘dip sticks’ available to purchase. Another suggestion was to provide the correct answers for those questions that had been answered incorrectly.

Inspections

Of the seventeen (17) Nisqually OSS owners who finished the post-test, eleven (11) did the inspection of their septic system. These 11 all have been certified to inspect their own OSS. The same Environmental Health staff member was present for all 11 inspections – which provided a consistent / controlled evaluation.

The conditions for the inspections were 1) an appointment with staff had to be scheduled, 2) septic tank lids had to be uncovered and 3) supplies and tools had to be ready for use.

Staff noted that the biggest confusion for the OSS owner was that ‘their tank’ didn’t look like the one in the video. Only 1 OSS of the 11 inspected looked like the septic tank in the video. Most of the eleven tanks were different, older style tanks. Owners were also confused about where to find the effluent filter as shown in the video – because none of the eleven systems had one. Four of the 11 systems had at least one deficiency. However, only one of the eleven owners recognized that there was a problem – that the baffle was broken and needed replacement. There is more variation of system types in the watershed than the video described. The consequence was that each of the ten homeowners received a one-on-one tutorial from county staff.

General Conclusions from Testing Pilot Model

- The video is a good refresher for certified OSS owners.
- The video does not provide enough instruction for an OSS owner to do their own inspection and successfully identify problems. In the field there are many variations of septic tank designs and system configurations and components, while the video only shows one version.
- OSS owners have a limited understanding of how a septic tank and system function.

Recommendations

The **primary recommendation** from staff who conducted the pilot project is that the video should be available to certified OSS owners to be used as a **‘refresher’**. (In fact, the link to the video is now being distributed to attendees of the 5 ½ hour training so they might have the video available when they do their next inspections.)

The video is **not recommended** as the sole training method for an OSS owner to conduct an inspection for a required operational certificate. More detailed instruction is needed to provide an OSS owner with the necessary information and skills to correctly inspect their own system and find deficiencies.

Other staff recommendations are as follows:

- The link to the video should be put on the Environmental Health website as an educational resource to be viewed by the public.
- Request that the video be edited by Washington State Department of Health to include a segment on identifying problems, different septic tank designs, examples of tanks without outlet filters, as well as a brief disclaimer that individual county requirements for inspections and pumps differ across Puget Sound.
- Inspections of OSS should be done by a Septic Professional
 - At time of real estate transactions (current requirement).
 - For alternative systems.
 - For initial OSS inspections when a property becomes part of an MRA or Sensitive Area.

Summary

The goal of the project was to determine if a more equitable, efficient and electronic method could enable county-wide septic system owners to become skilled at properly operating, maintaining and inspecting their own system. An online video is an electronic method and would be more equitable in that anyone with a home computer could view it. As a refresher for certified OSS owners, it would be a more efficient training model than a more labor intensive classroom setting and would be available to the OSS owner when needed to do an inspection. However, OSS owners who viewed the video and took the test online had difficulties inspecting their own systems and identifying problems. As an alternative to certifying OSS owners to inspect their own systems, this training method would be very labor intensive – both from the administration of the tests and videos to the time-consuming staff oversight and coaching of the initial inspections. Therefore, the final determination is that the video does not provide adequate training to certify an OSS owner to correctly do their own inspection and find deficiencies.

The professionally-produced video is a very good tool when used as a refresher for OSS owners who have previously attended the intensive classroom/demonstration park course offered by the county.

The video is a good educational tool for informing OSS owners of the basics of septic system operation and maintenance. It can be made even better by editing to include information on 'How Septic Systems Fail'.

Because the video by itself did not appear to provide adequate training to certify an OSS owner to successfully conduct their own inspections and identify maintenance and repair needs, the county should continue to explore other options for future MRA/Sensitive Area programs.

Appendix A

Thurston County On-Site Sewage Operation & Maintenance Program

Current Status, December 2013

Thurston County

On-Site Sewage Operation & Maintenance Program

Current Status

December 2013

Prepared by
BH Consulting, LLC

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Data was provided by the Surface Water Section of Environmental Health, specifically Business Applications Analyst Joel Plewa.

Funding is from Thurston County Public Health & Social Services 2012-2014 Consolidated Contract C16904 Amendment 8.

The purpose of this report is to capture the current status of the county's on-site sewage operation and maintenance program and to evaluate the various elements of the program. This report has been written to be used by staff as well as the advisory committee who is updating the county's 2008 On-Site Sewage Management Plan.

Linda Hofstad
BH Consulting, LLC
January 2014

Contents

Introduction.....	21
Background.....	23
Number of Systems	24
Notification of O&M Requirements	24
<i>Initial OPCs</i>	25
<i>Time of Transfer</i>	25
<i>Operational Certificate Renewal</i>	6
Fees and Budget	27
OSS Renewal Notice Response, Inspections and Maintenance	28
<i>OSS Notice Response</i>	28
<i>Inspections</i>	29
<i>Maintenance: Tank Pumps</i>	30
<i>Maintenance: Sampling</i>	30
Failing Systems	31
<i>Dye Test Results</i>	32
<i>Repair Records</i>	33
<i>Repair Records</i>	15
Financial assistance	35
Enforcement Effectiveness.....	38
Education / Training	39
<i>Workshops</i>	39
<i>Website / Online information</i>	40
<i>Community Outreach and Events</i>	41
<i>Septic Help Line</i>	41
Conclusions.....	41

List of Tables

Table 1 Thurston County OSS Stats	3
Table 2 Distribution of Number of OSS per Parcel	4
Table 3 Number of ‘New System Approvals’	5
Table 4 Time of Transfer Applicants	5
Table 5 Operational Certificate Renewal Notices.....	6
Table 6 Thurston County Onsite Sewage Operation and Maintenance Program 2014 Budgets.....	7
Table 7 O&M Renewal Notices Sent and First Response.....	8
Table 8 O&M Program Second Notices and Response.....	9
Table 9 O&M Program Non-conforming Notices	9
Table 10 Number of OSS Inspections Reports Submitted	10
Table 11 Septic Tank Pump Reports Submitted.....	10
Table 12 Monitoring Reports Submitted	11
Table 13 Compliance Status of Monitored Systems	11
Table 14 Number of Henderson MRA Failed Dye Tests.....	12
Table 15 OSS Repairs Permits	13
Table 16 Permitted Tank Replacements.....	13
Table 17 Numbers of Sand filter / Mound OSS and Replacement Permits	14
Table 18 Minor Repairs.....	15
Table 19 Riser Rebates Awarded	16
Table 20 Small O&M Grants.....	16
Table 21 Repair Grants.....	17
Table 22 Repair Loans.....	17
Table 23 Number of OSS in Compliance and Non-conforming.....	18
Table 24 Number of OSS Made Non-conforming and Number of OSS Reinstated	19
Table 25 Number Attending 2-Hour Workshops	19
Table 26 Number Attending Homeowner Inspection Certification Training.....	20

Figures

Figure 1 Days from Repair Permit to Installation	14
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Thurston County's Operation & Maintenance Program

Current program

December 2013

Introduction

For more than 40 years, Thurston County has worked to assure that on-site sewage systems (OSS) that pose the greatest risk to public health and the environment are properly managed. These efforts started with the "lakes" program in the late 1970's when new construction and monitoring requirements were put in place to reduce nutrient levels in lakes. The program has evolved to the recently adopted Nisqually Reach Watershed Protection Area with its special monitoring, maintenance and education programs. In between, the county has implemented, rescinded and modified programs as directed by the Thurston County Board of Health to address specific problems in defined areas as well as provide baseline services to all on-site sewage system (OSS) owners in Thurston County.

In 2005 and 2006 the State Board of Health and Washington State Legislature adopted laws (WAC 246-272A and RCW 70.118A) that directed the 12 Puget Sound counties to develop and adopt on-site sewage system management plans. These laws require counties to develop programs to:

- Progressively develop and maintain an inventory of all known OSS in operation within Thurston County.
- Find existing failing systems and ensure that system owners make necessary repairs.
- Find unknown systems and ensure that they are inspected and functioning properly, and repaired if necessary.
- Identify areas where OSS could pose an increased public health risk or contribute to degraded water quality.
- Identify operation, maintenance and monitoring requirements commensurate with the risks posed by OSS within sensitive areas.
- Enforce OSS owner permit application, operation, monitoring, maintenance and failure repair requirements.
- Develop a methodology for establishing Marine Recovery Areas (MRAs).
- Develop a database for keeping records associated with MRAs.
- Inventory all OSS in MRAs by 2012 and ensure all failing systems are serviced.
- Educate homeowners regarding their responsibilities for the operation and maintenance of their OSS.
- Remind and encourage homeowners to complete their operation and maintenance inspections.

The Thurston County On-site Sewage System Management Plan was developed by an advisory committee and county staff in response these laws. It was adopted on January 8, 2008. Since that time the county, residents and on-site professionals have done much to implement the plan.

This document is a report of Thurston County's On-Site Sewage System Operation & Maintenance Program as it exists in October 2013. It describes the program and highlights changes that came about as the county implemented the 2008 management plan to comply with requirements in RCW 70.118A, WAC 246-272A and the goals of the Puget Sound Partnership.

This report is divided into the following sections:

- Number of Systems
- Notification of O&M Requirements
- Fees and Budget
- OSS Notice Response, Inspections and Maintenance
- Failing Systems
- Financial Assistance
- Enforcement Effectiveness
- Education / Training

The data for this report is from the AMANDA permit tracking system and various databases maintained by Thurston County Environmental Health. The purpose of this report is to evaluate Thurston County's O&M program and compare it against the requirements in RCW 70.118A, WAC 246-272A and the goals of the Puget Sound Partnership.

Background

Thurston County has three active O&M programs:

- Henderson Watershed Protection Area / Marine Recover Area (Appendix A) – Implemented 2007
- Nisqually Reach Watershed Protection Area / Marine Recover Area (Appendix B) - Implemented 2013
- County-wide systems that require an operation & maintenance certificate for large and complex OSS – June 1999

The Henderson and Nisqually Reach Watershed Protection Area (WPA) / Marine Recovery Area (MRA) programs establish specific inspection requirements for every on-site sewage system within the program boundaries. The county-wide program applies to specific systems based on type or use that are outside the MRAs. It includes complex systems like mounds, sand filters, recirculating gravel filters, experimental and proprietary systems, aerobic treatment units (ATU's), drip dispersal systems, systems with disinfection units, holding tanks, remediation measures, community systems (COSS) and food establishments. Larger onsite sewage systems (LOSS), with design flows greater than 3,500 gpd, are regulated by Washington Department of Health and do not fall under the authority of the local health jurisdiction. Table 1 shows the number of systems within each program area. There is a combined total of 13,648 OSS in county O&M programs.

Of the *estimated* county-wide 70,000 OSS, 56,000+ do not require an operational certificate (OPC), i.e. gravity systems, pumped-to-gravity and pressure distribution systems that are outside the MRAs. These 56,000 are 80% of all septic systems in the county. They are not in any regulated O&M program at this time. Operation and maintenance information is available to these property owners online and two-hour basic OSS workshops offered by the County as resources are available.

TABLE 1

Thurston County OSS Stats

Henderson 5928 parcels		Nisqually 3781 parcels		County Required OPCs		Known OSS with No Special O&M Requirements
Systems	6510	Systems	4195	Systems	2943	
Total # of Systems in O&M programs: 13,648						

A requirement of RCW 70.118A is to develop an inventory of all OSS within the county. Thurston County has an inventory of 38,430 'known' OSS, i.e. a record of the septic system exists in the AMANDA database. [Table 1] Therefore, approximately 31,570 OSS are 'unknown' (70,000 – 38,430) OSS. 'Unknowns' become 'known' whenever ...

- The parcel is transferred at a time of sale
- A permitted repair is applied for
- An inspection report is submitted
- A building permit is reviewed
- A study area is inventoried

Number of Systems

To help assure that the OSS is being properly monitored and maintained, a renewable operational certificate is required for each OSS that is part of an active O&M program. This certificate must be renewed at an established frequency – the majority are every three years (some are annual). In order to renew, the OSS must be inspected by an onsite professional or certified homeowner (MRAs only) and an inspection report submitted along with documentation of completed maintenance or repairs. The most frequent maintenance item is pumping the septic tank.

There are often more than one OSS on a single parcel, and sometimes components of a single system are on more than one parcel. On some occasions the system components have more than one owner. Table 2 shows the distribution of the number of systems per parcel within the two MRAs and the county. Because of multiple OSS on single parcels, there were almost 600 more systems ‘discovered’ in the Henderson MRA than was first estimated.

TABLE 2
Distribution of Number of OSS per Parcel

Number of OSS	Henderson Parcels	Nisqually Parcels	County Parcels
1	5631	3659	26036
2	237	31	594
3-5	32	10	59
6-10	11	2	8
11-50	8	4	8
51-100	1	2	1
101-200	0	1	0

There are 13,648 OSS that are in regulated O&M programs. 14,108 operational certificates are required for these systems due to the extra OPCs for individual sewage tanks.

