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DRAFT

Introduction

As the westernmost community in Rockingham County, the town of Raymond is situated about halfway between the Cities of Manchester and Portsmouth directly off New Hampshire's major East-West corridor, Route 101. Raymond's population has grown significantly over the last 30 years and is projected to increase another 5.5% between 2020 and 2040. With its proximity to major employment centers in Manchester and Portsmouth as well as major transportation routes, the town is experiencing an increase in commercial and industrial growth, especially along the areas surrounding Exits 4 and 5. Additionally, the town's semi-rural nature with large tracts of open space and surface water resources makes it a desirable place to live and visit. Residents have routinely expressed their desire to maintain the vitality of the town's natural environment and ensure that critical natural resources such as groundwater, lakes, forests, and agricultural lands are preserved and protected from the impacts of development.

Protecting water resources in town is critical for all residents in Raymond who rely on groundwater for drinking water. The purpose of this Source Water Protection Plan (hereon referred to as the "Plan") is to identify Raymond's public water systems, potential contamination threats to those systems, and to establish a framework for ongoing monitoring and public involvement to better safeguard the community's drinking water.

A Summary of Regulatory Authority to Protect Drinking Water in New Hampshire

Federal Safe Drinking Water Act

The New Hampshire Department of Environmental Services (NHDES) has the authority to regulate public drinking water systems in the state under both the federal and state Safe Drinking Water Acts. The federal Safe Drinking Water Act applies to every public water system in the United States but does not apply to private wells. The Federal Safe Drinking Water Act applies minimum standards for state programs to protect public water systems and underground sources of drinking water.

New Hampshire Safe Drinking Water Act

The New Hampshire Safe Drinking Water Act (RSA 485:3) establishes authority for NHDES to adopt drinking water rules and primary drinking water standards, which apply to all public drinking water systems in the State. Through its Drinking Water Source Protection Program, DES provides guidance and assistance to water suppliers and municipalities to protect groundwater and surface water sources for public water systems.

Under RSA 485:23, water suppliers, local boards of health, local health officers, and citizens may petition DES to adopt rules to protect a particular water supply source. Under this section of the Act, NHDES has adopted rules to protect half of the state's 60 surface water supply sources.

New Hampshire Groundwater Protection Act

New Hampshire's Groundwater Protection Act, passed by the state legislature in 1991, is enabling legislation (e.g., water suppliers, town boards) that choose to play a role in actively managing threats (potential contamination sources) to protect valuable groundwater. Under the Act, all groundwater may be classified into one of four classes:

- GAA Classification, the most protected class, includes groundwater contributing to public water supply wells (wellhead protection areas).
- GA1 Classification, is groundwater identified as high value for present or future drinking water
- GA2 Classification, high yield stratified drift aquifers that are potentially valuable sources of drinking water.
- GB Classification, all groundwater not assigned to a higher class.

Under this Act, NHDES developed and adopted N.H. Code of Administrative Rules part Env-Wq 401 Best Management Practices (BMPs) for Groundwater Protection, which apply to all potential contamination sources in the state. The purpose of the BMPs is to help prevent a release of regulated substances, particularly into a high value water resource.

Water Resources in Raymond

Public Water Systems

Raymond has fifteen active public water systems (Table 1), all of which are serviced by groundwater via bedrock wells. Eleven of these public water systems are community water systems serving just over 5,000 residents year-round. The rest are characterized as transient non-community systems.

- **Community Water System:** Public water system which serves either at least 15 residential service connections on a year-round basis or serves at least 25 residents on a year-round basis.
- **Transient, Non-Community System:** A public water system serves at least 25 persons at least 60 days out of the year (restaurants, parks)
- **Non-Transient, Non-Community System:** A public water system that serves at least 25 of the same persons at least six months out of the year (schools, camps, large businesses)

ID	System Name	Address	System Type	System Category	Population Served
1972080	Blackstone Reserve	61 Lane Rd	Community System	Senior Housing	93
1972040	Branch River Apartments	310 Rte. 27	Community System	Apartments	120
1973050	Hill Top	2 Eagles Landing	Community System	Mobile Home Park	140
1975020	New Life Assembly Of God	Rte. 156	Transient Non-Community	Function Halls, Churches, Social Clubs	50
1978070	Nicks Place	171 Rte. 27	Transient Non-Community	Restaurant	100
1977050	Onway Lake Family Resort	15 Sargent Road	Transient Non-Community	Seasonal Residence	30
1972050	Pawtuckaway Farms	Stone Post Cir	Community System	Single Family Residences	38
1972070	PEU/Clearwater Estates	263 Rte. 27	Community System	Senior Housing	163
1973030	PEU/Green Hills Ests	Rte. 107	Community System	Mobile Home Park	623
1972010	PEU/Liberty Tree Acres	34 Washington Dr	Community System	Single Family Residences	183

1971010	Raymond Water Dept	Cider Ferry Rd	Community System	Major CWS (>1500 Pop or Surface Supply)	3300
1972020	Riverview Manor Condos	202 Rte. 27	Community System	Apartments	110
1973060	Tranquility Estates	Old Rte. 101	Community System	Mobile Home Park	315
1972060	Westgate Estates	Sherry Ln	Community System	Single Family Residences	115
1977010	Zions Camp	30 Onaway Lake Rd	Transient Non-Community	Campground	100

Wellhead Protection Areas

A Wellhead Protection Area (WHPA) is the surface or subsurface area surrounding a water well or well field supplying a public water system, through which contaminants are reasonably likely to move toward and reach such well or well field¹. Community and non-transient non-community public water systems have defined WHPAs, while transient systems do not have defined WHPAs. For bedrock wells producing less than 57,600 gallons in any 24-hour period, the WHPA is a circle whose radius depends on the maximum daily amount of water withdrawn from the well. For small overburden wells within unconfined aquifers, the WHPA is typically calculated based on existing hydrogeological information.²

For most public water systems, it is the responsibility of the system owner and/or operator to develop a Wellhead Protection Program (WHPP) that identifies potential contamination threats in the WHPA, sends educational mailings to all properties within the WHPA, and conducts best management practice inspections of potential contamination sources (inspections are required for large community systems only). There are six land uses prohibited within wellhead protection areas: hazardous waste disposal facilities, solid waste landfills, outdoor bulk storage of road salt, junkyards, snow dumps and wastewater or septage lagoons.

NHDES prohibits the above six land uses within delineated WHPAs but does not regulate other land uses. However, the State does identify land uses that could potentially contribute to groundwater contamination such as vehicle service and repair shops, manufacturing facilities, metalworking shops etc. (See Groundwater Contamination Section for more information on potential contamination sources). Therefore, land use within the WHPA is largely at the discretion of the community and should be managed and monitored carefully to avoid risk of groundwater contamination.

Aquifers

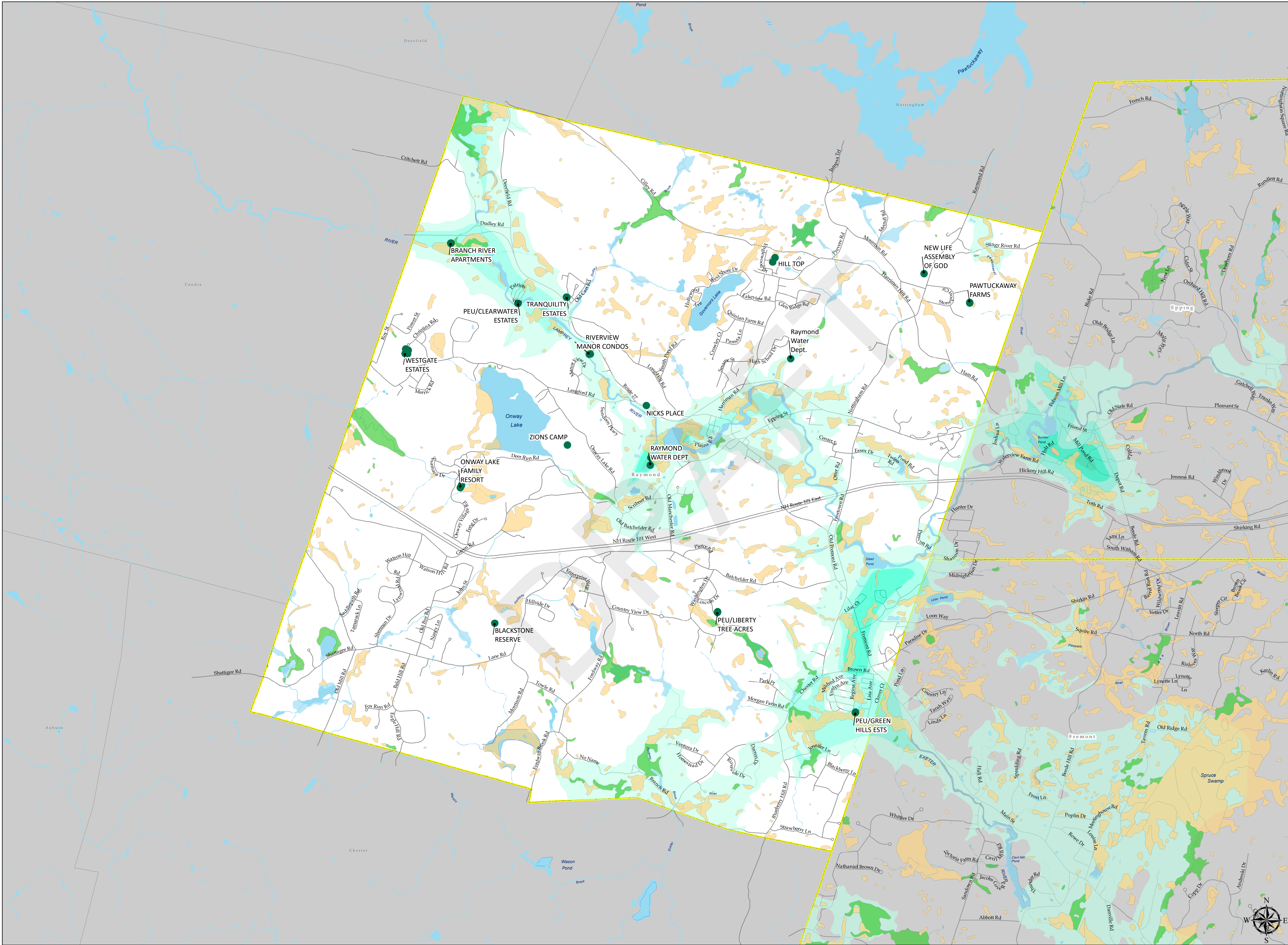
Aquifers are one of New Hampshire's most critical and important natural and economic resources. This is especially important in Raymond as all residents and businesses rely upon groundwater for drinking water.

