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# Survey of On-site Sewage System Industry Professionals about Operation and Maintenance of On-site Sewage Systems in King County, Washington

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## Executive Summary

### Survey of On-site Sewage System Industry Professionals

As part of an effort to develop a more focused and effective on-site sewage system (OSS) operation and maintenance (O&M) program, Public Health – Seattle & King County (Public Health) conducted a survey of OSS industry professionals who work in King County to gain insight about OSS O&M. Because of the key role that OSS professionals play in preserving water quality, protecting public health, and acting as liaisons between County residents and Public Health, this information is essential to shaping the future direction of the Public Health On-site Sewage System Operation and Maintenance Program (OSS O&M Program). During autumn 2018, 38 industry professionals provided feedback through a questionnaire, 23 attended focus group industry meetings, and two shared their opinion through interviews. Participants were from 11 companies and included OSS designers, maintainers, installers, and liquid waste pumpers.

### Key Findings

In general, OSS industry professionals stated that maintenance is important for effective OSS performance. However, based on their experience, they think that OSS in King County are not sufficiently maintained. Most participants attributed this to the lack of awareness among OSS owners that maintenance is important and provides long-term cost savings.

OSS industry professionals also shared that the current Public Health OSS O&M Program is inadequate to ensure that privately owned OSS are receiving sufficient maintenance and monitoring to support long-term performance and protect public health. The OSS O&M Program lacks technical and educational support for OSS owners, enforcement powers, a simple reporting process, and appropriate fees, all of which result in a general lack of trust from OSS owners and other community members.

### Participants' Key Recommendations

Most survey participants recommended addressing these issues to improve OSS O&M. They expressed interest in continuing to partner in future educational and program improvement projects, and proposed the following improvements:

- Increase community engagement and outreach to educate homeowners and real estate agents about O&M requirements.
- Improve Public Health OSS O&M Program services using maintenance reminders, enforcement actions, risk-based management, and appropriate fees.

Public Health will consider these recommendations as it continues to develop and implement an effective OSS O&M Program that serves King County residents by protecting public health and water quality.

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## Introduction

Public Health – Seattle & King County (Public Health) currently estimates that over 85,000 properties in King County have on-site sewage systems (OSS). OSS are found in both urban and rural settings. In fact, OSS are present in all 39 cities in King County in addition to the unincorporated areas. According to Public Health estimates, OSS in King County treat almost 11 million gallons of wastewater each day. When OSS are designed, installed, and operated properly, they provide highly effective wastewater treatment and benefit local ecosystems by contributing to groundwater recharge. Additionally, they protect the health of King County residents and keep pollutants out of the natural environment.

## Operation and Maintenance of On-site Sewage Systems

Guidelines from the United States Environmental Protection Agency (USEPA) and Washington state regulations show that ongoing operation, monitoring, and maintenance are essential for optimal OSS performance. Inspecting OSS and correcting minor issues can prevent OSS failures. Without proper maintenance, failures often result in unnecessary costs, risks to public health, and water pollution.<sup>1</sup> Because of this, Washington state code gives local health jurisdictions and OSS owners the shared responsibility of ensuring that operation and maintenance (O&M) takes place.

Washington Administrative Code (WAC) 246-272A-0270 requires that OSS owners operate, monitor, and maintain their OSS, which should include the following:

- Maintenance inspections every three years (for conventional gravity OSS) or annually (for all other OSS)
- Septage removal by a certified professional, when necessary
- Suitable and approved repairs or alterations when an OSS is not operating properly
- Protection of OSS from damage or inappropriate use

WAC also requires local health jurisdictions in the 12 counties bordering Puget Sound to develop and implement a management plan that oversees, coordinates, and facilitates proper O&M. The plan should include, among other components, an inventory of all local OSS; enforcement of operation, maintenance, and monitoring required to protect public and environmental health; and facilitation of homeowner education about O&M responsibilities (WAC 246-272A-0015). Public Health last revised its [draft OSS management plan](#), which has not yet been adopted, in 2016.

Despite this emphasis on the importance of proper O&M for long-term OSS effectiveness, counties in the Puget Sound region—and across the country—find it challenging to achieve adequate ongoing O&M programs for OSS. The general perception is that OSS need little attention, and the difficulty of enacting behavioral changes is a barrier to successful O&M programs at county-level health departments and districts.<sup>2</sup> Because of the many barriers to O&M, very few OSS are inspected and maintained per recommendations.<sup>3</sup> However, effective O&M management that implements regular maintenance can significantly decrease risks to public health and water quality. One example of such improvements are efforts in the Thurston County Henderson Watershed Protection Area, where ongoing maintenance and deficiency repairs have reduced the number of unhealthy sewage discharges to the environment. The amount of failing OSS identified in two consecutive cycles of dye testing decreased from 10% of 104

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<sup>1</sup> USEPA, 2002, pg. XIV.

<sup>2</sup> Washington State Department of Health, 2014, pg. 32–25.

<sup>3</sup> Washington State Department of Health, 2014, pg. 8–9; Minnesota Pollution Control Agency, 2018, pg. 20.

tests to 3% of 101 tests. The first cycle was completed from 2007 to 2009, and the second cycle was completed from 2010 to 2011.<sup>4</sup>

An additional challenge for OSS O&M is that with increased residential development, new OSS installations increasingly rely on advanced technology for wastewater treatment. Advanced treatment systems provide alternative options for lots with poor soil conditions and small parcels where conventional gravity systems are not feasible. In areas where soil treatment is limited, advanced systems are more effective at protecting groundwater and nearby surface waters. Although new systems with advanced technologies have these advantages, they also require more frequent maintenance, and maintainers must have specialized knowledge.<sup>5</sup>

Public Health strives to permit the simplest OSS design that meets site requirements; however, advanced treatment systems are sometimes required by code to achieve adequate wastewater treatment. When this is the case, proper O&M is essential to ensure that wastewater is sufficiently treated. To ensure that this is accomplished, Washington state code requires local health jurisdictions to oversee ongoing monitoring and maintenance for advanced treatment systems in sensitive areas (WAC 246-272A-0015).

### Operation and Maintenance Program in King County

The Public Health On-site Sewage System Operation and Maintenance Program (OSS O&M Program) uses several approaches to oversee OSS maintenance in the effort to achieve effective, long-term wastewater treatment. Per King County Board of Health (KCBOH) code, OSS owners are responsible for having their OSS inspected according to a routine maintenance schedule (13.60.010.A) and when properties with OSS are transferred to a new owner (13.60.030.A). State and County codes require routine maintenance every three years for gravity systems and at least every year for advanced treatment systems [WAC 246-27A-0270(1)(d), KCBOH Table 13.60-1]. For all OSS except those in the Marine Reserve Area on Vashon-Maury Island, the Public Health OSS O&M Program has no mechanism to verify that required inspections are taking place.

Since 2013, the number of OSS inspections has been steadily increasing, with over 5,000 inspections each year since 2015. However, the approximately 5,800 inspections that took place in 2017 covered less than 7% of the OSS inventory. Almost 70% of the 5,800 inspections in 2017 were a result of property transfers (as shown in Figure 1).

