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IA \(\neq \)AI



Conventional System



Epa.gov

Please note: Septic systems vary. Diagram is not to scale.



IA – Innovative Alternative Systems

Most common – Secondary Treatment Device

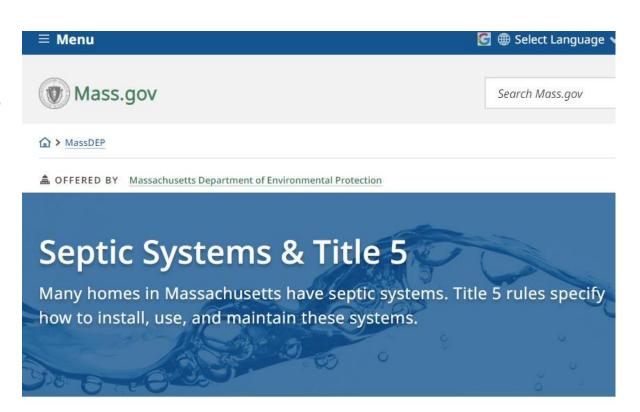
Works in tandem with a conventional system

Or, advanced components for primary, secondary, & tertiary units





Mass.gov



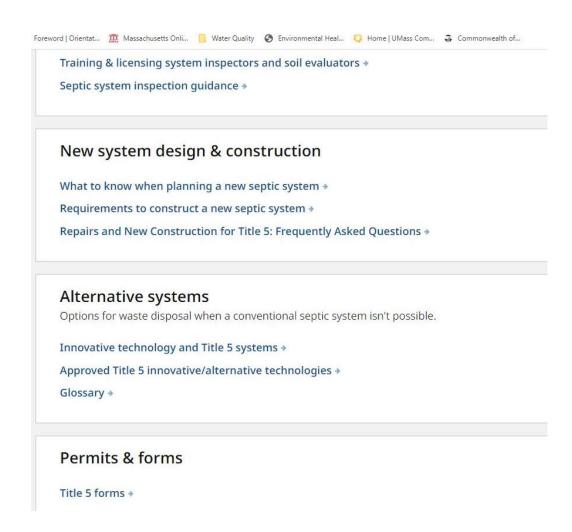
Learn how to care for your septic system, get it inspected, and more.

First time? Start here.

GUIDE: Buying or **Selling Property**



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Overview

Under the Title 5 Regulations (310 CMR 15.000), MassDEP must approve an innovative/alternative septic-system technology before it can be used in Massachusetts. There are 4 categories of approval:

- **General Use** systems will provide a level of environmental protection at least equivalent to that of a conventional on-site system designed in accordance with Title 5.
- **Piloting** is intended to provide field-testing and technical demonstration to determine if the technology can or cannot function effectively.
- Provisional Use approval is intended for evaluation of alternative systems that appear
 technically capable of providing levels of protection at least equivalent to those of a
 standard on-site disposal system.
- Remedial Use systems improve existing conditions at a particular facility or facilities served by a failed, failing, or nonconforming system.

Please note that MassDEP approval does not constitute an endorsement of any specific technology.

In each case, the system owner must follow the inspection and testing schedule required by the approval. Contact the manufacturers listed for schematics of these technologies.

In addition to the approval categories listed above, Title 5 also allows the use of **effluent tee filters** at the outlet of the septic tank in lieu of an outlet tee.



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Approved Title 5 innovative/alternative technologies

MassDEP must approve alternative septic systems for use in Massachusetts.

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- 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



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- General use
- Remedial use
- Nitrogen removal credits

MassDEP's Technology Approval Process for I/A Systems

Remedial Use Approval: MassDEP also approves I/A technologies for Remedial Use to improve conditions at existing sites served by a failing, failed, or nonconforming system.

Technology approvals for Remedial Use often include criteria under which a technology can be used, in order to allow one or more of the following:

- · Reduction in the size of a soil absorption system,
- · Reduction in the distance to groundwater, or
- Reduction in the required depth of naturally-occurring pervious soils.

If designed in compliance with the applicable MassDEP approval letter for the technology, I/A systems proposed for Remedial Use do not require MassDEP approval. As with an application for a conventional Title 5 system, the local Board of Health must approve an alternative system before installation and issue a Disposal System Construction Permit.

Nitrogen Removal Credits: Many systems, as part of their approval process, apply to MassDEP for Nitrogen Removal Credits. Title 5 restricts design flow to 440 gpd per acre in areas designated as "nitrogen sensitive." These include:

- The Zone II of public water supply wells
- · New residential construction served by both private wells and on-site systems,
- Other areas formally designated as nitrogen sensitive.