The main aquifers found in Raymond are fractured bedrock or unconsolidated glacial deposits commonly referred to as stratified drift aquifers. Stratified drift aquifers are composed of coarse to fine unconsolidated glacial melt water deposits and are typically found adjacent to or within the basins of major streams and rivers.

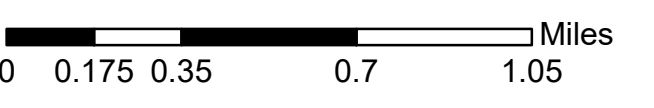
Several extensive potential high-yield stratified drift aquifers have been identified within the Town of Raymond by the U.S. Geological Survey. One of the largest aquifers is located within the northwest corner

¹ <https://www.epa.gov/oil-spills-prevention-and-preparedness-regulations/what-wellhead-protection-area-and-how-can>

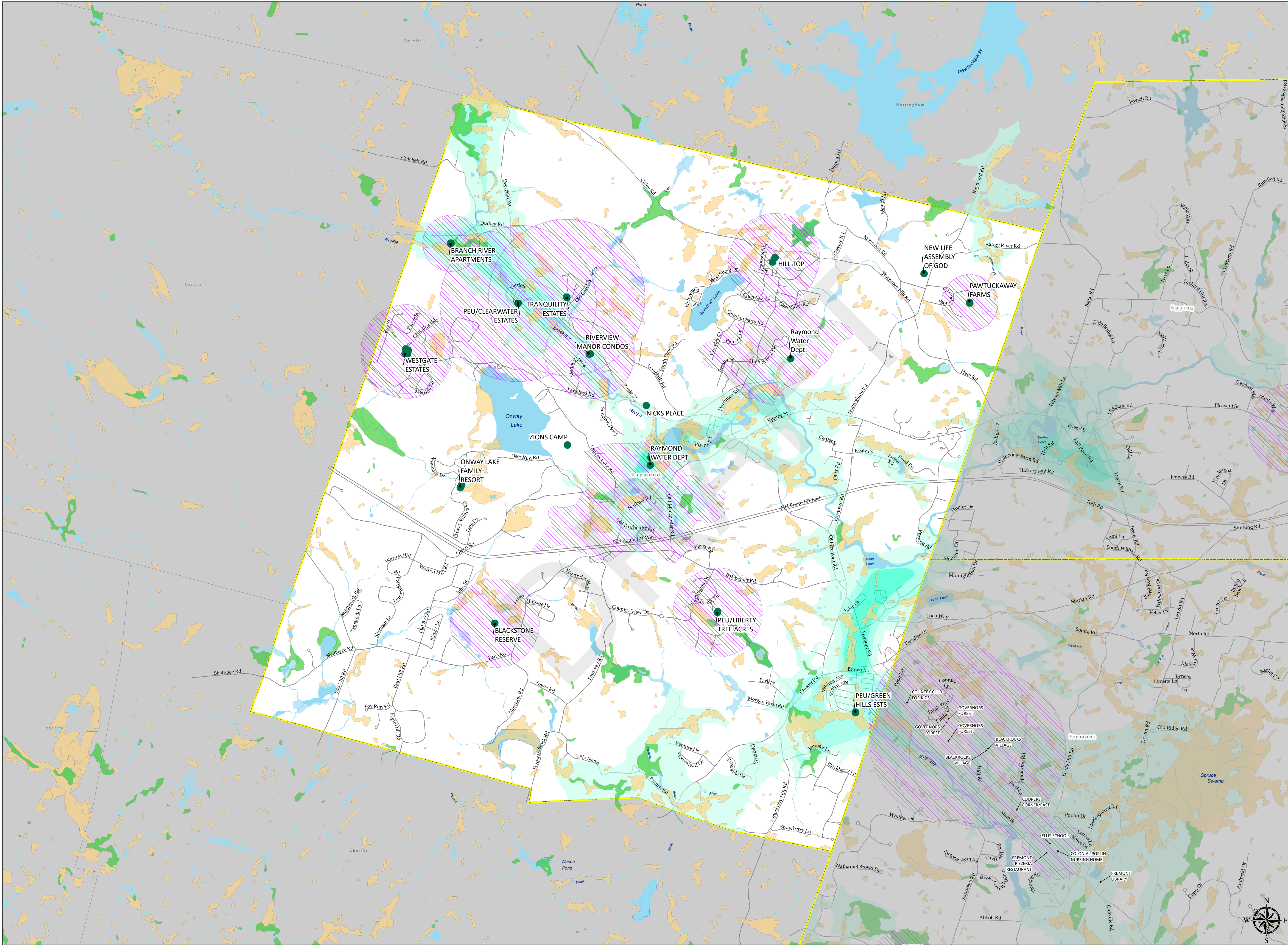
² <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/dwgb-12-10.pdf>



- Active Public Supply Wells (2022)
- National Wetlands Inventory
- Wetland Type**
 - Open Water
 - Freshwater Emergent Wetland
 - Freshwater Forested/Shrub Wetland
 - Other
- Stratified-Drift Aquifers
- RANGE**
 - Less than 500
 - 500 to 1000
 - 1000 to 2000
 - 2000 to 3000
 - Greater than 3000
- Road Type**
 - Roads
- Surface Water Features**
 - Shoreline; Stream
 - Intermittent Stream
 - Other Surface Water Feature
- RPC Towns
- New Hampshire Communities



Map 1 - Public Supply Wells and Wellhead Protection Area (NHDES)



● Active Public Supply Wells (2022)

▨ Wellhead Protection Areas (2022)

National Wetlands Inventory

Wetland Type

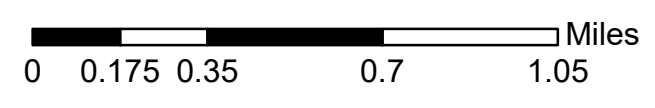
- Open Water
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Other

Stratified-Drift Aquifers

RANGE

- Less than 500
- 500 to 1000
- 1000 to 2000
- 2000 to 3000
- Greater than 3000

- Roads
- Waterbodies
- RPC Towns
- New Hampshire Communities



Map 2 - Public Supply Wells and Wellhead Protection Area (NHDES) and Stratified Drift Aquifer

● Active Public Supply Wells (2022)

