

North Salem Aquifer Conditions and Groundwater Quality

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Author of: January 2008 Municipal Groundwater Report

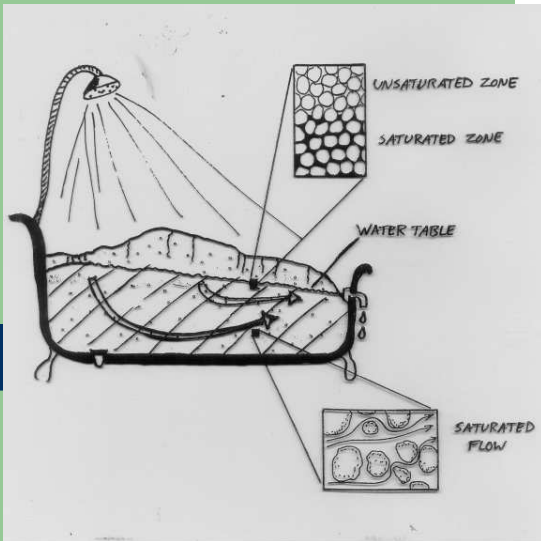
This presentation:

1. Hydrogeology 101
2. Review of available water quality data (mostly DOH)
3. What homeowners may want to consider & know

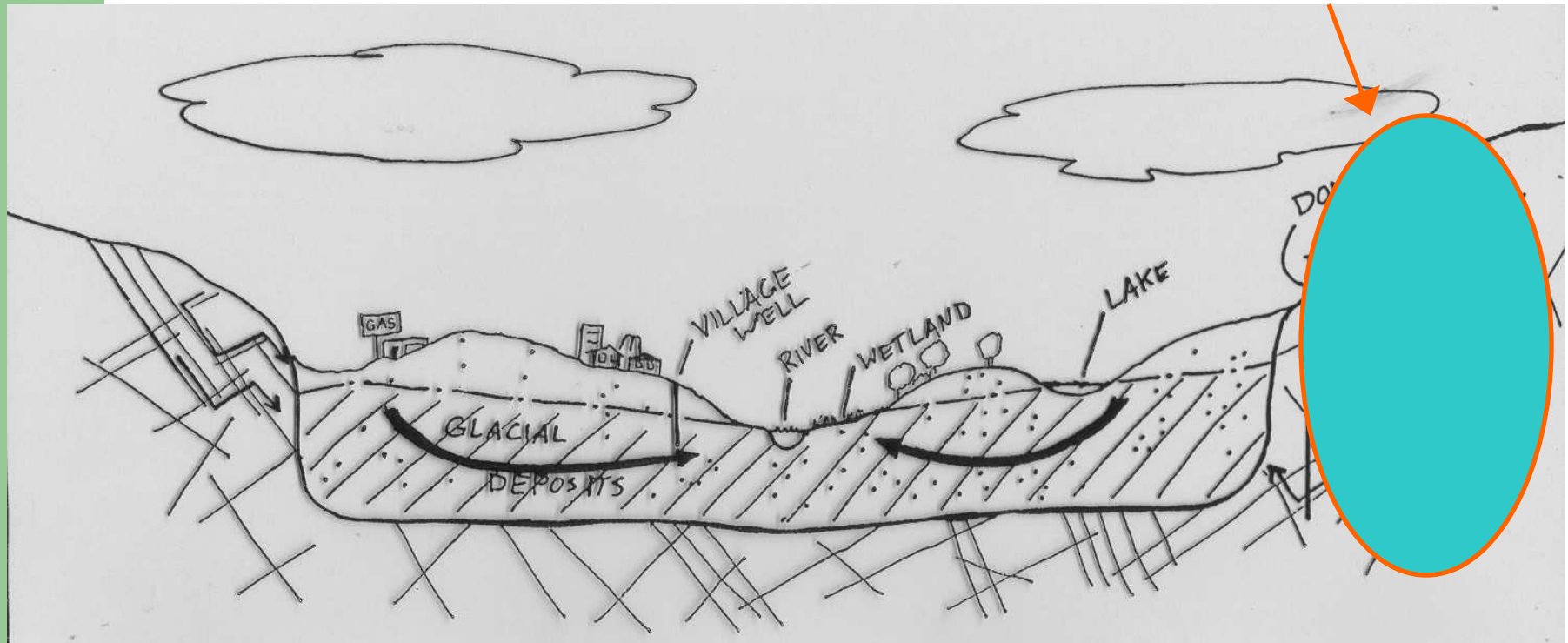
Hydrogeology 101

- Aquifers are Geologic Formations containing Useful Volumes of Water: This means all parts of North Salem overlie aquifers.
- Bedrock Aquifers: Nearly all wells in North Salem are drilled into rock and get water from fractures in rock.
- Recharge Source: Recharge comes from precipitation, which is about 46 inches/year.
- Recharge Rates Vary: From over 20inches/year on sandy soils to under 8inches/year in silt/clay soils