Some I/A technologies are specifically designed to remove nitrogen from wastewater, and many of these systems seek a nitrogen removal credit, which allows the property owner to increase the design flow per acre, usually to either 550 or 660 and per acre from the



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Remedial Use

- Secondary Treatment Devices
- Alternate SAS's

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Technology Chart

Technology	Model(s)	Company	Technology Description	Approved Use & Approval Date	
Singulair Bio-Kinetic Wastewater Treatment System	Singulair 960 DN, model 600, 750, 1000, and 1500. Singulair 960 DN Green, model 600	NORWECO, Inc. 220 Republic Street Norwalk, OH 44857	Secondary Treatment Unit (STU) and Nitrogen reduction Enhanced Three compartment tank with a pretreatment chamber, aerobic chamber, and settling/filtration chamber with Bio- Kinetic filter unit. TNT models remove nitrogen using timed aerobic and anaerobic periods in the second chamber. Installed between building sewer and SAS	Nitrogen reduction BOD <30 mg/L; TSS <30 mg/L; pH 6-9 For flow <2,000 GPD. Subject to Nitrogen Loading 660 GPD/acre w/TN <19mg/l. 550 GPD/acre w/ TN <25 mg/l Approval: January 3, 2019	
Sludgehammer	Sludgehammer ABG, models S-46 and S- 86	Sludgehammer Group Ltd 336 Division Road Petoskey, MI 49770	SAS Aeration with Bacterial Augmentation	To enhance and maintain performance of properly functioning SAS where conventional system with reserve area exists or can be buil on-site in full compliance with T5. No SAS size reduction. Flow <2,000 GPD Approval: April 2, 2015	
Smith & Loveless	Modular EAST	Smith & Loveless, Inc.	Secondary Treatment Unit:	Effluent: BOD5 = 30mg/L TSS=30 mg/L; pH:6-9 50% reduction in	



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Secondary Treatment Units –

- Standard Conditions
- For Remedial Use

Remedial Use - Alternative SAS, Patented Sand Filters Only (for Chambers, see Gen...

Remedial Use - Secondary Treatment Units

Standard Conditions for Secondary Treatment Units Approved for Remedial Use

These conditions for Secondary Treatment Units Approved for Remedial Use
These conditions apply only to the approvals listed below. Please be advised that if
designed in accordance with these conditions, MassDEP approval is no longer
required. Revised November 28, 2016 to remove the requirement to pressuredistribute the effluent after secondary treatment.

AdvanTex Treatment Systems AX-15, AX-20, AX-100 and AX-RT by Orenco Systems, Inc.

- AdvanTex Treatment System by Orenco Systems, Inc. Remedial Use Approval
- AX20 Treatment System Technology Inspection Checklist
- AX100 Treatment System Technology Inspection Checklist
- AX-RT Treatment System Technology Inspection Checklist

Amphidrome by F.R. Mahony & Associates, Inc.

- Amphidrome by FR Mahony Remedial Use Approval
- Amphidrome Treatment System Single Family Unit Technology Inspection
 Checklist



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Standard Conditions Letter

Remedial Use - Alternative SAS, Patented Sand Filters Only (for Chambers, see Gen...

Remedial Use - Secondary Treatment Units

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Charles D. Baker Governor

Karyn E. Polito Lieutenant Governor Matthew A. Beaton Secretary

> Martin Suuberg Commissioner

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Standard Conditions Letter

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



Review

Technology Approval Letter

- 1. General or Remedial
- 2. Alternate Soil Absorption Systems or Secondary Treatment Units
- 3. Approval up to date
- 4. Additional
 - 1. Installation Instructions
 - 2. Illustration
 - 3. Operation & Maintenance Checklist





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Approval Letters

RENEWAL OF APPROVAL FOR REMEDIAL USE

Pursuant to Title, 310 CMR 15.000

Name and Address of Applicant:

SepTech/Pirana System 1875 Joy Road Occidental, CA 95465

Trade name of technology: Pirana System (hereinafter called the "System"). Schematic drawings of a typical System and technology checklist are attached and are a part of this Approval.

