



DATE: June 15, 2026

TO: Scott Fincham, Loudoun County, Department of General Services

FROM: Dewberry Engineers

SUBJECT: Paeonian Springs and Waterford Interconnected Project History and Data Summary

Purpose

This document has been prepared in response to questions received during the Paeonian Springs/Waterford Interconnected Water/Wastewater Project Community Meeting on October 28, 2025. Its purpose is to summarize existing information regarding conditions within the communities, their history entering this program, the process of the feasibility studies and relevant data supporting the recommendation for a communal water and wastewater solution.

The information and data presented within this document has previously been considered in studies and recommendations made to date. Health department data (as presented here within) has previously been presented in the Paeonian Springs Water and Wastewater Feasibility Study (2019) and the Historic Waterford Water Feasibility Study (2022). This should not be considered as a standalone document due to its limited scope of recorded data. Previous studies, which are noted within and available via the following link: <https://www.loudoun.gov/interconnectedwaterproject> review the larger community concerns and challenges through the use of scientific reports, resident reporting and survey data.

Water and Wastewater Program

In 2011 the Loudoun County Water and Wastewater [Needs Assessment](#) was completed, which provided an overview of existing water and wastewater issues in the county and identified communities with potential water and wastewater needs. The Needs Assessment further provided recommendations in the areas of planning, policy, and implementation. The Needs Assessment was the first step in a systematic approach for addressing water and wastewater issues in the County.

One of the key outcomes of the Needs Assessment was the establishment of the Water and Wastewater Program, designed to assist and support communities experiencing issues with deficient or absent water and/or wastewater systems. The Program provides a means for communities in need of assistance to submit applications to Loudoun County, which residents in Paeonian Springs and Waterford did. More details can be found at www.loudoun.gov/WaterProjects.

Villages of Paeonian Springs and Waterford

Paeonian Springs and Waterford are designated as Rural Historic Villages as defined by the Loudoun 2019 General Plan. These are communities with ten or more buildings in a definable historic settlement pattern which typically contain a mix of residential, civic, and community-supporting commercial uses that serve village residents. They possess scenic and historic resources, act as gathering places for citizens, provide services to the surrounding community, and support rural tourism.

Both the Paeonian Springs and Waterford Communities submitted separate applications to the Program via community coordinators. Loudoun County and Loudoun Water worked with the community coordinators throughout the process. Paeonian Springs needed support for both their water and wastewater systems, while Waterford only needed support for their water systems as the community currently has a community wastewater collection and treatment system.

Both communities have a history of water and wastewater issues dating back to the 1960s and 1970s. Loudoun County assisted Waterford with wastewater issues permanently in 1978 with the operation of the Waterford wastewater treatment plant.

Historic Studies

Prior to the feasibility studies performed through the Program, a number of studies, assessments and other documentation have identified issues related to water and wastewater within these communities.

Paeonian Springs

Paeonian Springs water and wastewater systems were first considered in a 1972 Feasibility Study. A community system solution was initially introduced in this study.

In March of 1992, a letter from the Paeonian Springs Council, Inc. Board of Director President to Loudoun County noted that the water and sewer issues identified in the 1972 study still prevail.

In the 2011 Needs Assessment, Paeonian Springs was identified as a community with potential water and wastewater needs in the County. The Needs Assessment notes that the Loudoun County Health Department surveyed Paeonian Springs in 2000 and found 13% of water and wastewater facilities to be of unsatisfactory status and 27% of unknown status.

In 2017, Paeonian Springs applied to the Program. The application included the March 1992 letter from the Paeonian Springs Council noted above.

Additionally, the application included a March 2017 document from the Loudoun County Health Department that states “Staff at the Loudoun County Health Department strongly support efforts to develop central water and wastewater infrastructure for the Paeonian Springs community. The combination of small lots, aging, and inadequate wastewater systems, and wells of older construction make Paeonian Springs a priority for improved water and wastewater infrastructure.”

Following acceptance of the application, a feasibility study was completed in 2019 followed by additional studies for Paeonian Springs, which are further discussed below.