Notification of O&M Requirements

Septic system owners need to know the requirements and recommendations for operating and maintaining their OSS. A list of the requirements for proper OSS operation and maintenance is sent to the OSS owner when:

- An initial OPC is issued for a new or repaired OSS
- New O&M requirements are established for an existing OSS
- Ownership of a property with an OSS is transferred
- A postcard is sent to the owner to confirm that the required operational certificate for an existing OSS has been renewed, and that they should contact the department if they want another copy of the O&M requirements.

Initial OPCs

Permit applicants are sent a formal letter listing the O&M requirements for approved designs of OSS that will require a contract with a monitoring specialist or quarterly sampling. When any new or repaired system has been installed, the owner is sent an initial OPC that states the required and/or recommended O&M items. Upon renewal, postcards are mailed in lieu of the entire certificate and conditions. For systems that do not require an operational certificate, *County Other* in Table 3, the owner only receives an initial document with recommended maintenance.

TABLE 3
Number of 'New System Approvals'

Year	Henderson	Nisqually	County Required	County Other
2007	0	#N/A	0	609
2008	2	#N/A	0	412
2009	4	#N/A	0	242
2010	9	#N/A	0	250
2011	67	#N/A	64	207
2012	58	5	75	150

Time of Transfer

Thurston County adopted a Time of Transfer program in September 2010. A time of transfer report is required before a property served by an OSS can be sold or transferred. The applicant must submit a complete application and fees, have the OSS inspected, and have the septic tank pumped if it has not been pumped within the last twelve months. If the OSS is failing, it must be repaired. Any system deficiencies, including expired operational certificates, are reported to the applicant. Time of transfer applicants receive the requirements (or recommendations for gravity and pressure distribution systems) for proper operation and maintenance of their septic system. In 2012, 73% (985) of the time of transfer applications were for septic systems that do not currently require an operational certificate. [Table 4] Therefore, maintenance information was sent to almost one thousand septic owners who may not have previously gotten any maintenance information from the county. The Time of Transfer program has increased the distribution of septic system maintenance information. While one of the goals of the program was to ensure that new owners received information about the OSS they were purchasing, often times the applicant is a realtor, septic professional or current owner, and the information may not be passed on to the buyer.

TABLE 4
Time of Transfer Applicants

Year	Henderson	Nisqually	County Required	County Other
2010	34	#N/A	22	239
2011	124	#N/A	78	929
2012	173	100	98	985

Operational Certificate Renewal

The county permit tracking system, AMANDA, is a relational database that integrates all permitting functions, i.e. building permits, land use applications, OSS permits, food service permits, complaints and property violations, etc. The database includes OSS permit records. An electronic OSS record is created for each system when permitted or when 'discovered' in the case of existing 'unknown' systems. An operation and maintenance *folder* is created for each OSS where inspection and maintenance records can be tracked. If required, Inspection due dates are assigned and tracked. Upon completion of a satisfactory inspection and any needed maintenance or repairs, an OPC is issued.

When the certificate has not been renewed within 120 days of the renewal due date, the operational certificate folder status automatically changes to non-conforming. This places a 'red flag' on that property in AMANDA that shows the property has a violation. No other permit can be issued until the septic system and its operational certificate are brought into compliance. The status and history of inspections and maintenance of each OSS is recorded in the permit tracking system.

Table 5 lists the number of septic system parcels where the homeowner received operation and maintenance requirement information at time of certificate renewal. The majority of renewal notices for required operational certificates are on a 3-year renewal cycle; five hundred thirty-seven systems (537) require an annual renewal. In Table 5 the number for any given year is approximately one-third of the total notices for that program area. Note that the Nisqually program began in 2013 with the first notices being sent at the end of 2012.

TABLE 5
Operational Certificate Renewal Notices
Notification of O&M Requirements

Year	Henderson	Nisqually	County Required
2007	2016	#N/A	1164
2008	2060	#N/A	1089
2009	2379	#N/A	1026
2010	1854	#N/A	1053
2011	1946	#N/A	1020
2012	2043	*	894♦

*Nisqually has approximately 1424 notices sent annually.

♦ In 2011 the Washington State Department took over management of all OSS that were designed for flows greater than 3,500 gallons per day. That resulted in a reduction of 100+ *County Req'd* certificates.

Other than at Time of Transfer and for newly installed systems, the remainder of OSS owners do not receive written O&M recommendations for their OSS. Approximately 6,000 septic owners are annually sent information regarding operation and maintenance of their specific septic system as a result of the three O&M programs, new OSS installations and the Time of Transfer program.

Fees and Budget

Ongoing O&M activities in Thurston County are supported by a variety of funding sources. The county-wide operational certificate program is funded through an individual fee charged to the owner or applicant at time of initial issuance and upon renewal. The Henderson and Nisqually MRA programs are primarily funded by an annual fee charged through the property tax statement. In the case of Henderson the cost of fully implementing a successful program was greater than estimated, and grants have been used to supplement the budget. Grants have been used to augment work at Nisqually and dye testing and shoreline survey work along Eld Inlet. Grants have also been used to fund project work such as the current “Onsite Sewage Management in the Scatter Creek Aquifer” project and to fund the Urban Septic Assessment project in Lacey, Olympia and Tumwater and their urban growth areas. Beginning in 2010 a fee is charged for each septic tank pump report filed by pumping companies. This fee funds OSS complaint investigation and compliance activities for OSS reported to have deficiencies. A separate fee is charged for Time of Transfer reports.

Most fees must be paid in person by check or credit card. MRA program charges are collected through the property tax billing and collection system. Appendix C lists 2013 fees and program rates. The pump report fee is paid electronically by OSS pumping firms through a third party online web service and electronically transferred to the County. The County is exploring the use of a web-based permit application system which would allow the public to apply for permits and pay associated fees online.

The 2014 budget for all O&M program costs is itemized in Table 6. The O&M budget does not include the time of transfer program. The bottom rows of the table identify the revenue source for the different programs and activities, as well as the number of staff for each.

TABLE 6

Thurston County Onsite Sewage Operation and Maintenance Program 2014 Budgets

2014 Budget	Henderson MRA	Nisqually Reach MRA	MRA Compliance	OSS Owner Incentives/Financial Assistance	County-wide O&M	TOTAL
Salaries & Benefits	\$161,551.36	\$175,599.72	\$35,184.00	\$2,253.52	\$128,180.64	\$502,770.00
Lab Services	\$3,500.00	\$2,500.00			\$500.00	\$6,500.00
Postage	\$2,700.00	\$2,700.00			\$2,500.00	\$7,900.00
Supplies	\$5,500.00	\$4,000.00			\$4,000.00	\$13,500.00
Training	\$1,200.00	\$1,000.00			\$1,000.00	\$3,200.00
Misc. expenses	\$2,000.00	\$2,000.00			\$2,000.00	\$6,000.00
Mapping Services	\$5,000.00	\$4,500.00			\$5,000.00	\$14,500.00
Owner Grants/Rebates				\$24,000.00		\$24,000.00
Overhead/Internal Services	\$40,387.84	\$52,679.92	\$10,556.00	\$676.06	\$32,045.16	\$136,345.00
TOTAL	\$221,839.20	\$244,979.64	\$45,740.00	\$26,930.00	\$175,225.80	\$714,715.00
Revenue Source	Charge on property	Charge on property	State grant	Conservation District Assessment	Fee	
# of Staff	1.42	1.64	0.46	0.02	1.01	4.55

OSS Renewal Notice Response, Inspections and Maintenance

OSS Notice Response

Septic system inspections are required at time of Operational Certificate renewal. Operational Certificates are required for all OSS within the two marine recovery areas of Henderson and Nisqually as well as 2,943 other systems as required by sanitary code. [Table 1]

When operational certificate renewals are required, the process is as follows:

- 60 days before inspection due date Renewal Notice
- 30 days after due date.....Second Notice – reminder
- 60 days after due date.....Third Letter – informing of impending noncompliance
- 120 days after due date.....OSS automatically flagged as non-conforming; no permits can be issued until system brought into compliance

Upon completion of a satisfactory inspection and any needed maintenance or repairs, an OPC is issued. (If part of the county-wide program, fees must also be received.) Table 7 shows that approximately half (range 44 - 57%) of those who receive a first notice pay the fee if in the county-wide program, do the necessary inspection and required maintenance (pump tank or complete repairs), and renew their certificate. The compliance is similar for both Henderson and the county’s required OPC program.

**TABLE 7
O&M Renewal Notices Sent and First Response**

Year	Henderson	Renewed after 1 st notice	County Required	Renewed after 1 st notice
2007	2016	54%	1164	44%
2008	2060	46%	1089	53%
2009	2379	46%	1026	57%
2010	1854	48%	1053	54%
2011	1946	56%	1020	57%
2012	2043	54%	894	52%

Those who do not renew their certificate – either by not doing an inspection, not paying a renewal fee if in the county-wide program and / or not completing the required maintenance – receive a second notice thirty days after the certificate has expired. (In other words, three months after they receive the first notice.) Table 8 shows that about 40% of these who receive a second notice renew their certificate, i.e. do the required inspection, pay the renewal fee if required, submit the report and complete any necessary maintenance. Note: Table 8 data is for 2010 – 2012. Second notice and non-conforming notice processes were not fully automated until 2010.

TABLE 8
O&M Program Second Notices and Response

Year	Henderson	Renewed after 2 nd notice	County Required	Renewed after 2 nd notice
2010	963	42%	485	42%
2011	859	44%	435	43%
2012	929	39%	497	37%

A final notice is sent sixty days after the due date if no inspection report is received or needed maintenance or repairs done, or no payment if in the county-wide program. About 27% of all notices initially sent, get a third letter. [Table 9] This notice informs the owner that their system is about to be out of compliance and gives the owner an additional sixty days to complete the inspection and any necessary maintenance. If the owner does not comply or call for an extension of deadlines, the system is automatically flagged as ‘non-conforming’ in the permit tracking system. In order to bring the system back into compliance, everything that was required to renew the OPC must be completed, and in addition all sewage tanks must be pumped, a county inspection done and a county field inspection fee paid.

Eighty-four percent (84%) of OSS with required OPCs are inspected and needed maintenance is completed in a timely manner. The notification process is labor intensive because approximately 45% of the owners need more than one notice.

TABLE 9
O&M Program Non-conforming Notices

Year	Henderson	Percent of total notices sent	County Required	Percent of total notices sent
2010	563	30%	280	27%
2011	482	25%	249	24%
2012	566	28%	314	35%

Inspections

Prior to 2011 pump and inspection reports could be submitted to the department on paper. Since January 1, 2011 all pump reports have had to be submitted electronically via OnlineRME – Responsible Management Entity. Since January 1, 2012 inspection reports completed by onsite professionals have had to be submitted via OnlineRME.

Effective January 2010, the sanitary code required that OSS requiring renewable OPCs in the county-wide program had to be inspected by an OSS professional. This change was made to ensure that these alternative systems were being inspected by qualified individuals.

TABLE 10
Number of OSS Inspections Reports Submitted

Year	Henderson	Percent of 1 st notices sent	County Required	Percent of 1 st notices sent	Other County Inspections	Total Reports	Time of Transfer*
2007	1323	66%	824	70%	21	2168	
2008	1697	82%	980	90%	24	2701	
2009	2009	84%	816	80%	16	2841	
2010	1932	104%	887	84%	234	3053	16
2011	1903	98%	859	84%	174	2936	86
2012	1957	96%	779	87%	867	3603	381

* Time of Transfer number is a subset of 'County other'.

Maintenance: Tank Pumps

The most common OSS maintenance activity occurring is septic tank pumping. Since January 2010 pump reports have been filed electronically. To get an estimate of what percentage of tanks were pumped in Henderson during the first 3-year cycle, the number of pump reports received was divided by the number of notices sent in a given year. Most certainly tanks were being pumped without a renewal notice being sent. Though the almost 70% of septic tanks being pumped during the first 3-year Henderson cycle is a liberal estimate, more than a thousand tanks were being pumped each of the first three years. During the second cycle, 2010-2012, that dropped below 50%. About 3,700 tanks are being pumped annually in Thurston County.

TABLE 11
Septic Tank Pump Reports Submitted

Year	Henderson	Percent of notices sent	County Req'd	County Other	Time of Transfer*
2007	1294	64%	452	89	
2008	1513	73%	554	121	
2009	1667	71%	565	249	
2010	894	48%	552	1285	76
2011	944	49%	581	2346	370
2012	880	43%	447	2336	383

* Time of Transfer number is a subset of 'County other'.

