

Regional Source Water Planning Initiative in the Metropolitan Manchester Area



Southern New Hampshire Planning Commission

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Purpose of Initiative

- Work with the region's 13 municipalities to develop, adopt and implement tangible **source water/wellhead protection plans, rules and ordinances** for each community
- Address the **planning and implementation elements** of the NH DES Source Water Protection Grant Program
- SNHPC (Regional Planning Commissions) offer a unique planning role to assist municipalities in participating in the grant program and developing these plans
- Upon award, an **Advisory Committee** is typically formed or a municipality's existing Technical Coordinating Committee is utilized to guide the planning process



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Goals of Initiative

- Develop/seek adoption of a **Source Water Protection Plan** for each community in the region (focus on groundwater)
- Inventory and map – all active **Public Water Supply Systems** (public and private); existing **Wellhead Protection Areas (WHPAs)**; and **Potential Contamination Sources (PCS)** in each town
- Assess **threats** posed by PCSs and identify protection needs
- Promote education, inspection and implementation of **BMPs**
- Develop/seek adoption of local **land use regulations** to protect community's groundwater/drinking water (focus on stratified drift aquifers and WHPAs)



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Current Status of Initiative

- Between 2007 and 2011 - SNHPC applied for six **Source Water Protection Grants** to accomplish the goals
 - total of \$92,000 was awarded plus \$15,000 from SNHPC as in kind
 - we have worked with 9 communities to date
- **Four** of the **six** grants have been completed!
- SNHPC is currently working with the towns of Goffstown and Derry to develop/adopt plans and establish/update regulations.
- **Two** final grants are planned in FY 2012/13 for the towns of Londonderry and Bedford which will complete the initiative



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Conditions Before Initiative

- Only **Two** municipalities in Region with Source Water Protection Programs – Raymond and Goffstown
- **Seven** towns with no groundwater/aquifer protections or land use regulations in place at all
- **Six** towns with out of date 1970/80's era -- aquifer mapping/overlay zoning
- **Very limited** to no municipal inspections of PCSs or knowledge of existing KCS or PCS within community
- **Very limited** community-wide knowledge of wellhead protection areas and existing groundwater protection regulations



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Results of Initiative

- **Eleven** towns participating in initiative. **Two** municipalities – not participating
- **One** new wellhead protection program has been established.
- **Two** new aquifer protection ordinances have been adopted. **Five** existing aquifer protection ordinances have been updated and adopted at Town Meetings.
- **Two** planning boards have adopted site plan/subdivision regulations aimed at protecting groundwater and **five** towns are considering.
- **Three** towns now have adopted Source Water Protection Plans in place. **Five** towns are planning to adopt plans this year. One **town** denied their plan.



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Regional Context

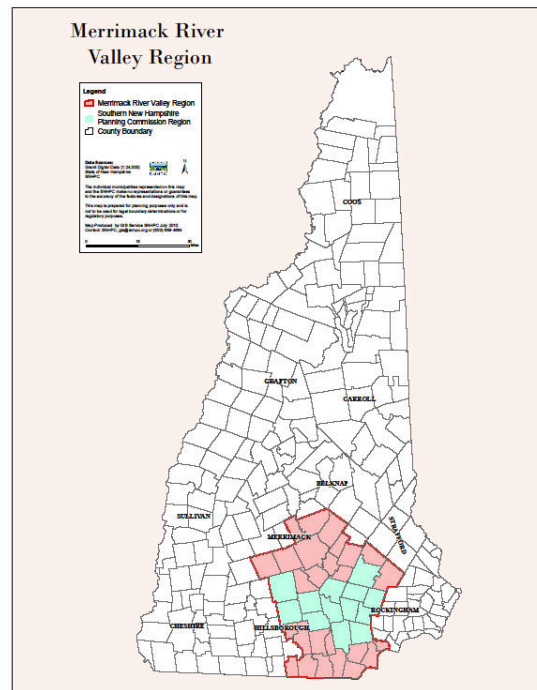
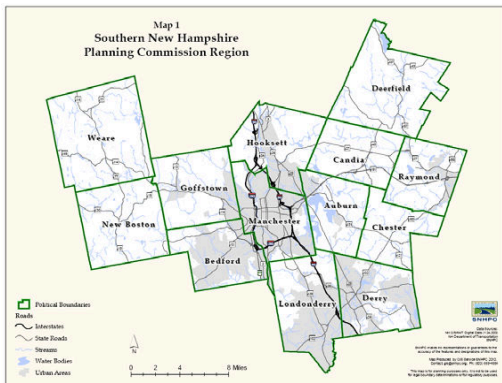
The **SNHPC Region** or **Manchester Metropolitan Area** – largest populated region of the state is home to:

- **261,262** people (2010 Census);
- **7,613** businesses (2008 NH Economic Labor MIB);
- **126,942** jobs (2008 Ibid.)
- **13** municipalities, including Manchester ranging in size from 3,909 to 109,565;
- **3** counties – Hillsborough; Merrimack and Rockingham
- And the **Merrimack River** – “The River That Runs Through It”!



