MORETOWN VILLAGE WASTEWATER FEASIBILITY STUDY

DRAFT REPORT FINDINGS

(60% complete)

Community Presentation and Discussion

GUIDED BY THE MORETOWN CLEAN WATER COMMITTEE

FUNDED BY VT CLEAN WATER STATE REVOLVING FUND

OTTER CREEK ENGINEERING

Contents

Committee Background and Activities

Wastewater Project Benefits

Summary of Study

State Programs in Support

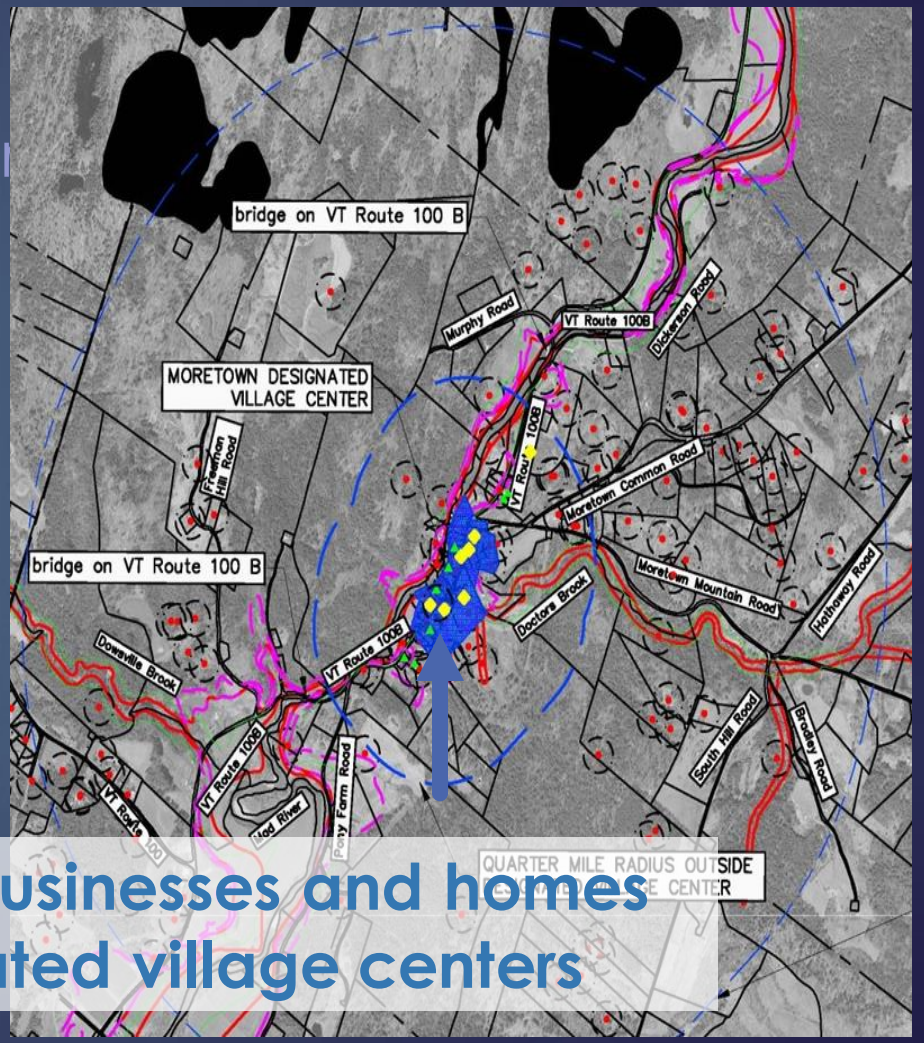
Moretown Clean Water Committee Convened to Explore Wastewater Opportunities

- Convened in 2022
- Created to evaluate options for a possible community wastewater system under supervision of Selectboard.
- Initial need based on understanding that soils are broadly unsuitable in the Village due to underlying clays and shallow depths to bedrock and groundwater for individual on-site treatment throughout the Designated Village Center.
- Committee Members:
  - Clark Amadon, Rae Washburn, David Westerman, Jay Pilliod, Jack Byrne, Deb Carroll
- Project Consultants and Support:
  - Otter Creek Engineering, Inc.