- Generally Plenty: There is generally plenty of groundwater for current and some future uses. But local overuse can occur, either by concentrated overpumping or overtaxing water with septic returns.

Critical Groundwater Functions



Typical
North Salem



Groundwater Quality

Resources available to date:

- Private well samples (very few)
- Some known spills and problem areas
- DOH records from many regulated locations (public buildings, water supplies, restaurants, schools).



Resident Volunteer
Charlotte Harris
collecting data

Groundwater Quality

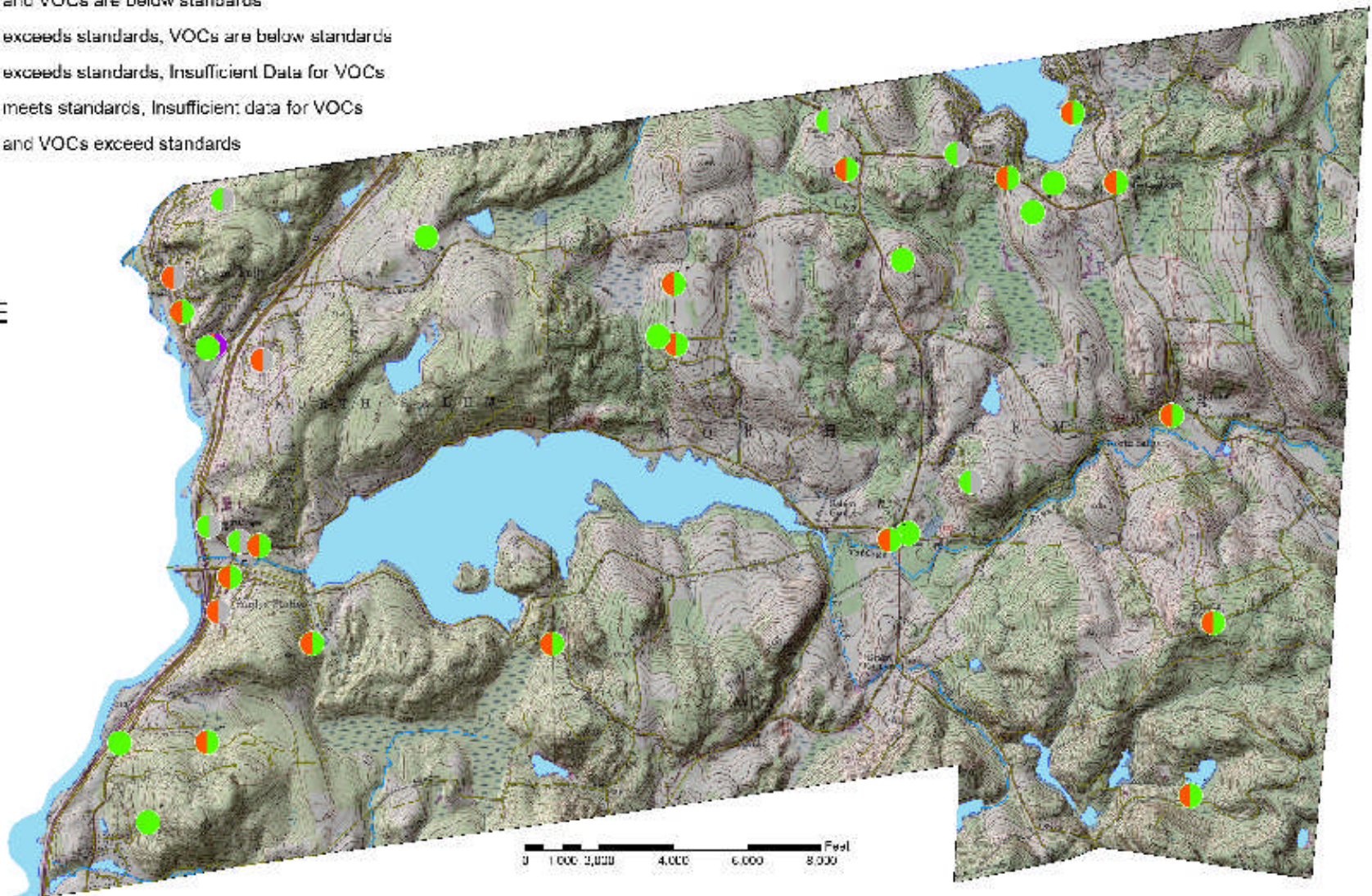
- Quality defects are either Human-Caused or Natural
- Human-Caused:
 - Salt from road salt, or water softener discharges to septic fields
 - Petroleum/solvent compounds
 - Septic Systems - nitrate, bacteria, pharmaceutical residues
 - Agricultural chemicals - nutrients, pesticides, herbicides
- Natural:
 - Iron, manganese, sulfur, hardness, corrosivity
 - Radiologicals (radium, radon, alpha/beta)