Transmittal Number X281365

Renewal Date: October 10, 2018 (previous modified Sept. 22, 2011)

Authority for Issuance

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental Protection hereby issues this Remedial Use Approval for SepTech/Pirana System, 1875 Joy Road, Occidental, CA 95465 (hereinafter "the Company"), approving the System described herein for Remedial Use in the Commonwealth of Massachusetts. Sale and use of the System are conditioned on compliance by the Company, Designer, Installer, Service Contractor (or 'Operator'), and the System owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

/signed/



Standard Conditions Letter

Review

Standard Conditions Letter

- 1. General or Remedial
- 2. Alternate Soil Absorption Systems or Secondary Treatment Units



Standard Conditions Letter

Discusses Operational Details

- 1. Disclosures, deed notices, certifications
- 2. Contract with an O & M provider
- 3. Requirements for sampling, reporting
- 4. Notice of failure
- 5. Pumping above the high-level alarm
- 6. System Owner acknowledgements



Technology Approval Letter

Discusses Technical Details

- 1. Specific to the technology, i.e. soils, spacing, horizon location
- 2. Operational details, i.e. Timed dosing, backwashing cycle
- 3. Installation details
- 4. Conditions applicable to owner
- 5. Conditions application to company



Proprietary vs. Generic Approvals

1. Proprietary = Technology specific

2. Generic

- 1. Bottomless Sand Filters (RI DEM)
- 2. Recirculating Sand Filters
- 3. Composting Toilets



Various secondary treatment units with pressure distribution SAS final dispersal

Numerous approved I/A secondary treatment units

- Advantex, Amphidrome, Bioclere, Busse-MA, Clean Solution, FujiClean, Hoot, JetBat, Low-Rate ISF, MicroFAST, ModularFAST, Perc-Rite, Puraflow, SeptiTech, Singulair **BioKinetic**
- Restoration Aerobic recovery system, SepTech Pirana, Soilair, Sludgehammer
- Both Perc-Rite

2. Alternate SASs

- Eljen, GeoMat, Presby, Simple-Septic Wastewater System
- Both Perc-Rite



Remedial Use vs Local Upgrade Approval

1. Allowable to combine, but not stack major "variance" requests

2. At the Board of Health's discretion

- 1. Certain criteria requires a hearing
- 2. Use the "variance" request framework



Plan Review & Document Submittal

- 1. Compliance with 310 CMR 15.000
- 2. Technology approval letter details
- 3. Standard Conditions letter requirements
- 4. Write a letter of review, citing deficiencies, state the date of submittal,
- 5. Document in tracking database



Plan Review Tracking

ú	A	В	С	D	E	F	G	н	1	J	K	L
1		Septic										
2	DtRecd	Applicant	Location	M/L	N,U,R,A	Permit #	PercDt	DenyDt	AppvIDt	Engineer	Installer	Comments
3	12/1/2007	Paul Gallup	268 Cedar St	11/268	U	103U	10/30/07	12/17/2007	12/20/2007	Black Hills Engine	eering	
5	12/17/2007								12/27/2007			LUA 25% reduction
6												
8	8/20/2007	Mark Clousse	45 Wallace Rd	38/45	υ		8/30/07		10/22/2007	Black Hills Engine	eering	Approval Greg Morff



Letter sample

Permitting and Construction Requirements per the design plan and Board of Health:

- Licensed installer obtains permit from Board of Health office; and
- Licensed installer supplies certification for Presby training to Board of Health office; and
- All Title 5 fill material, is subject to an in-situ sieve test; and
- All Presby C-33 fill, with less than 2% fines passing a #200 sieve, is subject to a sieve test; and
- Construction inspections shall be arranged by the installer with a 48-hr Notice and appointment set with the Board of Health Agent; and
- All terms of Title 5 shall be followed whether it is noted on the plan or not; and
- No elbows allowed in the Building Sewer with an angle greater than 22-degrees or Clean-out at angle; and (the Board of Health Agent recommended that the plumbing be changed so that there is no angle – if at all possible).
- Any manholes/risers to grade must have locking covers and be secured; and



Installation Inspection & Details

- 1. Fill requirements,
- 2. Elevation & cover requirements
- 3. SAS gravity feed w D-Box, or
- 4. SAS pressure distribution
- 5. Pumps, floats, alarms
- 6. Control panels



Installation SAS inspection

- 1. Clear water test
- 2. Pump/alarm operation
- 3. D-Box connections, if applicable
- 4. Unit operation
- 5. Pressure, squirt height
- 6. Bedding, cover, slope requirements



Installation Inspection con't.