Clean Water Committee Work to Date

Prioritizing Study Areas

Moretown Designated Village Center



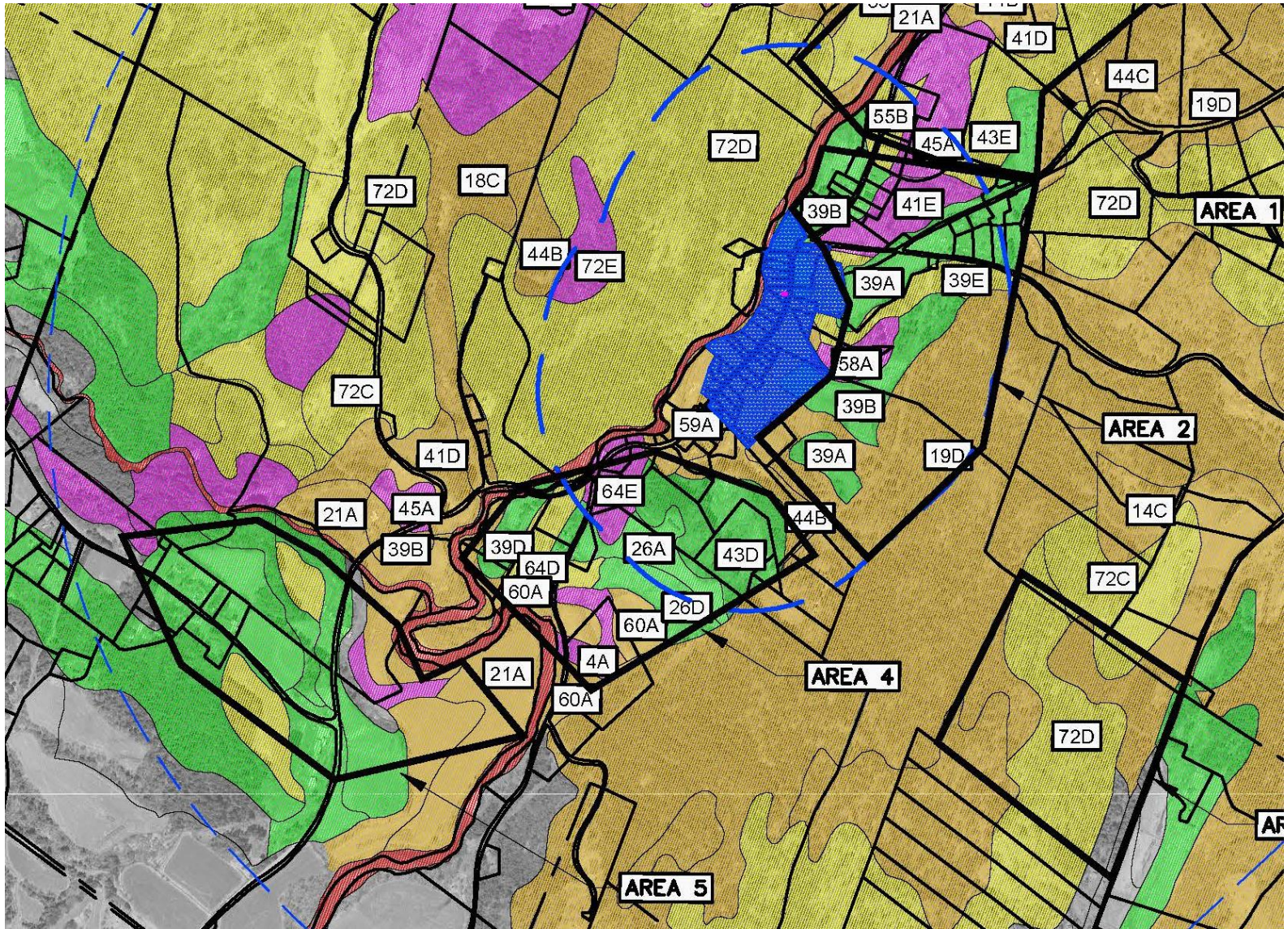
Primarily looking to serve existing businesses and homes and infill development in designated village centers

Clean Water Committee Work to Date
Town Meeting Day Survey

- In March of 2023, the committee solicited input from residents through an informal survey at Town Meeting day.
- An overwhelming number of responses were in favor of affordable housing in and around Moretown Village.
- A similar number wanted to support small, local shops, restaurants and other facilities within and around the village limits, which require some amount of wastewater capacity that does not currently exist.

Clean Water Committee Work to Date Property Identification and Test Pitting

- Prioritized sites based on location, soils and size
- Coordinated outreach to 9 property owners
- Received permission from 4 to complete test pitting
- Test pitting completed on 3 properties



Community Benefits

- Historic densities do not support current engineering standards for individual systems and well isolation systems.
- Individual on-site wastewater limits the potential for villages to continue or grow as vibrant community centers.
- Creates opportunities for new or expanded housing, public and civic spaces and businesses.
- If we don't invest in our villages, they decline.

Community Benefits

- Outdated systems cause groundwater and surface water contamination.
- Lack of space and soil conditions can prevent replacement or make it too costly.
- Development can be more cost effective without individual wastewater treatment.

Town Plan

- Consider Creating one or more municipal water systems for the Town
- Reduce Environnemental Impact from Stormwater Runoff and Wastewater disposal systems, especially those systems in densely settled and environmentally sensative areas.
- Encourage economic development with a focus on creating job opportunities while maintaining high environmental standards.

Process of wastewater planning

Wastewater Feasibility Analysis

WE ARE HERE!