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SNHPC Region within the Merrimack River Valley





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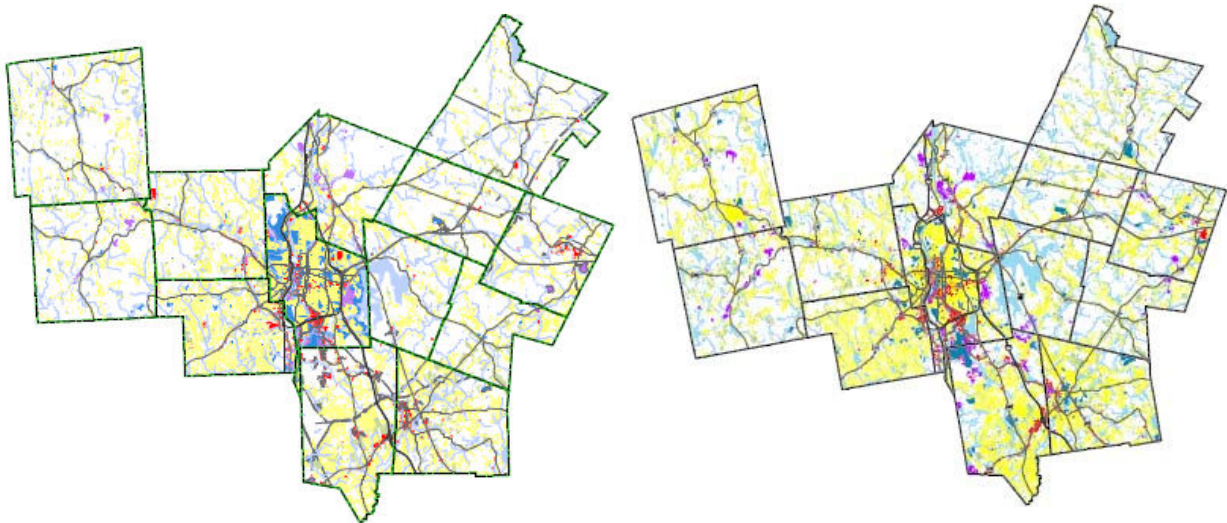
Growth Pressures

- The region is projected to add over **41,000** more residents over the next **20** years (OEP projections);
- Despite recent economic downturn, the region is consuming land at a steady and constant rate.
- In 1995, approximately **38%** of the region was developed. By 2009, the amount of developed acres increased to **44%**
- At this rate, we estimate that roughly **156,487 acres** or almost **50%** of the region will be developed by **2015**
- This will leave roughly **145,973** acres or **50%** of the region as open/undeveloped lands.



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Our Changing Landscape



2005 Existing Land Use

2010 Existing Land Use



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The Region's Water Resources by the Numbers

Surface Waters (Rivers/Lakes and Wetlands) = 27,000 acres or 8% of Region

Stratified Drift Aquifers (GRANIT) = 82,722 acres or 26% of Region

Population Relying on Groundwater (USGS 2005)

Household Wells = **97,735**

Community Water System Wells (total wells #84) = **5,802**

Population Served by Municipal Water Supply Systems = 160,029

Total Annual Groundwater Consumption (USGS 2005) = 7.674 mgd

Domestic = 6.583 mgd

Community Water Systems = 0.781mgd

Seven Municipalities Currently Relying on 100% Groundwater as Drinking Water

Population of the Region Relying on Groundwater = estimated at 103,537 (2005) or 39%

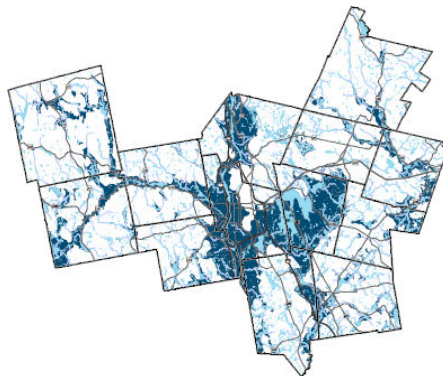
Total Population of Region = 263,566 (2005)

