

*INTERIM - Recommended Standards and Guidance for Performance,
Application, Design, and Operation & Maintenance*

Remediation Technologies and Processes

September 19, 2007



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Preface

The State Board of Health has directed the Department of Health (department) to develop rules that apply to remediation technologies and processes. Their use is not currently addressed in Chapter 246-272A.

The interim recommended standards and guidance (RS&G) for remediation technologies/processes contained in this document have been developed for statewide application. “Interim” is used in the title of this document for two purposes:

- 1) The framework or process for the application of remediation technologies/processes is in a state of flux, and
- 2) Remediation technologies/processes must either be addressed in rule or in a RS&G to be used. Until rules have been promulgated, the recommendations in this document have been developed to provide interim guidance to local health jurisdictions in handling requests for using such technologies/processes.

If any provision of these recommended standards is inconsistent with local jurisdictional rules, regulations, ordinances, policies, procedures or practices, the local standards take precedence. Application of the recommended standards presented here is at the full discretion of the local health officer.

Typical RS&G Organization:

Standards Section	Explanation
Performance	How this technology is expected to perform (treatment level and function).
Application	How this technology is to be applied. This section includes conditions that must be met prior to proceeding with design. Topics in this section describe the “approved” status of the technology, component listing requirements, permitting, installation, testing and inspection requirements, etc.
Design	How this technology is to be designed and constructed (includes minimum standards that must be met to obtain a permit).
Operation and Maintenance	How this technology is to be operated and maintained (includes responsibilities of various parties, recommended maintenance tasks and frequency, assurance measures, etc).
Appendices	Design examples, figures and tables, specific applications, and design and installation issues.

Introduction

WAC 246-272A defines the failure of an on-site sewage system (OSS) as “a condition of an on-site sewage system or component that threatens the public health by inadequately treating sewage or by creating a potential for direct or indirect contact between sewage and the public. Examples of failure include:

- (a) sewage on the surface of the ground;
- (b) sewage backing up into a structure caused by slow soil absorption of septic tank effluent;
- (c) sewage leaking from a sewage tank, or collection system;
- (d) cesspools or seepage pits where evidence of ground water or surface water quality degradation exists;
- (e) inadequately treated effluent contaminating ground water or surface water; or
- (f) noncompliance with standards stipulated on the permit.”

The traditional definition of failure includes the first two examples in the definition of failure. A primary cause of this kind of failure is plugging or clogging of the infiltrative surface at the bottom of a bed or trench. Plugging or clogging of the infiltrative surface can result from a variety of physical (solids in wastewater or fines in backfill/gravel are trapped by the surface, surface is compacted during installation), biological (masses of microorganisms collect at the surface), and chemical (waste products of microbiological metabolism) means.

This plugging or clogging (frequently called a biomat) restricts the flow of effluent into the soil. A certain degree of clogging may improve the treatment of wastewater by increasing effluent hydraulic retention times in the soil. However, severe clogging can produce too great of a reduction in permeability at the infiltrative surface, which causes backups or surfacing sewage.

WAC 246-272A-0010 defines "repair" as “the relocation, replacement or reconstruction of a failed on-site sewage system.” When an OSS fails, WAC 246-272A requires the failure be repaired. A prioritized list of actions to correct the failure is provided.

A variety of restorative actions to correct a failure may be proposed to get the system working again. For purposes of this guidance document, these actions are called **remedial actions** or **remediation**. Such actions may be indicated after troubleshooting (evaluating the system for potential factors that may have contributed to the failure). These actions may include non-proprietary actions such as reducing the wastewater quantity, reducing the organic load, resting a drainfield, and/or other non-proprietary or proprietary means to remove what has reduced the

flow into and through the infiltrative surface and increase the flow of effluent into the soil below. If remediation is successful, a repair may be unnecessary.

An assortment of proprietary biological, physical, and/or chemical technologies or processes have been proposed to “open-up” or remedy the plugged surface or biomat and increase or restore the flow of effluent into the soil below the infiltrative surface. Examples of each of these remediation processes include:

Biological – A technology that provides a combination of biological augmentation and aeration to the wastewater in a continuous manner to help digest and break down the excess biomat.

Physical – A process in which the plugged infiltrative surface is fractured/opened up by the injection of a large volume of compressed air and plastic beads.

Chemical – A process in which the oxygen concentration is increased at the infiltrative surface by mechanically adding air (aeration) or an oxygen releasing compound, such as an inorganic peroxide, to accelerate the decomposition of the excess biomat.