Wastewater Preliminary Engineering Investigation

Refines to a single or few preferred alternative(s)

More detailed feasibility and cost analysis

Environmental review

Permit analysis

Final Design Phase

Fieldwork (surveys, borings, easements)

Finalize funding options

Bond vote

Develop construction ready design documents

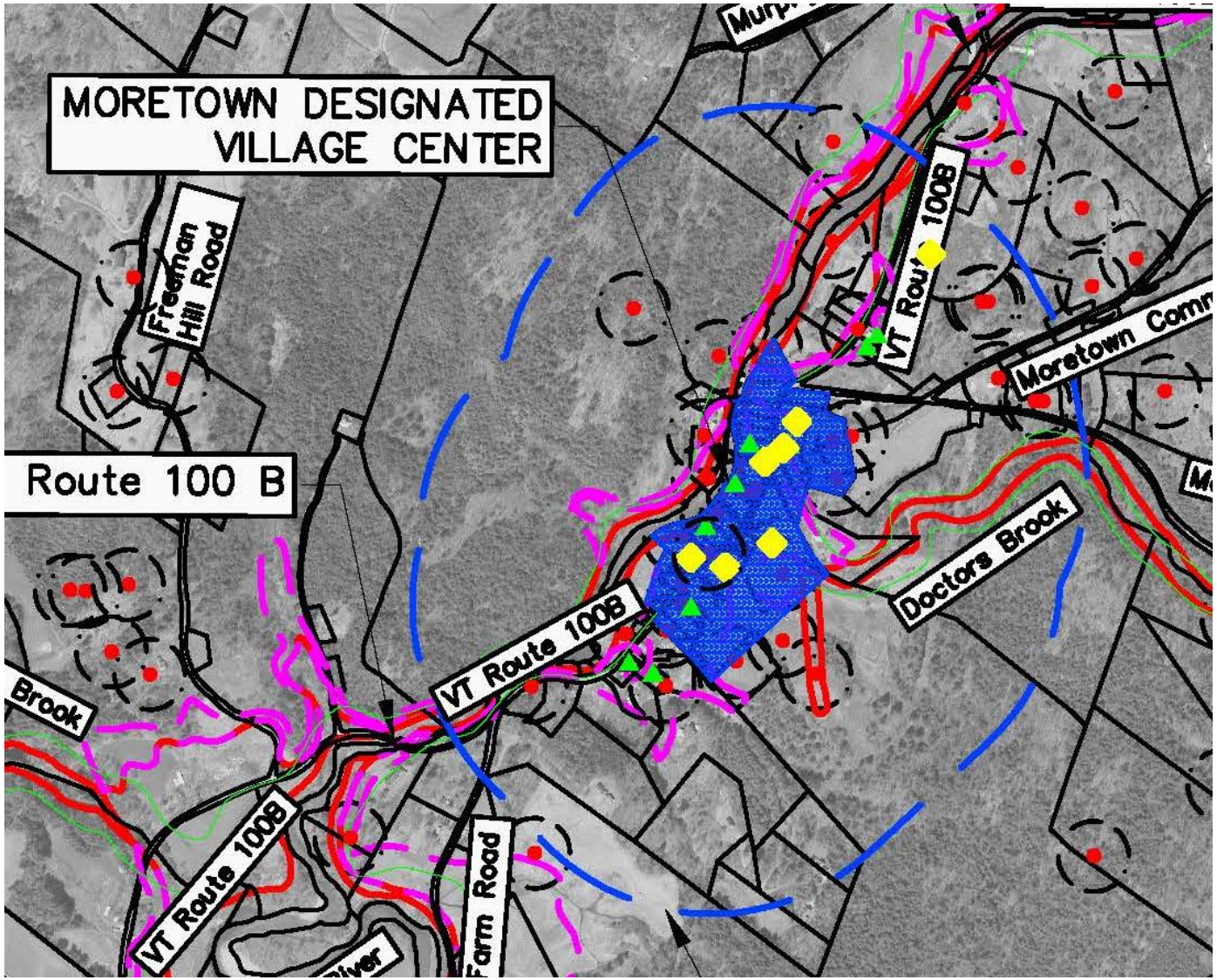
Bidding

Construction

Intent of Investigation

IDENTIFY	EVALUATE	ENSURE	PRIORITIZE
IDENTIFY cost effective and appropriately scaled solutions	EVALUATE alternatives for their ability to address the needs.	ENSURE solutions are protective of public health and safety.	PRIORITIZE 2-3 solutions (ideally!) that will service the vision for Moretown's Designated Village Center

Existing Water and Wastewater Supplies in Village Center



Approaches to Wastewater Collection and Treatment

DIRECT DISCHARGE

INDIRECT DISCHARGE

CENTRALIZED

- Large Collection Network
- Central Treatment Facilities
- Direct Discharge of Effluent to Surface Water
- Significant Infrastructure Investment
- Increased operations & maintenance

DECENTRALIZED

- Individual or Small Collection Network
- In ground collection and treatment (septic) systems that vary in size
- Indirect Discharge of Effluent to Subsurface

How much wastewater capacity does the village need?