Source: GRANIT/USGS/Census



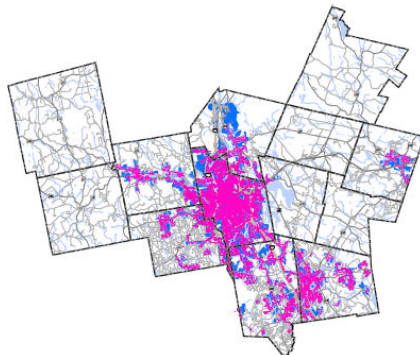
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Stratified Drift Aquifers/ Extent Public Water Systems



Source: GRANIT

**Stratified
Drift
Aquifers
(GRANIT)
=
82,722
acres
or 26% of
Region**



Source: MWW

Manchester
Water Works –
largest supplier
–16 million gpd
– 159,000
customers



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Known Contamination Sites



Source: NH DES One Stop

**Hazardous
Waste
Generators:**

1,294 sites

**Underground
Storage
Tanks:**

720 sites

**Above Ground
Storage
Tanks:**

181 sites

**Groundwater
Hazards:**

992 sites



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Why Source Water Planning?

- **Basic Public Health and Prevention:** most public water supply in NH is groundwater as primary source
- Groundwater is one of the most valuable natural resources in a community – Municipalities have an **interest** and **public duty** to protect their aquifers and source water supply
- Once **groundwater is contaminated** -- it may never recover and it is often too costly to clean
- Public and local officials have limited knowledge of all the community wells, WHPAs and threats to these systems in their communities – the plan's **educate, raise public awareness** and provide opportunity to step back take a look and see what can be improved....



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Factors to Keep in Mind

- This is the first time the region's municipalities (planning boards) have addressed Source Water Protection on a **comprehensive basis**.
- This is the first time **community-wide** Source Water Protection Plans have been prepared for the region's municipalities.
- **To be effective** -- we found the plans need to be crafted to be adopted by the planning boards as part of town's master plan.
- **To be successful** – the entire source water protection framework in New Hampshire (DES groundwater rules/model ordinance) -- must be explained so that planning boards/town officials/public fully understand what is being studied and why the plans are needed. With this understanding in place, public officials will be more fully vested in and support the effort. This requires constant education.



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Some Common Questions and Issues

- What is a public or community water system?
- Why should we protect privately owned systems?
- Should we involve local water precincts/districts?
- Should we protect all groundwater used as drinking water or only aquifers in our community?
- What's the difference between a WHPA and a sanitary protective radius?
- What is a KCS and PCS?
- How can we afford to conduct BMP inspections?
- How do we identify/assess threats to these systems?
- Why do we care about certain types of land use?
- What is the best source of aquifer mapping?
- Should we include all or portions of the NH DES Model Ordinance?



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What Is a Source Water Protection Plan (SWPP)?

The Planning Process begins with a **good definition** and **public purpose for the plan**:

A **Source Water Protection Plan** is a **planning guide** designed to enhance/protect drinking water supplies – source water areas – both surface and groundwater

The **purpose of the plan** is to:

- Identify the “public water systems” in the community;
- Identify threats to those systems e.g. PCS and KCS; and
- Recommend strategies and measures to protect the community’s source water and wellhead protection areas from contamination.

“Public Health”, “Best Management Practices” and “Land Use Planning” lie at the core of an effective source water protection plan



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Basics Parts of a Source Water Protection Plan

- **Inventory of the Community’s Public Water Supply Systems**
- **Identification/mapping of Wellhead Protection Areas (WHPA) and Aquifers**
- **A PCS Inventory and Assessment – field survey and use of Source Water Assessment Reports**
- **Protection and Management Action Strategies**

Like any good plan, a “Source Water Protection Plan” needs to be updated as conditions change and potential water sources are located.



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Focus on Source Water and Wellhead Protection

- **Source Water** is untreated water from streams, rivers, lakes, or underground aquifers which supply wells and public drinking water.
- **Wellhead Protection** is the act of “prevention” and the best line of “defense” a municipality, water supplier or homeowner can take to protect their drinking water supply from contamination.

A good SWPP aims to provide for both source water and wellhead protection



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What is a Public Water Supply System?

