

NON-TRADITIONAL ONSITE WASTEWATER SYSTEM COMPONENTS

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Traditional Onsite Wastewater Components in Title 5

- ❑ Title 5 is a state code, implemented at the municipal level
- ❑ First written in 1978, amended several times, major changes in 1995
- ❑ Many of the traditional components allowed today by Title 5 are same as in 1978
- ❑ 1995 Code allowed use of components that are not listed in the regulation through a DEP approval process [280-288]

310 CMR: DEPARTMENT OF ENVIRONMENTAL PROTECTION

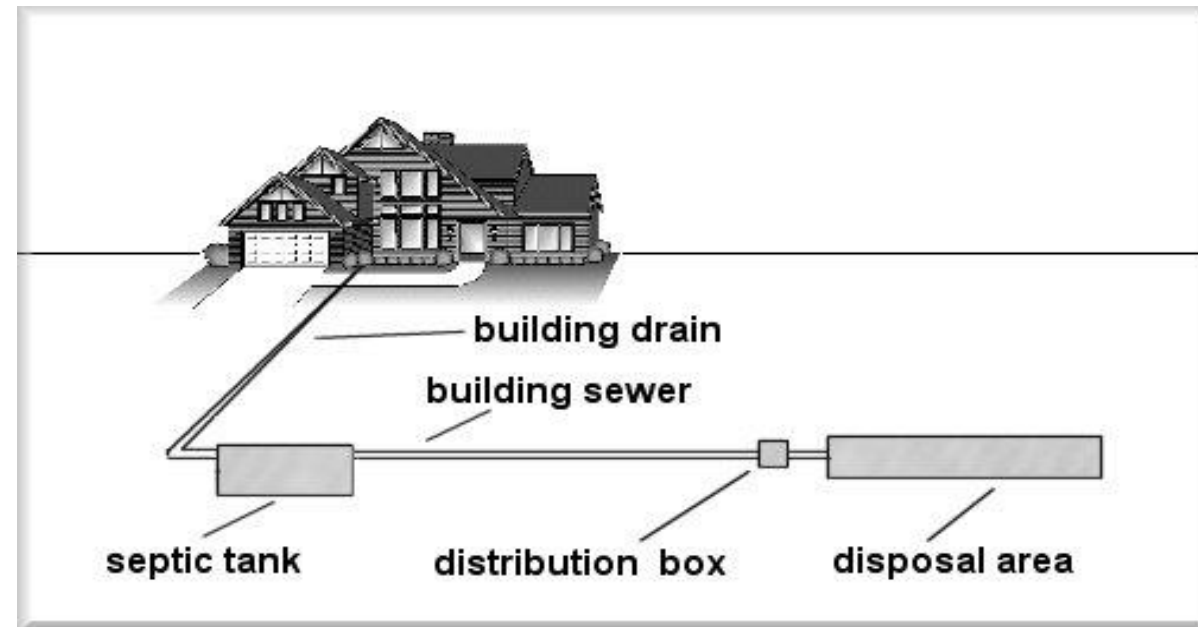
310 CMR 15.000: THE STATE ENVIRONMENTAL CODE, TITLE 5: STANDARD REQUIREMENTS FOR THE SITING, CONSTRUCTION, INSPECTION, UPGRADE AND EXPANSION OF ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEMS AND FOR THE TRANSPORT AND DISPOSAL OF SEPTAGE

SUBPART A: GENERAL PROVISIONS AND ENFORCEMENT

15.001: Purpose, Authority and Related Provisions
15.002: Definitions
15.003: Coordination with Local Approving Authorities
15.004: Applicability
15.006: Facilities Where the Total Design Flow Generated on the Facility Equals 10,000 gpd or Greater but Less than 15,000 gpd
15.007: Campgrounds
15.010: Division and Aggregation of Facilities
15.011: Criteria to Assess Whether Facilities are in Separate Ownership or Control
15.017: Approval of Soil Evaluators
15.018: Function of Soil Evaluators
15.019: Disposal System Installer's Permit
15.020: Disposal System Construction Permits
15.021: Certificates of Compliance

Traditional Onsite Wastewater Components in Title 5

- Title 5 allows and/or requires specific components to be used. These are to be designed and installed per the specification in the regulation
- These are “traditional” onsite wastewater components
 - i.e. concrete septic tank, distribution box, leach trenches



