

# Town of Madbury

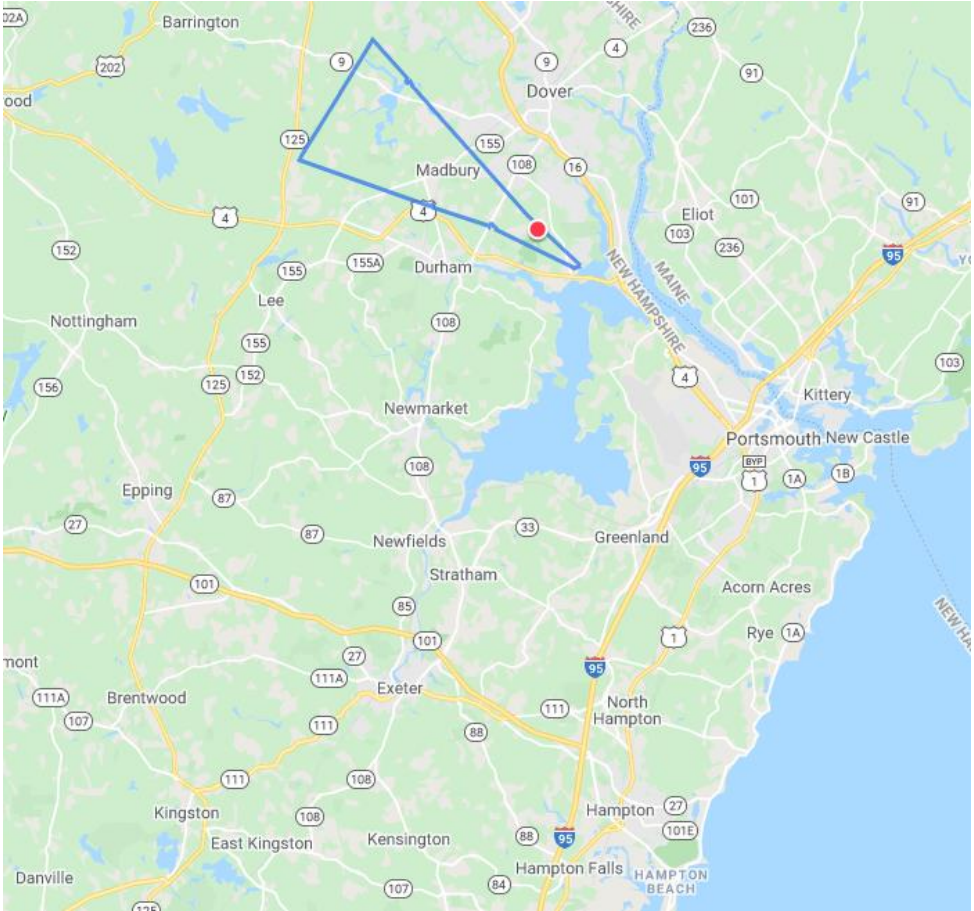
## *Water Resources*

Garret Ahlstrom  
March 26, 2021

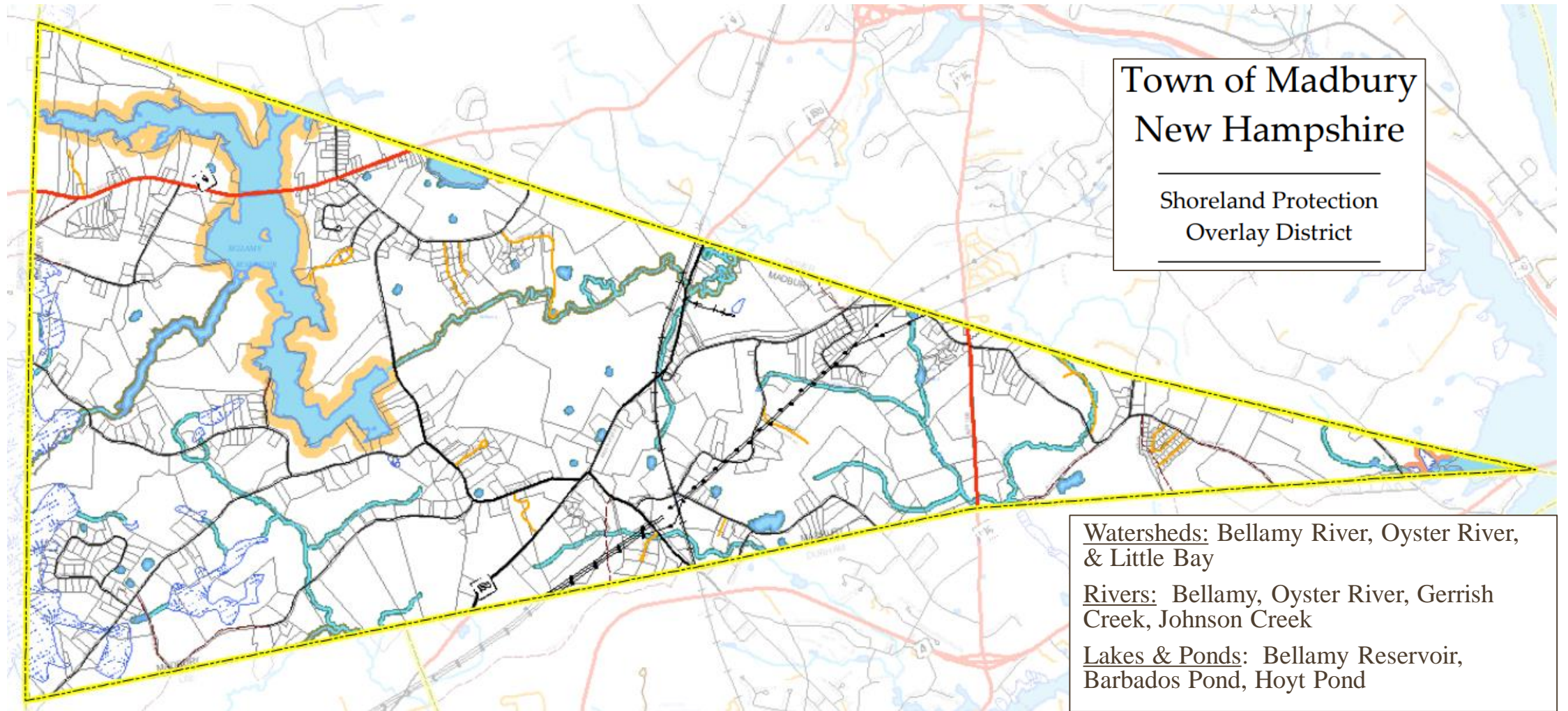


# Water Resources in the Town of Madbury, New Hampshire

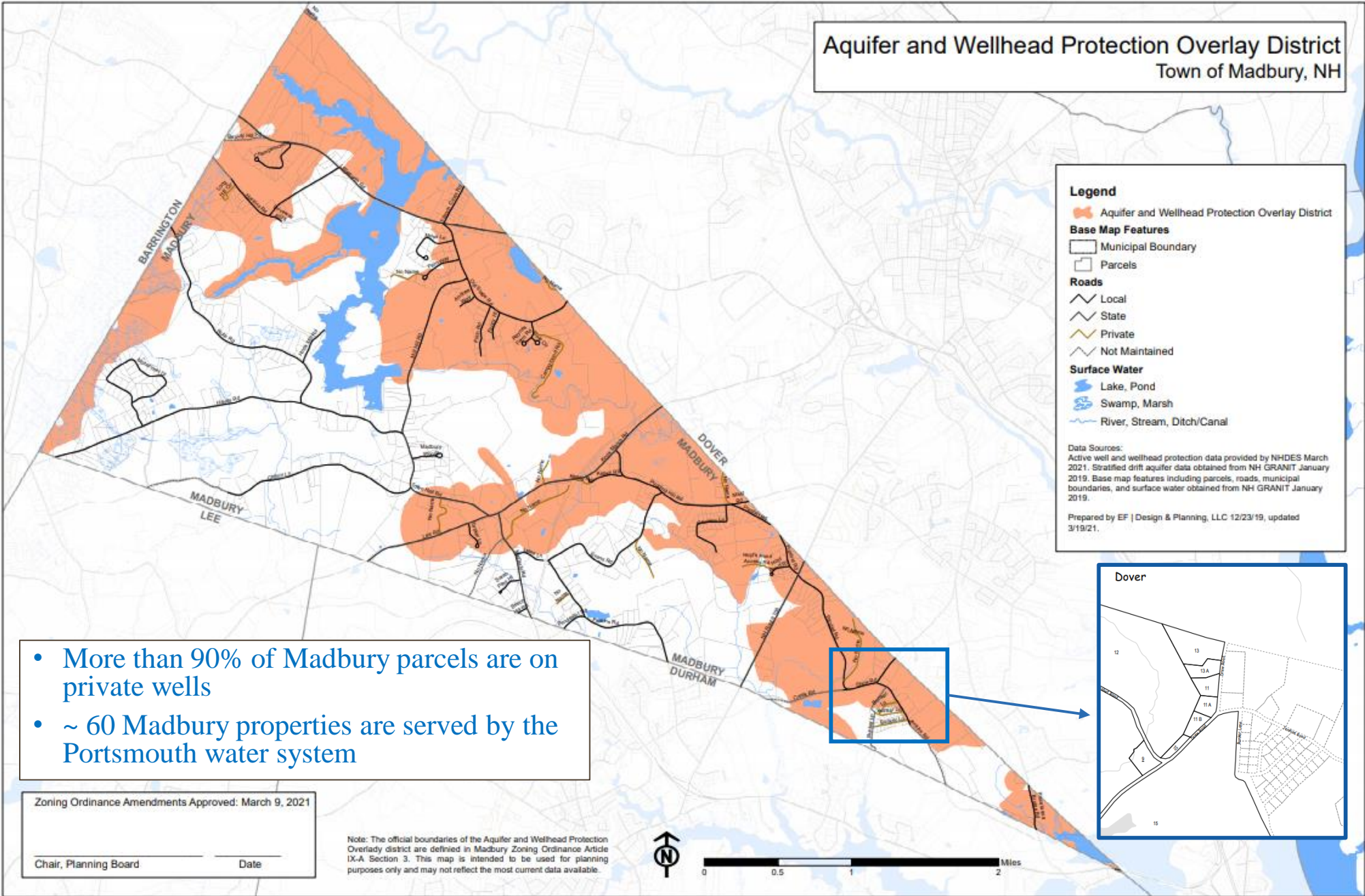
- Sources of Water
- Concerns
- Quality







# Aquifer and Wellhead Protection Overlay District Town of Madbury, NH



**Legend**

- Aquifer and Wellhead Protection Overlay District

**Base Map Features**

- Municipal Boundary
- Parcels

**Roads**

- Local
- State
- Private
- Not Maintained

**Surface Water**

- Lake, Pond
- Swamp, Marsh
- River, Stream, Ditch/Canal

Data Sources:  
Active well and wellhead protection data provided by NHDES March 2021. Stratified drift aquifer data obtained from NH GRANIT January 2019. Base map features including parcels, roads, municipal boundaries, and surface water obtained from NH GRANIT January 2019.

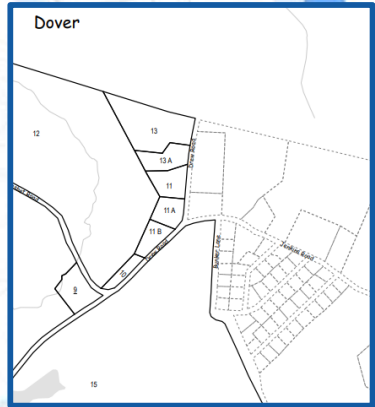
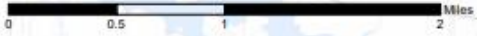
Prepared by EF | Design & Planning, LLC 12/23/19, updated 3/19/21.