This guidance document pertains only to proprietary remediation technologies. This does not preclude the use of non-proprietary physical remedial actions such as reducing wastewater quantities or organic loads from being attempted. More invasive non-proprietary remedial methods such as physically uncovering and raking or removing the surface layer of the soil/biomat fall within the definition of the repair of a failure by reconstructing the infiltrative surface. These proprietary and non-proprietary processes may be used separately or in combination.

1. Performance Standards

1.1. Intent

- 1.1.1. The intent of a remediation technology or process as addressed by this document is solely to “open-up” a clogged surface located at the infiltrative surface at the bottom of a trench or bed and restore flow into the soil below it. Remediation is being attempted in lieu of repairing a failed drainfield. Thus, the performance standard applied in this document is to sufficiently increase the infiltration rate through and into the soil below the infiltrative surface to remediate or mitigate the existing problem.
- 1.1.2. In some site conditions, the success of these technologies to open up a clogged infiltrative surface may result in increased treatment concerns. An example of such a situation is a septic tank-gravity drainfield permitted in a soil too coarse or shallow to meet current requirements. A biomat provides some protection by providing some treatment of effluent flowing through it into the soil below. If the biomat is “opened up,” the soils may provide insufficient treatment to percolating effluent in these situations, resulting in a higher risk to the receiving waters it will eventually reach. Thus, the performance standard applied in this document is that remediation technologies and processes will not adversely affect groundwater or surface water.
- 1.1.3. Improper use of remedial actions or products may cause unintentional physical damage to and have an adverse affect on the on-site sewage system function. Thus, the performance standard applied in this document is that remediation technologies and processes will not result in harm to the on-site sewage system.

1.2. Listing

- 1.2.1. A remediation technology or process is not considered a treatment or distribution technology/process to be used when a site requires a specific treatment component performance level be met. Thus, such technologies/processes are not reviewed and listed by the Department of Health in its List of Registered On-site Treatment and Distribution Products (Registered List). They may be permitted by local health officers as sewage technologies (WAC 246-272A-0100) as long as there is a departmental RS&G for use of this technology.
- 1.2.2. If representatives of a remediation process propose their proprietary technology to be used for new construction or repairs, to meet a treatment level, or to be used for nitrogen removal, the product registration and testing requirements in WAC 246-272A apply. The department’s review will entail comparing submitted data with those requirements. These “expanded” uses of the remediation technologies are not within the intent of this document.

- 1.2.3. On-Site Sewage System Additives - When a remediation technology or process uses an on-site sewage system additive product, the additive product must be reviewed and approved by the department according to the requirements in WAC 246-273. The department maintains a list of those additive products currently approved. The review is limited to an evaluation of the ingredients for possible harm to public health or water quality when the additives are used as directed. The product evaluation does not investigate the validity of performance claims by manufacturers. For this reason departmental approval and listing does not certify effectiveness, denote an endorsement, nor recommend use.

2. Application Standards

2.1. General Conditions

- 2.1.1. This guidance document neither addresses nor proposes a remediation technology or process be used as a preventive measure, to prevent excessive plugging of the infiltrative surface.
- 2.1.2. IAPMO has preliminary guide criteria (IGC 180-2003 ABG, 2003) to evaluate one type of remediation technology. NSF International is exploring developing a comprehensive protocol for bioremediation technologies. However, no testing protocol for remediation technologies and processes has been developed that is currently deemed acceptable by national experts. Thus, the Department's review of remediation technologies has been to determine if their use would harm an existing OSS. Based on this review, with the exceptions noted within this section, the use of remediation technologies does not appear to pose a threat to OSS components, if the manufacturer's instructions and the local health officer's requirements are followed.
- 2.1.3. A system owner, subject to the local health officer requirements, may choose to try this process to see if the existing problem will be resolved. ***The system owner bears the risk and cost of this attempt.*** There is no guarantee the problem will be resolved.
- 2.1.4. To help ensure proper application of remediation technologies and processes, the local health officer must provide effective oversight of remedial actions and the installation of remediation technologies.