Waterford

In 1966, a Feasibility Study for Waterford Water and Sewage Facilities was completed. This study identified issues with the onsite water and sewage disposal systems within the community, and recommended construction of community water and wastewater systems. In response to this study, the Waterford Sewage Collection System and Wastewater Treatment plant were constructed to address public health need.

The 1987 Waterford Area Management Plan published by Loudoun County stated “Waterford residents are served by individual well systems. Studies of geologic conditions and an analysis of existing well yields indicate that local subsurface conditions vary in their ability to provide a sufficient and reliable supply of potable water for individual and community needs.” And “The current situation that relies on numerous private well systems has several drawbacks, including increased expense and difficulty for the homeowner when wells run dry or produce low yields, dependence on two small local ponds and Catoctin Creek for fire control and possibility of contamination from failing drainfields. All of these problems could be addressed with the construction of a central groundwater supply system that could be owned and operated by the LCSA in conjunction with the existing sewage treatment plant.” This study also noted that the median well depth in Waterford significantly exceeds median depths in the Western Hills Watershed, which is further discussed below.

In 1997, the United States Geological Survey (USGS) published ‘Applications of Geologic Map Information for Assessing Water Quality and Maintaining and Restoring Living Resources,’ which stated “The historic town of Waterford, underlain by the gneiss-dike complex, has the highest concentration of wells in Loudoun County, resulting in chronic water shortages.”

The 2006 Waterford Elementary School Groundwater Supply Report, completed by Geotrans, noted “an unusually high proportion of wells in the village have low or very low well yields in comparison to other areas in Western Loudoun County.” And “Approximately 80 homes in Waterford are served by individual wells. As detailed in this report, many of these are low - yielding wells that were drilled to great depth in rock with very little permeability.”

In October 2011, the Waterford Foundation Inc. (WFI) published a white paper to summarize the water supply status for WFI properties in Waterford. The white paper notes that properties that may be considered for potential wells have siting problems such as “parcel size, setback requirements and pollution considerations.”

In March of 2019, Waterford applied to the Program. The application identifies issues with water in the system including low water yields; small, marshy or steep lots that limit ability to drill new wells; and periodic challenges where wells go “dry” or pressure drops so low water can’t be obtained.

The feasibility study for Waterford was then completed in 2022 and is further discussed below.

Feasibility Studies

The Program is administered through three (3) stages. Stage 1 is the application process and evaluation based on health and safety, Stage 2 is the development of a feasibility study and Stage 3 is an evaluation for other non-health and safety considerations. The purpose of the feasibility study is to evaluate issues and potential water and/or wastewater solutions needed to address the concerns within each community. The goal within the feasibility study is to identify alternatives that are technically viable that address public health needs and provide sustainable, long-term solutions for the communities. Once a solution is identified, preliminary budget cost estimates are developed and provided as part of the report. The feasibility study does not represent the final design or siting locations of any recommended solution, nor is the feasibility study the end of analysis in determining a community-wide solution.

Loudoun County and Loudoun Water met with community coordinators, representatives from organizations such as the Waterford Citizens Association and Waterford Foundation Incorporated, and presented a proposed feasibility scope to the communities prior to the start of the feasibility studies and through completion of the studies.

Paeonian Springs

The initial study concluded in 2019 and included all parcels submitted as part of the original application. A supplemental study was performed and completed in 2022 to assess the public health need of all parcels and the recommended community boundary was reduced to remove parcels with sufficient land area to provide safe and sustainable on-site solutions. Ultimately, the final boundary recommendation was used to determine feasible alternatives for water and wastewater systems.

For the wastewater system, the initial study assessed the continued use of individual private on-site sewage disposal systems, a subsurface discharging wastewater facility (i.e. large Alternative On-Site Sewage System (AOSS) and drainfield), a new surface water discharging wastewater treatment facility, and connections to nearby systems. During the initial study, connections to the nearby towns of Leesburg or Hamilton were considered and subsequently Purcellville. Based on the location of the communities and limited capacity of nearby systems, this alternative was not recommended. Ultimately, the initial recommendation was to utilize a large alternative on-site community sewage disposal system with a subsurface drainfield due to the limitations for other solutions, however, this would require acquiring more than 50 acres of land to site a new treatment facility and drainfield. This area is not readily available within the immediate vicinity of Paeonian Springs.

