

2014 Source Water Assessment

TRINITY EPISCOPAL CHURCH TRANSIENT NON-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. A ranking of LOW does NOT mean that the source is free from contamination risk. Without sufficient protection, ANY water supply can become contaminated.
- All the forested land, except a small sliver between Spring Brook Road and Danielson Pike, is protected conservation land. Therefore, although the percentage of high intensity land use is almost in the medium rating, land use is not expected to change as there is no more developable land in the WHPA.
- Three Leaking Underground Storage Tank (LUST) sites are located in the WHPA, two of which are still undergoing active remediation. The RI National Guard/RI State Police/Scituate Maintenance facility is an important potential pollution source because of the large number of vehicles and equipment stored, and potentially maintained at this site.

For further information please contact: Trinity Episcopal Church, 8 Collins Ln, N. Scituate, RI 02857

What you can do to protect your drinking water:

The Trinity Episcopal Church Water Supply WHPA encompasses an area of institutional and protected forest lands upon highly permeable soils. As such, unless methods for treatment of stormwater runoff and wastewater management are put into place, the potential for a decline in well water quality is elevated. What you can do to help:

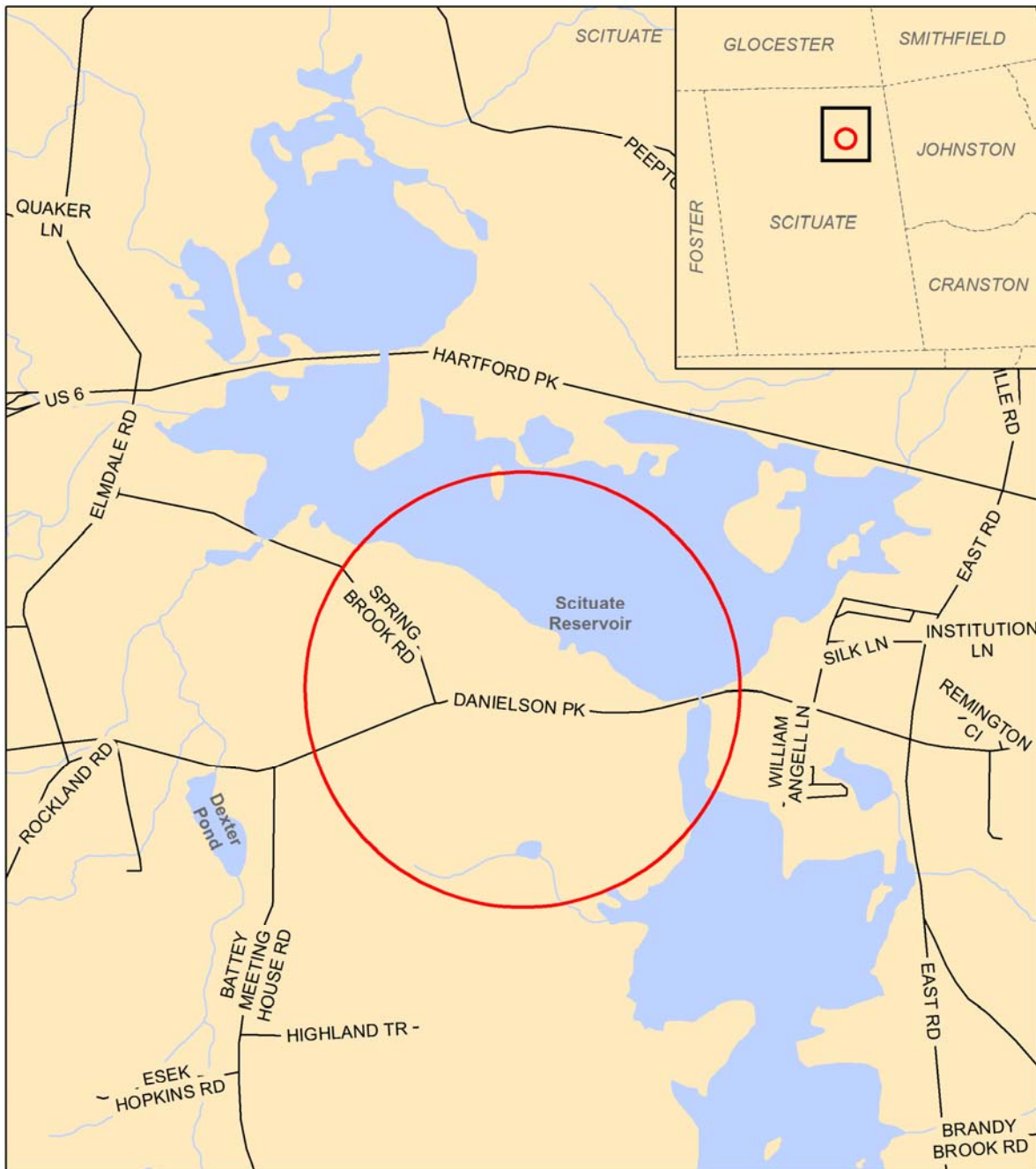
- **Set protection priorities**
 - Implement recommendations in the latest sanitary survey.
 - Inspect the water supply and protection area regularly for potential pollution sources.
 - Know the extent of the land area reserved for protection of the well (a 200' to 400' radius around the well) and ensure 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.
- **Examine septic systems:**
 - Septic systems can contribute bacteria, 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.
- Review the factsheet, *Practices to Extend the Life of Your System*, and share with water users and staff: <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 a parking area 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.
 - Avoid de-icing salt in the winter.
- **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.
 - Direct any rainwater from paved areas away from the well and onto vegetated areas.
 - Preserve existing trees and naturally vegetated areas on your property, as they help soak up and filter stormwater before it reaches the groundwater.