Maintenance: Sampling

Certain systems, such as those designed to meet a treatment standard, have required sampling as a condition of the operational certificate. The purpose of the sampling is to track the system's performance and ensure adequate sewage treatment prior to disposal. Many of these systems were installed in highly sensitive areas, often as repairs, where soil and site conditions were not adequate for installation of conventional systems. Sampling is typically required on a quarterly basis.

Sample results are reported electronically through OnlineRME. All systems that have monitoring requirements have a 1-year renewal frequency and must have a service contract with a Certified Monitoring Specialist (CMS) to do inspections and sampling. As of 2012 all Monitoring Specialists are submitting their reports online. Staff is assigned to track these results on a quarterly basis and notify owners and their CMS if the system is not performing as designed.

TABLE 12
Monitoring Reports Submitted

Year	Henderson	Nisqually	County Req'd
2007	8	N/A	94
2008	8	N/A	91
2009	17	N/A	128
2010	18	N/A	104
2011	30	N/A	172
2012	86	25	171

Oversight of these complex systems is especially important because they are in highly sensitive areas and need to adhere to treatment standards. If not adequately treating sewage, disposal can pose a risk of fecal coliform or nutrient pollution to ground and surface water. Compliance status for monitored systems is listed in Table 13. Reasons for monitored systems being out-of-compliance include: 1) no CMS contract, 2) sample results not meeting treatment standards, 3) not renewing operational certificate and/or 4) not paying required fees.

TABLE 13
Compliance Status of Monitored Systems
November 2013

Area	In Compliance	Non-conforming	Total
Henderson MRA	98	7	105
Nisqually MRA	44	1	45
County	212	42	254

Failing Systems

The department investigates complaints and reports of failing systems. When a failure is confirmed, the department notifies the owner of their responsibility to repair it and tracks progress for compliance. If the owner does not repair the system, the department uses a variety of methods to enforce compliance, including court orders and civil penalties.

Failing septic systems are currently identified through the following activities:

- Voluntary application of a repair permit
- Complaint report
- Time of transfer inspection report indicates problem
- OPC renewal inspection report indicates problem
- Pump report notes problem
- Failed dye test in MRA or special project area

Dye Test Results

The O&M program in the MRAs uses dye test methodology to identify failing septic systems. Henderson and Nisqually programs require high risk systems, those with close proximity to water and restrictive soils, to have a dye test evaluation once every six years – every other renewal cycle. The methodology used is effective at finding systems failing to surface water. Approximately fifty dye tests are due every wet season in Henderson. Table 14 shows the number of systems found to be failing through dye testing. The dye test failure rate dropped from 11 % during the first 3-year cycle of the Henderson program to 4% or less in the 2nd cycle 2010-2012. The reason for lower failure rate is unknown at this time.

The county has been conducting dye tests since the early 1990’s. The overall percent of shoreline systems found failing through dye testing has been 13 – 14%. This is the percentage seen during the first 2 years of the Henderson program, in 2007 and 2008. However, that rate has dropped to 2 – 4%. Following this data may help determine if routine dye testing and physical inspections and maintenance are contributing to lower rates of OSS failure.

**TABLE 14
Number of Henderson MRA Failed Dye Tests**

Year	Number of Tests	Number of Failed Tests in Henderson	Failed dye test percentage
2007	21	3	14%
2008	38	5	13%
2009	45	3	7%
2010	50	1	2%
2011	51	2	4%
2012	53	1	2%

When an OSS fails a dye test,

- the owner is notified of the results;
- diagnostics are often performed to determine the cause of failure;
- Notice of Violation is issued with a timeline to repair; and
- O&M staff tracks repair progress through the permitting process.
- Enforcement actions are taken when needed.

Repair Records

Another way to assess failures is to examine repair permit activity. Table 15 shows the number of system repair permits issued as well as the number installed. The rate of installation is consistent between the marine recovery area and the rest of the county.

For the six years examined, repairs of systems outside the Henderson MRA have been less than 1% – approximately 0.7% (470 permits / 63,490 systems) of the total estimated number of systems. Within the Henderson MRA 2.0% (132 repair permits / 6,510) of the systems have been repaired. It is reasonable to conclude that the higher number of repairs within the Henderson MRA is because more failures are found as a result of regular inspections of every system.

TABLE 15
OSS Repairs Permits

Year	Henderson			County		
	Issued	Installed	% installed	Issued	Installed	% installed
2007	26	24	92%	81	70	86%
2008	21	16	76%	86	78	91%
2009	28	25	89%	84	76	90%
2010	19	17	89%	83	75	90%
2011	21	20	95%	86	80	93%
2012	17	14	82%	50	42	84%
Total	132			470		

Table 16 shows the number of permits for tank replacements and installations. Within the Henderson MRA, there was a 71% drop in the number of tank replacement permits between the first and second inspection cycles. There was also a decrease in the number of tank replacements within the rest of the county during these same two time periods. However, the decrease was only 38%. The economic downturn may have been a factor in lower permitted tank replacements in the 2010 to 2012 time period. However, it is also possible that the Henderson inspection program identified leaking tanks that had been in that condition for some time, and once those were corrected the numbers decreased. Data from routine inspections may help estimate the life expectancy of sewage tanks.

TABLE 16
Permitted Tank Replacements

Year	Henderson		County	
	Issued	Installed	Issued	Installed
2007	26	24	42	38
2008	15	11	28	23
2009	24	22	19	13
2010	5	5	27	21
2011	5	5	17	15
2012	9	9	11	8

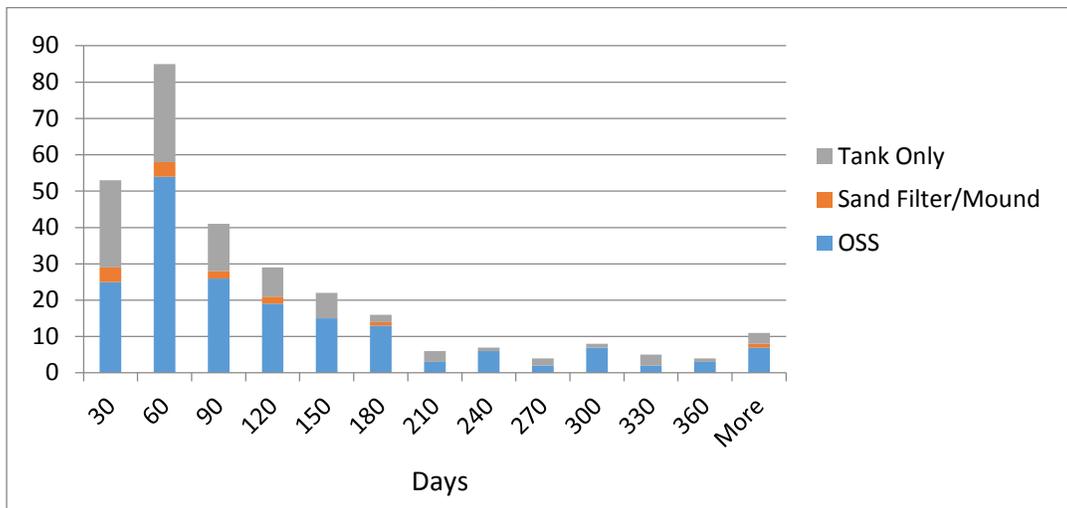
Repairs to sand filters and mounds include rebuilding / replacing these components. For the six year period 2007 – 2012, 3% of the sand filter, mound and sand filter / mound systems had replacement permits. [Table 17]

TABLE 17
**Numbers of Sand filter / Mound OSS
 and Replacement Permits**
 2007 - 2012

System type	Henderson		County	
	Total number of systems			
Sand filter only	118		1015	
Mound only	199		1023	
Sand filter/mound	82		205	
Total	399		2243	
	Rebuild / Replace Permits			
Year	Issued	Installed	Issued	Installed
2007	1	1	12	11
2008	1	1	8	7
2009	5	4	4	4
2010	0	0	8	7
2011	2	2	15	13
2012	2	2	11	8
Total	11	10	58	50

The majority of repairs are installed within 90 days of being permitted. (Figure 1)

FIGURE 1
Days from Repair Permit to Installation
 293 OSS: 2003 – 2013



Minor Repairs

An example of adaptive management happened during the first cycle of the Henderson program. When reviewing inspection and pump reports, staff noticed that a considerable number of repairs were being done that did not require a permit. In 2009, the county began tracking minor repairs. These are termed 'minor repairs' – minor because a permit is not required, but important because these problems could indicate that the system is failing. The sanitary code definition is as follows:

* **"Minor repair"** means the repair or replacement of any of the tightline pipe between a structure and a sewage tank; tightline between a sewage tank and the dispersal component; a pump; an interceptor drain; sewage tank pumps; pump control floats; effluent filters; pipes connecting multiple sewage tanks; OSS inspection boxes and ports where a sewage tank, treatment component, or soil dispersal component does not need to be replaced; and the replacement of a small section ten (10) feet or less of the SSAS damaged as the result of digging into it as part of an OSS evaluation. SANITARY CODE, ARTICLE IV, DEFINITIONS.

In 2009, which was the last year of the first 3-year inspection cycle, there were 431 minor repairs. [Table 18] It likely is true that the number of minor repairs that occurred in years one and two were similar. Hundreds of minor repairs were done. During the second 3-year cycle, the minor repairs decreased by half. With routine inspections and required reporting, it may be possible to estimate the number of minor repairs.

TABLE 18
Minor Repairs

Year	Henderson
2007	# N/A
2008	# N/ A
2009	431
2010	194
2011	184
2012	159

Financial assistance

To assist OSS owners incentives and financial assistance are an integral piece of Thurston County's O&M program. Rebates, grants and loans are available to various groups within the county. Each funding program has eligibility criteria. Rebates for installing risers over septic components are available only to septic owners in the MRA / Shellfish Protection Districts. The funding source for the rebates is an annual Conservation District assessment of residents within these districts. Rebates are \$50 per riser with a maximum of \$100 per system and two rebate awards per person. The program is administered by O&M program staff.

Riser rebates have been available to septic owners in Nisqually for the same number of years as in Henderson. [Table 19] The sharp increase in the number of Nisqually riser rebates coincides with development and adoption of Nisqually O&M program.

The number of rebates in Henderson peaked the second and third year of program implementation. Approximately, 13% of the Henderson systems have received rebates for installing risers.

**TABLE 19
Riser Rebates Awarded**

Year	Henderson SPD			Nisqually SPD		
	# of Risers	\$ in Rebates	# of OSS	# of Risers	\$ in Rebates	# of OSS
2007	254	\$12,700.00	154	4	\$200.00	2
2008	372	\$18,600.00	217	4	\$200.00	3
2009	377	\$18,850.00	244	9	\$450.00	5
2010	167	\$8,350.00	98	4	\$200.00	2
2011	140	\$7,000.00	83	38	\$1,900.00	21
2012	117	\$5,850.00	77	44	\$2,200.00	23
TOTAL	1427	\$71,350.00	873	103	\$5,150.00	56

Small grants are offered to low income septic owners within the two shellfish protection districts to help with the cost of inspections, maintenance and minor repairs. They are available to owners enrolled in the senior/disabled property tax exemption program or have an annual household income of \$40,000 per year or less. Qualifying owners are eligible for a small grant once every three years to coincide with their inspection frequency. The funding source for the rebates is an annual Conservation District assessment of residents within these districts.

**TABLE 20
Small O&M Grants**

Year	Henderson SPD		Nisqually SPD	
	# Grants Approved	\$ Granted	# Grants Approved	\$ Granted
2007	16	\$4,594.29	2	\$759.50
2008	26	\$8,408.84	0	\$0.00
2009	25	\$8,182.21	0	\$0.00
2010	20	\$6,855.89	1	\$500.00
2011	22	\$6,035.89	2	\$612.53
2012	26	\$6,283.10	1	\$420.40
TOTAL	135	\$40,360.22	6	\$2,292.43

The county health department has had a financial assistance program for septic system repairs since 1993. Tables 21 and 22 show amount and distribution of grant and loan repair funds. The data shows that while only about 10% of the OSS in the county are within the Henderson Watershed Protection Area roughly 30% of the repair grant and loan funds distributed were for Henderson OSS repairs.