Traditional Onsite Wastewater Components in Title 5



Traditional Onsite Wastewater Components in Title 5



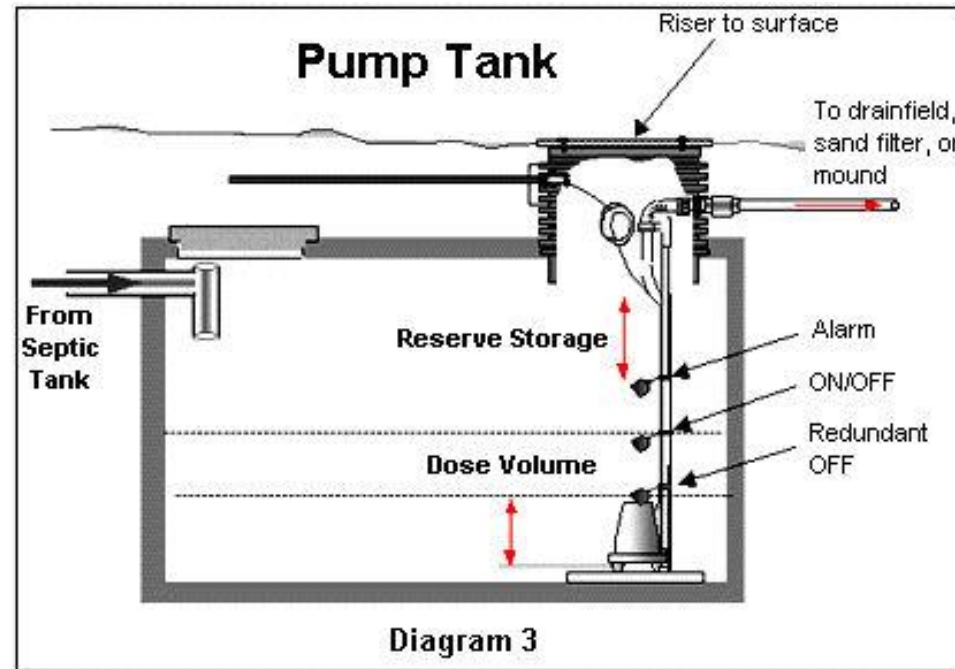
Traditional Onsite Wastewater Components in Title 5

- ❑ Concrete (or other) septic tank with inlet & outlet tees and gas baffle [223-226]
- ❑ Concrete (or other) pump tank with effluent pump [231,254]
- ❑ Concrete distribution box [232]
- ❑ Stone-and-pipe leach trench [251]
- ❑ Stone-and-pipe leach field [252]
- ❑ Concrete gallery, pit or chamber [253]

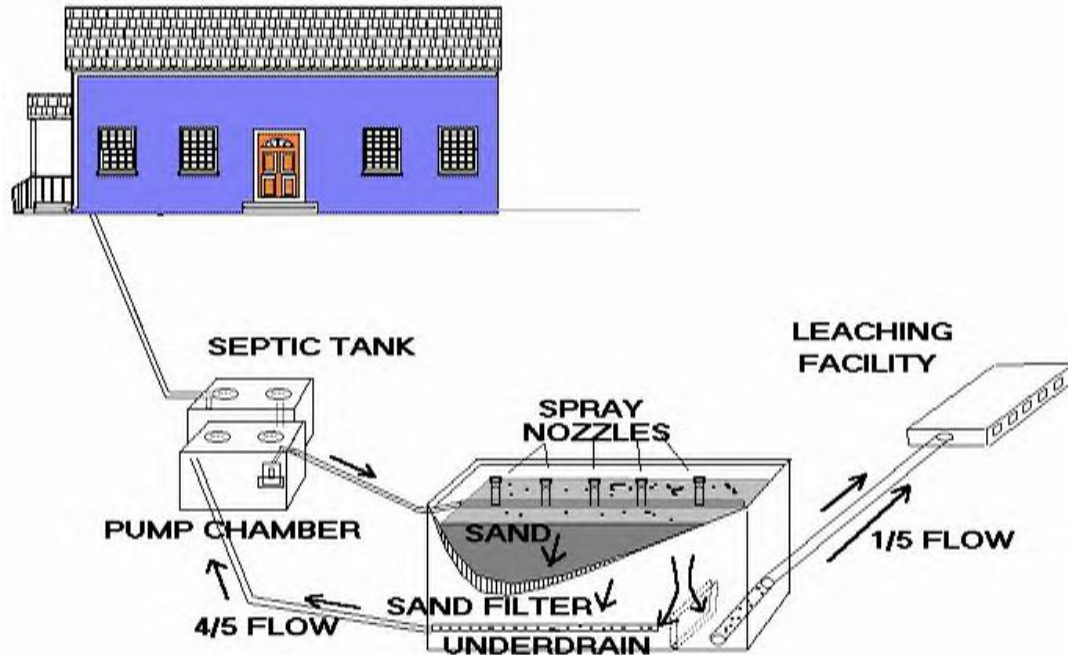


Traditional Onsite Wastewater Components in Title 5 (cont)

- ❑ Recirculating Sand Filter treatment system [202]
- ❑ Stone-and-pipe pressure distribution leach field [254]
- ❑ Humus/Composting toilets [289]
- ❑ Graywater systems [262]
- ❑ Tight tanks [260]
- ❑ Grease tank [230]
- ❑ Effluent filters [227]



Traditional Onsite Wastewater Components in Title 5 (cont)



That was (relatively) easy.....