Table 1- Summary of pollution risk results

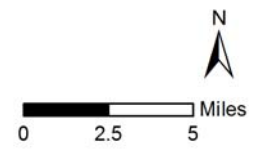
| Risk Indicator | Calculated Value – Risk Rating (score) | Explanation |
|--|--|---|
| Wellhead Protection Area Land Use | | |
| High intensity land use in WHPA | 9.5% - Low (0) | |
| Existing or potential pollution sources | | |
| Pollution sources within inner protective radius (400' to 200') of well | 0 – Low (0) | The 2009 Sanitary Survey indicated no pollution sources within the protective radius of the well. |
| Pollution sources per acre throughout WHPA, excluding inner protective radius (multiplied by 10) | Medium (5) | Public data were reviewed (LUSTs, CERCLIS and RIPDES sites) but are dated and less accurate than a windshield survey. Three LUST sites were identified in the WHPA. Two are actively undergoing remediation and remediation actions are complete at the third site. This information coupled with data limitations suggests that the risk be set to medium. |
| Water Quality | | |
| History of contaminant detects within the last 5 years | 0 - Low (0) | No data are available for the past 5 years. Testing is not required for Transient Non-Community Water Systems. |

| | | |
|---|---------------------|---|
| 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 | 0.19 mg/L – Low (0) | Nitrate levels in groundwater have been consistently low. |
| Overall Rating | 5 (low) | Note: A ranking of LOW does NOT mean that the source is free from contamination risk. Without sufficient protection, ANY water supply can become contaminated. |



Trinity Episcopal Church (TNC) (2980438)

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



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

Date: 11/6/2014

Figure 1- Location of Wellhead 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 wellhead 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.