**TABLE 21
Repair Grants**

Year	Henderson		Nisqually		County		All Areas	
	# of Grants	Amount	# of Grants	Amount	# of Grants	Amount	# of Grants	Amount
2007	0	0	0	0	1	\$3000	1	\$3000
2008	0	0	0	0	1	\$2800	1	\$2800
2009	6	\$19,655.33	1	\$3750.00	5	\$18,619.82	12	\$42,025.15
2010	2	\$6750	0	0	5	\$21,500	7	\$28,250
2011	6	\$15,250	0	0	8	\$41,750	14	\$57,000
2012	1	\$2250	0	0	1	\$6500	2	\$8750
TOTAL	15	\$43,905.33	1	\$3750.00	21	\$94,169.82	37	\$141,825.15

**TABLE 22
Repair Loans**

Year	Henderson		Nisqually		County		All Areas	
	# of Loans	Amount of Loans	# of Loans	Amount of Loans	# of Loans	Amount of Loans	# of Loans	Amount of Loans
2007	0	0	1	\$14,752.39	2	\$32,315.07	3	\$47,067.46
2008	3	\$47,932.73	0	0	3	\$33,584.76	6	\$81,517.49
2009	0	0	1	\$7,280.39	5	\$56,489.18	6	\$63,769.57
2010	2	\$21,831.09	0	0	1	\$19,480.47	3	\$41,311.56
2011	2	\$26,359.97	0	0	8	\$117,607.41	10	\$143,967.38
2012	2	\$25,268.67	0	0	0	0	2	\$25,268.67
TOTAL	9	\$121,392.46	2	\$22,032.78	19	259,476.89	30	\$402,902.13

In six years, over half a million, \$663,880, of financial assistance has helped Thurston county OSS owners operate, maintain and repair their septic systems.

Enforcement Effectiveness

Thurston County’s O&M Program enforcement strategy is a combination of active and passive enforcement. When an OPC has not been renewed within 120 days, and no request has been granted for an extension, the OSS is automatically designated as a non-conforming system and is out of compliance with the county sanitary code. This designation is noted in the permit tracking system and can be seen by all permitting staff. To reinstate an OPC the following is required:

- A system inspection by a certified professional
- Pump the tank if it is more than a year since the previous pump
- Complete any required repairs to the system
- Pay back renewal fees if in the county-wide O&M program
- Pay a county field inspection fee
- Complete an field inspection application for a county OSS inspection

The owner of a non-conforming OSS receives a written notice of the status and a reminder to bring it back into compliance at the time of prescribed renewal due date, i.e. usually three years after the last due date.

Table 23 lists the number of systems / components that are ‘*In Compliance*’ and ‘*Non-conforming*’ within each of the O&M program areas. Eighty-four percent (84%) are in compliance – both in Henderson and County.

**TABLE 23
Number of OSS in Compliance and Non-conforming**

	Henderson		Nisqually		County Required	
	Systems	Components*	Systems	Components*	Systems	Components*
In Compliance	5483	5601	4195	4274	2475	2713
Non-conforming	1027	1031	N/A	N/A	468	489
Total	6510	6632	4195	4274	2943	3202

*More components than systems due primarily to additional septic tanks.

Passive enforcement means that no permits can be issued for any activity on a parcel with a non-conforming OSS until the OSS is brought back into compliance. At time of transfer, non-conforming status is reported, which results in many OSS being brought back into compliance. [See Table 24] As well at time of certificate renewal many OSS are reinstated, i.e. brought back into compliance. The process to notify OSS owners of their non-conforming status was automated in 2010 and may explain the increase in Henderson reinstatements that year.

The department does take compliance action when high risk OSS within the marine recovery areas fall into non-conforming status. The typical actions taken first include direct communication attempts to inform the owner and get voluntary action. If unsuccessful, it is followed by a notice of violation and can go on to civil penalties and court action if needed.

TABLE 24
Number of OSS Made Non-conforming and Number of OSS Reinstated

Year	Henderson		County		Reinstatements due to Time of Transfer
	Made Non-Conforming	Reinstated	Made Non-Conforming	Reinstated	
2007			67	37	
2008	1	1	50	24	
2009	80	28	37	14	
2010	565	184	55	26	
2011	273	75	280	118	11
2012	302	66	170	59	24
Total	1221	354	659	278	

Education / Training

Environmental Health uses a variety of means to inform and education OSS owners throughout the county including informational brochures that are included when mailing new operational certificates.

Workshops

Two-hour basic septic system workshops are usually held several times each year in a variety of locations around the county. More than 2,000 people have attended these workshops from 1998 to 2008. [Table 25] These workshops are conducted by department onsite sewage staff and educators. Due to budget reductions, since 2011 the two-hour classes were not conducted unless grant funds were available.

TABLE 25
Number Attending 2-Hour Workshops

Year	Number of 2 hour workshops	Number attending
1998	5	208
1999	8	245
2000	6	186
2001	6	208
2002	7	174
2003	7	216
2004	8	211
2005	8	155
2006	8	243
2007	4	112+
2008	4	111
2011	2	N/A
Total	73	2039+

An integral piece of the Henderson Watershed Protection Area program has been a 5 ½ -hour class to train and certify owners of gravity, pressure distribution, mound and Glendon systems to inspect and maintain their systems. The training includes classroom instruction, as well as outdoor instruction at a ‘septic system demonstration park’, located at Thurston County Health Department where the owner training is held.

Since 2007, 161 training workshops have been held, and 2,295 homeowners have been certified. The class is now open to property owners in either Henderson or Nisqually Reach MRAs and who have a standard gravity, pressure distribution, mound or Glendon type system. The training is funded by annual program charges.

**TABLE 26
Number Attending Homeowner Inspection Certification Training**

Year	# of Workshops	Henderson		Nisqually	
		Registered	Attended	Registered	Attended
2007	42	603	554	#N/A	#N/A
2008	36	630	546	#N/A	#N/A
2009	37	607	507	#N/A	#N/A
2010	19	338	285	#N/A	#N/A
2011	12	238	209	#N/A	#N/A
2012	15	224	194	124	107

Part of evaluating the county’s septic system education programs is to determine if this intensive education effort is achieving its goals. A questionnaire was developed and sent (in September 2013) to 150 class attendees. These certified homeowners were chosen at random from class participants of the first 3-year cycle (2007 – 2009). The certified homeowner had to be ‘in good standing’, i.e. their certification had not been revoked due to failure to renew their certificate.

The overall response was very positive. The program content is providing homeowners with the skills to conduct their own septic system inspections. The inspections are being done and are being repeated at time of renewal. Information is recalled, or handouts and personal notes provide the needed refresher. More web-based inspection information is desired. If the attendees were to decide, they would continue the training program. The full report can be found in Appendix D.

Website / Online information

The Environmental Health website has pages of OSS and O&M information that can be viewed or downloaded. The webpages contain videos, brochures, fact sheets, lists of certified septic professionals, do-it-yourself instructions. More information can be found by ‘drilling down’ on each of the following pages:

- Septic Systems
- Septic System Operation & Maintenance
- Operational Certificates
- Educational Materials / Workshops
- Henderson Watershed Protection Area
- Nisqually Reach Watershed Protection Area

See Appendix E to preview what each of the above pages looks like.

Community Outreach and Events

The Environmental Health educators organize and host the two-hour basic septic system workshops. Other educational outreach activities include:

- Dr. Yu, Thurston County Health Officer, articles in The Olympian
- Talkin' Trash articles distributed by Thurston County Public Works Department's Solid Waste Program
- Homeowner association newsletter articles
- General newspaper articles
- A septic display used at events such as the county fair and other water quality-related workshops
- Environmental Health blog to provide information on the basics of septic systems.
- Brochures

Septic Help Line

The department has a designated 'Septic Help Line' that the public can call with questions, get advice and request technical assistance for their OSS.

Conclusions

Thurston County's operation and maintenance program is a 'work in progress'. In the last decade, the program has expanded from 3,000 OSS with required O&M to include two marine recovery areas for a total of more than 13,000 OSS. The program which began as an exercise in paper management is now primarily electronic – a database that stores OSS permit designs, records and maintenance reports; an automated inspection notification system that sends more than 7,500 notices annually; and electronic submittal of OSS inspections and pump reports by OSS professionals through use of a web-based application. More OSS are being routinely inspected and maintained than ever before, and eighty-four percent (84%) with required O&M are in compliance. Failures are being found and repairs completed. Compliance and enforcement are now an integral and specifically funded element of the program. Hundreds of minor repairs to OSS components are being done that are extending the life of systems. Education has been expanded to include a certification for OSS owners to conduct their own inspections. More and more septic system information is available on the county's website to assist OSS owners in the care and operation of their systems. More than half a million dollars have been distributed to assist Thurston county septic system owners in the operation and maintenance of their systems.

The primary goal of Thurston County's O&M program is to protect public health. The program has been designed to meet the requirements of state law, the county's sanitary code and the county's OSS management plan. These requirements have either been met, or the mechanisms to meet the requirement have been put in place. (See Appendix F)

The program is accomplishing its goal and meeting its legal requirements. As a 'work in progress', the O&M program faces the challenge of how to become fully funded without the reliance on federal and state grants.

Appendix B

Puget Sound County O&M Program Spreadsheet

County Info				Inspection Elements									OSS Education / Training			Funding & Fees		Additional information		
County	# OSS	MRA / Sensitive area	O&M program start	Inspection Frequency	Inspection Notification	How inspections rec'd	RME	QA/QC	Compliance	Enforcement	# of Failures / Year	Time of transfer	Homeowner Inspections	Education / Training	Education Fee	Funding	Report Fees	Notes	Pop	Database
Clallam	20,000	MRA	2000	annual: in MRA 1st inspection done by professional	not yet	paper	yes: pumpers + O&M service providers	not yet; want to	not yet	not yet	1 -2%	in sanitary code; prof inspection required; banks are requiring	yes; existing record + DIY training	Septic 101 + 201 online	free	Grants	no charge for homeowner	Must register for class online; Lower Dungeness - public support for insp prg	71,863	Tidemark
Island	32,000	Sole source aquifer	2008	annual in both sensitive areas	send 3 letters	paper: staff enters data	all	yes	22%	\$25 fine	estimated 100	in code; prof inspection required;	yes: gravity + pump to gravity	contract with CD + WSU	\$25 for certificate	Clean Water Dist - \$39 on prop tax - 3% to OnSite program	\$1.99	New website in Oct 2103 pumpers not req to report	79,177	Granicus
Jefferson	13,500	MRA	1997	gravity = every 3 yrs; risk areas = every 2 yrs	none yet	paper	yes - insp; not pump	random checking	poor	not yet	25	in code; prof inspection required;	200 certified; not ATU, proprietary, drip	Septic 101 (2 hrs) and 201 (online/3/5 hrs wksp); Req tests	\$10 authorization fee	Clean Water District; \$5 per parcel + grants	\$52 inspection rpt fee	Must have professional every 9 years; to be 'known' must have an inspection	29,854	Tidemark
King	155,000	MRA	1999	gravity = every 3 yrs all others annual	in MRA	paper + online	all	yes	90% for ToT	not active; NOV followed by Notice & Order; fines possible	13 as reported by RME	permit - \$111; escrow company oversees	yes	workshops discontinued due to lack of interest	\$40 paid by buyer	100% fee supported	\$28		1,960,000	Envision
Kitsap	58,000	None	1995	annual for all except gravity and pump to gravity	industry responsibility; 300 notices/month to lapsed owners; 50 tickets per month to service providers	online	all	PIC program	gravity + pump to grav = 40%; alternative OSS = 98%	50 tickets / mo \$524 / violation / day	1%	disclosure program; \$202 permit with full site evaluation (how gravity and pump to gravity get inspected)	6 in county; must become CMS with all fees	no	NA	\$50 /contract /year for all alternative systems = \$750,000 annually; fines for delinquency; tipping fees -2 cents per gallon	Find problems with gravity and pump to gravity thru PIC program; tickets in \$8000 range; contractors get tickets - \$30,000 annual online from contractor enforcement Contractor gets a monthly 'report card'... \$50 / contract after 60 days past due	254,500	RME	
Mason	25,756	2 MRAs	2004	gravity + pressure reminder = every 5 yrs mound + sand filter = every 3 yrs annual = ATU, Glendon, drip irrigation	direct mailing to address; 16¢ per card	paper + online	no	no	Oakland Bay > 50% Elsewhere = 47%	letter sent	~ 70 / yr	in code; prof inspection required + req pumping	yes; gravity, pressure, mounds, sandfilters	WSU	no charge	Grants	none	Scanning record drawings	60,832	Carmody
Pierce	84000 (gravity = 80%)	1 MRA	1997	gravity + pressure = not req'd out MRA for sand, mound, off-site df, duplex, small comm = every 3 yrs ATU, drip, experim, lg comm = annual	send monthly; 4th letter - going to file on title	all online; all professional	yes - insp + pump	at ToT and PIC grants	60 - 70%	record on title; must pay \$470 to remove and comply		\$230 permit, EH site inspection; \$50 prof filing	no	general info workshops	NA	Fees + grants	\$50 insp \$20 pump	Incentives: \$124 for inspection, \$124 for risers, \$200 for pumping within MRA	808,200	Envision
San Juan	8,000	entire cty	2007	gravity = every 3 yrs; all else = annual	postcards	online only	no	yes; site visits	80 - 90%	passive; no bldg permit; at ToT must be compliant		compliant with code; up to realtors	yes 4,000	training sessions on-site by staff	no	Fees + grants	\$30/report		15,824	in house
Skagit	15,000	12 MRAs	2001	gravity = every 3 yrs; all else = annual	every 2 yrs	online	yes	check work of inspectors	98% MRA	3 ltrs ... \$75/day fine up to \$5000 ... then collection	60 / yr	prof inspection within 6 months; repairs within 90 days of closing; seller subject to fine if no inspection	yes; not shoreline; gravity + pressure; must be permitted OSS; pump = more training	101 online; 201 field class; tests; qualify for \$100 rebate	no	Cty funded SPD \$25 / residential	none	Incentives: inspections + risers	118,222	Septic Management
Snohomish	75,000	None		not doing	none	online baseline of information	no	not yet	not yet	notice to title when permitted; owner responsible	~250	no program	none ... too costly	nothing active	NA	Grants	not yet	Septic Issues committee meets monthly; state supreme court upheld "can not change structure without meeting code" Low repair permit fees;	722,900	in house OSSOM
Thurston	70,000	2 MRAs	1990	every 3 yrs in MRA's (all OSS) + countywide mounds, sandfilters, Glendons; ATU, food, comm = annual	renewal basis = 3 letters; then nonconforming	online; paper for homeowners	yes - insp + pump	10% of inspections in MRA	84% in MRA	no permits allowed when out of compliance	~100	permit required; inspection and pump within last 6 months	yes: MRAs only; gravity, pressure, mound, Glendon only; 2,500 certified	5.5 hours class with demo park	no, class only for MRA owners	MRA charge; fees; grants	only pumping \$15	incentives: low income assistance, risers	258,332	Amanda
Whatcom	29,000	None	2008	MRA's = annual	annual	paper	no	not yet	96% sensitive area; 87% MRA; 30% remainder	\$125/day - capped at 4 days - then issue \$500 penalty	68 per yr	not mandatory; professional must do	Yes; gravity, pressure, sandfilter, mound	online only	no	\$19/prop on tax statement used 6116	no	Issue with parcel numbers; changed to a site # for each OSS; treasurer notifies EH when a parcel # is changed	205,262	WHAMO