Road Type
— Roads

Stratified-Drift Aquifers

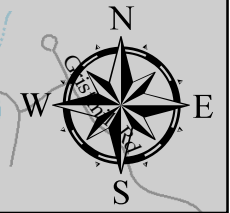
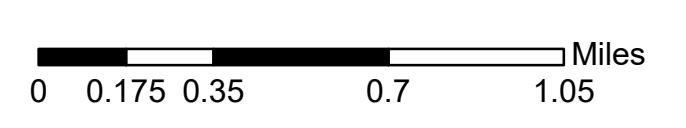
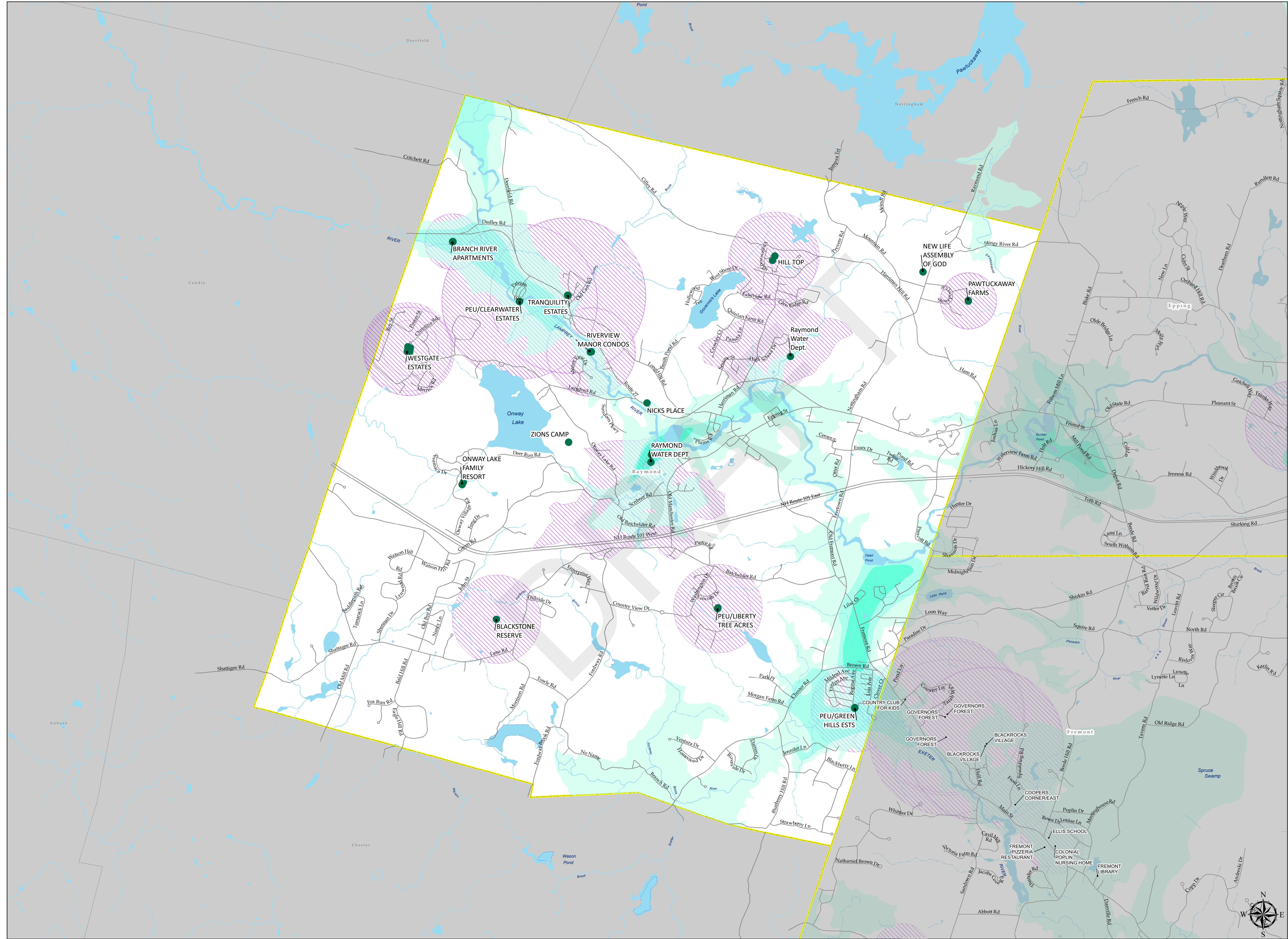
RANGE

- Less than 500
- 500 to 1000
- 1000 to 2000
- 2000 to 3000
- Greater than 3000

▨ Wellhead Protection Areas (2022)

▭ RPC Towns

▭ New Hampshire Communities



of Raymond and is projected to yield as much as 1.7 mgal/day. The West Epping and Newmarket Plains are Raymond's other two large aquifers.

Glacial formations such as eskers and kames make up the balance of Raymond's aquifers. These formations can be found east of Routes 102 and 107, north of Prescott Road, and along the North Branch of the Lamprey River.

Identification of Potential Contamination Sources

Any physical, biological, chemical, or radiological substance that could find its way into a source of drinking water is a potential source of contamination and could pose significant risk to public health. Contamination may result from several sources. Contaminated sites e.g., superfund sites, chemical storage facilities (oil and gas storage, underground storage tanks etc.), Industrial facilities that store chemicals, residential or commercial septic systems and stormwater runoff from impervious surfaces are all examples of potential contamination sources (PCS). The most common causes of groundwater contamination in New Hampshire are leaking underground storage tanks, mishandling of industrial chemicals, and stormwater runoff.³

New Hampshire's Groundwater Protection Act (RSA 485-C) identifies nineteen activities that have the potential to release contaminants to groundwater. These PCSs are human activities or operations that pose a reasonably foreseeable risk of introducing regulated substances into the environment in such quantities that would degrade the natural groundwater quality:

- Vehicle service and repair shops
- General service and repair shops
- Metalworking shops
- Manufacturing facilities
- Underground and above-ground storage tanks
- Waste and scrap processing and storage
- Transportation corridors
- Septic systems (at commercial and industrial facilities)
- Laboratories and certain professional offices (medical, dental, veterinary)
- Use of agricultural chemicals
- Salt storage and use
- Snow dumps
- Stormwater infiltration ponds or leaching catch basins
- Cleaning services
- Food processing plants
- Fueling and maintenance of earth moving equipment
- Concrete, asphalt, and tar manufacturing
- Cemeteries
- Hazardous waste facilities

³ <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/wd-06-41.pdf>

NHDES maintains a statewide inventory of the above potential contamination sources. Using this database, the following PCSs have been identified in Raymond:

Active Hazardous Waste Generators (2023)

The New Hampshire Hazardous Waste Rules, Env-Hw 103.65, defines hazardous waste as any solid, semi-solid, liquid or contained gaseous waste, or any combination of these wastes that have the potential to increase risk of irreversible or incapacitating illness, pose public health hazard if improperly managed and/or has been identified as a hazardous waste by NHDES Waste Management Division.

The Four characteristics of a hazardous waste as defined in Env-Hw 403 is any waste that is ignitable, corrosive, reactive or toxic (Env-Hw 403.03-06).

SQG – Small quantity generator: A Small Quantity Generator (SQG) generates less than 220 pounds of hazardous waste every calendar month.

FQG – Full quantity generator: Generates more than 220 pounds of hazardous waste in one month.

EPA ID	NAME	ADDRESS	GENERATOR SIZE
NHD510006570	Affordable Auto Sales & Repair	322 Rte. 127	NONE
NHD510126980	Aggregate Industries Ne Region Inc	91 Chester Rd	SQG
NHD510125925	Classy Image Auto	150 Rte. 27	NONE
NHD510223555	Dollar General Store 16773	98 Fremont Rd	SQG
NHD510205248	Drownes Auto Body	307 Rte.. 27	SQG
NHD986469484	Euro Cleaners Of Raymond	Rte.. 27 Cozy Corner Plaza (Unit 16)	NONE
NHD986469815	Ewaste Processing Services LLC	63 Epping St	NONE
NHD986469815	Extreme Adhesives LLC	63 Epping St	SQG
NHD510205776	Fast Eds Auto Body	3 Maple Ln	SQG
NHD510220981	Ferguson Waterworks 0593	1 Chester Rd	SQG
NHD510089485	Gibbs Oil Gas Station	69 Epping St	SQG
NHD510212020	Grants Towing & Recovery	236 Rte. 27	SQG
NHD510214869	Hannaford Food & Drug 8120	2 Freetown Rd	SQG
NHD510174113	Happy Ending Auto Body & Detailing	92 Rte. 27	SQG
NHD018963355	I C Reed & Sons Inc	47b Epping St	NONE
NHD510176175	Lamprey Dental Assc	37 Epping St	NONE
NHD510176175	Lamprey Family Dental	37 Epping St	NONE
NHD510191620	Magnum Machine Inc	1 Infinity Dr	SQG
NHD510174113	Michelins Auto Body & Sales	92 Rte. 27	NONE
NHD981211782	Moquins StaRte.r/Alternator	Longhill Rd	NONE
NHD510212160	Northeast Woodworking Inc	24 Old Manchester Rd	SQG
NHD510208374	On Site Autobody	312 Rte. 27 (Unit 43)	NONE
NHD986468908	Profile Metal Forming Inc	Epping Rd	NONE
NHD510100332	R P W Auto	139 Rte. 27	SQG
NHD510127178	Raymond Auto Clinic	27 Old Fremont Rd	NONE
NHD510123466	Raymond Public Works	Rte. 27	SQG
NHD510069743	Raymond School District	45 Harriman Hill Rd	SQG
NHD510100290	Rehrig Pacific Co	13 Center St	NONE
NHD500022330	Rite Aid 3288	3 Freetown Rd	SQG

NHD510174113	Schultz Auto Body	92 Rte. 27	NONE
NHD510160898	Shookus Special Tools	24c Old Manchester Rd	NONE
NHD510201528	Tradebe Hhw	Industrial Dr	SQG
NHD980503361	US EPA Region 1	Blueberry Hill Rd (Mottolo Pig Farm)	SQG
NHD510126980	Wakefield Materials	91 Chester Rd	SQG
NHD510213457	Walgreens 11225	53 Rte. 27	SQG
NHD500019591	Walmart Distribution Center 6030	42 Freetown Rd	FQG2
NHD500020706	Welch Ai S & Sons Inc	28 Main St	None

Active Remediation Sites (2023) (Sites being monitored and assessed for pollution by hazardous waste, MtBEA, petroleum and other contaminants).