Now we get to the hard part

Non-Traditional Onsite Wastewater Components in Title 5

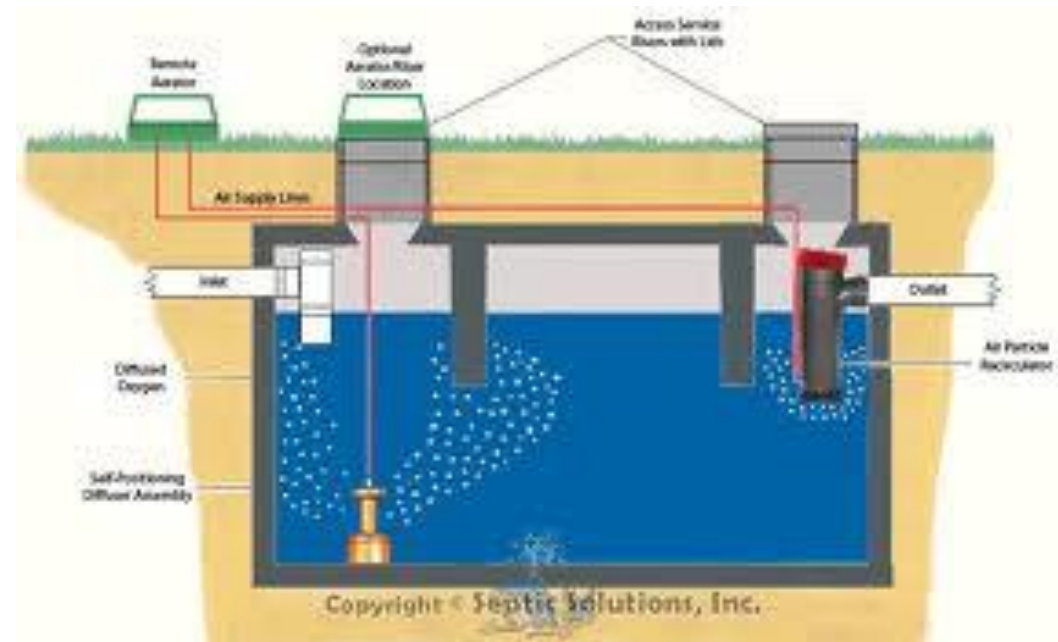
We will cover:

- What are Alternative components?
- Why are they used?
- What are the authorized Alternative components?
- How are they regulated?
- As a local health official, what should I look for?
- How much headache relief medication will I need after this talk?



Non-Traditional Onsite Wastewater Components in Title 5

- ❑ Defined in Title 5 as “Alternative Systems”
- ❑ Anything other than items previous listed



What are Alternative Components?

Any piece of equipment in an onsite wastewater system not specifically allowed in Title 5 (or the state plumbing code) which is authorized for use by DEP

- ❑ Can be a replacement of traditional components
 - i.e. plastic tank instead of a concrete tank, drip dispersal instead of pressure distribution
- ❑ Can augment traditional components
 - i.e. secondary treatment unit instead of just a septic tank
- ❑ Can be a new component that is not at all referenced in Title 5
 - i.e. Bottomless Sand Filter

Why?

Why are Alternative Components Used?

- ❑ Provide more tools in the toolbox for the designer and local health official
- ❑ Required in some situations, optional in others
- ❑ Examples where required:
 - ❑ 550 GPD new construction with well, need to reduce N load
 - ❑ Upgrade at site with <4' of natural soil
 - ❑ If impacted by new Nitrogen Sensitive Area change to Title 5



Why are Alternative Components Used? (cont)

- ❑ Examples where can be beneficial:
 - ❑ Site constraints
 - ❑ Aesthetics
 - ❑ Cost
 - ❑ Public health and environmental protection



What?

What Alternative Components are allowed?

