

# Town of Sherborn Zoning Board of Appeals Water Supply and Wastewater Treatment Presentation

## Apple Hill Estates & Pine Residences - Sherborn



# Presenters

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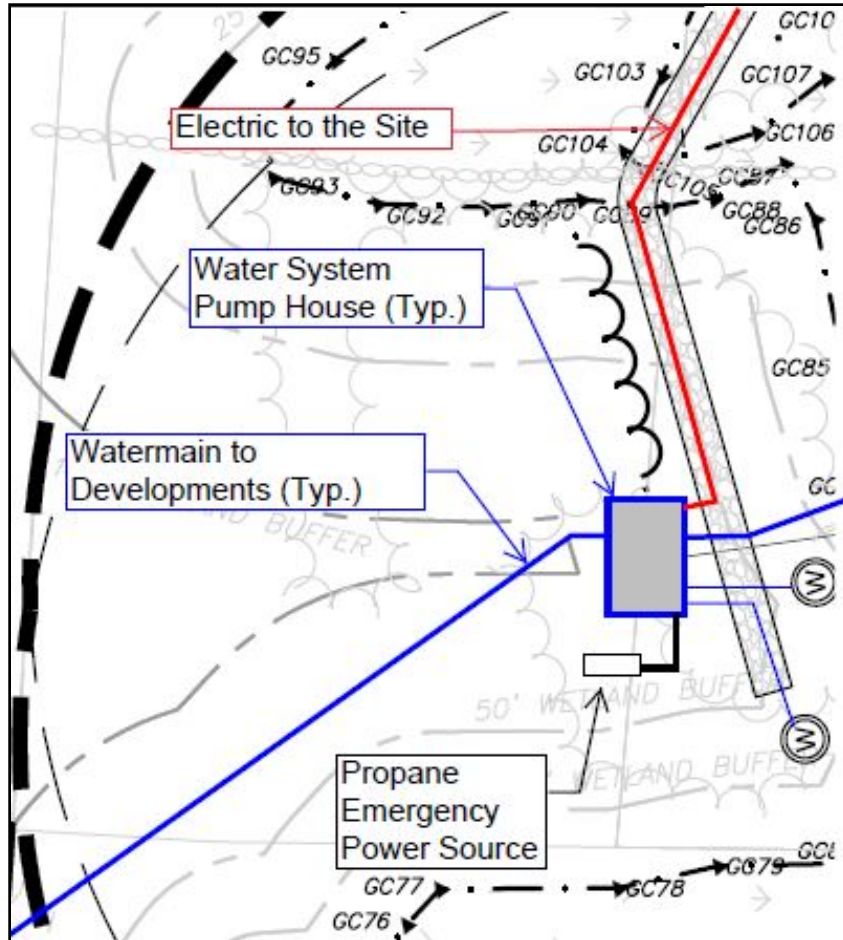
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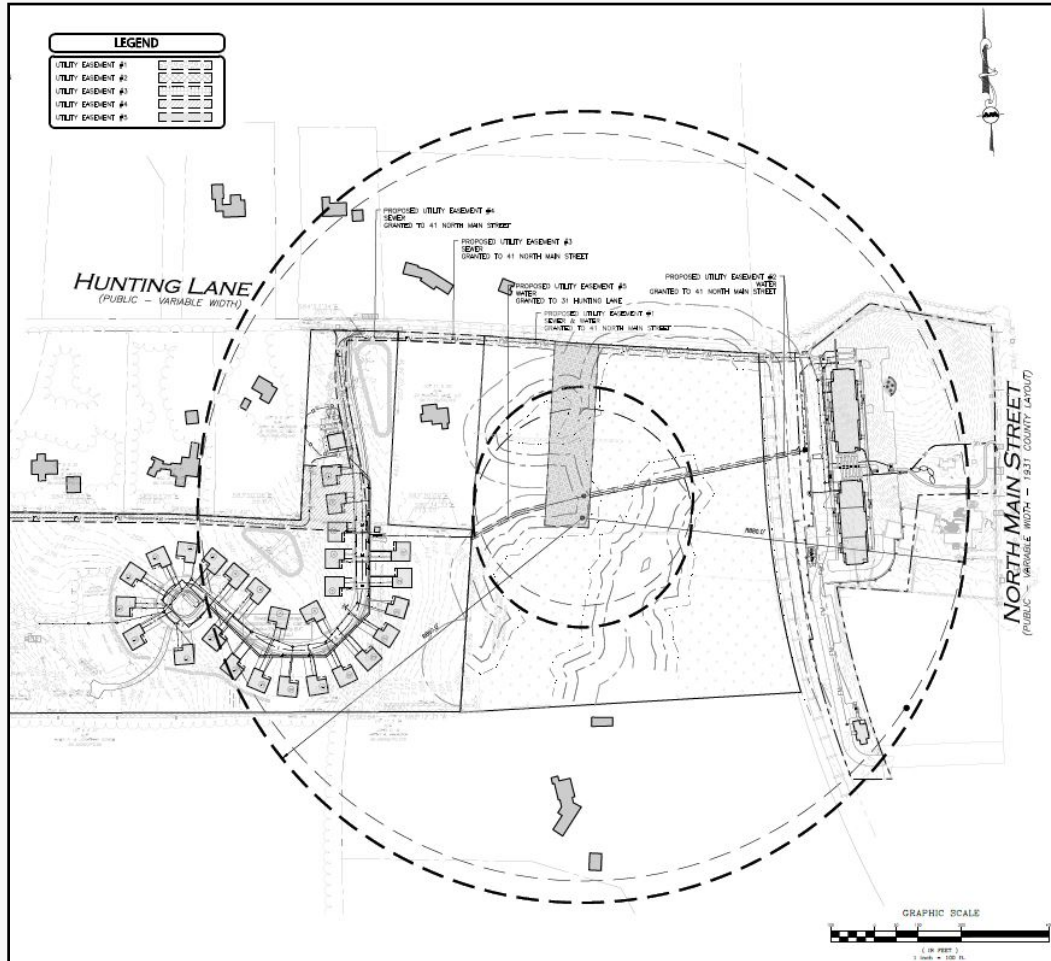
# Apple Hill Estates & Pine Residences Water System Schematic