Site Number	Site Name	Description
198404092	Raymond Landfill	Existing Landfill or Landfill Closure
198704094	Mottolo Waste Site	Superfund Site
198705081	Former Regis Tannery - Lot 43	Hazardous Waste Project
198906059	Ai S Welch + Sons	Hazardous Waste Project
199012023	Mardon Corp	Hazardous Waste Project
200005037	Cumberland Farms 2827	Leaking Underground Storage Tank
200212064	Former Aiw Assets Inc	Leaking Bulk Storage Facility Containing Motor Fuel
201110061	Former Regis Tannery - Lot 120	Hazardous Waste Project
201403049	Ltd Management	Leaking Underground Storage Tank
201406016	28 Main Street Area	Unsolicited Site Assessment (HWRB Reviewed)
201711016	Cook Property	On-Premises Use Facility Containing Fuel Oil
201811017	Lilac Court	On-Premises Use Facility Containing Fuel Oil
202201012	Desmarais Residence	On-Premises Use Facility Containing Fuel Oil
202210067	Hathaway Residence	On-Premises Use Facility Containing Fuel Oil
202301003	Barbin Property	On-Premises Use Facility Containing Fuel Oil
202302096	Land Off Industrial Drive (Lot 120-1)	Unsolicited Site Assessment (HWRB Reviewed)

Solid Waste Facilities

Facility Name	Address	Facility Type	Status
Raymond Municipal Landfill	Prescott Road	Unlined Landfill	Not operating
Raymond Transfer Station	104 Prescott Road	Collection/Storage/Transfer	Operating

Underground Storage Tanks

Site Number	Site Name	Site Address	Active Tanks
200011046	7 Eleven 32498	37 Freetown Rd	3
199808057	Iber Holmes Gove Middle School	1 Stephen Batchelder Prky	1
200005037	Mr Gas Plus li	62 Epping St	3
199001009	Nouria 02022	1 Center St	4
199506022	Phillips 66	69 Epping Rd	4
199812193	Raymond Circle K	51 Rte. 27	3
199809087	Raymond Senior High School	45 Harriman Hill Rd	1
199606073	Wal-Mart Distribution Ctr #6730	42 Freetown Rd	4

Above Ground Storage Tanks

Facility ID	Site Name	Address
000821A	Aggregate Industries Northeast Region	91 Chester Rd
0000117	Ai S Welch + Sons	28 Main St
960538A	Aiw Assets Inc	Depot Rd
960731A	D F Richard Energy	76 Rte. 27
0000630	Nh Dot Ps 513	77 Rte. 27
9812061	Palmer Gas Co Inc	Rte. 27
0000019	Psnh Raymond Substation	Old Rte. 101
0000344	Raymond Dept Of Public Works	Rte. 27

Stormwater Runoff Pollution

In New Hampshire, stormwater runoff is a major source of water pollution. This runoff carries pollutants such as sediment, road salt, chemicals, fertilizers, and other harmful substances that can degrade water quality if it is not treated⁴. Land development and alteration contributes to higher rates of stormwater runoff. Land development increases impervious surfaces, which results in reduced infiltration of rain and snowmelt into the ground and higher concentrations of runoff entering surface waters.

Despite the town's steady growth in population and commercial development, Raymond has large swaths of open space either undevelopable (wetlands) or maintained as conservation area. As such, Raymond's land cover is approximately 6.2% impervious (2019). As part of Raymond's Regional Drinking Water Assessment (2019), the RPC evaluated the percentage of impervious land cover within each wellhead protection area (WHPA). The higher the impervious land cover percentage the more susceptible a water system is to contamination from runoff.

Common Groundwater Contaminants in New Hampshire

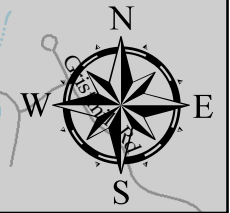
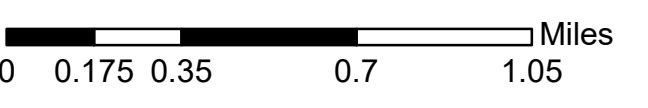
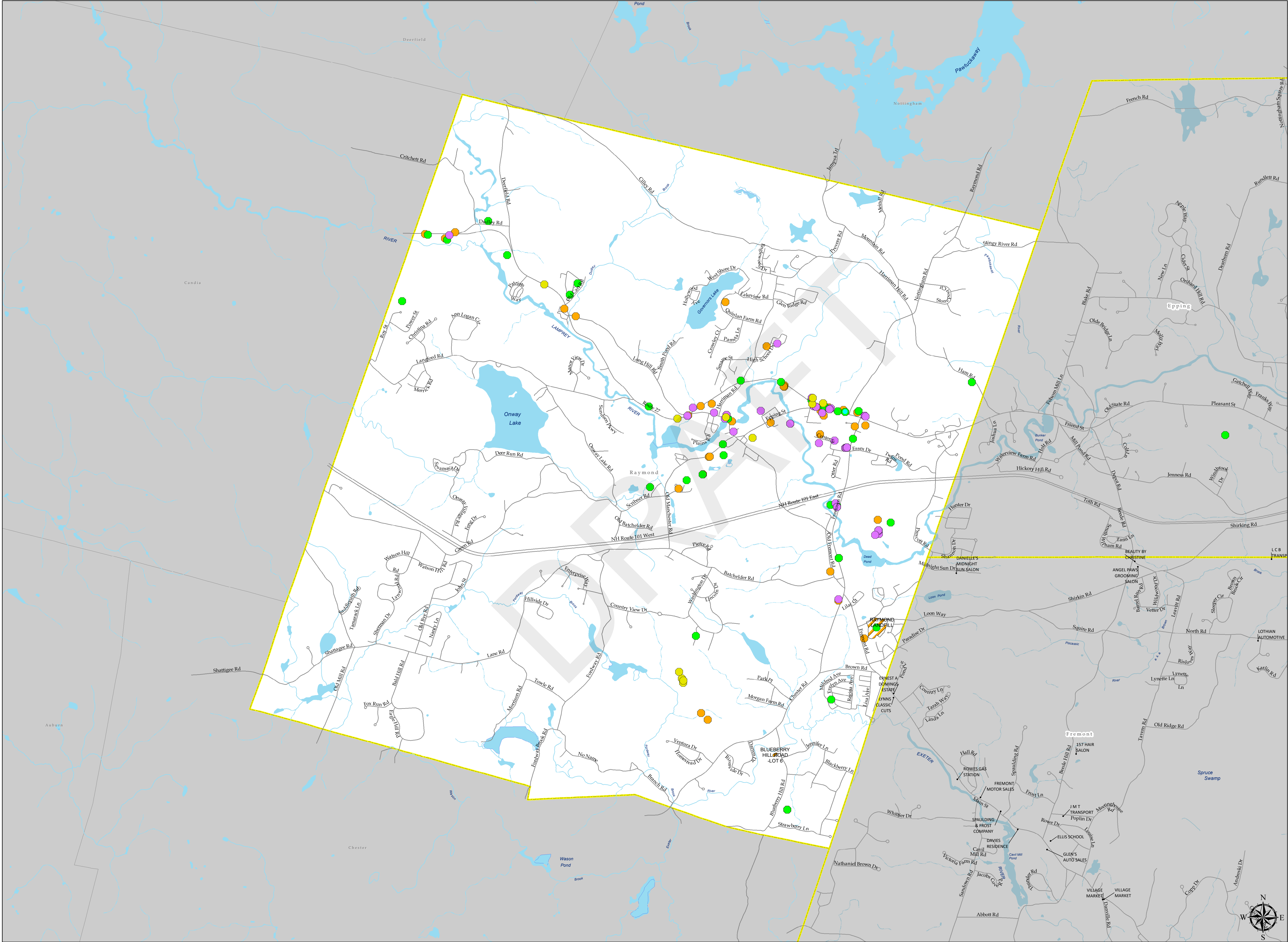
The most common contaminants in well water in New Hampshire are radon, arsenic, and bacteria. The NHDES recommends private well users have their water tested every three to five years for the following contaminants:

- Arsenic
- Bacteria (Total coliform, E.Coli)
- Chloride
- Copper
- Fluoride
- Hardness
- Iron
- Lead
- Manganese
- Nitrate/Nitrite
- pH
- Radon
- Sodium
- Uranium
- PFAS
- VOCs (Volatile organic compounds e.g., MtBE, benzene, industrial solvents)

⁴ https://www.therpc.org/download_file/view/1049/182

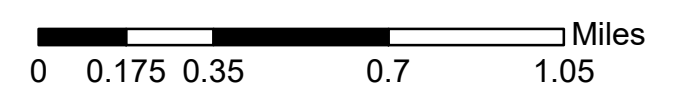
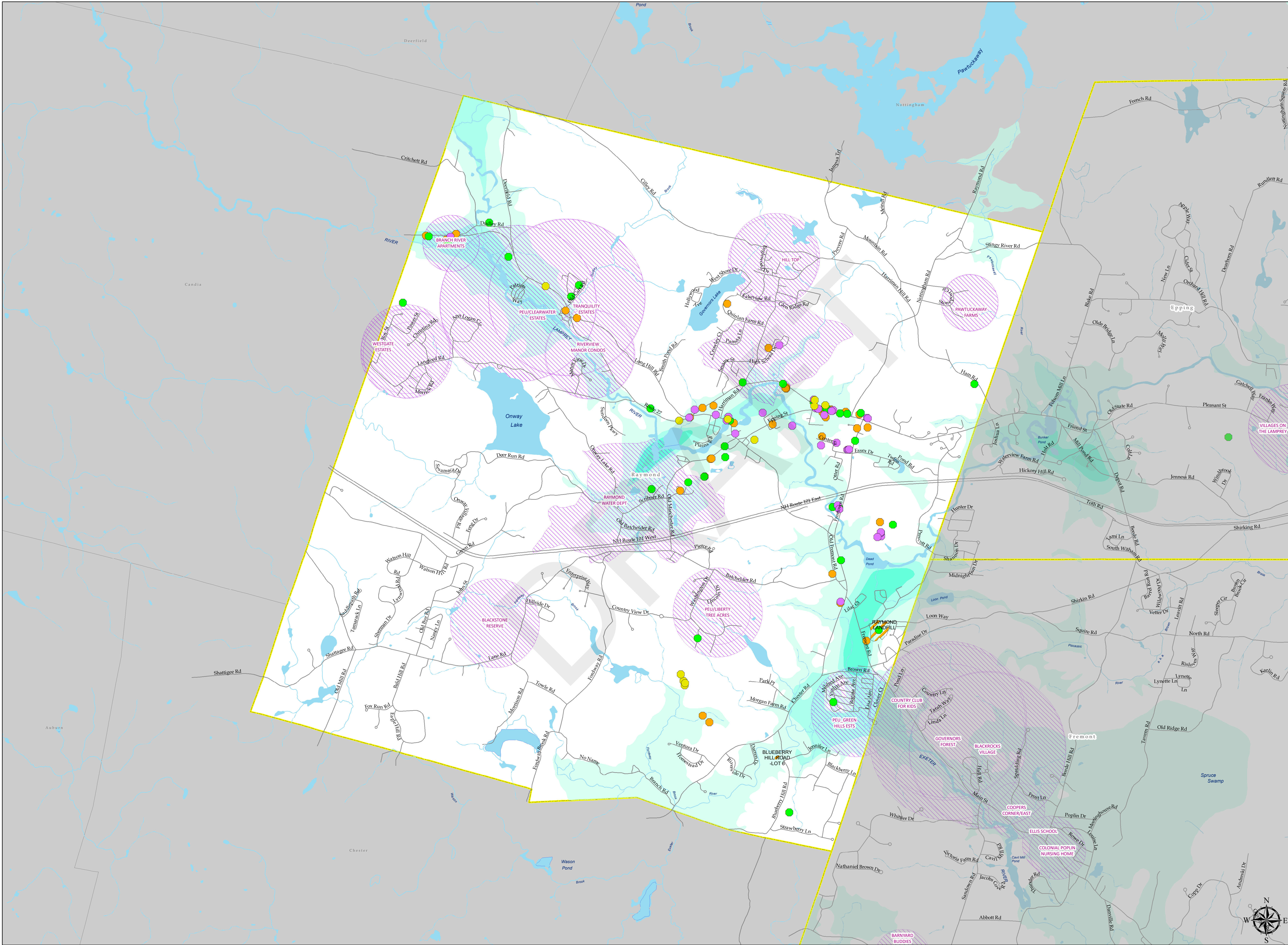
Map 3 - Potential Hazards

- Aboveground Storage Tanks
- Underground Storage Tanks
- Remediation Sites (Points)
- Hazardous Waste Generators (Points)
- Remediation Sites
- Road Type**
- Roads
- RPC Towns
- New Hampshire Communities



Map 4 - Potential Hazards and Wellhead Protection Areas and Stratified Drift Aquifer

- Aboveground Storage Tanks
- Underground Storage Tanks
- Remediation Sites (Points)
- Hazardous Waste Generators (Points)
- Remediation Sites
- Roads
- Wellhead Protection Areas (2022)
- Stratified-Drift Aquifers
- RANGE
 - Less than 500
 - 500 to 1000
 - 1000 to 2000
 - 2000 to 3000
 - Greater than 3000
- RPC Towns
- New Hampshire Communities



Emerging Contaminants of Concern: PFAS/PFOAS

Per- and polyfluoroalkyl substances (PFAS) are a large, complex group of synthetic chemicals that have been used in consumer products around the world since about the 1950s. They are ingredients in various everyday products. For example, PFAS are used to keep food from sticking to packaging or cookware, make clothes and carpets resistant to stains, and create firefighting foam that is more effective.⁵

These chemicals are long lasting, breaking down very slowly over time. Because of their widespread use and their longevity in the environment, PFAS is increasingly being found in drinking water, food, and other consumer products. While still ongoing, research has indicated that PFAS have been linked to negative health effects in humans such as thyroid disease, developmental and reproductive effects, and some cancers.

VOCs occur statewide, but a number of activities and land uses seem to be associated with a higher likelihood of water contamination such as nearby fuel spills or leaks and businesses that use petroleum products or petroleum-based chemicals.

PFAS in New Hampshire

PFAS drinking water standards currently vary from state to state because there are no national standards set for PFAS in drinking water by the U.S. Environmental Protection Agency (EPA). New Hampshire is one of a handful of states that have passed legislation establishing drinking water standards for PFAS/PFOAS. In July 2020, New Hampshire House Bill 1264 was signed into law establishing maximum contaminant levels (MCLs) as follows: (insert chart and graphic).

Per- and Polyfluoroalkyl Substance (PFAS)	NH Maximum Contaminant Level nanograms per liter (parts per trillion, or ppt)
Perfluorooctanoic acid (PFOA)	12
Perfluorooctane sulfonic acid (PFOS)	15
Perfluorohexane sulfonic acid (PFHxS)	18
Perfluorononanoic acid (PFNA)	11

Residents and businesses are encouraged to get their well water tested every three to five years for contaminants such as PFAS, lead and arsenic. The NHDES provides information and guidance for testing and treating well water with its 'Be Well Informed' guide:

<https://www4.des.state.nh.us/DWITool/Welcome.aspx>

Other recommendations to reduce risk of PFAS exposure include avoiding products such as non-stick cookware, products labeled as "stain-resistant" or "water-resistant," certain cosmetic and personal care products and some foods in packaging that may contain PFAS such as microwave popcorn, fast food boxes, bakery bags and bottled water. For more information visit: <https://www.epa.gov/pfas/pfas-explained>

⁵ <https://www.niehs.nih.gov/health/topics/agents/pfc/index.cfm>

Risk Assessment

Consistent with [NHDES's Source Water Assessment Reports](#) criteria produced between 2000 and 2003, Rockingham Planning Commission evaluated the vulnerability of Raymond's public water systems regarding each system's proximity to the types of known and potential contamination sources discussed above. RPC also evaluated the percentage of impervious land coverage and protected land coverage within each wellhead protection area, which can further indicate a water system's susceptibility to contamination.

According to the assessment, two public water systems in Raymond ranked 'High' for known contamination sources meaning that one or more known contamination sources have been identified within the wellhead protection area (WHPA) and within 1,000 feet of the well or intake:

- Branch River Apartments
- Hill Top

Additionally, the Branch River Apartments public water system and Nick's Place are ranked "Medium" for potential contamination sources, meaning 10 or fewer potential contamination sources have been identified within 1,000 feet of the well in the WHPA. See Appendix A for complete risk assessment.

Source Water Protection Strategies

Land Use Regulations

The most effective way to protect groundwater is by controlling land uses, either through acquisition of the land or easements, or through land use controls. Land use controls can include zoning ordinances, site plan review regulations, and subdivision regulations. Local regulations can also address specific activities such as gravel excavations, blasting, septic system operation and maintenance, and the use of underground storage tanks, fertilizer, and wastewater residuals (e.g., sludge or biosolids)⁶.

