

2014 Source Water Assessment

ROCKVILLE MILL COMMUNITY WATER SYSTEM

Main Findings

- Overall, the results indicate that the WHPA has a low susceptibility to contamination. This is an average ranking for the entire wellhead protection area, based on land use, soils and existing water quality. It is important to note that a LOW rating does NOT mean that the source is free from contamination risk. Without sufficient protection, ANY water supply can become contaminated.
- A potential source of pollution is the onsite wastewater treatment system (OWTS). This water system and OWTS serves a converted mill building consisting of 11 apartments, a commercial office, and a U.S. Postal Service office with approximately 50 people served daily.
- Water quality of the well water is acceptable, although sodium levels are approaching the U.S. EPA 20 mg/L guidance level for those on a restricted sodium diet. Elevated sodium levels identified in the well water might be related to salt usage on roadways or salt storage locations.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity such as the onsite wastewater treatment system or fertilizers.
- Water quality data indicate that the well is susceptible to contamination and best management practices should be implemented while carefully monitoring water quality in the well.

For further information please contact: Coastal Housing Corporation, 2638 East Main Road, Portsmouth, RI 02871.

What you can do to protect your drinking water:

The Rockville Mill Community Water Supply WHPA is predominantly rural in character and maintaining low density development as well as careful management of future development to avoid or mitigate potential sources of pollution will help to maintain water quality in the WHPA.

However, the Mill apartments and offices are a high density use and a potential source of pollution to the well, particularly from the OWTS. Proper care and regular maintenance of the advanced OWTS is essential to protect the water supply. Managing stormwater runoff and practicing low-maintenance landscape care within the vicinity of the well also will help protect water quality.

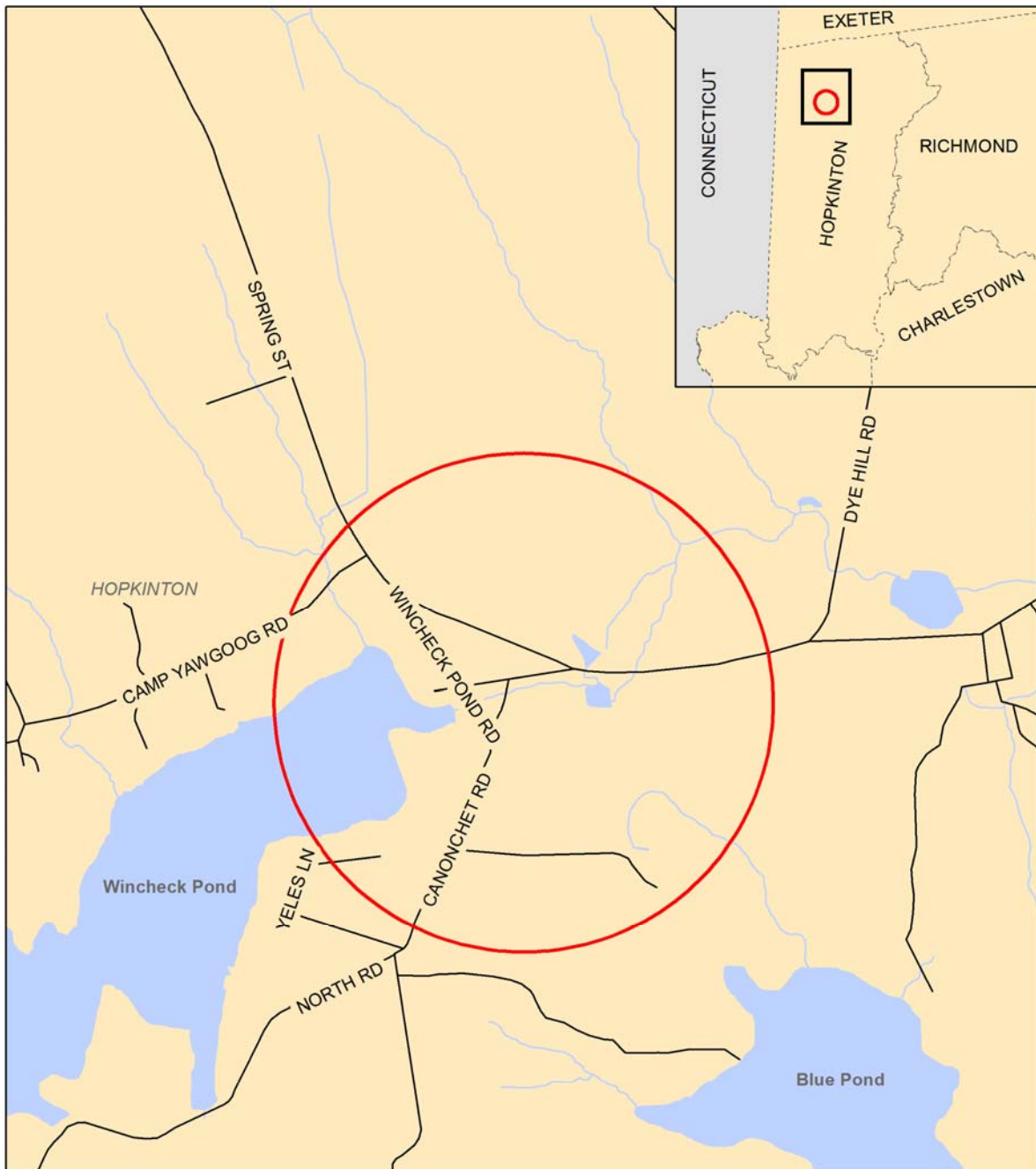
. What you can do to help:

- **Set protection priorities**
 - Implement recommendations in the latest sanitary survey.
 - Inspect the water supply and protection area regularly for potential pollution sources.
 - Know the extent of the land area reserved for protection of the well (a 200' to 400' radius around the well) and ensure that only activities that are both directly related to your water system and non-threatening to water quality occur there.

- **Remove underground storage tanks (USTs)**
 - Tanks that leak gasoline or oil contaminate soil and groundwater. If a UST is located within the protective radius, it should be removed, including any residential home heating oil tanks, which are not regulated by RI DEM.
 - Any tanks in the larger wellhead protection area should be above-ground, located on impermeable surfaces, and contained in an area large enough to hold the complete volume of a spill.
- **Inspect and maintain septic systems:**
 - Septic systems can contribute bacteria, viruses, nitrogen, and other contaminants to groundwater. All tanks, leach fields, and system components should be located outside the protective radius.
 - Inspect septic tanks annually and pump when needed. Hire only registered inspectors, listed at: https://web.uri.edu/owt/files/SepticinspectorsConv_091418_4.pdf
 - If you have an advanced OWTS, ensure that your maintenance contract is renewed annually.
 - Household chemicals, cleaning products, food wastes, and disposable wipes can disrupt system function, cause drain field clogging, or contribute toxics to groundwater. Review the factsheet, *Practices to Extend the Life of Your System*, and share with water users and staff annually: <https://web.uri.edu/nemo/wastewater-factsheets-for-homeowners/>
- **Evaluate storage areas:**
 - Store hazardous materials outside the protective radius (never within the radius!) and only inside a secure building with an impermeable floor and appropriate spill containment.
- **Restrict parking and vehicle use:**
 - Do not establish parking areas within the protective radius.
 - Ensure vehicle maintenance and washing are performed outside the radius.
 - Keep vehicles and equipment in good repair to prevent leaks and spills.
 - Direct any rainwater from paved areas away from the well and onto vegetated areas.
 - Avoid use of winter de-icing salt.
- **Avoid pesticides, herbicides, and fertilizers:**
 - Fertilizers (even organic varieties) are potential sources of nitrogen and bacteria, while pesticides and herbicides contain chemicals that also can pollute drinking water supplies. Any application of fertilizers, pesticides, and herbicides is prohibited within 200 ft. of any drilled well, and preferably, use or storage of such materials should be avoided throughout the entire protective radius.
- **Practice low-maintenance lawn care:**
 - Minimize lawn area and plant natives that don't require as much maintenance once established.
 - Minimize summer watering or consider allowing the lawn to go dormant during dry periods.
 - Preserve existing trees and naturally vegetated areas on your property, as they help soak up and filter stormwater before it reaches the groundwater.
- **Be aware of animal waste:**
 - Restrict pet access within the protective radius. Elsewhere on the property, require pet owners to pick up after pets.
 - Post signage as needed.