A **Public Water Supply (PWS)** is defined as “a piped water system having its own source of supply, serving 15 or more services or 25 or more people, for 60 or more days per year.”

A PWS is divided into three system types:

C - Community System: such as municipal, apartments, condos, mobile home parks, single-family developments.

P - Non-Transient/Non-Community: such as schools, daycares, year round office buildings, commercial/industrial businesses.

N - Transient/Non-Community: such as restaurants, motels, hotels, ski areas, beaches, campgrounds, etc.

A PWS can be private or publicly owned. All “active” PWSs should be identified and described in a source water protection plan.





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What is a Wellhead Protection Area (WHPA)

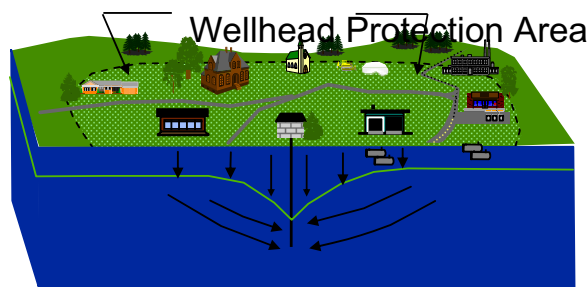
- The **contributing area** to a public water supply well from which water and contaminants are likely to reach the well
- NH DES recognizes WHPAs for “active” **C - community water systems** and for **P - non-transient, non-community water systems**, but not for **N - transient systems**
- There are **very few state restrictions** which apply to WHPAs except for hazardous waste, landfills, treated contaminated soils, etc.
- **Protection of source water in WHPA rests with municipality**



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How is a WHPA Delineated?

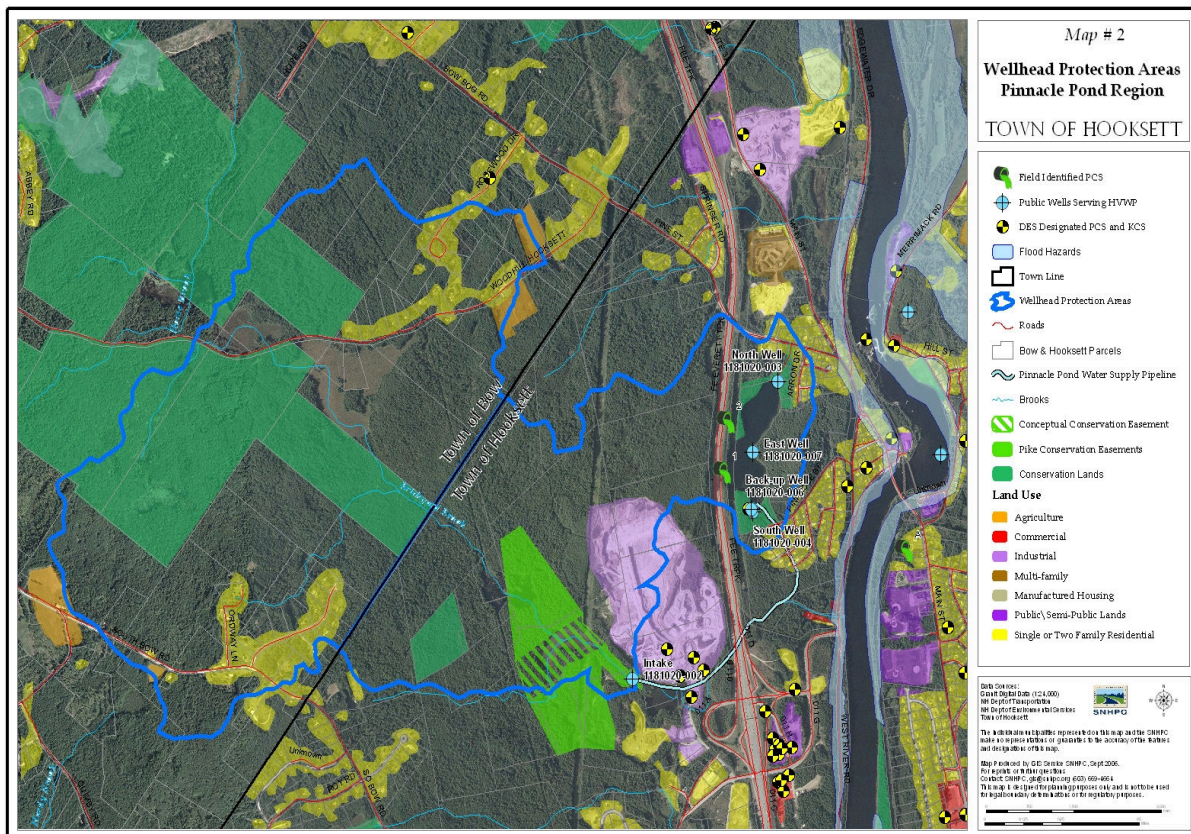
- For **bedrock wells**, the WHPA is a **circle with a fixed radius** based on production volume (max. daily amount of water withdrawn from well) – typically varies anywhere from 1,000 to 4,000 ft in diameter – as recognized by NH DES
- For **till and gravel wells**, the WHPA is calculated based upon a detailed hydrogeologic study