	Estimated Village Range	
Design Flow Designated Village Center	13,370 gpd	20,000 gpd
Design Flow Designated Village Center plus quarter mile buffer	22,610 gpd	35,000 gpd

Sources of information:

- Property owner surveys
- Existing databases and issued permits
- Town Plan and other planning documents
- Designated Village Center needs
- Allowable growth areas

Treatment, Conveyance and Disposal Options

Treatment Needs

- Primary (septic tanks)
- Secondary (Lagoons, package plants)
- Tertiary (advanced filtration)

Conveyance

- Standard Gravity Collection Sewers and Pump Stations
- Septic Tank Effluent Pumping (STEP) Systems
- Low Pressure Grinder Pump Systems

Disposal

- Inground Subsurface
- Mound System
- Spray Disposal

Preferred Treatment, Conveyance, and Disposal

Treatment Needs

- Primary Treatment (Septic Tanks)

Conveyance

- Dependent on disposal site location

Disposal

- Inground Subsurface

The initial focus of the investigation has sought to identify properties which have the potential to support small community wastewater treatment and disposal systems.

The committee targeted sites that could utilize simple and cost-effective solutions.

Opportunities for In-Ground Disposal Sites in **Moretown Village**

- Onsite investigations have been conducted at 3 sites
  - Private Property
  - Moretown Elementary School
  - Moretown Town Forest
- Opportunities for a small system found at the Private Property
- Limited to no opportunity at the school for expansion
- No Community solution available on the Town Forrest Property

Community Wastewater System Options

Option 1: **No Change**

Retain the existing on site wastewater disposal systems per lot.

Option 2: **Cluster Wastewater Disposal Systems**

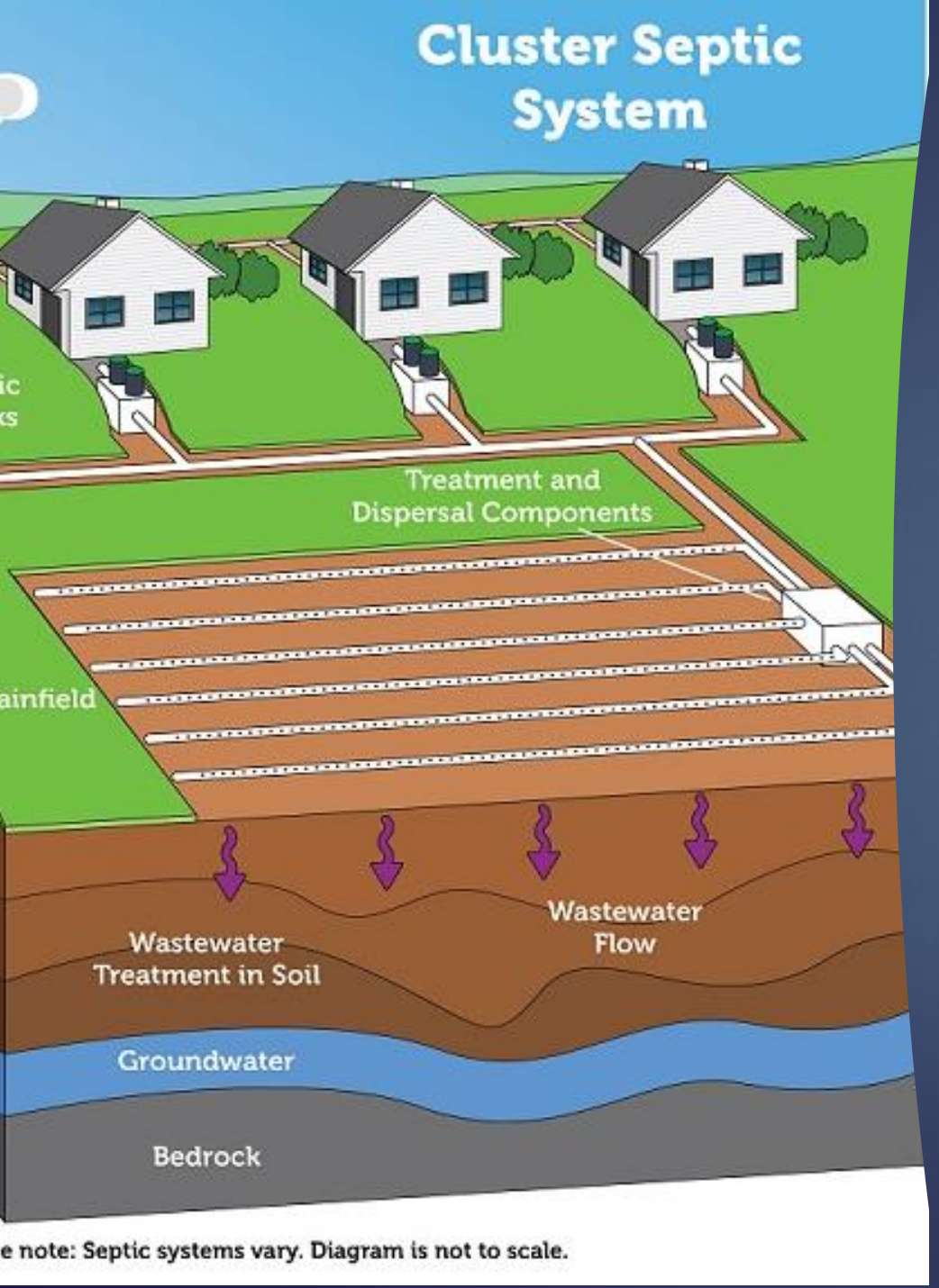
A series of small scale (less than 6,500 gpd capacity) wastewater systems in an effort to meet the needs of the village over time.