For the Water System, a communal well, treatment, and storage system was recommended for further study as a feasible solution.

Waterford

The initial study concluded in 2022 and reviewed several alternatives for the community including upgrading individual on-site systems, the use of shared private well systems, a community well water system, and connection or wholesale purchase of water from nearby municipal systems.

The ultimate recommendation was to proceed with the evaluation and use of a community water system.

Holistic Solution

In 2022, following the release of the Loudoun County Comprehensive Plan update, community systems were allowed to be interconnected to provide more sustainable solutions for communities within the rural policy area. Separately, Loudoun Water began planning and design efforts for a new Waterford Wastewater Treatment Plant to replace the aging system and meet new, more stringent, ammonia treatment requirements established by the Virginia Department of Environmental Quality.

The “Joint Water and Wastewater System Feasibility Study” was completed in October 2024. The purpose of this Feasibility Study was to evaluate the technical feasibility of constructing proposed interconnected water and wastewater systems to serve both the Village of Paeonian Springs and the Village of Waterford, and to identify technical challenges that could potentially prevent a project from moving forward. The study concluded that an interconnected water and wastewater system to serve the communities was technically feasible and more cost effective, relative to separate village systems.

There are several distinct advantages of this alternative.

1. Due to the lack of available land, the most significant challenge with this project is the land acquisition process. Since Waterford has an existing wastewater treatment facility located on a large parcel, this land area could be utilized to construct/expand the existing facility to treat additional flow from Paeonian Springs. This approach eliminates the challenges and minimizes costs associated with new land acquisition. It also eliminates the need to purchase nutrient discharge allocation credits, which are not currently available on the open market.
2. Since the Waterford facility has an existing discharge permit, a permit modification can be utilized rather than locating a new surface discharge point on Catoctin Creek for Paeonian Springs.
3. The needs of both communities can be met via construction of one (1) new water treatment facility and expansion of an existing wastewater treatment facility, instead of three (3) new treatment plants, which would include two (2) water treatment facilities and one (1) new wastewater treatment facility. This limits impact to the surrounding areas.
4. The use of a single water treatment facility and a single wastewater treatment facility minimizes interactions with existing historical sites.
5. The hydrogeological studies in the area indicate potential challenges in locating and developing wells to serve these communities. Evaluating well sites across a larger area significantly increases the likelihood of identifying, drilling, and developing sustainable wells for the communities that also do not impact other local wells.
6. Interconnecting the infrastructure for the communities significantly reduces the long-term operation and maintenance costs of the systems and reduces overall life cycle costs. Maintaining proper treatment and meeting effluent discharge permit requirements at one facility is also a more efficient operation.

In addition to these advantages, the fundamental characteristics of these communities make it difficult for individual homeowners to address their issues and this is further discussed below.

Community Background and Existing Conditions

In response to the questions received from residents of Loudoun County regarding the project, the following data has been summarized to further establish the criticality of the existing conditions and recurring trends.

As outlined in the feasibility studies, these communities have unique characteristics that create significant challenges for residents within the community to provide solutions to issues with their own on-site water and wastewater services. These challenges have been evidenced through years of deficiencies and failures associated with both individual water and sewer systems. The characteristics that directly impact these on-site systems include:

Community Density: Paeonian Springs and Waterford are among the most densely built villages in Loudoun County, which were common for the era in which they were established. Because homes are close together, their private wells and on-site sewage disposal systems are also located in close proximity and, therefore, decrease the opportunity for individual solutions without impacting neighbors.

For private wells, nearby wells may compete for the same underground water source. When several wells are close together, simultaneous pumping or heavy pumping from one well can lower the water level or reduce the water available to the others. In Waterford, the high density of wells on small lots increases the risk of interference and reduces productivity.

