I/A TECHNOLOGIES: Standard to Nitrogen Reducing

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MassDEP/MHOA 2024 Spring Seminars

Devens, Holyoke and Virtual

Agenda

- I/A technologies and MassDEP's approval process
- Overview of the various approval types
- Focus in on Nitrogen Reduction Technologies
- Reports: what to look for
- Follow-up and Questions

DISCLAIMER

This presentation represents the requirements of 310 CMR 15.000, Title 5 of the State Environmental Code, and is for educational and informational purposes only. Please note that municipalities may have regulations that are more restrictive than Title 5.

Any reference to a proprietary technology in the presentation or in answer to a question is solely for illustration and does not constitute an endorsement of or comment upon said technology by the presenter or MassDEP.

I/A Technologies and MassDEP's Approval Process

Types of I/A Technologies

- Restorative Treatment Processes
- Drip Dispersal Systems
- Patented Sand Filter SASs
- Bottomless Sand Filter
- Secondary Treatment Units (STUs)
- Nutrient Reducing
- Miscellaneous:
  - Septic tanks
  - Alternative aggregate
  - Effluent tee filters

Types of MassDEP I/A Approvals: Technology

Piloting Use Approval

Provisional Use Approval

General Use Approval

Remedial Use Approval

Piloting Use Approval: I/A Technology

- Applicant (tech co.) wants to demonstrate what the technology can do
- Limited data on technology or on technology in this climate
- 15 installations statewide limit
- Each and every site installation requires MassDEP approval
- Monthly monitoring and reporting
- With successful piloting, may apply for Provisional Use Approval

Piloting Use Approval: Site-Specific

- ❑ May be issued even without the technology having a Piloting Use Approval for what is requested at the specific site
- ❑ BOH is required prior to submittal to MassDEP
- ❑ MassDEP review and site approval is required

Provisional Use Approval

- In situ performance evaluation of the technology
- More data (than piloting) is available
- Often trying to confirm reliability
- Stepped monitoring: monthly to start and quarterly thereafter
- Installation of at least 50 units statewide
- 3 years of monitoring
- With successful provisional installations, may apply for General Use Approval
- Considered the “real” demonstration of system performance in MA – that’s why it takes a while!

General Use Approval

- Proven technology
- May be installed wherever a conventional Title 5 system can
- No limit/minimum on number of installations
- Various approvals types:
  - Fully specific for technology
  - Alternative SAS/sand filter/chamber with Standard Conditions
  - STU with Standard Conditions

Remedial Use Approval

- Can be approved with 12 months of data with similar climate conditions
- Unlimited number of installations statewide
- Three major categories of RUAs:
  - Individual;
  - Alternative SASs, Patented Sand Filters and Chambers; and
  - Secondary Treatment Units (STUs)
- Reductions in design criteria are permitted and may include:
  - Naturally occurring pervious material
  - Groundwater separation
  - SAS area
- Permitted for repairs only with no increase in flow

Alternative SASs and Secondary Treatment Units

- These RUA groupings have standard conditions
- Those for STUs are extensive and include:
  - Identification/maintenance of MFU option/area;
  - Extensive submittals accompanying DSCP application;
  - Numerous other requirements
- Those for Alternative SASs distinguish between:
  - Disposal only, including chambers; and
  - Disposal with treatment (patented sand filters)

Nitrogen Reducing Technologies

Piloting Use Approval

Provisional Use Approval

General Use Approval

Piloting Use Approved Nitrogen-Reducing Technologies

Bio Barrier MBR WWT System

Jet JC-1500 CF WWT System

RUCK CFT

Piloting Use Approval Monitoring 1

Year-Round Facility

Inspected first 12 months – monthly
I/E: pH, BOD5, TSS and TN
Thereafter – quarterly
E: pH, BOD5, TSS and TN
After at least 6 sampling quarters – quarterly
E: TN
Field tested: pH, turbidity, settleable solids and color
Non-residential must also monitor at least 4 quarters:
I: pH, BOD5, TSS and TN

Seasonal Facility

Inspected at least twice per year, once 30-60 days after occupancy and the second no less than 2 months after the first or just prior to seasonal end-of-use
I/E: pH, BOD5, TSS and TN
After at least 6 samples
E: TN
Field tested: pH, turbidity, settleable solids and color

Piloting Use Approval Monitoring 2

After at least 18 months and completion of the Performance Evaluation of the system showing it is in compliance with Title 5, effluent limits, and performance goals and conditions of the Approval for at least the previous 12 months, then:

Year-Round Facility

Inspected twice annually and at least 5 months apart (1 sample take between Dec 1 and Mar 1 of each year)

E: TN

Seasonal Facility

Inspected at least twice per year, once 30-60 days after occupancy and the second no less than 2 months after the first or just prior to seasonal end-of-use

E: TN

Piloting Use monitoring requirements for N-reducing I/As are confusing.

