

# Composting Toilets: Regulatory Barriers to an Integrated Green Solution

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## Outline

- Composting toilets
- Benefits of Composting Toilets
- Barriers
- Regulatory Examples
- Possible improvements
- Conclusions

## Composting Toilets

- How they work
  - Oldest, simplest mechanism of waste disposal
- Activity of decomposing organisms
  - Can eliminate a large percentage of pathogenic organisms
  - Degrades nutrients into more plant available forms



Image source: [www.enviroletbuzz.com](http://www.enviroletbuzz.com)

## Composting Toilets cont'd

- Many different types
- Becoming more popular due to water constraints, especially for commercial uses
- Efficacy based on temperature and time of residence
  - pH, C:N ratio, and moisture also can effect the composting process



## Benefits of Composting Toilets

- Conservation
  - Water
  - Possibly energy
- Water quality
  - Nutrients
  - Toxins/  
pharmaceuticals in  
human waste
- Land use planning
- Nutrient recycling



Image Source: Missouri DNR,  
via [www.lmvp.org](http://www.lmvp.org)

## Barriers to composting toilets

- Public perception – some misconceptions, some realistic concerns
  - “Ick” factor
  - Smell
  - Insect activity
  - Increased user involvement
- Cost
- Regulatory hurdles



Image source: [commons.wikimedia.org](http://commons.wikimedia.org)

## Regulatory Systems

- Approval of Innovative/Alternative systems
  - Explicit approval of composting toilets
  - Differing requirements for the toilet design
- Leachfield reductions
  - Most states have some percentage leachfield reduction. Some mandate that enough land be available for system designed on 100% of the flow
- Disposal requirements
  - End-product treated as dangerous
  - Some states have on-site disposal options

## Examples

- Vermont Law School
  - Act 250
    - Town of South Royalton said there was not enough water available for the larger building.
  - Clivus multrum composting toilets drastically reduce water usage to 15 gallons per day for the building.
  - Service over 600 students and staff, not emptied for until 2007. (Opened in 1998)



## Examples

- Cobb Hill Co-housing
  - Developed in early 2000s, before a Vermont rule change
  - Uses Phoenix composting toilets
  - Negotiated a 40% decrease in greywater leachfield size with the Vermont ANR



\*\*Updated regulations now provide an automatic 25% decrease, in addition to a reduction for multi-family developments like this co-housing project

Image source: Advanced Composting Systems, [www.compostingtoilet.com](http://www.compostingtoilet.com)

## Cobb Hill cont'd

- Problems
  - Design flow (for 22 families) was 4900 gpd
    - Actual water use was 1200 gpd.
      - Composting toilets, low flow showerheads, water conservation philosophy
    - The lack of flow volume may have contributed to later problems with the greywater system
    - Under current regulations, the required design flow would still be over twice what the community is actually using

## Cobb Hill Cont'd

- Disposal
  - State originally required disposal by a certified hazmat hauler to a certified hazmat landfill
    - Closest landfill is in Maine
  - State then told them to take the compost to a normal landfill
  - Finally, state approved a disposal site on Cobb Hill property

## Lessons

- They work. Water usage at both Cobb Hill and Vermont Law School were drastically decreased by the use of composting toilets.
- The regulatory process is not easy. Cobb Hill was philosophically committed to using a sustainable technology and had unified, continuous representation.

## Possible regulatory improvements

- Explicit approval of composting toilets
  - Almost all New England states do this
  - Removes uncertainty in the planning stage
  - Possibly based on a list of approved designs, or NSF standard
  - Design requirements related to disposal requirements



## Possible Regulatory Improvements: Disposal

- Landfill disposal doesn't capture the nutrient recycling benefits of composting toilets
- Massachusetts, Vermont, Rhode Island. allow on-site burial
- Surface application
  - Risk
  - Risk can be managed either through design requirements of the toilet, or through disposal requirements



Image source: [www.landofgraciousliving.com](http://www.landofgraciousliving.com)

## Centralized collection and “finishing”

- Regulated under solid waste authority
- Fits better into the modern paradigm of waste disposal
- Recycles nutrients
- Possible EPA part 503 certification for general application
- Dilutes energy conservation advantages
- Waste may not be pollution free



Industrial composting facility

Image source: [www.transformcomposting.com](http://www.transformcomposting.com)

## Possible Regulatory Improvements: Leachfield Reduction

- Leach field reductions (Design flow reduction)
  - Important for land use planning concerns
  - Reduction helps incentivize use by a significant decrease in cost
  - Cobb Hill Example: overengineering of a septic leach field for greywater may cause problems

## Conclusion

- Composting toilets may be a viable option for future development, providing many benefits, including water conservation and water quality protection.
- Many current regulatory schemes decrease those benefits and provide arguably unnecessary obstacles.
- Approving the use of composting toilets, automatic leach field reductions, and better disposal solutions are all important to encourage the use of composting toilets.
- Education of the public and regulators may also be important to dispel misconceptions about composting toilets.

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