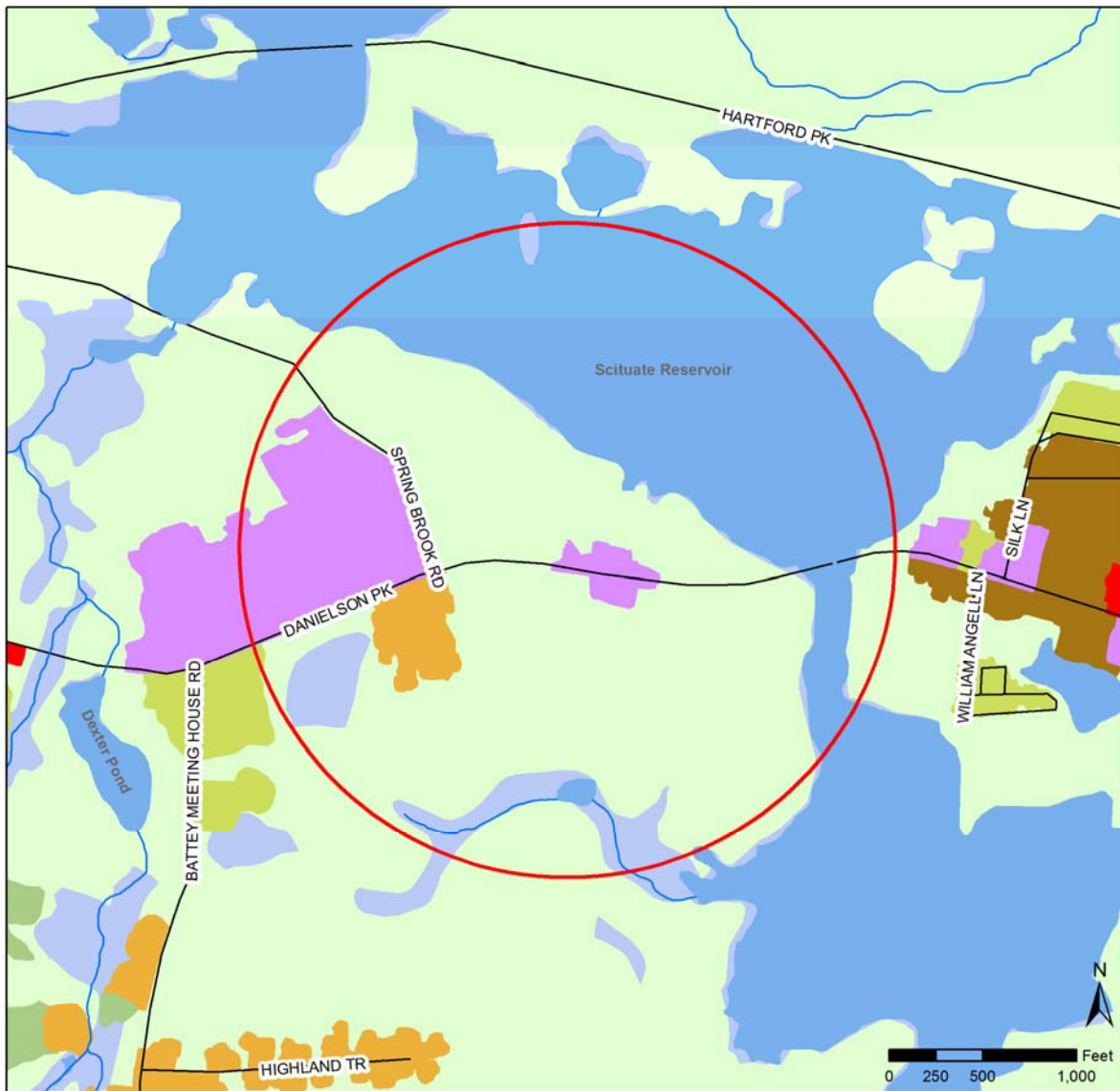
The MANAGE land use categories group land uses based on pollution potential (i.e.: developed recreation and urban open space are considered to have the same potential pollution loading, so they are grouped into the “Recreation” category). The MANAGE model then further assigns 11 land use categories into 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 Trinity Episcopal Church Water System WHPA reveals that 9.5% 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 high intensity land use consists of institutional land uses. The institutional uses include part of the Rhode Island State Police/National Guard/Scituate Maintenance facility and the Trinity Episcopal Church facility.

Table 2 - Land uses within WHPA

| Land Use (MANAGE Code & Description) | Total Area (acres) | % of Total Land Use |
|---|-----------------------|------------------------|
| [1] HD Res.(>8 /ac)* | | |
| [2] MHD Res.(4-7.9/ac)* | | |
| [3] MD Res.(1-3.9/ac) | 4.9 | 2.2% |
| [4] MLD Res.(0.5-0.9/ac) | | |
| [5] LD Res.<0.5/ac) | | |
| [6] Commercial* | | |
| [7] Industrial* | | |
| [8] Roads* | | |
| [9] Airports* | | |
| [10] Railroads* | | |
| [11] Junkyards* | | |
| [12] Recreation | 0.1 | 0.1% |
| [13] Institution* | 21.0 | 9.5% |
| [14] Pasture | | |
| [15] Cropland* | | |
| [16] Orchards* | | |
| [17] Brush | 8.2 | 3.7% |
| [18] Forest | 104.1 | 47.1% |
| [19] Barren | | |
| [20] Wetland (includes forested wetlands) | 11.3 | 5.1% |
| [21] Water | 71.3 | 32.3% |
| [22] Transitional | | |
| Total (acres) | 220.8 | 100% |
| Total High intensity land use | 21.0 | 9.5% |

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: 11/6/2014

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 Trinity Episcopal Church Water System WHPA was completed on October 6, 2009, 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).

Upon review of these data sources, three LUSTs were identified. Sites at the Rhode Island National Guard facility (identified June, 2005) and the Scituate Maintenance Facility (identified May, 2003) are undergoing active remediation. The third site, located at the Rhode Island State Police Facility is inactive, its remediation is complete. The sanitary survey did not provide any additional information on pollution sources on a per acre basis throughout the WHPA. Due to the limited up-to-date data available, and the presence of three LUST sites, the risk factor: Pollution Sources Per Acre Throughout the WHPA was set at medium.

