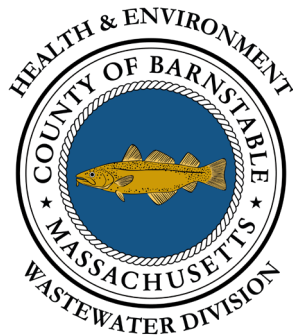

Falmouth Urine Diversion Planning Project Update



MAY 7, 2025



Project Phases

1. Planning and preparing for pilot project (Current)
2. Pilot project (Spring 2026)
3. Implementation (2028 onward)

Falmouth – MASSTC Intermunicipal Agreement

1. Initiated in May 2024.
2. Team: MASSTC, Consultant Team, Town, WQMC, FPAC.
3. Scope of work intended to answer questions about feasibility and efficacy of urine diversion as a watershed nutrient management tool.
4. Preparing and planning for pilot project.
5. Targeting completion of planning work by September 2025 in time to prepare town sponsored funding request for pilot project at November 2025 town meeting.

Why are we looking into UD?

1. Efficiency: Urine contributes around 80% of nitrogen and 50% of phosphorus to residential wastewater but only accounts for around 1% of the total volume.
2. Cost: UD system installations are estimated to cost around \$5K to \$15K per household depending on system specifics and owner preferences. The pilot project will provide more accurate cost data based on actual costs, not estimates or projections.
3. Nutrient Recycling: UD provides the opportunity to recycle nutrients as fertilizer products that would otherwise be pollutants requiring treatment in onsite or central wastewater systems.
4. Business Opportunities: Urine becomes a commodity spurring business and job growth rather than a waste that's expensive and energy intensive to dispose of.

How does UD work?

1. Separate urine from wastewater using specialized toilet fixtures and urinals.
2. Store in holding tanks at collection locations.
3. Pump out and bring to central storage and treatment facility.
4. Measure nutrient load and report to MassDEP toward watershed TMDLs.
5. Distribute to fertilizer manufacturers for processing.
6. Resulting fertilizer products applied in accordance with local and state plant nutrient rules.

Where are we now?

Regulatory approval pathways:

➤ MassDEP:

- Confirmed and engaged I/A Provisional Use permit pathway for pilot project.
- Confirmed ability for town to conduct watershed scale nutrient accounting.
- Currently working with DEP and MDAR to confirm jurisdiction on fertilizer production and use (next meeting May 27th).

➤ MDAR:

- Identified pathway to register urine-derived fertilizer products.
- Since planning work began, MDAR has approved the first urine-derived fertilizer product in MA.

➤ Continued on next slide...

Regulatory approval pathways, continued:

➤ Plumbing Board:

- Identified 2 pathways for toilet fixture approval: general acceptance or variance.
- Providing ongoing support to several toilet manufacturers to facilitate approvals.
- Plumbing and storage system drawings draft completed by engineer this week - currently being reviewed by team for final edits prior to submittal to plumbing board.
- Expect Plumbing Board review in June.

Next steps:

1. Determine subsidy amount and disbursement method.
2. Update draft participant agreement.
3. Preliminary (survey) assessment of potential participants.
4. Exploring disposal option at Falmouth WWTP.
5. Ongoing efforts to identify alternative/supplemental funding sources.
6. Aligning to request for pilot project funding at November town meeting.