But there is good news....

Results are reported to local BOH and to MassDEP through the Barnstable County Septic Management Program's IA Tracking Database:

https://septic.barnstablecountyhealth.org

Provisional Use Approved Nitrogen-Reducing Technologies

Advantex

Amphidrome

Bioclere for flows less than 2,000 gpd

FAST

Fuji Clean (900 gpd max)

Mod FAST

Septitech STAAR

Nitrex

NITORE

Provisional Use Approval Monitoring 1

Systems with Design Flows Less than 2,000 GPD

Year-Round Facility

- Inspected – quarterly; E: pH, BOD5, TSS and TN
- After 12 rounds of sampling, may be reduced to TN only quarterly
- After the 3-yr Performance Evaluation period, inspected at least twice per year, at least 5 months apart with one sample taken between Dec 1 and Mar 1; E: TN (minimum)

Seasonal Facility

- Inspected at least twice per year, once 30-60 days after occupancy and the second no less than 2 months after the first or just prior to seasonal end-of-use; E: pH, BOD5, TSS and TN
- After the 3-yr Performance Evaluation period, inspected at least twice per year, at least 1 sample shall be taken 30-60 days after each seasonal occupancy. 2nd sample must be taken no later than 2 months after the first; E: TN (minimum)

Provisional Use Approval Monitoring 2

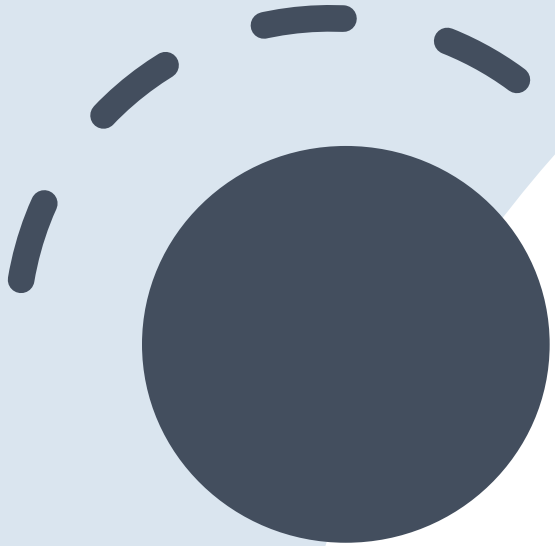
Systems with Design Flows 2,000 GPD to less than 10,000 GPD
In Nitrogen Sensitive Areas

Year-Round Facility

- Inspected – monthly for 36 months and quarterly thereafter; E: pH, BOD5, TSS and TN
- Influent monitored quarterly for at least 12 quarters: pH, BOD5, TSS and TN
- After the Performance Evaluation period, inspected at least twice per year, at least once quarterly, at least 2 months

Seasonal Facility

- Inspected and sampled monthly only when occupied.
- After the Performance Evaluation period, inspected at least twice per year. At least 1 sample shall be taken 30-60 days after occupancy. A second sample must be taken no later than 2 months after the first; E: TN (minimum)



Provisional Use monitoring requirements for N-reducing I/As are a bit less confusing. However, the approval did not include submittal of results to Barnstable County.

Luckily MassDEP issued a supplemental letter to all users of Provisional Use I/A units requiring submittal of monitoring results to the Barnstable County database.

General Use Approved Nitrogen-Reducing Technologies

Recirculating Sand Filters - Generic (25 mg/L TN) up to 10,000 GPD

Ruck (19 mg/L TN) up to 2,000 GPD

MicroFAST (19 or 25 mg/L TN) up to 2,000 GPD - residential only

Advantex <2,000 gpd

Bioclere < 2000 gpd

SeptiTech < 2,000 gpd

Singulair <2,000 gpd

General Use Approval Monitoring

Year-round Facility

- Inspected and sampled at least quarterly for the first year. E: TN
- Minimum of semi-annually thereafter, at least 5 months apart and with one sample taken between Dec 1 and Mar 1 of each year

Seasonal Facility

- Inspected and sampled a minimum of twice annually. E: TN
- At least on sample must be taken 30 to 60 days after the season occupancy begins the second must be taken no less than 2 months after the first sample

General Use Approval

Nitrogen Reduction Technologies

Monitoring reports are submitted to the BOH but there is no requirement for submittal to the Barnstable County Database*

MassDEP does audit the companies regarding compliance of the technologies.

* Unless the site is on the Cape

So what can you do about data for the GUA Nitrogen-Reducing I/A Technologies?