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<sup>4</sup> Thurston County Public Health and Social Services Department, 2013, pg. 19–20.

<sup>5</sup> USEPA, 2002, pg. 1–3.

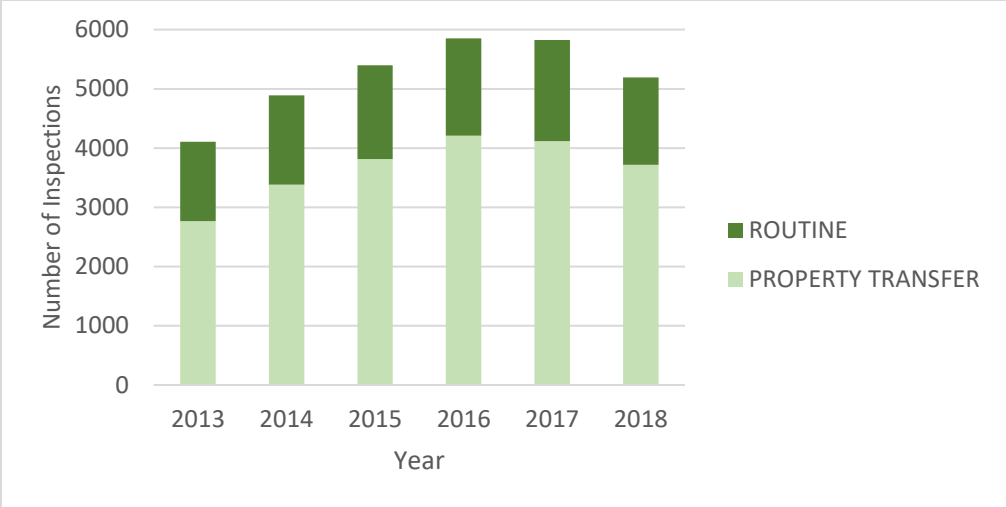


Figure 1. OSS Maintenance Inspections Reported to the Public Health OSS O&M Program (2013–2018)

Inspection reports are submitted to the Public Health OSS O&M Program, which maintains a database of current OSS so that owners and maintainers have the information that is necessary to properly use and take care of their systems. When submitting inspection reports, on-site system maintainers pay a \$28.00 fee for a routine O&M inspection report and a \$184.80 fee (plus a \$10.00 processing fee) for a property transfer inspection report. Public Health staff review property transfer inspection reports to ensure that inspections are complete and major deficiencies are addressed. Because many OSS in King County have not been recently inspected, Public Health also uses past OSS and assessor’s records to inventory the location, age, and type of OSS in the County.

An approach that King County uses to reduce bacterial pollution from OSS and other sources is to identify sensitive areas, where staff from the King County Department of Natural Resources and Parks (DNRP) document impaired water quality and trace fecal contamination to its sources. Some of the OSS that are failing or in need of a minor repair are identified and corrected through this process.

Public Health is also tasked with ensuring that knowledgeable, qualified professionals are certified to perform OSS O&M and that these professionals provide high-quality service to King County residents. Although OSS designers and engineers are licensed at the state level, the local health jurisdiction is responsible to certify OSS installers, maintainers, and liquid waste pumpers and haulers (WAC 246-272A-0340). These professionals provide OSS services that help to ensure that OSSs are optimally performing and adequately protecting water quality and public health. Because they interact with OSS owners in their daily work, OSS industry professionals play an important role as community educators and liaisons between County employees and OSS owners.

### Survey of OSS Industry Professionals

Public Health is working to develop a more focused and effective OSS O&M Program that meets the management plan requirement of local health jurisdictions in the Puget Sound region. Because of the important role that OSS professionals play in ensuring that OSS function properly, it is essential that their input and expertise inform the Public Health OSS O&M Program and associated services. To evaluate the current OSS O&M Program and develop recommendations for future improvements, Public Health reached out to industry professionals through surveys and focus group industry meetings. The

purpose of the surveys and meetings was to collaborate with and gain input from OSS industry professionals. The goals of these activities were as follows:

- Understand the needs of OSS owners and the barriers that prevent O&M.
- Identify the best strategies for OSS O&M Program improvements.
- Identify how to improve Public Health’s engagement with the industry and advance its shared goals.

By working together to evaluate and improve the OSS O&M Program, Public Health aims to offer support and services that most effectively serve the OSS owners and industry professionals of King County. Improving the OSS O&M Program will allow Public Health to better protect the health of King County residents, reduce premature OSS failures and the expenses associated with them, and keep the region’s surface water and groundwater clean from bacterial pollution.



## Methods: Participants and Procedures

Public Health engaged OSS industry professionals to gather input and direction in an inclusive manner. Industry engagement strategies included job shadowing, phone interviews, focus groups, and surveys.

Public Health contacted all OSS industry professionals certified to work in King County whose email address was available in their records. An email was sent to over 130 professionals (88% of all certified professionals) with an invitation to complete an online survey and participate in an industry meeting.

Public Health staff developed survey questions (see Appendix A) with direction and input from DNRP staff and an environmental policy consultant. The online survey was open on Survey Monkey for one month (August 22 through September 24). Thirty-eight responses were received via the online survey or in person at industry meetings. Surveys were completed on a voluntary basis.

Two focus groups were held during September 2018. Groups ranged in size from 10 to 13 participants, and meetings lasted approximately 90 minutes each. To make the meetings accessible and equitable, three possible meeting locations were proposed and the two with the most RSVPs were selected. Lunch was provided for meeting participants.

A total of 23 OSS professionals participated in the focus groups. Representatives from different OSS companies throughout King County were present at each meeting. OSS professionals represented in focus groups included liquid waste pumpers, maintainers, installers, and designers. Two additional interviews were conducted with individuals who wanted to contribute feedback at an alternative time.

Using an open-ended interview protocol to guide discussion, Public Health staff facilitated the focus groups. Questions (see Appendix B) were developed with direction and input from OSS O&M Program staff. Ground rules were shared at the beginning of each focus group, and meeting facilitators took notes during the meetings. All responses were anonymously reported, and “they” or “their” was used as the first-person singular pronoun to further protect the identity of participants, as well as to illustrate how their statements are representative of many focus group participants.

## Results

The survey focused on OSS failures, maintenance, and strategies to increase maintenance of OSS in King County, including improvements to the Public Health OSS O&M Program. The information presented in this report represents a summary of all survey and focus group results. Because of its generalized nature, the reported results reflect the opinion of the majority of participants and not the opinions of individuals themselves.

### Survey Findings

The figures below present summaries of results and responses for the questions included in the survey questionnaire.

1. What job do you have in the OSS industry?

Thirty-eight OSS professionals participated in the survey. Some participants had more than one OSS certification. They included the following:

- 12 designers
- 14 master installers
- 25 maintainers
- 15 liquid waste pumpers and haulers

2. Estimate how many **septic systems in King County are failing** based on your experience in the field (for example: effluent surfacing, drains backing up, tanks not draining)?

Over half (57%) of the survey respondents estimated that more than 10% of OSS in King County are failing, with a quarter of the respondents estimating that more than 25% of OSS in King County are failing.