## Water System Description

- Piping from well site to Apple Hill Estates cross-country via easement.
- Piping from well site to North Main Street via Pine Residences via directional drilling under wetlands and railroad.
- Underground domestic water storage tanks at each site sized to store two days of water:
  - 10,000 gallon at Apple Hill Estates
  - 20,000 gallon at Pine Residences
- Pump stations to provide water from tanks to individual buildings/residences.
- Treatment if required based on water quality.

# Apple Hill Estates & Pine Residences Water Supply Plan



## Water Supply System

- Permitting through MassDEP – New Source Approval Program.
- To be classified as Community Public Water Systems (PWS)
- Two wells installed in Aug/Sept 2019
  - Well 1: 820 ft deep, yield ~ 25 gpm (est)
  - Well 2: 820 ft deep, yield ~ 7 gpm (est)
- Zone I = 250 ft (based on 10,000 gpd (7 gpm) each well = 20,000 gpd total)
- Interim Wellhead Protection Area (IWPA) = 624 ft





# Apple Hill Estates & Pine Residences

## Zone I and IWPA Requirements

- **Zone I**

- A 100-foot to 400-foot protective radius around the wellhead calculated based on the approved pumping rate (gpd) of the well.
- Estimated Project Zone I Radius = 250-feet (around each well)
- Regulated under MassDEP Drinking Water Program Policy 94-03:

*"Requires PWS to own or control the Zone I of their wells and to limit activities to those directly related to the provision of the water supply, or to activities that will have no significant adverse impact on drinking water quality."*

- **Interim Wellhead Protection Area (IWPA)**

- Area that contributes recharge water for a groundwater source.
- The radius is proportional to the approved pumping rate (gpm) of the well.
- Estimated Project IWPA Radius = 624-feet (around each well)

*Requires review and limitation of land uses and activities with the potential to contaminate drinking water quality (i.e., hazardous waste sites, landfills, groundwater discharges).*