In Paeonian Springs, where each home relies on both a private well and an on-site sewage system, this density also means that wells and on-site sewage disposal systems sit close to each other, both on individual lots and between neighboring properties. If an on-site sewage disposal system malfunctions or fails, contaminants such as E. coli can move through surface water or groundwater and potentially reach nearby wells, increasing the risk of water contamination. This contamination has been documented in Paeonian Springs where private onsite wells have tested positive for E. coli.

Review of available well data shows that there is approximately 1 well per 0.4 acres within the Village of Waterford. Within Paeonian Springs, there is approximately 1 well per 0.67 acres. However, along Clarke's Gap Road, there is approximately 1 well per 10 acres, demonstrating a significant difference in well densities between the villages and the Clarke's Gap Road corridor. **Figure 1** below shows the recorded wells (marked by a blue dot) in the area.

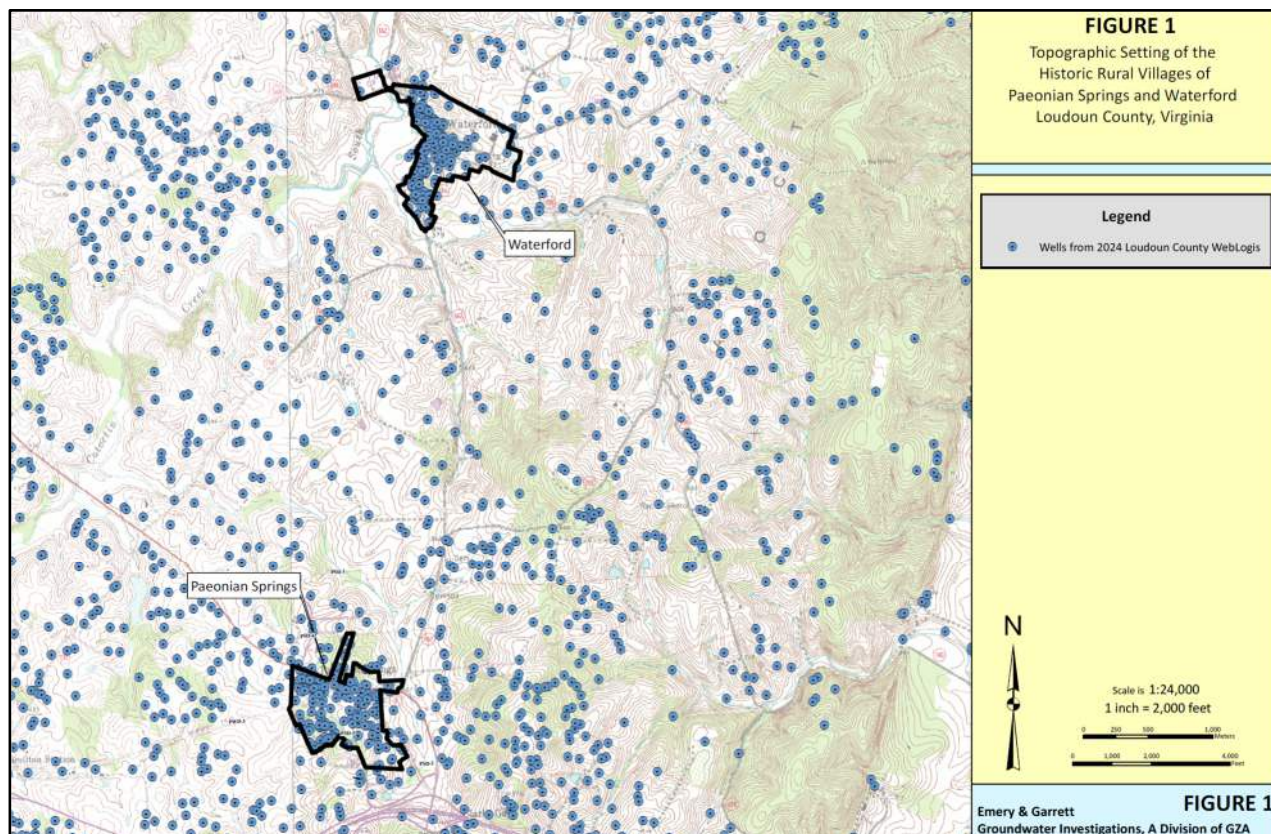


Figure 1 – Well Density

Small Parcels: The parcels within the Villages are relatively small lots. Within Paeonian Springs, the median parcel size is 0.28 acres with an average parcel size of 0.58 acres. In Waterford, the median parcel size is 0.3 acres with an average parcel size of 0.94 acres. These historic villages were built before current land use planning and modern well and sewage disposal regulations existed, and the small parcel sizes limit the available room to site a new well and private on-site sewage disposal system that meets today's required public health setback standards. Loudoun County ordinance requires a minimum distance of 50-ft from a well and septic tank, 50-ft or 100-ft between a well and an absorption field (drainfield) depending on well class, 10-ft between a well and a property line, and 50-ft or 100-ft from a well and buildings with wood framing or exterior depending on well class. These setbacks are required to be met for new wells along with setback requirements per Virginia Private Well Regulations (12VAC5-630-380). A 25' setback is still

required even for abandoned drainfields. It should be noted that identifying the boundary of an old drainfield can be challenging. The abandoned drainfield must also be properly documented and inactive for 2 years, or the setback for an active sewage disposal system will apply.

Depending on construction, older wells may be subject to more stringent setback requirements. Furthermore, should a well or on-site sewage disposal system fail, homeowners have limited and typically insufficient area to be able to site a new on-site system while meeting local and state requirements. These constraints increase the vulnerability of the community's drinking water and wastewater infrastructure and complicate remediation options. Additionally, constraints including steep slopes, site conditions like wetlands, or existing utilities further limit available area on parcels. And in some cases existing features and small parcel size limits the ability of equipment to access the site. This in turn further limits the property owner's ability to repair or explore new sewage disposal systems or additional wells within the parcel.