The Town of Raymond has adopted a Groundwater Conservation Overlay District in its Zoning Ordinance, which is an overlay district superimposed over the existing zoning districts. The ordinance includes performance standards for uses within the district as well as requirements for spill prevention control and countermeasure plans and pollution prevention. The ordinance also allows for the planning board to issue a conditional use permit for those uses that exceed 15% impervious coverage on a lot and those that propose storage and use of hazardous materials greater than 100 gallons at one time.

Currently, the Groundwater Conservation Overlay District is based on an official groundwater protection district zoning map which identifies all the stratified drift aquifers and aquifer recharge areas within the community. It also references the town's 1992 Wellhead Protection Program and includes the WHPAs. As new public water systems come online and pumping volumes of existing systems increase to accommodate population fluctuations, Raymond should consider amending its current groundwater ordinance to include all public water systems' WHPA as established by NHDES. This allows protection of current and future public water system without the need to amend zoning or zoning maps.

⁶ <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/wd-06-41.pdf>

Restricting land uses in ground water protection areas is an effective tool for minimizing the risk of groundwater contamination. Most recently (2023), Raymond added three new prohibited uses to its groundwater conservation district: Petroleum bulk plants, gas stations, and storage of commercial fertilizers. However, while this strategy may prevent new threats to groundwater, it cannot eliminate existing threats. Any existing use that predates land regulation changes is allowed to continue. Therefore, best practices for protecting groundwater should involve a combination of strategies.

Riparian Buffers

Maintaining vegetative buffers around water bodies is an important factor in protecting ground and surface water. Removing vegetation from shoreland areas can deteriorate water quality. Vegetative buffers protect water quality as plants, soil, and soil microbes in those buffers filter pollutants from water as it flows over the landscape on its way downhill or as it infiltrates into the ground. Native trees and shrubs are considered the most effective buffer plants for water quality. The filtration carried out by intact vegetative buffer plants is both mechanical and biochemical. The cleaner the water is entering drinking water systems, the more efficient and cost effective the treatment will be in providing high quality drinking water to communities.⁷

Raymond's zoning ordinance is consistent with the New Hampshire state law and regulations that stipulate buffer or setback protection to surface water sources. The zoning ordinance allows for certain land uses within wetlands buffers and shoreland protection areas with a special permit from the planning board, including buildings and structures, parking lots and roads. In the future the town may wish to revisit this list of uses allowed by special permit within wetland and shoreland protection buffers and prohibit those that propose new impervious cover within the protective buffer. The Town may also consider increasing buffer requirements for land directly adjacent to a surface water resource and furthermore, specify "no-cut" buffers to allow for native vegetation growth and ensure no disturbance to the water resource buffers.

Best Management Practice (BMPs) Inspections for Groundwater Protection

Recognizing the importance of protecting the natural quality of groundwater, the NH State Legislature passed the Groundwater Protection Act (RSA 485-C) in 1991. This legislation recognized that a wide variety of activities involve the use of materials that can, if not properly handled, contaminate groundwater. The Groundwater Protection Act directed the New Hampshire Department of Environmental Services (NHDES) to adopt rules specifying best management practices for groundwater protection, which apply to all potential contamination sources in the state. The BMPs within the rules are common-sense practices that apply to the storage, handling, and disposal of regulated substances established under RSA 485-C:6 and hazardous substances under 40 CFR § 302.

The Groundwater Protection Act authorizes municipalities to develop groundwater protection programs, which involve identifying potential contamination sources in town, educating residents and owners of businesses within groundwater protection areas, and conducting BMP inspections for potential contamination sources. Municipalities can implement these programs in two ways: The first is with a voluntary program, meaning that the local entity can conduct education and inspection activities, but cannot compel local businesses to allow inspections or to use BMPs. The second way, a regulatory

⁷ https://www.therpc.org/download_file/view/2729/449

program, is available to health officers and their agents who have obtained enforcement authority, either through the groundwater reclassification process (under RSA 485-C:9) or through a local health ordinance.

Raymond has established authority to conduct BMP inspections under its Groundwater Conservation Overlay District Zoning Ordinance. The performance standards incorporate many of the state BMP Rules, and additionally require pollution prevention measures (e.g., spill prevention and control) and stormwater treatment for commercial and industrial land uses. The ordinance was updated in 2023 to incorporate additional prohibited uses within the Overlay District including petroleum bulk plants, gas stations and storage of commercial fertilizers and road salt or de-icing chemicals in bulk.

Inspections are critical for minimizing the risk groundwater contamination. Specialized expertise is not needed to conduct BMP inspections. NHDES offers training to health officers and water supply operators to conduct inspection programs and has found their background and experience appropriate.

Public Education

Regardless of whether a town chooses to take a regulatory approach, every groundwater protection program should have a strong outreach and education component. Regulatory programs, which appropriately focus on only the riskiest land uses, can accomplish only so much. Since nearly all businesses and households use substances that can potentially contaminate groundwater, most potential contamination sources are unregulated, such as household cleaners, personal care products, lawn, and garden fertilizers, etc. Education and outreach activities may be geared business owners and residents located in the town's Groundwater Conservation Overlay District. Such educational messages may include the following:

- **Encourage proper maintenance of septic systems;** It is recommended that septic systems be pumped every two to three years. Failure to pump your septic tank can cause premature failure and overflows that pollute water, threaten public health, and are expensive to repair or replace.
- **Encourage the use of Eco-Friendly products:** Using "environmentally friendly" products that use biodegradable alternatives and less packaging can reduce the number of contaminants that find their way into surface and ground water.
- **Plant More Native Plants:** Gardens allow for more water to soak into the ground than lawns and are also great for pollinators. Use erosion control mulch to stabilize bare soils and sloped areas.
- **Dispose of chemicals properly:** Leftover medicines, paint, pesticides, or other chemicals must be disposed of safely and should never be poured down the drain or flushed. Make sure to participate in Raymond's Household Hazardous Waste collection day.
- **Always clean up pet waste:** Pet and domesticated animal waste contains fecal coliform bacteria and other disease-causing organisms, such as Salmonella, roundworms, and Giardia. Pick up after your pets and dispose of their waste so pollution does not runoff into waterways and cause harmful public and environmental health issues.
- **Vote for water protection:** Support protections for clean water in your community such as upgrades to wastewater treatment facilities, stormwater management projects, land conservation bonds, and natural resource protection regulations (i.e., those that protect buffer lands along water bodies).

- **Get Involved:** Local and regional conservation and watershed organizations as well as local land use boards rely on volunteers. This is one of the most effective ways to get involved with land use and water quality issues. Visit www.raymondnh.gov to find out when Raymond’s land use boards meet. As part of the Lamprey and Exeter River Watersheds, Raymond residents may also be nominated to participate on the Lamprey River Advisory Committee: <https://www.lampreyriver.org/> and the Exeter-Squamscott River Advisory Committee: <https://exeterriver.org/>

Private Water Well testing

Approximately 46 percent of New Hampshire residents use private wells for domestic water supply and many private well users who fail to test their well water risk being exposed to unhealthy levels of natural or anthropogenic contaminants in groundwater. Testing well water in a lab is the only way to determine the presence of contaminants and potential health risks. Municipalities should encourage regular well water testing for both aesthetic and health-based contaminants as recommended by NHDES and listed within the “Standard Analysis.” Municipalities may also refine their local definition of potable water found in their building codes to establish an enforceable standard for private well water quality. NHDES’ Guidance to Refine the Potable Water Definition in NH in Municipal Building Codes (2015) is available for download at www.des.nh.gov. (Search “Potable Water Guide”) The guidance provides sample language for refining the potable water definition in local building codes. Residents with private wells may also use the NHDES Be Well Informed web application to help interpret their private well water quality results from a lab report and obtain recommended treatment for specific contaminants. The web application is available at www.des.nh.gov. (Search “Be Well Informed”)⁸.

Additionally, towns can adopt a health ordinance to require water testing prior to issuing an occupancy permit for all new structures relying on onsite private wells. Alternatively, municipalities can require water testing for all real estate transactions; this would include older homes and businesses, not just new structures. Both ordinance approaches are allowed under RSA 31:39 and RSA147 that authorize to municipalities to have regulations related to public health.

Stormwater Management

Effective stormwater management is essential for reducing the rate of pollution and sediment loading of streams, rivers, and other water bodies. Treatment and management of stormwater has become an increasing topic of concern in New Hampshire with growing development patterns in the state’s coastal watershed.

In 2012, Raymond obtained coverage under the Phase II General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in New Hampshire (MS4), which requires operators of MS4s in urbanized areas and operators of small construction sites, through the National Pollutant Discharge Elimination System (NPDES) permit, to implement programs and practices to control polluted stormwater runoff. The Phase II permit is intended to help reduce adverse impacts to water quality and aquatic habitat by requiring the use of controls on unregulated sources of stormwater discharges, which have the greatest likelihood of causing continued water pollution. Under this permit, all MS4s with stormwater discharges from United States Census Bureau designated Urbanized Areas are required to seek

⁸ <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/wd-06-41.pdf>

NPDES permit coverage for those stormwater discharges. Raymond is part of the Boston, MA-NH-RI Urbanized Area.