Source: NH DES

A WHPA is not the Same as a Sanitary Protective Well Radius

- SPWR is the “**First Line of Defense**” against contamination
- The **radius** is 75 to 400 ft area around well which under current state law must be controlled by the water supplier through **ownership or easement**. Extent of the radius depends on maximum daily amount of water withdrawn from the well.
- **Use restrictions and activities** which pose threats:
 - underground storage tanks
 - septic systems/leach fields
 - herbicides, pesticides & fertilizers
 - storage of hazardous materials
 - parking and vehicle use





PCS Inventory and Assessment

- **Potential Contamination Source (PCS)** – human activities that pose a risk that regulated contaminants might be introduced into the environment in such quantities as to degrade the natural groundwater system (ND DES)
- **Local PCS Inventory** (within WHPAs)
 - Known vs Potential Contamination Sources
 - Source Water Assessment
 - State assessments are available at: www.des.nh.gov/dwspp
 - NH DES One Stop – PCS data
- **RCRA facilities** (hazardous waste generators)



Source Water Assessment Reports

Assessments of Public Water Supply Sources - FREEDOM

This report is a summary of NH Department of Environmental Services' assessments of the vulnerability of each source used by the public water system(s) located in this municipality. The sources listed here are grouped first by the type of public water system and then by the system itself. Each source was ranked according to a number of criteria; a vulnerability ranking is given for each criterion that applies to the source. An explanation of each column in the report can be found on the last page.

Source Number	Source Description	Source Type	Date Assessment Completed	Number of Vulnerability Rankings	Susceptibility Ranking Criteria														
					Highs	Mediums	Low	Wells/Inlets	Ditches	KCSs	PCSs	Highways/Rtts	Facilities	Septics	Ag Land Cover	Urban Land Cover	Airbath	Lagoons	Dry discharges
System Type: <input type="checkbox"/> C =Community; <input type="checkbox"/> P=Non-Transient, Non-Community; <input type="checkbox"/> N=Transient																			
EPAID 0861010 System Name: FREEDOM WATER PRECINCT																			
002	SPW	G	09/01/2000	1	1	10	L	L	L	L	L	L	L	H	L	M	L	L	L
003	SPW	G	09/01/2000	1	1	10	L	L	L	L	L	L	L	H	L	M	L	L	L
EPAID 0862010 System Name: LOV WATER CO INC																			
001	GPW	G	01/11/2000	1	2	9	L	L	M	L	L	L	H	L	M	L	L	L	L
002	SPW	G	01/11/2000	1	2	9	L	L	M	L	L	L	H	L	M	L	L	L	L
003	SPW	G	01/11/2000	1	2	9	L	L	M	L	L	L	H	L	M	L	L	L	L
EPAID 0862020 System Name: PINE LANDING CONDO ASSOC																			
001	BRW	G	02/29/2000	2	3	7	H	L	L	L	L	L	M	H	M	L	L	L	M
002	SPW	G	02/29/2000	2	3	7	H	L	L	L	L	L	M	H	M	L	L	L	M
EPAID 0862030 System Name: FREEDOM VILLAGE CONDOS																			
003	BRW	G	04/12/2000	2	1	9	L	L	L	L	H	L	H	L	M	L	L	L	L
004	BRW	G	04/12/2000	2	1	9	L	L	L	L	H	L	H	L	M	L	L	L	L



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NH DES List of PCS

NH DES List of “19” Potential Contamination Sources (per RSA 485C):