Human-Caused (nom-septic system)

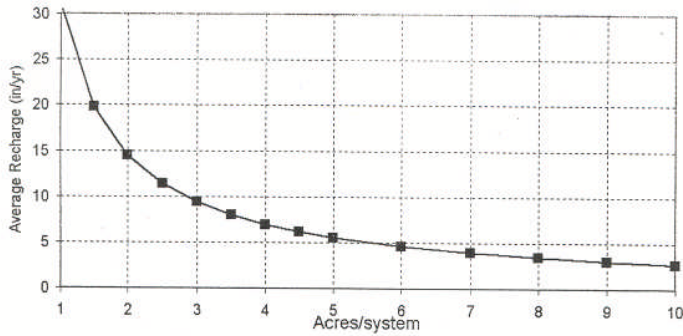
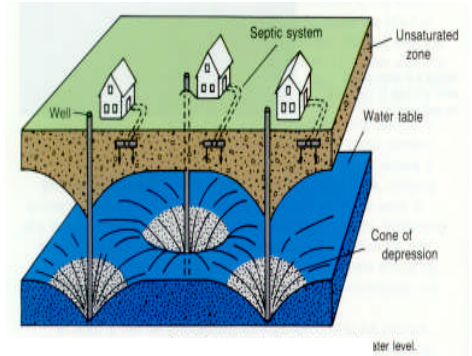
Legend

Human-Caused

- Sodium and VOCs are below standards
- Sodium exceeds standards, VOCs are below standards
- Sodium exceeds standards, Insufficient Data for VOCs
- Sodium meets standards, Insufficient data for VOCs
- Sodium and VOCs exceed standards