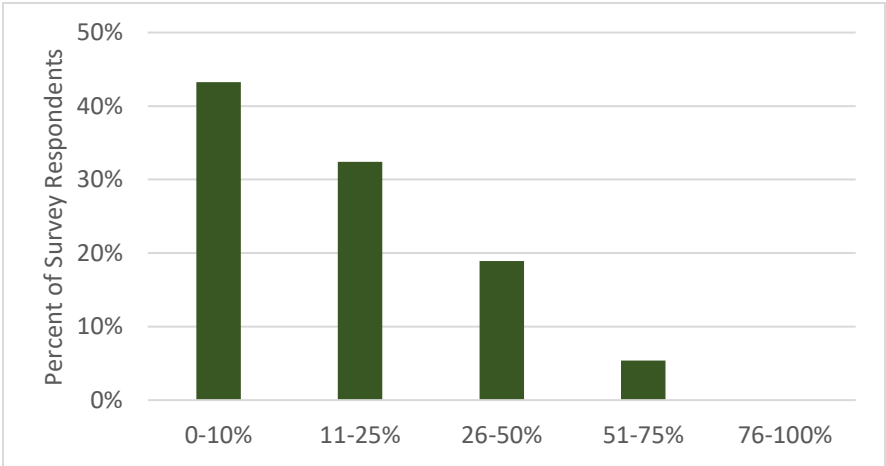
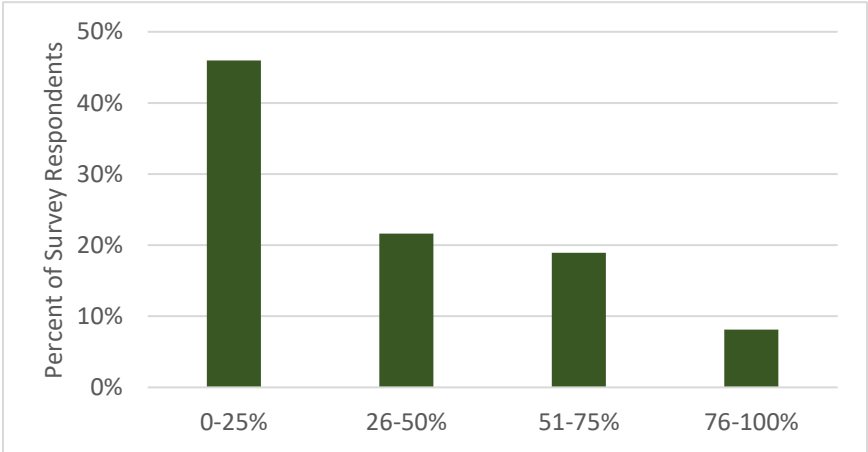


Figure 2. Estimated Proportion of OSSs in King County that Are Failing

3. Of those failures, approximately how many could have been **avoided with better monitoring and maintenance**?

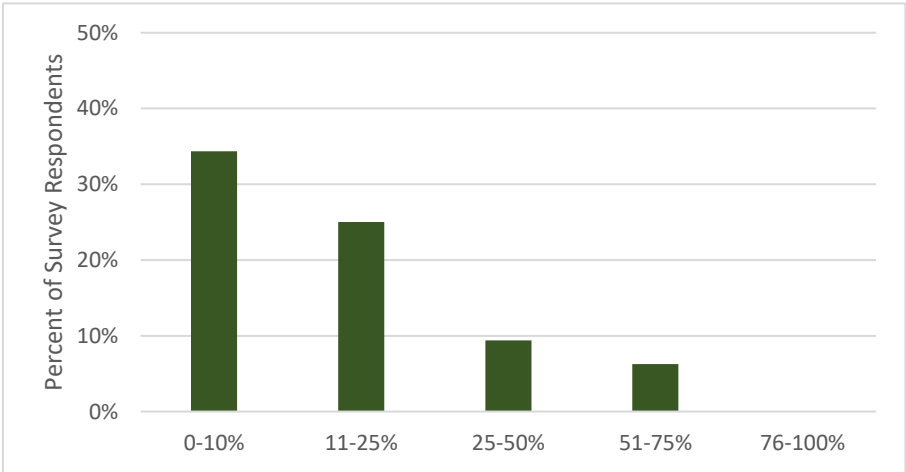
Of the survey respondents, 54% thought that over a quarter of current OSS failures could be prevented with better O&M. Twenty-nine percent of survey respondents thought that better O&M could prevent more than half of the current OSS failures.



**Figure 3. Proportion of Failures in King County that Could be Avoided with Better Monitoring and Maintenance**

4. Please estimate how many **failing septic systems** are being **used by people of color and/or people who don't speak English**.

Thirty-five percent of survey respondents thought that less than 10% of failing OSSs are used by people of color or people who do not speak English. Thirty-one percent of respondents thought that more than 10%, but less than 75% of failing OSS, are used by people of color or people who do not speak English. Participants also recommended that Public Health take lifestyle and cultural context into consideration when communicating about O&M, especially around topics of disposing of grease and limiting water use to designed capacities. Important languages to include in educational efforts are Spanish, Korean, Vietnamese, Chinese, and Russian.



**Figure 4. Proportion of Failing OSSs Used by People of Color and/or People Who Do not Speak English**

5. What **motivates** King County residents to care for their septic systems? Rate on a scale from 1–5 (1=not important at all, 5=very important).

The most important motivations identified in the survey were avoiding the need for an OSS repair or replacement and avoiding the nuisance of a failed OSS. Additional comments in the survey emphasized the importance of the King County requirement for a maintenance inspection before a property is transferred (two comments). Participants also commented that OSSs are maintained when there is already a nuisance; for example, the toilet is not flushing or there is sewage surfacing (three comments).

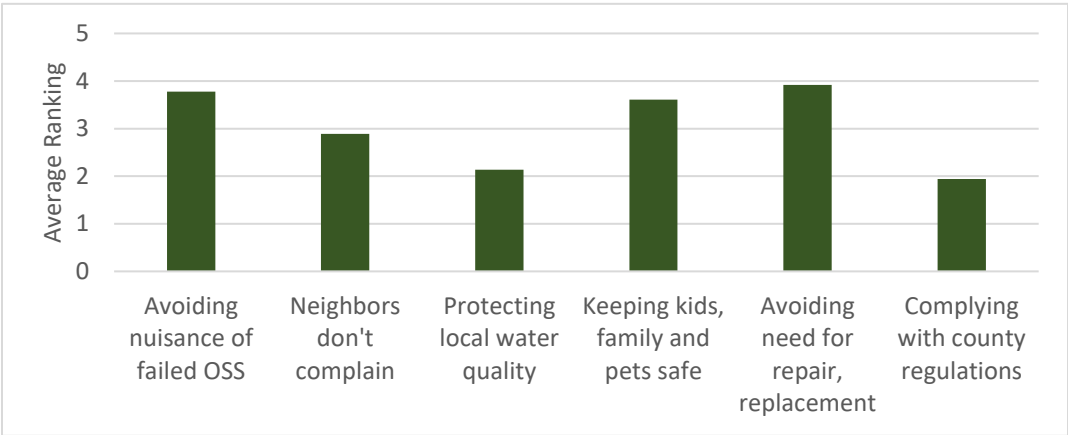


Figure 5. Motivations for OSS Maintenance

6. What **barriers** prevent owners from monitoring and maintaining their septic system? Rate on a scale from 1–5 (1=strongly disagree, 5=strongly agree).