# Apple Hill Estates & Pine Residences Water System Permitting

- **MassDEP New Source Approval Permitting**
  - Approval to Site a Source & Conduct a Pumping Test (less than 70 gpm) – *BRP WS 13*
  - MassDEP will review proposal and determine what other wells to monitor (typically require monitoring of abutter drinking water wells and wetlands)
  - Extended Duration Pumping Tests (Each well will be pumped at approximately 10 gpm and monitored for 48-hrs+)
  - Approval of Pumping Test Report and to Construct Source – *BRP WS 15*
- **No local permitting through Board of Health**
- **Conservation Commission**
  - Approval previously received for well installation, monitoring well drive points at BVW, and short duration pump testing.
  - Amended filing in conjunction with the Comprehensive Permit is required for piping from wells to each site and water system construction.

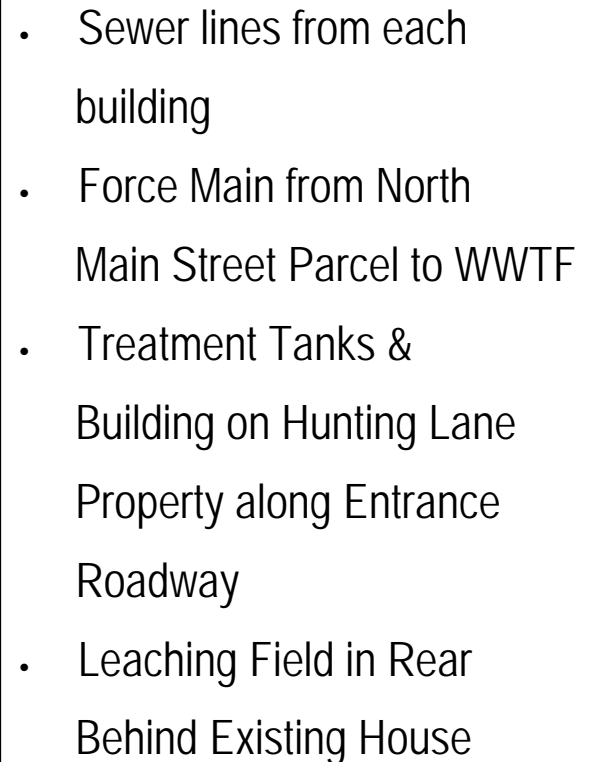


# Apple Hill Estates & Pine Residences MassDEP Groundwater Discharge Permit Program

- The Groundwater Discharge Permit Program was started in the 1980s
  - To date, there have been approximately 1,000 GWDPs issued in Mass.
  - Permits are most often issued to private residential condominium and rental developments such as Apple Hill / Pine Residences
- MassDEP is the sole approving authority per 314 CMR 5.00. The Process, from concept through operations, is highly regulated and overseen by MassDEP Engineers during permitting, construction and operations.
- Permitting is a two step process:
  - Hydrogeological Permitting (BRP WP 83) approves the site for a specific quantity of effluent into a tested and approved leaching field location
  - After the BRP WP 83 process is complete, the treatment system is approved as part of the BRP WP 79 GWDP application process



## System Description





# Apple Hill Estates & Pine Residences Wastewater System Description

- **Treatment System Commensurate with Groundwater Discharge Effluent Quality Limits**
  - Leaching Field is not located in any Mapped MassDEP Sensitive Areas
  - Anticipate treatment to remove Organic Material, Suspended Solids & Nitrogen
  - Anticipate Including UV Disinfection and an Active Odor Control System
- **Systems Under Consideration Have Proven MassDEP Track Record for Reliability and Consistent Effluent Quality**
  - Amphidrome
  - Membrane Bio-Reactors (MBRs)
  - Rotating Biological Contactor (RBCs)
  - Sequencing Batch Reactors (SBRs)