- More than 90% of Madbury parcels are on private wells
- ~ 60 Madbury properties are served by the Portsmouth water system

Zoning Ordinance Amendments Approved: March 9, 2021

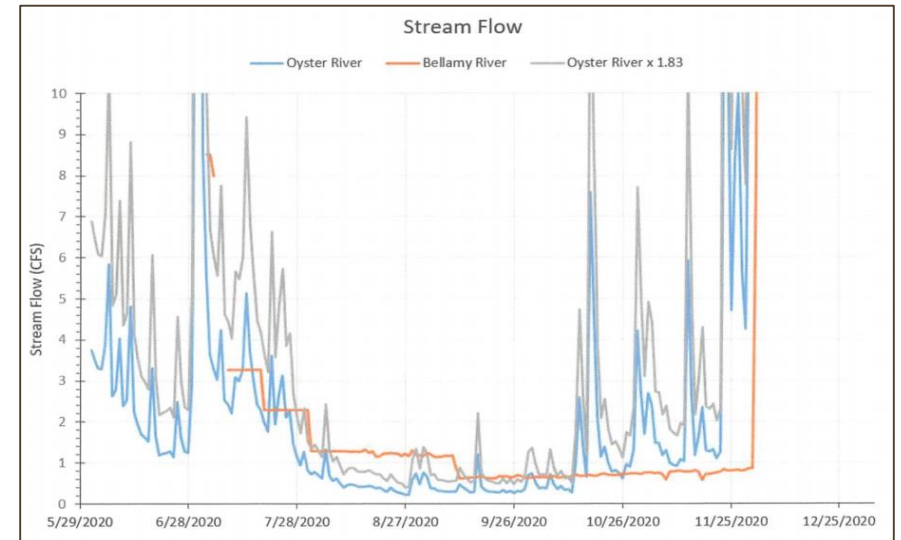
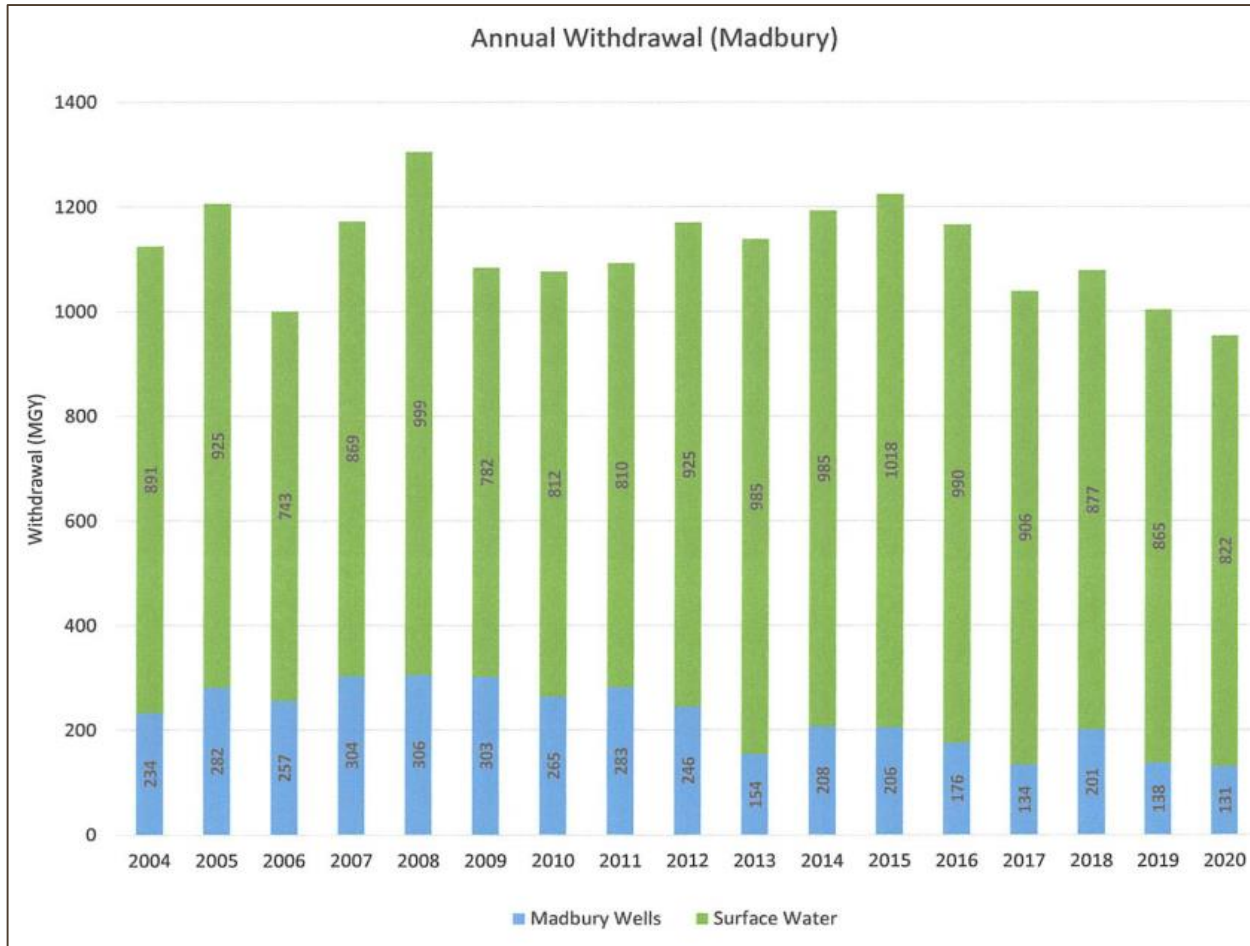
Chair, Planning Board \_\_\_\_\_ Date \_\_\_\_\_

Note: The official boundaries of the Aquifer and Wellhead Protection Overlay district are defined in Madbury Zoning Ordinance Article IX-A Section 3. This map is intended to be used for planning purposes only and may not reflect the most current data available.