Survey results indicate that homeowners face many barriers to maintenance. On average, survey respondents agree more than disagree that all of the examples provided, such as not knowing that maintenance is necessary, not knowing how to maintain, and forgetting to maintain, are barriers to OSS maintenance in King County. Other barriers mentioned by respondents include the lack of county-level enforcement and receiving bad advice from acquaintances who do not think that maintenance is necessary.

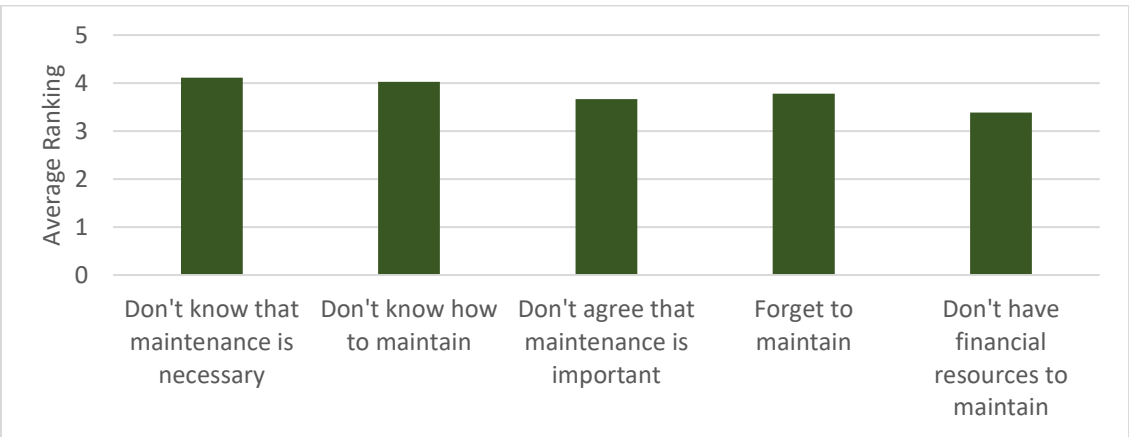


Figure 6. Barriers to OSS Maintenance

7., 8. What items are the biggest issues for **septage contamination**? *Select all that apply.* Do you have **problems when disposing of septage at an approved facility** because the septage is contaminated?

Most survey respondents (71%) agreed that flushable wipes and fats, oils, and grease are the biggest issues for septic contamination. All survey respondents declared that they either do not dispose of septage or have no problems disposing of septage because it is contaminated.

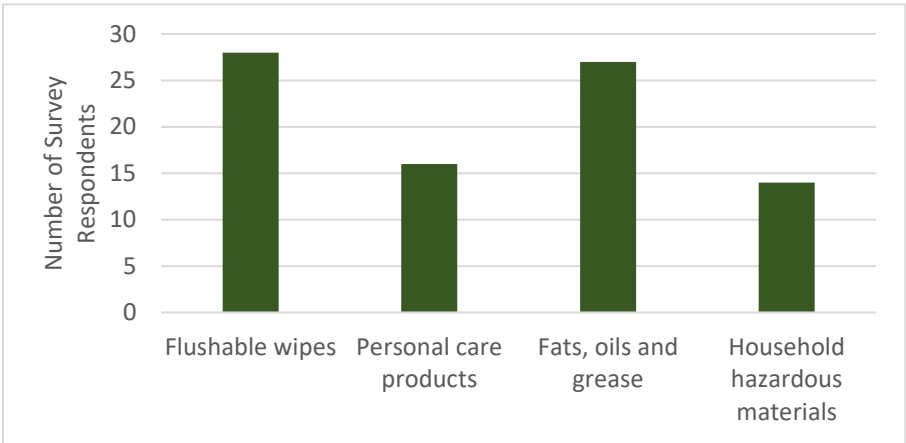


Figure 7. Biggest Issues for Septage Contamination

9. Public Health is interested in expanding its services to better manage regular maintenance inspections. **What aspects of managing operation and maintenance should Public Health prioritize?** *Select the top three.*

Averaging over all survey responses, the top three priorities for future OSS O&M Program expansions are owner education, service reminders, and technical support for OSS professionals. Five respondents also mentioned an additional priority of maintenance enforcement. Other suggestions were providing more information at the time of sale and developing a program with more focused, reduced fees.

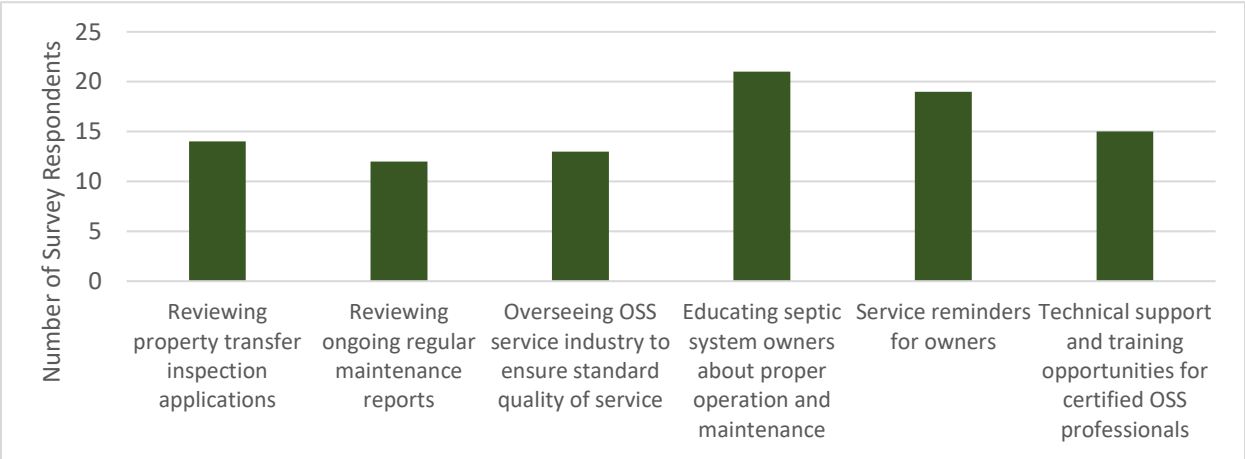


Figure 8. Recommended Public Health Future Priorities

10. **What aspects of County services** should Public Health focus on as it works to improve its O&M management? *Select the three answers that have the highest priority.*

Averaging over all survey responses, the top three priorities for OSS O&M Program service improvements are identifying and focusing efforts on high-risk OSS, simplifying reporting processes, and improving the OSS database. Other recommendations given in the comments include improving the requirements for and review of OSS inspections at the time of property transfer.