- Plastic tanks
- Effluent filters
- Effluent pump systems
- General wastewater potency reducing systems, SAS remediation
- Secondary Treatment Units (STUs) – Regular, Specific pollutant removal
- Soil Absorption Systems (SASs) – Drip Dispersal, Alternate Aggregate, Chambers, Treatment, Restoration, Bottomless Sand Filter

What Alternative Components are allowed?

Plastic tanks

- Some standards in Title 5. Can be used by right if the tank complies
- Others have Certifications on DEP website
- General or Remedial Use



What Alternative Components are allowed?

Effluent filters

- ❑ Some standards in Title 5
- ❑ Approvals on DEP website
- ❑ General or Remedial Use



What Alternative Components are allowed?

Effluent pump systems

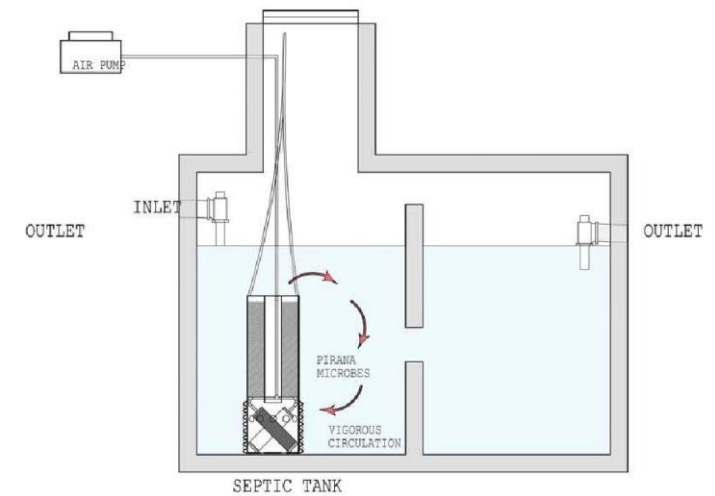
- Approvals on DEP website
- General or Remedial Use



What Alternative Components are allowed?

Wastewater potency reducing systems and SAS remediation systems

- ❑ Remedial Use – Can try reduce biomat layer as long as adequate water table separation
- ❑ General Use – Can reduce wastewater potency
- ❑ Approvals on DEP website



What Alternative Components are allowed?

Secondary Treatment Unit (STU)s

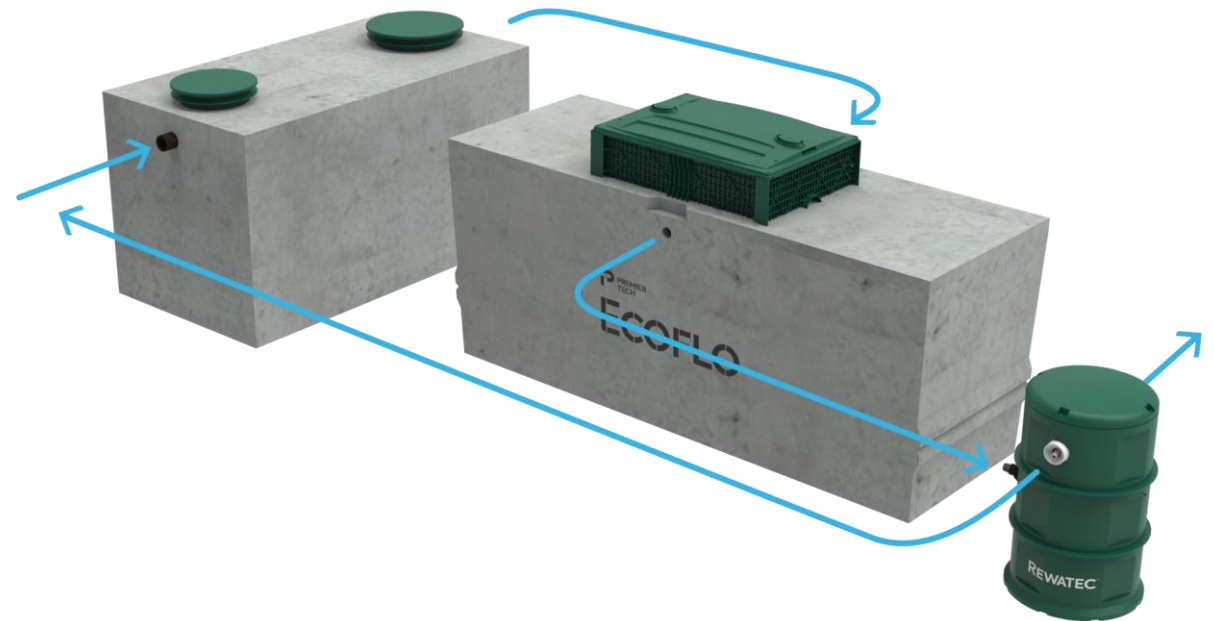
- ❑ Remedial Use – Can reduce SAS size by 50%, depth to water table by 2' and/or depth of natural soil by 2'
- ❑ General Use – Can reduce size by 50% but not to make parcel buildable if cannot hold a conventional system
- ❑ Approvals on DEP website
- ❑ Also see STU General Use and STU Remedial Use documents on DEP website



What Alternative Components are allowed?