As part of complying with the MS4 general permit, all permittees are required to develop a stormwater management program (SWMP), which describes the town's activities and measures that will be implemented to manage and treat stormwater runoff and comply with the conditions of the permit. In compliance with the permit, Raymond has adopted stormwater management standards in its site plan and subdivision regulations to help minimize the environmental impacts of increased stormwater runoff from new construction. Such standards promote the use of low impact development and green infrastructure, enable groundwater recharge and volume control, promote best management practices for salt storage and incorporate the latest precipitation models found in the NH Stormwater Manual, Volume 2. The stormwater management standards also include more stringent requirements for redevelopment activities by leveraging the economic investment of developers in redevelopment projects to improve stormwater management on existing sites and improve water quality.

Raymond has retained engineering firm Weston & Sampson to develop the town's Stormwater Management Program. When available, that program can be found on the town's website: www.raymondnh.gov/ms4.

Master Plan

Before adopting or amending existing regulations, Raymond should ensure groundwater protection is identified as a priority in its master plan. The master plan is a document prepared by the planning board designed to guide the overall character, growth, and quality of life in the community. The themes and objectives of the master plan are guided by a comprehensive public engagement strategy and is reflective of the needs, concerns, and values of the community. While the master plan is not a legal document, it provides the legal basis for zoning and land use regulations.

Raymond's 2008 Master Plan addresses water resources in the Land Use and Natural Resources chapters, which reference the Raymond Water Resources Management and Protection Plan as a measure to protect the town's water resources. It is recommended the master plan be revisited and updated every ten years to ensure the land use tools used to guide the growth and development of the community reflect the vision and priorities established in the plan. Additionally, this source water protection plan should be adopted as part of the town's master plan to provide the legal basis for the town's groundwater protection regulations.

Land Conservation

The most effective strategy for protecting water resources is protecting land from future development. In addition to water quality benefits, land conservation is also beneficial for recreation, wildlife, and air quality. Conserving land can be achieved through easements, deed restrictions, or purchase. However, these methods can be costly. Other options to protect land is through land use regulations, voluntary protections, and land management planning. The Raymond Conservation Commission identified 51 high priority parcels in Raymond in its 2010 Open Space Plan. The goal of conserving these 51 parcels is to be ensure natural ecosystem services enjoyed by residents today, will be preserved and available to future generations (Raymond Conservation Commission Open Space Plan, 2010). The Open Space plan details the evaluation process for land conservation and provides guidance to the town boards and staff on the best ways to preserve and utilize open space in town.

There are several land use planning tools that address the preservation of open space such as cluster or open space development. The purpose of open space development is to encourage more efficient land development patterns that preserve open and green spaces, farmland, scenic areas, and other natural resources. Raymond's Conservation Development ordinance requires 50% of the total parcel on which a residential development is proposed to be permanently conserved as open space.

Transfer of Development Rights (TDR) is another zoning tool used to promote development in places best suited for development, while letting all property owners recoup the value of development. Within a TDR framework, the owner of land ill-suited for new housing (e.g., where there is a farm or where there are no utilities) could sell development rights to an owner of land more suitable to new housing (e.g., in a developed area with infrastructure access). The benefit of a TDR is that it ensures new housing options are built in areas with existing infrastructure and amenities while preserving open space, agriculture, and ecologically significant areas such as wetlands⁹.

Strategies and Recommendations for Source Water Protection (NEEDS COMMITTEE REVIEW)

The following strategies have been identified for the Community to implement to better protect sources of drinking water:

Land Use Regulations

1. Amend current groundwater conservation overlay district ordinance to include all aquifer recharge areas and all public water systems' (PWS) wellhead protection areas (WHPA). *This allows protection of current and future public water system without the need to amend zoning or zoning maps.* Also, ensure that the description for the location of the study identifying the aquifers is correct. For the RPC region these are:
 - a. Stratified-Drift Aquifers in the Exeter, Lamprey, and Oyster River Basins - US Geological Survey Open-File Report 92-95, "Geohydrologic and Ground-Water-Quality Data for Stratified-Drift Aquifers in the Exeter, Lamprey, and Oyster River Basins, Southeastern New Hampshire."
 - b. Stratified-Drift Aquifers in the Lower Merrimack and Coastal River Basins - US Geological Survey Water-Resources Investigations Report 91-4025, "Geohydrology and Water Quality of Stratified-Drift Aquifers in the Lower Merrimack and Coastal River Basins, Southeastern New Hampshire."
2. Increase the minimum private well radius to 100 feet or more. State requirements are 75 feet; *increasing well radius can better protect private wells from contamination from neighboring septic systems, land uses, and influence from other wells. This can be done under site plan and subdivision regulations.*
3. Increase setbacks for buildings, structures, septic systems and fertilizer application near surface waters and wetlands to help filter stormwater runoff. Requiring buffers remain in a natural state (no-cut) further improves water quality.
4. Adopt health ordinance to require water testing for all prior issuing occupancy permit for all new structures relying on onsite private wells. Alternatively, municipalities can require water testing for

⁹ https://nhhousingtoolbox.org/resource-archive/20230413-nh_housing_toolbox-final.pdf

all real estate transactions; this would include older homes and businesses, not just new structures. Both ordinance approaches are allowed under RSA 31:39 and RSA147 that authorize to municipalities to have regulations related to public health. See [NHDES model ordinance](#) for further options.

5. Amend Groundwater Conservation Overlay District Conditional Use Permit Criteria as follows:
 - a. *The Planning Board may grant a Conditional Use Permit for those uses listed above only after written findings of fact are made that all the following are true:*
 1. *The proposed use will not detrimentally affect the quality of the groundwater contained in the aquifer by directly contributing to pollution or by increasing the long-term susceptibility of the aquifer to potential pollutants.*
 2. *The proposed use will not cause a significant reduction in the long-term volume of water contained in the aquifer or in the storage capacity of the aquifer;*
 3. *The proposed use will discharge no wastewater on site other than that typically discharged by domestic waste water disposal systems and will not involve onsite storage or disposal of toxic or hazardous wastes as herein defined;*
 4. *The proposed use complies with all other applicable sections of this Section 5.2.6*
 - ii. *In granting such approval the Planning Board must first determine that the proposed use is not a prohibited use and will be in compliance with the Performance Standards as well as all applicable local, state and federal requirements. The Planning Board may, at its discretion, require a performance guaranty or bond, in an amount and with surety conditions satisfactory to the Board, to be posted to ensure completion of construction of any facilities required for compliance with the Performance Standards. The amount of this bond shall be in addition to any other bond required by the Board under either the Subdivision or Site Plan Review Regulations.*

Public Education

1. Promote private well testing by supplying testing kits and information about testing at town events. NHDES *Be Well Informed Guide* can be used to help homeowners interpret results.
2. Develop and distribute informational flyers explaining actions individuals can take to help protect drinking water (currently doing under PREPA project).
3. Distribute information regarding the proper maintenance of septic systems, appropriate fertilizer use, and other general groundwater protection information at Town Hall, and community or common buildings.
4. Work with the Conservation Commission to promote awareness of types of plantings residents should and should not plant in their yards to enhance water quality.
5. Encourage residents and businesses to participate in household hazardous waste day.

BMP Inspections

1. Develop and maintain inventory of business owners using large quantities of regulated substances (greater than 5 gallons).
2. Send businesses using large quantities of regulated substances a program explanation letter notifying them of the town's groundwater protection efforts and the BMP rules.







3. Establish a timeframe for conducting BMP inspections for businesses using large quantities of regulated substances (quarterly, annually etc.)