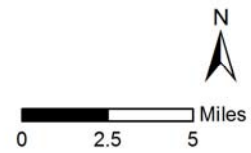
Table 1- Summary of pollution risk results

Risk Indicator	Calculated Value – Risk Rating (score)	Explanation
Wellhead Protection Area Land Use		
High intensity land use in WHPA	<1% - Low (0)	
Existing or potential pollution sources		
Pollution sources within inner protective radius (400' to 200') of well	0 – Low (0)	The 2013 Sanitary Survey indicates no pollution sources within the protective radius of the well
Pollution sources per acre throughout WHPA, excluding inner protective radius (multiplied by 10)	Limited data - Medium (5)	Public data were reviewed (LUSTs, CERCLIS and RIPDES sites) but are dated and less accurate than a windshield survey. Since limited data were available, risk was set to medium.
Water Quality		
History of contaminant detects within the last 5 years	≤ ½ MCL - Medium (5)	No violations of the standards for regulated contaminants (excluding bacteria and nitrates) have been identified. However, there have been detections below levels considered acceptable by U.S. EPA. This indicates the need for continued monitoring.
Source water bacteria detects within the last 5 years	0 – Low (0)	Bacteria have not been detected.
Maximum nitrate – nitrogen (NO ₃ -N) concentration in the last 5 years	0.89 mg/L – Medium (5)	Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
Overall Rating	15 (low)	Note: A LOW rating does NOT mean that the source is free from contamination risk. Without sufficient protection, ANY water supply can become contaminated.



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- Well Head Protection Area
- Municipal boundary
- Lakes and Ponds
- ROADS
- Streams/Rivers



Data: Well Head Protection Areas: RI HEALTH 2014, Towns: RIGIS, State lines: MASS GIS

Date: 7/1/2014

Figure 1- Location of Well Head Protection Area

UNDERSTANDING THE ASSESSMENT

Why was the assessment done?

The Safe Drinking Water Act (SDWA) Amendments of 1996 required states to develop and implement Source Water Assessment Programs (SWAPs) to analyze existing and potential threats to the quality of the public drinking water throughout the state. Using these programs, most states have completed Source Water Assessments for every public water system -- from major metropolitan areas to the smallest towns. Even schools, restaurants, and other public facilities that have wells or surface water supplies have been assessed. A source water assessment is a study and report, unique to a water system that provides basic information about the water used to provide drinking water. States are working with local communities and public water systems to identify protection measures to address potential threats to sources of drinking water. In Rhode Island, RI HEALTH's Office of Drinking Water Quality administers the Source Water Assessment Program.

What area was evaluated for this assessment?

The Source Water Protection Area, the area evaluated for this assessment, is the critical area surrounding a public water supply well or an intake on a surface source. For a public water supply well this is the well head protection area (WHPA). The WHPA is the estimated area from which groundwater and surface water will flow from under severe pumping conditions. This can also be stated as the maximum estimated area that water withdrawn from the well will ever be drawn from. For most bedrock wells this area is a volume dependent circle. For wells in sand and gravel this area is generally not a circle, but an irregular shape determined by sedimentary deposits and pumping rate. The Source Water Protection Area for surface water sources is generally the watershed of the surface waterbody.

Will the potential contamination sources identified in the sanitary survey contaminate my source?

Potential contamination sources identified in sanitary surveys are facilities that typically use, produce, handle or store contaminants of concern, which, if improperly managed, could find their way to a source of public drinking water. It is important to understand that a release may never occur from a potential contamination source, provided good management practices are used. Many potential contamination sources are regulated at the federal level, the state level, or both, to reduce the risk of a release. There are a number of methods that water systems can use to work cooperatively with potential contamination sources. These often involve educational visits and inspections of stored materials.

How should this assessment be used?

This assessment should be used to plan for improved protection of public drinking water sources. Additional information may also be useful such as identification of the 100-year flood plain, tax map information, soils information or high-density development areas. This assessment is a good starting place for planning protection programs. **Communities should act now to protect valuable water supply resources; once contamination occurs clean-up is costly, often technically difficult, and sometimes infeasible. Additionally, unprotected watersheds and wellheads can lead to deterioration of water quality that may eventually lead to higher treatment costs.**

EXPLANATION & DETERMINATION OF POLLUTION RISK FACTORS

This Source Water Assessment was completed using the Guide to Updating Source Water Assessments and Protection Plans, Version 3 – 2010. All risk indicator ratings were obtained from this document. A summary of methods as well as calculated risks are presented here.

Risk Factors

Risk Factors: High Intensity Land Use in WHPA

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High intensity land use was determined using Rhode Island GIS (RIGIS) land use data (2011 data). Land uses within the WHPA were calculated using ArcView 10.2 (ESRI) and then aggregated based on land use categories defined in URI Cooperative Extension MANAGE model (Method for Assessment, Nutrient Loading And Geographic Assessment). The MANAGE model documents a method for informing decisions about environmental risks associated with land use. MANAGE includes data management models for ArcView 10.2, an Excel predictive model, and various tools for viewing land use/soils and landscape data. Technical documentation for the MANAGE model can be obtained from the University of Rhode Island Non-Point Education for Municipal Officials (NEMO) program.