Poor Soils (Paeonian Springs): In on-site sewage disposal systems, the drainfield is where wastewater flows into the ground as the final step in the treatment process. Specific soil characteristics, including texture, permeability, and structure, are necessary to be able to achieve treatment, and the soil must allow for the wastewater to soak in at a slow, steady rate. Sandy or sandy-loam soils usually work well; heavy clay or water-logged soils often do not. Within Paeonian Springs, there are areas with unfavorable soil for siting an on-site sewage disposal system and some areas of saturated or hydric soils. Health department records show history of failed soil tests on multiple parcels. One of these test reports notes "insufficient depth and area of suitable soil over hard rock, position in landscape subject to flooding or periodic saturation." The existence of poor soils and saturated soil throughout the community further limits available area for residents to address ongoing issues or site new on-site sewage disposal systems.

Hydrogeological Conditions (Waterford): Waterford's groundwater is supplied by bedrock wells that rely on water-bearing fractures. The area's geology, dominated by metamorphic and igneous rocks, restricts groundwater flow to fractures, limiting well yields. For wells, potential water-bearing subsurface features include fracture zones and bedrock discontinuities. Waterford sits on unfractured, poorly transmissive bedrock that is unfavorable for finding groundwater. In other words, the bedrock underlying the region severely limits groundwater availability. These hydrogeological conditions impact water quantity and the movement of groundwater within the Waterford aquifer and, therefore, makes locating a well with a desired yield within the small lots and in compliance with the setback requirements very challenging, if not impossible for some affected properties.

Furthermore, Waterford is located in the Western Hills Watershed which is comprised of the drainage basins of the South Fork of Catoctin Creek and the North Fork of Goose Creek and encompasses an area of over 70 square miles. Due to the hydrogeology, wells in Waterford require a deeper depth compared to other wells in the Western Hills Watershed. The median well depth in Waterford is approximately 550 feet. This depth significantly exceeds median depths of 300 to 400 feet determined for different bedrock units in the entire Western Hills Watershed (Tetra Tech, 2019). Additionally, as noted in the Groundwater Resource Evaluation, Tetra Tech identified the median bedrock well yield in Water in Waterford to be less than 2 gpm, which is significantly lower than the reported range of yield (8 gpm to 12 gpm) in the Western Hills Watershed (Tetra Tech, 2022).