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

Laboratory results for samples collected from the active well in the Trinity Episcopal Church 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. No data were available for this time period (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 Trinity Episcopal Church was set at low, as contaminant testing is not required for Transient Non-Community well systems.

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 for 2009 through 2013. 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 Trinity Episcopal Church 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 2009 through 2013. The maximum observed nitrate-nitrogen value was 0.19 mg/L NO₃-N. This nitrate-nitrogen value falls under a risk rating of low – nitrate levels in groundwater have been consistently low.

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 Trinity Episcopal Church Water System WHPA all 21 acres of high intensity land uses are located on excessively permeable soils, which is equivalent to 9.5% of the total land use, corresponding with a risk rating of medium. Almost the entire land are of the WHPA is located in an area of excessively permeable soil.

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).

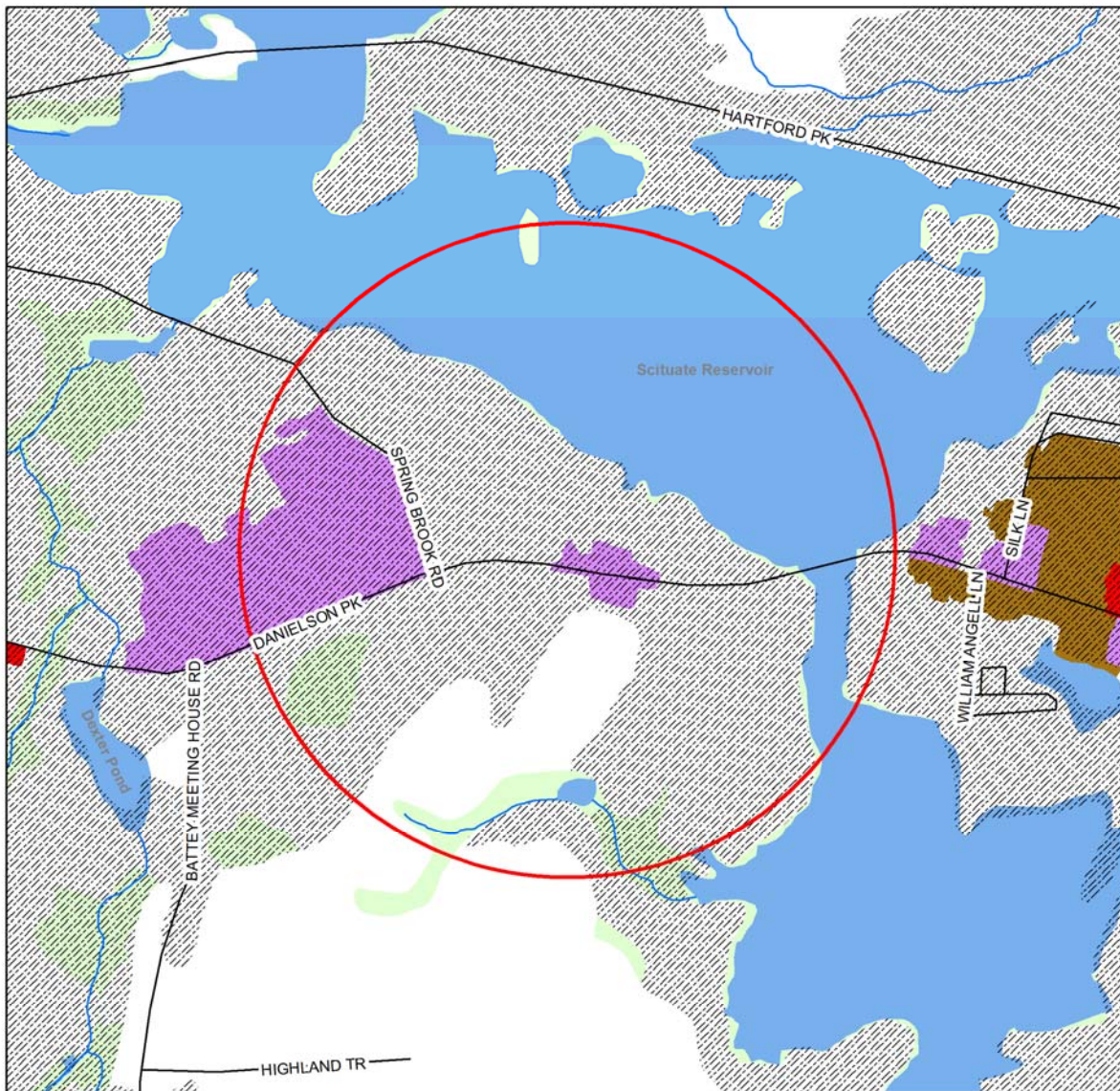
| Indicator | Low (0) | Medium (5) | High (10) | Extreme (25) |
|---|---------|------------|-----------|--------------|
| 2. High intensity land use on highly permeable soils throughout the WHPA. | < 5% | 5 - 14% | 15 - 30% | > 30 |