Septic Systems Areas of Concern

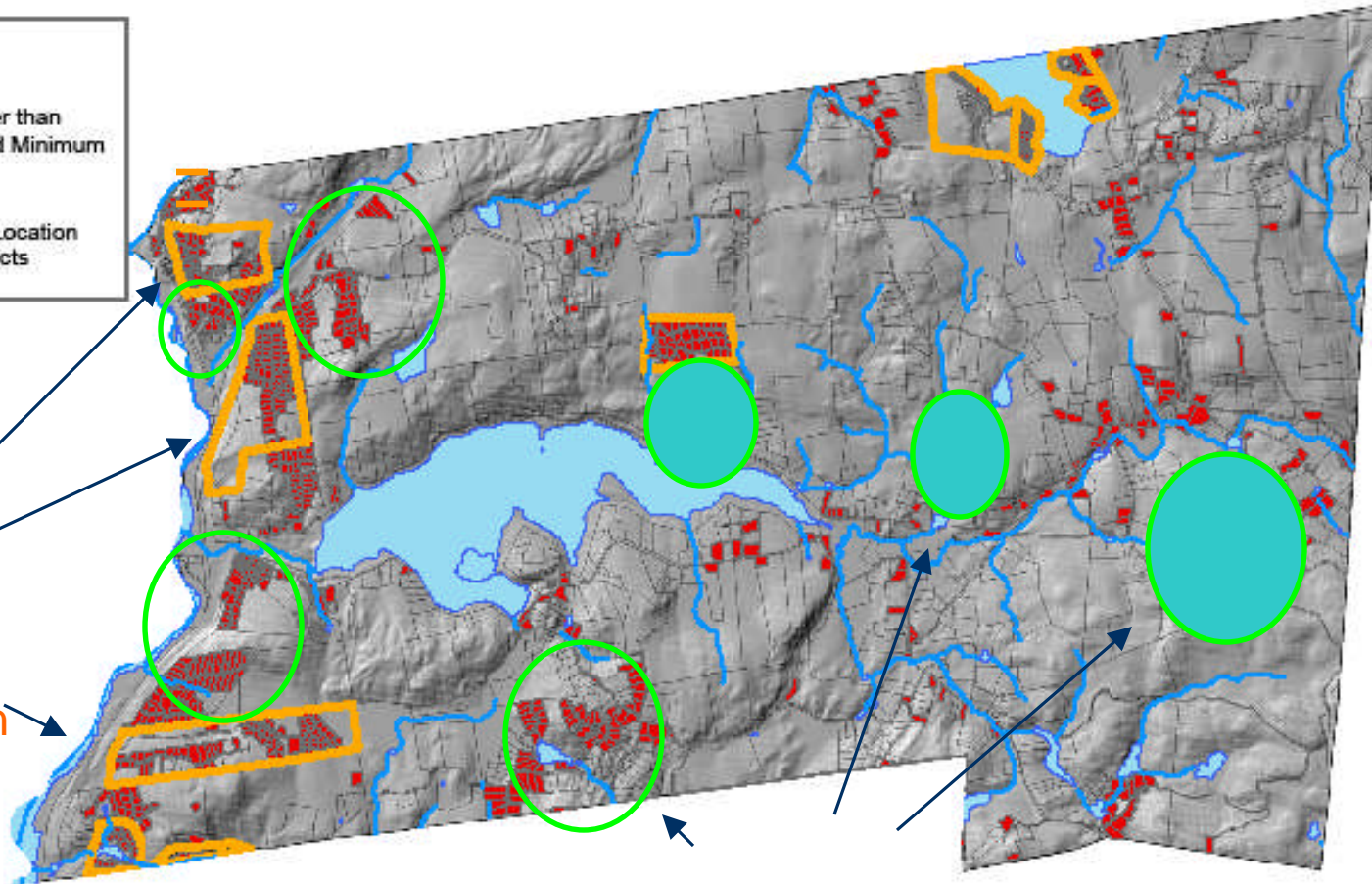


Legend

- Parcels Smaller than Recommended Minimum Parcel Size
- Approximate Location of Water Districts