Age: The typical design life for wells is 30 to 50 years and the typical design life of an onsite sewage disposal system is approximately 20-40 years if properly installed and maintained but much less if not. Both communities have aging systems. In Paeonian Springs, the average age of existing wells is approximately 45 years and the average age of existing wastewater disposal systems is approximately 46 years. In Waterford, the average age of existing wells is approximately 40 years. As the systems age, there is increased potential for recurring issues and ultimately failure. These issues may include decreased yield due to sediment or mineral buildup, and failure of well components among others. On-site sewage disposal systems may experience buildup over its lifecycle where soil in the systems drainfield may become saturated or biologically clogged preventing proper treatment and leading to drainfield failure, and aging system components like concrete septic tanks which typically last 50 years may begin to degrade and leak. Additionally, improperly functioning or failed systems may not meet current construction standards, increasing potential for well, groundwater and/or surface water contamination.

The combination of the above characteristics increases risk of water quality issues (Paeonian Springs), water quantity issues (Waterford), and on-site sewage disposal issues (Paeonian Springs). Without sufficient area to address inevitable system issues and failures, the resiliency of these communities and long-term viability is at risk. The following section presents a summary of existing conditions within the Communities.

Existing Condition Summary

The Feasibility Studies performed to date have included evaluation of available health department data to determine the status of existing systems within the communities, identify issues with existing systems and understand the extent of those issues. These analyses are detailed in the Paeonian Springs Water and Wastewater Feasibility Study (October 2019) and the Waterford Water Feasibility Study (March 2022).

As noted previously, the Paeonian Springs boundary considered in the original feasibility study included all applicants to the Program. The proposed Paeonian Springs service area boundary was subsequently revised in April 2022 as detailed in the Paeonian Springs Water & Wastewater Boundary and Treatment Alternatives Technical Memorandum. The Waterford boundary is based on the existing Waterford Service Area for the sewage collection system. The boundary has been revised subsequent to the March 2022 study to only include parcels fully within the service area.

The analysis presented below considers properties (or single address points). Throughout both Communities, a single property can be comprised of multiple parcels, meaning adjacent parcels with only one identified owner. That is, multiple parcels which were transferred under a single sale. Individual parcel tax information lists each parcel as being part of a multi-parcel sale. The proposed Paeonian Springs service area boundary has 201 parcels and 112 properties. The Waterford Service Area has 144 parcels (previously 154 parcels), excluding the WWTP parcel, and 121 properties.

In addition to health department data, surveys were also conducted for the Waterford community. These are further discussed below.

Surveys

In an effort to understand the conditions within Waterford and supplement available health department data, a voluntary survey was sent out to 117 residents of the Waterford community by Dewberry in March 2021. The purpose of the survey was to obtain feedback from the community regarding any issues experienced with well yield. A total of 82 responses were received and the responses indicated issues such as low well yield and wells running dry. The results of this survey are discussed in more detail in the Historic Waterford Water Feasibility Study (March 2022).

Following the completion of the Waterford Water Feasibility Study and in response to community feedback, the County conducted an additional Waterford survey in November 2022 to evaluate support for solutions proposed by the Study and other information. Survey notices were sent out to property owners of 154 parcels located wholly or partially within the study area and a total of 77 responses (representing 72 parcels) were received. The results of the survey indicated support for a communal water system. The details of this survey are available via the Board of Supervisors February 21, 2023 meeting minutes under Item #9g, Attachment 2.

The survey data provides additional information and context to the applications and available health department data. It is recognized that there are limitations to the surveys. Survey results may not fully capture the extent of issues within the communities as property owners may be hesitant to provide complete information regarding the extent and severity of issues being experienced. The survey data represents a snapshot of lived experience for a subset of the community.

Data Sources

The assessments within the feasibility studies performed to date have utilized a combination of publicly available data, targeted on site sampling, and community surveys to document the existing conditions of the systems. This data is then overlaid with community characteristics where engineering judgment is used to evaluate the issue and determine the best alternative to provide a long-term, sustainable solution

for each of the communities. One of the key goals of the program, which drives the ultimate recommendation, is to address existing and future public health and community viability concerns.