- | | |
|---|--|
| <i>Vehicle Service and repair shops</i> | <i>General Service and Repair shops</i> |
| <i>Metal Working Shops</i> | <i>Salt Storage and Use</i> |
| <i>Snow Dumps</i> | <i>Storm Water infiltration ponds or leaching catch basins</i> |
| <i>Manufacturing Facilities storage</i> | <i>Underground or above ground Tanks</i> |
| <i>Cleaning Services</i> | <i>Waste and Scrap Processing and storage</i> |
| <i>Food Processing Plants</i> | <i>Transportation Corridors</i> |
| <i>Septic Systems</i> | <i>Laboratories and certain professional offices (medical, dental, veterinary)</i> |
| <i>Use of Agricultural Chemicals</i> | <i>Fueling and Maintenance of Earth moving equipment</i> |
| <i>Concrete, asphalt, and tar manufacture</i> | <i>Cemeteries</i> |
| | <i>Hazardous Waste Facilities</i> |

(Source: NH DES WD-WSEB-12-3)



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Windshield Survey: Vulnerability Assessment

- One of the most difficult parts of the plan: **identifying current level of threat** the PCS or KCS has to source water
- Develop **Criteria for this Assessment**: We consider PCS Location and existing property conditions; PCS Size/condition and storage of regulated substances; Proximity/distance of activities to wells; Use of BMPs and Handling Practices: likelihood of spill or accident
- **Level of threat** – usually ranked as “low”, “medium” or “high” with respect to BMP management need
- We also consider criteria/vulnerability rankings noted on NH DES Source Water Assessment Report
- **Key considerations** – this is a “drive by only” and not an actual on site inspection



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Protection, Management and Action Steps

Voluntary:

- Land Protection – acquisition or conservation easements
- Public Education – signs, flyers, school visits
- Outreach to Owners/Businesses
- Voluntary Inspection



Mandatory:

- Land Use Regulations – zoning, subdivision, site plan, etc.
- Best Management Practices (BMP) – local monitoring; BMP rules enforced by NH DES for PCS > 5 gallons
- Health Ordinances
- Groundwater Reclassification – restricts 6 high-risk land uses and requires BMP enforcement
- Model Groundwater Protection Ordinance – NH DES, April 2010
- Groundwater/Aquifer Protection Ordinances



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Action Considerations

Examples:

- ✓ Prohibit uses or institute management inspection of high-risk activities;
- ✓ Formulate strategic land use development controls; (matching control to threat)
- ✓ Educate property owners within WHPA
- ✓ Formulate emergency response plans.
- ✓ See also NH DES guidance documents.



Begin with sound technical basis and organization and end with strong commitment



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**Always Remember –
“The Devil is in the Details”**



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**Local Plans: Lessons,
Experience and Achievements**

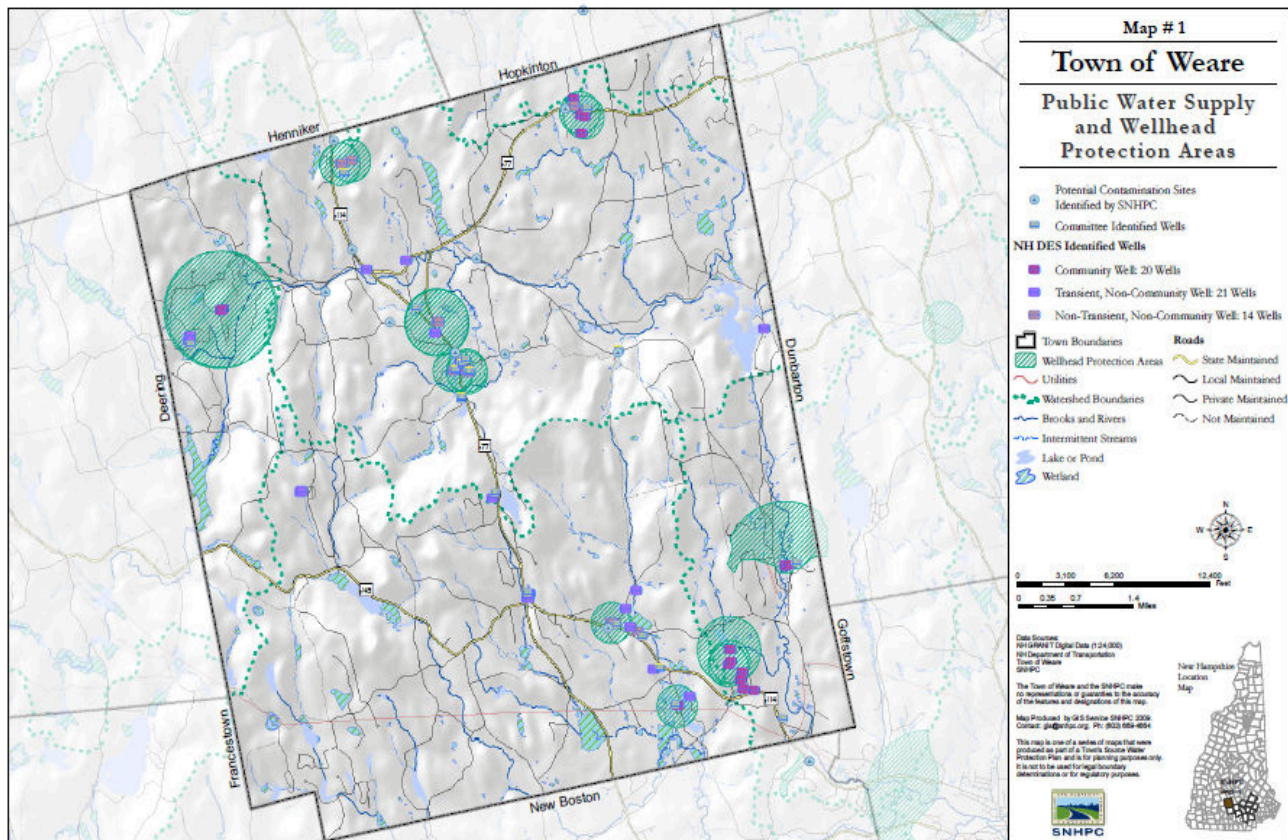
Town of Weare Source Water Protection Plan