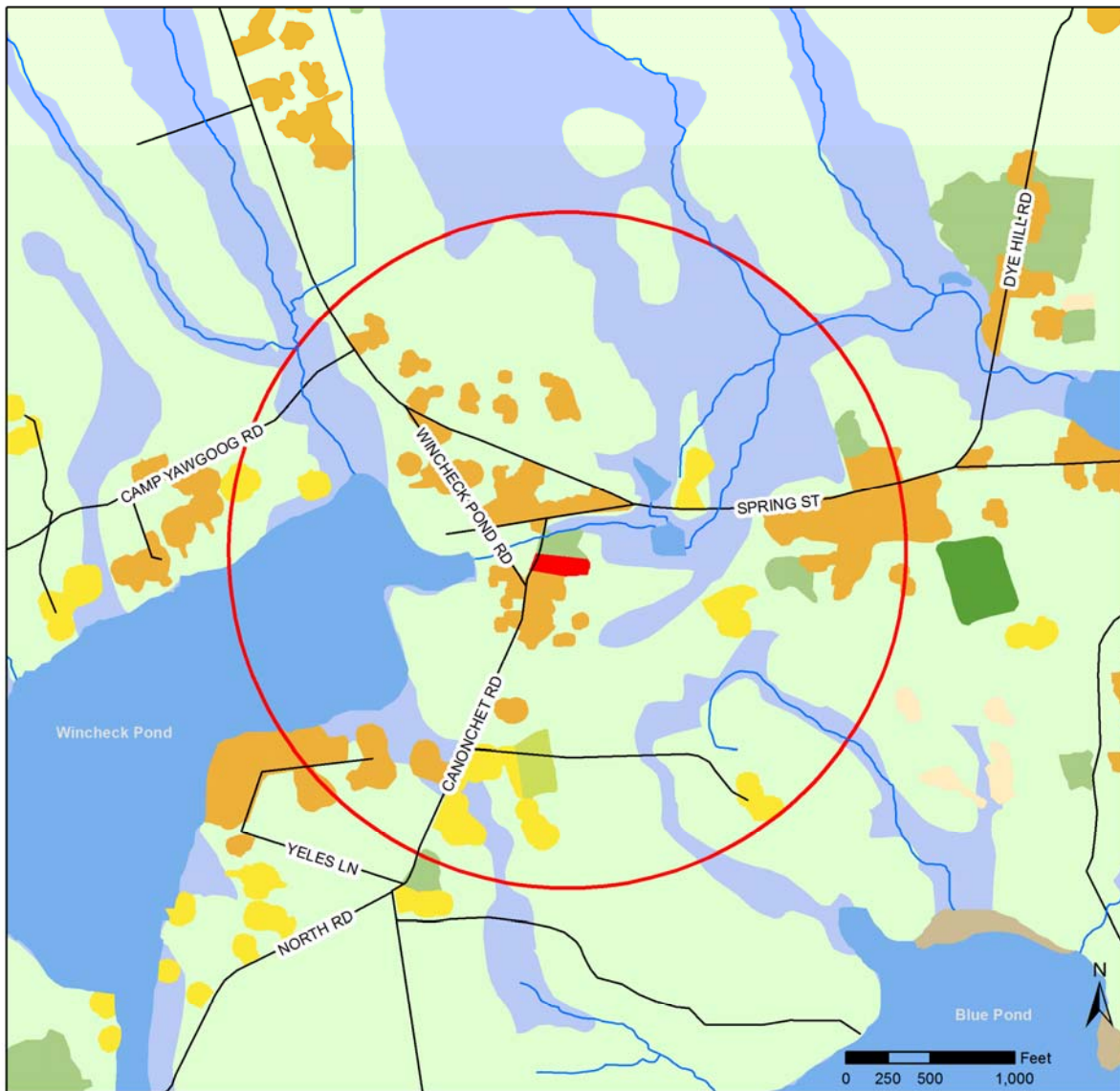
The MANAGE land use categories group land uses based on pollution potential (ie: developed recreation and urban open space are considered to have the same potential pollution loading, so they are grouped into the “Recreation” category). The MANAGE model then further assigns 11 land use categories into a group identified as high intensity land use (Appendix B). High intensity land uses are considered to have elevated risk of potential contamination when compared to non-high intensity land uses. The percentage of high intensity land use in the WHPA under study is then compared to the rating scale for the risk indicator: High intensity land use in WHPA.

A summary of all land uses found within the Rockville Mill Community Water System WHPA reveals that less than 1% of the WHPA is considered to be developed as high intensity land use, corresponding with a risk rating of low (figure 2, table 2). The small amount of high intensity land use identified inside the WHPA is categorized as a residential/commercial land use and correlates with the Upper Rockville Mill affordable housing complex, which receives water from the well discussed in this document. This facility is a historic mill that was renovated and now contains 11 housing units, a commercial office and a U.S. Post office.

Table 2 - Land uses within WHPA

Land Use (MANAGE Code & Description)	Total Area (acres)	% of Total Land Use
[1] HD Res.(>8 /ac)*	0	0
[2] MHD Res.(4-7.9/ac)*	0	0
[3] MD Res.(1-3.9/ac)	22.2	7.6%
[4] MLD Res.(0.5-0.9/ac)	5.5	1.9%
[5] LD Res.(<0.5/ac)	9.7	3.3%
[6] Commercial*	0.8	0.3%
[7] Industrial*	0.0	0 %
[8] Roads*	0	0
[9] Airports*	0	0
[10] Railroads*	0	0
[11] Junkyards*	0	0
[12] Recreation	1.7	0.6%
[13] Institution*	0	0
[14] Pasture	3.0	1.0%
[15] Cropland*	0	0
[16] Orchards*	0	0
[17] Brush	0.5	0.2%
[18] Forest	148.0	50.9%
[19] Barren	0	0
[20] Wetland (includes forested wetland)	69.4	23.9%
[21] Water	29.9	10.3%
[22] Transitional	0	0
Total (acres)	290.7	100.0%
Total High intensity land use	0.8	0.3%

Note: An asterisk indicates a High intensity land use.



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Data: RIGIS 2011 Land use modified to include forested wetlands, WHPA: RI HEALTH 2014, Stream/Rivers: RIGIS Streams5k

Date: 7/8/2014

Figure 2 - Land use in the vicinity of the WHPA

Risk Factors: Pollution Sources Within the Inner Protective Radius and Per Acre Throughout the WHPA

Information on the presence or absence of pollution sources within the inner protective radius of the well can usually be obtained through the Rhode Island Department of Health Sanitary Surveys and Waivers. Pollution sources within the inner protective radius of a well are likely to contaminate the well due to the close proximity. The most recent sanitary survey of the Rockville Mill Community Water System WHPA was completed on January 10, 2013, and did not indicate the presence of any pollution sources within the inner protective radius of the well (Appendix C). Therefore, this risk factor was set at low.

Potential pollutant sources throughout the WHPA also have the potential to contaminate the groundwater feeding the well. The greater the number of potential pollutant threats the greater the chance of well contamination. Potential pollutant sources are facilities that are not actively polluting but may be at greater risk of polluting groundwater simply because of their use of chemicals. Businesses such as drycleaners, gas stations, hardware and garden supply shops as well as areas with high intensity cultivation all use chemicals that have the potential to contaminate groundwater. The best method for determining potential pollution sources in the WHPA is a direct windshield survey of the area. Public data available through RIGIS is also useful, but not as comprehensive as a windshield survey.

This Source Water Assessment was limited to utilizing existing data to determine pollution sources on a per acre basis in the WHPA. The following data sources were obtained from RIGIS and reviewed:

- Leaking Underground Storage Tanks (LUSTs) (from 1992-2012),
- Rhode Island Pollution Discharge Elimination System (RIPDES) sanitary permits (last updated in 2000)
- Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS/Superfund) sites (last updated in 1997).

No data points were located within the Rockville Mill Community Water System WHPA. Additionally, the sanitary survey did not provide any information on pollution sources on a per acre basis throughout the WHPA. Due to the limited data available, the risk factor: Pollution Sources Per Acre Throughout the WHPA was set at medium to be protective.

Risk Factors: History of Contaminant, Bacteria and Nitrate-Nitrogen Detections

Laboratory results for samples collected from the active well in the Rockville Mill Community Water System WHPA were obtained from Rhode Island Department of Health and used to determine risk factors: history of contaminant, bacteria and nitrate-nitrogen detections within the last five years. These data provide direct evidence of the quality of well water.

Risk Factor: History of contaminant detections within the last 5 years

All contaminant detections recorded in the laboratory records (excluding bacteria, nitrogen, sodium, calcium and magnesium) for the past five years were reviewed. Data were available for 2012, 2013 and 2014 (Appendix D). A risk rating for each contaminant above the detection limit was assigned based on the Maximum Contaminant Level (MCL). The MCL is based on either Rhode Island or U.S. Environmental Protection Agency (EPA) drinking water standards and advisory levels. The highest risk rating observed for each well was used to set the total risk rating for that well. This risk factor for Rockville Mill Community Water System WHPA was set at medium; No violations of the standards for regulated contaminants (excluding bacteria and nitrates) have been identified. However, there have been detections below levels considered acceptable by U.S. EPA. This indicates the need for continued monitoring.