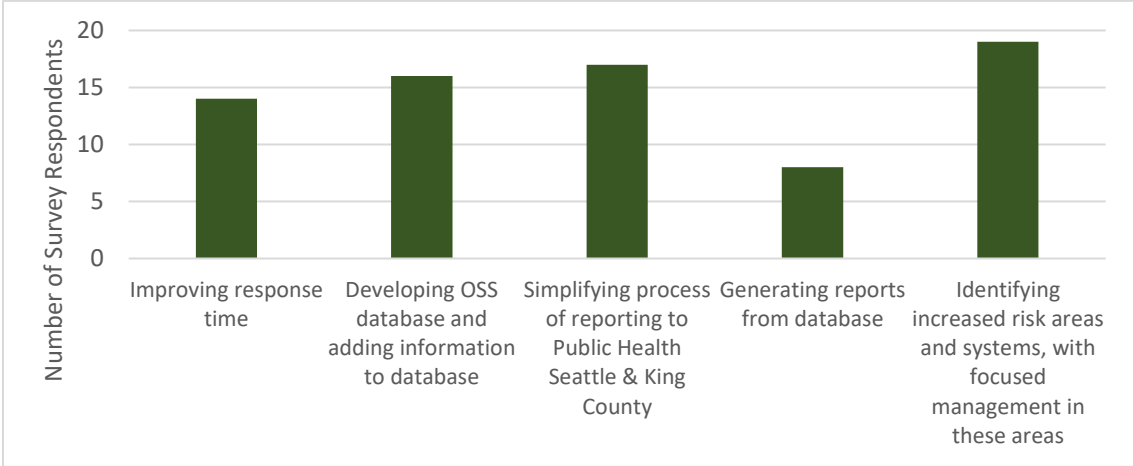


Figure 9. Recommended Improvements to Public Health Services

11. Public Health is trying to increase the number of regular maintenance reports that it receives. Do any of the following make it **difficult for maintainers and pumpers to inform Public Health about maintenance activities**? *Select all that apply.*

Both fees and confusion about the reporting process make it difficult for more than one-third of survey respondents to submit reports. Some survey comments indicated that the current online reporting has simplified the reporting process, whereas others think that it is more confusing than the previous paper reports.

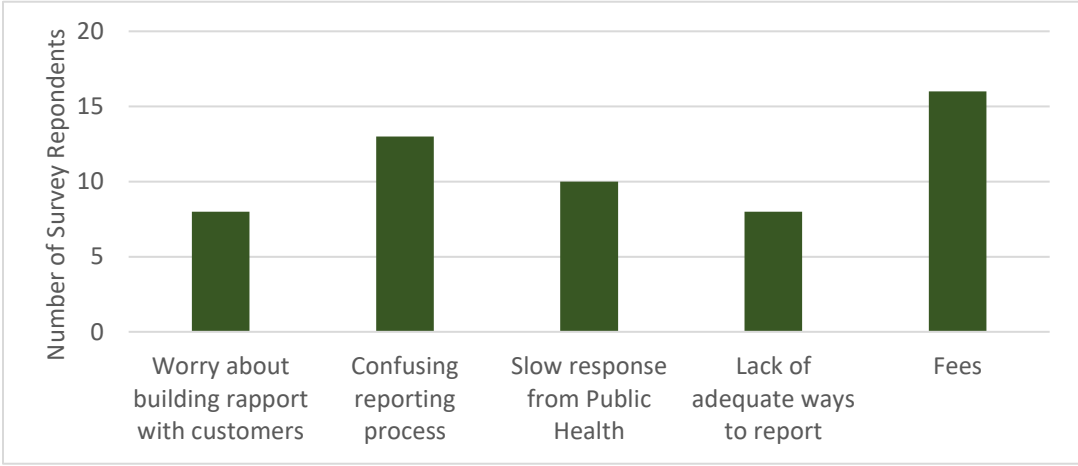


Figure 10. Difficulties in Informing Public Health about Maintenance Activities

12., 13. When increasing outreach efforts to educate owners about proper operation and maintenance, what are the most important topics? Select all that apply. What percentage of septic system owners know about loans for system repairs?

Eighty percent of survey respondents thought that general information about septic systems was an important education topic. Other important topics included landscaping and construction to protect the drainfield and proper disposal of household products. All but one survey respondent thought that 0 to 25% of OSS owners know about loans for OSS repairs.

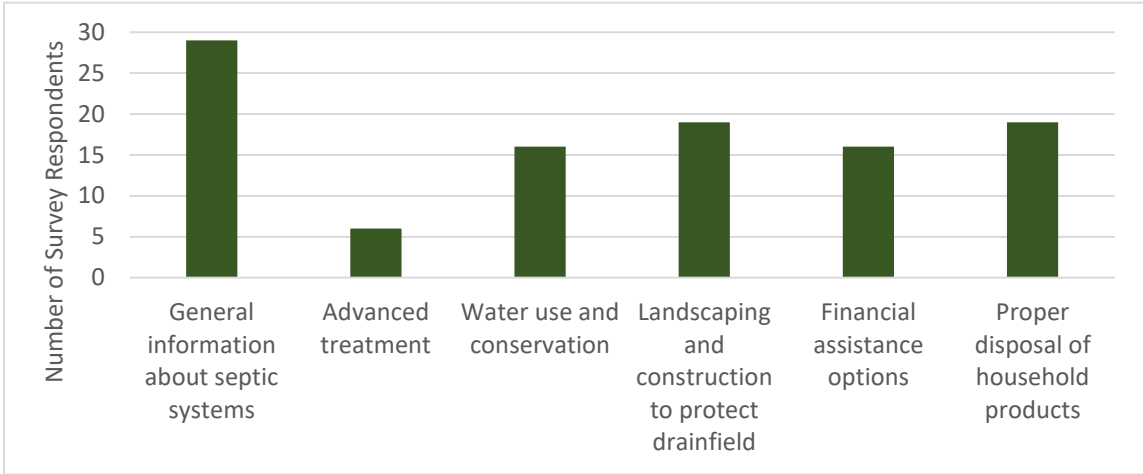


Figure 11. Most Important OSS Education Topics

14. What are the **best ways to communicate** with septic system owners to increase education? *Select all that apply.*

Survey respondents thought that the best methods of education are online classes and partnering with OSS industry professionals and real estate agents to provide education. Participants commented that education is essential, and that OSS industry professionals have the unique ability to provide site-specific information to OSS owners.