Water district systems provide protection

Areas of possible concern

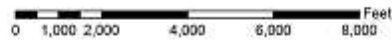
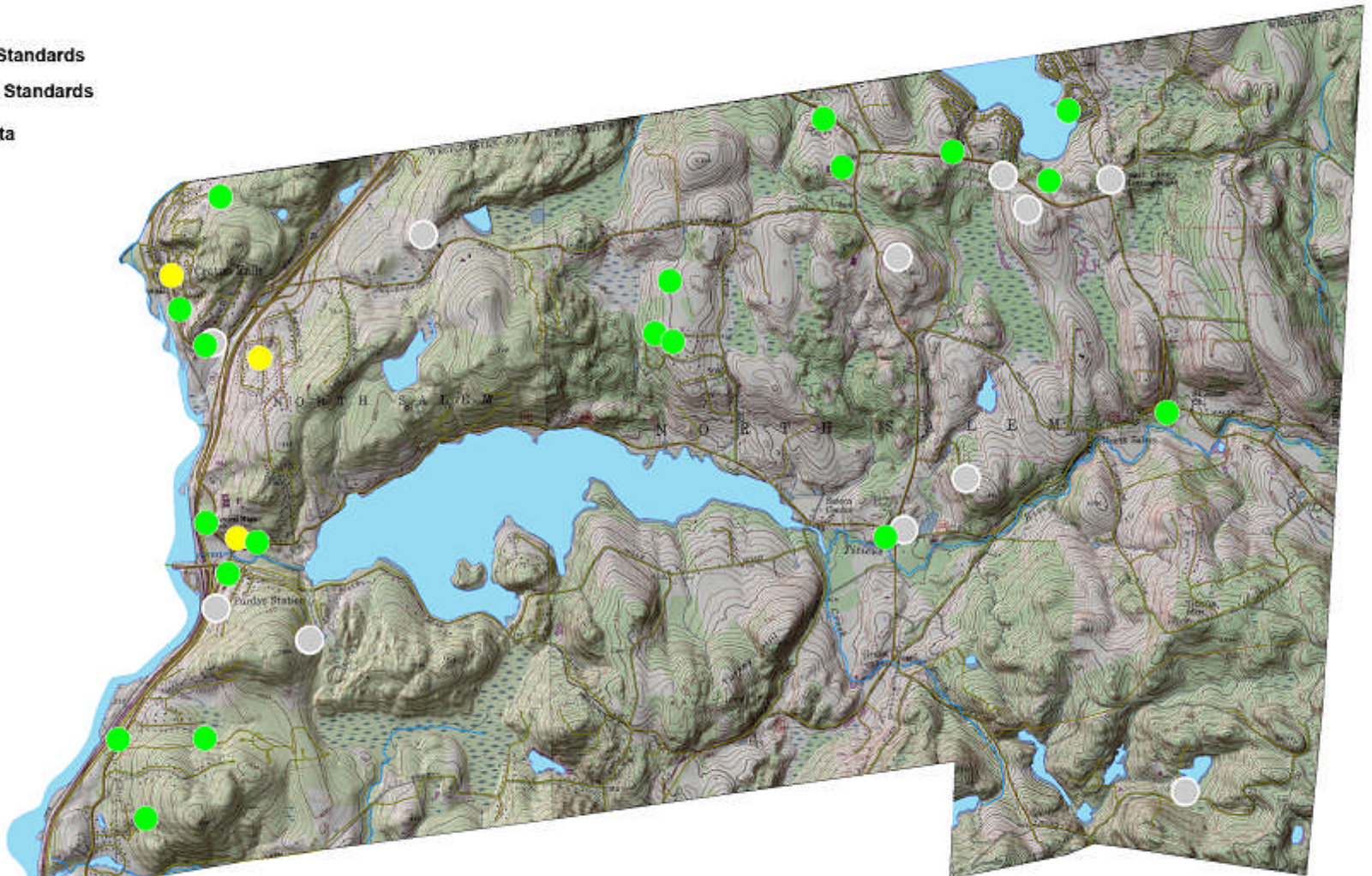


Radiologicals (excluding radon)