Additionally, sodium levels are approaching 20 mg/L in Rockville Mill Community Water System WHPA. Sodium data from 2012 to 2014 range from 18.0 to 19.2 mg/L. Calcium, sodium and magnesium data are not analyzed as well contaminants, as they are naturally occurring. However, sodium is reviewed when levels consistently approach or exceed 20 mg/L because sodium and chloride are indicators of contamination from road salt and can also indicate the presence of other runoff pollutants. The U.S. EPA listed sodium on the “drinking water advisory” list with 20 mg/L as the guidance level for those on a restricted sodium diet (EPA 822-S-12-001, 2012 Edition of the Drinking Water Standards and Health Advisories, April 2012). This is not an official contamination level; however, sodium concentrations approaching or exceeding 20 mg/L should be reported.

Risk Factor: Source Water Bacteria Detections within the last 5 years

All available bacteria data for the past five years were reviewed. Data were available from 2012 thru 2014. The maximum pollution risk rating for bacteria is based on the number of positive total coliform detections at the source per the number of total coliform samples collected over the five year period. It is assumed that routine bacterial analysis is for total coliform bacteria and that analysis of *Fecal coliform* only occurs after detections of total coliform are observed. Heterotrophic Plate Count (HPC) values are not used in this analysis. It is assumed for the purposes of this Source Water Assessment that if *Fecal coliform* samples are collected and return a result in violation of RI HEALTH regulations that the cause of the contamination was identified and corrected. Therefore, no WHPAs are ranked in the extreme category for the purposes of the Source Water Assessment Program.

This risk rating for Rockville Mill Community Water System WHPA was set at Low – Bacteria have not been detected.

Risk Factor: Maximum nitrate-nitrogen (NO₃-N) concentration in the last 5 years

Nitrate-Nitrogen data from the past five years of data were reviewed. Data were available for 2012 and 2013. The maximum observed nitrate-nitrogen value was 0.89 mg/L NO₃-N. This nitrate-nitrogen value falls under a risk rating of medium – nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.

The yearly maximum and average nitrogen values for the well are generally plotted and the data reviewed for trends. There are not enough data available to suggest trends.

Additional Risk Indicators/Assessment Steps

The following risk factors are not part of the official risk rating, but provide additional information on potential risks to the groundwater resource.

Risk Factor: High Intensity Land Use on Excessively Permeable Soils in the WHPA

The percentage of high intensity land uses on excessively permeable soils in the WHPA is also a risk indicator (figure 3, table 3). Excessively permeable soils (as obtained from the RIGIS 2014 Soils data) allow contaminants and water to rapidly infiltrate into the ground. Excessively permeable soils when located in conjunction with high intensity land uses increase the risk of well contamination. Therefore, when evaluating WHPAs, locating potential pollution sources that lie on excessively permeable soils is an important component of the risk analysis. In the Rockville Mill Community Water System WHPA, there are no high intensity land uses located on excessively permeable soils, corresponding with a risk rating of low. Additionally, no excessively permeable soils are located within the WHPA (figure 3).

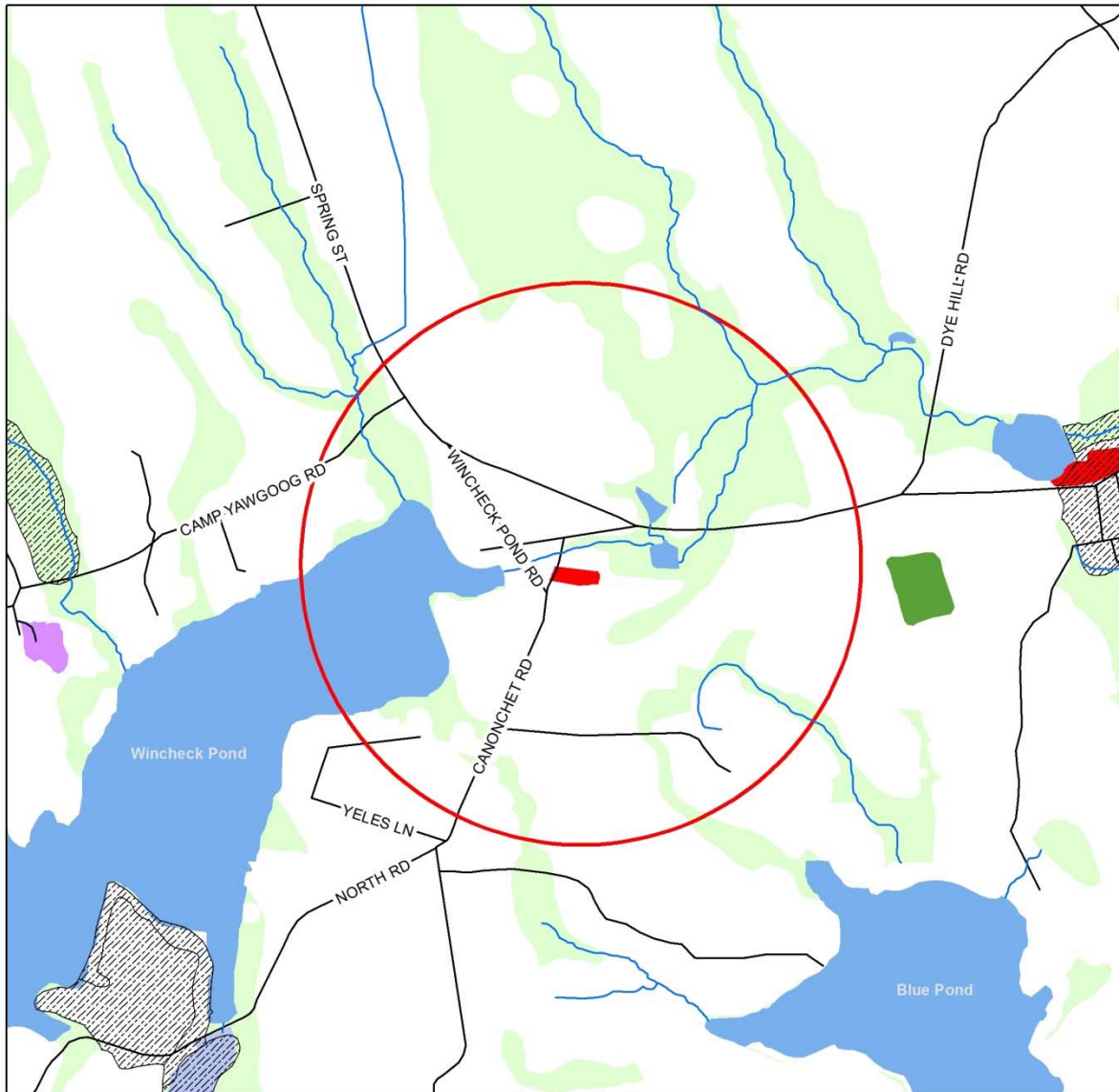
Table 3 - Risk indicator rating for High Intensity Land Use on Highly Permeable Soils Throughout the WHPA (from Guide to Updating Source Water Assessments and Protection Plans, V3, December 2010 (Attachments, 2003 risk rating indicator table).