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 Trinity Episcopal Church Water System WHPA reveals that the soils are mainly types A and B with a deep water table. Almost the entire area has excessively permeable soils (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, which may channel water away from the wellhead in the southern area of the WHPA. The A and B soils are expected to allow rapid infiltration of water into the groundwater and could become problematic if contaminants are released in this area. The Rhode Island State Police, National Guard and Scituate Maintenance facilities are potential sources of contamination due to the presence of large numbers of vehicles and as evidenced by the presence of two LUSTs identified at their sites.

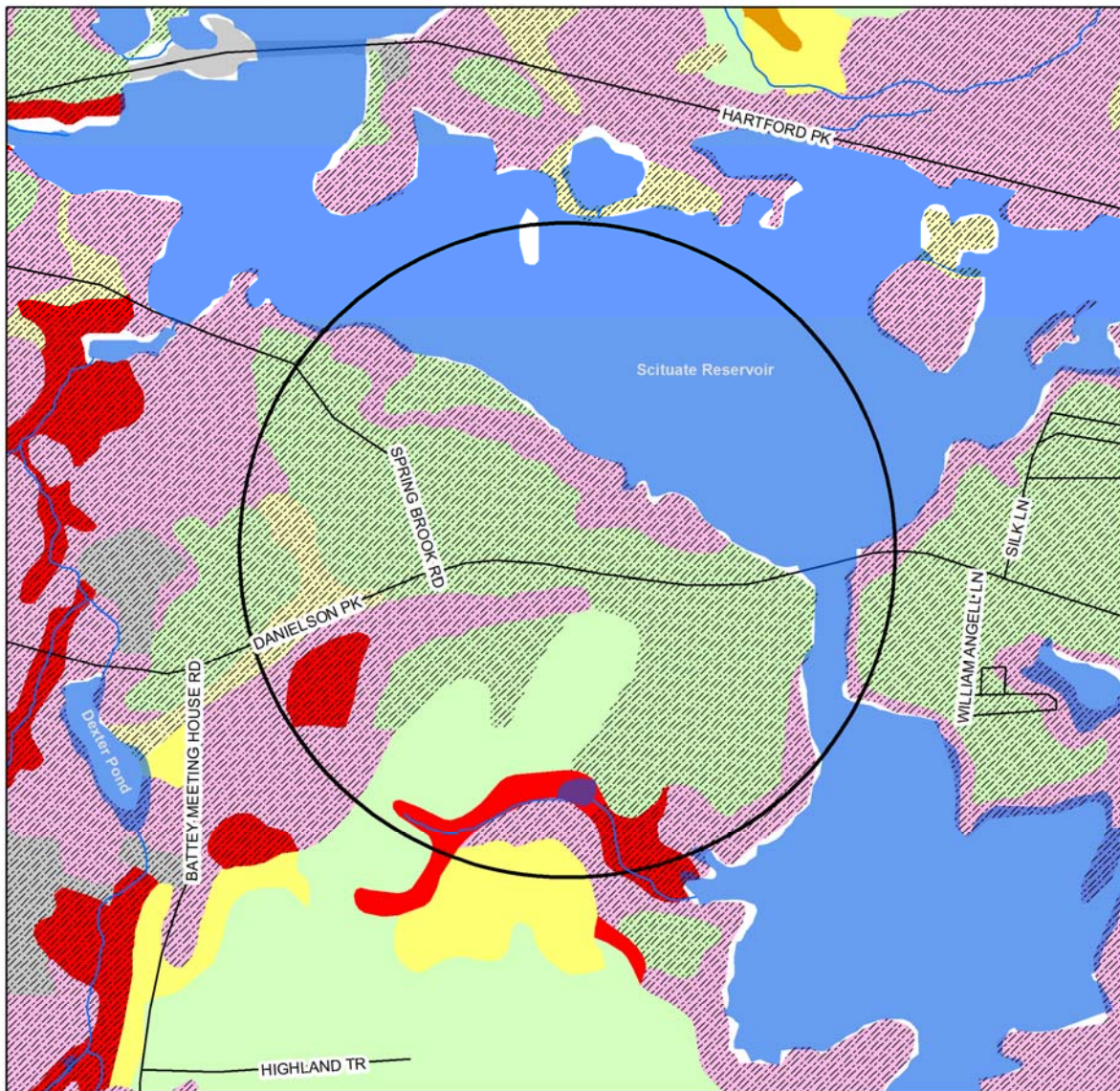


Trinity Episcopal Church Water System (2980438)