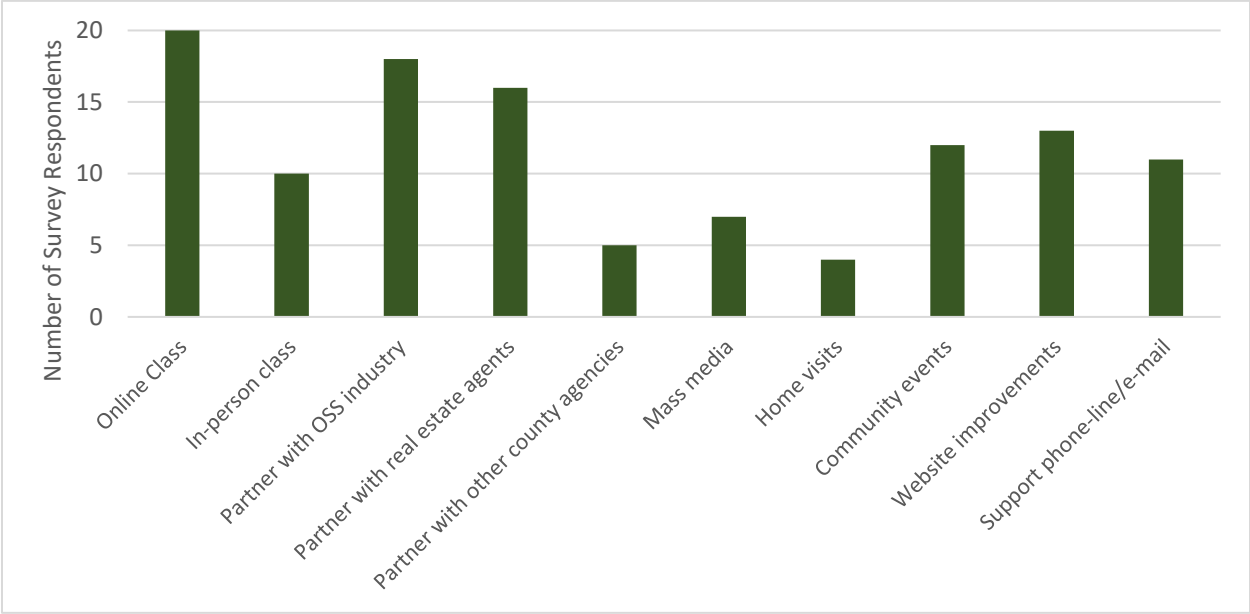


Figure 12. Best Education Platforms for OSS Education

15. Where would you like to meet for **future industry meetings**? *Select all that apply.*

Most survey respondents recommended meeting in Kent or Renton, although one respondent pointed out that the survey did not include any options in northern King County, which may be more convenient for some industry professionals.

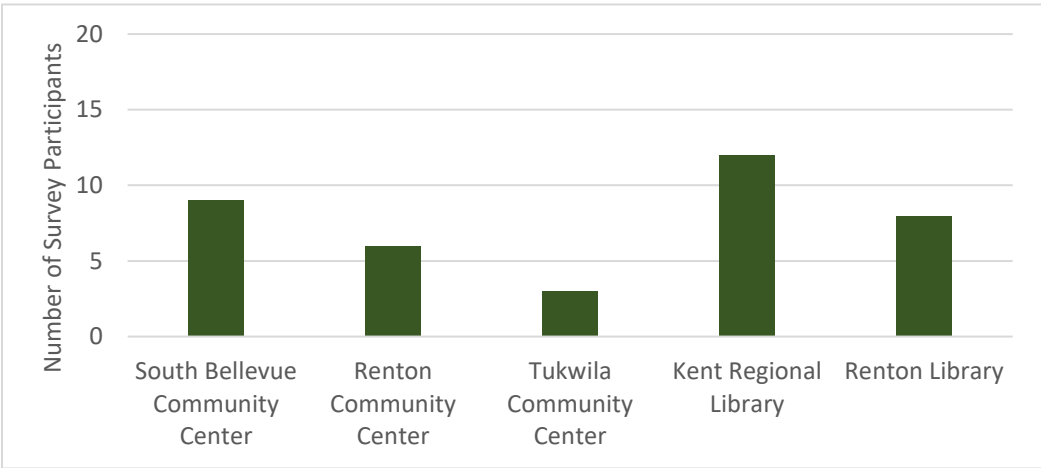


Figure 13. Recommended Future Meeting Locations



Survey respondents also provided comments to the above questions or answers to open-ended questions. In these comments, some professionals expressed distrust that Public Health had good intentions in requesting feedback and wanted the OSS O&M Program to engage with them as little as possible (three comments). Many professionals included detailed comments about current program services, such as repair permits, requirements at time of sale, use of electronic reporting, and customer service. Several respondents indicated that the OSS Program needs to consistently hold industry professionals to the same standards and that a minimum reporting requirement needs to be clearly communicated (four comments). Respondents also requested improved consistency in inspection reviews (two comments).

### Focus Group and Interview Results

Analysis of focus group and interview transcripts revealed a number of key findings related to OSS professionals' experience with OSS and OSS owners. Focus group and interview participants provided insight about barriers to OSS maintenance and recommendations on how to address these barriers. This feedback has been organized into the following five categories to highlight the themes that emerged during the focus groups and interviews:

- **Reasons for maintenance:** O&M is critical to prevent problems with OSS and provide cost savings.
- **Lack of maintenance awareness and knowledge:** OSS owners do not know that regular maintenance is important and do not know how to properly operate and maintain OSS. Real estate agents do not understand the property transfer inspection requirements.
- **OSS O&M Program inadequate to ensure maintenance:** Because the OSS O&M Program lacks the capacity to educate and remind OSS owners to perform maintenance or enforce maintenance inspections, OSS O&M in King County is lacking.
- **Partnership and community engagement:** To address the lack of O&M knowledge, the Public Health OSS O&M Program should partner with OSS industry professionals, real estate agencies, and other stakeholders to engage community members and provide education.
- **OSS O&M Program improvements:** To address program inadequacies, the Public Health OSS O&M Program should use a risk-based approach to remind OSS owners about necessary maintenance and enforce maintenance inspections required by Washington state code. Public Health should also simplify its current inspection reporting process and evaluate the best approach to collecting fees for reports.

These findings are addressed in more detail in the following section.

## Key Themes

### Reasons for Maintenance

OSS industry professionals indicated that maintenance is a critical part of proper OSS use. Fifty-four percent of survey respondents thought that more than a quarter of OSS failures in King County could be avoided with regular inspections and maintenance. On-site system maintainers find many issues when they are inspecting OSSs in King County, and they see this as an indication that OSS failures are very prevalent and need to be identified and addressed. Of the survey respondents, 57% think that more than 10% of King County OSSs are failing, and 24% think that more than a quarter are failing. One of the ways that maintenance can prevent failures is by fixing small OSS problems before they progress to larger issues and failures. As one participant stated, “It is easier if we catch [a broken tank] when it just has a crack than when it is falling apart.”

Focus group participants also emphasized that maintenance provides important cost savings for OSS owners. The cost of good operation and maintenance is much lower than major repairs or that of a new OSS, so periodically paying a small amount will save owners money in the end. A common experience that industry professionals have seen in King County is that homeowners “think that they will save a few hundred dollars [by not performing maintenance], and then they have to deal with a large, expensive problem.”

### Identified Issue #1: Lack of Maintenance Awareness and Knowledge

Industry professionals indicated that most homeowners do not perform OSS maintenance because there is an extreme lack of awareness that maintenance is necessary. One participant shared that “a lot of people don’t realize that [their OSS] has to be maintained on a regular basis. No one has ever told them.” There is a misconception that an OSS does not need to be maintained if there are no visible issues.