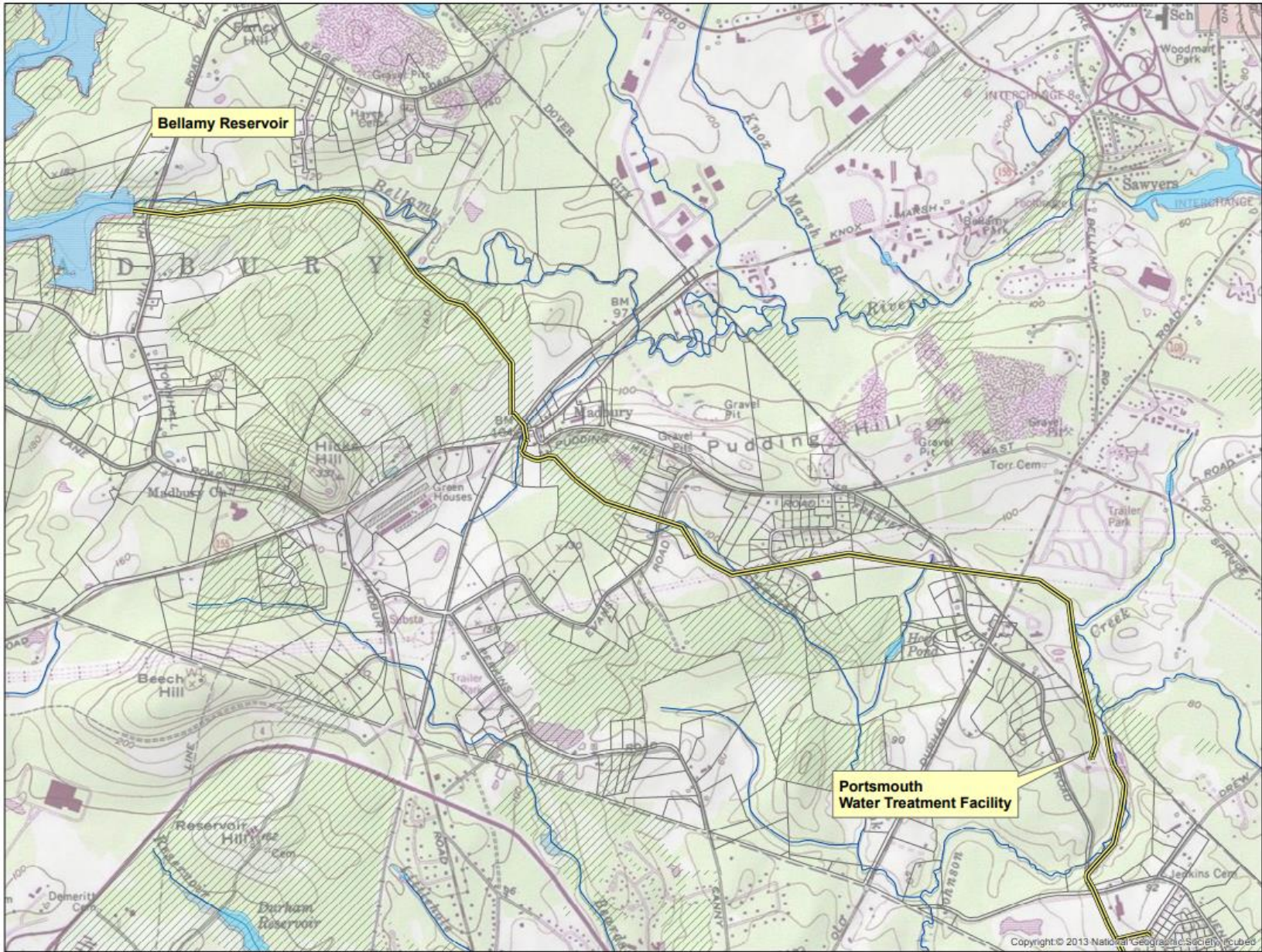




- About 70% of all Portsmouth Water System water comes from Madbury
- Historically ~ 1,100,000,000 gallons per year (~1100 MGY, 3MGD, 2100GPM)
- ~ 85% from Bellamy Reservoir, ~15% from wells on the treatment plant property
- Portsmouth is promoting water conservation and managing stream flow in the Bellamy





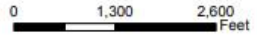


**Portsmouth  
Transmission Main  
Bellamy Reservoir to  
Water Treatment Facility**



**NOTES:**  
 Map is intended for use by the Madbury Planning Board for reference purposes only. The mapped location of the transmission main is approximate, thus should not be used for anything more than a general reference of its approximate location.  
 Map shall not be distributed to the public.