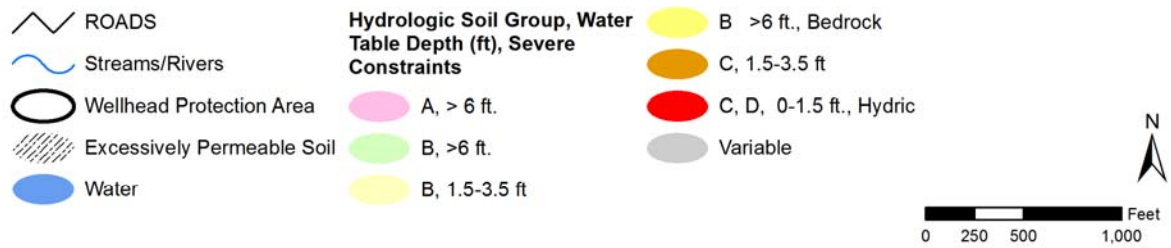


Data: RIGIS 2011 Land use modified to include forested wetlands, WHPA: RI HEALTH 2014, Stream/Rivers: RIGIS Streams5k Date: 11/6/2014

Figure 3 - High intensity land use and excessively permeable soils



Trinity Episcopal Church Water System (2980438)



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: 11/6/2014

Figure 4 - Hydrologic soil group and water table depth

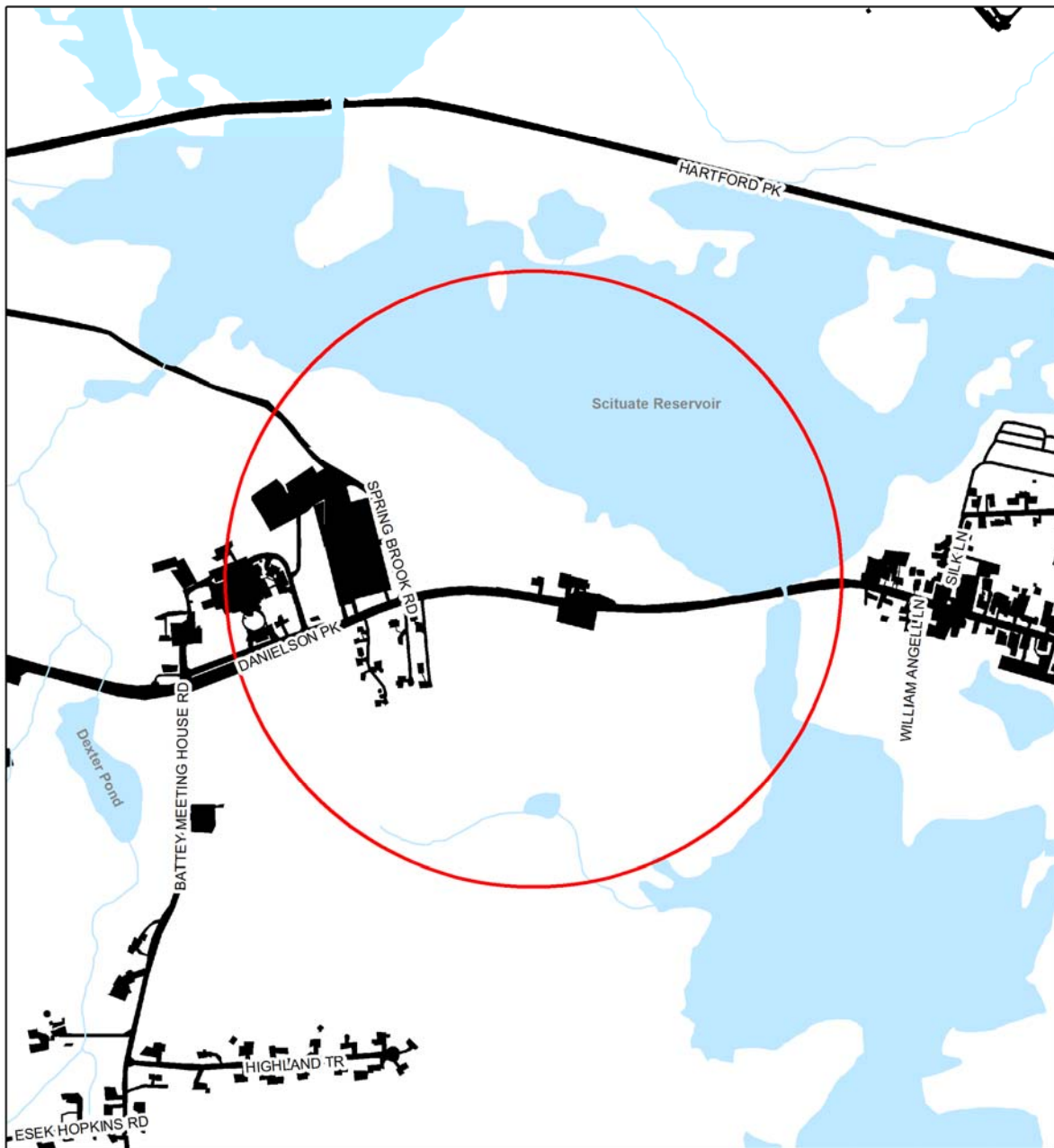
Impervious surfaces in WHPA

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.

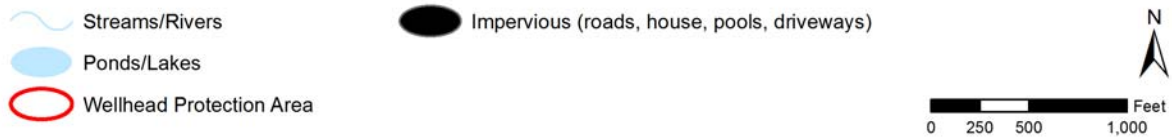
Impervious surface coverage for the Trinity Episcopal Church Water System WHPA was calculated in ArcView 10.2 (ESRI) using the Rhode Island 2011 Impervious Surface Coverage available from RIGIS. The percentage of impervious surface found in Trinity Episcopal Church's Water System WHPA is 8%, corresponding to a risk rating of low (table 4, 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 |



Trinity Episcopal Church Water System (2980438)



Data: RIGIS 2011 Land use modified to include forested wetlands, WHPA: RI HEALTH 2014, Stream/Rivers: RIGIS Streams5k Date: 11/6/2014

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>

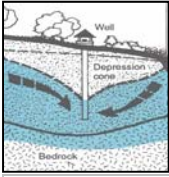
RI HEALTH and RI NEMO. 2010. *Guide to Updating Source Water Assessments and Protection Plans Version 3 – December 2010*.

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)

WS ID: RI2980438



Department of Health

Three Capitol Hill
Providence, RI 02908-5097

TTY: 711
www.health.ri.gov

CERTIFIED MAIL

October 27, 2009

Milton Schumacher
Trinity Episcopal Church
8 Collins Lane
N. Scituate, RI 02857

Dear Mr. Schumacher:

Enclosed please find the Sanitary Survey Report for the Trinity Episcopal Church Public Water System. Department of Health personnel conducted the survey on October 6, 2009. 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 forty-five (45) 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 45 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 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,

David R. Zanfagna
Environmental Scientist
Rhode Island Department of Health
Office of Drinking Water Quality

PARTIES PRESENT

| NAME | ORGANIZATION |
|-------------------|--------------------------|
| Andrew H. Hall | DWQ |
| David R. Zanfagna | DWQ |
| Milton Schumacher | Trinity Episcopal Church |

SYSTEM OVERVIEW

The Trinity Episcopal Church Public Water System currently meets definition as a non-community, transient water system serving approximately 100 consumers on a daily basis. There are 3 service connections, which include the rectory, church and the hall building. The water system consists of a ___' deep drilled well, located in a concrete lined pit, comprised of 6" well casing and equipped with a gooseneck-vented well cover. A ___ HP submersible pump set at ___' within the well with a capacity of ___ gpm. Source #1, Drilled Well #1 is geographically located N41°.49.967 W071°.35.923.

Water is pumped from the well to a Well-X-Trol WX-203 diaphragm type pressure tank with a 32-gallon total volume located in the rectory basement. A control switch mounted near the tank allows for a ___ - ___ psi pump operation. Water is then directed through an old well pit, then feeding the hall and from the hall to the church.

This system is not equipped with auxiliary power.

SECTION I - SIGNIFICANT DEFICIENCIES

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

No observations were recorded in this category.

SECTION II - MINOR DEFICIENCIES

Items in this section must be corrected and/or addressed within forty-five (45) days of the receipt of this Survey.