Data is not as onerous as for piloting or provisional: only TN and usually only quarterly for year-round facilities.

Data could be quickly reviewed for compliance by staff, interns, volunteers and flagged if there are issues.

Data could be managed on a spreadsheet by staff, interns, volunteers.

If you see data out of compliance, contact MassDEP.

Any questions?

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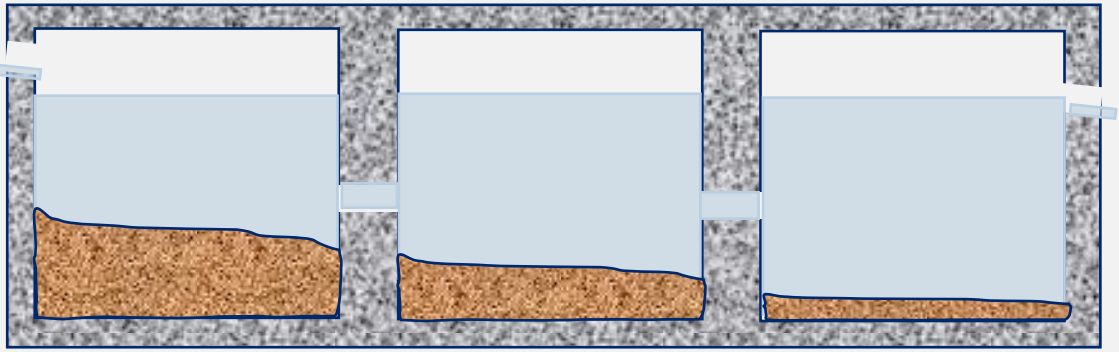
Popular Questions that the Regional Offices Answered this Year

Accessory Dwelling Units & Title 5 Compliance

- Under MA Building Code and Zoning Codes, an attached ADU (in-law apartment) in conjunction with the main house count as a SFH.
- Under T5, it is multiple dwelling units, requiring:
  - For a single septic system, two septic tanks in series or two-compartment septic tank; or
  - Two separate septic systems.

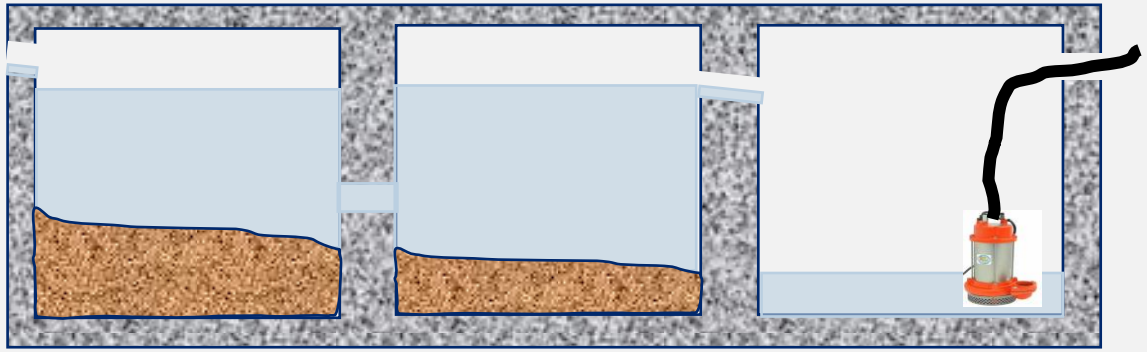
Use of a Three-Compartment Tank

As a 3-Compartment Septic Tank



Not Permitted
310 CMR 15.224(1) prohibits the number of compartments in a septic tank from exceeding 2.

As a 2-Compartment Septic Tank with a Pump Chamber



Perfectly fine.
The number of septic tank chambers has not exceeded two and site conditions may warrant using a single structure for both the septic tank and pump chamber.

Alternative Perc Policy

- As reflected in LUA and in the *Alternative to Percolation Testing: Guidance for System Upgrades*
- Only for repair of existing systems
- No increase in flow
- May not be used for increase in flow
- May not be used for new construction
- For increases in flow or new construction, dewatered percolation testing can be done

Variances to I/A Approvals

Can a BOH vary any condition of an I/A approval or related standard conditions of that approval?

No, the BOH cannot vary any condition of any I/A approval or the standard conditions associated with that approval. Any flexibility permitted with that technology is already outlined within the approval and may not be expanded upon.

Bedroom Deed Restrictions

- 310 CMR 15.002 (definition of bedroom) permits the use of deed restrictions.
- Just because a deed restriction is prepared by the homeowner/developer/etc. does not mean the BOH has to accept it.
- The deed restriction should make sense given the dwelling layout and number of rooms.