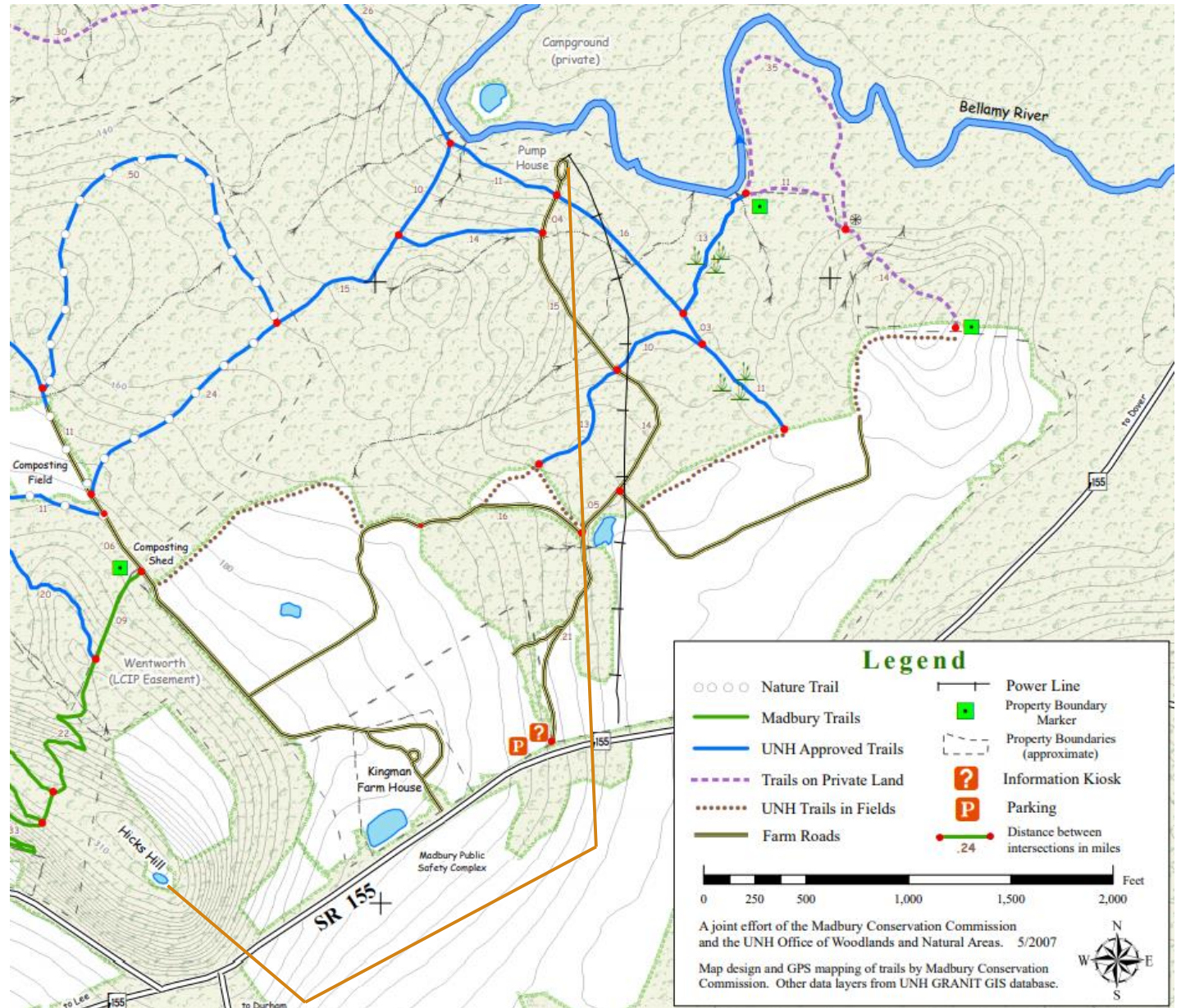
- Legend**
- Portsmouth Transmission Main
  - Surface Water
  - Approx. Parcel Bounds - Madbury
  - Conservation/Easement
  - Stream (NHD)





# Hicks Hill System

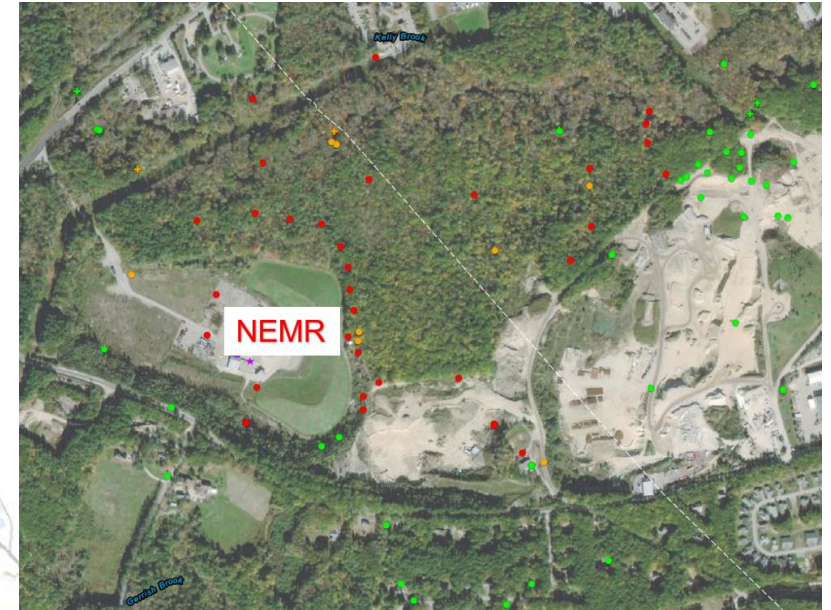
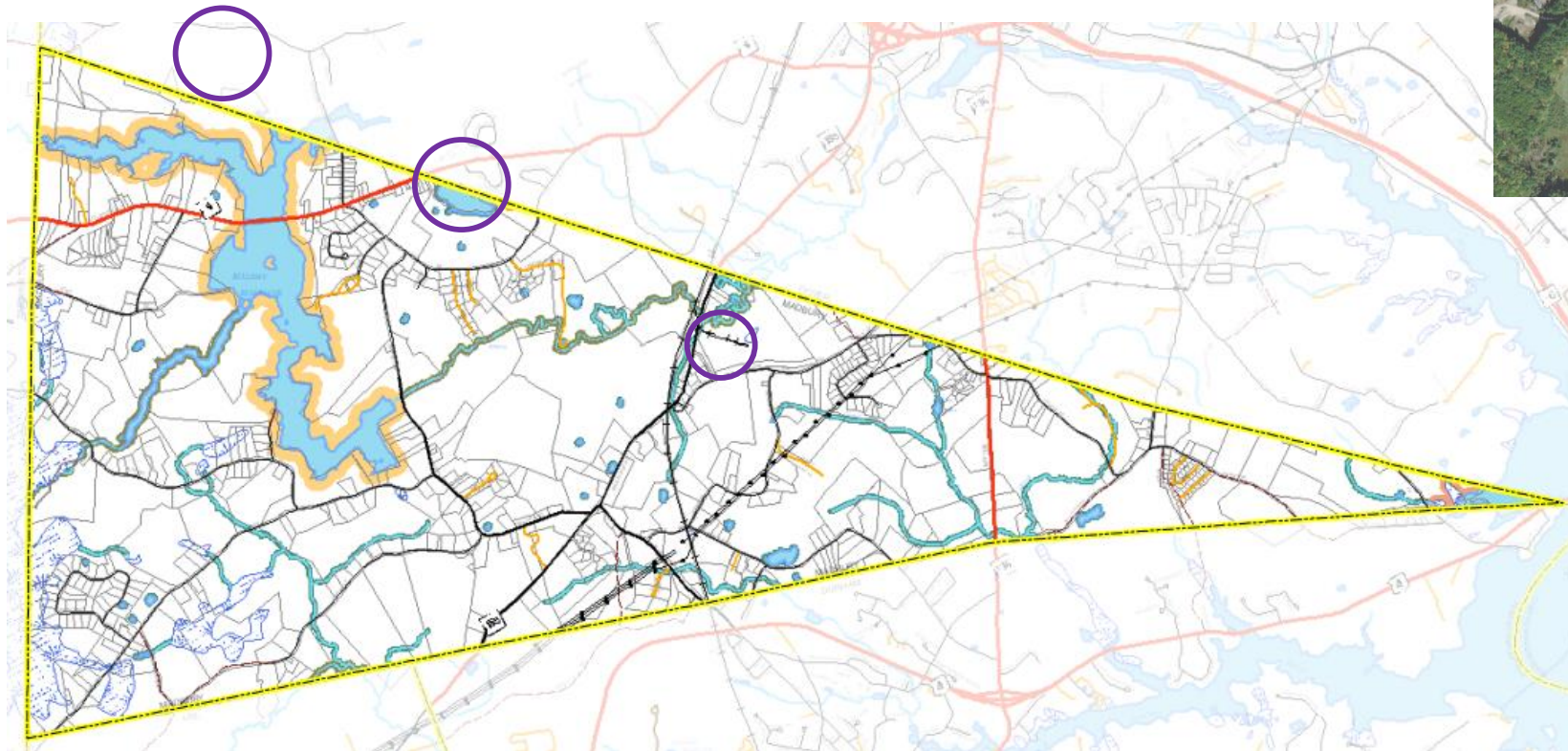
- The Town of Madbury maintains rights to withdraw from the Bellamy River
- Underground pipe connects a pump house to a small reservoir on Hicks Hill
- Originally served Elliot Rose
- System is not currently active