Although industry professionals indicated that awareness is low among most King County residents, they said that knowledge is especially lacking among people who have recently moved to King County. This includes people who moved from residences with municipal sewer systems and people from various cultural backgrounds, whose cooking practices or average family size can affect their wastewater generation. In addition to the lack of awareness among homeowners, real estate agents are also unaware of maintenance requirements in King County, which is problematic because most OSS inspections performed in King County occur at the time of sale.

Most participants agreed that lack of awareness is a strong barrier to performing maintenance. However, survey respondents indicated that there were many additional barriers preventing maintenance. On average, industry professionals agreed more than disagreed that the following are barriers to maintenance: not knowing how to maintain OSS, forgetting to maintain OSS, not agreeing that maintenance is important, and not having the financial resources to maintain OSS. Participants also pointed out that many OSS owners inaccurately apply the experiences of past family members or acquaintances who never serviced their OSSs, thinking that this means they do not need to maintain their OSS either.

### Identified Issue #2: OSS O&M Program Inadequate to Ensure Maintenance

OSS professionals also expressed the opinion that the current Public Health OSS O&M Program does not have sufficient services to increase OSS maintenance. Specific issues that they identified were a lack of service reminders, lack of enforcement power, and the general mistrust of government agencies.

Industry professionals gave many examples of OSS O&M programs in other counties that are providing these important services and that have had better success in encouraging owners to maintain OSS. Service reminders were considered important because property owners often forget that their OSS needs to be maintained and do not take the initiative without a reminder. Industry professionals indicated that when a government agency requires OSS maintenance and communicates about this, more people follow through.

However, they also warned that a reminder letter was not enough on its own. Because maintenance is not currently enforced in King County, industry professionals are often unable to convince owners to perform maintenance. As they explained, “[Owners] ask what will happen if they don’t [have an inspection], and we have to say that nothing will happen [from the County].” Recommended types of enforcement were a fine for missing an inspection or the ability to stop a property sale if the OSS is not properly functioning.

### Proposed Solution #1: Partnership and Community Engagement

Many industry professionals that participated in this survey indicated that education and outreach to homeowners and real estate professionals is essential to increasing maintenance and improving OSS performance. Educating OSS owners about proper O&M was selected as the most important future priority for Public Health, chosen by 62% of survey participants. As one participant said, “Unless [a septic] company is educating the owners and realtors, there isn’t a lot of information that is out there being publicly and widely spread throughout the community with OSS.”

Participants recommended various outreach and education strategies. Among survey participants, 56% recommended online classes; other recommended methods included brochures, commercials, websites, community events, and one-on-one explanations for property owners. Based on industry professionals’ current strategies, the time of sale is an essential intervention point to educate new owners about OSS O&M. Participants recommended that new owners receive a packet with information about OSS maintenance. Public Health, industry professionals, or real estate agencies could provide this packet at the time of inspection or 90 days after the time of sale. This packet could include pictures of the site’s OSS to help the owner understand their own system.

Survey respondents selected general information about OSSs (81%), proper disposal of household products (52%), and landscaping and construction to protect the drainfield (52%) as the most important topics for education. When communicating about disposal, it is important to focus on flushable wipes and fats, oils, and grease because these are the most common contaminants in septage. In addition, participants recommended that Public Health take lifestyle and cultural context into consideration when engaging the community about O&M. Participants also noted that many homeowners are not willing to change their daily habits, so educating about increased pumping frequency in addition to proper disposal may be important to show the connection between proper OSS operations and reduced pumping costs.

Industry professionals also recommended that community education include information about maintenance costs. All but one survey respondent thought that less than 25% of OSS owners in King County know about loans for OSS repairs. Future education should explain the savings provided by consistent maintenance, the general costs of ongoing maintenance (to provide information for budgeting and saving), as well as information about financing options through loans and grants. Participants also thought that many homeowners do not realize how much a new OSS costs. In an

example provided by one maintainer, an owner thought that he would have to pay \$5,000 for a new OSS, but ended up having to pay \$30,000.

Additional community engagement activities could include providing incentives for OSS maintenance. Industry professionals gave examples of rebates and discounts provided by other counties or by maintenance companies. These rebates often covered part of the cost of installing tank risers or conducting a maintenance inspection.

### Proposed Solution #2: Public Health OSS O&M Program Improvements

OSS industry professionals recommended several service expansions to address the inability of the current OSS O&M Program to ensure adequate maintenance. The most supported recommendation was increasing the program's power to enforce maintenance inspections and corrections of OSS deficiencies. Additionally, 56% of respondents thought that King County should focus on providing service reminders for OSS owners.

When determining the frequency of necessary inspections, both the type of OSS and its location should be taken into consideration. Sixty-one percent of survey respondents thought that a risk-based approach that focuses management on high-risk OSS is an important future focus for Public Health. Participants recognized that sending reminders and enforcing maintenance would require additional time and resources. However, because they thought that this was so important, they recommended starting with a subset of all King County OSS (e.g., based on age, location, risk of failure, etc.) and then gradually expanding to include them all.

Beyond adding new services to the OSS O&M Program, many industry professionals also recommended improving current services and requirements. Some suggested improvements include simplifying the process of reporting about maintenance activities (recommended by 55% of survey respondents), communicating consistently and clearly with industry professionals, reevaluating and clarifying requirements for limited repair permits, and updating inspection requirements at time-of-sale inspections. Fifty-five percent of survey respondents also indicated that the current fee required for follow-up reports can prevent maintainers from informing Public Health about maintenance activities, and meeting participants recommended that an annual fee or fee at the time of pumping replace the fee for follow-up reports.

Industry professionals emphasized that when evaluating program improvements, it is important to learn from nearby counties. Many counties in Western Washington have recently advanced their OSS O&M programs, and King County can learn from their experiences and adopt the successful components of those programs. Participants' examples of beneficial improvements included Snohomish County's Savvy Septic education and rebate program and Pierce County's OSS O&M Program. Industry professionals also indicated that consistency across counties reduces confusion in reporting and requirements because many maintainers work in multiple counties.

## Conclusion

According to data from inspection reports, only 7% of OSS in King County were inspected in 2017, which is reflective of the consistent lack of routine OSS maintenance. Feedback provided by OSS industry professionals indicates that OSS in King County are not regularly maintained because owners lack awareness about necessary maintenance and the Public Health OSS O&M Program does not provide adequate services to ensure that maintenance occurs.

Proposed strategies to improve maintenance include community engagement and education, particularly in areas with degraded water quality and high-risk factors for fecal contamination, as well as overall OSS O&M Program improvements. Participants recommended that educational efforts focus on OSS owners and real estate agents and that they include general information about OSS maintenance and its cost effectiveness. They also recommended that Public Health improve its current reporting process and fee distribution as well as implement new services that provide maintenance reminders and enforce OSS maintenance and repairs.

The recommendations discussed above provide guidance for Public Health as it develops the future direction of the OSS O&M Program. Public Health management is considering input from industry professionals alongside reports about water quality analysis and watershed-focused program development. Public Health intends to act on OSS professionals' feedback and to engage other partners for input within its larger effort to develop an OSS O&M Program that best serves the residents of King County and protects public health and water quality.