Appendix C

Summary of Puget Sound Septic System Operation & Maintenance Programs December 2013

Septic systems have been, and will continue to be, the only viable option for wastewater disposal for hundreds of thousands of Puget Sound property owners. As Puget Sound has increasingly become prime real estate over the last decades, the need for orderly oversight and regulations has increased. Regulations for the protection of the public's health have become a necessity. As population density increases, as water quality of ground and surface water declines, and as knowledge continues to grow of how soils and topography uniquely 'set the stage' for how septic systems function around Puget Sound, the need for an intentional and consistent approach (rules and regulations) to design, install, operate and maintain septic system has become increasingly apparent.

Washington State Department of Health has had rules and regulations in place since 1974 in Registered Code of Washington (RCW) and the defining Washington Administrative Code (WAC). To meet the need for an intentional and consistent approach (rules and regulations) to design, install, operate and maintain septic system, the rule change adopted in 2006 requires that all Puget Sound counties have an On-Site Sewage (OSS) Management Plan that must address specific elements.

One of those elements is how 'the County' will educate septic system owners about how septic systems function as well as how to properly operate and maintain them. Indeed, Puget Sound counties have had Operation & Maintenance programs for septic systems for decades. Over the years the Washington State Department of Health has published and distributed thousands of pamphlets and brochures. However, with septic systems most often 'out of sight' it can correctly be assumed that they are also often 'out of mind'. Water quality data throughout the Sound confirms that septic systems are a serious contributor to nonpoint pollution and a cause of water quality degradation of our lakes, streams, ground water and Puget Sound.

With expanding development throughout the last half century, much of Puget Sound prime property for siting of septic systems has been developed. Shoreline 'view properties' are most often encumbered by less than desirable soil type and topography making not just siting but operating and maintaining septic systems, especially the complex systems, a challenge. Complex system types require professional expertise combined with disciplined maintenance in order to function as designed and not contribute to nonpoint pollution. In addition, what were summer cabins for city dwellers in the 1950's have become year-round residences with a significantly different use than their systems were designed for. All of these factors have pointed to the need for consistent rules and regulations and their enforcement by county governments.

When state rules and regulations are adopted, Puget Sound counties are required to update their Sanitary Codes to comply with new requirements. Puget Sound counties are a patchwork of communities with rich diversity. With that diversity comes varying approaches to compliance with state requirements. And these approaches are heavily influenced by multiple factors including level of staffing, budget constraints, funding mechanisms, current water quality data, public awareness and resistance, and political will.

In order to learn what approaches to septic system operation and maintenance Puget Sound counties have developed, I talked with a representative from each county—usually the manager of the O&M program. I developed a list of 'topics' to ask about and organized them as the primary spreadsheet document for reference and comparison.

What follows is an appendix to the spreadsheet and is a summary of conversations with O&M managers from the 12 Puget Sound counties: Clallam, Island, Jefferson, King, Kitsap, Mason, Pierce, San Juan, Skagit, Snohomish, Thurston, and Whatcom. Each topic is concluded with what Thurston County does.

County Information

Number of septic systems:

The number of septic systems ranges from 8,000 in San Juan County to an estimated 155,000 in King County.

Thurston County has an estimated 70,000 systems of which 10,000+ are in Watershed Protection Areas / Marine Recovery Areas (MRA). 3,000+ have required operational certificates due to system type, use or state requirement. The remaining 56,000+ are 'outside' of these areas and/or requirements.

Marine Recovery Areas:

Half of the counties have a Marine Recovery Area—some having several. Skagit County has twelve which was determined to be the best management strategy for their sensitive area. Some of the MRA's have been formed as a result of shellfish growing area downgrades. Other counties have designated *sensitive areas*, e.g. Island County has a 'sole source aquifer' sensitive area.

Thurston County has two Marine Recovery Areas: Henderson Inlet and Nisqually Reach. Each was formed initially as a Shellfish Protection Area after commercial shellfish growing area downgrades.

Inspection Elements

Frequency of required system inspections:

State law requires that gravity septic systems be inspected every three years. All other system types have an annual inspection requirement.

Frequency of required inspections is a moving target among Puget Sound counties – from no requirement to an annual inspection requirement. Two of the twelve counties do not currently have any requirement for inspection. Two other counties are requiring annual inspections for all systems. The remaining eight counties either require annual inspections for all aerobic treatment units (ATU's), drip irrigation, food, community and experimental systems and / or annual inspections for all systems in sensitive or MRA areas. Most of the counties have language in their sanitary code that requires gravity systems to be inspected every three years. Other than in MRA or sensitive areas, no county has a program that has enforcement for gravity systems.

Thurston County requires renewal every year for ATU's, proprietary systems, schools and community systems everywhere in the county. Mounds, sand filters and Glendons have a 3-year renewal requirement everywhere in the county. Within the Watershed Protection Areas all other systems have a 3-year renewal requirement.

Notification:

Sending notices to homeowners to inspect their septic system varies among Puget Sound counties in both approach and frequency. A few counties send out an annual notice to everyone using general postage options – simply sending a postcard to an address. Some counties require annual inspections but send out notices every two years. Other counties require inspections every two years and send out no notices. Several counties send the three letters: first notice, past due, out of compliance. If no response to these three letters, then

compliance takes effect. Kitsap County places the responsibility on the industry professionals to conduct an inspection annually. Therefore, if the inspection report is late, the notification goes to the service provider. All other counties make the property owner responsible for compliance.

Thurston County sends renewal notifications for all required operational certificates sixty (60) days before due date, a second notice thirty (30) days after due date and a non-conforming notice sixty (60) days past due.

Septic system inspection forms:

Depending on their technology and whether the county is set up to accept electronic reports, the inspection forms are either received electronically via the web or paper over-the-counter. In Kitsap, Pierce and Thurston counties, the industry professionals are primarily responsible for reporting the inspection information. In other counties the homeowner is required to submit the inspection report.

Thurston County receives paper inspection reports only from certified homeowners. All other reports, including pumper reports, must be filed electronically via OnlineRME.

Reporting:

Reports include inspection, tank pumping and monitoring, when required because of system type. Depending whether counties can receive electronic reports, reports are filed either online or with paper, in which case staff enters the data.

Thurston County requires that all reports, except those completed by certified homeowners, be reported electronically. Inspection reports are required for all OSS with an operational certificate. Pump reports are required for all pump outs. Monitoring reports are required for all ATU's and systems using disinfection.

Quality Assurance /Quality Control:

All persons interviewed expressed that this component is necessary for an effective O&M program. However, with the program demands on staffing and funding, as well as the complexity of setting up these programs, prioritizing what gets done first takes precedent. Some counties are randomly conducting site visits of inspections done by homeowners; others are reviewing each inspection report submitted and field checking on a percentage of reports. Use of OnlineRME by many counties has provided various reports that are being used to conduct quality control.

Thurston County's Watershed Protection Area programs and the Countywide Required O&M have a program goal of conducting 10% quality control reviews / inspections. Currently, staff is able to conduct 5%.

Compliance:

Compliance is defined as having the required inspection done, a report submitted and required maintenance completed. In general where programs exist, compliance is good in designated areas, i.e. marine recovery areas or sensitive areas. Compliance rates range from 70 to 98%. In areas that lie outside these designated areas or where there are no focused programs for gravity systems, the compliance rate is often less than 50%. The only county with a high countywide compliance rate is San Juan County with an 80 – 90% rate. The entire county, all 8,000 septic systems, is included in that program.

Thurston County policy is to place the out-of-compliance systems into non-conforming status 120 days past the due date. An administrative fee of \$310 is assessed to bring the system back into compliance. All outstanding fees, a professional inspection and having the septic tank pumped within the last year are all required to bring the system into compliance. Currently, the compliance rate within the MRA's and Required OPC programs is 84%.

Enforcement:

When OSS owners do not meet the inspection and maintenance requirements for the OSS, the Puget Sound counties' options for enforcement vary from daily fines to passive compliance to nothing. Several counties assess daily fines ranging from \$25 - \$524. Other counties choose to not allow any type of building permit until the septic system is brought into compliance. Most counties who have an active enforcement policy have charges to bring the system back into compliance. Two counties record on the title that the septic system is out-of-compliance. To remove the statement from the title after bringing the system back into compliance incurs further charges.

Thurston County policy is to place the septic systems that have not been renewed as 'out-of-compliance'. Those properties cannot retain any kind of building permit until the septic system is brought into compliance. If a septic system is found failing, then active enforcement is pursued. The septic system is identified as 'in violation'; a notice of violation is issued; and timelines for repair are established.

Time of Transfer:

Adopted into state law in 2006, counties are required to progressively inventory and find failures. Many counties use the 'time of transfer' program to help accomplish this objective. Most counties have something in place for real estate transfers, though the requirements may not yet be 'mandatory'. In many counties the responsibility to comply with the law lies with either the real estate community or the lenders. Politics do come into play with this type of program; one person interviewed stated that 'an influential real estate agent' has significantly shaped their county's program. Three counties have programs that require a county permit and a site inspection by county staff.

Thurston County requires a 'time of transfer' application for all real estate transactions. The application must include an inspection report done by a professional or certified homeowner and proof that the septic tank has been pumped within the last year.

OSS Education and Training

Homeowner inspections:

Nine of the twelve counties do have provisions for homeowners to conduct their own inspections and submit their reports to the county. Most of these nine counties require training – either online or at a workshop. Several counties require passing a test at the end of training in order to be certified to conduct an inspection. Nowhere are homeowners certified to inspect ATU's, proprietary devices or commercial systems. Kitsap allows homeowners to inspect their own system providing the individual becomes a Certified Monitoring Specialist paying all annual fees and passing the required exams. San Juan County has 4,000 certified homeowners; Thurston County has more than 2,500.

Thurston County has a 5 ½ hour training program for qualifying homeowners whose gravity, pressure distribution, mound and Glendon systems is located within the Henderson or Nisqually Reach MRA. Upon completion of the training homeowners are certified to conduct inspections on their own system and submit the required reports to the county.

Education / training program:

Education includes websites, brochures, booths at community events, signs on city buses, radio spots, workshops, as well as training for homeowners who want to do their own system inspections. The counties who do certify homeowners have either online courses, i.e. Septic 101 and 201, or training workshops or a combination of the two. The training workshops are conducted by contract with Conservation Districts or Washington State University or presented by environmental health staff. In all counties that offer homeowner training, only specific system types qualify for inspection by a homeowner.

Thurston County training program is taught by an environmental health specialist to certify homeowners in the MRA's who have gravity, pressure distribution, mounds or Glendons. [A Class Questionnaire Summary report is available for details.] Informational 2-hour workshops are offered as funding is available.