# Threats to Water Quality

- Tolend Road land fill > Bellamy Reservoir > Portsmouth
- Hydro-mining > Barbados Pond > Dover wells
- NEMR > Pudding Hill Aquifer > Dover wells





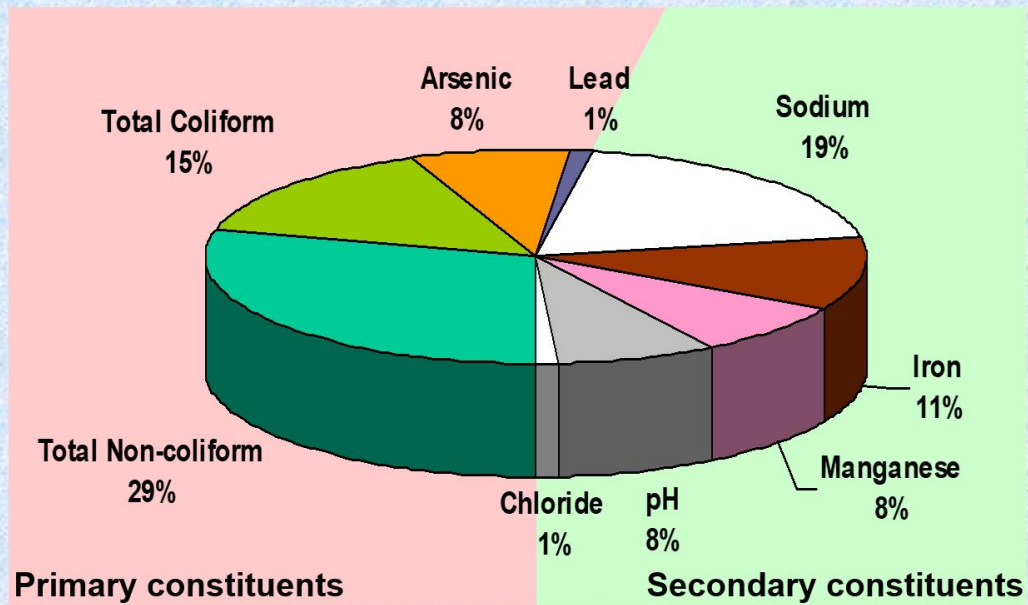
# Residential Water Testing

- 1989-90, wide range of constituents, 38 and 63 wells respectively
- 1994, radon, 29 wells
- 2000, VOC, 74 wells
- 2006, standard analysis, 54 wells
- 2012, VOC, 56 wells
- 2015, standard analysis, 40 wells
- (2015, MTBE and VOC, conducted by NH DES)
- 2019, standard analysis 41 wells, and PFAS/PFOS 38 wells