1. The drilled well cover had a direct opening where electrical conduit entered to supply power to the submersible pump. This opening must be sealed.
2. The drilled well cover had an unscreened gooseneck vent which constituted a direct opening to your drilled well. The vent must be screened.

SECTION III - GENERAL COMMENTS AND RECOMMENDATIONS

3. 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.

4. 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.
5. 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 TCR SAMPLES

No Positive Samples were reported in the past year.

REJECTED TCR SAMPLES

No Rejected Samples were reported in the past year.

MONITORING VIOLATIONS (With Number)

No monitoring violations were reported in the past year.

MCL VIOLATIONS

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

OTHER VIOLATIONS (With Number)

No other violations were reported in the past year.

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

Risk Factor 4 - History of Contaminant Detections in Source Water

| FAC NAME | COLL DATE | ANALYTE NAME | CONC. | Unit | Standard | Units | Standard Reference | Risk |
|--------------------------------------|-----------|--------------|-------|------|----------|-------|--------------------|------|
| NO SAMPLES REPORTED FOR CONTAMINANTS | | | | | | | | |

Overall risk rating LOW

| FAC NAME | COLL DATE | ANALYTE NAME | CONC. | Unit | Standard | Units | Standard Reference | Risk |
|--------------------------------|-----------|--------------|-------|------|----------|-------|--------------------|------|
| NO SAMPLES REPORTED FOR SODIUM | | | | | | | | |

No risk assigned on the basis of sodium

Risk factor 5 - Source Water Bacteria Dections within the last 5 years

| FAC NAME | COLL DATE | ANALYTE NAME | CONC. | Unit | Standard | Units | Standard Reference | Risk |
|---------------------|-----------|----------------|-------|------|----------|-------|--------------------|------|
| DISTRIBUTION SYSTEM | 02-Nov-09 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 01-Mar-10 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 17-Jun-10 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 22-Sep-10 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 14-Dec-10 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 15-Mar-11 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 03-Jun-11 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 23-Sep-11 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 09-Dec-11 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 23-Mar-12 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 30-May-12 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 18-Sep-12 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 11-Dec-12 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 28-Mar-13 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 24-Jun-13 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 23-Sep-13 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 17-Dec-13 | COLIFORM (TCR) | | | 0 | | | |
| DISTRIBUTION SYSTEM | 01-Mar-10 | E. COLI | | | 0 | | | |
| DISTRIBUTION SYSTEM | 17-Jun-10 | E. COLI | | | 0 | | | |
| DISTRIBUTION SYSTEM | 22-Sep-10 | E. COLI | | | 0 | | | |

| | | | | | | | | |
|---------------------|-----------|---------|--|--|--|---|--|--|
| DISTRIBUTION SYSTEM | 14-Dec-10 | E. COLI | | | | 0 | | |
| DISTRIBUTION SYSTEM | 15-Mar-11 | E. COLI | | | | 0 | | |
| DISTRIBUTION SYSTEM | 03-Jun-11 | E. COLI | | | | 0 | | |
| DISTRIBUTION SYSTEM | 23-Sep-11 | E. COLI | | | | 0 | | |
| DISTRIBUTION SYSTEM | 09-Dec-11 | E. COLI | | | | 0 | | |
| DISTRIBUTION SYSTEM | 23-Mar-12 | E. COLI | | | | 0 | | |
| DISTRIBUTION SYSTEM | 30-May-12 | E. COLI | | | | 0 | | |
| DISTRIBUTION SYSTEM | 18-Sep-12 | E. COLI | | | | 0 | | |

Overall risk rating Low

Risk factor 6 - Maximum nitrate-nitrogen concentration in the last 5 years

| FAC NAME | COLL DATE | ANALYTE NAME | CONC. | Unit | Standard | Units | Standard Reference | Risk |
|-----------------|-----------|--------------|-------|------|----------|-------|--------------------|------|
| DRILLED WELL #1 | 02-Nov-09 | NITRATE | 0.07 | MG/L | | | | |
| DRILLED WELL #1 | 14-Dec-10 | NITRATE | 0.05 | MG/L | | | | |
| DRILLED WELL #1 | 09-Dec-11 | NITRATE | 0.04 | MG/L | | | | |
| DRILLED WELL #1 | 11-Dec-12 | NITRATE | 0.19 | MG/L | | | | |
| DRILLED WELL #1 | 19-Dec-13 | NITRATE | 0.1 | MG/L | | | | |

Average 0.09

Maximum 0.19

Overall risk rating Low