Funding and Fees

Funding:

Essentially all twelve counties have used Department of Health grant funding to either support or supplement their O&M programs. However, seven counties have funding programs in place that either fully or significantly fund their O&M program: Island, Jefferson, King, Kitsap, Skagit, Thurston and Whatcom. Island County has a Clean Water District with annual \$39 charges collected on the property tax statement of which 3% goes to the On-site program. Jefferson County has a Clean Water District that charge \$5 per parcel. King County's program is fully fee supported. Kitsap County requires an annual \$50 contract for all alternative systems within the county; this fee is collected by the service provider and transmitted to the county via OnlineRME. Skagit County has a county-funded Shellfish Protection District that assesses an annual \$25 charge per residence with a septic system. Thurston County has a range of charges depending on location and program; charges are collected either via direct payment from the property owner or on the tax statement if within an MRA. Whatcom County is the first county to enact SSB 6116 / RCW 70.05.190. The \$19 / property charges went on the property tax statements in February 2013. This action will enable Whatcom County to fully fund their O&M program without any grant funding.

Most counties use the grants to either subsidize their current programs or supplement those programs. For example, scanning record drawings, implementing a notification program, adding staff for follow-up quality control, compliance and enforcement and hiring staff to conduct training are choices counties are making for use of the grant dollars. Grant dollars also provide cash for incentives such as risers, inspections and tank pump outs. Some counties use the grant dollars to fully support their programs.

Thurston County has a fee schedule for the Countywide Required Operational Certificates as well as the Watershed Protection Areas. The countywide charge is \$120 per renewal (\$60 for those in senior / disabled tax program), is individually billed and collected via personal check. The Henderson and Nisqually Reach Watershed Protection Areas charges are collected via the property tax statement. These two areas have a risk-based rate schedule –low risk, high risk and community.

Fees:

Fees are charges in addition to program rates, i.e. Clean Water Districts, Shellfish Protection Districts and Watershed Protection Districts that have been discussed under the 'Funding' heading.

Some counties have opted to require report filing fees. Pierce County charges \$50 per inspection report and \$20 per pump report. King County charges \$28 per report submittal. For many counties these fees are collected via OnlineRME and transferred to the respective county. San Juan County charges \$30 per report submittal.

Island County charges \$25 for a certified homeowner inspection certificate. Jefferson County charges a \$10 'authorization fee' for inspection certification. In King County at time of sale the buyer pays \$40 for homeowner education.

Thurston County requires a \$15 fee per pump report. There is no charge for inspection reports which are covered by either operational certificate renewal charges or time of transfer application fees.

Additional Information

Databases:

The twelve Puget Sound counties have ten different database systems: Amanda, Envision, Granicus, Carmody, OnlineRME, Septic Management, Tidemark, WHAMO and in-house databases. These databases are used to store specific parcel information: permit data, system information, O&M data, compliance records and enforcement details. Eight counties also use OnlineRME so industry professionals can report inspection and pump data directly to the county using electronic data entry. Most of these eight counties have a separate internal database for system design, repair, notification and enforcement tracking. Using a common database for entry of maintenance data, means that data can be shared and compared on a Puget Sound basis.

Thurston County uses Amanda which is a permit tracking software program that connects all of Thurston County's permitting departments enabling staff to view all current and past activities on a piece of property. Microsoft Access interfaces with Amanda to send renewal notices as well as confirmation that an operational certificate has been renewed. All inspection and pump reports are submitted by professionals using OnlineRME which interfaces with the County permit-tracking system, and some data, but not all, automatically transfers on a nightly basis.

Inventory:

State law requires each Puget Sound county to develop an inventory of all OSS within their county. All of the counties are working toward that goal. However, when the number of septic systems ranges from 8,000 in San Juan County to an estimated 155,000 in King County, the challenge facing each county is dependent on a number of factors – not just how many OSS there are to inventory.

Regardless of how 'known' and 'unknown' OSS are defined, it can be assumed that most alternative systems are newer and have some permit on file and therefore most are 'known'. One can then deduce that the majority of 'unknowns', those without any record or permit, are standard gravity systems that could even have been installed 50 to 100 years ago when no one even considered permits.

Areas serviced by municipal sewer also present a challenge. As cities and towns grew and sewer lines were extended, not all properties hooked up to the utility and conversion records were not always kept.

‘Unknowns’ are sprinkled throughout older residential areas and can be very labor intensive to find.

How to ‘define’ inventoried OSS varies among the counties. ‘Known’ systems can include just those systems that have a record on file from a permit or a record drawing OR it can mean everything that has a record plus all parcels not served by sewer where a structure is likely to be a residence, i.e. greater than a certain value. Some counties are adding the term ‘Assumed’ as a subset of ‘Known’— meaning that given the parameters assigned, i.e. value of structure, no sewer service, no record on file, it can be assumed that the structure is served by an OSS.

‘Unknown’ systems can include everything that doesn’t have a permit or record drawing OR it can be an estimated number of systems that haven’t been counted in any systematic way, i.e. value of structure. Some counties are using DOH grants to fund staff time to specifically conduct the inventory by going through county records parcel-by-parcel and scanning all records into their database. Whatcom County is using aerial maps to identify structures that probably have an OSS. Field staff are given lists of properties to verify when they are out doing other work.

State law required that inventories in marine recovery areas be completed by 2012. That goal has mostly been completed.

Thurston County has been working on its inventory and is making steady progress. All 10,705 OSS in the two marine recovery areas were fully inventoried by the end of 2012. Of the estimated 70,000 OSS in the entire county, 31,570 are yet to be inventoried. When special projects are conducted, i.e. Scatter Creek Aquifer Area study, Eld Inlet study, OSS are inventoried. ‘Time of transfer’ program is also accounting for many OSS being added to the inventory.

Political climate:

This factor plays a significant role with regard to program support and funding. In general, if the political support is present, there is at least partial funding. If the support is limited, the program is limited in scope and function.

Thurston County has strong support from the Board of Health for the Environmental Health O&M program.

General Conclusions:

- The majority of counties have some program in place. King County has hired a program manager in the last year to further develop their program. Snohomish County has chosen an alternative approach to establish its program. The other ten counties have programs that range from one staff person persistently working to expand their current program to counties that have a fully funded, fully-developed, electronic-based program.
- There are ten different database programs being used. This likely presents problems in transmitting data to State Department of Health or sharing data between counties.
- The programs that have the highest rates of compliance are those within a Marine Recovery Area or sensitive area.
- All counties place the responsibility to routinely conduct septic system inspections on the property owner.

- Though most counties would like to have a better funded more comprehensive program, most are working on maintaining basic program elements and expanding the program as time and resources allow.
- Nine counties accept inspection reports conducted by homeowners. What system types and which owners qualify for self-inspections vary from county to county.
- Whatcom County has led the way in adopting the 2012 legislation enabling charges on county property tax statements for implementing and funding on-site sewage management plans.
- The twelve Puget Sound counties each face different challenges. Some counties are struggling to simply maintain staff. For others, economics are favorable. Without state financial assistance, several counties would not have a program. The political climate can change with each election – adding support or withdrawing it.
- Operation and management of OSS is not a one-time fix; it is an on-going, forever program.

Appendix D

Henderson Certified Homeowner Questionnaire

Summary Report

October 2013

An integral piece of the Henderson Watershed Protection Area program has been to offer a 5 ½ -hour class to homeowners of gravity, pressure distribution, mound and Glendon systems on how to inspect and maintain their septic system. Upon completion of the class, homeowners are certified to inspect their own system and submit reports to the Health Department. This class has been taught by Dave Tipton, a veteran environmental health specialist. In addition to classroom instruction, a 'septic system demonstration park' was constructed at the Thurston County Health Department on Lilly Road in Olympia where the owner training is held.

Since 2007, 161 training workshops have been held; 2402 homeowners have been certified. These classes have had high attendance and a very low cancellation rate. The class is open to owners who live within the boundary of the Protection Area and have either a standard gravity, pressure distribution, mound or Glendon system. The program is funded by annual program charges.

Notification, registration and preparation for class takes significant staff time. The first 3-year cycle (2007 – 2009) of the Henderson program was a full schedule of four classes (each with 15 – 20 participants) held monthly with August having no classes. The second 3-year cycle (2010 – 2012) had full classes though fewer were held.

Part of evaluating the county's septic system education programs is to determine if this intensive education effort is achieving the goals and if it should be continued. A questionnaire was developed and sent (in September 2013) to 150 class attendees. These certified homeowners were chosen at random from class participants the first 3-year cycle (2007 – 2009) registration list. The certified homeowner had to be 'in good standing', i.e. their certification had not been revoked due to failure to renew their certificate.

The purpose of the questionnaire was to learn if class participants:

- Thought the class was helpful
- Had experience doing septic system inspections before they took the class
- Were able to successfully do their own inspection after the training
- Could remember how to inspect their system three years later when they renewed their operational certificate
- Needed to have their septic tank pumped
- Thought a refresher of some sort would be helpful to them
- Believe the county should keep the program

Of the 150 questionnaires mailed, thirteen (13) were returned as undeliverable and seventy (70) were returned completed (51%).

The results are as follows:

1. Had you been doing your own septic system inspections before attending the class?
Yes: 14 (20%) **No: 54(77%)** No answer: 2 (3%)

Three-fourths of class attendees had not been inspecting their own systems prior to attending the class. One respondent stated that prior to the class they did not know the difference between a septic system and municipal sewer. Even those who answered “yes” and who had been inspecting their own systems answered question 2 as ‘very helpful’.

Conclusion: The class is educating primarily owners who have never inspected their septic system prior to taking the training.

2. How helpful was the 5-hour homeowner septic system training?

Very helpful: 65 (93%) Somewhat helpful: 5 (7%)

Knew everything before: 0 Waste of time: 0

The comments at the bottom of the questionnaire confirmed that the instruction was helpful and much appreciated. The instructor was applauded for making the material interesting and easy to understand. Many commented that the class time was well used – ‘no wasted time’.

Conclusion: Resounding approval of the instruction content and training.

3. Did you conduct your own inspection of your septic system after attending the class?

Yes: 65 (93%) No: 5 (7%)

The question always arises: So they took the class, did they go do the inspection? The answer for this sampling indicates that 93% of them did. Some who answered ‘no’ indicated that they were ‘too old’ to do the work; others said they preferred to hire a professional. One comment expressed an appreciation for learning how to pick a ‘responsible company’.

Conclusion: Good follow-through to action.

4. Were you confident doing your own inspection?

Easy to do the inspection: 58 (83%) Had some problems: 11 (16%)

Wouldn’t do it again: 1

A considerable amount of information is presented during the 5 ½ hour class and this question was posed to ask if participants could remember everything needed to conduct their inspection. A number commented that they took notes during class and filed them and the handouts for future reference. They said they found those most helpful when the time came to do the renewal inspection. A clear majority found the inspection easy to do.

Conclusion: The majority responded that it was ‘easy to do’ their inspection.

5. Did you need help doing the inspection?

No: 57 (81%) Yes: 13 (19%)

Had to call the county: 3 Had to hire a pumper: 5

The instructor told the classes that he was available to offer help—either over the phone or a site visit. The 11 who ‘had some problems’ (question 4), needed some help and chose to either call the county or hire a pumper. Of those who hired a pumper, one comment was that the pumper had confirmed that the homeowner did know what they were doing and had done the inspection correctly.

Conclusion: The majority did not need help with the inspection. If they did, help was readily available.

6. Did your septic tank need pumping?

Yes: 21 (30%) **No: 49 (70%)**

Almost three-fourths of the tanks did not need to be pumped. However, some people did write that the tank needed to be pumped at the subsequent renewal cycle. Many commented that this class was saving them money by not having to hire someone to do their inspection. It appears that it was also saving them money by not having to pump the tank.

Conclusion: The majority of tanks did not need pumping.

7. Did you conduct your own inspection when your renewal notice came in 2010, 2011 or 2012?

Yes: 66 (94%) No: 4 (6%)

Most homeowners are continuing to do their inspections at renewal time.

Conclusion: Step one toward becoming a maintenance habit.

8. Did you still remember how to do the inspection?

Yes: 62 (88%) No: 8 (12%)

Forgot everything: 0 Had to call the county: 1 Had to hire a pumper: 2

Most of the respondents remembered how to do their inspection. Comments indicated the importance of taking good notes during the class and filing them for future reference. The handouts were also most helpful to attendees.

Conclusion: Class material is learned and remembered.

9. Have you recommended the training to your neighbors?

Yes: 56 (80%) No: 12 (17%) No answer: 2

Many class attendees told their friends and neighbors about the class. Also many sessions had neighbors attending together.

Conclusion: Word-of-mouth is great publicity.

10. Would a refresher be helpful? If so, what kind of format would be best for you?

No: 23 (33%) **Yes: 47 (67%)**

Classroom/septic park: 12 Online tutorial: 26 'How To' brochure: 19

Two-thirds of the respondents said they would like some sort of refresher. The preference was for a web-based tutorial followed by a brochure (also available online to download). Twelve preferred a classroom session. Some suggested that a 'Reminder' be put on the EH web page linking to basic inspection instructions.