Secondary Treatment Unit (STU)s with pollutant-specific removal capability

- ❑ Remedial Use – Demonstrated to remove pollutant of concern (usually N)
- ❑ General Use – Can load parcel more heavily due to demonstrated pollutant removal
- ❑ Piloting and provisional systems being tried
- ❑ Approvals on DEP website
- ❑ Also see STU General Use and STU Remedial Use documents on DEP website



What Alternative Components are allowed?

Soil Absorption System – Drip Dispersal

- ❑ Approvals on DEP website
- ❑ General or Remedial Use



What Alternative Components are allowed?

Soil Absorption System – Alternate Aggregate

- Approvals on DEP website
- General Use



What Alternative Components are allowed?

Soil Absorption System – Chambers

- ❑ Plastic or Concrete
- ❑ Usually a smaller footprint than standard system
- ❑ Approvals on DEP website
- ❑ General Use - Allowed to reduce size but not to make parcel buildable if cannot hold a conventional system
- ❑ Remedial Use – Allowed to reduce size



What Alternative Components are allowed?

Soil Absorption System – Treatment

- ❑ Fabric and media to provide treatment
- ❑ Approvals on DEP website
- ❑ General Use – Allowed to reduce size but not to make parcel buildable if cannot hold a conventional system
- ❑ Remedial Use – Allowed to reduce size, distance to water table and/or depth of naturally occurring soil



What Alternative Components are allowed?

Soil Absorption System – Bottomless Sand Filter (BSF)

- ❑ High loading rate soil absorption system
- ❑ Approval on DEP website
- ❑ Remedial Use – Allowed pretty much as a last resort, typically when little room for any other sized SAS



How?



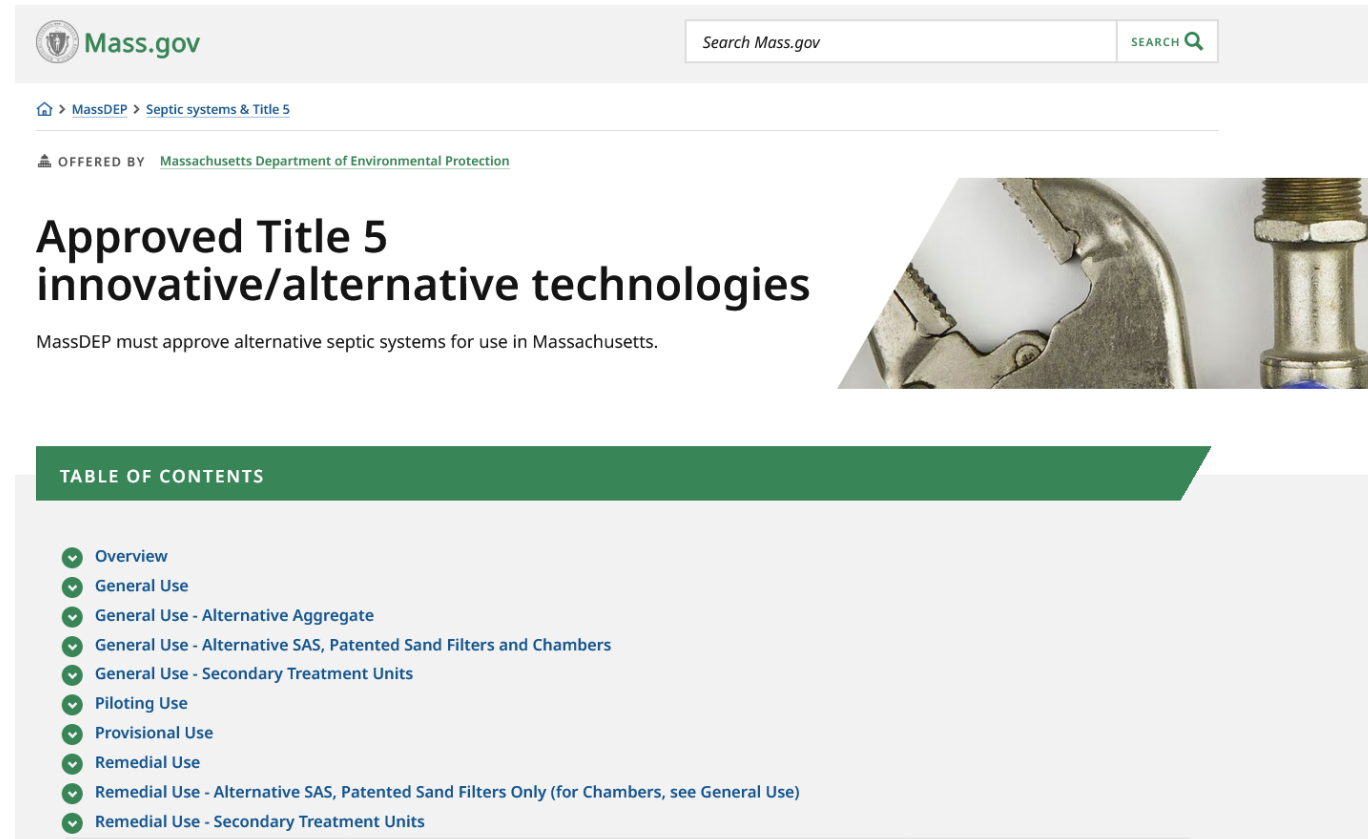
Why all this complexity?