Indicator	Low (0)	Medium (5)	High (10)	Extreme (25)
2. High intensity land use on highly permeable soils throughout the WHPA.	< 5%	5 - 14%	15 - 30%	> 30

In addition to evaluating the percentage of high intensity land use on highly permeable soils, soil hydrogroup was combined with water table depth to reveal likely pathways for water flow and pollutant movement. Soils are placed within four hydrogroups: A – highly permeable soil, B – moderately permeable soil, C – slow infiltration soil and D – wetland/very slow infiltration soil. Group A soils, or the most permeable soils, generally consist of well sorted sands and gravel that easily and quickly allow water and soluble contaminants to move toward a working well. In contrast, group C & D soils are slowly permeable, with high water tables that promote runoff to nearby surface waters rather than infiltration.

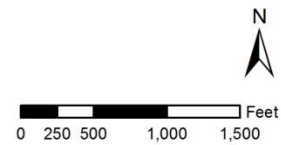
Water table depth is the depth under the surface where the soil is saturated with water. In areas with sandy soils and a deep water table, pollutants can easily infiltrate to underlying groundwater reservoirs. Alternatively, soils with slow permeability have lower infiltration rates and tend to have a higher water table. In New England high water table wet soils are almost always connected to wetlands, intermittent drainage ways and small streams, forming an extended drainage network where pollutants can easily flow from hydraulically active soils to surface waters. Although these indicators are extremely useful in identifying pathways for contaminant movement to receiving waters, soils are less reliable indicators in urban areas where natural drainage patterns have been altered by stream channelization, artificial fill and subsurface drains.

Further investigation into the soils within the Rockville Mill Community Water System WHPA reveals that the soils range from hydrogroup B to D, with varying water table depths (figure 4). Soils encompassing the areas around the stream network in and around the WHPA consist of hydrogroup C and D soils with high watertables indicating an extended wetland drainage flow pattern extending beyond the stream banks. This flow network will channel surface waters toward Wincheck Pond and is not expected to negatively impact well water quality.



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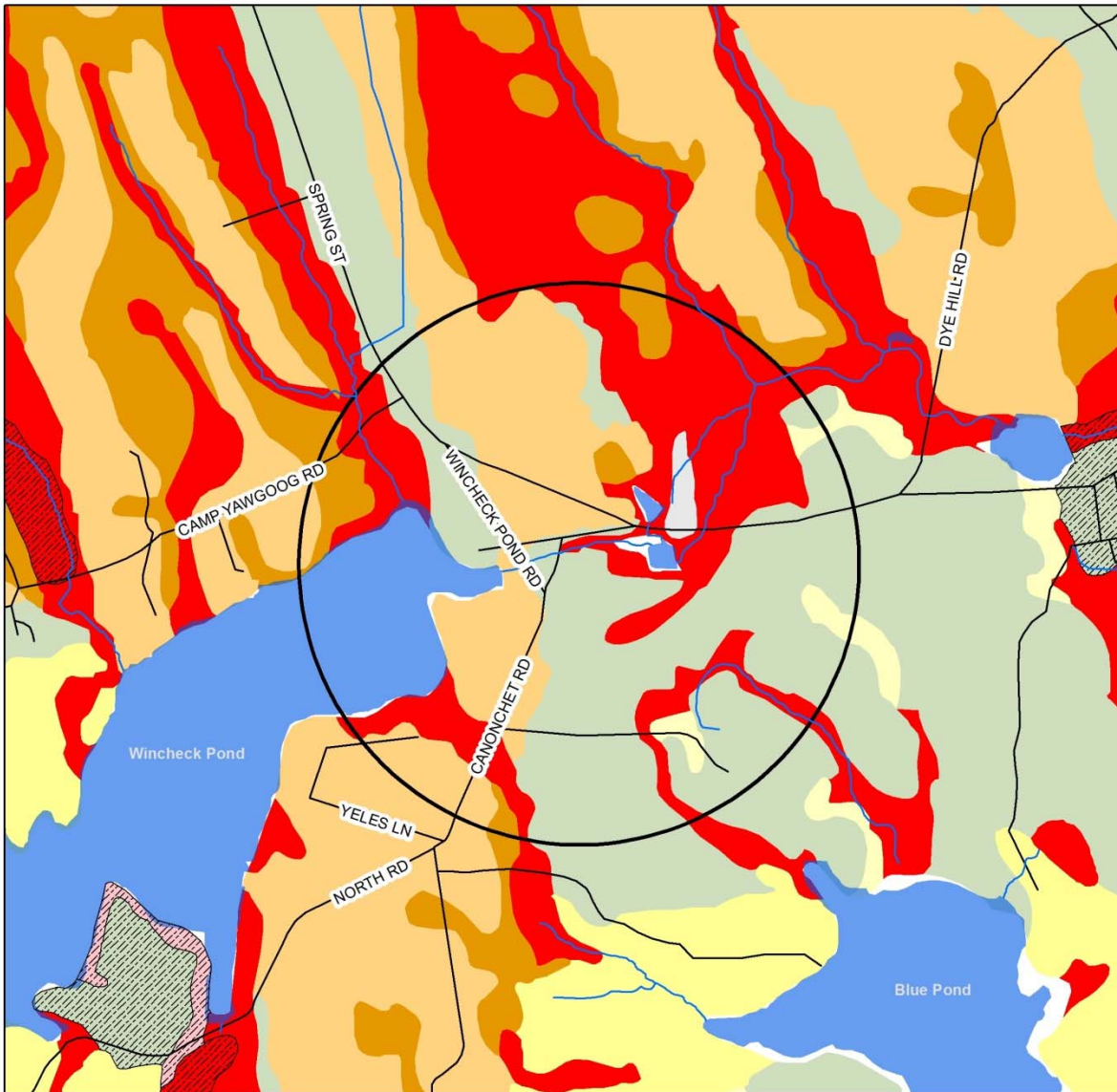
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|----------------------------|--|
| Streams/Rivers | High Intensity Land Use Category |
| Well Head Protection | Commercial, Commercial/Industrial Mixed, Commercial/Residential Mixed and Industrial |
| Excessively Permeable Soil | Institutional |
| Water | Cropland (tillable), Orchards, Groves, Nurseries and Confined Feeding Operations |
| Wetland | |
| Forested wetland | |



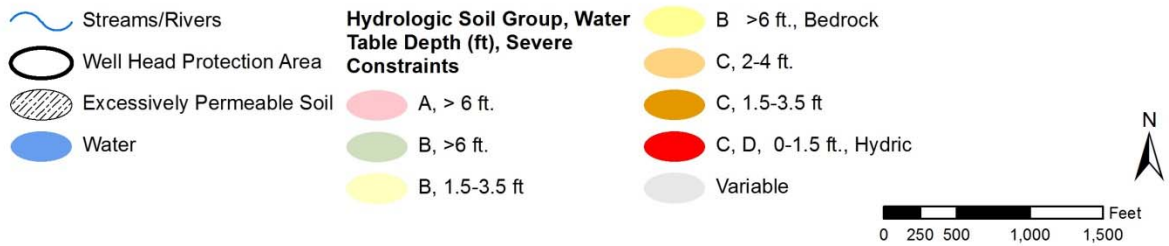
Data: RIGIS 2011 Land use modified to include forested wetlands, WHPA: RI HEALTH 2014, Stream/Rivers: RIGIS Streams5k