Option 3: **Expand Investigation**

Expand investigation radius and pursue additional landowners with desirable sites and evaluate secondary and tertiary treatment options.

Option 1: No Change/ No Community Wastewater

- Opt not to pursue a community wastewater system to serve the Designated Village.
- Wastewater solutions continue to be the responsibility of individual landowners on a site by site basis.
- Design capacity is limited on a per lot basis, which will impact the potential for reuse, expansion and infill development.
- Replacement costs of individual on-site wastewater systems are born by the existing property owners
- Redevelopment / Expansion of existing uses (adding bedrooms, employees, etc) is limited by the density of existing development and location of private water supplies.



Option 2: Cluster Wastewater Disposal Systems

- Several cluster, soil based wastewater disposal systems in areas where suitable soil exists, phased in over a period of time
- Build out in phases; could potentially achieve up to 30,000 gpd of total design capacity
- Total design capacity limited by unsuitable soil, uninterested landowners and proximity to Designated Village Center

Treatment and Conveyance Alternatives

Conventional Wastewater Collection

- Municipal gravity sewer mains contain service laterals to collect individual property owner waste
- Effluent (including solids) is conveyed via gravity along topography to low areas where small community pump stations are located.
- Wastewater is pumped from these locations to the disposal sites. In some instances, solids are removed at the pump station sites and effluent only is pumped for disposal.

Treatment and Conveyance Alternatives

Septic Tank Effluent Pumping (STEP)

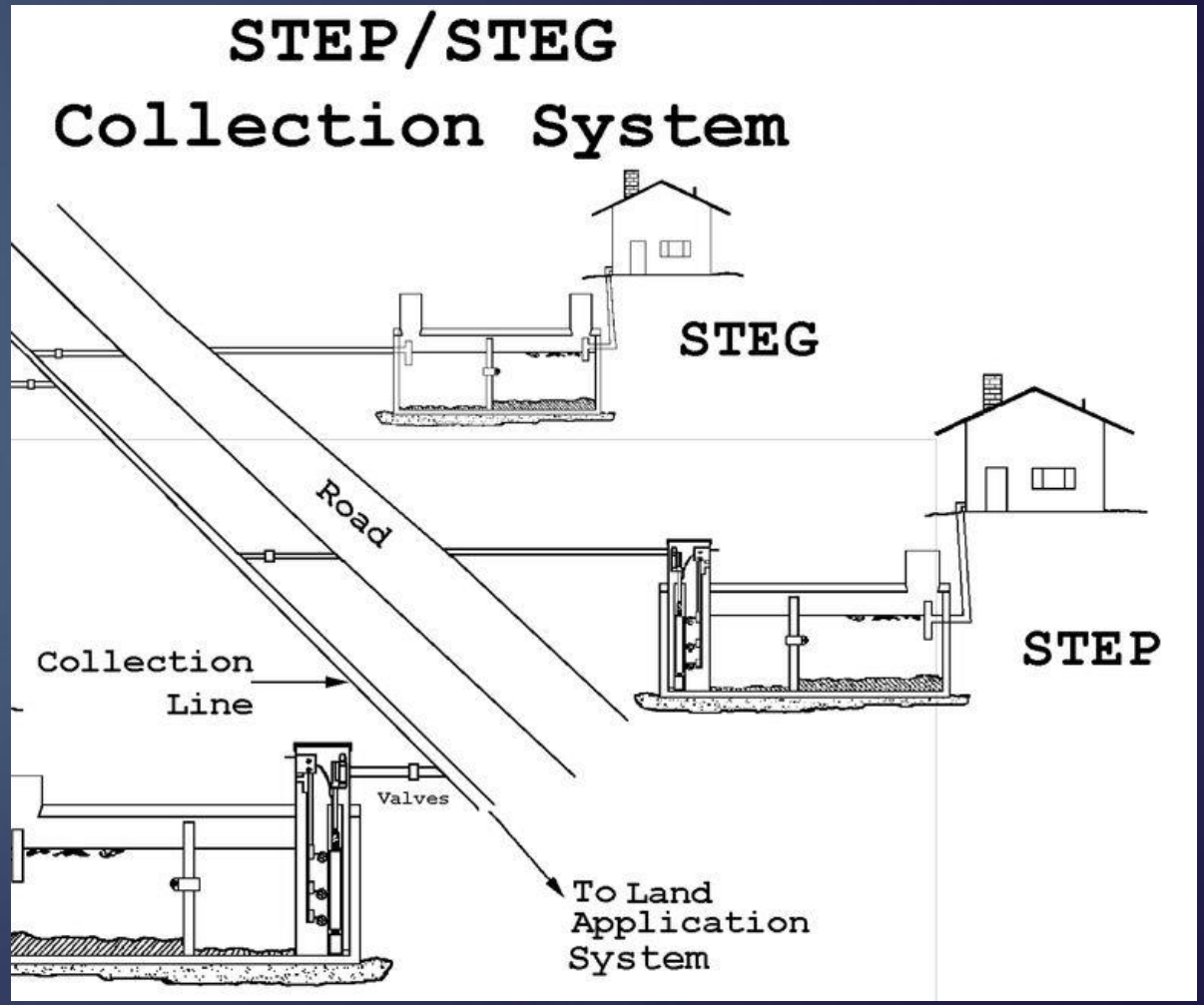
- Provides primary treatment at users property
- For residential and low strength commercial waste connections, this occurs through the installation of a properly sized septic tank.
- Effluent from the septic tank is subsequently pumped into a shared, low pressure sewer force main, where it is conveyed to a disposal site.