Legend

Radiologicals

- Levels Within Standards
- Levels Exceed Standards
- Insufficient Data

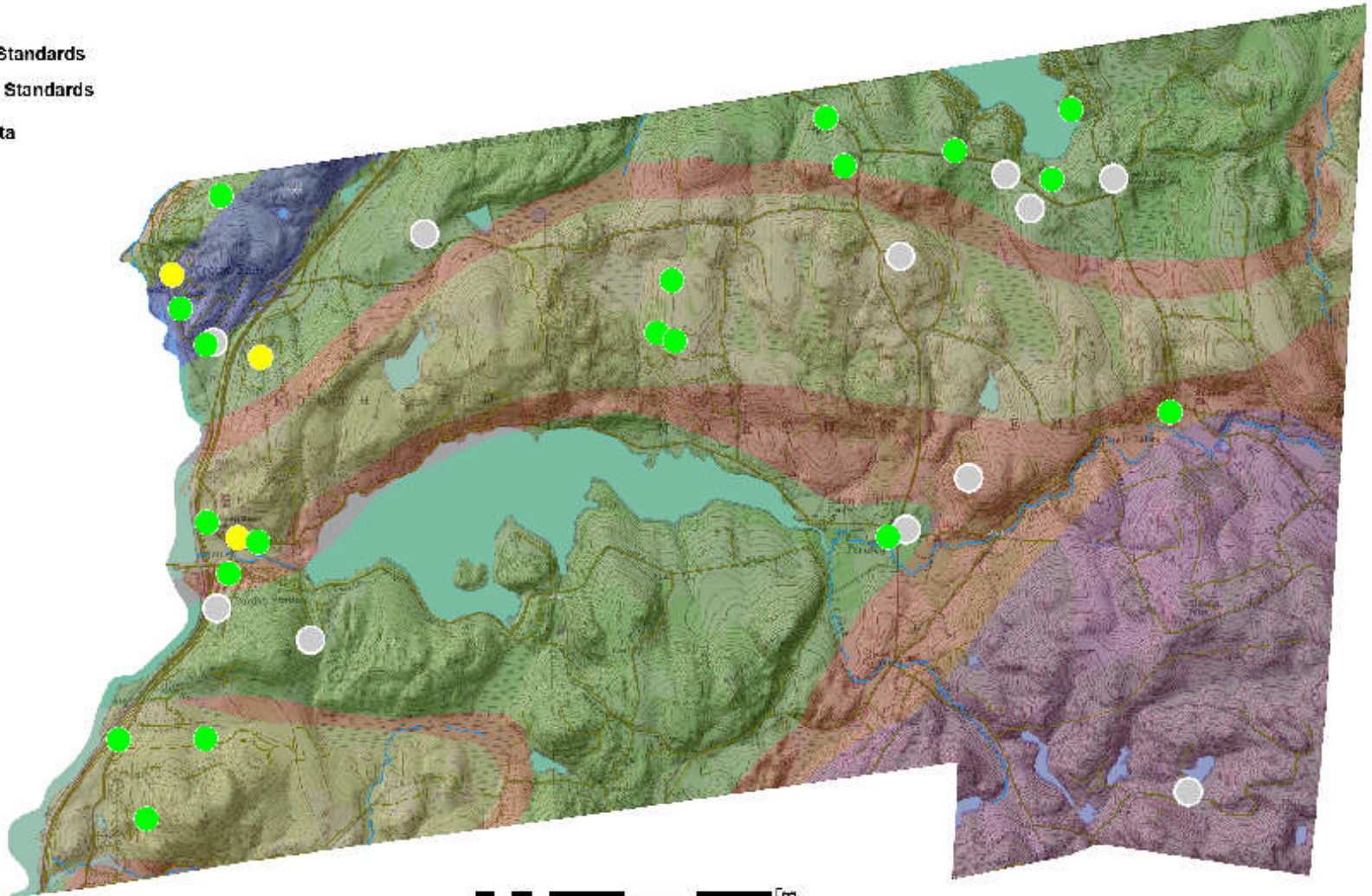


Radiologicals – no obvious geologic pattern (yet)