Date: 4/9/2014

Figure 3 - High intensity land use and excessively permeable soils



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Data: Lakes/Ponds: RIGIS 2011 Land use modified to include forested wetlands, WHPA: RI HEALTH 2014, Stream/Rivers: RIGIS Streams5k, Soils: RIGIS 2014 soils

Date: 4/8/2014

Figure 4 - Hydrologic soil group and water table depth

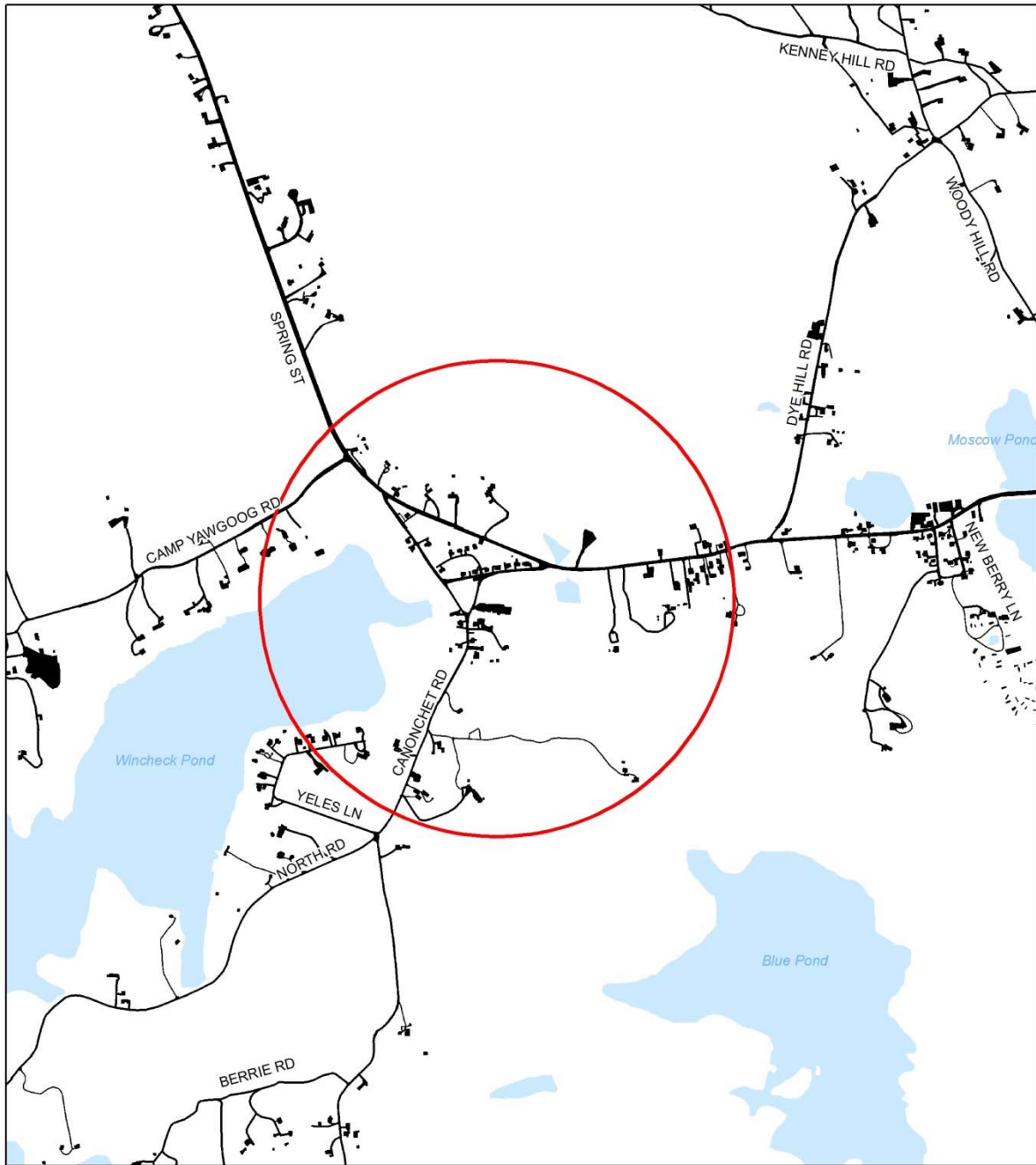
Impervious surfaces in WHPA

Impervious surface analysis is an important consideration when performing a pollution risk assessment. In general, the amount of storm water runoff is positively correlated with the amount of impervious surface in a WHPA. Therefore, in a more densely developed area, there will be higher amounts of storm water runoff than natural areas. Storm water runoff can transport harmful contaminants into surface water bodies as it flows over impervious surfaces such as roads, parking lots and commercial facilities. Impervious surfaces also impede precipitation from reaching groundwater, reducing recharge.

Impervious surface coverage for the Rockville Mill Community Water System WHPA was calculated in ArcView 10.2 (ESRI) using the Rhode Island 2011 Impervious Surface Coverage available from RIGIS. The percentage of impervious surface found in Rockville Mill Community Water System WHPA is 6%, corresponding to a risk rating of low (table 3, figure 5).

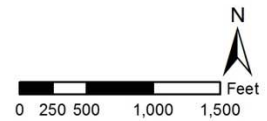
Table 4 - Risk indicator rating for Percentage of Impervious Surface Throughout the WHPA (from Guide to Updating Source Water Assessments and Protection Plans, V3, December 2010).

Indicator	Low (0)	Medium (5)	High (10)	Extreme (25)
Impervious Surface (% in WHPA)	< 10%	10 - 14%	15 - 25%	> 25



Rockville Mill Community Water System (2980447)

○ Well Head Protection Area ● Impervious (roads, houses, pools, driveways)



Service Layer Credits:

Data: Well Head Protection Areas: RI HEALTH 2014, Impervious Surfaces: RIGIS 2011

Date: 4/9/2014

Figure 5 - Impervious surfaces in the vicinity of the WHPA

References:

RI HEALTH. 2012. *Rules and Regulations Pertaining to Public Drinking Water, as amended September 2012* (R46-13-DWQ). Retrieved from:

<http://sos.ri.gov/documents/archives/regdocs/released/pdf/DOH/7059.pdf>

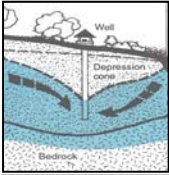
RI HEALTH and RI NEMO. 2010. *Guide to Updating Source Water Assessments and Protection Plans Version 3 – December 2010*.

U.S. Environmental Protection Agency. (2012). *2012 Edition of the Drinking Water Standards and Health Advisories* (EPA 822-S-12-001). Washington, DC: Office of Water. Retrieved from:

<http://water.epa.gov/action/advisories/drinking/upload/dwstandards2012.pdf>

Appendix A: 2003, 2010 and 2014 SWA Risk Rating Summaries

From: RI HEALTH and RI NEMO. 2010. *Guide to Updating Source Water Assessments and Protection Plans Version 3 – December 2010.*



Wellhead Protection Area Pollution Risk Rating
Revised October, 2006

Wellhead Protection Area RISK INDICATOR	RATING			
	Low	Medium	High	Extreme
	0	5	10	25
Wellhead Protection Area land use				
1. High intensity land use.	< 10%	10 - 24%	25 - 40%	> 40%
Existing or potential pollution sources				
2. Pollution sources within inner protective radius (400' or 200') of well.	0	1	2 - 3	> 3
3. Pollution sources per acre throughout WHPA, excluding inner protective radius. Multiply this number by 10.	< 0.1	0.1 - 0.5	0.5 - 1	> 1
Water quality				
4. History of contaminant detects within last 5 years.	Trace ¹	≤1/2 MCL	>1/2 MCL	> MCL (Violation)
5. Source water Bacteria detects within 5 years.	<5% of samples have Total coliform detection	>5% of samples have Total coliform detection	Fecal coliform detected, cause identified and corrected	Fecal coliform violation ²
6. Maximum nitrate-nitrogen (NO ₃ -N) concentration in last 5 years.	≤.5 mg/l	0.5 - 2 mg/l	> 2 - 5 mg/l	> 5 mg/l
Maximum	0	30	60	150
Overall Ranking - Sum of all risk ratings.	0 – 19	20 – 59	60 – 100	> 100

Notes:

¹ Trace = Less than 10% of the contaminant MCL

² It is assumed for the purposes of the SWAP that if Fecal coliform samples are collected and return a result in violation of RI HEALTH regulations that the cause of the contamination was identified and corrected. Therefore, no bacterial samples are ranked in the extreme category for the purposes of the SWAP program.