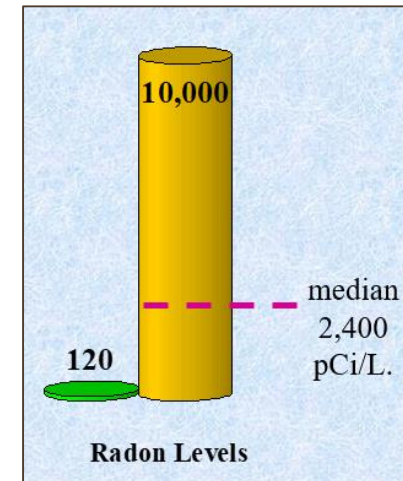
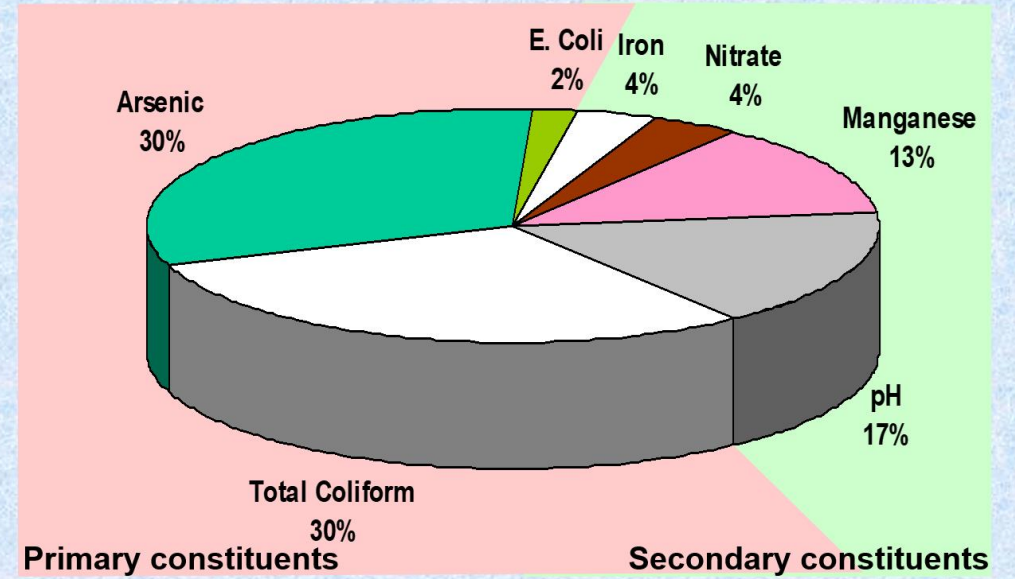


