Sewage Handling and Disposal Regulations
Climate Change Subgroup
May 12, 2022 – 1:00 PM to 3:00 PM
Meeting Summary

Meeting Location:

5th Floor Main Conference Room, 109 Governor Street, Richmond, Virginia, 23219

Virtual Participation Available Via Webex:

Attendees:

Lance Gregory	V'Lent Lassiter	Anthony Creech	Curtis Moore
Josh Anderson	Skip Stiles	Valerie Rourke	Brenden Rivenbark
Tess Kendrick	Tom Ashton		

1. Review of hazard analysis.

Mr. Gregory began the meeting by reviewing the hazard analysis for impacts of climate change on onsite sewage systems completed during the previous meeting.

2. Critical control point and critical limits discussion.

The subgroup then discussed critical control points and critical limits associated with the identified hazards. The control points and limits are captured in Attachment 2.

3. Next steps.

Mr. Gregory noted the schedule for future meeting prior to the meeting adjourning.

Agenda

1. Review of hazard analysis.
2. Critical control point discussion.
3. Critical limits discussion.
4. Next steps.

Attachment 2
Sewage Handling and Disposal Regulations Revisions
Climate Change Subgroup
Hazard Analysis and Critical Control Points Outline

U.S. FDA HAACP Principles and Applications
https://www.fda.gov/food/hazard-analysis-critical-control-point-haccp/haccp-principles-application-guidelines#guide

HAACP Principals

1. Conduct a hazard analysis.
2. Determine the critical control points (CCPs).
3. Establish critical limits.
4. Establish monitoring procedures.
5. Establish corrective actions.
6. Establish verification procedures.
7. Establish record-keeping and documentation procedures.

Before You Start HAACP

Describe the product and processing method(s).

Product: (properly operating – disposal and treatment) onsite sewage systems

Processing methods:

- Conventional onsite sewage systems disperse STE within 18 inches of SHWT (true water table or tidal influence). (Timeframe – 30 to 40 years, but subjective to the use of home)
- Alternative onsite sewage systems (AOSS) disperse TL-2/TL-3 effluent within 6 inches of SHWT. (Timeframe – potentially can last as long as the treatment unit functions properly)
- AOSS disperse direct dispersal to ground water (higher treatment than TL-3) with no required standoff to SHWT. (Timeframe – potentially can last as long as the treatment unit functions properly)

Describe the intended use of the product.

Normal uses of onsite sewage systems:

- Individual residences. (varying levels of risk for some homes)
- Community based systems. (varying levels of risk for some community systems)
- Nonresidential facilities.
    - Different types of businesses. Some business serve high risk population (e.g. nursing homes, clinics, hospitals, residential assisted living facilities)

Intent is to treat wastewater to ensure all sewage is disposed of in a safe and sanitary manner to protect public health and the environment.

Develop a flow diagram for the process.

- Approval of site and soil evaluations for subdivision/certification letter (optional).
- Site/soil evaluation and design for construction permit.
- VDH level 1 review of design.
- VDH level 2 review of design (10%).
- Construction permit issued.

- Pre-construction meeting (optional – required by some designers)
- Installation.
- Inspection of system.
- Issuance of operation permit.
- Annual inspection (AOSS). (Can be more frequent, more frequent O&M visits and sampling for non-residential systems and large AOSS)
- Lab samples for AOSS. 5 years for generally approved residential. More frequent for non-residential and non-generally approved.
- 5 year pump out (conventional systems in CBPA). (Inspections and effluent filters are also an option)
- Renewable OPs.

Conducting a hazard analysis.

Develop a list of hazards which are likely to cause injury or illness if they are not controlled. (If hazard is not likely to occur would not require further consideration).

- Discharge of effluent to surface waters when an onsite system is flooded by surface water. System flooded, not properly treating effluent. Biological
- Discharge of effluent to waters with active shellfish harvest. Biological, physical, and chemical contamination of the shellfish harvesting areas (side effect of economic impact)
- Contamination of groundwater because of inadequate treatment prior to dispersal to groundwater, due to rise in groundwater level. Biological, chemical.
- Backup of sewage into homes, as a result of flooding of the system. Biological, chemical.
- Premature septic failures, may be no other regulatory complaint option for onsite disposal. Biological.
- Subdivision lot approvals/certification letters do not expire, may result in permits in areas impact by climate change. Biological, chemical.
- Damage to system components from increasing climate event, frequency and severity. Physical
- Climate change can impact supply chains for onsite system components.

How might different factors influence the likelihood and severity of the hazards.