2.2. Permitting

- 2.2.1. WAC 246-272A-0200(1) states, "...a person proposing the installation, repair, modification, connection to, or an expansion of an OSS, shall ... obtain a permit from the local health officer." The use of a remediation technology or process as defined in this guidance document constitutes a modification of the OSS; thus, a permit must be obtained from the local health officer. An operational permit may also be required by the local health officer if that is the process selected to administer and enforce local health officer decisions.
- 2.2.2. Typically, when issuing a permit, the local health officer is approving the permitted use with some assurance the use will have a long-term beneficial effect. However, when permitting a remediation technology or process, the local health officer is accepting or allowing the permitted use as an attempt to resolve a failing system. Because of reasons detailed in this guidance document, there is no assurance the remediation technology or use will have a permanent positive impact. This is consistent with the definition of "approved" in WAC 246-272A-0010: "a written statement of acceptability issued by the local health officer or the department."
- 2.2.3. The intent of using a remediation technology/process is not included in the definition of a "repair." WAC 246-272A is silent to the use of remediation. Because the requirement to repair the OSS failure [WAC 246-272A-0280(1)] will not be met when a remediation technology/process is applied as a means to correct a failure, a waiver from this requirement must be granted before remediation can be used in a repair situation. Table 1 in Appendix A contains recommended criteria and mitigation measures to assist the Local Health Officer and the designer when considering this type of waiver request, and to help assure that waivers granted for this purpose are consistent with the standards in, and the intent of WAC 246-272A. The permit must take into account the mitigating requirements of this guidance document and the response to the waiver request on a site-specific basis.
- 2.2.4. A local health jurisdiction may permit a remediation technology or process even though it is not included on the Registered List. Adding a remediation technology to, or performing a remediation process on a system failing because insufficiently treated effluent is flowing into ground and/or surface water is not permitted unless it has met the requirements in WAC 246-272A for proprietary treatment product testing and listing (See Listing, Subsection 1.2).
- 2.2.5. Prior to issuing a permit, a thorough assessment of the failing system shall be performed by a designer, or by the local health officer. A monitoring/maintenance service provider can be very helpful when involved in this failure analysis work. The intent of this assessment is two-fold:

- 2.2.5.1. To determine potential factors that may have contributed to the failure. These factors need to be addressed and changed or corrected prior to the installation or use of a remediation technology/process.
- 2.2.5.2. To evaluate the type of failure. The use of a remediation technology/process is not appropriate if the cause of the failure:
 - 2.2.5.2.1. Cannot be corrected or abated.
 - 2.2.5.2.2. Resulted in a failure other than a plugging of the infiltrative surface in a trench or bed. This includes failures where the soil provides insufficient treatment prior to effluent reaching ground and/or surface water. An example of this situation is when a failed OSS is not meeting the vertical or horizontal separation requirements of a conforming system. Thus, remediation is not a substitute for meeting the requirements for a conforming system or the treatment component performance levels in WAC 246-272A-0280 Repair of Failures.

It is important that the causes of failure be determined before attempting any remediation to a system. Users must be aware that when any remediation method is used to correct a failure from a clogged biomat only the conditions are treated or fixed. The causes of the failure will usually persist. Therefore, all causes should be identified and appropriate corrective action taken to prevent recurrences. Otherwise any possible effectiveness that the remediation effort may have will be short-lived.

- 2.2.6. The thorough assessment of the failing system shall include:
 - 2.2.6.1. A review of the permit and as-built or record drawing for the last permitted action pertaining to the failing system. This may be the initial new construction permit, a repair permit, or a permit issued for some other system modification. This will provide information on design parameters, system component settings, and system component locations.
 - 2.2.6.2. A review of the monitoring and maintenance the system has received (or not received) throughout its life.
 - 2.2.6.3. A determination of the actual wastewater flow and comparison with the design flow.
 - 2.2.6.4. A determination of the actual hydraulic and organic loading rates and comparison with the design loading rates.
 - 2.2.6.5. An inspection of and verification of the performance of all system components, including any mechanical components.

- 2.2.6.6. A review of the soils to verify the soil descriptions in the design are accurate. If a soil evaluation is not included in an existing permit, an evaluation should be taken to determine the soil characteristics and to locate any limiting layers in the soil that may be present.
- 2.2.6.7. A determination of the factor(s) that is/are contributing to the failure. Prior to permit issuance, these factors need to be satisfactorily corrected or addressed so another failure will not occur. [WAC 246-272A-0280(5) requires a designer to address the factors contributing to a failure in a design to repair a failing OSS.]
- 2.2.7. Some of the remediation technologies/processes will take some time to correct the failing situation. Others, if successful, will show immediate results. The local health officer must balance a request to use a remediation technology/process with the risk posed by the on-going failure of the system. Considerations would include the on-going risk to ground and/or surface waters and the potential for members of the public being exposed to insufficiently treated sewage. The use of a remediation technology/process should not be permitted on a site, unless these risks are appropriately addressed.
- 2.2.8. The local health officer may permit the use of a remediation technology/process without requiring the submittal of a detailed design, if he/she determines one is not necessary. In those cases where a design is not deemed to be necessary, a concise plan needs to be developed and submitted by a designer prior to the permit being issued by the local health officer. Per WAC 196-33-200(8), designers are reminded that if they have a financial relationship with a technology or process that will be included in the plan or design, that relationship needs to be disclosed to their client. The plan or design needs to:
 - 2.2.8.1. Identify the results of the failure assessment,
 - 2.2.8.2. Discuss the proposed course of action, including site-specific mitigation measures for containing and/or decontaminating sewage surfacing areas, and other measures for preventing the public from being exposed to inadequately treated effluent.
 - 2.2.8.3. Provide detailed information in the manner in which the proposed remediation will take place. The manufacturer's recommended method for product/process use and quantities and concentration of product (if applicable) must be included in this information.
 - 2.2.8.4. Discuss alternatives or options considered, and