I am just an over-worked local health officials, why do I need to deal with all this?

- ❑ Alternative onsite system components
 - ❑ Can be beneficial for the resident or property owner
 - ❑ Can be beneficial for public health and environmental protection
 - ❑ Are part of the Title 5 Code which is required to be implemented by the “Local Approving Authority” – that means you!
 - ❑ Your DEP regional office is your go-to resource for complex matters such as this when they arise

What paperwork is relevant?

- ❑ Each non-traditional component has one (or more) general regulatory documents and/or product-specific authorizations
- ❑ DEP website has all
- ❑ Some products have standards in Title 5 as well as in separate approval documents i.e. effluent filters
- ❑ Some approvals direct the reader to the manual for the product
- ❑ Not easy to understand



The screenshot shows the Mass.gov website page for 'Approved Title 5 innovative/alternative technologies'. The page header includes the Mass.gov logo, a search bar, and a breadcrumb trail: 'MassDEP > Septic systems & Title 5'. Below the header, it states 'OFFERED BY Massachusetts Department of Environmental Protection'. The main heading is 'Approved Title 5 innovative/alternative technologies', followed by the text 'MassDEP must approve alternative septic systems for use in Massachusetts.' To the right of the text is an image of a metal pipe fitting. Below the main heading is a green 'TABLE OF CONTENTS' section with a list of links, each preceded by a downward-pointing arrow icon:

- Overview
- General Use
- General Use - Alternative Aggregate
- General Use - Alternative SAS, Patented Sand Filters and Chambers
- General Use - Secondary Treatment Units
- Piloting Use
- Provisional Use
- Remedial Use
- Remedial Use - Alternative SAS, Patented Sand Filters Only (for Chambers, see General Use)
- Remedial Use - Secondary Treatment Units

What paperwork is relevant?

Key point to understand -

Is the Alternative component proposed for:

- General Use – For New Construction, if paperwork is followed. Cannot be used to make an unbuildable parcel buildable
- Remedial Use – For Upgrades, if paperwork is followed. More flexibility in usage
- Piloting or Provisional Use – Items being tested to see if suitable for use statewide

What paperwork is relevant?

Key DEP-issued paperwork to be familiar with

- ❑ Secondary Treatment Unit (STU) Standard Conditions – General Use and Remedial Use
- ❑ Soil Absorption System (SAS) Standard Conditions
- ❑ Individual product approval letters



STU General Use

- ❑ Key points:
 - ❑ New Construction (i.e. reserve area)
 - ❑ Effluent reduced to 30 mg/L BOD & TSS
 - ❑ Can reduce size of SAS by up to 50% (if show can build a full-sized SAS)
 - ❑ Designer certification
 - ❑ Owner acknowledgement
 - ❑ Installer certified to build (if required)
 - ❑ C of C special statement by designer and installer
 - ❑ Requires lifetime O&M service
 - ❑ O&M triggers for additional investigation
 - ❑ Deed notice for awareness of future owners
 - ❑ O&M reports to locals annually

Standard Conditions for Secondary Treatment Units Certified for General Use

Last Revised: March 20, 2015

A Secondary Treatment Unit (STU) is an alternative technology designed to reduce the amount of organic material and solids in sanitary wastewater. An STU may be used as a component of an on-site sewage disposal system to enhance treatment prior to discharge to the soil absorption system (SAS). For residential systems with design flows less than 2,000 gpd, certain STU's may be used as a component of an on-site sewage disposal to reduce the effective leaching area required for the SAS where soil or site conditions may make conventional soil absorption systems more costly or less desirable to construct. For residential systems with design flows less than 2,000 gpd, an STU which allows for a reduced leach field may require less land area, potentially less fill, and less disturbance of the site.