# Residential Water Testing

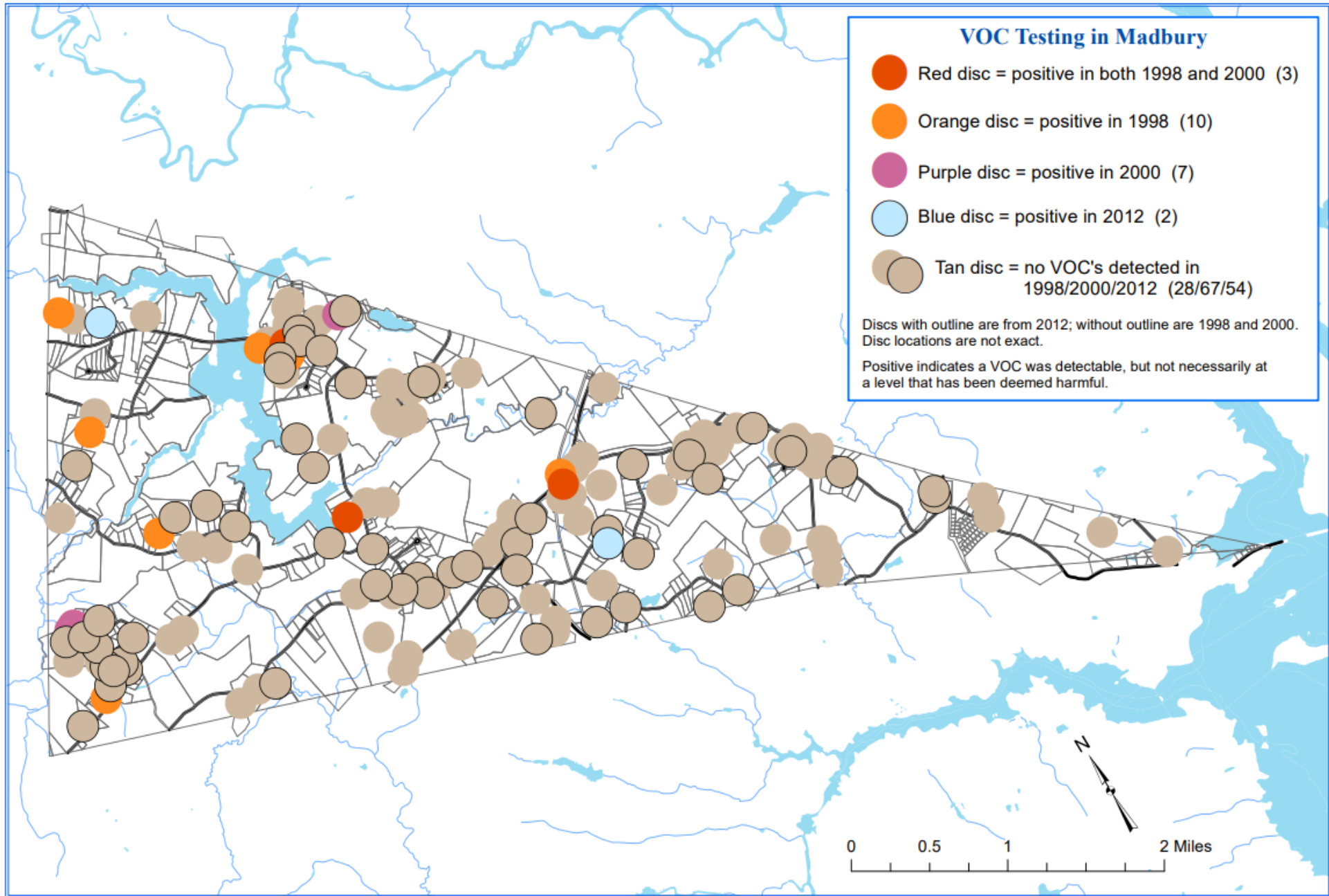
## Causes of Well Contamination 1989-90



## Causes of Well Contamination 2006

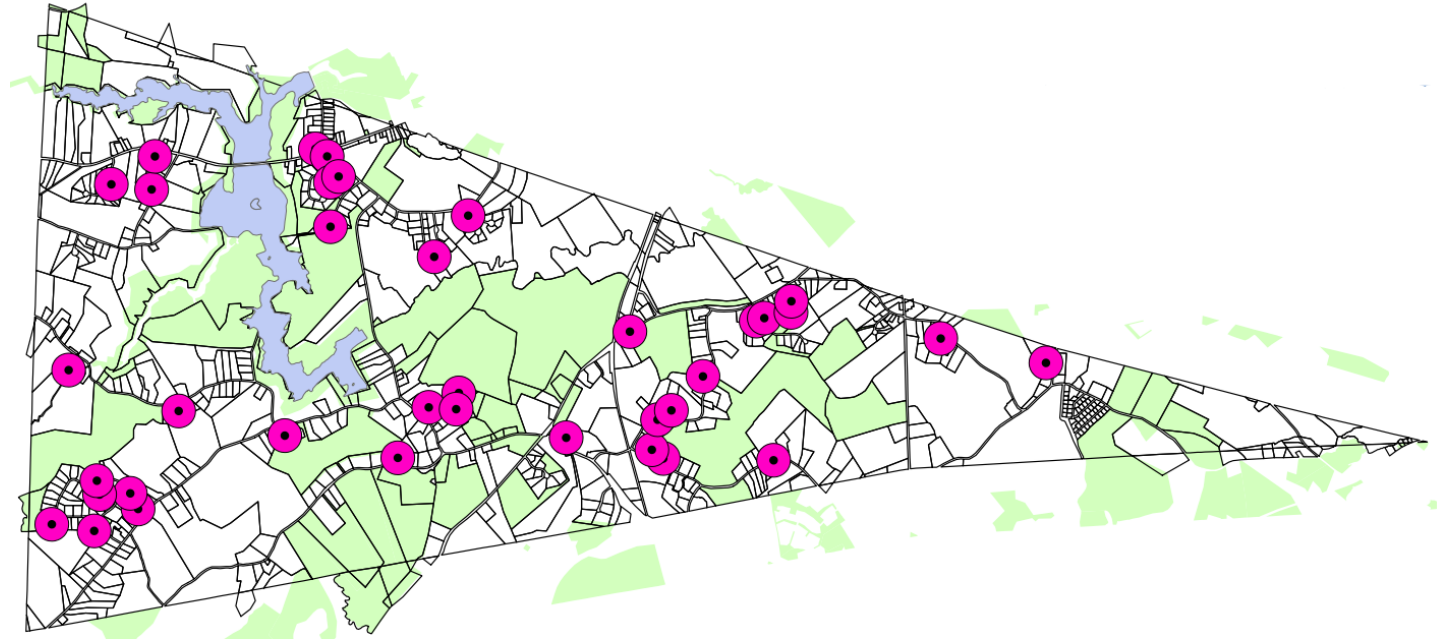








# 2019 Residential Well Testing



- In 2019 Madbury offered to collect samples from private homeowners for Standard Analysis test
- Homeowner paid about half (\$55); remainder (\$65) subsidized by the Madbury Water Board
- Additionally, DES offered VOC and PFAS analyses if Standard Analysis and GPS data was shared.
- Standard Analysis: Total Coliform Bacteria, E.coli Bacteria, nitrate, nitrite, chloride, sodium, fluoride, pH, hardness, iron, manganese, lead, copper, and arsenic
- 41 Samples total:
  - 37 Standard Analysis, VOC and PFAS
  - 3 Standard Analysis only
  - 1 Standard Analysis, VOC and PFAS for the DHHS biomonitoring program

# 2019 Residential Well Testing

- Summary of Standard Analysis samples (41) with results exceeding federal/state standards:

Parameter	EPA MCL or recommended	Number exceed MCL	%
• Arsenic	0.010 mg/L (MCL in 2019)	13	32%
• Arsenic	0.005mg/L (NH limit in 2021)	17	41%
• Iron	0.300mg/L	4	10%
• Manganese	0.050mg/L	3	7%
• pH	6.5-8.5	3	7%
• Nitrate	10mg/L	1	2%
• Total Coliform Bacteria present		6	15%

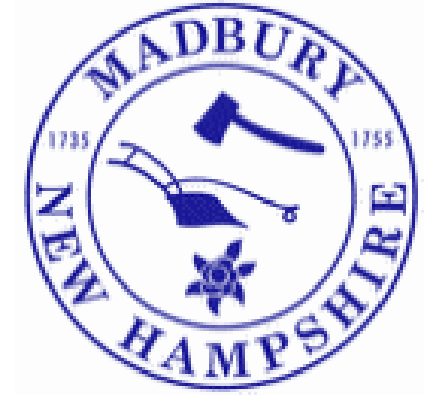
- Summary of VOC samples (38): no VOCs found
- Summary of PFAS samples (38): no sample exceeded the state limits for 4 PFAS compounds

<u>NH Limits: PFOA at 12 ng/L; PFOS at 15ng/L; PFNA at 11 ng/L; PFHxS at 18ng/L</u>	
• PFOA was found present in 19 of the samples (50%)	
• PFOS was found present in 8 samples (21%)	
• PFNA and PFHxS were not found in reportable levels	
• One sample over 100ng/L PFAS, however, none of the NH standards were exceeded	



# Madbury is Committed to Water Resources

Water resources is the first policy goal in the town's Master Plan:



## The Vision for Madbury

Be a quality residential community that preserves and maintains the Town's historic and rural character.

## Policy Goals

To achieve this Vision, the Town has established ten policy goals in order of priority:

1. Protect **water resources** in Madbury from contamination, depletion and disfigurement using watershed management principles. Act as stewards for municipal and regional water supplies located within the Oyster River, Bellamy River, and Little Bay watersheds.
2. Preserve Madbury's **rural atmosphere and landscape**. Protect and manage open space, wetlands, forests, fields, agricultural resources, scenic vistas, and historic resources for the benefit of present and future generations.

The town has benefited from its own conservation efforts as well as efforts from other entities including Portsmouth, the Forest Society, Farm and Ranchland Protection Program, Wetland Reserve Program, and the Land & Community Heritage Investment Program

# Thank You