# Apple Hill Estates & Pine Residences Schematic WWTF System



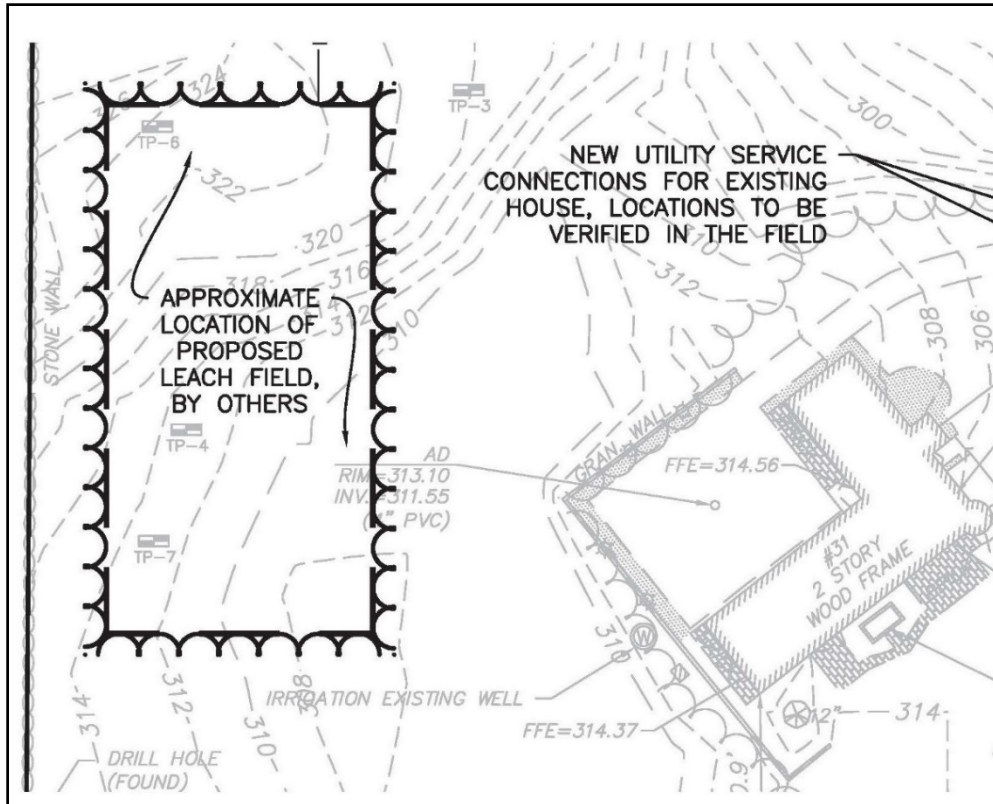
## System Description

- Pretreatment Tanks for Solids Settling
- Aerobic Treatment for Organics Removal and Ammonia Conversion
- Anoxic Treatment for Nitrates Removal
- Final Filtration for Solids Removal
- Active Odor Control System
- UV Disinfection for bacteria and virus destruction

# Apple Hill Estates & Pine Residences Effluent Disposal Area

## System Description

- Pumped effluent to gravity trenches
- Soils in this Area Generally Consist of:
  - Greater than 5-ft of Sandy Loam
  - Perc Rates less than 5 Minutes Per Inch (MPI)
  - Seasonal High Groundwater approximately 2 to 3 feet below grade
- Hydrogeological Analysis will determine groundwater mounding from effluent disposal, 4-ft minimum offsets (per DEP) will be maintained.



# Apple Hill Estates & Pine Residences Wastewater Treatment Facility Operations

- Operations are also highly regulated in accordance with 314 CMR 12.00.
  - Operators are required to be trained and licensed by the Commonwealth before being allowed to run any facility of this type.
  - All GWDP WWTFs are required to have an operation team that is available on a 24-hr basis to immediately respond to alarm conditions
- Prior to start-up of the facility, regulations require that an interest bearing escrow account be established with MassDEP as a signatory and 25% of the system's total construction cost be deposited into the account.
  - This account serves as a financial backstop in the event that permit compliance requires operational or system modifications.
- MassDEP requires monthly effluent testing as well as quarterly groundwater quality monitoring as part of all permits. This data is reviewed monthly and MassDEP has the regulatory authority to address any compliance issues.
- MassDEP conducts an annual inspection of every facility.



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**DISCUSSION / QUESTIONS?**

**THANK YOU!**