The System consists of an STU preceding a soil absorption system and, when the leaching area is reduced or the design flow is 2,000 gpd or greater, the SAS must be pressure dosed. A conventional septic tank precedes the STU unless exempt by the Special Conditions for a specific Technology.

The use of an STU in accordance with this General Use Certification requires, among other things:

- A Disclosure Notice in the Deed to the property (310 CMR 15.287(10)) (A Deed Notice template is available from the Department);
- Certifications by the Designer and the Installer (310 CMR 15.021(3));
- A Massachusetts certified operator who has received training for the technology and is under contract for periodic inspection and maintenance (310 CMR 15.287(10));
- Periodic sampling, recordkeeping, and reporting, in accordance with this Approval;
- Notification within 24 hours by the System Owner to the local approving authority of any System failure;
- When pumping is required to discharge to the SAS, 24-hour emergency wastewater storage capacity above the elevation of the high level alarm;
- System Owner Acknowledgement of Responsibilities, in accordance with this Approval.



STU Remedial Use

- Key points:
 - Upgrade (i.e. no reserve area)
 - Effluent reduced to 30 mg/L BOD & TSS
 - May allow 50% size of SAS, 2' water table reduction and/or 2' natural soil reduction
 - Best Feasible Upgrade to be shown
 - Designer certification
 - Owner acknowledgement
 - Installer certified to build
 - C of C special statement by designer and installer
 - Requires lifetime O&M service
 - O&M triggers for additional investigation
 - Deed notice for awareness of future owners
 - O&M reports to locals annually

Standard Conditions for Secondary Treatment Units Approved for Remedial Use

Last Revision Date: November 30, 2016

A Secondary Treatment Unit (STU) is an alternative technology that may be used as a component of an on-site sewage disposal system where soil or site conditions make conventional soil absorption systems more costly to construct or infeasible. A conventional system may be more costly to construct or infeasible where there is a shallow water table and/or limited area for the siting of a conventional system. As compared to a conventional system, in certain instances, an STU provides for higher loading rates (smaller leaching area) and may require less land area, potentially less fill, and less disturbance of the site.

The System consists of an STU designed to reduce the organic material and solids in the wastewater which reduces the demand for treatment in the soil absorption system. A conventional septic tank precedes the STU unless exempt by the Special Conditions for a specific Technology.

The use of an STU in accordance with this Approval for Remedial Use requires, among other things:

- A Disclosure Notice in the Deed to the property (310 CMR 15.287(10)) (A Deed Notice template is available from the Department);
- Certifications by the Designer and the Installer (310 CMR 15.021(3));
- A Massachusetts certified operator who has received training for the technology and is under contract for periodic inspection and maintenance (310 CMR 15.287(10));
- Periodic sampling, recordkeeping, and reporting, in accordance with this Approval;
- Notification within 24 hours by the System Owner to the local approving authority of any System failure;
- When pumping is required to discharge to the SAS, 24-hour emergency wastewater storage capacity above the elevation of the high level alarm; and
- System Owner Acknowledgement of Responsibilities, in accordance with this Approval.



Alternative SAS

□ Key points:

- Some are Disposal only
- Some are Treatment with Disposal
- Often has a smaller footprint

- For new construction need to show conventional primary and reserve area, need to have min 400 sq. ft.

- For upgrade need to show best feasible replacement, 400 sq. ft. if possible, no LUA for additional footprint reduction
- Upgrade using Treatment with Disposal can reduce distance to water table or depth of natural soil by 2'

Standard Conditions for Alternative Soil Absorption Systems with General Use Certification and/or Approved for Remedial Use

Revised: March 5, 2018

These Standard Conditions apply to Alternative Soil Absorption System (Alt. SAS) technologies for disposal-only as well as for technologies providing both treatment and disposal. Currently these approved alternative technologies include the following,

Alt. SAS Disposal-Only,

- **Contactor, Field Drain Contactor, and Recharger Chambers**, by Cultec, Inc.
- **Biodiffuser & ARC Chambers**, by Infiltrator Systems, Inc.
- **Infiltrator Chambers**, by Infiltrator Systems, Inc.
- **Eljen Mantis M5**, by Eljen Corp.