- Discharge of effluent to surface waters when an onsite system is flooded by surface water. System flooded, not properly treating effluent. Biological, physical and chemical.
    - Duration and frequency of the flooding.
    - Distance from the shoreline. (Critical Control Point)
        - Elevation would influence the likelihood of severity if close to shore.
        - Systems on bluff, bluff could be undercut.
    - Elevation compared to mean high water. (Critical control point)
    - The strength of the wastewater being discharge, level of treatment provided. (CCP)
        - Different for residence vs. a commercial facility.
        - Is the flooding impacting both the treatment unit and absorption area, or just the absorption area.
        - The configuration of the components influence the severity.
    - Factors will continue to change with climate change.
        - Renewable OP?
- Discharge of effluent to waters with active shellfish harvest. Biological, physical, and chemical contamination of the shellfish harvesting areas (side effect of economic impact)

    - Distance from shellfish waters. (CCP)
    - Elevation compared to mean high water. (CCP)
    - Duration and frequency of the flooding.
    - VDH shellfish program in place, management of shellfish water for harvesting.
    - The strength of the wastewater being discharge.
- Contamination of groundwater because of inadequate treatment prior to dispersal to groundwater, due to rise in groundwater level. Biological, chemical.
    - Separation distance from trench bottom to groundwater. (CCP)
    - Level of treatment provided. (CCP)
    - Are components (e.g. tanks) watertight? (CCP)
        - Floating tanks.
    - Mechanical protection of the components; are component protected from flooding?
    - Factors will continue to change with climate change.
        - Renewable OP?
    - Is the property or neighboring properties served by wells (e.g. drinking water, agricultural, etc)? (CCP)
        - Use of the well.
- Backup of sewage into the structure, as a result of flooding of the system. Biological, chemical.
    - Structural integrity of the components.
    - Typically nothing getting to the drainfield when backing up in the house.
    - Bucking grade systems.
        - Addressed in current regulations.
    - Use of the structure influence the hazards (e.g. greater hazard backing up in a nursing home). (CCP)
    - Larger flows will result in more severe impact/more likely. (gpd and waste strength = CCP)
- Premature septic failures, may be no other regulatory complaint option for onsite disposal. Biological.
- Subdivision lot approvals/certification letters do not expire, may result in permits in areas impact by climate change. Biological, chemical.
- Damage to system components from increasing climate event, frequency and severity. Physical
    - Structural integrity of the components.
    - Erosion of the soils around the system components.
    - Severe – tank collapse, treatment unit collapse, floating of tanks.
    - Minor – e.g. need to reconstruct electrical controls
        - ATUs do not function properly without power.
    - Is system mechanically functioning as intended?
        - VDH has O&M requirements for AOSS
            - Specify additional site visit following flood events.
    - Is system biologically functioning as intended?
        - VDH has sampling requirements for AOSS
            - Specify additional sampling following flood events.
    - Performance based CCP – maybe having someone that is responsible for the onsite system that is not the owner.
        - AOSS has an operator.
        - COSS don't have ongoing oversight; additional site visit following a flooding event.
    - Storm flooding can be directional in the Bay.

    - https://cmap2.vims.edu/SCHISM/TidewatchViewer.html - could use to see where you may target outreach.
- Surface influenced aquifers impacted by flooding/failing systems.
    - Skip – information that shows estimated 18-20% increase in rainfall intensity.
    - Changes in the floodplains – shifting of floodplains.

Overall

- Properties at risk not fully identified.
- Some onsite sewage system serve higher risk population. If system flooded, failing, backing up, creates a higher risk for injury. Biological, chemical. (Higher risk – physical limitations or economic)
- Treatment level of the system.
    - Type of treatment
- Electrical components in the system – yes/no.
- Volume of effluent being produced.

Discharge of effluent to surface waters.

- Permitting of systems that meet minimum separation under today's conditions.
- Likelihood/severity based on pace of change.
- Proximity to shoreline.

Discharge of effluent to waters with active shellfish harvest.

- Permitting of systems that meet minimum separation under today's conditions.
- Likelihood/severity based on pace of change.
- Proximity to shoreline.

Contamination of groundwater.

- Permitting of systems that meet minimum separation under today's conditions.
- Likelihood/severity based on pace of change.

Backup of sewage into home.

Premature septic failures.

- Certification letters/subdivision approvals that do not expire.
- Likelihood/severity based on pace of change.

Properties at risk not fully identified.

- May continue status quo permitting in areas at future risk.

Other hazards.

Each step in onsite permitting, installation, and operation process should be listed along with measures necessary to control the hazard.

- Distance from the shoreline. (Critical Control Point)
- Elevation compared to mean high water. (Critical control point)
- The strength of the wastewater being discharge, level of treatment provided. (CCP)
- Distance from shellfish waters. (CCP)
- Elevation compared to mean high water. (CCP)
- Separation distance from trench bottom to groundwater. (CCP)
- Level of treatment provided. (CCP)
- Are components (e.g. tanks) watertight? (CCP)
- Is the property or neighboring properties served by wells (e.g. drinking water, agricultural, etc)? (CCP)
- Use of the structure influence the hazards (e.g. greater hazard backing up in a nursing home). (CCP)
- Larger flows will result in more severe impact/more likely. (gpd and waste strength = CCP)
- Structural integrity of the components. (CCP)
- Performance based CCP – maybe having someone that is responsible for the onsite system that is not the owner.