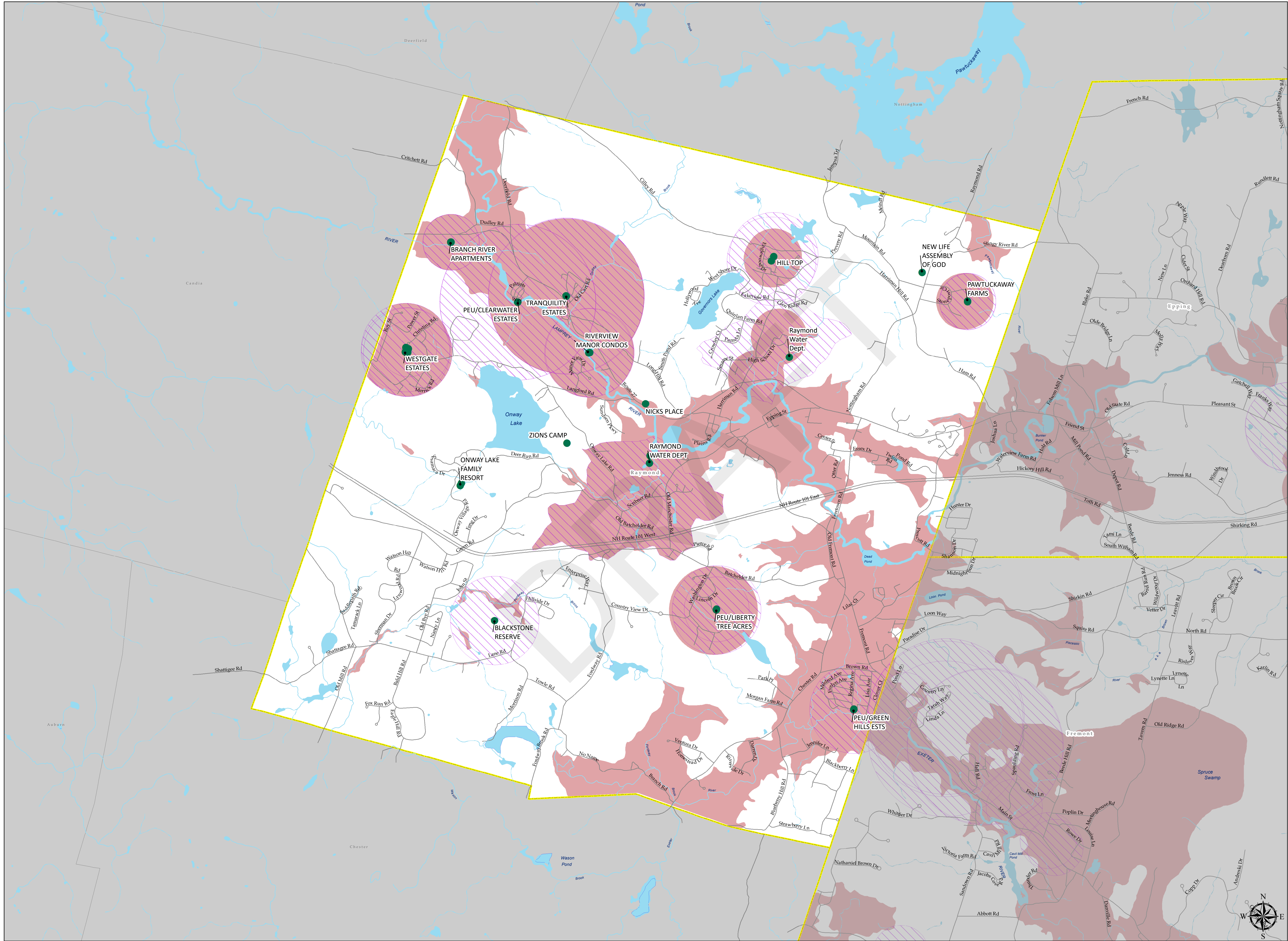
Staff and Board Training

1. Convene land use boards annually to discuss water resource protection issues and goals for strengthening or changing town regulations.
2. Solicit NHDES Source Water Protection Bureau staff or Rockingham Planning Commission staff to provide annual informational and training session on water resource protection funding opportunities.
3. Keep apprised of water resource protection funding opportunities, grant deadlines and grant writing workshops.
4. Conduct staff BMP inspection training annually.

DRAFT

Map 5 - Wellhead Protection Areas and Public Supply Wells and Zoning Protected Areas

-  Active Public Supply Wells (2022)
-  Roads
-  Zoning or Code Protected Areas
-  Wellhead Protection Areas (2022)
-  RPC Towns
-  New Hampshire Communities



0 0.175 0.35 0.7 1.05 Miles

Appendix A: Public Water System Vulnerability Assessment

Ranking Criteria:

KCSs: Known contamination sources in the vicinity of the source. This includes any site known to DES where contaminants are known or very likely to have been released to the ground, and where remediation is not complete.

- Low (L) = None present in the WHPA
- Medium (M) = One or more KCSs in the WHPA but not within 1,000 feet of the well or intake
- High (H) = One or more KCSs within the WHPA and within 1,000 feet of the well or intake

PCSs: Potential contamination sources in the vicinity of the source. This includes any site known to DES where contaminants are known or very likely to be used in significant quantities, but where there are no known releases to the ground.

- Low (L) = No PCSs within 1,000 ft of the well in the WHPA
- Medium (M) = 10 or fewer PCSs identified within 1,000 feet of the well in the WHPA
- High (H) = 10 or more PCSs identified within 1,000 feet of the well in the WHPA. For transient sources, a ranking of "H" means one or more PCS have been identified in the WHPA within 1,000 ft of the well.

Urban Land Cover: The percentage of urban land cover in the vicinity of the source, based primarily on satellite images. This criterion does not apply to sources serving transient systems.

- L = less than 10% of the WHPA or HAC is urban, and less than 10% of the WHPA within 1,000 ft of the well is urban.
- M (for community and non-transient groundwater sources) = less than 10% of WHPA is urban but 10% or more of the WHPA within 1,000 ft of the well is urban.
- H (for community and non-transient groundwater sources) = 10% or more of WHPA is urban.

Agricultural Land Cover: The percentage of agricultural land cover in the vicinity of the source (in the WHPA or within 300 ft of surface water in the HAC), based on satellite images. This criterion does not apply to sources serving transient systems. L = no agricultural land. M = less than 10% agriculture land. H = 10% or more agriculture land.

Impervious Land Cover in the WHPA: The percentage of land cover within a WHPA where precipitation is not able to infiltrate into the ground. Impervious surfaces may consist of roadways, rooftops, parking lots, and compacted gravel. The higher the impervious land cover percentage the more susceptible the source is to contamination from runoff and there is decreased ability for precipitation to absorb into the ground.

Conservation and Public Land Cover: The percentage of land cover with development restrictions either through deed restrictions or conservation easement within the WHPA. The higher the conservation or public land cover percentage there is decreased risk for potential contamination on a source from land development.

EPA ID	Source #	System Name	System Type	Rank For KCS	Rank For PCS	Urban Land Cover	Agricultural Cover	Impervious Land Cover % In WHPA	Conservation Land Cover % In WHPA
1972080	001	Black Stone Reserve	C	L	L	L	NA	2.6	1.6
1972040	001	Branch River Apartments	C	H	M	L	L	11.5	9.4
1972040	002	Branch River Apartments	C	H	M	L	L	11.6	12.6
1973050	002	Hill Top	C	H	L	M	L	7.1	5.3
1973050	004	Hill Top	C	H	L	M	L	7.8	7.4
1975020	001	New Life Assembly of God	N	L	L	N/A	L	0.0	4.7
1978070	001	Nick's Place	N	L	H	N/A	L	0.0	0.0
1977050	002	Onway Lake Family Resort	N	L	L	N/A	L	0.0	0.0
1977050	001	Onway Lake Family Resort	N	L	L	N/A	L	0.0	0.0
1972050	002	Pawtuckaway Farms	C	L	L	M	L	5.9	12.6
1972050	001	Pawtuckaway Farms	C	L	L	M	L	5.9	6.0
1972070	001	PEU/Clearwater Estates	C	M	M	M	L	5.0	10.2
1972070	002	PEU/Clearwater Estates	C	M	M	M	L	5.0	5.3
1973030	001	PEU/Green Hill Estates	C	M	M	M	L	12.4	3.9
1973030	002	PEU/Green Hill Estates	C	M	M	M	L	12.4	3.9
1973030	003	PEU/Green Hill Estates	C	M	M	M	L	12.4	3.9
1973030	004	PEU/Green Hill Estates	C	M	M	M	L	12.4	3.9
1972010	006	PEU/Liberty Tree Acres	C	M	L	M	L	7.2	8.1
1972010	005	PEU/Liberty Tree Acres	C	L	L	M	L	8.1	7.5
1971010	004	Raymond Water Dept	C	L	L	M	L	0.0	0.0

1971010	003	Raymond Water Dept	C	M	M	L	L	7.5	0.0
1971010	005	Raymond Water Dept	C	L	L	M	L	0.0	7.7
1971010	006	Raymond Water Dept	C	M	L	L	L	7.9	0.0
1972020	003	Riverview Manor Condos	C	M	M	M	L	8.6	8.5
1972020	002	Riverview Manor Condos	C	M	M	M	L	8.6	9.4
1973060	004	Tranquility Estates	C	M	M	M	L	4.6	1.9
1973060	104	Tranquility Estates	C	M	M	M	L	4.6	1.9
1972060	001	Westgate Estates	C	M	L	L	L	9.4	6.0
1972060	004	Westgate Estates	C	M	L	L	L	9.2	9.2
1972060	003	Westgate Estates	C	M	L	L	L	9.6	9.4
1972060	008	Westgate Estates	C	L	L	L	L	10.2	9.8
1977010	002	Zions Camp	N	L	L	N/A	L	0.0	0.0

Appendix B: Funding and Training Resources for Source Water Protection
(to be added)