As noted above, the existing conditions summarized here are based on available health department data, which have been considered in previous studies, and provide updated data over years since the studies were completed.

The data presented below only considers available health department data. The records are limited in some instances, but the assessment presents information based on what is publicly available.

For the assessment presented within, each component is presented utilizing three (3) main risk categories: realized risk, emerging risk, and potential risk as further described below. The intent of this categorization is to quantify existing conditions and apply an associated low, medium and high risk to those existing conditions and potential future issues the communities are facing for long-term sustainability.

Waterford - Water

Based on studies performed, Waterford's primary challenge is wells with low yield or no yield. Previous studies considered community surveys, hydrogeological studies, and available data. The analysis presented below is based only on available health department data.

- **Realized Risk**
 - Realized risks are considered instances where wells have run dry, homeowners have dug wells, and low yielding wells.
- **Emerging Risk**
 - Emerging risks are identified as well systems that have a history of hydrofracking or deepening, parcels that utilize supplemental water, setback requirements are not met, and those properties that rely on more than one (1) well.
- **Potential Risk**
 - Potential risk includes wells that are nearing or at the end of their useful life (≥ 50 years old), shared wells, wells located within easements or on adjacent properties, and properties with insufficient area to site new wells.

The tables below summarize the number of properties that meet these criteria. All properties within the community are considered for each criteria. Therefore, a single property could fall under more than one of the criteria and risk categories being considered.

Table 1 – Waterford Realized Risk Summary

REALIZED RISKS	NO. PROPERTIES	% PROPERTIES
Abandoned Well	44	37%
Dry Well Instances	51	43%
Dug Well	11	9%
Low Yield (≤ 1 gpm)	20	17%
Low Yield (≤ 2 gpm)*	29	24%

*The Groundwater Resource Evaluation completed by Tetra Tech in March 2022 identified 43 wells with yields ≤ 2 gpm.

Table 2 – Waterford Emerging Risk Summary

EMERGING RISK	NO. OF PROPERTIES	% SERVICE AREA
History of Hydrofracking and/or Deepening	3	3%
Supplements Water (Hauled in & Cisterns)	7	6%
Multiple Active Wells	21	18%
Setback Requirements Not Met*	31	26%
*Additional setbacks may apply.		

Table 3 – Waterford Potential Risk Summary

POTENTIAL RISK	NO. OF PROPERTIES	% SERVICE AREA
Shared Private Well (Active)*	8	7%
Well Located on Adjacent Property	7	6%
Risk of Insufficient Area to Install New	97	82%
Low Yield (≤ 4 gpm)	50	42%
Age (≥ 30 yrs)	75	63%
Age (≥ 40 yrs)	45	38%
Age (≥ 50 yrs)	21	18%
*Historical data shows up to 24 properties have had shared wells in the past		

Based on this review, 94% of properties in Waterford fall under one or more of these criteria.

Paeonian Springs - Water

The Paeonian Springs on-site water systems' main mode of failure is well contamination, poor water quality (not quantity), and limited area for siting new wells. Again, this assessment summarizes the health department data findings in three (3) main categories.

- Realized Risks
 - Realized risks are instances where wells have contamination, specifically E.Coli and Total Coliform, both historical and present.
- Emerging Risk
 - Emerging risks are identified as wells that do not meet setback requirements.
- Potential Risk
 - Potential risk includes wells that are nearing or at the end of their useful life (≥ 50 years old), shared wells, wells located within easements or on adjacent properties, and properties with insufficient area to site new wells.

Table 4 – Paeonian Springs Water Realized Risk Summary

REALIZED RISKS	NO. OF PROPERTIES	% SERVICE AREA
E. coli (historical)*	3	3%
Total Coliform (historical)	6	5%
*Loudoun County also conducted voluntary testing in August of 2021 for Total Coliform, E.Coli, Nitrate and Nitrite, and Chloride in wells. 30 wells were tested. Of those tested, three (3) wells were positive for E.Coli. This represents 10% of the sampling pool. In addition, of those tested, 11 were positive for Total Coliform. This represents 37% of the sampling pool.		