Conclusion: Data indicates a convenient refresher is desired.

11. Should the county continue to offer the training?

Yes: 68 (97%) No answer: 2

With the exception of two respondents who didn't answer the question, the answer was a resounding 'yes'. One of the two who didn't answer, wrote that it was 'easier to hire' a pumper.

Conclusion: Affirmation of the value of the training.

Comments written at the bottom of the questionnaire have been included with the above question results. Many respondents expressed their appreciation for the opportunity to do their own inspections.

The overall response was very positive. The program content is providing homeowners with the skills to conduct their own septic system inspections. The inspections are being done and are being repeated at time of renewal. Information is recalled or handouts and personal notes provide the needed refresher. More web-based inspection information is desired. If the attendees were to decide, they would continue the training program.

Appendix E

Pumper Responses to Questionnaire

November 2013

Purpose of pumper questionnaire summary: to gain feedback from certified septic system pumpers regarding OSS owner inspection training as part of the evaluation of Thurston County's OSS education programs.

Background: Thurston County offers basic 2-hour septic system workshops to OSS owners throughout the county when funding is available. These workshops are taught by a sanitarian and an Environmental Health educator and provide a basic understanding of what a septic system is and how to operate and maintain it. Attendance at the workshop does not qualify an OSS owner to inspect their own system.

Thurston County offers an enhanced septic system inspection certification training option for a select group of OSS owners (an estimated 8,000 of the county's 70,000 OSS owners) within the Marine Recovery Areas (MRAs) who have standard gravity, pressure distribution, mound or Glendon septic systems. Upon completion of a 5 ½ hour classroom training session, the owner is certified to conduct their own required inspection and submit the report to the county. The training is taught by an environmental health specialist and includes classroom lecture with question-and-answer, videos, handouts -- including county records of each owner's system, as well as a visit to the demonstration park where actual septic system components can be viewed.

All other OSS owners who have an inspection requirement must hire a professional to conduct their inspection and submit the report.

The goal of the pumper survey was to learn from the septic pumpers what their professional in-field experience is regarding OSS homeowner inspections.

- What system types can homeowners adequately inspect?
- What system types should homeowners not be inspecting?
- What type of training would ensure proper homeowner inspections?
- Are certified homeowners doing their inspections correctly?
- Would homeowners of gravity systems 'out in the county' be interested in training to self-inspect?

Questionnaire Responses:

The attached questionnaire was sent via e-mail to twenty-six (26) septic tank pumpers who are certified in Thurston County. No online responses were received. Phone calls were made to pumpers located in Thurston County. Their responses are noted after each question.

- What types of systems could be inspected by trained owners?
 - Gravity
 - Pressure distribution – some pumpers were concerned about the pumps
 - Mounds – not all agreed
- Which systems should not be inspected by an owner?

- Mounds – don't understand the monitoring ports
 - Glendons – don't have adequate training
 - 'Keep their fingers off the panel'
 - Sandfilters
 - All ATU's, proprietary, etc.
- What type of training is needed to ensure that the inspections are done properly?
 - Current training is good
 - Hands on is most helpful
 - Some pumpers continue education while pumping
 - Do owners mention that they have taken the 5 ½ -hour training?
 - Lots
 - 'Quite often'
 - 'Don't see a lot who have taken training'
 - Receive calls of 'We need you!' ... have taken the class and 'chickened out'
 - 'Do get something out of it'
 - Attendees have a better understanding
 - 'People mention it all the time; they like the class.'
 - From your daily experience, how well are owners doing when they do their own inspections?
 - Some owners are on top of it, are responsible
 - Pleased to be able to take a class
 - Most are pretty good
 - Some think they now know more than a pumper
 - Some owners don't want to mess with it
 - Do you think owners of gravity systems would be interested in attending a training session?
 - If an inspection requirement were to be enforced, options are needed for the public to accept
 - Some will resist regardless; no amount of incentives will work
 - Responsible owners will take a class
 - Other comments:
 - Increase in business after Henderson program began
 - Time of sale program really hasn't increased business – were doing pumps before
 - One pumper has seen an increase in time of sale
 - People are surprised / alarmed that their tank is full
 - Need something better than a sock for measuring
 - Have trouble measuring the bottom sludge
 - Pumper asks about diet. Has observed that beef eater wastes collect in the scum layer; fish, chicken, turkey eater waste collect on the bottom
 - After training offered, business decreased by 40%; taking money out of our mouths
 - Wipes are becoming a serious problem – they are not flushable as it says on the package

Observations:

- Pumpers view their 'service role' differently: strictly business vs educator
- One pumper asks if the owner lives in an MRA and has taken the class

- Some pumpers encourage homeowners to take the 5 ½ hour training
- Some pumpers are proactive in finding record drawings
- Most pumpers have an inspection only option
- Many pumpers have a 'clientele' of loyal customers
- Some pumpers focus on time of transfer service

Dear Septic System Pumper,

We need your perspective and input. Thurston County Environmental Health is evaluating their homeowner septic system education and training programs.

As septic system professionals you work daily with septic system owners. Your conversations with these owners, your knowledge and your insights are extremely valuable for our review of the county's existing programs. You know how much the owners know – or don't know. You play a significant role in educating septic system owners about their systems and how to care for them. You probably hear comments about any county-sponsored training they may have attended.

With approximately 70,000 septic systems in the county, the county currently has three education programs:

1. The intensive 5 ½ hour homeowner certification program **only for owners of gravity, pressure, mound and Glendon systems in the watershed protection areas of Henderson and Nisqually Reach;**
2. A 2-hour workshop – held two to four times per year as funding permits; (hasn't been held for 18 months) and
3. Basic septic system information at the Environmental Health website.

Currently only those certified owners in the Henderson and Nisqually Reach programs (approximately 10,000 systems) can do their own inspections for renewal of an operational certificate. Many owners of septic systems that are required to have an operational certificate that live outside a watershed protection area (approximately 3,000 systems) want to be certified to inspect their own systems. Plus state law requires that all septic systems be inspected routinely. (An additional 57,000 systems)

Do you have suggestions or comments on homeowner inspection programs? Your response to these questions is very important. Please send your comments back via e-mail. If you prefer, print out this questionnaire and mail to **Thurston County Environmental Health, 2000 Lakeridge Dr., Olympia, WA 98502** with an **Attn: Pump Questionnaire**. Or you can give me a call to talk about your ideas.

- What types of systems could be inspected by trained owners?
- Which systems should not be inspected by an owner?
- What type of training is needed to ensure that the inspections are done properly?
- Do owners mention that they have taken the 5 ½ -hour training?
- From your daily experience, how well are owners doing when they do their own inspections?
- Do you think owners of gravity systems would be interested in attending a training session? Would they prefer an online course?

Thank you for your time,
Linda Hofstad, BH Consulting

253-983-9168

Appendix F

Survey of Five Puget Sound Counties Online OSS Training

December 2013

Purpose of summary: evaluation of Puget Sound online OSS training programs to provide information for discussion of the Thurston County OSS education program.

Background:

Thurston County offers an enhanced septic system inspection certification training only for septic systems owners within the Marine Recovery Areas (MRAs) who have standard gravity, pressure distribution, mound or Glendon septic systems. Upon completion of a 5 ½ hour training session the owner is certified to conduct their own required inspection and submit the report to the county. The training is taught by an environmental health specialist and includes classroom lecture with question-and-answer, videos, handouts -- including county records of each owner's system, as well as a visit to the demonstration park where actual septic system components can be viewed.

Thurston County's training is a classroom, in-person option for a select group of homeowners – an estimated 8,000 of the county's 70,000 OSS owners. There is no other OSS training option; Thurston County does not offer any online training for homeowner certification. All other OSS owners who have an inspection requirement must hire a professional to conduct their inspection and submit the report.

As part of the evaluation of Thurston County's OSS education program, online homeowner training could be an option for consideration.

- Basic education vs. inspector training
- Report submittal
- Certification cost to homeowner
- Program cost
- Funding source
- Limitations

Five Puget Sound counties have online training options for homeowners: Clallam, Island, Jefferson, Skagit and Whatcom. The information is presented in table format followed by bulleted detail for each county, including the website address for further information and review.

Program element	Clallam	Island	Jefferson	Skagit	Whatcom
Basic education	Septic 101 online	Septic 101 online	Septic 101 online	Septic 101 online Classroom to qualify to do own inspection	HOST Online^
Inspector training to conduct own inspection	Septic 201 online	Septic 201 online	Septic 201 online	Septic 201 class only	
OSS types*	G ,P, M, SF	G, P	G, P, M, SF	G, P, M, SF	G, P, M, SF
Exam	Yes	Yes	Yes	Yes: 101 online No: in class	No Checklist + signature of course completion
Online format	Video	PowerPoint	Uses Clallam's	Slides - voice over	PowerPt – no audio
Report submittal	Yes	Yes	Yes	Yes	Yes
Cost to owner	None	\$25	\$10	None	None
Annual program cost	\$13,108	Not possible due to current program changes	Not available: getting it up and running	Included within other activities	\$2000 - \$3000
Funding source	Grants	DOH grants	Clean Water District + DOH grants	DOH grants	OSS fee (6116) only revenue source
Limitations	Existing record; 1 st MRA done by professional; no for real estate transaction; no community or commercial	Cannot be in MRA or Sensitive Area	Professional inspection every 9 years	Not shorelines; must have permit on file: not for property sale; additional training if pump component	No community or food; not if site was non-conforming at time of repair issuance; not for real estate transfer
QA/QC	Adding field component 2014	Yes	Random review	Yes	Not yet
*G = gravity, P = pressure distribution, M = mound, SF = sand filter					^Went online because too much staff time

The following is bulleted detail for the five Puget Sound counties that have **online** training options for homeowners: Clallam, Island, Jefferson, Skagit and Whatcom including the website address for further information and review.

Clallam County

http://www.clallam.net/hhs/EnvironmentalHealth/onsite_septic101.html

- Septic 101 – Basics
- Septic 201 – How to conduct an inspection
- Professional video production
 - Actor speaks
 - Actor demonstrates building tools
 - Actor demonstrates inspecting
- Language not exclusive to Clallam County
- Some differences from Thurston ...
 - 18 inches to pump
 - Can inspect sandfilters
- Exam
- Introductory page noting
 - Who can inspect
 - Which systems can be inspected by homeowner (gravity, pressure distribution, mounds and sandfilters)

Island County

<http://www.islandcountyeoh.org/page/118>

- Septic 101 – Basics
 - Voice over
 - PowerPoint type presentation
- How to Inspect Your Septic System ... copy of Clallam County's 201
- Septic 201 – How to inspect
 - About to go online
- Can inspect gravity and pressure distribution
- \$25 certification fee
- Language exclusive to Island County
- Exams
- Brief introductory page

Jefferson County

<http://www.jeffersoncountypublichealth.org/index.php?resources-for-homeowners>

- *Homeowner Authorization*
- Septic 101 – Basics (Clallam’s video)
- Septic 201 – How to Conduct an Inspection (Clallam’s video)
- Exam after each course
- Sidebar with links to chapters in video
- Can inspect gravity, pressure distribution, mounds and sandfilters
- \$10 authorization fee
- Introduction page easy to navigate

Skagit County

www.skagitcounty.net/septic

- Septic 101 – Basics
- Septic 201 – Class only
- Quiz online for 101
- Can inspect
 - Gravity and pressure distribution
 - Must be permitted
 - Pump component requires additional training
- Qualifies for \$100 rebate (pump, inspection)
- Exclusive to Skagit County
- 101 is slides with voice over

Whatcom County

http://www.whatcomcounty.us/health/environmental/sewage_systems/certification.jsp

- Homeowner Online Septic Training (HOST)
- Can inspect gravity, pressure distribution, sandfilters and mounds
- PowerPoint type format – no audio
- Easy to read introductory page

Information that is included on the county webpages:

- Why inspections are important to public health
- What’s an MRA
- How to get financial assistance
- How to get a record drawing
- Link / how to find previous homeowner reports
- Lists of professionals

Appendix G

Letters of Invitation to participate in the pilot project



COUNTY COMMISSIONERS

Cathy Wolfe
District One

Sandra Romero
District Two

Karen Valenzuela
District Three

**PUBLIC HEALTH AND
SOCIAL SERVICES DEPARTMENT**

June 2, 2014

Don Sloma, MPH
Director

Rachel C. Wood, MD, MPH
Health Officer

Dear Henderson Certified Septic Owner,

Several years ago, you took a 5 ½ -hour class taught by Thurston County Health Department staff to learn how to inspect and maintain your septic system. After attending the class, you were issued a certificate that authorized you to do inspections of your system.

