



Sustainable & Affordable Wastewater Solutions for Bristol, VT

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Goals

How can Bristol expand wastewater management in an affordable and sustainable way to support housing development?



Agenda

1. Current state
2. Problems
3. Solutions
4. Recommendations



Current State

2023-24 Wastewater Evaluation Summary:

“The wastewater collection, treatment and disposal portions of the system are generally in good working condition...The largest concern is the levels of BOD5 in the wastewater effluent which have slightly exceeded the current permit limits.” (13)

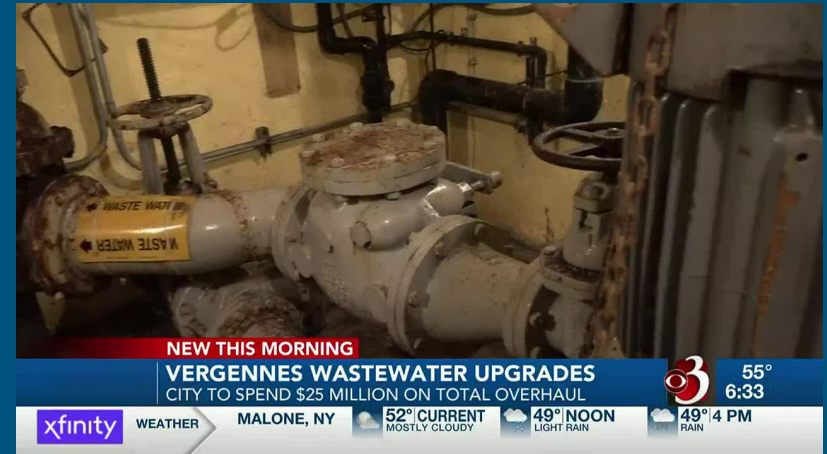
Municipal system (According to Jill Marsano, VTUMS Water Operator):

- ½ of hydraulic loading capacity is being used
- 110% of organic capacity is being used (BOD5, TSS...)
- Certain connections have high FOG (Fats, oils, and grease) concentrations
 - Conclusion: Municipal system faces blockages, corrosion, and lessened efficacy as a result this highly concentrated wastewater.

Beyond Municipal System: Bristol has good soils for septic installations

Problems Faced

- New septic for single units
 - Extensive regulations
 - Isolation, slope
 - Expensive installation costs
 - Increasing cost of final units
- Expanding municipal system
 - Very costly
 - A long term project



Solutions

- Reducing costs for new developments
 - Decentralized Clustered Systems
- Funding for long term municipal expansion
 - National and State Grants and Loans
- Source reduction strategies
 - Pre-Treatment
 - Water Saving Fixtures
 - Municipal and Private

New Development Options

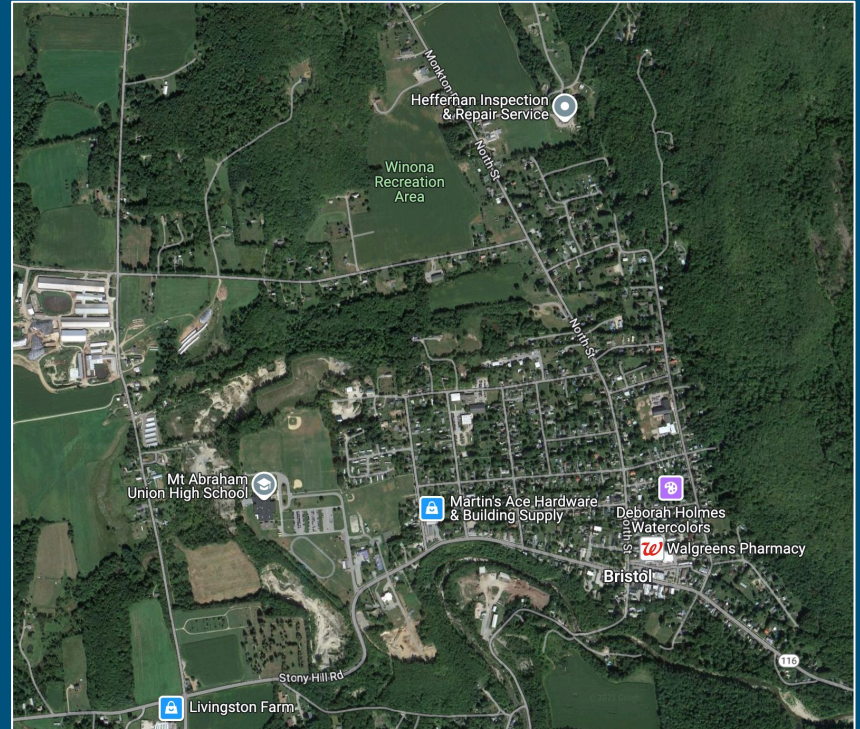
- Shared decentralized systems
 - Reduce installation costs
- Cluster septic systems
 - Recommended by Brent Rakowski of Otter Creek Engineering and Jill Marsano
- Example: Bristol Cohousing
 - Serves 14 units
 - Fosters community



Potential Sites for Future Cluster Systems

Important to note: these sites were picked based on an eye test, noting their open land and proximity to downtown as an example of potential development

- Corner of West Pleasant and Liberty
- Corner of Maple Street and Pine
- Corner of Hazel and Monkton



Example Suggested by Jill Marsano: Plank Road and Jay Drive

According to Jill Marsano:

- Current owner: Diane Heffernan
- Kids will develop or sell land to developers after they inherit it
- Potential site for housing units on cluster systems



Funding for Municipal System Expansion

- May be plausible in the long term: 10-15 years away
- Federal funding sources: EPA/USDA grants including Clean Water State Revolving Fund (CWSRF), Environmental Justice Grants, etc; up to a few million dollars
- Vermont Housing Improvement Program (VHIP): up to \$50,000 for private projects
- Vermont state grants: Clean Water Initiative (CWIP), ranging from ~\$200k to \$3 million
 - Example: University of Vermont Extension project (\$3.1 million), Champlain Valley Farmer Coalition (\$550k) for educational outreach and technical assistance

Financial Loans for Municipal System Expansion

- Sewer District Budget, approx. 50k dollars per year, with extra unallocated money from previous years (debt retirement about \$11,000 to \$12,000 per year)
- Fees paid by users
- Vergennes: expanded wastewater treatment in 2022, project was \$25 million, received \$17.5 million loan from USDA and \$7.5 million in grants from EPA and VT government.
- Shelburne, 6k people: Nov. 2024 approved \$38 million bond measure for upgrading wastewater treatment facilities
- Projected cost for Bristol: **\$30-45 million** (scaled from Vergennes model)

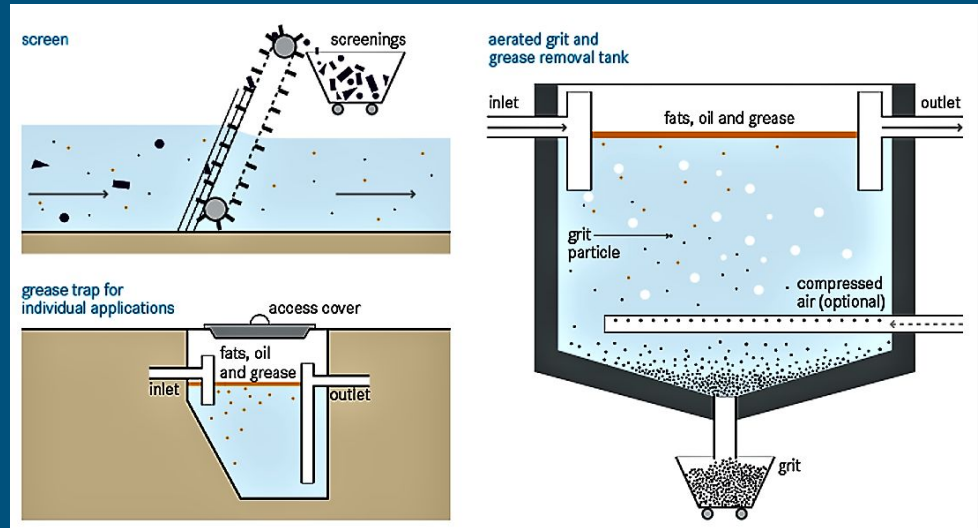
Source Reduction Strategies

Improving Municipal Capacity

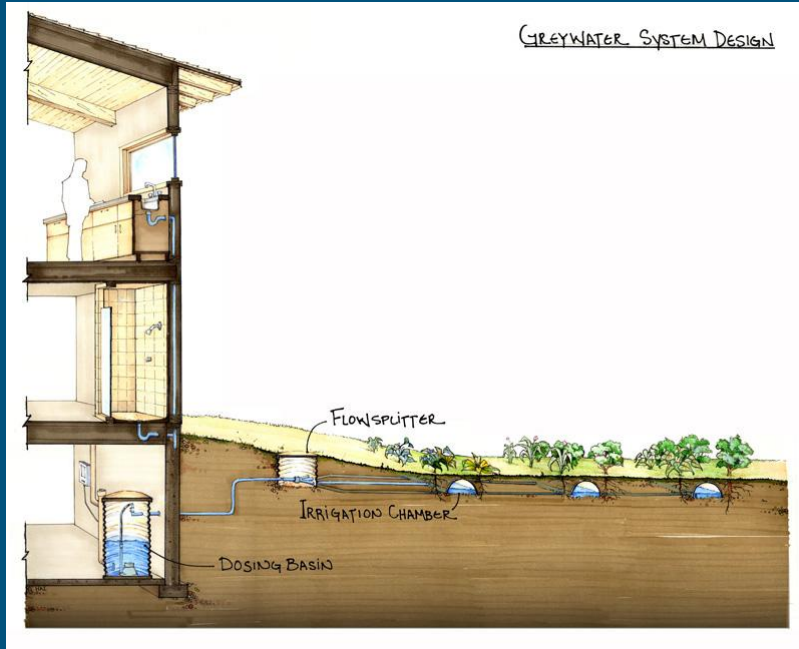
- Pre-treatment (FOG traps) incentivised for highly concentrated units
- Water Saving Fixtures

Suggestions for New Developments

- Greywater Systems
- Community Greenspace
- Water Saving Fixtures



New Development with Greywater Systems



Final Recommendations:

1. Reduce water use in residences and municipal system
2. Have connections producing highly concentrated (FOG) wastewater pre-treat
 - a. Encourage w/ incentivization, for ex: discount on wastewater fees if they properly install + maintain grease traps.
3. Focus on shared systems like Bristol Cohousing
 - a. When possible: connect to pre-existing septic systems that are using their capacity
4. Future: expand municipal system
 - a. Encourage high-density developments with a development fee for wastewater treatment to reduce costs (more units, more affordable)



Thank you!