- 2.2.8.5. Provide detailed subsequent follow-up action. This will address issues noted in Section 6.0 and at least the following: the length of time monitoring the remediation process and its effects will occur, who is responsible for doing the on-going monitoring, required documentation of a contract or agreement between the OSS owner and the entity responsible for the monitoring, and reporting requirements to the local health officer.
- 2.2.9. Since the permitted use of a remediation technology/process is for a failing OSS with an overly restrictive biomat or plugged infiltrative surface at the bottom of a trench or bed, the local health officer shall require the installation of a monitoring port at the beginning and end of each trench or in each of the corners and the center of a bed. This will allow observations of whether the remediation technology/process is performing properly or not. Sample monitoring ports are depicted in Appendix B. They should extend from the bottom of the trench or bed in a gravel filled SSAS. Monitoring ports for gravelless distribution products should meet the observation port requirements in the RS&G for Gravelless Distribution Products. All ports must have a cover and be anchored in place so it can't accidentally be pulled out when taking the cover off.
- 2.2.10. While on-going monitoring and maintenance is needed for all systems, the local health officer shall require periodic monitoring inspections of the OSS to verify the remedial technology/process is producing the desired effect – the biomat or plugged infiltrative surface has been “opened up” and effluent flow into and through the infiltrative surface into the underlying soil has been restored.
- 2.2.11. If a failing condition persists after a remediation technology/process has been used for three to six months (appropriate length of time is dependent on the level of public health risk posed by the failure and attempts to remediate it), the local health officer shall require a repair as per the requirements of WAC 246-272A.

3. Design

Remediation technologies/processes covered in this RS&G document are exclusively proprietary products representing a wide variety of designs, materials used and methods of assembly. As such, there are no specific recommended standards for the design of the technologies other than those design requirements for system components that are specified in WAC 246-272A-0238 to facilitate operation, monitoring and maintenance.

4. Installation/Process Operation

4.1. Installation

- 4.1.1. The installation (or operation of equipment to perform the process for some physical and chemical remediation processes) requires knowledge, training, and experience in the process being used on a site, as well as in the basic principles of on-going system design, installation, function, operation, maintenance (including troubleshooting), and electrical codes.
- 4.1.2. It is imperative the local health officer approve persons performing this work. Installers are typically the most qualified professionals to install remediation technologies. At the discretion of the local health officer, other professionals authorized by the manufacturer of the technology/process may be involved in this work.
- 4.1.3. Remediation technology/process installation or operation procedures shall not adversely affect treatment performance in any manner or cause any physical damage to the on-site sewage system.

5. Operation, Monitoring, & Maintenance

5.1. General

- 5.1.1. The local health officer has the authority to require that an acceptable maintenance agreement be established, and supporting documents be developed and approved by the local health officer, prior to the issuance of the permit. It is recommended that a maintenance agreement be required when, in the opinion of the local health authority, the ongoing operation and/or monitoring of the remediation technology/process is best assured by the existence of such an agreement.
- 5.1.2. For a period of at least six months, the system should be monitored to see if the problem or failure is resolved. Monitoring should also document the timing of the failure/problem and the attempted remedial action. The assessment shall address questions such as, when an OSS fails in the winter and the remediation attempt went into the spring or summer, what is impact of drier weather on the results. If the problem/failure is not resolved, other corrective actions may be needed. The remedial technology may be required to be removed from the system.
- 5.1.3. The primary observations or measurements to be made and recorded include:
 - 5.1.3.1. Whether the symptom of failure (surfacing or backing up) stops.
 - 5.1.3.2. Depth of effluent ponding in the monitoring ports located in the trenches/beds.