https://cityoflacey.org/wastewater-programs/

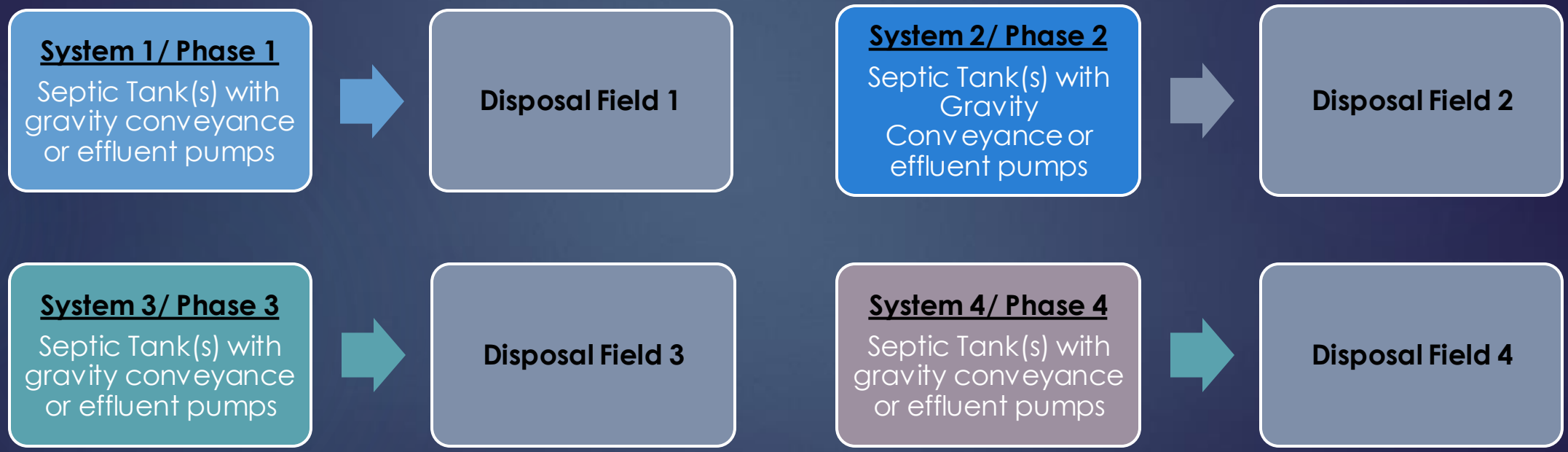
Treatment and Conveyance Alternatives

Septic Tank Effluent Gravity (STEG)

- Provides primary treatment at users property
- For residential and low strength commercial waste connections, this occurs through the installation of a properly sized septic tank.
- Effluent from the septic tank flows via gravity through a shared collection main. Since the line handles effluent only, it is often smaller than traditional sewers