Pump Inspection





Installation SAS inspection

1. Alternative SAS requirements

2. Pressure distribution

- 1. Manifold
- 2. Laterals
- 3. Elevation
- 4. Orifice direction, covers
- 5. Distal pressure
- 6. Equal pressure, inspecting, cleaning



Installation inspection, orifice shields





Installation inspection, shields





Pressure Distribution

Distal Pressure test and Landscape covers





Pressure Distribution

Squirt test – No more than 10% variation, distal end





Pressure Distribution

Modify distal ends for squirt height





Installation SAS inspection - PD

	☐ Check Float C	peration					
	ŶOK	°Failure	ŶR	Replaced			
	☐ Check Pump (Operation					
	OK	Failure	□ R	eplaced			
Soil Ab	sorption System	(pressure distribu	tion lines)				
	Brush Laterals						
	☐ Flush Laterals						
	☐ Measure Squis ☐ OK/Failure:	rt Height (distal)	ft				
	Valve & valv	e box: ok/replaced	÷		Comme	ent:	
		32,05			100	85	
Comme	ents:						
West 9	ents:	Contract	or:			Date:	-772
Site: Reference Datum:	ents:	Contract				Date:	
Site:	ents:	N-201 - 2027				787000	200
Site: Reference Datum:	#1 #2	Elevation		#5	#6	787000	#8
Site: Reference Datum: Pod ID		Elevation	1:	#5	#6	HI:	#8
Site: Reference Datum: Pod ID Lateral ID		Elevation	1:	#5	#6	HI:	#8
Site: Reference Datum: Pod ID Lateral ID Length(ft)		Elevation	1:	#5	#6	HI:	#8
Site: Reference Datum: Pod ID Lateral ID Length(ft) Lateral elevation		Elevation	1:	#5	#6	HI:	#8



Installation Documentation

- 1. Sand Fill certification (T5 vs. c-33, or other)
- 2. Aggregate certification
- 3. Impervious barrier specifications
- 4. Electrician
- 5. Take measurements, elevations
- 6. Record the PD squirt height
- 7. Photograph all features before backfill
- 8. Ask the designer to explain the process



Photograph installation components, etc.

- 1. Overall conditions
- 2. Orientation of components





Once backfilled...MHs look all the same







As-Built submittal

- 1. As-Built reflects any approved minor differences
- 2. As-Built shows distances ("swing ties")
- 3. As-Built is submitted with an updated Operations Manual
 - 1. Time-dosed or
 - On-Demand
 - 3. Alarm events, visual, audio, telemetric? PD Baseline
- 4. Name & phone number of O&M contractor
- 5. Evidence of recorded documents at Registry of Deeds ('being clause" property reference)



O & M Follow-up

- 1. Ensure a current O & M contract, renewable w/term
- 2. Name, address, phone number for O & M contractor
- 3. Contract states regular visits, testing type and frequency, and emergency on-call visits
- 4. Receipt of routine/event inspection report
- 5. Track minimum visits are done, with reports received (Remedial by January 31st)



DEP O & M form



Massachusetts Department of Environmental Protection Bureau of Resource Protection - Title 5

DEP Approved Inspection and O&M Form for Title 5 I/A **Treatment and Disposal Systems**

. Field	Testing				
Field Insp	pection:				
Color:	gray	□ brown	clear	turbid	
	Other (sp	ecify):			
Odor:	musty	earthy	moldy	offensive turbid	
Effluent 9	Solids: 🔲 n	o 🔲 some			
pH	SU Sto 9	DO 2 or gre	mg/L ater Turb	idity NTU	
	Remedial or Ge dard Methods an	neral Use syster	m fail the Field T	esting, effluent samples shall be	collected
. Sampl	ing Informa	ation			
Samples	Taken: 🔲 Ir	nfluent 🔲 E	Effluent		
	cial systems or s reducing system		esign flow of 200	00 gpd and greater, and General	Use
			gpd		
Paramete	ers sampled: 🔲	рН 🔲 BOD 🔲 (CBOD 🗖 TSS	TN Other (list below)	
				Fra 7	DG



As-Built Package for Homeowners

- 1. CoC
- 2. Letter of approval with conditions
- **Photos**
- 4. Pertinent documents, O&M, etc.

A Guide to Your Septic System

Read and follow the Dos and Don'ts list provided herein:

DO

Conserve water to reduce the amount of wastewater that must be treated and disposed. Repair leaking faucets and tailets promptly.

Only discharge biodegradable wastes into

Divert down spouts and other surface water away from your soil treatment area

Keep your septic tank cover accessible for tank inspections and pumping.