Appendix B – MANAGE Land use categories cross referenced to RIGIS (2011) land use categories.

RIGIS Land Use ID	RIGIS Land Use Description	MANAGE ID	MANAGE Land Use Description	High Intensity Land Use
111	High density residential	1	HDR	x
112	Medium high density residential	2	MHDR	x
113	Medium Density Residential	3	MDR	
750	Transitional Areas	3	MDR	
114	Medium Low Density Residential	4	MLDR	
115	Low Density Residential	5	LDR	
120	Commercial & Services	6	COMMERCIAL	x
152	Commercial /Industrial mixed	6	COMMERCIAL	x
151	Commercial/residential mixed	6	COMMERCIAL	x
147	Other transportation	6	COMMERCIAL	x
130	Industrial	7	INDUSTRIAL	x
141	Roads	8	ROADS	x
142	Airports	9	AIRPORTS	x
143	Railroads	10	RAILROADS	x
145	Waste Disposal Areas	11	JUNKYARDS	x
163	Cemeteries	12	RECREATION	
161	Developed Recreation	12	RECREATION	
162	Urban Open Space	12	RECREATION	
170	Institutional	13	INSTITUTION	x
144	Water and Sewage Treatment Facilities	13	INSTITUTION	x
250	Idle Agriculture	14	PASTURE	
210	Pasture	14	PASTURE	
146	Power Lines	14	PASTURE	
240	Confined feeding operations	15	CROPLAND	x
220	Cropland	15	CROPLAND	x
230	Orchards, groves, nurseries	16	ORCHARDS	x
300	Brushland	17	BRUSH	
420	Coniferous forest	18	FOREST	
410	Deciduous forest	18	FOREST	
430	Mixed forest	18	FOREST	
710	Beaches	19	BARREN	
760	Mixed barren	19	BARREN	
730	Rock outcrop	19	BARREN	
720	Sandy areas other than beaches	19	BARREN	
740	Strip mines, quarries, gravel pits	19	BARREN	
610 ²	Forested Wetland	20	WETLAND	
600	Wetland	20	WETLAND	
500	Water	21	WATER	

Notes:

1. The table presented above was used in the SWAP reports and is provided here for reference.
2. RIGIS code 610 is RI NEMO code and is not found in RIGIS data. 2011 Land use data were processed in ArcGIS 10.2 to determine which forested areas were most likely forested wetlands. These areas were then re-coded from forest to forested wetlands.
3. The small amount of commercial area is a commercial/residential mix. RIGIS 2011 land use identifies it as industrial, but upon researching the site, it is a commercial/residential building.

Appendix C – Sanitary Survey (most recent)



Department of Health
Three Capitol Hill
Providence, RI 02908-5097

TTY: 711
www.health.ri.gov

CERTIFIED MAIL

February 20, 2013

Mr. James E. Dilly
Rockville Mill Community Water System
2638 East Main Road
Portsmouth, RI 02871

Dear Mr. Dilly:

Enclosed please find the Sanitary Survey Report for the Rockville Mill Community Water System Community Public Water System. Department of Health personnel conducted the survey on January 10, 2013. This survey was conducted in accordance with Section 16.4g of the Rules and Regulations Pertaining to Public Drinking Water (R46-13-DWQ).

The narrative portion of the survey is divided into three sections. Section I lists Significant Deficiencies that were identified during the survey. Significant Deficiencies should have been addressed within ten (10) working days of the survey. Section II contains Minor Deficiencies that were identified during the survey. Minor Deficiencies must be addressed and/or corrected within thirty (30) days of the receipt of this survey package. Section III, General Comments and Recommendations, is intended to provide you with additional information on proper water system operations, which may further safeguard your water system. **A written response is required within 30 days of receipt of this survey, specifying how and when each deficiency has been or will be corrected and/or addressed.** In addition, please provide any missing information, as indicated by highlighted areas throughout this report.

Please feel free to contact the Office of Drinking Water Quality (DWQ) at (401) 222-6867 if you should have any questions concerning this survey or if you wish to discuss this matter further.

Thank you for your time and continued cooperation.

Sincerely,

Andrew J. Hall
Environmental Scientist
Rhode Island Department of Health
Office of Drinking Water Quality

PARTIES PRESENT

NAME	ORGANIZATION
Andrew J. Hall	DWQ
David R. Zanfagna	DWQ
Joel Russell	J. Russel Water Well, Inc.

SYSTEM OVERVIEW

Rockville Mill Community Water System, located at 332 Canonchet Road in Hopkinton, is a converted mill building consisting of 11 apartments housing approximately 40 people, and a commercial office as well as a U.S. Postal Service office adding approximately ten more people for a total of people served daily.

Source of supply is a six inch diameter, 500 foot deep, drilled bedrock well with a one horse power Goulds submerible pump, having a rated capacity of 15 gallons per minute, set at 200 feet within the well.

Water is pumped from the well, through a water meter to three Water Pro WP1195S pressure storage tanks located in the utility room.

A fire suppression system in the utility consisting of a total of 30,000 gallons of storage is not connected with the sanitary supply

There is no treatment for this water supply.

A backup emergency generator is in place in case of power loss.

SECTION I - SIGNIFICANT DEFICIENCIES

To protect your public drinking water supply from contamination the following significant deficiencies must be corrected within ten (10) days. Authority: R46-13-DWQ Rules and Regulations Pertaining to Public Drinking Water.

1. No observations were recorded in this category.

SECTION II - MINOR DEFICIENCIES

Minor Deficiencies in this section must be corrected and/or addressed within thirty (30) days of the receipt of this Survey

2. The grading immediately surrounding gravel packed well needs to be adjusted such the surface/storm water cannot pool around the well casing possibly seeping along the casing contaminating the ground water supply.

SECTION III - GENERAL COMMENTS AND RECOMMENDATIONS

3. No observations were recorded in this category.

4. All the pressurized storage tanks should be maintained in accordance with the manufacturer's recommendations to ensure proper operation of water system equipment along with potability of supply. Examples of maintenance would be maintaining proper air charge on respective tank and occasional flushing of these tanks to remove any accumulated sediment.
5. Please be reminded that **proper disinfection** must be practiced whenever intrusive work on the system is performed or if your system is ever dewatered. After appropriate disinfection and flushing, additional bacteriological samples should be taken to verify that the system is coliform free.
6. You are reminded that this office must be notified of any modifications to your system as per R46-13-DWQ, Sec.4.1. An **Application for Approval** form must be submitted for any planned significant modifications including equipment upgrades and design improvements to your system. Routine maintenance on a water system, such as pipe and valve replacement or repair does not need to be reported. **In Kind Replacement** form must be submitted for replacement of pumps, storage/pressure tanks or treatment components that are functionally equivalent to the original components.