In September 2013, we sent a questionnaire about how the workshop could be improved to 150 certified septic owners in the Henderson area. Many people suggested that an online refresher course would be helpful. We found a video we believe may serve as a good refresher of septic system function and inspection. We would like your opinion on the video and how useful it is as a refresher.

We are asking for your help and would like you to:

- Take a pre-test online about your septic inspection knowledge;
- Watch a video on your computer about caring for and inspecting septic systems;
- Take a post-test online to determine if the video refreshed your knowledge; and
- Answer a set of questions to evaluate the video.

The best way for us to know if the video is useful is to have folks watch it and tell us what you think. **Your participation in this study will not affect your current certification to inspect your septic system.**

To participate, please send an e-mail to: Environmental_Health@co.thurston.wa.us
Include your **name, street address, tax parcel number, and phone number** in the e-mail. Type **"Septic Pilot Study"** in the subject line. All communication, including tests, will be done via e-mail. If we have questions, we will contact you by phone.

Please send your email no later than Monday, June 16, 2014.

If you have questions, please call 360-867-2626 or e-mail us.

Thank you!

Thurston County Environmental Health Invitations to Participate in Project - Appendix G



COUNTY COMMISSIONERS

Cathy Wolfe
District One

Sandra Romero
District Two

Karen Valenzuela
District Three

**PUBLIC HEALTH AND
SOCIAL SERVICES DEPARTMENT**

June 2, 2014

Don Sloma, MPH
Director

Rachel C. Wood, MD, MPH
Health Officer

Dear Nisqually Reach Septic Owner,

Thurston County Environmental Health would like to find out if an online training course would be an effective way to train and certify septic owners to inspect their own systems. We are conducting a small pilot training study and are **asking for volunteers**.

Since January 1, 2013 the area where you live has been designated as the ***Nisqually Reach Watershed Protection Area***. Septic systems must be routinely inspected and have any needed maintenance done – the most common maintenance item is pumping the septic tank. These inspections are due every three years.

Your first inspection notice will be coming in 2015. When you receive your notice, you can choose to

- Hire a professional to do the inspection; OR
- Attend a 5 ½ hour training class taught by Thurston County staff and do your own inspection.

If you participate in this pilot training study, you would be certified to conduct your own septic inspections, saving you the cost of a professional inspection, which ranges from \$150 to \$300.

To participate, the following conditions must be met:

- ✓ Have never conducted an inspection of a septic system
- ✓ Have never attended a county-offered septic education program
- ✓ Own a gravity or pressure distribution septic system

If you meet the conditions above and would like to participate, you would be expected to:

- Take a pre-test online to test your knowledge of septic systems;
- Watch two training videos on your computer about caring for and inspecting septic systems;
- Take a post-test online to find out if the videos taught you what you needed to know;
- Answer a set of questions to evaluate the videos; and
- Agree to inspect your own septic system with a County staff person present.

Upon successful completion of your inspection, and any necessary maintenance or repairs, you would be issued your operational certificate good for three years, and be certified to conduct future inspections of your system.

~ OVER ~

To participate, please send an e-mail to: [Environmental Health@co.thurston.wa.us](mailto:Environmental_Health@co.thurston.wa.us)

Include your **name, street address, tax parcel number,** and **phone number** in the e-mail. Type “**Septic Pilot Study**” in the subject line. All communication, including tests, will be done via e-mail. If we have questions, we will contact you by phone.

Please send your email no later than Monday, June 16, 2014.

If you have questions, please call 360-867-2626 or e-mail us.

Thank you!

Appendix H

Test Sample



Thurston County Environmental Health Pilot Study – Pre and Post Test

*Required Question(s)

* 1. Contact with sewage from your septic system can result in infection and illness.

True	False
<input type="radio"/>	<input type="radio"/>

* 2. Septic Systems can fail and pollute our water resources?

True	False
<input type="radio"/>	<input type="radio"/>

* 3. The septic tank is primarily used to:

- separate solid material from the wastewater.
- accept garbage from the home.
- provide complete treatment of wastewater.

* 4. Inspecting your septic system regularly

- is a homeowner's responsibility.
- can prevent costly repairs later and save money in the long run.
- is required for all septic systems
- all of the above.

* 5. Using a lot of water at once

- a. can overwhelm the septic system.
- b. will help clean your septic tank.
- c. is recommended for new septic systems.
- d. both b and c.

* 6. A reserve area

- is an extra septic tank.
- is where you can park cars over your system.
- is an area set aside for a replacement drainfield.
- none of the above.

* 7. Bleach and other household cleaners can have this effect on septic tanks:

- They make the tank smell nice.
- They keep the tank clean inside.
- They increase sludge digestion in the tank.
- They kill some of the tank's good bacteria and disrupt the living environment.

* 8. Driving or storing vehicles on the drainfield or reserve area

- might break the distribution pipes.
- can compact the soils over the drainfield so they don't drain properly.
- may reduce the soil's natural ability to absorb and filter effluent.
- all of the above.

* 9. A failed or leaking septic system is dangerous because

- it can expose people to harmful bacteria in sewage.
- it can expose people to harmful viruses in sewage.
- it can negatively impact the water quality for everyone.
- all of the above.

* 10. Which of the following is ***NOT*** a sign of a failing drainfield?

- strong odors emanating from the drainfield.
- mushy, swampy patches of effluent.
- slightly greener grass over the drainfield area.
- extreme variation in grass over the drainfield.

* 11. Commercial septic system additives, yeast, cabbage, and raw meat do not need to be added to the septic tank to help it do the job of clarifying sewage.

True	False
<input type="radio"/>	<input type="radio"/>

- * 12. Septic systems need to be inspected in order to keep them working a long time (30 years or more) and to assure that they are treating sewage adequately.

True	False
<input type="radio"/>	<input type="radio"/>

- * 13. What is the primary purpose of the drainfield?

- Treat sewage to reduce the amount of bacteria and viruses as well as reduce the overall strength of sewage before it is released into the ground to become groundwater.
- Reduce sewage odors and keep animals from coming into contact with the pathogenic bacteria and viruses.

- * 14. The clear fluid that exits the septic tank is called

- sludge.
- scum.
- effluent.
- all of the above

- * 15. The solids that settle at the bottom of the septic tank are called

- sludge.
- scum.
- effluent.
- baffles.

- * 16. The solids that float at the top of the septic tank are called

- sludge.
- scum.
- effluent.
- baffles.

- * 17. A system that uses an effluent pump is called a

- gravity system.
- pressurized system.
- standard system.
- cesspool system.

- * 18. A mound system is
- a septic system without a tank.
 - raised or above ground drainfield system.
 - a septic system without baffles.
 - none of the above.
- * 19. If you cannot locate your septic tank, contact your local health department for
- a set of blueprints.
 - a metal detector.
 - an "as-built" drawing.
 - none of the above.
- * 20. You can determine the scum and sludge levels in your septic tank by
- using PVC tools you make yourself to measure levels.
 - using just a tape measure.
 - visually inspecting your tank.
 - none of the above.
- * 21. Before starting your inspection, what paperwork should you have on hand?
- a. your sewer bill.
 - b. the inspection or reporting form checklist and as-built drawing.
 - c. your water bill.
 - d. both b and c.
- * 22. Leaning too far over a septic tank is dangerous because
- septic systems produce dangerous fumes that could overwhelm you.
 - you could lose your balance and fall into the tank.
 - you could drop something in the tank that splashes you with sewage.
 - all of the above.

* 23. You should leave the tank lids off when moving on to next phase of inspection.

True	False
<input type="radio"/>	<input type="radio"/>

* 24. What is the primary purpose of the septic tank?

- It decreases the number of bacteria, viruses, and other pathogens in sewage.
- It breaks down solids into liquids and gases.
- It clarifies sewage before it goes into the drainfield.

* 25. When inspecting your septic system

- wear gloves and eye protection.
- enter the septic tank if necessary.
- work alone so the inspection goes faster.
- none of the above.

* 26. When cleaning your inspection tools, use

- soap and water.
- a water and bleach solution.
- a pressure washer.
- none of the above.

* 27. The septic tank should only be pumped when the solid material reaches 50% of the tank volume.

True	False
<input type="radio"/>	<input type="radio"/>

* 28. The two layers of solids in your septic tank are the:

- scum and sludge layers.
- sludge and effluent layers.
- fine particulate and sand.

* 29. What are signs that the effluent pump isn't working properly?

- Effluent level is above where the pipe leaves the pump chamber.
- Effluent is covering the electrical box.
- Pump is running continuously.
- All of the above.

* 30. To easily access your septic tank from ground level without digging you need

- risers.
- a baffle.
- a distribution box.
- none of the above.

* 31. If the total of the scum layer and the sludge layer is 1/3 of liquid depth, then

- you need to call a professional to pump your system.
- your tank is fine and doesn't need maintenance.
- you need to replace your baffle filters.
- flush your toilet several times.

* 32. The liquid level in the septic tank should be

- above the outlet pipe.
- at the base of the outlet pipe.
- well below the bottom of the outlet pipe.
- none of the above.

* 33. The outlet baffle

- keeps effluent from entering the drainfield.
- supports the lid of the tank.
- keeps solids from entering the drainfield.
- both a and b

* 34. You should clean your outlet baffle filter effluent filter screen by

- scrubbing it with a brush.
- using a pressure washer.
- gently rinsing it with a hose over the inlet side or first compartment of the tank.
- shaking it out on the ground.

* 35. If you notice seepage or foul odors in your drainfield

- it's functioning properly.
- dig down to find the source of the problem.
- call a professional.

none of the above.

* 36. A mound drainfield may have a problem if

- the inspection port is dry.
- the mound has grass planted on it.
- there are soggy spots at the base of the mound.
- none of the above.

* 37. The alarm for the pump is tested by

- assuring the alarm float is attached to the discharge pipe.
- pressing the "test" button on the alarm.
- lifting the alarm float by hand or with a tool.
- turn off power to the pump and wait for 2 days.

* 38. You open the septic tank and see the tank is half full. This is because

- the tank has not refilled since the last pumping.
- the tank leaks and must be repaired or replaced.
- the microorganisms in the tank are working properly.
- this is normal and what one expects to see.

Questions inserted at end of video post test for Henderson certified owners:

1. Have you conducted your own inspections of your septic system since attending the owner training class?

Yes No

2. Did you still remember how to do the inspection?

Yes No Forgot everything Had to call the county Had to hire a pumper:

3. Was this video refresher helpful?

Very helpful Somewhat helpful Knew everything before Waste of time

4. Suggestions / Comments for improving the training ...

Thank you!

Appendix I

Post-Test Suggestions / Comments for Improving the Training

Henderson Pilot Project Participants

- Thought it was very good. Good one to check as a reminder each time.
- I don't know how I did on the pretest compared to the post test, but I found the videos helpful and would recommend viewing them before attempting an inspection. They were well done. The inspection form I used was also a helpful reminder for what items to inspect.
- Although I have had experience with gravity systems the video was helpful for other types. We currently have a pressure system. Our drainfield is in a wooded area. It would have been helpful if more info on maintaining the surface area was included. The area is susceptible to surface brush and small seedlings. Should it be cleared each year, etc.?
- 1. Alternative for people without computer at home.
2. The water I pump from my well is hard (some debris and sand, use it to flush toilet down to septic tank. Would this hurt septic tank in the long run?
- The training is just fine. I enjoyed the videos. They were very helpful.
- Send a how-to pamphlet along with the inspection paperwork as a reminder.
- I like the video the way it was presented, and I liked how you did the inspection on an actual septic system.
- Regularly scheduled video reviews.
- Provide an email link to septic owners to easily access the training videos, when needed.
- #37 & #38 have two correct answers I believe. Thank you
- I think the videos are good and it is helpful to confirm that I remember most of the training. Somehow either I missed it or dozed when the percentage of tank filled with sludge and scum was discussed. Since this is the most important part for decision making based on the inspection, perhaps some visuals to help make sure the point is communicated.
- The video is a very effective training course for septic system maintenance. The video is very well organized and directed and the graphics are very clear. It was nice to have the refresher. Thanks!
- Have ready to purchase dip sticks to eliminate barrier to ease and frequency of home inspections.
- I did all my work at the end of July or early August. Video was great refresher to have available. Thanks.
- Question 23 on this test wasn't very good. It didn't describe "the next phase of the inspection" so as to know exactly how to answer the question.
- I don't have anything to add.
- Fine.
- If I missed any questions I hope you will provide me with the correct answers then I can rest assured I am in compliance.
- Keep the videos available for refresher.
- On question 38 could not answers A or B technically be correct? Very helpful refresher course, and an excellent resource for homeowners. Thank you.
- None.
- None whatsoever.
- There were two videos. The second covered most of what the first had so the first video was really not necessary. The second was most inclusive and covered everything I needed to know as a homeowner.
- Perhaps have video refreshers for each specific type of septic system. It may confuse some when seeing all types of systems. Good training. Thank you.