Preliminary Pilot Project Concept

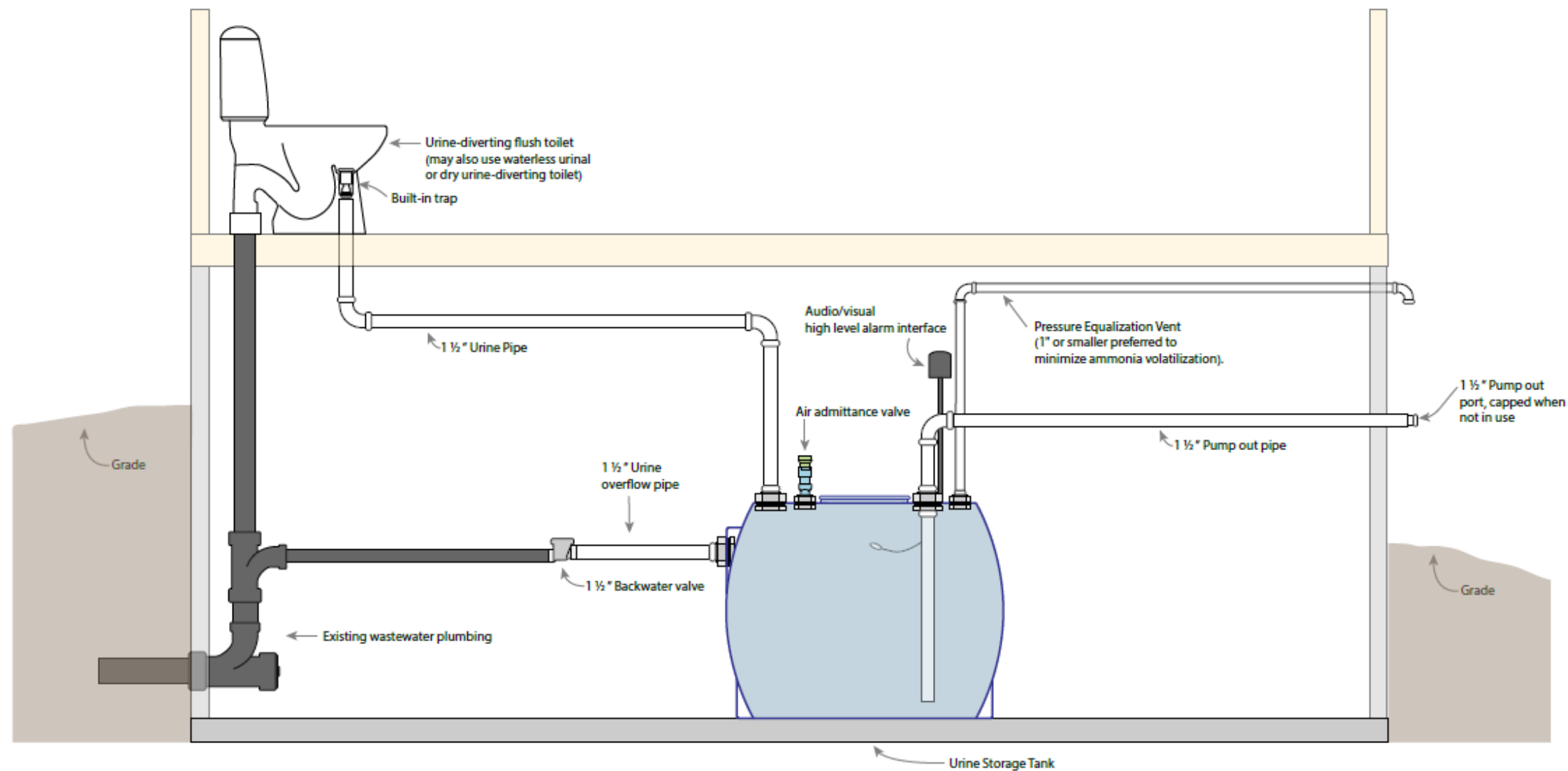
1. Targeting spring 2026 start date.
2. Conduct in-home assessments.
3. Sign participant agreements (including subsidy disbursement strategy).
4. Complete system designs and permitting.
5. Install UD systems in 50 homes and operate and monitor for 3 years.
6. Report results to MassDEP.
7. Integrate UD into town watershed planning.

Questions?

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Notes:

- Urine pump-out pipes slope backward toward the storage tank. Pump-out to be performed using vacuum suction, using gasketed cam-lock cap between pump-out pipe and service provider's collection hose. Fitting on pump-out pipe to be capped with gasketed cam-lock connector after pump-out.
- Storage tanks sized to exceed 14 day storage capacity.
- A high-level alarm will report when storage tanks are at 75% capacity. In configurations with multiple connected tanks, the float alarm will be on the tank that receives urine from the urine collection plumbing.
- All horizontal pipe runs between fixture and storage tank: $\frac{1}{8}'' : 12''$ slope
- Rigid pipe sch. 40 ABS or PVC unless noted

- Cleanouts or sweep fittings at corners or where appropriate
- Relative pipe elevations shown in the schematic will be recognized in installation
- Pipe connections to tanks are made using bulkhead fittings or manufacturer-installed fittings.
- Tanks can be located outdoors, subject to requirements of the "Detailed System Narrative" document, including that outdoor storage tanks must either be: 1) installed below grade, 2) used only seasonally, or 3) equipped with a freeze-compatible high-level alarm.
- Urine storage tank vents shall either 1) be connected to the plumbing venting system, or 2) extend directly to the outdoors and terminate no less than 12-inches above grade.

Title:

Configuration 2: Plumbed urine diversion system Gravity flow with overflow



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Design developed in collaboration
with Nutrient Networks, Inc.



Sheet: 1 of 1

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