5.2. User's Manual

- 5.2.1. A user's manual for the biological remediation technologies/processes must be developed and/or provided by the manufacturer of the technology. This material must contain the following, at a minimum:
 - 5.2.1.1. A diagram of the remediation technology/process components added to the system and where in the OSS they are located,
 - 5.2.1.2. Explanation of the function, operational expectations, owner responsibility, etc. of the added remediation technology components,
 - 5.2.1.3. Names and telephone numbers of the individual who installed the remediation technology (or performed the remediation process for a physical or chemical process), the local health officer, component/process manufacturer or provider, and/or the entity responsible for monitoring the technology's performance, and
 - 5.2.1.4. Information on the periodic monitoring and maintenance requirements of the technology or process.
- 5.2.2. For the on-site sewage system to operate properly, its various components need periodic monitoring and maintenance. Biological remediation technologies will require on-going monitoring and maintenance. Because of the complexities of remediation technologies and processes and the issues surrounding them, it is recommended that monitoring and maintenance be performed by experienced and qualified monitoring/maintenance service providers. Assurance that this monitoring and maintenance is performed is the responsibility of the system owner.
- 5.2.3. A final report shall be developed by the entity responsible for the on-going monitoring of the remediation attempt. This report shall detail the findings, conclusions, and recommendations. The local health officer shall use this report in making the final determination concerning the future of the attempted remediation action.

5.3. Action Conditions

- 5.3.1. When a monitoring inspection, or any other observation, reveals the remediation technology/process is not correcting the problem (surfacing or backing up continues or effluent ponding in observation ports does not diminish), the owner of the system must take appropriate action, according to the direction and satisfaction of the local health officer. These actions include:
 - 5.3.1.1. Discontinue the use of a remediation technology,

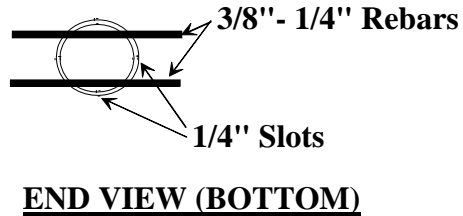
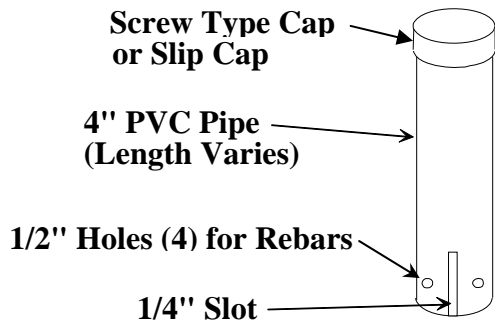
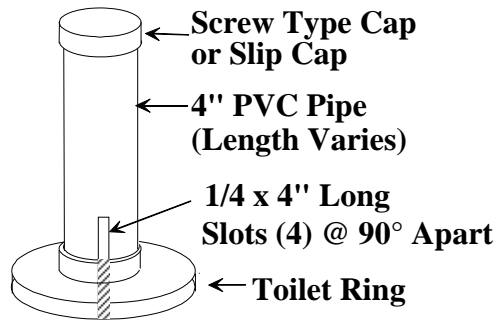
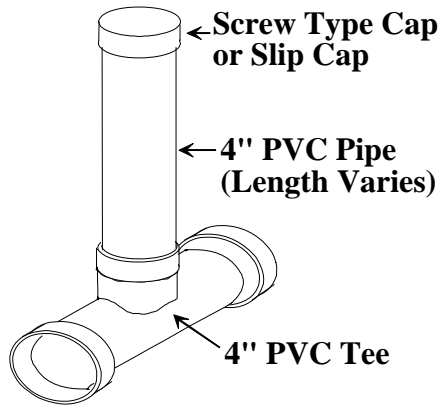
- 5.3.1.2. A repair that complies with WAC 246-272A-0280, and
- 5.3.1.3. Potential interim use of another remediation technology.