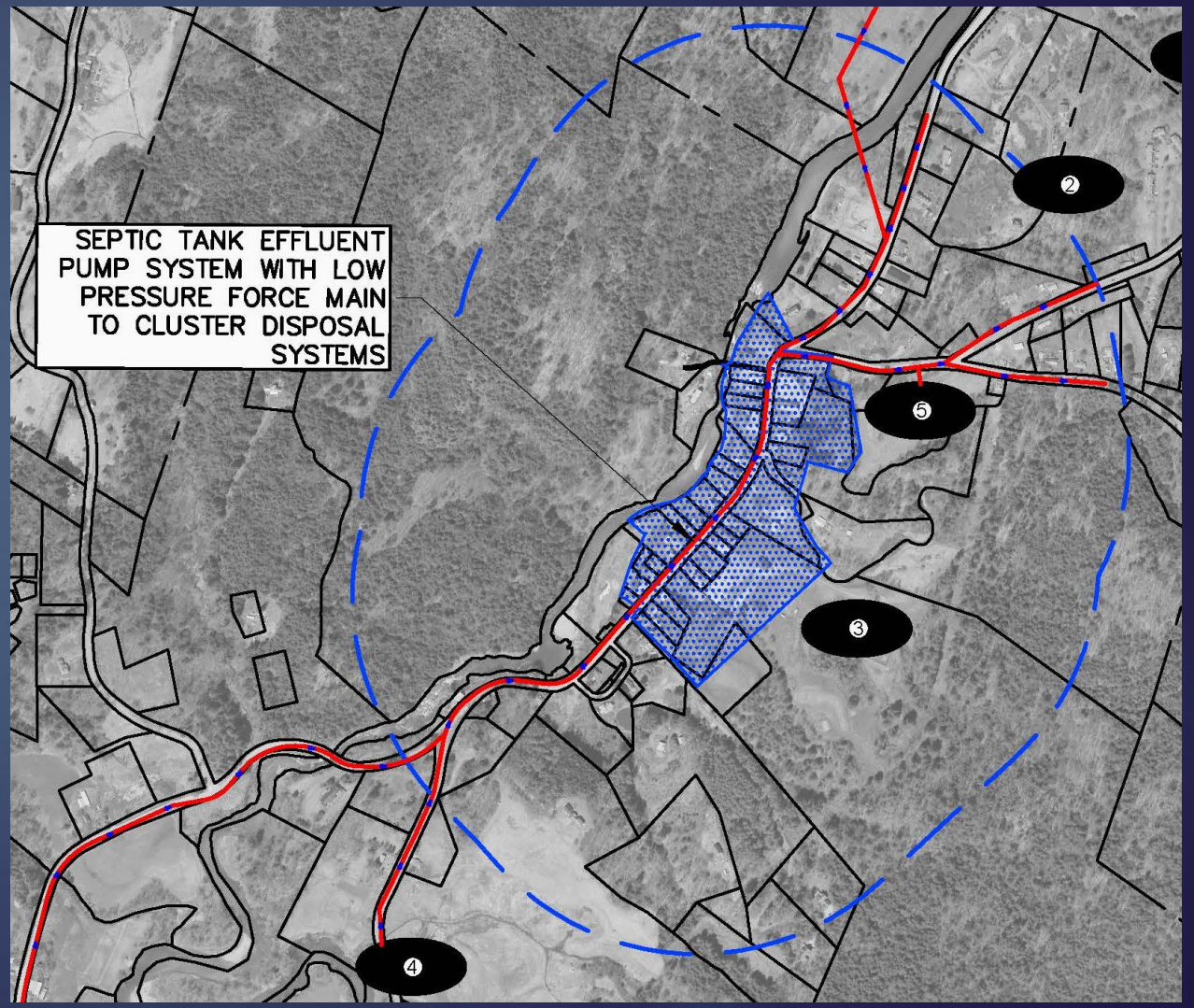


Phased Cluster Systems with Septic Tank Effluent Gravity / Pumping (STEG / STEP)



Phase 1 Cluster System Potential at Private Property

- Inground Disposal System with capacity for 6,000 gpd with pre-treatment
- Working through design alternatives
- Approximate construction estimate of $2 million to potentially serve 20-24 homes



Option 3: Expand Investigation

- Expand investigation radius to explore sites outside existing investigation radius.
- Identify new landowners who may be willing to partner with Town
- Conduct on-site investigations for soil suitability
- Evaluate benefits and costs associated with secondary and tertiary treatment systems

Secondary and Tertiary Treatment of Wastewater

GPD capacity can be increased if the treatment level of the waste is increased

- Secondary treatment: biological treatment of wastewater to reduce the effluent strength prior to discharge
- Tertiary treatment: a third level of effluent renovation, often through filtration

Rotating Biological Contactor (RBC) in Bridgewater, Vermont, Design Capacity of 35,000 gpd

Advanced Treatment Options

- Recirculating Sand Filter: Viable alternative to conventional methods when soils are not conducive to proper treatment and disposal of wastewater
- Algae Wheel: An algal-bacterial bioreactor, utilizes algae which grows on rotating wheels.
- Conventional Aerated Lagoon: Viable secondary treatment system in advance of spray disposal under the current Indirect Discharge Rules.
- Membrane Bioreactor (MBR): Low energy advanced treatment process.

Project Example: Shoreham Wastewater Treatment Facility

- 12,000 linear feet of gravity sewer collection system, community pump station, force main and 35,000 gallon per day wastewater treatment facility
- including recirculating sand filters and ultraviolet disinfection
- Housed in a "Vermont Barn" structure to blend in with the local neighborhood.

Alternative Approach

- This investigation did not find sites suitable and/or that gave permission for onsite investigations which would encompass a full community solution.
- Limited number of properties with moderately suited soil for on site disposal
- Development of a Public Community Water System would eliminate concerns from overlapping private water and wastewater supplies
- Has the added benefit of allowing for what areas of soil remain on lot to be utilized for wastewater system expansion.