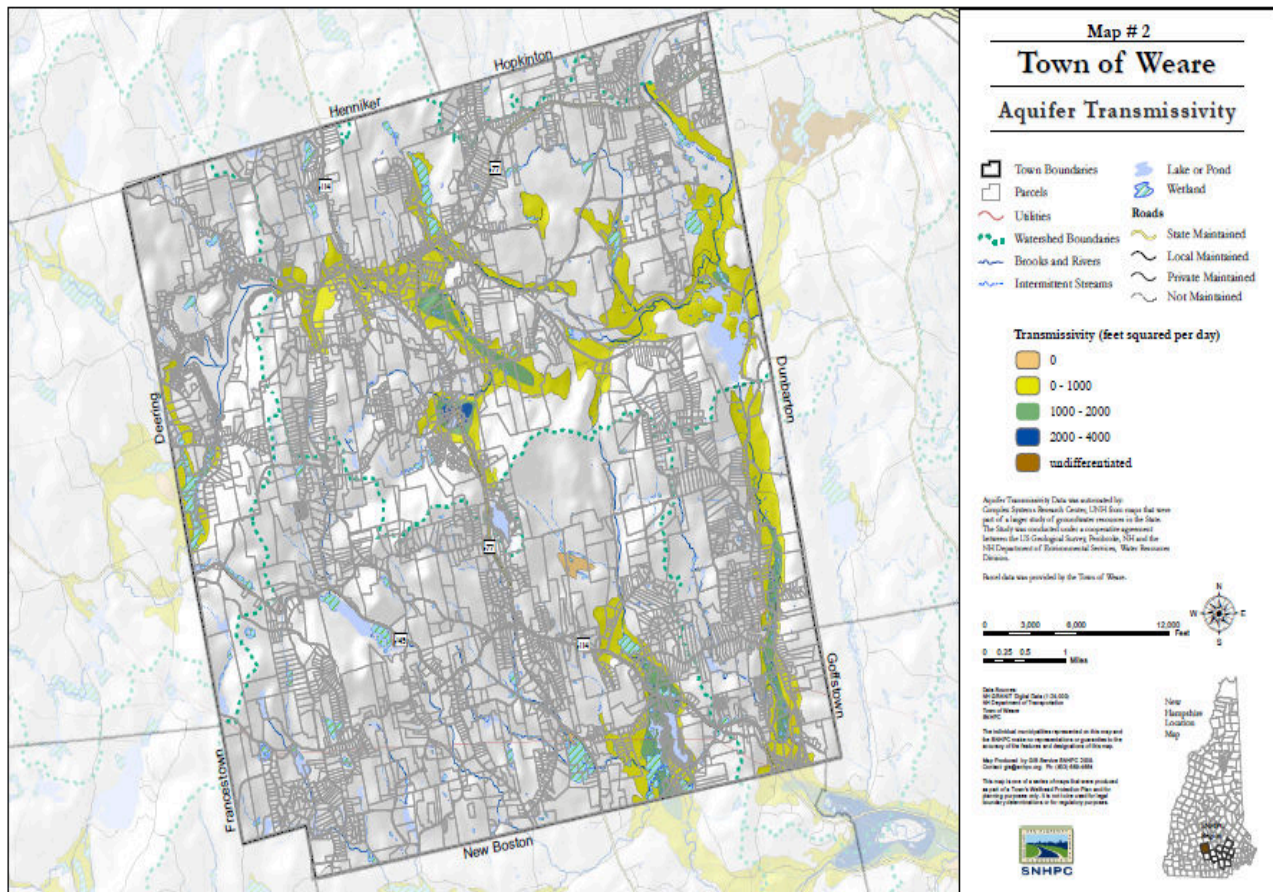
- **Time your source water planning with actual groundwater contamination issues within the community!**
- **Verify and Double Count All PWS Systems:**
 - NH DES One Stop Data identified a total of 30 active systems
 - 17 of which have designated Wellhead Protection Areas
 - The Advisory Committee – identified an additional 11 quasi-public water systems to include in the plan - these are not true PWS and do not have wellhead protection areas, but the public drinks the well water