Appendix A – Recommended Waiver Criteria and Mitigation Measures

Table 1.				
WAC Section	Specific Item Waived	Extent or Degree Waived	Minimum Issues/ Criteria to Consider*	Recommended Mitigation Measures*
246-272A-0280(1)	When an OSS failure occurs, the OSS owner shall repair or replace the OSS or component, or a system meeting the requirements of Table IX	When an OSS failure occurs, the OSS owner remediates the OSS in lieu of repairing or replacement.	1) Risks of public exposure to sewage by on-going failure	1a) Containing and decontaminating surfacing areas by pumping sewage tanks, placement of barriers around the perimeter, covering, and/or treating the surfacing area with lime.
			2) Failure analysis.	2a) Failure assessment performed by a designer consistent with the <i>Recommended Standards and Guidance for Remediation Technologies and Processes</i> so that the causes of the failure are identified and addressed.
			3) Special permit requirements for the use of remediation technology or process	3a) Written action plan submitted for approval by a designer consistent with the <i>Recommended Standards and Guidance for Remediation Technologies and Processes</i> 3b) Results of failure assessment shows that the OSS either meets the soil/site requirements of a conforming system or the treatment component performance requirements in Table IX, WAC 246-272A. 3c) Remediation technology or process is limited to restoration of a clogged infiltrative surface. 3d) LHO waiver granted prior to permit issuance for the OSS modification.
			4) Special installation & operation requirements	4) Remediation technology/process installation and operation procedures consistent with the <i>Recommended Standards and Guidance for Remediation Technologies and Processes</i> .
			5) Performance assurance of remediation technologies/ process	5a) Management program established that assures the on-going monitoring, operation and maintenance of the OSS. 5b) Monitoring report required that documents monitoring activities, corrective actions taken, and performance standards are met consistent with the <i>Recommended Standards and Guidance for Remediation Technologies and Processes</i> .

* **The local health officer may require additional site-specific issues and criteria to consider, and mitigation measures.**

Appendix B – Monitoring/Inspection Ports



Appendix C - Glossary

Term	Meaning / Description
Accessible	When applied to a fixture, connection, appliance or equipment, means having access thereto, but which first may require the removal of an access panel, door, or similar obstructions. Readily accessible means direct access without the necessity of removing any panel, door, or similar obstruction.
Additive	A commercial product added to an on-site sewage system intended to affect the performance or aesthetics of an on-site sewage system.
Aeration	The process of bringing air in contact with wastewater by using a compressor or blower and a diffuser for the purposes of promoting biological degradation.
Approved	A written statement of acceptability, issued by the Department of Health.
Bed	A soil dispersal component consisting of an excavation with a width greater than three feet.
Biological Augmentation	The process of using specific strains of microorganisms through inoculums in tandem with a microbial inoculation generation device that is part of an on-site sewage system treatment sequence, typically the septic tank, to biologically remediate a clogged biomat.
Biological Oxygen Demand (BOD5)	An index of the amount of oxygen that will be consumed by the decomposition of organic matter in wastewater. This is the result of a laboratory analysis that consists of measuring the initial dissolved oxygen concentration, incubating the sample for five days at 68o F, then measuring the final dissolved oxygen. The difference in dissolved oxygen concentration corrected for the initial dilution and sample volume is called the BOD5. The BOD5 test is one of the commonly used indicators of wastewater strength.
Biomat	A layer of biological growth and inorganic residue that develops at the infiltrative surface.

Carbonaceous Biological Oxygen Demand (CBOD5)	Same as the 5-day biochemical oxygen demand (BOD5) test, except that the NITROGENOUS DEMAND is prevented by addition of a nitrification inhibitor to the sample.
Category 1 Treatment Component	A treatment component designed to treat sewage with strength typical of a residential source when septic tank effluent is anticipated to be equal to or less than treatment level E.
Coliform (Bacteria)	A group of bacteria that produce gas and ferment lactose, some of which are found in the intestinal tract of warm-blooded animals. They are indicators of potential ground water and/or surface water contamination with such fecal material.
Conforming System	Any on-site sewage system or component, meeting any of the following criteria: (a) In full compliance with new construction requirements under this chapter; or (b) Approved, installed and operating in accordance with requirements of previous editions of this chapter; or (c) Permitted by the waiver process under WAC 246-272A-0420 that assures public health protection by higher treatment performance or other methods.
Department	The Washington State Department of Health.
Designer	A person who matches site and soil characteristics with appropriate on-site sewage technology. This term applies to both on-site sewage treatment system designers licensed under chapter 18.210 RCW and professional engineers licensed under chapter 18.43 RCW.
Design Flow	The maximum volume of sewage a residence, structure, or other facility is estimated to generate in a twenty-four-hour period. It incorporates both an operating capacity and a surge capacity for the system during periodic heavy use events. The sizing and design of the on-site sewage system components are based on the design flow.
Disinfection	The process of destroying pathogenic microorganisms in sewage through the application of ultraviolet light, chlorination, or ozonation.