Funding Opportunities

Combination of sources:

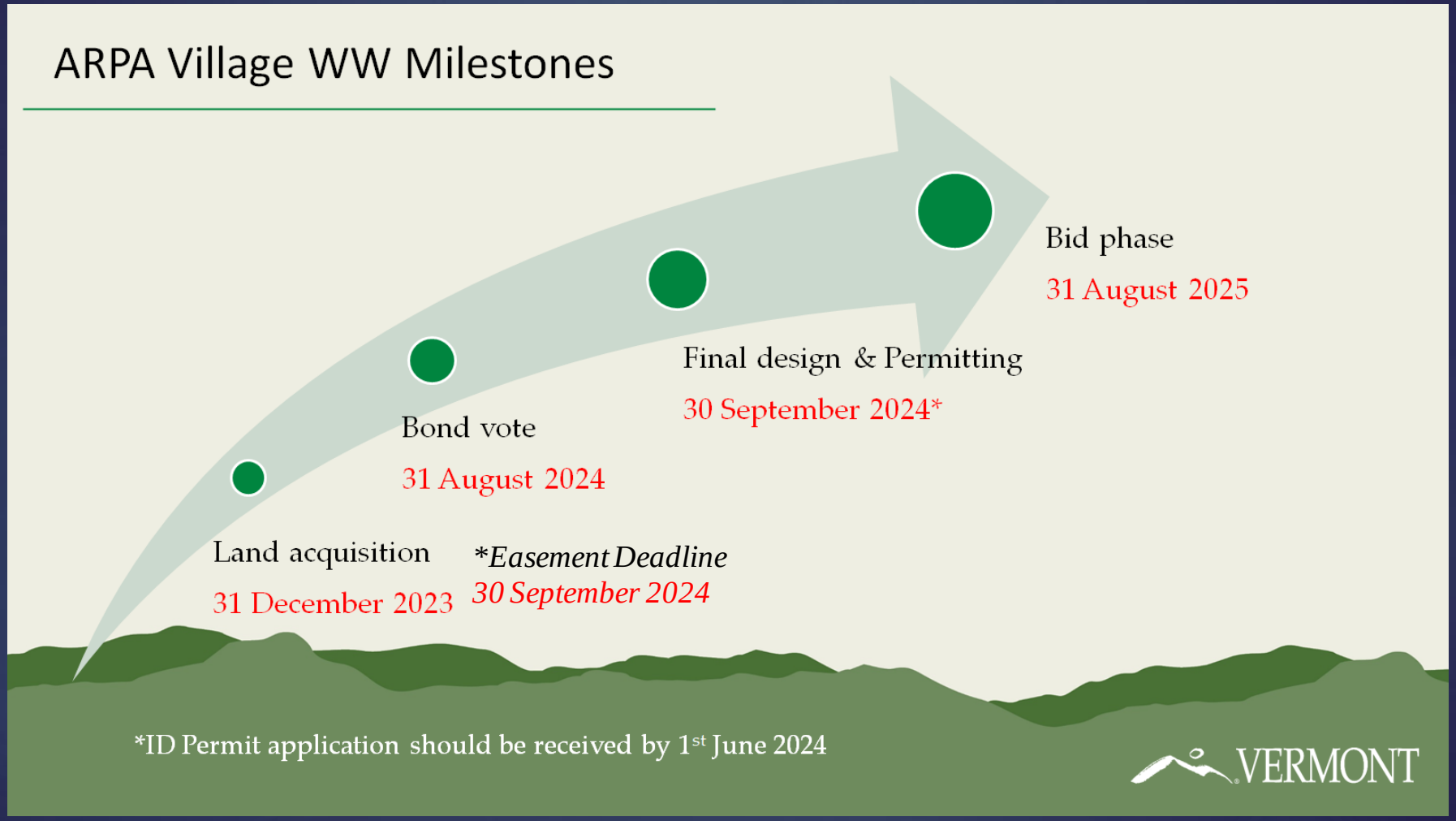
- Grants
- Low-interest loans
- Municipal bonds

Now is an unprecedented time to access funding for village wastewater projects, but there is a time limit on when ARPA funds need to be expended.

CWSRF Wastewater Process

- Step 0: Feasibility
- Step 1: Preliminary Engineering and Planning
- Step 2: Final Design
- Step 3: Construction

ARPA Funding Timeline



Next steps

- Continued discussion around feasibility of cluster systems
- Consider development of a public community water system
- Reach out to landowners further from the Designated Village Center who may have suitable sites
- Evaluate Secondary and Tertiary Treatment Options
- Report to Selectboard
- Finalize Options and Report

Questions and Comments

- Constructive, respectful feedback
- Everyone may speak once, ~2min limit
- May have opportunity to speak again if there is time
- Alternate 2 questions in the room, with 2 questions via zoom

Questions?

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