Table 5 – Paeonian Springs Water Emerging Risk Summary

EMERGING RISK	NO. OF PROPERTIES	% SERVICE AREA
Setback Requirements Not Met	19	17%
Construction Standards Not Met	17	15%
*Additional setbacks may apply.		

Table 6 – Paeonian Springs Water Potential Risk Summary

POTENTIAL RISK	NO. OF PROPERTIES	% SERVICE AREA
Shared Private Well (Historical)	2	2%
Well Located on Adjacent Property	3	3%
Risk of Insufficient Area to Install New	88	79%
Age (≥ 30 yrs)	84	76%
Age (≥ 40 yrs)	59	53%
Age (≥ 50 yrs)	47	42%

Paeonian Springs - Wastewater:

The aging on-site sewage disposal systems in Paeonian Springs and limited area to address related issues presents potential for well water, groundwater, and surface water contamination from on-site sewage disposal systems. Within Paeonian Springs there are four (4) properties that rely on Pump & Hauls, and at least four (4) on privies or porta-potties. Again, the data is broken down into three (3) risk categories.

- Realized Risks
 - Realized risks are instances where homes have inadequate systems (such as pump and haul or pit privy), and historic failures.
- Emerging Risk
 - Emerging risks are identified as on-site sewage disposal systems with history of repairs, inadequate systems, properties with no drainfield reserve area for on-site sewage disposal systems, and those systems nearing or at the end of their useful life (≥ 30 to ≥ 50 years old). Inadequate systems under this criterion include bed systems installed before 2022, overlapping drainfields, undersized drainfields, and drainfields functioning with shut off lines.
- Potential Risk
 - Potential risk includes properties where setback requirements are not met, and those properties with drainfields for on-site sewage disposal systems sited on adjacent properties utilizing easements.

Table 7 – Paeonian Springs Wastewater Realized Risk Summary

REALIZED RISK	NO. OF PROPERTIES	% SERVICE AREA
Active Pump & Haul	4	4%
Pit Privy*	4	4%
Historic Failures (Past/Present)	33	30%
*The pit privy number is based on health department records. This does not account for the visible portable toilets (porta potties) located throughout the community. Three (3) porta potties were identified during a community walk through in June 2026. The walk through only accounted for porta potties that were visible from right of way.		

Table 8 – Paeonian Springs Wastewater Emerging Risk Summary

EMERGING RISK	NO. OF PROPERTIES	% SERVICE AREA
At Least One Repair	53	48%
Inadequate System	25	23%
No Drainfield Reserve Area	83	75%
Age ≥ 30 years Old	86	77%
Age ≥ 40 years Old	62	56%
Age ≥ 50 years Old	43	39%

Table 9 – Paeonian Springs Wastewater Potential Risk Summary

POTENTIAL RISK	NO. OF PROPERTIES	% SERVICE AREA
Setback Requirements Not Met	23	21%
Drainfield on Adjacent Property	7	6%

Based on this review of both water and wastewater, 81% of properties in Paeonian Springs fall under one or more of these criteria.

Summary

Paeonian Springs and Waterford face long-standing and increasingly critical challenges with their individual water and wastewater systems. Both communities exhibit conditions, including dense development, small parcel sizes, aging infrastructure, limited available land, unfavorable soils, and complex hydrogeological constraints, that significantly hinder homeowners' ability to maintain safe and sustainable on-site systems.

Given these constraints, a communal, interconnected water and wastewater solution provides the most reliable, resilient, and cost-effective path forward. The joint system approach leverages existing infrastructure, mitigates land acquisition challenges, ability to address supply and treatment challenges at a broader scale, and enables higher-quality, compliant treatment to protect public health and community wellbeing. The proposed communal solution is not only technically feasible but also the most effective solution to ensure the long-term viability, safety, and sustainability of the historical villages of Paeonian Springs and Waterford.