Distribution Technology	Any arrangement of equipment and/or materials that distributes sewage within an on-site sewage system.
Dosing Tank / Chamber	A tank which collects treated effluent from a treatment component and periodically discharges it into another treatment component or to the soil dispersal component, depending upon the needs and design of the particular on-site sewage system.
Drainfield	See “Subsurface Soil Absorption System (SSAS)” and “Soil Dispersal Component”.
Drain Rock	Clean, washed gravel or crushed rock ranging in size from three-quarters inch to two and one-half inches, and containing no more than two percent by weight passing a US No. 8 sieve and no more than one percent by weight passing a US No. 200 sieve.
Effluent	Liquid discharged from a septic tank or other on-site sewage system component.
Failure	<p>A condition of an on-site sewage system or component that threatens the public health by inadequately treating sewage or creating a potential for direct or indirect contact between sewage and the public. Examples of failure include:</p> <ul style="list-style-type: none"> a) sewage on the surface of the ground; b) sewage backing up into a structure caused by slow absorption of septic tank effluent; c) sewage leaking from a sewage tank, or collection system; d) cesspool or seepage pits where evidence of ground water or surface water quality degradation exists; or e) inadequately treated effluent contaminating ground water or surface water. f) noncompliance with standards stipulated on the permit.
Fecal Coliform (Bacteria)	Coliform bacteria specifically originating from the intestines of warm-blooded animals, used as a potential indicator of ground water and/or surface water pollution.

Filter	A device or structure for removing suspended solid or colloidal material from wastewater.
Filtrate	Liquid which has passed through a filter.
Final Treatment/ Disposal Unit	That portion of an on-site sewage system designed to provide final treatment and disposal of the effluent from a wastewater treatment unit, including, but not limited to, absorption fields (drainfields), sand mounds, and sand-lined trenches.
Hydraulic Loading Rate	The amount of effluent applied to a given treatment step, in this chapter expressed as gallons per square foot per day (gal/sq.ft./day).
Infiltrative Surface	The surface within a treatment component or soil dispersal component to which effluent is applied and through which effluent moves into original, undisturbed soil or other porous treatment media. In drainfields, this is the drain rock-original soil interface at the bottom of the trench; in mound systems, this is the gravel-mound sand and the sand-original soil interfaces; in sand-lined trenches/beds (sand filter), this is the gravel-sand interface and the sand-original soil interface at the bottom of the trench or bed.
Influent	Wastewater, partially or completely treated, or in its natural state (raw wastewater), flowing into a reservoir, tank, treatment component, or soil dispersal component.
Installer	A person approved by the local health officer to install on-site systems or components.
Local Health Officer	The health officer of the city, county, or city-county health department or district within the state of Washington, or a representative, authorized by and under the direct supervision of the local health officer, as defined in chapter 70.05 RCW.
Maintenance	The actions necessary to keep the on-site sewage system components functioning as designed.
Monitoring	Periodic or continuous checking of an on-site sewage system, which is performed by observations and measurements, to determine if the system is functioning as intended and if system maintenance is needed. Monitoring also includes maintaining accurate records that document monitoring activities.

Oil & Greases (formerly referred to as Fats, Oils, & Greases)	Oil and grease, a component of sewage typically originating from food stuffs (animal fats or vegetable oils) or consisting of compounds of alcohol or glycerol with fatty acids (soaps and lotions). Typically expressed in mg/L.
On-Site Sewage System (OSS)	An integrated system of components, located on or nearby the property it serves, that conveys, stores, treats, and/or provides subsurface soil treatment and dispersal of sewage. It consists of a collection system, a treatment component or treatment sequence, and a soil dispersal component. An on-site sewage system also refers to a holding tank sewage system or other system that does not have a soil dispersal component.
Operating Capacity	The average daily volume of sewage an OSS can treat and disperse on a sustained basis. The operating capacity, which is lower than the design flow, is an integral part of the design and is used as an index in OSS monitoring.
Percolation	The flow or trickling of a liquid downward through a contact or filtering medium. The liquid may or may not fill the pores of the medium.
Pressure Distribution	A system of small diameter pipes equally distributing effluent throughout a SSAS, as described in the "Recommended Standards and Guidance for Pressure Distribution Systems" by the Washington State Department of Health. A subsurface drip system may be used wherever pressure distribution is required.
Proprietary Product	A sewage treatment or distribution technology subject to a patent or trademark.
Public Domain Technology	A sewage treatment and distribution technology, method, or material not subject to a patent or trademark.
Pump Chamber	A tank or compartment following the septic tank or other pretreatment process which contains a pump, floats and volume for storage of effluent. In timed dosing pressure distribution systems, this is frequently called a "surge tank" or "equalization tank." If a siphon is used, in lieu of a pump, this is called a "siphon chamber."
Raw Wastewater	Wastewater before it receives any treatment.