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## Appendix A. Survey Questions for OSS Industry Professionals

### Survey: OSS Operation and Maintenance in King County

You are receiving this survey as part of our effort to improve and expand our on-site sewage system (OSS) operation and management program. We will present the results at the upcoming industry meetings.

Your input is very important to us as we seek to better serve you and your customers!

1. What job do you have in the OSS industry?
  - a. Designer
  - b. Master Installer
  - c. Maintainer
  - d. Pumper
  
2. Estimate how many **septic systems in King County are failing** based on your experience in the field (for example: effluent surfacing, drains backing up, tanks not draining)?
  - a. 0-10%
  - b. 11-25%
  - c. 26-50%
  - d. 51-75%
  - e. 76-100%
  
3. Of those failures, approximately how many could have been **avoided with better monitoring and maintenance**?
  - a. 0-25%
  - b. 26-50%
  - c. 51-75%
  - d. 76-100%
  
4. Please estimate how many **failing septic systems** are being **used by people of color and/or people who don't speak English**.
  - a. 0-10%
  - b. 11-25%
  - c. 26-50%
  - d. 51-75%
  - e. 76-100%

5. What **motivates** King County residents to care for their septic systems? Rate on a scale from 1-5 (1=not important at all, 5=very important).

- Avoiding the nuisance of a failed septic systems (water back-up, odor etc.)
- Making sure that neighbors don't complain
- Protecting local water quality
- Keeping kids, family and pets safe
- Avoiding the need for repair, replacement of system
- Complying with County regulations
- Other (*Please specify*): \_\_\_\_\_

6. What **barriers** prevent owners from monitoring and maintaining their septic system? Rate on a scale from 1 - 5 (1=strongly disagree, 5=strongly agree).

- Don't know that maintenance is necessary
- Don't know how to maintain
- Don't agree that maintenance is important
- Forget to maintain
- Don't have financial resources to maintain
- Other (*Please specify*): \_\_\_\_\_

7. Do you have **problems when disposing septage at an approved facility** because the septage is contaminated (for example: large items in septage)?

- a. Yes
- b. No
- c. I do not dispose of septage.

8. What items are the biggest issues for **septage contamination**? *Select all that apply.*

- a. Flushable wipes
- b. Personal care products
- c. Fats, oils and grease
- d. Household hazardous materials (for example paint, car oil, etc.)
- e. Other (*please specify*): \_\_\_\_\_

9. Public Health Seattle & King County (PHSKC) is interested in expanding our services to better manage regular maintenance inspections. **What aspects of managing operation and maintenance should PHSKC prioritize?** *Select the top three.*

- a. Reviewing property transfer inspection applications
- b. Reviewing ongoing regular maintenance reports
- c. Overseeing OSS service industry to ensure standard quality of service
- d. Educating septic system owners about proper operation and maintenance
- e. Service reminders for owners
- f. Technical support and training opportunities for certified OSS professionals
- g. Other (*please specify*): \_\_\_\_\_



10. **What aspects of County services** should we focus on as we work to improve our O&M management? *Select the three answers that have the highest priority.*
- a. Improving response time
  - b. Developing OSS database and adding information to database
  - c. Simplifying process of reporting to PHSKC
  - d. Generating reports from database
  - e. Identifying increased risk areas and systems, with focused management in these areas
  - f. Other (*please specify*): \_\_\_\_\_
11. Public Health Seattle & King County is trying to increase the number of regular maintenance reports that we receive.  
Do any of the following make it **difficult for maintainers and pumpers to inform Public Health about maintenance activities**? *Select all that apply.*
- a. Worry about building rapport with customers
  - b. Confusing reporting process
  - c. Slow response from PH
  - d. Lack of adequate ways to report
  - e. Fees
  - f. Other (*please specify*): \_\_\_\_\_
12. When increasing **outreach efforts to educate owners** about proper operation and maintenance, what are the **most important topics**? *Select all that apply.*
- a. General information about septic systems
  - b. Advanced treatment
  - c. Water use and conservation
  - d. Landscaping and construction to protect drainfield
  - e. Financial assistance options
  - f. Proper disposal of household products
  - g. Other (*please specify*): \_\_\_\_\_
13. What percent of septic system owners know about **loans for system repairs**?
- a. 0-25%
  - b. 26-50%
  - c. 51-75%
  - d. 76-100%

14. What are the **best ways to communicate** with septic system owners to increase education? *Select all that apply.*
- a. Online classes for OSS owners
  - b. In-person classes for OSS owners
  - c. Partner with OSS industry professionals to provide brochures and educational materials
  - d. Partner with real estate agents to provide brochures and educational materials
  - e. Partner with other County agencies (e.g. Permitting and Environmental Review) to provide brochures and educational materials
  - f. Announcements on mass media (newspapers, television, radio, etc.)
  - g. Home visits
  - h. Presentations at community events and fairs
  - i. Improvements to PHSKC OSS program website
  - j. Other (*please specify*): \_\_\_\_\_

15. What can Public Health Seattle & King County do to **better support your work**?

16. Where would you like to meet for **future industry meetings**? *Select all that apply.*
- a. South Bellevue Community Center
  - b. Renton Community Center
  - c. Tukwila Community Center
  - d. Kent Regional Library
  - e. Renton Library
  - f. Other (*please specify*): \_\_\_\_\_

17. Do you have any other comments, questions or concerns?

Thank you for sharing your thoughts!

## Appendix B. Focus Group Questions for OSS Industry Professionals

### HOMEOWNER BARRIERS/NEEDS

- Many survey respondents indicated that people in King County don't maintain their septic systems. Do you agree with this? If so, what are some reasons why they don't maintain their septic system?
- How have you encouraged homeowners to maintain their septic systems? Do you have any suggestions about good strategies that we could use to encourage homeowners to properly operate and maintain their systems?

### ON-SITE SYSTEM MAINTAINERS NEEDS

- Survey responses show that flushable wipes and fats, oils, and grease are the biggest issues for contamination. What types of educational materials would be helpful to reduce this issue?

### PUBLIC HEALTH IMPROVEMENTS

- Many respondents indicated that, in their opinion, an operation and maintenance (O&M) program would be most successful with service reminders. Could you further explain what this would look like? What type of service reminders would you recommend? How often?
- Respondents also pointed out that enforcement from the County would be necessary for a successful O&M program. What are your thoughts about this? What type of enforcement would you recommend?
- Survey respondents indicated that fees are often a barrier to reporting about O&M activities. Because [Public Health – Seattle & King County is] a fee-based organization, it has to continue to collect fees, but it is evaluating what this looks like. Are there improvements you would recommend to how we collect fees and how we communicate about them?
- One issue that has been raised is that our reporting process for inspections is confusing. What specific parts do you (or other professionals in the County) find confusing? How could we make this better?
- Many respondents indicated that Public Health should work on updating our database and making sure that the information there is usable. What type of information would be helpful for us to provide to you?
- Are there any additional needs or difficulties that you face that you want us to be aware of?