Legend

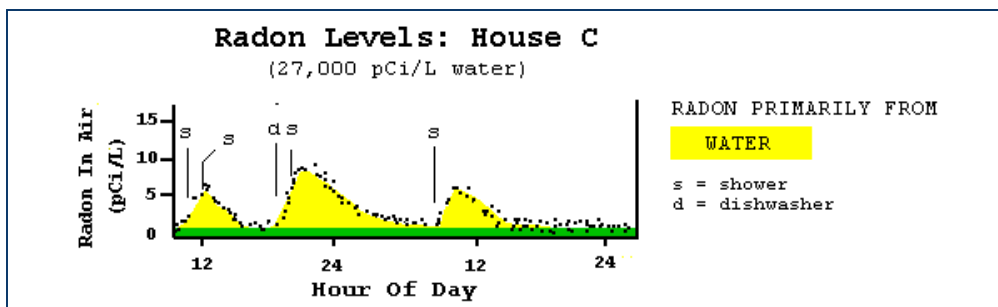
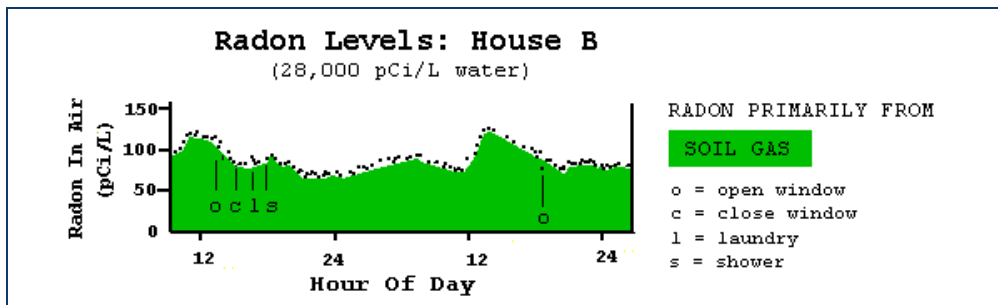
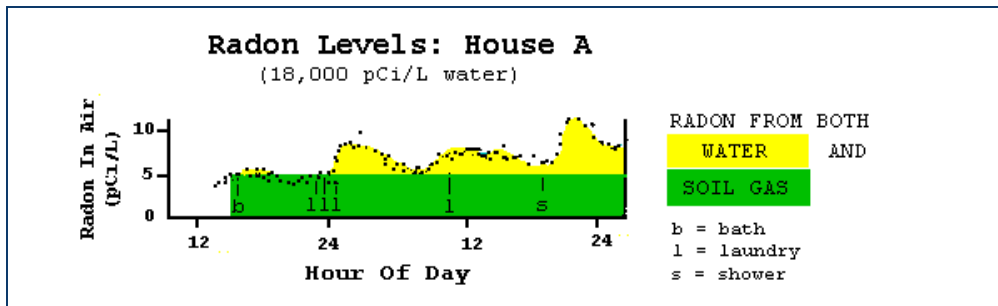
Radiologicals

- Levels Within Standards
- Levels Exceed Standards
- Insufficient Data



0 1,000 2,000 4,000 6,000 8,000 Feet

Radon from soil gas or water supply sources



Radon is a breakdown from Radium 226

Radon in homes can come from water or soil gas.

Radon in water is released mostly from hot, moving water (showers, dishwasher, clotheswasher)

Source: University of Maine

Ideas to Discuss

- Generally good water in North Salem. More data would help. County well sampling law may help.
- Private wells less understood. Sampling is encouraged:
 - 1) septic system contaminants: nitrate, nitrite, e-coli
(sample in dry late summer for “worst case”)
 - 2) salt; sodium, chloride
 - 3) other common concerns: iron, manganese, total coliform, odor, total hardness, VOCs.
 - 4) radiologicals from geologic formations: radon (gas or water) and perhaps sample for radium 226
- Lab costs for compounds above run \$200 to \$300
- Treatment options exist, or connect to central water