POSITIVE SAMPLES

No Positive Samples were reported in the past year.

REJECTED TCR SAMPLES

No Rejected Samples were reported in the past year.

MONITORING VIOLATIONS

No monitoring violations were reported in the past year.

MCL VIOLATIONS

No maximum contaminant level violations were reported in the past year.

OTHER VIOLATIONS

No other violations were reported in the past year.

Appendix D – Laboratory results (summarized for 5 year period leading up to this report)

Rockville Mill Community Water System WHPA

Contaminants

PWS NAME	FAC NAME	COLL DATE	ANALYTE NAME	CONC.	Unit	Standard	Units	Standard Reference	Risk
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	ALKALINITY, TOTAL	27	MG/L	NA			NA
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	15-Oct-12	BARIUM	0.011	MG/L	2	mg/L	Rhode Island MCL	Low
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	BENZO(B)FLUOR ANTHENE	0.0001	mg/L	0.0002	mg/L	This contaminant is part of PAH group, using Benzo(a)pyrene standard for RI for MCL	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	BENZO(K)FLUOR ANTHENE	0.0001	mg/L	0.0002	mg/L	This contaminant is part of PAH group, using Benzo(a)pyrene standard for RI for MCL	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	CHLORIDE	37.3	MG/L	250	mg/l	National Secondary Drinking Water Regs.	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	15-Oct-12	CHROMIUM	0.002	MG/L	0.1	mg/L	Rhode Island MCL	Low
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	CONDUCTIVITY @ 25 C UMHOS/CM	197	UMHO /CM	NA			NA
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	15-Oct-12	COPPER, FREE	0.005	MG/L	1.3	mg/l	Rhode Island, action level	Low
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Dec-12	COPPER, FREE	0.085	MG/L	1.3	mg/l	Rhode Island, action level	Low
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Dec-12	COPPER, FREE	0.099	MG/L	1.3	mg/l	Rhode Island, action level	Low
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Dec-12	COPPER, FREE	0.422	MG/L	1.3	mg/l	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Dec-12	COPPER, FREE	0.196	MG/L	1.3	mg/l	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Dec-12	COPPER, FREE	0.048	MG/L	1.3	mg/l	Rhode Island, action level	Low

WATER SYSTEM									
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Jun-13	COPPER, FREE	0.129	MG/L	1.3	mg/l	Rhode Island, action level	Low
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Jun-13	COPPER, FREE	0.101	MG/L	1.3	mg/l	Rhode Island, action level	Low
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Jun-13	COPPER, FREE	0.137	MG/L	1.3	mg/l	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Jun-13	COPPER, FREE	0.14	MG/L	1.3	mg/l	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Jun-13	COPPER, FREE	0.145	MG/L	1.3	mg/l	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	DI(2-ETHYLHEXYL) PHTHALATE	0.002	mg/L	0.006	mg/L	Rhode Island MCL	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	05-Mar-13	DI(2-ETHYLHEXYL) PHTHALATE	0.001	mg/L	0.006	mg/L	Rhode Island MCL	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	16-Jul-13	DI(2-ETHYLHEXYL) PHTHALATE	0.003	mg/L	0.006	mg/L	Rhode Island MCL	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	22-Oct-13	DI(2-ETHYLHEXYL) PHTHALATE	0.002	mg/L	0.006	mg/L	Rhode Island MCL	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	HARDNESS, TOTAL (AS CaCO3)	48.1	MG/L	NA			NA
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	15-Oct-12	IRON	0.04	MG/L	0.3	MG/l	National Secondary Drinking Water Regs.	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Dec-12	LEAD	0.003	MG/L	0.015	mg/L	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Dec-12	LEAD	0.003	MG/L	0.015	mg/L	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Dec-12	LEAD	0.002	MG/L	0.015	mg/L	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Dec-12	LEAD	0.004	MG/L	0.015	mg/L	Rhode Island, action level	Medium

WATER SYSTEM									
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Jun-13	LEAD	0.002	MG/L	0.015	mg/L	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Jun-13	LEAD	0.002	MG/L	0.015	mg/L	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Jun-13	LEAD	0.006	MG/L	0.015	mg/L	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Jun-13	LEAD	0.002	MG/L	0.015	mg/L	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	28-Jun-13	LEAD	0.002	MG/L	0.015	mg/L	Rhode Island, action level	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	15-Oct-12	MANGANESE	0.007	MG/L	0.05	mg/L	National Secondary Drinking Water Regs.	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	METHOXYCHLOR	0.0001	mg/L	0.04	mg/L	Rhode Island MCL	Low
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	PH	6.45	PH	6.5-8.5		National Secondary Drinking Water Regs.	NA
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	POTASSIUM	2.1	MG/L	NA			NA
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	05-Mar-13	RADIUM-228	1.82	PCI/L	5	pCi/l	Combined radium (RI MCL)	Medium
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	RESIDUE, NONFILTERABLE-FIXED	138	MG/L	NA			NA
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	RESIDUE, TOTAL-VOLATILE	30	MG/L	NA			NA
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	SULFATE	6.43	MG/L	250	mg/L	National Secondary Drinking Water Regs.	Low
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	TDS	138	MG/L	500	mg/L	National Secondary Drinking Water Regs.	Medium

Overall risk rating

Medium

Sodium

PWS NAME	FAC NAME	COLL DATE	ANALYTE NAME	CONC.	Unit	Standard	Units	Standard Reference	Risk
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	10/15/2012	SODIUM	19	MG/L	20	mg/L	EPA Drinking water advisory table	
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	3/5/2013	SODIUM	18	MG/L			20 mg/L for individuals on a 500 mg/day restricted sodium diet	
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	3/5/2013	SODIUM	19.2	MG/L				
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	3/5/2014	SODIUM	18.6	MG/L				

No risk assigned on the basis of sodium

Bacteria

PWS NAME	FAC NAME	COLL DATE	ANALYTE NAME	CONC.	Unit	Standard	Units	Standard Reference	Risk
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	COLIFORM (TCR)	0					
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	05-Mar-13	COLIFORM (TCR)	0					
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	14-May-13	COLIFORM (TCR)	0					
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	16-Jul-13	COLIFORM (TCR)	0					
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	22-Oct-13	COLIFORM (TCR)	0					
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	05-Mar-14	COLIFORM (TCR)	0					
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	E. COLI	0					
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	05-Mar-13	E. COLI	0					
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	14-May-13	E. COLI	0					

ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	16-Jul-13	E. COLI	0					
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	22-Oct-13	E. COLI	0					
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	05-Mar-14	E. COLI	0					

Overall risk rating

LOW

Nitrate-Nitrogen

PWS NAME	FAC NAME	COLL DATE	ANALYTE NAME	CONC.	Unit	Standard	Units	Standard Reference	Risk
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DISTRIBUTION SYSTEM	15-Oct-12	NITRATE	0.84	MG/L	10	mg/L	Rhode Island MCL	
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	05-Mar-13	NITRATE	0.89	MG/L				
ROCKVILLE MILL COMMUNITY WATER SYSTEM	DRILLED WELL	05-Mar-13	NITRATE	0.89	MG/L				

Average

0.87

Maximum

0.89

Overall risk rating

MEDIUM