Have your effluent screen inspected and cleaned Have your septic tank pumped regularly

inspected for leaks and cracks.

Call a professional when you have problems. Compost your parbage or put it in the trash

instead of putting it down the sink. Make sure any water conditioning or softening

equipment is approved for use with your system and that it is properly set for your water conditioning/softening needs and operating correctly.

Flush sanitary napkins, tampons, disposable dinners condoms wines cot litter and such products into your system.

Dump solvents, oils, paints, thinners, disinfectants, pesticides or poisons down the drain; these can disrupt the treatment process and contaminate

Dig in your soil treatment area or build anything over it.

Plant anything over your soil treatment area

Drive over your soil treatment area or compact the soil in any way.

Use a garbage disposal unless your septic tank was sized to handle the required sludge storage

SAFETY FIRST!

NEVER physically enter a septic tank or other parts of the treatment system. Call your service

Keep access areas locked at all times to prevent unauthorized entry

Your Local Service Provider is:





NoWRA Homeowner's Onsite System Guide and Record Keeping Folder

This folder provides you with essential information about your oratile wastewater treatment system and guidelines for operation and maintenance to keep your system working effectively and trouble-free willia protecting water quality and the sentimenter. If the provides a place to keep of documents, records and other informations about your provides and the sentiments. water freatment system including your permit, site drawings, records of maintenance and repairs performed

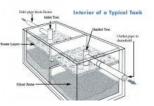
Syste	m Permit:				
Issued	to:		Da	te Issued:	
Addres	s				
Legal I	Description:				
Syste	m Description:				
Design	Flow (gpd) or Number of	Bedrooms:			
Septic	Tank volume (gallons):	- 33	Number of C	Compartments:	
Dosing	Tank or Pump Comparts	nent capacity (gallons)		
Tank(s	Manufacturer(s):				
Advan	ced pretreatment Device:	□ Yes □ No Bras	d		
	m Accessories: Effluent screen Pump or siphon Other	☐ Distribution	box or Drop box	Control Panel with audible visible plann	
Disper	rsal Method:				
☐ Trenches or bed (and number):			Type of dispersal media (e.g., rock/gravel, fabric wrapped pipe, chambers, polystyrene socks, etc.)		
000	Drip Dispersal Spray Irrigation Other	☐ At-Grade ☐ Mound		☐ Lagoon ☐ Discharge to lake/river	
Disper					
Insta	llation Contractor				
				phone	
Servi	ce Provider:			-2101-2-2	
	fress:				
Tele	ephone:			Service Contract: Yes N	
Pum	per:				
Add	Iress:				
	200				

YOUR ONSITE WASTEWATER TREATMENT SYS

You are the owner (and operator!) of an ensite westewe treatment system that is designed to be environmentally safe and to protect public health. A properly installed an aparated system treats wastewater from your home and returns it to the groundwater. Secassfully used for over 100 years, nearly one-fourth of the United States population uses this method of wastewater treatment.

SYSTEM DESCRIPTION

The first component in the system is a septic tank that uses natural processes to treat the westowater generated area (also called a drainfield) where the wastewater i dispersed back into the groundwater after it is treated



THE SOIL TREATMENT AREA

vides final treatment of the wastewater and returns the treated water to the groundwater. The total area required for adequate soil treatment is determined by the expected peak flow of westewater from the home and the characteristics of the sail in the treatment area. The sail treatone larger bed, and is typically kept at a shallow death. The sail treatment area must be constructed in permeable soils and be two or more feet above the seasonal high groundwater table. While there are many types of soil tment area systems the following describes a typical washed rock trench system.

area by gravity or is desed by pump or siphon. The effluent enters the soil and is treated as it percelates to the groundwater. The sail acts as biological filter to remove any remaining harmful substances including diseasecausing becteria and other undesirable wastewater constituents in the soptic tank efficient.

can be used. This includes at-prodes, mounds or drip distribution. There are also other trench media that can be used in place of the washed rock. If you have any of these alternatives contact your local service provider or NOWRA



BoH O & M Follow-up

- 1. Enter data into a database*
- 2. Track routine inspections & alarm events
- 3. Ensure minimum visits are done, with reports received (Remedial by January 31st)
- 4. Follow-up deficiencies with calls to O & M provider
- 5. Email or letters to owner

*Barnstable County database, masstc.org



Yankee On-site Wastewater Association

https://www.yankeeonsite.org/membership/

QUESTIONS & ANSWERS