Weare Source Water Protection Committee Identified Quasi-Public Wells:

1	Alma Shmid Apartments
2	American Legion Post #66
3	CJ Bolton Inc.
4	Mom's Pasties
5	Post Office
6	TD Bank North
7	Weare Center Store
8	Weare Fire Station (East)
9	Weare Fire Station (South)
10	Weare Library
11	Weare Safety

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Identified Types of PCSs & THREATS

Total of 10 PCS identified in WHPAs (No KCS noted):

- Equipment storage/machinery sites
- Heavy equipment storage
- RV and tank storage
- Salvage yard/used car lot storage
- Car wash and auto detailing center
- Auto repair
- Auto gas station
- Large truck storage and repair
- Cosmetic product use

Threats – all ranked as low to medium





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Identified Protection Options

- Adopt SWPP as part of Town's Master Plan
- Require Private Well Testing prior to CO
- Conduct BMP Compliance Surveys
- Increase Public Awareness of Wellhead Protection Areas – signs/letters/website
- Update Town's Aquifer Overlay Zoning – Groundwater Protection District – include new Aquifer Mapping
- Amend Site Plan/Subdivision Regulations
- Add Wellhead Protection Areas to Aquifer Map and Ordinance
- Allow NH DES compliant "Greenyard Junkyards"
- Eliminate Special Exemptions and add Conditional Use Permits



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Approaches Accepted by PB

- Replace Old 1977 Aquifer Map with new 2000 NH Geological Survey Enhanced Aquifer Map – this was completed
- Update the town's existing aquifer protection zoning district using provisions of DES Model Groundwater Ordinance as guide – this was completed
- Amend site plan/subdivision regulations to require private well testing prior to CO
- Develop a Floating Overlay Zone Town to protect all groundwater within the town – to be pursued this summer



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Lessons Learned from Weare

- Get a Champion to help bring the SWPP and Advisory Committee recommendations to the Planning Board
- Never expect the Planning Board to rubber stamp the Advisory Committee's recommendations
- If you have an ongoing groundwater contamination issue in the town this will help motivate the board to action
- Public support for drinking water protection often stronger than the planning board's recommendations
- Recognition of the need for public protection of WHPAs of privately owned WPS is not easy to implement
- Aquifer protection and overall groundwater protection is an easier sell utilizing the NH DES model ordinance as a guide



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Lessons Learned from Small Towns in General

- Always touch base with everyone before you plan – BOS; PB; all PWS operators – not contacting town officials and the agricultural fairgrounds in Deerfield was a case in point
- If you include a public works garage as one of your PWS systems - make sure there are no BMP violations before you inspect – citing violations during the plan building process is a nail in the coffin – the New Boston Road Agent and action of the Planning Board was a case in point
- Seek regulations of high risk land uses through zoning as Conditional Use Permit and emphasize that residential uses are exempt



Lessons Learned from All Towns

- Make sure your Advisory Committee knows upfront to include public WHPAs and water precincts in the planning process
- If you can not get mandatory BMP inspections in the final ordinances, seek voluntary compliance and/or inspections as part of site plan/subdivision regulations where there is less cost to the town
- Always consider the economic impact of your final regulations – in these times, municipalities are financially stressed and environmental regulations are often viewed as extra burden
- Finally always stress the public health needs and make sure everyone is clear on the overall state's requirements and the local responsibility and educate, educate and educate...