Alt. SAS Treatment with Disposal - Patented Sand Filters,

- **Eljen GSF Geotextile Sand Filter System**, by Eljen Corp.
- **Enviro-Septic Wastewater Treatment System**, by Presby Environmental, Inc.
- **Advanced Enviro-Septic System**, by Presby Environmental, Inc.
- **Simple-Septic Wastewater Treatment System**, by Presby Environmental, Inc.
- **Infiltrator ATL system**, by Infiltrator Systems, Inc.
- **GeoMat Leaching System**, by Geomatrix Systems, LLC.

An alternative SAS may be appropriate for new construction, increases in flow, or for the upgrade of an existing failing, failed, or nonconforming system where reducing the disturbance of the site is desired.

Alternative Disposal-Only technologies approved by the Department may be substituted for conventional SAS's allowed under Title 5. The alternative Chamber technologies, when compared to conventional Title 5 chambers, provide options from some of the Title 5 requirements such as offering plastic instead of concrete chambers and eliminating the need for stone aggregate around the chamber while allowing higher loading rates and reduced effective leaching area. Other options include Chambers installed with aggregate meeting the requirements of Title 5, however Alternative Chambers used with aggregate are not allowed higher loading rates which must remain the same as required by Title 5 for conventional chambers with aggregate. In addition to alternative Chambers,

Alternative SAS

- ❑ Key points (cont):
 - ❑ Designer certification
 - ❑ Owner acknowledgement
 - ❑ Installer certified to build (if required)
 - ❑ C of C special statement by designer and installer
 - ❑ Deed notice for future owners needed (for upgrades only)
 - ❑ Not demonstrated to DEP that equal to conventional system, so must connect to sanitary sewer if becomes available
 - ❑ Additional items are to be documented during a System Inspection

Example Product Approval Letter

Key points in Certification:

- Explains the components
- Lists model numbers
- Describes pollution removal features
- Describes where can and cannot be used
- Reminder that this product requires:
 - Deed notice
 - Designer certification
 - Owner acknowledgement of responsibilities
 - System O&M
 - Service reports due by Feb 15 to locals



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

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Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

CERTIFICATION FOR GENERAL USE Pursuant to Title 5, 310 CMR 15.000

Name and Address of Applicant:

Orengo System, Inc.
814 Airway Ave.
Sutherlin, OR 97479

Trade name of technology and models: Advantex Wastewater Treatment System Models AX20, AX20RT, AX25RT and AX100 (all hereinafter the "System" or the "Technology") for facilities with design flows less than 2,000 gallons per day (GPD). Schematic drawings illustrating each of the models and an Inspection Checklist are attached and are part of this Certification.

Transmittal Number: X280570
Date of Issuance: October 25, 2018; modified February 7, 2019 (numbering correction only)

Authority for Issuance

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental Protection (hereinafter "the Department") hereby issues this General Use Approval to: Orengo System, Inc., 814 Airway Ave., Sutherlin, OR 97479 (hereinafter "the Company"), approving the above referenced Advantex Wastewater Treatment System (herein after "the Technology" or "System") for use in the Commonwealth of Massachusetts. Sale and use of the Technology are subject to compliance by the Company, the Designer, the System Installer, the Operator, and the System Owner with the terms and conditions herein. Any noncompliance with the terms or conditions of this Certification constitutes a violation of 310 CMR 15.000

/signed/

Marybeth Chubb, Section Chief
Bureau of Water Resources
Wastewater Management Program

February 7, 2019
Date

This information is available in alternate format. Call Michelle Waters-Ekanem, Diversity Director, at 617-292-5751. TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

Printed on Recycled Paper

Closure



What should I be looking for?

Plan/DSCP stage –

- Designer should provide you with the relevant approvals. This makes it easy for you to review and hopefully assures they have read and applied them correctly
- Review relevant DEP documents
- Require designer endorsement, owner acknowledgement, deed notice, O&M agreement, and/or installer training as might be required
- Require “proof plan” and/or Best Feasible Upgrade to be shown as might be required
- Recommend not to issue DSCP until O&M agreement and deed notice are in place (if needed)
- Large and/or non-residential wastewater flow can require involvement from product company

What should I be looking for?

Construction stage –

- Brand and model is as specified by designer
- Do not issue C of C until deed notice and O&M agreement is on file, if needed

What should I be looking for?

Post-Construction stage –

- ❑ Do not issue C of C until deed notice and O&M agreement is on file, if needed. Special certification of compliance by designer and installer might also be needed
- ❑ Possibly develop a system to track systems which need O&M, assure this is being completed
- ❑ Some components have enhanced System Inspection requirements, note this in file for the property

Questions?

Daniel Ottenheimer, R.S., P.E.