Readily Accessible	Having direct access to a plumbing fixture, connection, appliance or equipment without the necessity of removing any panel, door, or similar obstruction.
Registered List	“List of Registered On-site Treatment and Distribution Products” developed and maintained by the department.
Remediation or Remedial Action	The process of remedying or fixing the condition of a clogged biomat by a chemical, biological, or physical means.
Repair	The relocation, replacement or reconstruction of a failed on-site sewage system.
Residential Sewage	Sewage having the consistency and strength typical of wastewater from domestic households.
Restrictive Layer	A stratum impeding the vertical movement of water, air, and growth of plant roots, such as hardpan, clay pan, fragipan, caliche, some compacted soils, bedrock, and unstructured clay soils.
Routine Servicing	Servicing all system components as needed, including product manufacturer's requirements / recommendations for service.
Septic Tank	A water tight pretreatment receptacle receiving the discharge of sewage from a building sewer or sewers, designed and constructed to permit separation of settleable and floating solids from the liquid, detention and anaerobic/facultative digestion of the organic matter, prior to discharge of the liquid.
Service Interval	The time period between planned site visits to perform various system monitoring functions such as checking equipment, renewing depleted disinfectant chemical supply, collecting samples. The service intervals may be specified by contracts, operation plans, or local health jurisdiction permits.
Sewage	Any urine, feces, and the water carrying human wastes including kitchen, bath, and laundry wastes from residences, building, industrial establishments or other places. For the purposes of this document, “sewage” is generally synonymous with domestic wastewater. Also see "residential sewage” and “wastewater”.

Sewage Quality	<p>Contents in sewage that include:</p> <ul style="list-style-type: none"> a) CBOD5, TSS, and O&G; b) other parameters that can adversely affect treatment. Examples include pH, temperature, and dissolved oxygen; and c) other constituents that create concerns due to specific site sensitivity. Examples include fecal coliform and nitrogen.
Soil Dispersal Component	<p>A technology making up that portion of an on-site sewage system that releases effluent from a treatment component into the soil for dispersal, final treatment, and recycling. This includes, but is not limited to, absorption fields (drainfields), sand mounds, bottomless sand filters, and sand-lined trenches.</p>
Subsurface Soil Absorption System - "SSAS"	<p>A soil dispersal component of trenches or beds containing either a distribution pipe within a layer of drainrock covered with a geotextile, or an approved gravelless distribution technology, designed and installed in original, undisturbed, unsaturated soil providing at least minimal vertical separations as established in WAC 246-272A, with either gravity or pressure distribution of the treatment component effluent.</p>
Suitable Soil	<p>Original, undisturbed soil of types 1 through 6.</p>
Total Suspended Solids (TSS)	<p>Suspended solids refer to the dispersed particulate matter in a wastewater sample that may be retained by a filter medium. Suspended solids may include both settleable and unsetttable solids of both inorganic and organic origin. This parameter is widely used to monitor the performance of the various stages of wastewater treatment, often used in conjunction with CBOD5 to describe wastewater strength. The test consists of filtering a known volume of sample through a weighed filter membrane that is then dried and re-weighed.</p>
Treatment Component	<p>A technology that treats sewage in preparation for further treatment and/or disposal into the soil environment. Some treatment components, such as mound systems, incorporate a soil dispersal component in lieu of separate treatment and disposal components. Treatment occurs by a variety of physical, chemical, and/or biological means. Constituents of sewage or effluent may be removed or reduced in concentrations.</p>

<p>Treatment Level</p>	<p>One of six levels (A, B, C, D, E, & N) used in WAC 246-272A to:</p> <ul style="list-style-type: none"> a) Identify treatment component performance demonstrated through requirements specified in WAC 246-272A-0110; and b) Match site conditions of vertical separation and soil type with treatment components. <p>Treatment Levels used in WAC 246-272A are not intended to be applied as field compliance standards. Their intended use is for establishing treatment product performance in a product testing setting under established protocols by qualified testing entities.</p>
<p>Treatment Sequence</p>	<p>Any series of treatment components that discharges treated sewage to the soil dispersal component.</p>
<p>Trench</p>	<p>A soil dispersal component consisting of an excavation with a width of three feet or less.</p>
<p>Vertical Separation</p>	<p>The depth of unsaturated, original, undisturbed soil of Soil types 1 - 6 between the bottom infiltrative surface of a soil dispersal component and the highest seasonal water table, a restrictive layer, or Soil Type 7.</p>
<p>Wastewater</p>	<p>See “Sewage.”</p>

Appendix D- Bibliography

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